



Economic Analysis for the Final “Revised Definition of ‘Waters of the United States’” Rule

U.S. Environmental Protection Agency
and
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Abbreviations

ACS	American Community Survey
AFVO	Animal fats and vegetable oils
AJD	Approved jurisdictional determination
APA	Administrative Procedure Act
ASWM	Association of State Wetland Managers
BMP	Best management practice
BPJ	Best professional judgment
C&D	Construction and development
CBG	Census block group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Corps	U.S. Army Corps of Engineers
CTs	Census tracts
EA	Economic analysis
ELI	Environmental Law Institute
E.O.	Executive Order
FOSC	Federal on-site coordinator
FR	<i>Federal Register</i>
FRP	Facility Response Plan
FTE	Full-time equivalent
HUC	Hydrologic unit code
HUC4	4-digit hydrologic unit code
HUC12	12-digit hydrologic unit code
ICR	Information Collection Request
JD	Jurisdictional determination
LA	Load Allocation
LEDPA	Least environmentally damaging practicable alternative
MEP	Maximum extent practicable
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-sector general permit
NAICS	North American Industry Classification System
NHD	National Hydrography Dataset

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPFC	National Pollution Funds Center
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWPR	Navigable Waters Protection Rule
OMB	Office of Management and Budget
OPA	Oil Pollution Act of 1990
ORM2	Operation and Maintenance Business Information Link, Regulatory Module
OSLTF	Oil Spill Liability Trust Fund
OSRO	Oil spill removal organization
PHMSA	Pipeline and Hazardous Materials Safety Administration
PJD	Preliminary jurisdictional determination
<i>Rapanos</i>	<i>Rapanos v. United States</i> , 547 U.S. 715 (2006)
RFA	Regulatory Flexibility Act
RHA	Rivers and Harbors Act
RPA	Resource and Programmatic Assessment
RPWWN	Wetlands adjacent to but not directly abutting relatively permanent waters
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SISNOSE	Significant Economic Impact on a Substantial Number of Small Entities
SPCC	Spill Prevention, Control and Countermeasure
<i>SWANCC</i>	<i>Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers</i> , 531 U.S. 159 (2001)
SWMP	Stormwater management program
U.S. EPA	U.S. Environmental Protection Agency
TAS	Treatment in a Manner Similar as a State
TBEL	Technology-based effluent limit
TMDL	Total Maximum Daily Load
TNW	Traditional navigable waters
UMRA	Unfunded Mandates Reform Act
USDA	United States Department of Agriculture

USGS	United States Geological Survey
WLA	Wasteload allocation
WTP	Willingness to pay
WQBEL	Water quality-based effluent limit
WQS	Water quality standards

Executive Summary

Under the final rule, the U.S. Environmental Protection Agency and Department of the Army (“the agencies”) are exercising their authority to interpret “waters of the United States” to mean the waters defined by the familiar 1986 regulations, with amendments to reflect the agencies’ determination of the statutory limits on the scope of the “waters of the United States” informed by the text of the relevant provisions of the Clean Water Act and the statute as a whole, the scientific record, relevant Supreme Court precedent, and the agencies’ experience and technical expertise after more than 30 years of implementing the longstanding pre-2015 regulations defining “waters of the United States.” The term “waters of the United States” establishes the geographic jurisdictional scope of the Clean Water Act.

This action is a significant regulatory action (per Section 2(f)(4) of E.O. 12866) that was submitted to the Office of Management and Budget (OMB) for review. Therefore, pursuant to Executive Orders 12866 (Regulatory Planning and Review) and 13563 (Improving Regulation and Regulatory Review), the agencies have prepared this Economic Analysis (EA) to inform the public of potential effects associated with this rulemaking. This analysis is not required by the Clean Water Act and the costs and benefits analysis presented in the EA is not used by the agencies to help determine the extent of their authority under the Clean Water Act.

This EA assesses the potential impacts of the final changes to the definition of “waters of the United States” based on the potential effects to Clean Water Act programs that rely on that definition. A baseline is a description of the world absent the final rule, and the economic analysis thus describes the world with the final rule in place relative to that baseline. While the 2020 Navigable Waters Protection Rule (NWPR) remains in the Code of Federal Regulations, two courts have vacated the rule and the agencies are now implementing the definition of “waters of the United States” consistent with the pre-2015 regulatory regime nationwide.¹ As a result, the agencies consider two baselines in this EA: a primary baseline of the pre-2015 regulatory regime,² and a secondary baseline of the 2020 NWPR (85 FR 22250; June 22, 2020), which was in effect from June 22, 2020 to August 30, 2021. The agencies’ estimate based on the primary baseline is that the final rule will have *de minimis* impact. This is the estimate that the agencies consider to be the estimate that best reflects current circumstances.

¹ On August 30, 2021, the U.S. District Court for the District of Arizona issued an order vacating and remanding the 2020 NWPR in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. The U.S. District Court for the District of New Mexico also remanded and vacated the rule on September 27, 2021, in the case of *Navajo Nation v. U.S. Environmental Protection Agency*. In light of these orders, the agencies have halted implementation of the 2020 NWPR and have been interpreting “waters of the United States” consistent with the pre-2015 regulatory regime until further notice. EPA and the Corps have separate regulations defining the statutory term “waters of the United States,” but their interpretations were substantially similar and remained largely unchanged between 1977 and 2015. See 42 FR 37122, 37124, 37127 (July 19, 1977); 44 FR 32854 (June 7, 1979). For convenience, the agencies in this preamble will generally cite the Corps’ longstanding regulations and will refer to them as “the 1986 regulations,” “the pre-2015 regulations,” or “the regulations in place until 2015” as inclusive of EPA’s comparable regulations that were recodified in 1988 and of the exclusion for prior converted cropland both agencies added in 1993.

² The pre-2015 regulatory regime refers to the agencies’ pre-2015 regulatory definition of “waters of the United States,” implemented consistent with relevant case law and longstanding practice, as informed by applicable guidance, training, and experience.

Although the definition of “waters of the United States” affects several Clean Water Act programs, the quantitative analyses here focus on the Clean Water Act section 404 dredged and fill permits. These permits are required for discharges of dredged or fill material to many types of water, and the cost analysis focuses on costs to obtain permits, mitigation costs, and administrative costs to States for Clean Water Act section 401 certifications for Clean Water Act section 404 permits. The monetized benefits analysis focuses on the value of ecosystem services provided by wetland areas protected due to mitigation requirements. Avoidance and minimization costs are not captured in the monetized benefits due to data limitations. The agencies expect that there are important categories of benefits that are not monetized, such as improvements in downstream water quality and reducing flood risk that could increase benefits to the extent that they are not incorporated into the total value elicited in underlying studies.

Economic Analysis of Clean Water Act Jurisdictional Change under the Primary Baseline

The analysis of impacts relative to the primary baseline of the pre-2015 regulatory regime shows no monetized benefits or monetized costs since the final rule restores very similar protections and would not change current implementation sufficiently to quantifiably alter overall costs to the regulated public or States and Tribes. Minor differences between the total scope of jurisdiction under the final rule and the pre-2015 regulatory regime are possible based on how current agency guidance and practice compares to the implementation practices described in the final rule. The agencies expect that there will be a slight and unquantifiable increase in certain resources being found to be jurisdictional under the final rule in comparison to the pre-2015 regulatory regime. These increases are related to changes in some respects to the manner of implementing the relatively permanent standard and the significant nexus standard. As these increases are *de minimis* and cannot be quantified, this rule is not economically significant relative to the primary baseline.

The agencies expect implementation changes associated with the final rule to result in *de minimis* effects to the Clean Water Act programs. As a result, the national annual quantified benefits of the Clean Water Act programs are estimated to be *de minimis*, and the national quantified annual costs from the Clean Water Act programs are estimated to be *de minimis*, as shown in Table ES-1. Per Executive Order (E.O.) 13563, the agencies have determined that the benefits of the final rule justify its costs, under the primary baseline. The agencies acknowledge that there would likely be some administrative costs associated with regulated entities as well as States, Tribes and localities reviewing the final rule language and ensuring their activities going forward are in keeping with it. However, these administrative costs would be *de minimis*. The agencies also acknowledge that there would likely be some minimal increased costs associated with regulated entities obtaining permits and complying with mitigation requirements under section 404 for the slight and unquantifiable increase in certain resources being found to be jurisdictional under the final rule in comparison to the pre-2015 regulatory regime. However, as stated above, these nationwide costs would be *de minimis*.

Table ES-1: Total national benefits and costs (2021\$) relative to primary baseline of the pre-2015 regulatory regime	
Benefits	<i>de minimis*</i>
Costs	<i>de minimis*</i>
Net Benefits	<i>de minimis*</i>

Table ES-1: Total national benefits and costs (2021\$) relative to primary baseline of the pre-2015 regulatory regime

*There would likely be some costs and benefits associated with the final rule, but on a nationwide level those costs and benefits would be so small as to not be reasonably quantifiable.

Economic Analysis of Clean Water Act Jurisdictional Change Under the Secondary Baseline

The agencies also conducted an economic analysis relative to the secondary, or alternate, baseline of the 2020 NWPR to provide the public with best available information on the way the change in jurisdiction under the final rule will impact various Clean Water Act programs, with an emphasis on the Clean Water Act section 404 program because (1) the agencies have rich data from the section 404 program and (2) experience shows the section 404 program to be the program most immediately and directly impacted by changes to the definition of “waters of the United States.” The economic analysis consists of a national analysis of the benefits and costs of the final rule as they pertain to the Clean Water Act section 404 program and a series of qualitative assessments of the effects of the final rule on other Clean Water Act programs. Here the agencies describe for the public the results of analyzing the final rule relative to the secondary baseline of the 2020 NWPR.

The economic analysis under the secondary baseline has multiple components. First, it provides a national quantitative assessment of the estimated benefits and costs of the final rule’s potential effects on the Clean Water Act section 404 program compared to the 2020 NWPR. The secondary baseline compares data between the pre-2015 regulatory regime (*i.e.*, the primary baseline) and the 2020 NWPR. This is because the primary baseline poses *de minimis* changes in comparison to the final rule and because the data available for this analysis are most strongly associated with prior jurisdictional determinations and section 404 permitting decisions made under the pre-2015 regulatory regime and the 2020 NWPR. This benefit-cost analysis builds upon a meta-analysis of wetland valuation studies. Relative to the meta-analysis used in the economic analysis of the proposed rule (U.S. EPA and Army, 2021), the agencies have: (1) incorporated 11 additional studies into the meta-data (3 freshwater wetland and 8 saltwater wetland valuation studies), (2) developed a “pooled” meta-analytic model based on meta-data from freshwater and saltwater wetland valuation studies, and (3) implemented a benefit transfer methodology that uses a radius-based approach to determine market extent. Second, it contains qualitative assessments of certain programs that depend at least in part upon the definition of “waters of the United States,” including the section 311 and section 402 programs. Third, environmental justice and Tribal impact analyses assess how the benefits associated with the final rule are distributed across vulnerable and Tribal communities relative to society at large. Lastly, a sector impact analysis delves into which economic sectors would be subject indirectly to the impacts of the final rule; though indirect, those impacts are included in aggregate in this analysis.

The agencies note that the economic analysis of the secondary baseline is subject to various layers of uncertainty regarding the potential implications of the change in Clean Water Act jurisdiction as well as data limitations. Notably, the main challenge is quantifying the amount, type, and location of water resources that are affected by the changing definition of “waters of the United States.” For this analysis, the agencies were able to rely on approximately one year of 2020 NWPR Clean Water Act section 404 implementation data to help predict the change between the secondary baseline of the 2020 NWPR and

the final rule (*see* Section III.C.2.1 for detail). There are uncertainties associated with both the estimation of benefit and cost estimates. The benefit estimates, in particular, do not reflect the full scope of benefits of this rule, as they omit known sources of benefits that are inherently difficult to quantify. Many of the benefits provided by these water features can be episodic and highly dispersed, making them inherently difficult to accurately quantify their aggregate effect over time and across landscapes. Examples of these benefit categories include the ability to sequester carbon, reduce soil erosion, and retain flood waters. For a discussion of the unquantified benefits, *see* section III.C.6 on analytical uncertainties.

The qualitative assessments for the Clean Water Act section 311 and 402 programs provide a national assessment of the potential effects of this rule in cases where the agencies currently lack the datasets to quantitatively assess the effects. The qualitative analyses are intended to provide information on the potential direction of the effects.

National Analysis of Potential Effects and Benefits and Costs of the Final Rule on Clean Water Act Section 404 under the Secondary Baseline

This rule could affect requirements to obtain Clean Water Act section 404 permits for certain activities in waters where jurisdictional status would change in comparison to the 2020 NWPR. Where applicable, it may also affect requirements for permittees to mitigate unavoidable impacts from those activities. In comparison to the 2020 NWPR secondary baseline, there are likely to be more jurisdictional waters under the final rule. In the context of the 2020 NWPR secondary baseline, with these additional waters there may be an increased need to demonstrate that impacts have been minimized to the maximum extent practicable, as well as an increased need for and amount of mitigation to offset impacts of activities.

Table ES-2 presents national estimates of the increase in wetland mitigation acres between the 2020 NWPR and the final rule. Relative to the 2020 NWPR secondary baseline, permanent wetland mitigation acres are estimated to increase by 1,406.3 annually and temporary mitigation acres by 265.1 annually. Under the final rule, the increase in wetland mitigation acres would accumulate over time. The cumulative increase in wetland acres from an increase in mitigation requirements over a 20-year timeframe (between 2023 and 2042) is 32,099.5 acres.

Table ES-2: Estimated national increase in wetland mitigation acres under the final rule relative to the secondary baseline of 2020 NWPR

Annual Average Increase in Wetland Mitigation Acres			Cumulative Increase in Wetland Mitigation Acres (20 years) ¹		
Permanent	Temporary	Total	Permanent	Temporary	Total
1,406.3	265.1	1,671.4	28,122.1	3,977.4	32,099.5

¹ The cumulative increase in the permanent wetland mitigation acres assumes a linear trend over a 20-year period from 2023 to 2042. The temporary increase in wetland mitigation acres assumes a linear trend over a 15-year period from 2028 to 2042. The 5-year lag in benefits from mitigation measures for temporary impacts is based on discussion with the Corps and accounts for the time required for temporarily impacted areas to return to their original state.

It is possible to estimate, quantify, and value some but not all the potential effects of the final rule. Accordingly, for the secondary baseline, the agencies focused on potential Clean Water Act section 404 program impacts of the final rule for which data are sufficient to develop quantitative estimates. Inputs for

this analysis include the Clean Water Act section 404 permit data from the U.S. Army Corps of Engineers' (Corps') Operation and Maintenance Business Information Link, Regulatory Module (ORM2) database, which the agencies used to predict the number of permits potentially affected by the final rule, as well as Corps ORM2 data on jurisdictional determinations (JD), which the agencies used to identify affected resources that may change status under the final rule, as compared to the 2020 NWPR. To estimate potential costs, the agencies used a similar methodology as used in the analysis of the 2020 NWPR (U.S. EPA and Army, 2020a). As shown in Table ES-3, total estimated national annualized social costs (including permitting and mitigation costs and State costs from increases in section 401 reviews) ranged from \$218 million to \$547 million at a 3% discount rate. Using a 7% discount rate, total estimated national annualized costs range from \$227 million to \$569 million. The national cost estimates presented in the proposal analysis did not include cost estimates for those States that the agencies considered to have State-level permitting programs commensurate with the proposed regulations. However, the agencies received public comments recommending that the national level cost and benefit estimates include these States. As a result, the national cost and benefit estimates presented in the economic analysis for the final rule are for all States, except Hawaii and the District of Columbia which lacked sufficient data to base estimates on. Appendix C presents State-level cost estimates.

Table ES-3: Total national annualized compliance costs, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Cost Category	3% Discount Rate ¹		7% Discount Rate ¹	
	Low	High	Low	High
Mitigation Costs	\$175.8	\$390.3	\$182.6	\$405.5
Permit Costs	\$41.7	\$136.2	\$43.3	\$141.5
State costs from increases in section 401 reviews	\$0.6	\$21.0	\$0.7	\$21.8
Total²	\$218.0 + A	\$547.5 + A	\$226.6 + A	\$568.7 + A
¹ Total costs annualized over the 2023-2042 analysis period. Reflects expected costs in 49 States (excludes Hawaii and District of Columbia).				
² The "A" represents unquantified costs such as those for avoidance and minimization efforts required under Clean Water Act section 404 permits and those costs that may occur under the Clean Water Act section 311, 401, and 402 programs.				

To estimate benefits, the agencies relied upon a wetland valuation meta-analysis function. The meta-analysis uses the results of multiple wetland valuation studies to derive an underlying valuation function that can be adjusted and applied nationally (see Appendix B for detail). The agencies applied several benefit transfer approaches which differed in their assumptions of the extent of the market for wetlands. This included benefit transfer approaches which assumed market extents of 50-, 100-, and 200-miles from county centroids, and a benefit transfer approach which assumed market extents were limited to state boundaries. In general, larger market extents lead to larger benefits. As shown in Table ES-4, the estimated annualized national benefits under the secondary baseline of the 2020 NWPR, using a 3% discount rate, range between \$1,402 million (using a 50-mile radius as market extent) and \$2,190 million (using a 200-mile radius as market extent). The agencies note that even though mean per household willingness-to-pay (WTP) is lower for larger market areas (because of larger baseline wetland areas), the summation of values over larger populations leads to larger aggregate population-level WTP. Using a 7% discount rate, total estimated national annualized benefits range from \$1,206 million to \$1,885 million.

Table ES-4: Total national annualized benefits, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Extent of the market	Number of affected households in 2019 (millions) ^{1,2,3}	Average household WTP per 100 acres (2021\$) ^{1,4}	Total annualized benefits (millions 2021\$) ^{1,5,6}	
			3% Discount Rate	7% Discount Rate
50-mile Radius	120.0	\$7.59	\$1,401.7 + B	\$1,205.5 + B
100-mile Radius		\$2.70	\$1,601.0 + B	\$1,377.2 + B
200-mile Radius		\$1.41	\$2,189.8 + B	\$1,884.6 + B
State-level		\$1.24	\$2,034.5 + B	\$1,752.3 + B

¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.

² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period using population projections from Hauer et al. (2021).

³ The same number of acres are protected under the rule regardless of what radii are used. However, the acreage of protected wetlands that households have WTP for does vary based on the radius selected. The radii chosen also effects the proportion of protected wetlands that are considered either local or non-local.

⁴ For buffer-level market extents, benefit estimates are based on a benefit transfer application of the Pooled Model to 50-mile, 100-mile, and 200-mile buffers of county centroids for counties in the conterminous United States (excluding Hawaii, Alaska, and the District of Columbia; see Appendix B for detail). For the state-level market extent, benefit estimates are based on a benefit transfer application of the Pooled Model to all States (excluding Hawaii and the District of Columbia; see Appendix D for detail). The household WTP per 100 acres estimates shown are averages across States or Counties.

⁵ Total benefits are annualized over the 2023-2042 analysis period. Given data limitations, benefits could not be calculated for Alaska at a level finer than the State (*i.e.*, at a county-equivalent level) for the 50-mile, 100-mile, and 200-mile buffer market extents. National benefits for the three buffer market extents include estimated benefits for Alaska using a State-specific benefit transfer.

⁶ The “B” represents unquantified benefits such as those for wetlands and streams protected through avoidance and minimization efforts required under Clean Water Act section 404 permits, carbon sequestration benefits, and those benefits that may occur under the Clean Water Act section 311, 401, and 402 programs.

The monetized benefit estimates do not fully account for all benefits, such as the water quality benefits associated with avoidance and minimization efforts and benefits associated with upstream and downstream connectivity of wetlands. Many of the benefits provided by these water features can be episodic and highly dispersed, making it inherently difficult to accurately quantify their aggregate effect over time and across landscapes. For a discussion of the unquantified benefits, see Section III.C.3 on analytical uncertainties. Relative to the secondary baseline of the 2020 NWPR, using a 3 percent discount rate, the low estimates for benefits and costs result in net benefits of \$1,184 million. Similarly, the high estimates for benefits and costs result in net benefits of \$1,642 million. Different factors led to the ranges for costs and benefits, such that low/high benefits are not necessarily correlated with low/high costs.³ Net benefits could thus range from \$854 million (if low benefit estimates are combined with high cost estimates) to \$1,972 million (if high benefit estimates are combined with low cost estimates). The unquantified costs (A) and unquantified benefits (B) would also contribute B-A to any estimate of net benefits, though this unquantified estimate is not expected to negate the positive net benefits. Thus, under

³ Because low and high estimates of benefits and costs are driven by different factors (*i.e.*, extent of the market vs. mitigation cost per acre or linear foot), they are unlikely to be correlated.

E.O. 13563, the agencies would interpret the benefits of this rule as justifying its costs, as compared to the secondary baseline of the 2020 NWPR.

The monetized benefit estimates do not have a linear relationship to estimated acres of avoided wetland losses. The primary reason is the wide range of estimated household (“HH”) WTP for avoided wetland losses (see the Table ES-5 below). The average household (“HH”) WTP estimate varies geographically, by county, as do estimates of avoided losses of wetlands. Relevant factors, such as household income and geographic region of the country contribute to this observed variation in HH WTP. In particular, the proportion of wetlands that are forested has a large effect on HH WTP. The Table ES-5 shows that the average HH WTP for both forested local and non-local wetlands have wider ranges and higher mean values than the non-forested wetlands categories.

Table ES-5: WTP per 100 acres by wetland type (2021\$)			
Wetland Type	Minimum	WTP per 100 Acres¹	
		Mean	Maximum
Local, forested	\$1.62	\$28.55	\$56.35
Local, non-forested	\$0.23	\$3.07	\$6.14
Non-local, forested	\$0.07	\$1.28	\$2.59
Non-local, non-forested	\$0.01	\$0.15	\$0.30
¹ The WTP values per 100 acres are based on the estimated minimum, mean, and maximum values across all counties included in the analysis.			

The geographic variation in population density also contributes to the non-linear relationship between benefit estimates and avoided wetland losses. An acre of protected wetlands generates significantly more benefits in a highly populated urban area compared with a rural area, due to the much larger number of households estimated to value it. The Table ES-5 also shows the importance of whether a protected wetland is considered local or non-local. Both forested and non-forested local wetlands have a significantly higher WTP than forested and non-forested non-local wetlands. The numbers of local and non-local wetlands valued by households are a direct result of the buffer distances chosen, and the national benefit estimates demonstrate a high sensitivity to the buffer distances for both local avoided wetland losses (*i.e.*, 30 miles) and non-local avoided wetland losses (*i.e.*, 50, 100, and 200 miles). The combination of these factors results in some counties in some states being particularly influential in the wetlands benefit transfer results.

Outside of this rulemaking, the agencies plan to further refine aspects of their approach to valuing benefits associated with preserving wetlands, including incorporating ecosystem service effects. The agencies plan to undertake peer review on aspects of their approach including examination of influential variables and the agencies’ application of the meta-analysis.

State and Tribal Secondary Baseline Protections

The agencies examined the extent to which waters were protected by State and Tribal laws and regulations while the 2020 NWPR was in effect. The agencies assessed State programs under the 2020 NWPR jurisdictional change with respect to aquatic resource protections and water quality protections for

“waters of the State.” States with more protective State regulations on “waters of the State” may see fewer costs and benefits associated with this final rule in comparison to those States with fewer State regulations on “waters of the State.” After receiving public comment on the proposed method for assessing State costs and benefits, the agencies have changed this portion of the analysis to a qualitative discussion of State regulatory programs. The agencies do not exclude any portions of costs and benefits for given States from the overall quantitative analysis. The assessments of current State programs can be found in the Supplementary Material to this EA (U.S. EPA and Army, 2022a; hereafter, “regulatory compendium”).⁴

Potential Effects of the Final Rule Relative to Secondary Baseline on Other Major Clean Water Act Programs

The definition of “waters of the United States” affects the implementation of other Clean Water Act programs, including the section 303(c) water quality standards program, the section 311 oil spill prevention program, the section 401 water quality certification program, and the section 402 NPDES permit program. A revised definition of “waters of the United States” will affect these Clean Water Act programs at both the federal and State level. Potential effects may vary based on a State’s authority under its own State law to address aquatic resources and their capacity to address these aquatic resources through non-regulatory efforts.

Clean Water Act Section 402

Facilities that currently have a NPDES permit under Clean Water Act section 402 or under an authorized State program can be assumed to either discharge to a “water of the United States” or to waters that convey pollutants downstream to a jurisdictional water. It is possible that over time some dischargers could have forgone permits due to the 2020 NWPR’s narrower definition of “waters of the United States”; however, this is not something the agencies observed during the one year the rule was implemented. It is possible that reinstating protections on certain receiving waters may move the compliance point for a given discharger and result in incremental costs to meet any more stringent limits *if* the discharger sought relaxed limits after the 2020 NWPR was promulgated, but these costs are expected to be minimal. The incremental costs would be more likely if the State did not protect these immediate receiving waters under State law.

Clean Water Act Section 311

Section 311 of the Clean Water Act, Oil Spill Prevention, Preparedness, Reporting and Response, includes two main components that address the risk and harm from oil spills: (1) spill prevention requirements contained in the EPA’s Spill Prevention, Control, and Countermeasure (SPCC) and worst case discharge preparedness requirements in EPA’s Facility Response Plan (FRP) regulations for non-transportation related facilities and in the United States Coast Guard and Department of Transportation

⁴ Available in the docket for this rule, Docket ID Number EPA-HQ-OW-2021-0602. This document is also referred to as the Updated State Snapshots.

regulations for transportation-related facilities, and (2) spill notification and response, as described under the National Contingency Plan.

Applicability of the SPCC and FRP depends on whether there is a reasonable expectation that a discharge from the facility could reach navigable waters based on geographical and locational aspects of the facility, and therefore changes in Clean Water Act jurisdiction could affect the need for compliance with both SPCC and FRP requirements for some facilities. The agencies estimate that approximately 550,000 facilities are currently subject to SPCC requirements and about 3,800 facilities are subject to FRP requirements.

The agencies do not believe the 2020 NWPR caused a substantive change to the compliance costs subject to SPCC and FRP requirements or changed the number of pipeline or rail operators that are required to prepare and maintain facility response plans. The agencies believe that most facilities still chose to continue to implement spill prevention measures that are considered good engineering practices for their industry, such as secondary containment, overfill prevention, practices to ensure the safe transfer of oil to bulk storage containers and visual inspections of bulk storage containers while the agencies pursue this rulemaking. The agencies also did not observe that changes in the scope of “waters of the United States” under the 2020 NWPR had a material effect on spill notification and response. Accordingly, the agencies anticipate that impacts of the final rule on the Clean Water Act section 311 program would not be significant.

Clean Water Act Section 303

The potential effect of the definitional change on the number of waterbodies added to the impaired waters list (and subsequent total maximum daily load (TMDL) development) is uncertain. Absent the application of the Clean Water Act to waters that would return to being jurisdictional under the final rule, States and Tribes can still choose to impose similar State or Tribal law requirements on these waters irrespective of federal mandates. Some States have developed standards for certain categories of water (*e.g.*, ephemeral features) that could be jurisdictional under the final rule but not jurisdictional under the secondary baseline of the 2020 NWPR, and others have not. The development and revision of Statewide or Tribal water quality standards is typically an ongoing process, so changes that the 2020 NWPR could have precipitated might not have appeared during the year that it was in effect.

Changes in Clean Water Act jurisdiction could lead to requests for changes in TMDL waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources. The agencies do not know what share of the currently more than 73,000 completed TMDLs nationwide covered waters were affected by the 2020 NWPR under the secondary baseline and would return to being jurisdictional under the final rule.

Clean Water Act Section 401

Under the final rule, the number of Clean Water Act section 404 permits would be expected to increase since certain features would no longer be categorically excluded from the definition of “waters of the United States.” An increase in Clean Water Act section 404 permits could result in costs to States and authorized Tribes by increasing the number of section 401 reviews and required staff time. Simultaneously, it could increase environmental and social benefits related to section 401 reviews.

Forty-seven States and one U.S. territory have been authorized to administer all or parts of the Clean Water Act section 402 program. States that have not been authorized to administer the section 402 program and Tribes authorized to administer section 401 would continue to have the opportunity to complete section 401 certification on EPA-issued section 402 permits. If there are a larger number of EPA-issued section 402 permits, then there would be an increase in the number of section 401 reviews, associated staff time and associated environmental and social benefits.

I. Introduction and Overview

Under the final rule, the U.S. Environmental Protection Agency and Department of the Army (“the agencies”) are exercising their authority to interpret “waters of the United States” to mean the waters defined by the regulations in place prior to the 2015 Clean Water Rule defining “waters of the United States,” with amendments to reflect the agencies’ determination of the statutory limits on the scope of the “waters of the United States” informed by Supreme Court precedent, the best available science, and the agencies’ experience and technical expertise. “Waters of the United States” is a foundational term establishing the geographic jurisdictional scope of the Clean Water Act.

On January 20, 2021, the Biden administration issued Executive Order 13990 entitled “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.” Executive Order 13990 directs federal agencies to review all existing regulations, orders, guidance documents, policies, and any other similar agency actions promulgated, issued, or adopted between January 20, 2017, and January 20, 2021, including the Navigable Waters Protection Rule (2020 NWPR). Executive Order 13990 also specifically revoked Executive Order 13778 of February 28, 2017 (“Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the “Waters of the United States” Rule”), which had resulted in promulgation of the 2020 NWPR. Beginning on June 9, 2021, the agencies filed declarations from EPA Assistant Administrator Radhika Fox and Acting Assistant Secretary of the Army for Civil Works Jaime A. Pinkham in multiple district court challenges to the 2020 NWPR, stating that the agencies had completed their review of the 2020 NWPR and determined the rule must be replaced.⁵

On August 30, 2021, the U.S. District Court for the District of Arizona issued an order vacating and remanding the 2020 NWPR. *Pascua Yaqui Tribe v. EPA*, No. 4:20-cv-00266, 2021 WL 3855977 (D. Ariz. Aug. 30, 2021). On September 2, 2021, the Department of the Army directed the U.S. Army Corps of Engineers (Corps) to resume conducting approved jurisdictional determinations nationwide consistent with the pre-2015 “waters of the United States” regulatory regime. The pre-2015 regulatory regime refers to the agencies’ pre-2015 regulatory definition of “waters of the United States” at 33 CFR 328.3, implemented consistent with relevant case law and longstanding practice, as informed by applicable guidance, training, and experience. On September 27, 2021, the U.S. District Court for the District of New Mexico also remanded the 2020 NWPR to EPA and the Army and vacated the rule. *Navajo Nation v. EPA*, No. 2:20-cv-00602 (D.N.M. Sept. 27, 2021).

The agencies are exercising their authority to interpret “waters of the United States” to mean the waters defined by the regulations in place prior to the 2015 Clean Water Rule defining “waters of the United States,” with amendments to reflect the agencies’ determination of the statutory limits on the scope of the “waters of the United States” informed by Supreme Court precedent, the best available science, and the agencies’ experience and technical expertise. As a result of the *Pascua Yaqui* and *Navajo Nation* vacatur, this rule generally will establish a familiar legal framework.

⁵ Declarations of Radhika Fox and Jaime A. Pinkham, filed in *Conservation Law Found. et al. v. EPA et al.*, 20-cv-10820-DPW (D. Mass. Jun. 9, 2021) as well as in every other district court challenge to the 2020 NWPR.

This Economic Analysis (EA) assesses the potential impacts of the changes to the definition of “waters of the United States” based on the potential effects on the Clean Water Act programs that rely on the definition of “waters of the United States.” Two baselines are presented: a primary baseline of the pre-2015 regulatory regime and a secondary baseline of the 2020 NWPR. For purposes of meeting the statutory and executive order requirements for a significant rulemaking, the primary baseline of the pre-2015 regulatory regime is used. This analysis is consistent with the fact that the agencies are implementing the pre-2015 regulatory regime since the *Pascua Yaqui* and *Navajo Nation* vacatur. An economic analysis using the secondary baseline of the 2020 NWPR is also provided because it provides the public with best available information about the forecast of impacts of the final rule compared to the 2020 NWPR. This method of using two baselines is consistent with the EPA’s *Guidelines for Preparing Economic Analyses* (U.S. EPA, 2010) and the Office of Management and Budget (OMB) Circular A-4 (U.S. Office of Management and Budget, 2003) regarding developing multiple baselines.

I.A Overview of Economic Analysis

This EA is organized as follows. Chapter One provides an overview of this document, with the EA conducted relative to two baselines. Chapter Two qualitatively describes how State regulatory programs potentially function in concert with federal protections. Chapter Three contains the analysis of the potential impacts of this rule on Clean Water Act programs and a national-scale evaluation of the Clean Water Act section 404 program, relative to the secondary baseline. Chapter Four provides an Environmental Justice Analysis relative to the secondary baseline. Chapter Five presents a Tribal Impacts Analysis relative to the secondary baseline, and Chapter Six presents a Sector Impact Analysis relative to the secondary baseline.

Chapter One is organized as follows. The remainder of this section provides a high-level overview of the methodology used in Chapter Three. Section 1.B includes a summary of changes in Clean Water Act jurisdiction between the two baselines and the final rule. Section 1.C summarizes how the Cowardin Classification system was used as part of assessing the change in scope of jurisdiction. Section 1.D includes the complete results of the economic analysis relative to the primary baseline. Finally, Section 1.E contains the chapter summary.

For the secondary baseline analysis, the agencies considered a geospatial analysis of the regulatory option by identifying specific waterbodies that would potentially not be jurisdictional under the 2020 NWPR but would be jurisdictional under the final rule. However, the agencies determined that they could not easily approximate the categories of waters that the 2020 NWPR does and does not protect using the most comprehensive and nationally consistent geospatial surface hydrology and wetland data available, the National Hydrography Dataset (NHD; U.S. Geological Survey, n.d.) and the National Wetlands Inventory (NWI; U.S. Fish and Wildlife Service (U.S. FWS), n.d.). For example, certain waters were categorically excluded under the 2020 NWPR (*e.g.*, ephemerals); however, such features may be jurisdictional as non-relatively permanent waters based on a case-specific significant nexus analysis under the final rule. Thus, the agencies did not use the NHD or NWI to assess potential changes in jurisdiction as a result of replacing the 2020 NWPR with the final rule. Rather, the agencies used Clean Water Act section 404 jurisdictional determination data to estimate the change in waters requiring permit protection under the two regulatory regimes. For the primary baseline, the extent of this analysis is nested within Section I.B.3, and the overall conclusion is that the differences are *de minimis* between the primary baseline and final rule. For the secondary baseline, outcomes of approved jurisdictional determinations (AJDs) under the

pre-2015 regulatory regime are compared to those from the 2020 NWPR. AJDs that were based on either the *Rapanos* Guidance or 2020 NWPR were used to estimate the probability of different types of water features being a “water of the United States” under either regulatory regime. By contrast, the agencies did not use preliminary jurisdictional determinations (PJDs) to estimate probabilities because under a PJD, the site owner voluntarily waives or sets aside questions regarding Clean Water Act jurisdiction over a particular site and thus moves forward without a formal determination assuming all waters will be treated as jurisdictional. The difference in the probability of being a “water of the United States” under these two regulatory regimes was used to estimate the likely extent of change in jurisdiction for different types of water features. This approach allowed the agencies to perform a national analysis of the potential change in benefits and costs to society of moving from the secondary baseline of the 2020 NWPR to the final rule. *See* Section III.C.2 for more details.

This national analysis is limited to the Clean Water Act section 404 program for two reasons. First, the agencies do not have sufficient national data to perform a similar analysis for the waters affected by the Clean Water Act sections 402, 311, and other programs. Secondly, the agencies continue to believe that likely jurisdictional changes under the 2020 NWPR did not have a substantial effect on the universe of activities covered by these other Clean Water Act programs during the short time it was in effect, as discussed in more detail in Sections III.A (section 311), III.B (section 402), and III.D (sections 303 and 401).

There are several supporting documents to this EA, including an updated snapshot of the applicable regulatory and legal framework currently in place in States and on Tribal lands to provide context for how aquatic resources are protected (*see* Supplementary Material), a detailed appendix of how change in jurisdictional scope was quantified (Appendix A), a wetland meta-analysis (Appendix B), the State-level results of the overall analysis (Appendix C), a sensitivity analysis of national benefits from increases in wetland mitigation requirements (Appendix D), mapped NHD stream mileage and NWI wetland acreage by State (Appendix E), State-level results for the environmental justice analysis (Appendix F), a sector impact analysis which tracks economic sectors that tend to directly or indirectly be involved in Clean Water Act section 404 permitting (Appendix G), and alternative permit cost estimates using Sunding and Zilberman (2002) values (Appendix H). Additional appendices are provided to detail protocols used in analyses or to summarize findings via supplementary figures and tables.

EPA’s Science Advisory Board (SAB) also reviewed aspects of the proposed rule EA. On March 7, 2022, the Chartered SAB unanimously voted to review the scientific and technical basis of the proposed rule. The SAB formed a Work Group of its chartered members which issued a draft review on May 9, 2022, and the SAB issued their final review on July 5, 2022 (EPA-SAB-22-005). All materials related to the SAB’s review are available in the docket for this rule and on the SAB’s website. The SAB’s review was generally favorable towards the approaches taken in the proposed rule EA. The SAB made recommendations for improvement of the EA, particularly regarding the environmental federalism approach and the continued non-monetization of certain benefits. The SAB indicated that the agencies’ plans for expanding the environmental justice analysis for this rule were appropriate and provided recommendations for improving and clarifying the analysis. Many of the substantive recommendations provided by the SAB on the EA were also received as part of the public notice process on the proposed rule. A memorandum summarizing the agencies’ interactions with the SAB and the SAB’s review of the proposed rule and its supporting documents is available in the docket for this rule.

I.B Summary of the Final Changes in Clean Water Act Jurisdiction Relative to the Secondary Baseline

I.B.1 The Pre-2015 Regulatory Regime Baseline

The definition of the term “waters of the United States” in the 1986 regulations⁶ is defined at paragraph (a) of that rule as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - ii. (From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - iii. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (a)(1) through (4) of this section;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1) through (6) of this section;
8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

⁶ EPA and the Corps have separate regulations defining the statutory term “waters of the United States,” but their interpretations were substantially similar and remained largely unchanged between 1977 and 2015. *See, e.g.*, 42 FR 37122, 37144 (July 19, 1977); 44 FR 32854, 32901 (June 7, 1979). For convenience, in this document and in the preamble the agencies will generally cite the Corps’ longstanding regulations and will refer to them as “the 1986 regulations,” “the pre-2015 regulations,” or “the regulations in place until 2015.” These references are inclusive of EPA’s comparable regulations that were recodified in 1988 and of the exclusion for prior converted cropland, which both agencies added in 1993.

9. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Due to Supreme Court decisions, the agencies' implementation of the 1986 regulations differs from the straight text of the regulations. The agencies' pre-2015 practice is informed by applicable agency guidance documents and consistent with Supreme Court's decisions in *United States v. Riverside Bayview Homes*, *SWANCC*, and *Rapanos* and longstanding agency practice. When this document refers to the categories of "waters of the United States" used in the 1986 regulations, the agencies are specifically referring to the categories as they are implemented under the pre-2015 regulatory regime.

Under pre-2015 practice, the agencies assert jurisdiction over the following waters without need for a significant nexus analysis:

- traditional navigable waters, interstate waters, and the territorial seas;⁷
- wetlands adjacent to traditional navigable waters, interstate waters, and the territorial seas;
- impoundments of jurisdictional waters;⁸
- non-navigable tributaries of traditional navigable waters, interstate waters, or the territorial seas that are relatively permanent (*i.e.*, where the tributaries typically flow year-round or have continuous flow at least seasonally); and
- wetlands that directly abut such tributaries.

Under pre-2015 practice, the agencies assess whether the following waters are jurisdictional based on a case-specific analysis to determine whether they have a significant nexus with a traditional navigable water, interstate water, or the territorial seas:

- non-navigable tributaries that are not relatively permanent;
- wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary.

Under pre-2015 practice, the agencies utilize the 2003 *SWANCC* Guidance for determinations that are made under the (a)(3) category of that rule. The Guidance stated that in light of the *SWANCC* decision, the agencies should not assert Clean Water Act jurisdiction over waters under the (a)(3) category of the 1986 regulations, where the sole basis available for asserting jurisdiction rests on any of the factors listed in the "Migratory Bird Rule" and also established coordination procedures for paragraph (a)(3) "other

⁷ Although interstate waters and the territorial seas were not addressed in the Supreme Court decisions, the agencies have long recognized that protecting these waters, along with traditional navigable waters is a fundamental aim of the Clean Water Act, and thus have treated such waters in a similar manner to traditional navigable waters. All three categories of waters are waters where the federal interest is indisputable.

⁸ Impoundments were not addressed directly by the *Riverside Bayview*, *SWANCC*, or *Rapanos* Supreme Court decisions, but under pre-2015 practice impoundments of jurisdictional waters remain jurisdictional.

waters.” See 68 FR 1991, 1995 (January 15, 2003) (“field staff should seek formal project-specific Headquarters approval prior to asserting jurisdiction over such waters, including permitting and enforcement actions”). While the agencies’ regulations have long authorized the assertion of jurisdiction on a case-specific basis over waters that do not fall within the jurisdictional provisions by water type, since *SWANCC* and the issuance of the *SWANCC* Guidance with its requirement of headquarters approval over determinations under that provision, the agencies have not in practice asserted jurisdiction over paragraph (a)(3) “other waters” under the pre-2015 regulatory regime.⁹

I.B.2 The 2020 NWPR Baseline

The agencies’ definition of “waters of the United States” under the 2020 NWPR, the secondary baseline, encompassed the following waters:

- The territorial seas and traditional navigable waters (traditional navigable waters) (paragraph (a)(1) waters under the 2020 NWPR);
- Tributaries (paragraph (a)(2) waters under the 2020 NWPR);
- Lakes and ponds, and impoundments of jurisdictional waters (paragraph (a)(3) waters under the 2020 NWPR); and
- Adjacent wetlands (paragraph (a)(4) waters under the 2020 NWPR).

The 2020 NWPR grouped the territorial seas and traditional navigable waters (including waters which are subject to the ebb and flow of the tide) as “waters of the United States” into paragraph (a)(1) of that definition to simplify the regulation. The 2020 NWPR eliminated interstate waters as a separate, standalone category of jurisdictional waters. Under the 2020 NWPR, interstate waters were jurisdictional only where they fell within another category of jurisdictional waters under the rule.

The agencies included tributaries of the territorial seas and traditional navigable waters as “waters of the United States” in the 2020 NWPR. The 2020 NWPR defined “tributary” to mean:

A river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a paragraph (a)(1) water in a typical year either directly or indirectly through one or more paragraph (a)(2) through (4) waters. A tributary must be perennial or intermittent in a typical year. The alteration or relocation of a tributary does not modify its jurisdictional status as long as it continues to satisfy the flow conditions of this definition. A tributary does not lose its jurisdictional status if it contributes surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a subterranean river, through a culvert, dam, tunnel, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. The term tributary includes a ditch that either

⁹ Note that when the 2015 Clean Water Rule was in effect, the agencies did assert jurisdiction over waters that would have been known as paragraph (a)(3) “other waters,” by rule if they were adjacent waters as defined by that rule and on a case-specific basis if they fell within the provisions requiring case-specific significant nexus determinations. The 2020 NWPR also asserted jurisdiction over certain lakes and ponds that would have been jurisdictional as paragraph (a)(3) “other waters.”

relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland as long as the ditch satisfies the flow conditions of this definition.

“Perennial” was defined as “surface water flowing continuously year-round.” “Intermittent” was defined as “surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).” “Ephemeral” was defined as “surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).” The 2020 NWPR’s definition of “tributary” included only those rivers and streams with perennial and intermittent flow. The agencies used the term “reach” in the 2020 NWPR to mean a section of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope.

Ditches were not a standalone category in the 2020 NWPR, but they were jurisdictional if they were traditional navigable waters (including tidal ditches) or if they were tributaries. The term “tributary,” as defined in the 2020 NWPR, included those ditches that either relocated a tributary, were constructed in a tributary, or were constructed in adjacent wetlands as long as those ditches satisfied the flow conditions of the 2020 NWPR’s “tributary” definition. The term “ditch” was defined as “a constructed or excavated channel used to convey water.” Portions of ditches constructed in adjacent wetlands were also jurisdictional as adjacent wetlands if they satisfied the definition of “tributary.”

The 2020 NWPR included lakes, ponds, and impoundments of jurisdictional waters as a separate category of “waters of the United States.” “Lakes and ponds, and impoundments of jurisdictional waters” were defined to mean:

standing bodies of open water that contribute surface water flow to a territorial sea or traditional navigable water in a typical year either directly or through one or more jurisdictional waters. A lake, pond, or impoundment did not lose its jurisdictional status if it contributed surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a culvert, dike, spillway, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. A lake or pond, or impoundment of a jurisdictional water was also jurisdictional if it were inundated by flooding from a territorial sea, a traditional navigable water, a tributary, or another jurisdictional lake, pond, or impoundment of a jurisdictional water in a typical year.

The fourth and final category of “waters of the United States” in the 2020 NWPR was adjacent wetlands. The 2020 NWPR defined “adjacent wetlands” as those wetlands that:

(i) abut, meaning to touch at least at one point or side of, a territorial sea, a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water; (ii) are inundated by flooding from a territorial sea, a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water in a typical year; (iii) are physically separated from a territorial sea, a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water only by a natural berm, bank, dune, or similar natural feature; or (iv) are physically separated from a territorial sea, a traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection

between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland was jurisdictional in its entirety when a road or similar artificial structure divided the wetland, as long as the structure allowed for a direct hydrologic surface connection through or over that structure in a typical year.

The 2020 NWPR listed 12 types of non-jurisdictional waters, also known as excluded waters. The first exclusion made clear that waters or water features that were not explicitly included as “waters of the United States” were not jurisdictional. The agencies retained two existing exclusions for prior converted cropland and waste treatment systems, though they defined those categories in regulatory text for the first time. The agencies defined “prior converted cropland” in the regulatory text as:

Any area that, prior to December 23, 1985, was drained or otherwise manipulated for the purpose, or having the effect, of making production of an agricultural product possible. EPA and the Corps will recognize designations of prior converted cropland made by the Secretary of Agriculture. An area is no longer considered *prior converted cropland* for purposes of the Clean Water Act when the area is abandoned and has reverted to wetlands, as defined in paragraph (c)(16) of this section. Abandonment occurs when prior converted cropland is not used for, or in support of, agricultural purposes at least once in the immediately preceding five years. For the purposes of the Clean Water Act, the EPA Administrator shall have the final authority to determine whether prior converted cropland has been abandoned.

The agencies clarified that a designation of “prior converted cropland” for purposes of the Clean Water Act no longer applied if the area had been abandoned and reverted to wetlands.

In the 2020 NWPR, the agencies defined “waste treatment systems” to include “all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge).”

The 2020 NWPR also excluded the following waters from the definition of “waters of the United States:”

- groundwater, including groundwater drained through subsurface drainage systems;
- ephemeral features, including ephemeral streams, swales, gullies, rills, and pools;
- diffuse stormwater run-off and directional sheet flow over upland;
- ditches that are not specifically included as the territorial seas, traditional navigable waters, or tributaries, as well as those portions of ditches that were constructed in adjacent wetlands that did not satisfy the conditions of the “adjacent wetlands” definition;
- artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease;
- artificial lakes and ponds including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as

those artificial lakes and ponds were not impoundments of jurisdictional waters that met the conditions of the definition of “lakes and ponds, and impoundments of jurisdictional waters;”

- water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel;
- stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off; and
- groundwater recharge basins, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in non-jurisdictional waters.

The 2020 NWPR included definitions for “high tide line,” “ordinary high water mark,” “snowpack,” “tidal waters and waters subject to the ebb and flow of the tide,” “typical year,” “upland,” and “wetlands” in its regulatory text. The definitions for “wetlands,” “high tide line,” and “ordinary high water mark” remained unchanged from prior codified definitions in the Corps’ 1986 regulations. The agencies defined the term “upland” in their regulations for the first time. “Upland” was defined in the 2020 NWPR as any land area that under normal circumstances did not satisfy all three wetland factors (hydrology, hydrophytic vegetation, and hydric soils) identified in the definition of “wetland” and that did not lie below the ordinary high water mark or the high tide line of a jurisdictional water.

I.B.3 The Final Rule and How It Compares to Prior Regimes

In this rule, the agencies are exercising their discretionary authority to interpret “waters of the United States” to mean the waters defined by the familiar 1986 regulations, with amendments to reflect the agencies’ determination of the statutory limits on the scope of the “waters of the United States” informed by Supreme Court precedent, the best available science, and the agencies’ experience and technical expertise. This rule thus defines “waters of the United States” to include the familiar types of waters in the 1986 regulations – traditional navigable waters, interstate waters, impoundments, tributaries, the territorial seas, adjacent wetlands, and waters that do not fall within the other categories – while adding, where appropriate, a requirement that waters also meet either the significant nexus standard or the relatively permanent standard. The final rule is as follows:

In this rule, consistent with the general framework of the 1986 regulations, the agencies interpret the term “waters of the United States” at paragraph (a) to include:

- (1) Waters which are:
 - (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
 - (ii) The territorial seas; or
 - (iii) Interstate waters, including interstate wetlands;
- (2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
- (3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section:
 - (i) That are relatively permanent, standing or continuously flowing bodies of water; or
 - (ii) That either alone or in combination with similarly situated waters in the region,

significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;

(4) Wetlands adjacent to the following waters:

- (i) Waters identified in paragraph (a)(1) of this section; or
- (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3)(i) of this section and with a continuous surface connection to such waters; or
- (iii) Waters identified in paragraph (a)(2) or (3) of this section when the wetlands either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;

(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) of this section:

- (i) That are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3)(i) of this section; or
- (ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section.

The final rule under paragraph (b) also establishes exclusions from the definition of “waters of the United States” even where they otherwise meet the terms of paragraphs (a)(2) through (5) of the rule:

- (1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;
- (2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area’s status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;
- (3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;
- (4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;
- (5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;
- (6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;
- (7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and
- (8) Swales and erosional features (*e.g.*, gullies, small washes) characterized by low volume, infrequent, or short duration flow.

Under paragraph (c) of the final rule, the following definitions apply:

(1) *Wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) *Adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes, and the like are “adjacent wetlands.”

(3) *High tide line* means the line of intersection of the land with the water’s surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(4) *Ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) *Tidal waters* means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

(6) *Significantly affect* means a material influence on the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section. For purposes of determining whether waters, either alone or in combination with similarly situated waters in the region, have a material influence on the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section, the functions identified in paragraph (c)(6)(i) below will be assessed and the factors identified in paragraph (c)(6)(ii) below will be considered:

(i) Functions to be assessed:

- (A) Contribution of flow;
- (B) Trapping, transformation, filtering, and transport of materials (including nutrients, sediment, and other pollutants);
- (C) Retention and attenuation of floodwaters and runoff;
- (D) Modulation of temperature in waters identified in paragraph (a)(1) of this section; or
- (E) Provision of habitat and food resources for aquatic species located in waters identified in paragraph (a)(1) of this section;

(ii) Factors to be considered:

- (A) The distance from a water identified in paragraph (a)(1) of this section;
- (B) Hydrologic factors, such as the frequency, duration, magnitude, timing, and

- rate of hydrologic connections, including shallow subsurface flow;
- (C) The size, density, or number of waters that have been determined to be similarly situated;
- (D) Landscape position and geomorphology; and
- (E) Climatological variables such as temperature, rainfall, and snowpack.

I.B.3.1 Traditional Navigable Waters, Territorial Seas and Interstate Waters

I.B.3.1.1 Treatment in the Final Rule

The agencies have long defined traditional navigable waters as “[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.” Under the final rule, the agencies make no changes to the definition of traditional navigable waters. The agencies issued guidance in 2007 regarding traditional navigable waters that helped inform determinations of whether a water is a traditional navigable water (*see* Appendix D in U.S. Army Corps of Engineers, 2007). This guidance was used under pre-2015 practice and was applied under each subsequent regulation. The agencies will continue to use this guidance to determine whether a water is a traditional navigable water for the purposes of the Clean Water Act and the agencies’ implementing regulations under this final rule.

Consistent with the Clean Water Act¹⁰ and past regulations, the agencies’ final rule includes “the territorial seas” as “waters of the United States.” The territorial seas establish the seaward limit of “waters of the United States” and are clearly jurisdictional under the Clean Water Act.

The final rule defines “waters of the United States” to include interstate waters, including interstate wetlands, consistent with the 1986 regulations. Under the final rule, interstate waters are “waters of the United States” even if they are not traditional navigable waters or the territorial seas and do not connect to such waters.

I.B.3.1.2 Comparison of the Final Rule to the Primary Baseline

The final rule combines traditional navigable waters, the territorial seas, and interstate waters under the paragraph (a)(1) category, while the regulatory text from the 1980s separated each of these water types into distinct categories of water. However, this change in the final rule is organizational and is not intended to represent a change in scope of jurisdiction for these waters in comparison to the primary baseline.

I.B.3.1.3 Comparison of the Final Rule to the Secondary Baseline

The final rule combines traditional navigable waters, the territorial seas, and interstate waters under the paragraph (a)(1) category. The regulatory text from the 2020 NWPR combined only traditional navigable waters and territorial seas under the paragraph (a)(1) category and had no separate category to cover interstate waters.

¹⁰ *See* 33 U.S.C. 1362(7), defining “navigable waters” as “the waters of the United States, including the territorial seas.”

The 2020 NWPR explicitly excluded traditional navigable waters and the territorial seas under most of the rule’s (b)(1) exclusions for the first time, a change from longstanding practice. Under the final rule, the agencies would return to the prior practice of the exclusions not applying to traditional navigable waters, the territorial seas, or interstate waters, and thus will regulate all traditional navigable waters, including waters subject to the ebb and flow of the tide, territorial seas, and interstate waters.

Interstate waters could only be jurisdictional under the 2020 NWPR if they also met one of the categories of jurisdictional waters under paragraphs (a)(1) through (4) of that rule. Under the final rule, any interstate waters, including wetlands, would be jurisdictional if they cross or serve as State boundaries. For example, a wetland straddling a State line would be considered jurisdictional regardless of whether it satisfies any of the conditions for jurisdiction under other categories of the final rule.

The agencies assume that the scope of jurisdiction for traditional navigable waters and territorial seas under the final rule would not pose a change from the secondary baseline of the 2020 NWPR, except for traditional navigable waters and territorial seas that were excluded under the 2020 NWPR. Such waters would remain jurisdictional as traditional navigable waters and territorial seas under the final rule, representing a change from the secondary baseline. This change would likely be *de minimis* and cannot be accurately assessed using data from the ORM2 dataset (*see* Section I.B.3.1(4)). The agencies also expect that there would be an increase in the scope of jurisdiction from the secondary baseline of the 2020 NWPR for interstate waters, including wetlands; however, the agencies have no way to assess this change due to limitations within the ORM2 dataset (*see* Section I.B.3.1(4)).

I.B.3.1.4 Documentation in ORM2

Under the primary baseline of the pre-2015 regulatory regime, some Corps Districts chose to document an aquatic resource as a relatively permanent water instead of a case-specific traditional navigable water for ease of documentation and workload. Some AJDs for relatively permanent waters therefore are traditional navigable waters; so, the ORM2 data on traditional navigable waters under the pre-2015 regulatory regime likely underestimates the number of resources assessed under AJDs that are traditional navigable waters. However, those aquatic resources would be captured in the relatively permanent waters category described in the “Tributaries” section below. Similarly, for AJDs made under the 2020 NWPR, it is likely that some traditional navigable waters could have been classified under that rule’s paragraph (a)(2) tributary category or paragraph (a)(3) lake, pond, or impoundment category in ORM2.

Waters that are territorial seas historically have been subsumed by the traditional navigable water definition (*i.e.*, under the pre-2015 regulatory regime, if a resource was a territorial sea, it generally was also a traditional navigable water, and therefore would be categorized as a traditional navigable water rather than a territorial sea.¹¹ “Territorial sea” is not a selectable, separate category in ORM2 under the pre-2015 regulatory regime. The territorial seas thus are typically categorized as traditional navigable waters in the ORM2 database under pre-2015 practice and have a separate category in ORM2 for AJDs conducted under the 2020 NWPR.

¹¹ The agencies acknowledge that while most territorial seas are also traditional navigable waters, portions of the territorial seas that may not be navigable or capable of being used in interstate or foreign commerce but are still jurisdictional if they meet the definition of “the territorial seas” in the Clean Water Act.

The *Rapanos* AJD form associated with the pre-2015 regulatory regime, and the associated ORM2 data do not indicate whether a water is jurisdictional as an “interstate water.” Instead, these waters are generally represented by other ORM2 categories of aquatic resources (including categories for traditional navigable waters, tributaries, adjacent wetlands, and impoundments of jurisdictional waters). Because “interstate waters” are not identified on the *Rapanos* AJD form or in the associated ORM2 data, the agencies are unable to quantify the potential change in jurisdiction under the final rule relative to the secondary baseline of the 2020 NWPR with respect to interstate waters.

I.B.3.2 Tributaries

I.B.3.2.1 Treatment in the Final Rule

A tributary for purposes of this rule includes rivers, streams, lakes, ponds, and impoundments, regardless of their flow regime, that flow directly or indirectly through another water or waters to a traditional navigable water, the territorial seas, or an interstate water. Waters through which a tributary may flow indirectly include, for example, impoundments, wetlands, lakes, ponds, and streams. This is consistent with pre-2015 practice. Lakes and ponds that are tributaries are discussed in Section I.B.3.3.

Under the final rule, tributaries, regardless of their flow regime, will be assessed under the relatively permanent or significant nexus standard per paragraph (a)(3) of the final rule. Rivers, streams, lakes, and ponds that are not tributaries and that do not meet the criteria for jurisdiction under one of the other categories will be assessed under the relatively permanent or significant nexus standard per paragraph (a)(5) of this rule (*see* Section I.B.3.6). All tributaries to traditional navigable waters, the territorial seas, interstate waters, or jurisdictional impoundments that are relatively permanent, standing, or continuously flowing waters and non-relatively permanent tributaries that have a significant nexus with a traditional navigable water, the territorial seas, or interstate water are jurisdictional. Tributaries meet the relatively permanent standard when they are relatively permanent, standing or continuously flowing bodies of water. Under the final rule, non-relatively permanent tributaries would be evaluated according to the significant nexus standard.

The agencies’ longstanding interpretation of the Clean Water Act includes tributaries that are natural, modified, or constructed waters, and the agencies are continuing this practice in the final rule. As discussed further in the exclusions section, certain ditches are explicitly excluded from the definition of “waters of the United States” where they are not paragraph (a)(1) waters: ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water. Under the final rule, a ditch is jurisdictional if it is a tributary that meets the relatively permanent standard. If the ditch does not meet the conditions of paragraph (a)(1) and was excavated wholly in dry land, draining only dry land, and has less than relatively permanent flow, the ditch is considered non-jurisdictional, consistent with pre-2015 practice, even if it would otherwise be considered a tributary. For non-relatively permanent ditches that are not constructed in dry land and draining only dry land, where they are tributaries, the agencies would determine under paragraph (a)(3)(ii) of the final rule if they have a case-specific significant nexus to a traditional navigable water, territorial sea, or interstate water.

I.B.3.2.2 Comparison of the Final Rule to the Primary Baseline

Generally speaking, the final rule is consistent with pre-2015 practice for tributaries being assessed via application of the relatively permanent standard. Application of the relatively permanent standard for tributaries will be largely consistent with the pre-2015 regulatory practice, though the agencies have provided some small revisions to the standard compared to pre-2015 practice to add clarity regarding implementation of the standard. Under the final rule, the relatively permanent standard encompasses surface waters that have flowing or standing water year-round or continuously during certain times of the year, whereas under pre-2015 practice tributaries are considered relatively permanent if they typically flow year-round or have continuous flow at least seasonally (*e.g.*, typically three months). Any associated change in scope of jurisdiction is expected to be *de minimis* and cannot be estimated.

Under the final rule, the significant nexus standard will have two main differences from pre-2015 regulatory practice for tributaries. The first difference applies to the definition of “significantly affect” in the final rule. The agencies have added specific factors and functions that will be considered as part of the significant nexus analysis, and have noted that waters that meet the standard when they, either alone or in combination with similarly situated waters in the region, have a material influence on traditional navigable waters, the territorial seas, or interstate waters. The agencies have added this language to the final rule to provide clarity to regulators, stakeholders, and the regulated public. Second, for tributaries and their adjacent wetlands assessed under the standard, the scope of “in the region” differs between the final rule and pre-2015 practice. The pre-2015 regulatory regime assesses the “relevant reach” of the tributary (*i.e.*, a tributary of the same stream order) and wetlands adjacent to that “relevant reach” as the geographic extent of the significant nexus analysis. Like pre-2015 practice, the agencies consider tributaries and their adjacent wetlands to be “similarly situated” waters. The agencies consider similarly situated waters to be “in the region” when they lie within the catchment area of the tributary of interest. Accordingly, in implementing the significant nexus standard under this rule, all tributaries and adjacent wetlands within the catchment area of the tributary of interest will be analyzed as part of the significant nexus analysis. For purposes of a significant nexus analysis for tributaries and adjacent wetlands, the agencies will identify the “region” as the catchment that drains to and includes the tributary of interest. Catchments will be delineated from the downstream-most point of the tributary reach of interest and include the land uphill that drains to that point. It is expected that this will slightly increase the number of tributaries that are found to be jurisdictional under the significant nexus standard compared to pre-2015 practice; however, the overall proportion of resources that this would impact is likely small. For example, when looking at data associated with jurisdictional determinations carried out under the *Rapanos* Guidance (including AJDs, PJDs and JD Concurrences), the proportion of non-relatively permanent tributaries that would be potentially impacted by this change in the significant nexus analysis is only 0.25% of all aquatic resources associated with jurisdictional determinations.¹² This 0.25% represents tributaries that were found to be non-jurisdictional via the significant nexus standard under pre-2015 practice. An unknown fraction of this 0.25% could potentially become jurisdictional under this final rule. Because determinations are made on a case-specific basis and the agencies are unable to accurately reassess prior determinations based on the final rule’s new scope for “in the region,” the agencies cannot

¹² Date range considered: January 1, 2010 to April 9, 2021

estimate what the potential change in jurisdiction will be for tributaries that are assessed under the significant nexus standard as compared to the primary baseline.

Ditches that are tributaries are considered jurisdictional in a manner consistent with pre-2015 practice; however, changes to tributary ditches assessed under a significant nexus analysis are discussed in the above paragraph.

I.B.3.2.3 Comparison of the Final Rule to the Secondary Baseline

Broadly reviewing differences between the 2020 NWPR and the final rule, the final rule will assess if streams meet the criteria to be a jurisdictional “tributary” via application of the relatively permanent standard or the significant nexus standard where such waters flow directly or indirectly through another water or waters to a traditional navigable water, the territorial seas, or an interstate water; whereas the agencies defined “tributaries” as jurisdictional in the 2020 NWPR if they were perennial or intermittent and contributed surface water flow to a traditional navigable water or the territorial seas in a “typical year” either directly or through one or more waters that were jurisdictional under that rule, and excluded ephemeral features (*see* Section I.B.2 for more details). While lakes, ponds, and impoundments can be tributaries under the final rule, such waters would be assessed for jurisdiction under the lakes and ponds and impoundments of jurisdictional waters category of the 2020 NWPR, unless excluded under that rule.

Tributaries evaluated under the final rule would be categorized as either relatively permanent waters that are assessed under the relatively permanent standard or non-relatively permanent waters that are assessed under the significant nexus standard. The final rule will continue to regulate the vast majority of waters that met the 2020 NWPR’s definition of “tributary,” while also allowing for some streams that did not meet the 2020 NWPR’s definition of “tributary” to be jurisdictional in situations in which the waters in question meet either the relatively permanent or significant nexus standard. Waters could also be tributaries under the final rule when they were not under the 2020 NWPR because they are tributaries to interstate waters not connected to a traditional navigable water or the territorial seas.

The 2020 NWPR did not cover any ephemeral streams; under the final rule, some of these excluded ephemeral streams will be jurisdictional based on a case-specific significant nexus evaluation. Under the 2020 NWPR, some perennial and intermittent streams did not satisfy jurisdictional requirements due to lack of contribution of surface flow to traditional navigable waters or the territorial seas in a typical year, whereas such streams are jurisdictional under the final rule if they meet either the relatively permanent or significant nexus standard. For example, although the 2020 NWPR allowed for ephemeral streams to serve as a non-jurisdictional connection between upstream and downstream jurisdictional tributaries, it did not protect perennial or intermittent streams that flowed into ephemeral features that did not contribute surface water flow in a typical year to a downstream jurisdictional water, but such streams are jurisdictional under the final rule if they meet either the relatively permanent or significant nexus standard.

Relative to the secondary baseline of the 2020 NWPR, the final rule would therefore include more waters as tributaries for the reasons articulated above.

Some ditches will be considered jurisdictional under the final rule that were not jurisdictional under the 2020 NWPR. The 2020 NWPR excluded all upland ditches regardless of flow (unless they met the

conditions of paragraph (a)(1)) and limited which other ditches could be covered as tributaries, for example by indicating that a ditch needed to relocate an “entire portion” of the tributary rather than divert some of the flow and indicating that a ditch created in uplands would be excluded even where it drained a wetland. Under the final rule a tributary ditch does not need to relocate a tributary, be constructed in a tributary, or be constructed in an adjacent wetland to be considered a jurisdictional tributary, so long as it meets the relatively permanent or significant nexus standard and is not excluded under paragraph (b). Under the 2020 NWPR, however, a jurisdictional ditch had to satisfy one of these three criteria and contribute perennial or intermittent flow to a traditional navigable water or the territorial seas in a typical year. As a result, it is expected that there will be more jurisdictional ditches that are tributaries under the final rule as compared to the secondary baseline.

The agencies have assessed stream reach data associated with jurisdictional determinations completed nationally and within the arid Southwest (in the States of Arizona and New Mexico) and have found that the 2020 NWPR caused a significant change in the number of stream reaches found to be non-jurisdictional in the calendar year from June 22, 2020 to June 21, 2021, in these two States in comparison to years in which the pre-2015 regulatory regime were implemented (U.S. EPA and Army, 2022b).¹³ Arizona had the highest proportion of non-jurisdictional stream findings across the nation, with 13 percent of all non-jurisdictional stream determinations in the nation in the first year the 2020 NWPR was effective (June 22, 2020 to June 21, 2021). Given that spatially Arizona comprises only three percent of the land in the United States, it is clear that the 2020 NWPR definition had more substantial effects in some areas of the country than others.¹⁴ The agencies have also assessed approved jurisdictional determination data utilizing the Cowardin classification system to identify the proportions of tributaries found to be jurisdictional or non-jurisdictional under pre-2015 regulatory regime and under the 2020 NWPR (Section III.C.2) (Cowardin et al., 1979).

I.B.3.2.4 Documentation in ORM2

The Corps’ ORM2 database does not directly track whether a tributary is a ditch or not under either the pre-2015 regulatory regime or the 2020 NWPR. It also does not directly denote when a tributary is subsumed by the paragraph (a)(1) waters under prior regimes. Lastly, there is no way to use ORM2 data to assess for changes in flow regime along a stream reach.

However, the Cowardin classification system that is denoted in ORM2 does allow for an assessment of what proportions of tributaries were found to be jurisdictional or non-jurisdictional under the pre-2015 regulatory regime and under the 2020 NWPR. This is the basis for assessing the difference in the change of scope of jurisdiction for the secondary baseline. Given that there are *de minimis* changes to the proportion of tributary resources that would have required 404 permits under the primary baseline as compared to the final rule, the agencies are assessing the secondary baseline via a comparison of the pre-2015 regulatory regime and the 2020 NWPR. *See* Section III.C.2 for more details.

¹³ Available in the docket for this rule, Docket ID Number EPA-HQ-OW-2021-0602.

¹⁴ *Ibid.*

I.B.3.3 Lakes and ponds

I.B.3.3.1 Treatment in the Final Rule

Consistent with the pre-2015 regulatory regime, under the final rule lakes, ponds, and impoundments that are not paragraph (a)(1) waters can be considered for jurisdiction under the paragraph (a)(3) category for tributaries and under the paragraph (a)(5) category for intrastate waters that do not meet the jurisdictional criteria under other categories. In addition, impoundments of jurisdictional waters continue to have their separate category under the final rule (paragraph “(a)(2) Impoundments of jurisdictional waters” – *see* Section I.B.3.4). Because impoundments would comprise a distinct category under the final rule, this document discusses them separately. Lakes and ponds that are paragraph (a)(1) waters are discussed in Section I.B.3.1. Lakes and ponds that are assessed under the paragraph (a)(5) category of the final rule are discussed in Section I.B.3.6.

I.B.3.3.2 Comparison of the Final Rule to the Primary Baseline

Under the pre-2015 regulatory regime, lakes and ponds that are traditional navigable waters or interstate waters are included as “waters of the United States.” There is no change in jurisdiction for such waters as discussed in Section I.B.3.1. Lakes and ponds that are tributaries are jurisdictional under the pre-2015 regulatory regime when they are relatively permanent waters or where they have a significant nexus to a traditional navigable water, the territorial seas, or an interstate water. As discussed in Section I.B.3.2(2), the agencies are making minor revisions to the relatively permanent standard for tributaries in the final rule as compared to pre-2015 practice. The agencies anticipate there will be no practicable difference for most lakes and ponds that would be jurisdictional as relatively permanent tributaries under the final rule as compared to the primary baseline of the pre-2015 regulatory practice. For lakes and ponds that are tributaries and are assessed under the significant nexus standard, the agencies are making changes to “the region” that is assessed as part of a significant nexus analysis for tributaries and their adjacent wetlands, as discussed in Section I.B.3.2.2. Thus, the agencies believe that there will be a slight increase in lakes and ponds that are part of the tributary network and that are found to be jurisdictional under the final rule’s significant nexus standard compared to pre-2015 practice. However, the overall proportion of resources that this would impact is likely small (*see* discussion in Section I.B.3.2), and the agencies are unable to estimate what the potential change in jurisdiction will be.

Lakes and ponds considered for jurisdiction under paragraph (a)(5) of the final and the comparable paragraph (a)(3) of the 1986 regulations as implemented consistent with pre-2015 practice are discussed in Section I.B.3.6. The agencies final rule makes changes to the jurisdictional criteria considered for lakes and ponds evaluated under paragraph (a)(5) of the final rule as compared to the jurisdictional criteria for lakes and ponds evaluated under the comparable paragraph (a)(3) under pre-2015 practice. This rule replaces the interstate commerce test used in paragraph (a)(3) of the 1986 regulations with the relatively permanent standard and the significant nexus standard for the comparable paragraph (a)(5) category in this rule. Prior to the *SWANCC* decision, paragraph (a)(3) of the 1986 regulations provided a broad scope of jurisdiction for waters considered under that category. However, as discussed in Section I.B.1, after the *SWANCC* decision, in practice the agencies have not asserted jurisdiction over waters assessed under paragraph (a)(3) of the 1986 regulations. Compared to the straight regulatory text of paragraph (a)(3) of the 1986 regulations, the final rule’s analogous paragraph (a)(5) category represents a decrease in jurisdiction for waters considered under that category. Compared to pre-2015 practice, however, there

will likely be waters determined to be jurisdictional under paragraph (a)(5) of the final rule that in practice would not have been found jurisdictional, including lakes and ponds evaluated under paragraph (a)(5). In particular, there are cases in which certain lakes and ponds that would be non-jurisdictional under the pre-2015 regulatory regime baseline (when evaluated under paragraph (a)(3) of the 1986 regulations) may now be jurisdictional under the comparable paragraph (a)(5) of the final rule via the relatively permanent standard, such as certain oxbow lakes and ponds.¹⁵ In addition, lakes and ponds assessed under paragraph (a)(5) utilizing the significant nexus standard may also experience some changes in jurisdiction when compared to pre-2015 practice.¹⁶ When looking at data associated with JDs carried out under pre-2015 practice (including AJDs, PJDs and JD Concurrences), the proportion of non-relatively permanent waters that would be potentially impacted by replacing the interstate commerce test with the significant nexus standard is only 0.25% of all aquatic resources that underwent jurisdictional determinations.¹⁷ This 0.25% represents isolated lacustrine features and isolated palustrine features that likely would be ponds assessed under paragraph (a)(3) of the 1986 regulations consistent with pre-2015 practice that were found to be non-jurisdictional under pre-2015 practice. An unknown fraction of this 0.25% could potentially be determined jurisdictional under this final rule. The agencies cannot assess what this unknown fraction would be, as each aquatic resource would require a case-specific analysis to see if it meets the jurisdictional criteria established under paragraph (a)(5) of this final rule. These are discussed in Section I.B.3.6.

I.B.3.3.3 Comparison of the Final Rule to the Secondary Baseline

Broadly reviewing differences between the 2020 NWPR and the final rule, the final rule returns to the pre-2015 regulatory practice of incorporating lakes and ponds into other categories of waters and including a separate category for impoundments of jurisdictional waters; whereas the 2020 NWPR created a single regulatory category for lakes and ponds, and impoundments of jurisdictional waters. Because impoundments comprise a distinct category under the final rule, this document discusses them separately in Section I.B.3.4. For more details on the 2020 NWPR approach to lakes and ponds, *see* Section I.B.2.

The agencies anticipate that there will be no practicable difference for most lakes and ponds that would be jurisdictional as relatively permanent waters under the final rule as compared to the secondary baseline of the 2020 NWPR. Traditional navigable waters and interstate waters were discussed previously in Section I.B.3.1. As noted in that section, certain interstate lakes and ponds are jurisdictional under the final rule that would not be jurisdictional under the 2020 NWPR, representing a small change from the secondary baseline, but the agencies are unable to estimate that change.

There are cases in which certain lakes and ponds that would have been jurisdictional under the 2020 NWPR may not be jurisdictional under the final rule. The 2020 NWPR included as “waters of the United States” lakes and ponds that are inundated by flooding from a traditional navigable water, a territorial sea,

¹⁵ Such waters would likely have been considered jurisdictional under paragraph (a)(3) of the 1986 regulations prior to the *SWANCC* decision.

¹⁶ Similarly, these waters would likely have been considered jurisdictional under paragraph (a)(3) of the 1986 regulations prior to the *SWANCC* decision.

¹⁷ Date range considered: January 1, 2010, to April 9, 2021.

a tributary as defined in that rule, or a jurisdictional lake, pond, or impoundment in a typical year, such as certain oxbow lakes. Such waters may be considered jurisdictional under the final rule as tributaries where they meet either the relatively permanent or significant nexus standard, although some may not be part of the stream network and would need to be evaluated for jurisdiction under the final rule’s (a)(5) category. Some of the lakes and ponds which would have been found jurisdictional under the 2020 NWPR could be non-jurisdictional under the final rule if they do not meet either the relatively permanent or significant nexus standard under the final rule’s (a)(5) category. *See* Section I.B.3.6 for more details on (a)(5) waters under the final rule.

There are also cases in which certain lakes and ponds considered non-jurisdictional under the 2020 NWPR would be jurisdictional under the final rule. Under the final rule, relatively permanent lakes and ponds that are considered tributaries are jurisdictional, but such waters may not have met the requirements for jurisdiction under the 2020 NWPR’s lakes and ponds, and impoundments of jurisdictional waters category. For example, lakes and ponds would not be jurisdictional under the 2020 NWPR if they do not contribute flow in a typical year to a traditional navigable water or territorial seas or if they are tributaries to interstate waters that do not ultimately connect to a traditional navigable water or the territorial seas. In addition, non-relatively permanent lakes and ponds that are considered tributaries under the final rule would undergo a case-specific significant nexus evaluation to determine their jurisdictional status. This includes ephemeral lakes and ponds that were non-jurisdictional under the 2020 NWPR but could be jurisdictional under the final rule.

I.B.3.3.4 Documentation in ORM2

From the available AJD data under the pre-2015 regulatory regime, the agencies are unable to parse tributaries into lakes, ponds, or streams, as there is no field in ORM2 for the Corps to note this status (although the agencies could parse out isolated features into lacustrine systems, as described in Section I.B.3.3). Thus, the agencies are unable to estimate the percentage of non-relatively permanent lake and pond tributaries which were deemed jurisdictional under the pre-2015 regulatory regime and, to predict their status under the final rule in comparison with the secondary baseline. The agencies are also unable to quantify how many lakes and ponds are upstream of ephemeral reaches that do not contribute surface water flow to a downstream jurisdictional water in a typical year.

I.B.3.4 Impoundments

I.B.3.4.1 Treatment in the Final Rule

Under the final rule, impoundments can be created by impounding one of the “waters of United States” that was jurisdictional under this rule’s definition at the time the impoundment was created, and impoundments of waters that at the time of assessment meet the definition of “waters of the United States” under paragraph (a)(1), (a)(3), or (a)(4) of this rule, regardless of the water’s jurisdictional status at the time the impoundment was created. Waters that are jurisdictional under paragraph (a)(5), do not categorically retain their jurisdictional status as “waters of the United States” under paragraph (a)(2). However, a subsequently impounded jurisdictional paragraph (a)(5) water may still be determined to be jurisdictional if it meets the requirements of a category of “waters of the United States” other than paragraph (a)(2) at the

time of assessment (*i.e.*, as a traditional navigable water, territorial sea, interstate water, jurisdictional tributary, jurisdictional adjacent wetland, or paragraph (a)(5) water).

I.B.3.4.2 Comparison of the Final Rule to the Primary Baseline

Under the final rule, impoundments of jurisdictional waters would be jurisdictional similar to the pre-2015 regulatory regime. Interstate waters and impoundments were not addressed directly by the *Riverside Bayview*, *SWANCC*, or *Rapanos* Supreme Court decisions.

The only change associated with the impoundments category in the final rule compared to the pre-2015 regulatory regime is the regulatory text for impoundments, which does not include impoundments of paragraph (a)(5) waters. Instead, such impoundments would need to meet the jurisdictional criteria under one of the other categories of the final rule to be jurisdictional. As previously discussed, under the pre-2015 regulatory regime, however, in practice waters were not found to be jurisdictional under the paragraph (a)(3) category following the *SWANCC* decision. Thus, this does not constitute a change from pre-2015 practice for the impoundments category, and it will result in no difference in the scope of jurisdiction for impoundments. As discussed elsewhere in this document (Sections I.B.3.2 and I.B.3.5), however, there will be a small change in jurisdiction under the final rule as compared to pre-2015 practice for tributaries and adjacent wetlands, and impoundments of those waters. The agencies are unable to estimate what this small change would be as compared to pre-2015 for impoundments.

I.B.3.4.3 Comparison of the Final Rule to the Secondary Baseline

Under the 2020 NWPR, paragraph (a)(3) waters included lakes and ponds, and impoundments of jurisdictional waters. As such, impoundments of jurisdictional waters had the same jurisdictional requirements as lakes and ponds. *See* Section I.B.3.3(3). Many impoundments of “waters of the United States” are impoundments of relatively permanent tributaries and traditional navigable waters. These impoundments are jurisdictional under the final rule, and many of these features would be jurisdictional under the 2020 NWPR. Because more waters are jurisdictional under the final rule as tributaries and adjacent wetlands than under the 2020 NWPR, impoundments of such waters would be jurisdictional under the final rule but would not have been jurisdictional under the 2020 NWPR. For example, under the 2020 NWPR, impoundments of ephemeral streams would not have been found jurisdictional, but some of these impoundments may be jurisdictional under the final rule where the streams meet the jurisdictional criteria to be jurisdictional as tributaries. Additionally, regardless of the type of water being impounded under the 2020 NWPR, if there was no direct outlet from the impoundment to downstream waters and no inundation by flooding in a typical year, the impoundment would not have been jurisdictional. This is not a requirement for impoundments of jurisdictional waters under the final rule. Many small impoundments do not have outflows and are on steep enough terrain that backwater flooding conditions would not occur. These impoundments were not jurisdictional under the 2020 NWPR but are under the final rule where they impound jurisdictional waters.

For these reasons, it is likely that the final rule will result in more impoundments of “waters of the United States” being found to be jurisdictional as compared to the secondary baseline. However, the agencies cannot assess the scope of this change due to data constraints. Given that impoundments made up only 0.14% of ORM2 data associated with pre-2015 regulatory practice, the agencies find that the slight

difference in jurisdiction between the 2020 NWPR and the final rule would be *de minimis* for this category of waters.

I.B.3.4.4 Documentation in ORM2

ORM2 data for pre-2015 regulatory practice captures impoundments of jurisdictional waters as a separate category. Where impoundments of jurisdictional waters are traditional navigable waters or tributaries, they may be categorized as such in the database. ORM2 data for the 2020 NWPR does not separate impoundments from lakes and ponds as they were assessed under the same category and therefore cannot be used to differentiate the scope of jurisdiction between pre-2015 regulatory practice, the 2020 NWPR, or the final rule.

I.B.3.5 Adjacent Wetlands

I.B.3.5.1 Treatment in the Final Rule

Consistent with the 1986 regulations, the agencies' final rule defines "adjacent" to mean "bordering, contiguous, or neighboring." The final rule also states that "[w]etlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands,'" which is also consistent with the 1986 regulations. Adjacent wetlands that are jurisdictional under the final rule include wetlands adjacent to traditional navigable waters, the territorial seas, and interstate waters; wetlands adjacent to impoundments or to tributaries that are relatively permanent, standing, or continuously flowing bodies of water and that have a continuous surface connection to such waters; and wetlands adjacent to impoundments or to tributaries and that significantly affect the chemical, physical, or biological integrity of traditional navigable waters, the territorial seas, or interstate waters, either alone or in combination with similarly situated waters in the region.

Adjacent wetlands under the final rule include those with an unbroken surface or shallow sub-surface connection to jurisdictional waters, consistent with the pre-2015 regulatory regime. Such wetlands are jurisdictional under the final rule where they are adjacent to traditional navigable waters, the territorial seas, or interstate waters or where they are adjacent to jurisdictional tributaries or jurisdictional impoundments and meet either the relatively permanent or significant nexus standards. Adjacent wetlands under the final rule consistent with implementation under the pre-2015 approach would also include wetlands that are physically proximate (*i.e.*, reasonably close) to jurisdictional waters, either categorically (when they are adjacent to a traditional navigable water, the territorial seas, or interstate waters) or where they are adjacent to jurisdictional tributaries or jurisdictional impoundments and meet the significant nexus standard.

Not all adjacent wetlands are jurisdictional under the final rule. Under the final rule, adjacent wetlands are evaluated differently depending on the water to which they are adjacent (traditional navigable waters, the territorial seas, interstate waters, impoundments, and tributaries). The agencies anticipate no change in jurisdiction compared to pre-2015 practice for wetlands adjacent to traditional navigable waters, the territorial seas, or interstate waters. Such wetlands are jurisdictional under both regulatory regimes without the need for a significant nexus analysis.

Wetlands adjacent to tributaries that are relatively permanent, standing, or continuously flowing waters would be analyzed in different ways, depending on whether they have a continuous surface connection to

such waters. Adjacent wetlands with a continuous surface connection to a tributary or impoundment that meets the relatively permanent standard or would be jurisdictional under the relatively permanent standard without the need for further analysis. This includes wetlands that are abutting the tributaries. Wetlands adjacent to but that do not have a continuous surface connection to a relatively permanent water would require a case-specific significant nexus analysis to determine their jurisdictional status. Similarly, all wetlands adjacent to non-relatively permanent waters would require a case-specific significant nexus evaluation to determine their jurisdictional status. This approach does not represent a change from pre-2015 practice.

I.B.3.5.2 Comparison of the Final Rule to the Primary Baseline

For wetlands adjacent to traditional navigable waters, the territorial seas, and interstate waters, the agencies anticipate that there will be no change in jurisdiction for these waters under the final rule compared to pre-2015 practice. Generally speaking, the final rule is consistent with the pre-2015 practice for adjacent wetlands being assessed via application of the relatively permanent standard. The final rule does, however, provide clarifying language that wetlands behind natural berms may on certain occasions maintain a continuous surface connection with the waters to which they are adjacent. This change may result in some wetlands adjacent to relatively permanent waters being determined to meet the relatively permanent standard under the final rule, whereas they may have been assessed under the significant nexus standard under pre-2015 practice. Some, but not all, of such wetlands may have been found to be jurisdictional under pre-2015 practice after a case-specific significant nexus analysis. Where such wetlands would have been found to not have a significant nexus with a traditional navigable water, territorial sea, or interstate water under pre-2015 practice, this would represent a change in jurisdiction under the final rule as compared to pre-2015 practice. The agencies are not able to quantify this change but anticipate that it likely will be negligible.

The final rule changes which waters are considered “in the region” as compared to pre-2015 practice for tributaries and their adjacent wetlands, as discussed in Section I.B.3.2. Additionally, the final rule’s definition of “significantly affect” provides specific factors and functions that should be considered as part of the significant nexus analysis, also discussed in Section I.B.3.2. Thus, the agencies expect there will be a slight increase in the number of adjacent wetlands found to be jurisdictional under the significant nexus standard; however, the overall proportion of resources that this would impact is small. For example, when looking at data associated with JDs carried out under pre-2015 practice (including AJs, PJs and JD Concurrences), the proportion of adjacent wetlands assessed under a significant nexus analysis that would be potentially impacted by this change is only 0.05% of all aquatic resources associated with jurisdictional determinations.¹⁸ This 0.05% represents adjacent wetlands that were found to be non-jurisdictional via the significant nexus standard under pre-2015 practice. An unknown fraction of this 0.05% could potentially become jurisdictional under this final rule. Because determinations are made on a case-specific basis and the agencies are unable to accurately reassess prior determinations based on the final rule’s new scope for “in the region,” the agencies cannot estimate what the potential change in jurisdiction will be for tributaries that are assessed under the significant nexus standard as compared to the primary baseline.

¹⁸ Date range considered: January 1, 2010 to April 9, 2021

I.B.3.5.3 Comparison of the Final Rule to the Secondary Baseline

Changes in the adjacent wetlands category compared to the secondary baseline of the 2020 NWPR would be due to both the revised definition for “adjacent wetlands” in the 2020 NWPR as well as revisions to the other categories of waters that were considered jurisdictional as tributaries and as jurisdictional lakes and ponds, and impoundments of jurisdictional waters. The elimination of interstate waters as a separate category of jurisdiction under the 2020 NWPR also eliminated jurisdiction over wetlands adjacent to such waters and their tributaries, where such interstate waters are jurisdictional only because they cross or serve as State boundaries. Thus, the final rule likely includes more wetlands as “waters of the United States” than the secondary baseline of the 2020 NWPR. The agencies are unable to quantify this change in direct relation to regulatory categories.

The 2020 NWPR changed the longstanding definition of adjacent, which this final rule reestablishes. Under the 2020 NWPR, wetlands were considered adjacent when they: abutted jurisdictional waters, were inundated by flooding from jurisdictional waters in a typical year; when they were physically separated from jurisdictional waters only by certain natural features; and when they were physically separated from jurisdictional waters only by certain artificial structures that allowed for a direct hydrologic surface connection between the wetlands and the jurisdictional waters in a typical year (*see* Section I.B.2 for more details on jurisdiction under the 2020 NWPR).

The final rule includes more streams, such as certain ephemeral streams, as jurisdictional tributaries than the 2020 NWPR, and therefore, likely would include more wetlands adjacent to those tributaries as jurisdictional. However, because many of the additional streams the final rule includes as jurisdictional compared to the 2020 NWPR are likely non-relatively permanent streams, the jurisdictional status of wetlands adjacent to such streams must be determined according to the significant nexus standard; such wetlands would not be categorically jurisdictional under the final rule. As discussed in Section I.B.3.2, there may be some relatively permanent tributaries that are jurisdictional under the final rule that would not be jurisdictional under the 2020 NWPR, and wetlands adjacent to such tributaries are jurisdictional under the final rule where they meet either the relatively permanent or significant nexus standard. Such wetlands, where they are jurisdictional under the final rule, represent a change in jurisdiction compared to the 2020 NWPR.

Adjacent wetlands under the final rule include those with an unbroken surface or shallow sub-surface connection to jurisdictional waters. Some of these wetlands may have been adjacent under the 2020 NWPR, for example, where they are directly abutting jurisdictional waters or where they are inundated by flooding from a jurisdictional water in a typical year. However, others may not have been, including, for example, those wetlands that are adjacent under the final rule solely due to a hydrological connection to a jurisdictional water via an unbroken shallow subsurface connection.

Wetlands physically separated from jurisdictional waters by natural river berms, beach dunes, and the like were considered adjacent under the 2020 NWPR and would continue to be considered adjacent under the final rule. The final rule would also include wetlands separated from jurisdictional waters by artificial dikes, barriers, or similar artificial structures as adjacent wetlands, regardless of whether the wetlands have a direct hydrologic surface connection to those jurisdictional waters in a typical year via a culvert, flood or tide gate, or similar feature. This differs from the 2020 NWPR which required a direct hydrologic surface connection in a typical year for such wetlands to be jurisdictional.

Finally, adjacent wetlands under the final rule consistent with implementation under the pre-2015 approach would also include wetlands that are physically proximate (*i.e.*, reasonably close) to jurisdictional waters, either categorically (for those wetlands adjacent to traditional navigable waters, the territorial seas, or interstate waters) or through a significant nexus analysis. Such wetlands were only adjacent under the 2020 NWPR if they were inundated by flooding in a typical year by a jurisdictional water, if they were physically separated from a jurisdictional water only by a natural berm or similar natural structure, or if they were physically separated from jurisdictional water only by an artificial structure so long as that structure allows for a direct hydrologic surface connection in a typical year. Otherwise, proximate wetlands were not considered adjacent under the 2020 NWPR. Under the final rule, such wetlands that are adjacent to but not directly abutting relatively permanent waters and non-relatively permanent waters would be jurisdictional only if they have significant nexus to a traditional navigable water, territorial sea, or interstate water.

I.B.3.5.4 Documentation in ORM2

Given that there are *de minimis* changes to the proportion of tributary resources that would have required Clean Water Act section 404 permits under the primary baseline, the agencies are assessing the secondary baseline via a comparison of the pre-2015 regulatory regime and the 2020 NWPR. The specific adjacent wetland category that cannot be surmised as fully jurisdictional or non-jurisdictional when comparing pre-2015 practice as a proxy for the final rule and the 2020 NWPR is primarily for adjacent wetlands evaluated under a significant nexus analysis. This makes a direct comparison to the 2020 NWPR categories of adjacent wetlands challenging. The Cowardin classification system that is denoted in ORM2 does allow for an assessment of what proportions of palustrine features were found to be jurisdictional or non-jurisdictional between the pre-2015 regulatory regime and under the 2020 NWPR. This is the basis for assessing the difference in the potential change of scope in jurisdiction for the secondary baseline. See Section III.C.2 for more details.

I.B.3.6 Intrastate Waters That Do Not Fall within Other Jurisdictional Provisions

I.B.3.6.1 Treatment in the Final Rule

As articulated in Section I.B.3.3 on lakes and ponds, the (a)(5) category of waters in the final rule will allow for intrastate lakes and ponds, streams, and wetlands not identified in paragraphs (a)(1) through (4) of the final rule to be considered for jurisdiction under the relatively permanent and significant nexus standards. Under the final rule, paragraph (a)(5) waters that meet either the relatively permanent standard or the significant nexus standard are jurisdictional.

Section I.B.3 provides additional discussion on the definition of “significantly affect” in this rule, including the factors that will be evaluated and the functions that will be assessed as part of a significant nexus analysis. In implementing the significant nexus standard, the agencies generally intend to analyze waters under paragraph (a)(5) individually to determine if they significantly affect the chemical, physical, or biological integrity of a paragraph (a)(1) water. This approach reflects the agencies’ consideration of public comments, as well as implementation considerations for waters assessed under paragraph (a)(5).

It is expected that relatively permanent lakes and ponds which are not part of tributary networks but which have continuous surface connections to tributary systems are the most likely resources which could

be considered jurisdictional paragraph (a)(5) waters. To illustrate, a relatively permanent lake located near a tributary that meets the relatively permanent standard, but separated by a natural berm, to the extent that berm provides evidence of a continuous surface connection, is jurisdictional as a paragraph (a)(5) water under the relatively permanent standard. Similarly, a relatively permanent oxbow pond located near a traditional navigable water, and connected to that traditional navigable water via a swale that provides a continuous surface connection between the pond and the traditional navigable water, is jurisdictional as a paragraph (a)(5) water under the relatively permanent standard. Wetlands with similar characteristics are considered for jurisdiction under the final rule as adjacent wetlands. When an intrastate lake, pond, stream or wetland that does not meet the jurisdictional criteria under other categories of the final rule does not have a continuous surface connection, regardless of flow regime, it would be assessed as a paragraph (a)(5) water via a significant nexus analysis. Some waters could be considered jurisdictional under paragraph (a)(5) where they significantly affect the chemical, physical, or biological integrity of traditional navigable waters, the territorial seas, or interstate waters, though the agencies anticipate that more resources will likely be found jurisdictional under paragraph (a)(5) pursuant to the relatively permanent standard.

I.B.3.6.2 Comparison of the Final Rule to the Primary Baseline

The agencies final rule makes changes to the jurisdictional criteria considered for intrastate waters evaluated under paragraph (a)(5) of the final rule as compared to the jurisdictional criteria intrastate waters evaluated under the comparable paragraph (a)(3) of the 1986 regulations, which is utilized under pre-2015 practice. This rule replaces the interstate commerce test used in paragraph (a)(3) of the 1986 regulations with the relatively permanent standard and the significant nexus standard for the comparable paragraph (a)(5) category in this rule. Prior to the *SWANCC* decision, paragraph (a)(3) of the 1986 regulations provided a broad scope of jurisdiction for waters considered under that category. However, after the *SWANCC* decision, as discussed in Section I.B.1, in practice the agencies have not asserted jurisdiction over waters assessed under paragraph (a)(3) of the 1986 regulations. Compared to the straight regulatory text of paragraph (a)(3) of the 1986 regulations, the final rule’s analogous paragraph (a)(5) category represents a decrease in jurisdiction for waters considered under that category. However, there will likely be waters that are jurisdictional under paragraph (a)(5) of the final rule that in practice would not have been jurisdictional under the comparable paragraph (a)(3) category of the 1986 regulations as implemented consistent with the pre-2015 regulatory regime. This includes waters evaluated under paragraph (a)(5) pursuant to the relatively permanent standard, as discussed in Section I.B.3.6(1), and waters evaluated under paragraph (a)(5) pursuant to the significant nexus standard. Similar to pre-2015 practice, waters evaluated under paragraph (a)(5) pursuant to the significant nexus standard will generally be considered individually. When considered individually, there are likely few of these resources that would feasibly be found to have a significant nexus. For example, there would be a higher likelihood for the water to be jurisdictional as an (a)(5) water if it were substantially large, and/or in close proximity to the nearest traditional navigable waters, territorial seas, or interstate waters (“paragraph (a)(1) waters”).

For example, when looking at data associated with JDs carried out under the *Rapanos* Guidance utilized consistent with pre-2015 practice (including AJDs, PJDs and JD Concurrences), the proportion of waters considered under paragraph (a)(3) of the 1986 regulations which will require an assessment under either the relatively permanent standard or significant nexus standard under the final rule is only 3.64% of all

aquatic resources that underwent jurisdictional determinations.¹⁹ This 3.64% represents intrastate rivers, streams, wetlands, lakes and ponds, and other types of waters that were found to be non-jurisdictional after an evaluation under paragraph (a)(3) of the 1986 regulations under pre-2015 practice. An unknown yet likely small fraction of this 4% could potentially become jurisdictional under this final rule under either the relatively permanent standard or the significant nexus standard.

To delve into this matter more, the agencies reviewed AJD data under the 2015 Clean Water Rule, which provided a very different avenue for finding certain intrastate waters to be jurisdictional. The number of observations from the 2015 Clean Water Rule within ORM2 that could potentially have been comparable to the implementation of paragraph (a)(5) of the final rule was so small that the dataset is not statistically viable for comparison. In short, the number of features to which this applies is too small to use for inferences of change in scope.

I.B.3.6.3 Comparison of the Final Rule to the Secondary Baseline

Under the 2020 NWPR, most waters that are assessed under paragraph (a)(5) of the final rule would have fallen under the 2020 NWPR’s paragraph (b)(1) exclusion for waters not identified in that rule’s four categories of “waters of the United States.” Some waters evaluated under paragraph (a)(5) of the final rule may have been jurisdictional under the 2020 NWPR’s category for “lakes and ponds, and impoundments of jurisdictional waters” (e.g., non-tributary lakes and ponds that are inundated by flooding in a typical year from traditional navigable water, a territorial sea, jurisdictional tributary under the 2020 NWPR, or jurisdictional lake and pond, or impoundment under the 2020 NWPR).

As discussed in previous sections, the agencies have been using data associated with pre-2015 practice to estimate potential changes between the final rule and the 2020 NWPR, but there are also data constraints which prevent a direct comparison of resources the 2020 NWPR found to be jurisdictional compared to what the pre-2015 regulatory practice found jurisdictional for these non-navigable, intrastate waters. Generally speaking, there are likely few resources from pre-2015 regulatory practice that would become jurisdictional under the (a)(5) category under the final rule. The difference in scope of jurisdiction from the primary baseline is expected to be *de minimis*. Applying that forward to the 2020 NWPR, where the differences were also *de minimis*, the agencies believe that overall the changes in jurisdiction related to (a)(5) waters in the final rule in comparison to the 2020 NWPR’s approach to non-navigable, isolated, intrastate waters will be *de minimis*.

I.B.3.6.4 Documentation in ORM2

Under pre-2015 regulatory practice, in ORM2 the water type “Isolate” was used as a catch-all for the (a)(3) “other waters category” under that regime. This water type could be further broken down by Cowardin classification into lacustrine, palustrine, and riverine resources.

Under the 2020 NWPR, most waters that would be evaluated under paragraph (a)(5) of the final rule were captured under the paragraph (b)(1) water type of that rule in ORM2; however, there is no way to differentiate these from other non-jurisdictional features excluded under paragraph (b)(1) of the 2020

¹⁹ Date range considered: January 1, 2010 to April 9, 2021.

NWPR within ORM2. Similarly there is no way to track which lake, ponds, and impoundments under paragraph (a)(3) of the 2020 NWPR would be considered under paragraph (a)(5) of the final rule.

ORM2 data associated with the 2015 Clean Water Rule has multiple categories for waters evaluated under paragraphs (a)(6), (a)(7), and (a)(8) of that rule²⁰ which could be parsed in different ways to assess the number of features that might be comparable to features that would be considered for jurisdiction under paragraph (a)(5) of the final rule. However, the resources are very case-specific, and whether the resource meets the relatively permanent standard, its size, its landscape position, and its distance from a traditional navigable water, territorial sea, or interstate water are key factors under the final rule in determining if it is jurisdictional. The data the agencies assessed had very few resources that might be comparable, and of those that were likely comparable, there was too much uncertainty to ensure that they would be truly comparable without further information.

I.B.3.7 Waters Excluded from the Definition of “Waters of the United States”

I.B.3.7.1 Treatment in the Final Rule

Under the final rule, certain waters are excluded from the definition of “waters of the United States,” including waters added to the exclusions at paragraph (b) that would have generally not been considered “waters of the United States” consistent with the agencies’ longstanding practice and each of the subsequent rules defining “waters of the United States.” Excluded waters are non-jurisdictional and are not subject to the regulation under the Clean Water Act. The agencies are listing these exclusions in the regulatory text in a new paragraph (b) which consolidates the exclusions together in a single regulatory section. Under the final rule, where a feature satisfies the terms of an exclusion, it is excluded from jurisdiction even where the feature would otherwise be jurisdictional under paragraphs (a)(2) through (5) of this rule. Paragraph (a)(1) waters (traditional navigable waters, the territorial seas, and interstate waters) are not subject to the exclusions, consistent with longstanding practice (other than the 2020 NWPR).

Prior converted cropland and waste treatment systems have been excluded from the definition of “waters of the United States” since 1993 and 1979, respectively, and those exclusions are continued in the final rule. The agencies have clarified in the final rule that the exclusion for prior converted cropland applies to those determinations made by the U.S. Department of Agriculture (USDA). This revision is instead to restore longstanding and familiar practice under the pre-2015 regulatory regime and maintains consistency and compatibility between the agencies’ implementation of the Clean Water Act and the USDA’s implementation of the Food Security Act by providing that prior converted cropland under the Clean Water Act encompasses areas designated by USDA as prior converted cropland. The agencies have also added clarity to the regulatory text that the exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. The final rule

²⁰ Paragraph (a)(6) of the 2015 Clean Water Rule was for adjacent waters, which included lakes and ponds which would be considered under paragraph (a)(5) of the final rule but also included adjacent wetlands which would be evaluated under paragraph (a)(4) of this final rule. Paragraphs (a)(7) and (a)(8) of the 2015 Clean Water Rule was for certain waters that did not meet the jurisdictional criteria under other categories of that rule and could be considered on a case-specific basis, either alone or with similarly situated waters in the region, for jurisdiction under that rule’s significant nexus standard. Together, these categories include categories of waters under the 2015 Clean Water Rule that will be evaluated under paragraph (a)(5) of the final rule.

would maintain the provision promulgated in 1993 that EPA retains final authority to determine whether an area is subject to the requirements of the Clean Water Act. Additionally, the agencies have revised the regulatory text of the waste treatment system exclusion to provide clarity, including deleting an obsolete cross-reference and deleting a suspended sentence that had been featured only in the version of the exclusion contained in EPA’s NDPES regulations. These revisions are intended to provide clarity and do not represent a change from the agencies’ decades-long practice implementing the exclusion.

Additional exclusions are also included in regulatory text for waters and features that were generally not considered “waters of the United States” consistent with the agencies’ pre-2015 practice. These include: ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water; artificially irrigated areas that would revert to dry land if the irrigation ceased; artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing; artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons; waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and swales and erosional features (*e.g.*, gullies, small washes) characterized by low volume, infrequent, or short duration flow.

I.B.3.7.2 Comparison of the Final Rule to the Primary Baseline

Consistent with pre-2015 practice, the agencies have clarified in the final rule that the exclusions do not apply to traditional navigable waters, the territorial seas, or interstate waters. The agencies are continuing the two longstanding exclusions that were part of the pre-2015 regulatory regime for waste treatment systems and prior converted cropland. The changes to the regulatory text for the exclusion for waste treatment systems are intended to provide clarity and are not intended to be a change from the agencies’ pre-2015 practice.

The regulatory text changes to the prior converted cropland exclusion to clarify that the exclusion will cease when the area has changed use, so that it is no longer available for the production of agricultural commodities, may represent a change from pre-2015 practice. The agencies have implemented both “change in use” and “abandonment” for purposes of ceasing the exclusion for prior converted cropland over the years. The preamble to EPA and the Corps’ 1993 regulations, provided that land would lose its prior converted status if it is abandoned and it exhibits wetland characteristics (abandonment).²¹ The Federal Agriculture Improvement and Reform Act of 1996 amended the Food Security Act and changed this “abandonment” principle, replacing it with a new approach referred to as “change in use.”²² EPA and the Corps did not address the 1996 amendments in rulemaking. In 2005, the Corps and National Resources Conservation Service (NRCS) issued a joint Memorandum to the Field (U.S. Department of Agriculture, 2005) in an effort to again align the Clean Water Act section 404 program with the Food

²¹ 58 FR 45034 (August 25, 1993), available at <https://www.loc.gov/item/fr058163/>.

²² Public Law 104-127, 110 Stat. 888 (1996). Under the 1996 amendments, an area retains its status as prior converted cropland for purposes of the wetland conservation provisions so long as it continues to be available for agricultural purposes. *See* H.R. Conf. Rep. No. 104-494, at 380 (1996).

Security Act by adopting the principle that a wetland can lose prior converted cropland status following a “change in use.” The Memorandum stated, “[a] certified [prior converted] determination made by NRCS remains valid as long as the area is devoted to an agricultural use. If the land changes to a non-agricultural use, the [prior converted] determination is no longer applicable and a new wetland determination is required for CWA purposes.” It defined “agricultural use” as “open land planted to an agricultural crop, used for the production of food or fiber, used for haying or grazing, left idle per USDA programs, or diverted from crop production to an approved cultural practice that prevents erosion or other degradation.” EPA was not a signatory of the 2005 memorandum and generally continued the “abandonment” practice. The change in use policy was later declared unlawful by one district court because it was found to effectively modify the 1993 preamble language without any rulemaking process.²³ Following this decision, the agencies did not implement “change in use” in areas subject to the court’s jurisdiction. The agencies rescinded the 2005 Memorandum following publication of the 2020 NWPR, on January 28, 2021. Given the rescission of the 2005 Memorandum, the agencies are currently utilizing the “abandonment” principle for determining when an area can lose its prior converted cropland status, consistent with the 1993 preamble. While the final rule is not intended to represent a change in which waters are properly excluded under the prior converted cropland exclusion, there may be differences in which resources lose their status as prior converted cropland under the final rule due to the clarification in the final rule that “change in use” is the proper criteria to consider when determining if an area is still prior converted cropland. The Corps does not track in ORM2 under pre-2015 practice if a water meets the prior converted cropland exclusion and does not track if a resource has lost its status as prior converted cropland. In addition, such a determination, under either the “abandonment” or “change in use” principles would require very site-specific information. Thus, the agencies are unable to estimate what this potential change in jurisdiction would be.

The agencies have interpreted certain waters to be generally non-jurisdictional under pre-2015 practice. For example, the 1986 and 1988 preamble language both states that the agencies do not generally consider certain waters to be “waters of the United States.” The preamble to the 1986 regulations, for example, explains that the agencies generally do not assert jurisdiction over “certain other features” including: artificially irrigated areas which would revert to upland if the irrigation ceased; artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing; artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons; and waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of “waters of the United States.” 51 FR 41217. In the *Rapanos* Guidance, the agencies added an additional category to this list, explaining that “[s]wales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) are generally not waters of the United States.” *Rapanos* Guidance at 11-12. The agencies in the *Rapanos* Guidance also provided additional clarity regarding ditches that were generally non-jurisdictional: ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water. *Id.* at 12.

²³ *New Hope Power Co. v. U.S. Army Corps of Eng’rs*, 746 F. Supp. 2d 1272, 1282 (S.D. Fla. 2010).

To provide clarity on which waters are jurisdictional and which are not and to enhance certainty for the public, the agencies are codifying exclusions for these features in the regulatory text in paragraph (b) and removing the possibility that these waters could be found jurisdictional on a case-specific basis. The agencies have made minor revisions to the text of the exclusions as compared to the 1986 preamble language or the *Rapanos* Guidance (e.g., changing uplands to “dry land”) to provide clarity and consistency, but the agencies have not intended for these minor clarifying revisions to represent a change in implementation. Because the agencies did not generally assert jurisdiction over these features in practice, codifying exclusions for these features is not a significant change from the pre-2015 regulatory regime. Many commenters supported codifying exclusions for these features.

I.B.3.7.3 Comparison of the Final Rule to the Secondary Baseline

The 2020 NWPR explicitly excluded waters that were not otherwise included in the definition of “waters of the United States.” The 2020 NWPR also continued some of the exclusions that were added to the regulatory text of the 2015 Clean Water, many of which were waters that had been found to be generally non-jurisdictional under pre-2015 practice but expanded the scope of some of those exclusions. The 2020 NWPR also differed from pre-2015 practice by explicitly allowing some exclusions to apply to traditional navigable waters and the territorial seas. The list of exclusions in the final rule is generally consistent with most of the exclusions under the 2015 Clean Water Rule and 2020 NWPR and will be familiar to the public. Where the agencies assumed no changes or limited changes when comparing the exclusions identified in paragraph (b) of the 2020 NWPR and those waters excluded under paragraph (b) of the final rule, there is no further discussion. For example, many of the water features that are generally not considered “waters of the United States” under the final rule would not be included in the 2020 NWPR’s definition of “waters of the United States” and therefore would be excluded under paragraph (b)(1) of the 2020 NWPR definition. In addition, groundwater, including groundwater drained through subsurface drainage systems, and diffuse stormwater run-off and directional sheet flow over upland are not considered “waters of the United States” under the final rule, and are explicitly excluded under the 2020 NWPR.

Waste Treatment Systems

Under the 2020 NWPR, the agencies retained an exclusion for waste treatment systems, but for the first time added a definition of the term to the regulatory text to include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge). The agencies have retained the waste treatment exclusion from the pre-2015 regulations, with minor text edits to correct outdated cross-references, but as discussed in Section I.B.3.7(2) do not intend for these clerical corrections to change the application of the waste treatment exclusion as compared to pre-2015 practice. Thus, the agencies do not anticipate a substantial change for waste treatment systems under the final rule as compared to the secondary baseline of the 2020 NWPR but note that if a system were located on a water whose jurisdictional status changes under the 2020 NWPR, the application of the exclusion would have likewise changed. It is anticipated that the final rule which returns to language similar to the pre-2015 regulations with minor clerical corrections would not create a substantial difference in jurisdictional status for waste treatment systems. Because this category of exclusions under the 2020 NWPR applied to traditional navigable waters and the territorial seas (and

because interstate waters was no longer an independent basis for jurisdiction under the 2020 NWPR), there could be some waters that are paragraph (a)(1) waters under the final rule that would have been excluded as waste treatment systems under the 2020 NWPR. The agencies are unable to quantify this change.

Prior Converted Cropland

The 2020 NWPR provided a regulatory definition of prior converted cropland for purposes of the Clean Water Act for the first time. Generally, the 2020 NWPR's approach to prior converted cropland substantially broadened the scope of prior converted cropland and reduced the likelihood that it would ever lose its excluded status. The 2020 NWPR provided that an area remains prior converted cropland for purposes of the Clean Water Act unless the area is abandoned and has reverted to wetlands, defining abandonment to occur when prior converted cropland "is not used for, or in support of, agricultural purposes at least once in the immediately preceding five years." 85 FR 22339; 33 CFR 328.3(c)(9). The 2020 NWPR then presented a broad interpretation of "agricultural purposes," including but not limited to crop production, haying, grazing, idling land for conservation uses (such as habitat; pollinator and wildlife management; and water storage, supply, and flood management); irrigation tailwater storage; crawfish farming; cranberry bogs; nutrient retention; and idling land for soil recovery following natural disasters such as hurricanes and drought. 85 FR 22321. Given the breadth of "agricultural purposes" under the 2020 NWPR, former cropland that reverts to wetlands otherwise meeting the definition of "waters of the United States" could have maintained its excluded prior converted cropland status simply by, for example, being grazed or idled for habitat conservation once in five years. These wetlands could then have been filled without triggering any Clean Water Act regulatory protection.

The 2020 NWPR's definition of prior converted cropland extended the Clean Water Act exclusion beyond those areas that the USDA considers prior converted cropland under the Food Security Act. Specifically, while USDA's implementation of prior converted cropland requires production of an "agricultural commodity," the 2020 NWPR defined prior converted cropland to encompass any area used to produce an "agricultural product," a term that introduced ambiguity and further distinguished the Clean Water Act's prior converted cropland exclusion from USDA's approach. *Compare* 7 CFR 12.33(b) *with* 33 CFR 328.3(c)(9). The 2020 NWPR's definition provided that the agencies would recognize prior converted cropland designations made by USDA, 33 CFR 328.3(c)(9), but the list of examples that the 2020 NWPR provides for "agricultural product" suggests the term is substantially broader than the USDA's requirement for land used for "commodity crops."

The final rule restores longstanding and familiar practice under the pre-2015 regulatory regime and maintains consistency and compatibility between the agencies' implementation of the Clean Water Act and the USDA's implementation of the Food Security Act by providing that prior converted cropland under the Clean Water Act encompasses areas designated by USDA as prior converted cropland. Areas USDA has not so designated are not eligible for this Clean Water Act exclusion. Consistent with USDA's definition, the Clean Water Act exclusion for prior converted cropland only covers wetlands and does not exclude other types of non-wetland aquatic resources (*e.g.*, tributaries, ponds, most ditches) that are located within the prior converted cropland area. Any area that has not reverted to a wetland that meets this rule's definitions will not be considered a "water of the United States."

The final rule also differs from the 2020 NWPR by clarifying that an area can lose its status as prior converted cropland due to a change in use, whereas the 2020 NWPR utilized the “abandonment” principle. The agencies believe that this clarification better aligns the agencies’ implementation of which waters are properly prior converted cropland with the USDA’s interpretation, which also utilizes “change in use” for determining if an area has lost its prior converted cropland status. The agencies believe that this will change the number of areas that are able to maintain their prior converted cropland status, should the area revert to a wetland that meets the final rule’s definition of “waters of the United States,” but are unable to estimate this change.

The agencies anticipate that fewer waters would be excluded as prior converted cropland under the final rule’s language, compared to under the 2020 NWPR. However, the agencies are unable to quantify this change. Not all prior converted cropland that has been officially designated by USDA’s NRCS has been mapped throughout the country. In addition, not all land that qualifies under the Food Security Act of 1985 as prior converted cropland has been officially designated as such. Further, NRCS is statutorily prohibited from sharing data and information on program participants and their land, even with other federal agencies.²⁴ Therefore, NRCS data were not available for the agencies to identify potential effects or changes in jurisdiction. Although estimates of the acreage of prior converted croplands have been made in the past (e.g., 53 million acres; White House Office on Environmental Policy, 1993), the agencies could not leverage this information in this analysis. In addition, the Corps does not document in ORM2 when waters met the prior converted cropland exclusion under the pre-2015 regulatory regime, and one year of NWPR data is not sufficient to surmise how the 2020 NWPR’s definition of prior converted cropland would be implemented. No agency data exist to provide estimates on the current extent of prior converted cropland or the comparable applicability between pre-2015 regulatory regime (that the final rule will restore) and under the secondary baseline of the 2020 NWPR.

Ephemeral Features, Including Ephemeral Streams

The 2020 NWPR excluded ephemeral features, including ephemeral streams, swales, gullies, rills, and pools, from the definition of “waters of the United States.” As previously discussed, the exclusion for all ephemeral features in 2020 NWPR is not retained in the final rule. For example, the final rule includes those ephemeral streams, lakes, and ponds that meet the jurisdictional criteria under paragraphs (a)(1) through (5) of the final rule. For example, an ephemeral lake that is an interstate water is jurisdictional under the final rule but would not have been jurisdictional under the 2020 NWPR. Similarly, an ephemeral stream that meets the criteria to be jurisdictional as a tributary under the final rule would be a “water of the United States” under the final rule but would not have under the 2020 NWPR. Changes in jurisdiction for ephemeral streams are discussed in section I.B.3.2. Consistent with pre-2015 practice,

²⁴ Section 1619 of the Food, Conservation, and Energy Act of 2008 prohibits USDA, its contractors, and cooperators, from disclosing information provided by an agricultural producer or owner of agricultural land concerning the agricultural operation, farming or conservation practices, or the land itself, in order to participate in a USDA program, as well as geospatial information maintained by USDA with respect to such agricultural land or operations, subject to certain exceptions and authorized disclosures. Covered information may only be shared with other federal agencies outside USDA for specific purposes under a cooperative program, *i.e.*, not for general regulatory or enforcement purposes. Available at <https://www.agriculture.senate.gov/imo/media/doc/110-246%20-%20Food,%20Conservation,%20And%20Energy%20Act%20Of%202008.pdf>.

features like non-wetland swales, gullies,²⁵ and rills are not considered jurisdictional under the final rule because they are not tributaries or because they do not have a significant nexus to a downstream traditional navigable water, territorial sea, or interstate water, and such waters would not have been jurisdictional under the 2020 NWPR. Thus, for swales, gullies, and rills, the agencies expect no change in jurisdiction under the final rule as compared to the 2020 NWPR.

Ditches

Under the 2020 NWPR, all ditches that were not subject to jurisdiction as a territorial sea, traditional navigable water, or tributary, as well as those portions of ditches that were constructed in an adjacent wetland that did not satisfy the conditions of the “adjacent wetlands” definition were excluded. Some of the ditches excluded under the 2020 NWPR would be considered non-jurisdictional under the final rule, such as ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water. In addition, non-relatively permanent ditches that are not created in dry land and that lack a case-specific significant nexus would also be non-jurisdictional under the final rule. Thus, ditches that would be non-jurisdictional under the final rule would not represent a change from the ditch exclusion in the 2020 NWPR. However, other ditches that were excluded under the 2020 NWPR may be jurisdictional under the final rule if they cross State lines regardless of any connection to a traditional navigable water or the territorial seas, are relatively permanent waters, or are non-relatively permanent ditches that are not excavated wholly in and draining only dry lands with a case-specific significant nexus to a traditional navigable water, territorial sea, or interstate water. The agencies are unable to quantify this change.

Certain Other Features

The 2020 NWPR excluded “artificially irrigated areas, artificial lakes and ponds, and water filled depressions,” which included fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease. The text of the exclusion changed somewhat from the 1986 and 1988 preamble language used under the final rule by adding “including fields flooded for agricultural production” and with a slight modification from “if the irrigation ceased” to “should application of irrigation water to that area cease,” but the agencies anticipate that there would be little to no change in the scope of jurisdiction for all of the features associated with these waters.

The 2020 NWPR excluded artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as those artificial lakes and ponds were not impoundments of jurisdictional waters that met the conditions of the “lakes and ponds, and impoundments of jurisdictional waters” definition in the rule. The 2020 NWPR’s exclusion differs from the scope of waters that would be considered non-jurisdictional in a few ways, including by identifying water storage reservoirs, farm ponds, and log cleaning ponds as excluded types of artificial lakes and ponds, and not specifically

²⁵ Some ephemeral streams are colloquially called “gullies.” Regardless of the name they are given locally, some such ephemeral streams could be found jurisdictional under the final rule if they cross State lines regardless of any connection to a TNW or if they satisfy a significant nexus evaluation.

including settling basins or artificial lakes and ponds used for rice growing in this category of exclusions. The agencies are unable to quantify this change.

In the final rule, the exclusion of artificial lakes and ponds would be limited to those excavated fully in uplands. Artificial ponds and lakes constructed or excavated in newly non-jurisdictional waters (waters that were found to be jurisdictional prior to the 2020 NWPR) were excluded under the 2020 NWPR. For example, under the 2020 NWPR an artificial pond could be constructed by impounding an ephemeral stream, but such a pond would be jurisdictional under the final rule as an impoundment if the ephemeral stream met the significant nexus standard to be jurisdictional. In addition, under the 2020 NWPR, an artificial lake or pond created in a non-jurisdictional wetland would be excluded, but such a lake or pond could be jurisdictional under the final rule, for example if it was a relatively permanent water that had a continuous surface connection to a tributary that meets the relatively permanent standard via a swale. The exclusion in the final rule would also not apply to those waters that are traditional navigable waters, the territorial seas, or interstate waters, whereas it would under the 2020 NWPR. Therefore, some water features could have been excluded under the 2020 NWPR that could be considered jurisdictional under the final rule for this category. The agencies are unable to quantify this change.

The 2020 NWPR's exclusion for water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel differs from the scope of waters that will be not jurisdictional under the final rule. The 1986 and 1988 preamble language and the final rule include additional specifications that such waters are generally non-jurisdictional unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of "waters of the United States." Although not included in the regulatory text, in the preamble to the 2020 NWPR the agencies clarified that once a feature subject to this exclusion is no longer used for its original purpose, it no longer qualifies for the exclusion. Similar to artificial lakes and ponds, water-filled depressions and pits that met the terms of the exclusion that were constructed or excavated in non-jurisdictional waters were non-jurisdictional under the 2020 NWPR, but that same condition does not apply under the final rule. Under the final rule, this exclusion also not apply to waters that are traditional navigable waters, the territorial seas, or interstate waters, whereas it would under the 2020 NWPR. The agencies are unable to quantify this change.

Stormwater Control Features

The 2020 NWPR excluded stormwater control features constructed in upland or in non-jurisdictional waters that convey, treat, infiltrate, or store stormwater run-off. Similar to some of the other exclusions, stormwater control features that met the terms of the exclusion and were constructed in non-jurisdictional waters were non-jurisdictional under the 2020 NWPR. There is no such exclusion for stormwater control features under the final rule and such waters were not listed as generally non-jurisdictional under the 1986 and 1988 preamble language, though some stormwater features would be non-jurisdictional under the final rule. The agencies are unable to quantify this change.

Groundwater Recharge, Water Reuse, and Wastewater Recycling Structures

The 2020 NWPR excluded groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in

non-jurisdictional waters. Similar to some of the other exclusions, structures that met the terms of the exclusion that were constructed in non-jurisdictional waters were non-jurisdictional under the 2020 NWPR. The 1986 and 1988 preamble language that informs the exclusions in the final rule does not include a similar category of waters generally considered non-jurisdictional. Such waters were likely not considered jurisdictional under prior practice unless they were connected to the tributary network or were jurisdictional impoundments, and even then, some such waters could be considered excluded under the exclusion for waste treatment systems. Under the final rule, there is the potential for such waters to be jurisdictional if they are traditional navigable waters, the territorial seas, or interstate waters or if they meet either the relatively permanent or significant nexus standard and do not fall under the waste treatment exclusion. The agencies are unable to quantify this change.

I.B.3.7.4 Documentation in ORM2

The agencies are unable to query ORM2 to determine how many waters have been determined to meet an exclusion from the definition of “waters of the United States” under the pre-2015 regulatory regime and are unable to quantify the magnitude of the changes in jurisdiction due to some of these exclusions.

I.B.4 Comparison of the Scope of Jurisdiction: Primary Baseline and Final Rule

Table I-1: Regulatory Category Crosswalk between the Primary Baseline and the Final Rule			
Water type	Pre-2015	Corresponding Categories?*	Final Rule
Traditional navigable waters	(a)(1) Traditional navigable waters	Yes	(a)(1) Traditional navigable waters, territorial seas, interstate waters
Interstate waters**	(a)(2) Interstate waters	Yes	(a)(1) Traditional navigable waters, territorial seas, interstate waters
Territorial seas**	(a)(6) Territorial Seas	Yes	(a)(1) Traditional navigable waters, territorial seas, interstate waters
Impoundments	(a)(4) Impoundments of jurisdictional waters	Yes	(a)(2) Impoundments of jurisdictional waters (except impoundments of (a)(5) waters)
Lakes and Ponds	(a)(5) Tributaries (see also (a)(3) waters)	As tributaries, yes (see also (a)(5) waters under the final rule)	(a)(3) Tributaries (meeting relatively permanent standard, or meeting significant nexus standard) (see also (a)(5) waters)
Tributaries	(a)(5) Tributaries	Mostly	(a)(3) Tributaries (meeting relatively permanent standard, or meeting significant nexus standard)
Adjacent Wetlands	(a)(7) Adjacent wetlands (adjacent to (a)(1), (a)(2), or (a)(6) waters, or abutting relatively permanent waters, or adjacent to relatively permanent or non-relatively permanent waters and meeting significant nexus standard)	Mostly	(a)(4) Adjacent wetlands (adjacent to (a)(1) waters, or adjacent to relatively permanent (a)(2)-(a)(3) waters with a continuous surface connection, or adjacent to (a)(2)-(a)(3) waters and meeting the significant nexus standard)

Table I-1: Regulatory Category Crosswalk between the Primary Baseline and the Final Rule

Water type	Pre-2015	Corresponding Categories?*	Final Rule
Intrastate Waters Not Meeting Other Categories of Waters	(a)(3) Other waters that could impact interstate or foreign commerce***	No, but miniscule impact to jurisdiction	(a)(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) (and meeting relatively permanent standard or significant nexus standard)

* This column summarizes whether types of aquatic resources are expected to be found to be jurisdictional at a comparable rate to those found to be jurisdictional under pre-2015 practice.

** Interstate waters are categorized under the *Rapanos* AJD form as any other type of resource; the distinction, which is not captured in ORM2, is that these resources cross or serve as State boundaries. These resources are thus not separated within ORM2 for aquatic resources associated with *Rapanos* AJDs. Similarly, territorial seas are categorized under the *Rapanos* AJD form as traditional navigable waters.

*** While these resources should have required an analysis of their commerce links under (a)(3) under the pre-2015 regulatory regime, in practice, this became a ‘catch all’ category used by Corps staff in ORM2 to denote non-jurisdictional, isolated resources.

I.B.5 Comparison of Scope of Jurisdiction: Secondary Baseline and Final Rule

Table I-2: Regulatory Category Crosswalk between the Secondary Baseline and the Final Rule

Water type	2020 NWPR	Corresponding Categories?*	Final Rule
Traditional navigable waters	(a)(1) Traditional navigable waters and territorial seas	Mostly	(a)(1) Traditional navigable waters, territorial seas, interstate waters
Interstate waters**	N/A	No	(a)(1) Traditional navigable waters, territorial seas, interstate waters
Territorial seas	(a)(1) Territorial Seas	Yes	(a)(1) Traditional navigable waters, territorial seas, interstate waters
Impoundments	(a)(3) Lakes and ponds, and impoundments of jurisdictional waters or (b)(1) Waters that are not (a)(1) - (a)(4)	Mostly	(a)(2) Impoundments of jurisdictional waters (except impoundments of (a)(5) waters)
Lakes and Ponds	(a)(3) Lakes and ponds, and impoundments of jurisdictional waters or (b)(1) Waters that are not (a)(1) - (a)(4)	As tributaries, mostly (see also (a)(5) waters under the final rule)	(a)(3) Tributaries (meeting relatively permanent standard, or meeting significant nexus standard) (see also (a)(5) waters)
Tributaries***	(a)(2) Tributaries, (a)(3) Lakes and ponds, and impoundments of jurisdictional waters, or (b)(1) or (b)(3) exclusions	No	(a)(3) Tributaries (meeting relatively permanent standard or significant nexus standard)
Adjacent Wetlands***	(a)(4) Adjacent wetlands or (b)(1) exclusions	No	(a)(4) Adjacent wetlands (adjacent to (a)(1) waters, or adjacent to relatively permanent (a)(2)-(a)(3) waters with a continuous surface connection, or adjacent to (a)(2)-

Table I-2: Regulatory Category Crosswalk between the Secondary Baseline and the Final Rule

Water type	2020 NWPR	Corresponding Categories?*	Final Rule
			(a)(3) waters and meeting the significant nexus standard)
Intrastate Waters Not Meeting Other Categories of Waters	Paragraph (b) exclusions (see also (a)(3) waters)***	Mostly	(a)(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) (meeting relatively permanent standard or significant nexus standard)
<p>* This column summarizes whether types of aquatic resources are expected to be found to be jurisdictional at a comparable rate to those found to be jurisdictional under pre-2015 practice.</p> <p>** Interstate waters were not an independent basis for jurisdiction under the 2020 NWPR. Such waters were jurisdictional only were they met one of the other jurisdictional criteria under that rule.</p> <p>*** See descriptions within Section I.B for more details on how the 2020 NWPR's scope of jurisdiction was tied more heavily to flow regime and certain surface hydrologic connections in a typical year rather than how waters significantly affect traditional navigable waters or territorial seas.</p>			

I.C Assessing the Change in Scope of Jurisdiction with the Cowardin Classification

I.C.1 Prior Methods for Assessing Change in Scope

The EA for the 2020 NWPR included national quantitative analyses and three in-depth case studies. These efforts demonstrated the difficulty of comparing different jurisdictional regimes and quantifying the environmental and economic effects. However, despite these challenges, the agencies recognize the value of quantitative comparisons analyses to the extent possible.

Under the 2015 Clean Water Rule, a comparison of scope of jurisdiction from the baseline of pre-2015 practice to the new rule was carried out by forecasting the change in jurisdictional scope through analysis of prior jurisdictional determinations. Specific regulatory definitions were assessed in one of two ways: (1) Does the regulatory definition translate equally between rules? For example, the implementation of traditional navigable waters has been generally comparable between rules, and therefore it has been assumed that such resources would largely remain jurisdictional regardless of rule.²⁶ (2) If the regulatory definition does not translate equally between rules, what do the agencies forecast the change in jurisdictional scope to be?

Because the 2020 NWPR had been in place for just over a year before its vacatur,²⁷ and the agencies are largely returning to a familiar regulatory approach that is similar to their pre-2015 regulatory regime, with

²⁶ The 2020 NWPR did allow for most exclusions to apply to TNWs, which is a change from longstanding practice. The agencies are returning to the prior practice that would not allow exclusions to apply to TNWs. Thus, there were potentially some TNWs excluded under the 2020 NWPR that would be jurisdictional under both pre-2015 practice and the final rule.

²⁷ The 2020 NWPR was subject to preliminary injunction by the U.S. District Court for the District of Colorado and thus the agencies did not implement the 2020 NWPR in jurisdictions subject to the court's jurisdiction until April 2021.

amendments to reflect the agencies’ interpretation of the statutory limits on the scope of the “waters of the United States,” informed by the statute as a whole, the scientific record, relevant Supreme Court case law, public comment, and the agencies’ experience and expertise, one might think that carrying out a similar review of change in jurisdictional scope would be straightforward. However, the definitions under the 2020 NWPR were significantly different from those in the pre-2015 regulatory regime and the final rule, and information collected in jurisdictional determinations under the 2020 NWPR does not contain the same level of detail. Assessing the jurisdictional scope of individual aquatic resources would be more subjective than similar prior assessments have been.

I.C.2 Assessing Change in Scope between Pre-2015 Practice and the 2020 NWPR

An alternative method for assessing the change in scope of jurisdiction has been used in this economic analysis. This method relies on a field within the ORM2 database which has remained unchanged since 2010, the Cowardin code, which is associated with individual aquatic resources categorized by hydromorphic characteristics, such as palustrine features (*e.g.*, wetlands and ponds), lacustrine features (*e.g.*, lakes), and riverine features (*e.g.*, streams and rivers). As this field has remained unchanged regardless of definitional changes, the probability of jurisdictional findings under given rules can be related to specific resource types as defined by the Cowardin classification system (Cowardin et al., 1979). While data within ORM2 is imperfect in nature, the agencies consider this method of assessing potential changes in the scope of jurisdiction is reliable. This method is described in detail in Chapter III and in Appendix A. Public comment on this method was generally favorable with the technique. As such, the agencies continue to use it for this economic analysis.

I.D Economic Analysis of the Final Rule using the Primary Baseline

The primary baseline for the economic analysis is the pre-2015 regulatory regime, which consists of the 1986 “waters of the United States” regulation (33 CFR 328.3), as informed by the 2003 *SWANCC* and 2008 *Rapanos* Guidance documents. The statutory requirements considered during development of the final rule include the Regulatory Flexibility Act (RFA) and Small Business Regulatory Enforcement Fairness Act (SBREFA), the Paperwork Reduction Act, the Unfunded Mandate Reform Act, and the National Technology Transfer and Advancement Act. The analysis is also conducted pursuant to Executive Orders 12866 (Regulatory Planning and Review), 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), 13132 (Federalism), 13175 (Consultation and Coordination with Indian Tribal Governments), 13045 (Protection of Children from Environmental Health Risks and Safety Risks), 13211 (Action Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use), and 13563 (Improving Regulation and Regulatory Review). Requirements with specific import for an economic and programmatic analysis are described below; others are addressed in the preamble to the final rule.

I.D.1 Unfunded Mandate Reform Act

The Unfunded Mandate Reform Act (UMRA) contains requirements for agencies when regulations include unfunded federal mandates imposed by the federal government on State, Tribal, and local governments. The final rule does not contain any unfunded mandate and does not significantly or uniquely affect small governments. The final definition of “waters of the United States” applies broadly to Clean Water Act programs. The action imposes no enforceable duty on any State, Tribal, or local governments, or the private sector.

I.D.2 Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

E.O. 12898 requires federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The agencies believe that the final rule does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples. The final rule is definitional in nature. The regulations established in the final rule are founded on the familiar framework of the 1986 regulations and are generally consistent with the pre-2015 regulatory regime. The agencies have, however, conducted an environmental justice analysis for the final rule relative to the secondary baseline for informational purposes.

I.D.3 Executive Orders 12866 Regulatory Planning and Review and 13563 Improving Regulation and Regulatory Review

The final rule is a significant regulatory action that was submitted to OMB for review. However, because the primary baseline is the pre-2015 regulatory regime and the regulations established in the final rule are founded on the familiar framework of the 1986 regulations and are generally consistent with the pre-2015 regulatory regime, the world with the final rule is very similar to the world without this rule. The analysis of such a rule is straightforward. The agencies acknowledge that there would likely to be some costs associated with regulated entities as well as States, Tribes, and localities reviewing the final rule language and ensuring their activities going forward are in keeping with it. However, these costs would be *de minimis*. Any attempts to quantify them would be highly speculative and imprecise. Thus, the final rule will have no monetized effect compared to the primary baseline and thus the benefits and the costs of the rule are trivially different from \$0. The agencies have determined that, relative to the primary baseline, the benefits of this rule justify the costs (Table I-3).

Table I-3: Total national benefits and costs (millions 2021\$) relative to primary baseline of the pre-2015 regulatory regime	
Benefits	<i>de minimis</i>
Costs	<i>de minimis</i>
Net Benefits	<i>de minimis</i>

I.D.4 Regulatory Flexibility Act and Small Business Regulatory Enforcement Fairness Act

The Regulatory Flexibility Act (RFA, 5 U.S.C. et seq., Public Law 96-354), as amended by the 1996 Small Business Regulatory Enforcement Fairness Act (SBREFA Public Law 104-121), requires federal agencies to consider the economic impact that a new rule will have on small entities. The purpose of the RFA and SBREFA laws is to ensure that, in developing rules, agencies identify and consider ways to avoid undue impacts on small entities that will be affected by the regulation, whether as small businesses or organizations that will be subject to regulatory requirements or as small governments that will be responsible for complying with or administering the regulation. While the RFA does not require an agency to minimize a rule's impact on small entities if there are legal, policy, factual, or other reasons for not doing so, it does require that agencies:

- Determine, to the extent feasible, the economic impact on small entities subject to the rule;
- Explore regulatory options for reducing any significant economic impact on a substantial number of such entities; and
- Explain the ultimate choice of regulatory approach.

For proposed and final rules subject to notice and comment under the Administrative Procedure Act (APA) or other statutes, the agencies must either certify that the rule “will not, if promulgated, have a significant economic impact on a substantial number of small entities” (“SISNOSE”) or prepare a Regulatory Flexibility Analysis if the agency cannot make this certification. Small entities include small businesses and small organizations as defined by the Small Business Administration (SBA), and governmental jurisdictions with populations of less than 50,000.

The agencies certify that this rule will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities. This rule would codify a regulatory regime very similar to the one currently being implemented nationwide due to the vacatur of the 2020 definition of “waters of the United States.” Additionally, the final rule does not “subject” any entities of any size to any specific regulatory burden. It is designed to clarify the statutory term “navigable waters,” defined as “waters of the United States,” which defines the scope of Clean Water Act jurisdiction 33 U.S.C. 1362(7). The scope of Clean Water Act jurisdiction is informed by the text, structure, and history of the Clean Water Act and Supreme Court case law, including the geographical and hydrological factors identified in *Rapanos v. United States*, 547 U.S. 715 (2006). None of these factors are readily informed by the RFA. *See, e.g., Cement Kiln Recycling Coal. v. EPA*, 255 F.3d 855 (D.C. Cir. 2001) (“[T]o require an agency to assess the impact on all of the nation’s small businesses possibly affected by a rule would be to convert every rulemaking process into a massive exercise in economic modeling, an approach we have already rejected.”); *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000); *Am. Trucking Ass’n v. EPA*, 175 F.3d 1027, 1045 (D.C. Cir. 1999) (“[A]n agency may justify its certification under the RFA upon the ‘factual basis’ that the rule does not directly regulate any small entities.”); *Mid-Tex Elec. Co-op, Inc. v. FERC*, 773 F.2d 327, 343 (D.C. Cir. 1985) (“Congress did not intend to require that every agency consider every indirect effect that any regulation might have on small businesses in any stratum of the national economy.”).

Under the RFA, the impact of concern is any significant adverse economic impact on small entities, because the primary purpose of the initial regulatory flexibility analysis is to identify and address regulatory alternatives “which minimize any significant economic impact of the proposed rule on small entities.” 5 U.S.C. 603. In this case, the agencies conclude that this rule will not significantly impact small entities because it narrows the scope of jurisdiction from the text of the 1986 regulations. Because fewer waters will be subject to the Clean Water Act under this rule than fall within the scope of the text of the regulations in effect, this action will not affect small entities to a greater degree than the existing regulations currently in effect. A key change is the deletion of the provision in the 1986 regulations that defines “waters of the United States” as all paragraph (a)(3) “other waters” such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: which are or could be used by interstate or

foreign travelers for recreational or other purposes; from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce. Under this rule, a broad interstate commerce connection is not sufficient to meet the definition of “waters of the United States.” Instead, waters must meet either the relatively permanent standard or the significant nexus standard. Further, waters in a watershed in which there is no connection to a traditional navigable water, the territorial seas, or an interstate water, would not be “waters of the United States.” In addition, this rule would explicitly exclude some features and waters over which the agencies have not generally asserted jurisdiction, but which are not excluded in the text of the 1986 regulations, and in so doing eliminates the authority of the agencies to determine in case-specific circumstances that some such waters are jurisdictional “waters of the United States.” This rule also provides new limitations on the scope of jurisdictional tributaries and most adjacent wetlands by establishing a requirement that they meet either the relatively permanent standard or the significant nexus standard. Together, these changes serve to narrow the scope of this rule in comparison to the text of the regulation in effect. Because the rule narrows the scope of jurisdiction from the text of the 1986 regulations, this action will not have a significant adverse economic impact on a substantial number of small entities, and therefore no regulatory flexibility analysis is required.

Nevertheless, the agencies recognize that the scope of the term “waters of the United States” is of great national interest, including within the small business community. In light of this interest, the agencies sought early input from representatives of small entities while formulating a definition of this term, including holding a public meeting dedicated to hearing feedback from small entities on August 25, 2021 (see <https://www.epa.gov/wotus/2021-waters-united-states-public-meeting-materials>). A variety of small entities such as farmers and ranchers, environmental and conservation non-profits, as well as building, consulting, and brewing businesses provided their input on the rulemaking. This process has enabled the agencies to hear directly from these representatives from the outset about how they should approach this complex question of statutory interpretation.

I.E I.E. Summary

As discussed in this chapter, the agencies’ ability to make quantitative estimates of changes in Clean Water Act jurisdiction under the final rule relative to the pre-2015 regulatory practice (primary baseline) and NWPR (secondary baseline) is limited by available data and the case-specific consideration of jurisdiction for certain waters that would be required under the final rule. Compared to the pre-2015 regulatory practice, it is expected that the final rule will lead to a *de minimis* increase in jurisdictional resources due to nuanced changes in the implementation of the significant nexus standard and the assessment of non-navigable, isolated, intrastate waters via the relatively permanent standard and the significant nexus standard. In reviewing the first year of implementation of the 2020 NWPR, the agencies have ORM2 data that demonstrate the magnitude of the effects of the deregulatory scope of the 2020 NWPR, and analyses show ephemeral streams and wetlands to be much more affected than estimated in the analysis of the 2020 NWPR in the 2020 NWPR’s Economic Analysis (U.S. EPA and Army, 2020a).

No ephemeral streams were jurisdictional under the 2020 NWPR, whereas those that satisfy the significant nexus standard would be jurisdictional under the final rule. Similarly, certain wetlands that would be found jurisdictional under the final rule would not have been jurisdictional under the 2020 NWPR. This includes certain wetlands that would be jurisdictional under the final rule as adjacent but that did not meet the requirements to be adjacent under the 2020 NWPR definition, and wetlands adjacent

to those ephemeral streams that would be considered jurisdictional under the final rule. Some additional streams that were not jurisdictional under the 2020 NWPR would be jurisdictional under the final rule where they meet either the relatively permanent or significant nexus standard, if such streams do not contribute surface water flow to a territorial sea or traditional navigable water in a typical year (*e.g.*, an intermittent or perennial stream that eventually dissipates on the desert floor with surface flow reaching a downstream jurisdictional water only in atypical years), as the 2020 NWPR required. In addition, there could be a subset of interstate waters that would be categorically jurisdictional under the final rule that may not have been jurisdictional under the 2020 NWPR due to the elimination of interstate waters as a standalone category of jurisdictional waters. The final rule would not affect the scope of jurisdictional territorial seas or traditional navigable waters nor would it substantially affect the jurisdictional status of most relatively permanent waters relative to the baseline. The final rule could result in an increase in jurisdictional lakes and ponds and impoundments in comparison to the 2020 NWPR.

II. State and Tribal Regulatory Practice

Clean Water Act programs including the section 303 water quality standards program, the section 311 Oil Spill Prevention program, the section 401 water quality certification program, the section 402 NPDES permit program, and the section 404 permit program for the discharge of dredged or fill material, rely on the definition of “waters of the United States” for program implementation. A revised definition of “waters of the United States” would affect these federal programs as implemented at the State or Tribal level. Potential effects of this rule, however, will vary based on a State’s independent legal authority and programs under its own State law to protect aquatic resources. For this analysis, the agencies focus on State regulatory practice as no Tribe administers the Clean Water Act section 402 or 404 permit programs, and the majority of Tribes do not have approved water quality standards or issue Clean Water Act section 401 water quality certifications.²⁸

States implementing Clean Water Act programs such as TMDLs, impaired waters, delegated NPDES programs, assumed dredged and fill programs will need to regulate discharges into all waters that the final rule defines as jurisdictional. For those States that do not regulate as broadly as either the pre-2015 regulatory practice or the 2020 NWPR, the broader scope of jurisdiction under the final rule represents a change. Programs in States that are typically implemented by the federal government (section 311 oil spill programs and section 404 permitting programs) or triggered by federal permits (section 401 certification) are affected by the definition of “waters of the United States.” State regulatory programs operating under State law are independent of Clean Water Act jurisdictional issues, and under all definitions of “waters of the United States,” they may be broader or more limited in scope than the applicable definition. Some States do not have their own dredged and fill permitting program and rely on the Clean Water Act section 401 program to address dredged and fill activities that are permitted by the Corps.

²⁸ This analysis does not consider how the 574 federally recognized Tribes might respond to a change in Clean Water Act jurisdiction, nor does it include Tribes in its calculations of costs and benefits. Currently, 80 Tribes have been found eligible to administer a Clean Water Act section 303(c) water quality standards program, and the EPA has approved water quality standards (WQS) for 47 of these Tribes. The EPA has promulgated federal water quality standards for one additional Tribe, and a few Tribes have water quality standards that are not current federally approved. Seventy-nine Tribes have the authority to administer a Clean Water Act section 401 water quality certification program. Many Tribes may lack the capacity to administer a water quality standards program or a certification program. Other Tribes may rely on the federal government for enforcement of water quality standards, particularly for enforcement of non-Tribal members. Currently, no Tribes have obtained treatment in a manner similar to a State (TAS) status to administer either the Clean Water Act section 402 or 404 programs. The agencies (or with a few exceptions for Clean Water Act section 402, the State) generally issue Clean Water Act sections 402 and 404 permits on Tribal lands. A few Tribes have some type of permitting program for discharges of dredged or fill material into “waters of the Tribe.” Many Tribes may lack the capacity to administer either the Clean Water Act section 402 or the 404 programs, to create permitting programs for discharges, or to expand permitting programs that currently exist. Further, some Tribes have stated during Tribal consultation and engagement on the 2020 NWPR that they are not interested in seeking TAS for Clean Water Act programs like water quality standards and Clean Water Act sections 402 and 404 if the federal government reduces the scope of the Clean Water Act jurisdiction. In addition, this economic analysis does not account for potential effects related to subsistence fishing, rice growing, or cultural uses of water that are unique to Tribes and their reliance on waters. This analysis also does not account for which Tribes regulate waters as broadly as the Clean Water Act or have legal frameworks that permit them to regulate “waters of the Tribe” as broadly.

The Corps regulates the discharge of dredged or fill material into all “waters of the United States” in forty-seven States²⁹. However, most States have some form of State program implemented under State authorities. Most of these programs are not comprehensive. They protect only some of the waters that are jurisdictional under the Clean Water Act, and in some cases specifically addressed waters that are not federally jurisdictional under the final rule. For this economic analysis, the agencies qualitatively assessed which States have regulatory practices in place which are as broad or broader than the pre-2015 regulatory regime. The agencies additionally assessed which States made changes to their regulatory practice in relation to Clean Water Act section 404 permitting, surface water protections, and water quality protections while the 2020 NWPR was being implemented.

Under the baseline of pre-2015 practice, the final rule will have relatively minimal effects on States due to the *de minimis* change in scope to jurisdiction under the final rule. Most States developed their regulatory programs under pre-2015 practice (in many cases even before guidance reflecting Supreme Court decisions). Under the secondary baseline of change from practice under the 2020 NWPR, States that protected fewer waters as a result of the 2020 NWPR would need to comply with the scope of protections proposed here. States that already regulate at or above the scope specified in the final rule would theoretically not have waters that are affected by the final rule. For this secondary baseline analysis, the agencies have attempted to identify which States already regulate as broadly as intended by this rule. However, quantifying the extent of protections that States provide for “waters of the States” is not feasible with the limited information available. While some States have the authority to regulate as broadly or more broadly than the final rule, the implementation of those regulations is tied to a variety of factors, such as budgets, staffing, availability of implementation tools, and government priorities. On the other side of the spectrum of implementation, other States may have a dearth of regulations relating to “waters of the States,” but those States may be more actively implementing their more limited regulations. Because of these nuances, the agencies do not have the capacity to assess how broadly or narrowly State regulations apply to “waters of the States” in practice, nor do the agencies have the capacity to assess the overlap between “waters of the States” and “waters of the United States.”

The purpose of this chapter is to summarize the current status of Clean Water Act programs in the States based on the agencies’ current understanding and to describe how that information is used to characterize the States’ current “waters of the State” under the secondary baseline of the 2020 NWPR compared to the level of jurisdiction required by this rule. The agencies recognize that the federal and State laws and programs can overlap, and some States have more stringent requirements than the federal regulations. The way in which these programs are administered and affect sources of water pollution will depend on the regulatory requirements or permits issued. The agencies received comment on the accuracy of assumptions for given States and Tribes outlined in the Economic Analysis for the Proposed Rule. This input has been integrated into this Economic Analysis for the Final Rule and the associated supplementary material.

²⁹ Before 2020, only two States were approved to administer the Clean Water Act section 404 program for certain waters in those States. In December 2020, Florida became the third State to receive EPA approval to administer the Clean Water Act section 404 program and began to administer its assumed permitting program on December 22, 2020. Permitting for assumed section 404 programs is affected by the terms of federal jurisdiction.

II.A “Waters of the State”

Each State has its own definition of “waters of the State,” and many States define similar types of areas and aquatic resources as “waters of the State.” A few States also reference “waters of the United States” within their definitions of “waters of the State.” All State definitions are more inclusive than past and current definitions of “waters of the United States” in at least some way. Most State definitions also include some combination of groundwater and artificial waters. Some States do not include all waters within the scope of their definition of “waters of the State,” often including exemptions in their regulations for certain types of “waters of the State,” for certain industries, or for certain types of permits. Effectively, about half of the States cover at least some surface waters beyond the scope of federal Clean Water Act requirements.

All States have a definition of “wetlands” in their State laws and regulations. While these definitions also vary widely in exact language, they all either recite, reference, incorporate, or outline similar factors as the federal regulatory definition of “wetlands.” Some are more inclusive than the federal regulatory definition, while others incorporate the exact federal factors of a wetland. Many States have different wetland definitions for tidal, nontidal, coastal, and freshwater wetlands. Isolated waters are rarely explicitly included under these definitions, but at least 26 States have programs to cover all or some isolated waters, including wetlands.³⁰ The agencies do not have sufficient information at this time to conclude that those 26 States are the only States that cover some or all isolated waters. The agencies acknowledge that accounting for the existing State-level protection of all or some isolated waters, including wetlands, would bring down both the estimated costs and benefits of this rulemaking.

II.B State Regulatory Practice

Within the economic analysis for the proposed rule, States that must expand their regulatory coverage were assumed to realize benefits and costs from the rule, while States that currently protect waters at or above the levels required by the proposed rule would not be affected by the rule and therefore were not assumed to realize benefits and costs. For this economic analysis for the final rule, the agencies recognize the merit in public comments received regarding the quantitative methodology used in the proposed rule – namely that there are too many unknowns to dependably make quantitative assumptions on costs and benefits within given States based on State regulatory programs. The agencies have shifted to a qualitative assessment of potential costs and benefits related to State regulatory programs. Appendix C presents the costs and benefits segmented by State. Table II-1 presents which States protect waters generally more broadly than the final rule; however, the agencies do not have access to information needed to say definitively whether States have the capacity to implement their State regulations.

During NWPR development, the agencies compiled information on State wetland and surface water programs and regulations to describe the breadth of State authorities and to provide a current picture of federal and State regulatory management of aquatic resources. Information was drawn from multiple State and federal sources, as well as from previous analyses undertaken by independent associations and institutions, including an Environmental Law Institute (ELI) report that “examines [the] limitations imposed by State law that could constrain the ability of State agencies” to protect water resources in the

³⁰ This count includes the twenty-five States that regulate the discharge of dredged and fill activities in isolated waters and one additional State (Hawaii) that regulates point source discharges to isolated wetlands.

absence of Clean Water Act regulation (*see* Appendix I in ELI, 2013). The agencies recognize that these summaries do not necessarily capture all the complexities of State programs.³¹ Definitions for State and territorial waters, including wetlands, were drawn from online directories of regulatory titles and code; therefore, these were pulled directly from State laws. Information on State and territorial water laws and programs was found through State and territorial agency websites. Information on the various Clean Water Act programmatic areas (Clean Water Act sections 303, 311, 401, 402, and 404) was found through EPA and Corps websites, numerous publications, maps, and from EPA regional staff. Corrections were made based on input from State and territorial agencies during the 2020 NWPR rulemaking process, resulting in the State Snapshots appendix within the Resource Programmatic Assessment (RPA) for the 2020 NWPR (U.S. EPA and Army, 2020b). Following the June 9, 2021 declaration that the agencies intended to revise the definition of “waters of the United States,” the agencies updated the State Snapshots for this secondary baseline analysis. These updates followed the same logistical pathway as prior efforts, but with a focus on what has changed in the time since the State Snapshots were created. These updates also incorporate corrections based on input from State and territorial agencies during this rulemaking’s public comment period. The updated State Snapshots are provided as supplementary material to this EA titled “Compendium of State and Tribal Regulatory Practice” (hereafter, referred to as the “regulatory compendium”; U.S. EPA and Army, 2022a). This document is available on the EPA website and in the docket for the final rule.³²

II.B.1 Regulation of Dredge and Fill Material

Twenty-three States regulate “waters of the State” that will not be subject to federal jurisdiction under the final rule (Table II-1).³³ These States either explicitly cover non-federally jurisdictional waters in the text of their regulations or applied their broad regulatory authority in a way that would also capture some waters that were no longer considered “waters of the United States.”³⁴ The regulatory compendium reviews changes that occurred to regulatory practice while the 2020 NWPR was in place. Perhaps predictably, such changes were related to the scope of State regulatory programs before the 2020 NWPR. At least 11 States made changes to regulatory practice that have either been implemented or will be implemented to alter the regulatory scope of their programs following promulgation of the 2020 NWPR. Many of the States that strengthened protections already protected waters as or more broadly than the final rule would require prior to the 2020 NWPR. Similarly, many of the States that weakened protections

³¹ While the ELI report is a readily available summary of potential limitations imposed by State law that could constrain States to regulate waters in the absence of federal regulation, there is disagreement about the reliability of their findings. Some commenters on the then-proposed 2015 Rule identified shortcomings and inaccuracies of the analysis and results that may limit the degree to which the agencies can rely upon it.

³² Available in the docket for this rule, Docket ID Number EPA-HQ-OW-2021-0602.

³³ These numbers were compiled from research that was primarily conducted prior to 2015. While some States clearly regulate at least some waters more broadly than baseline set by the pre-2015 regulatory regime, the agencies cannot at this time determine whether all States that regulated beyond that baseline would also regulate beyond the scope of the final rule. It is assumed that if they regulate beyond *Rapanos* Guidance practice, they also regulate beyond the scope of the 2020 NWPR. Additionally, these values have been updated based on changes to regulatory practice which occurred since the 2020 NWPR was promulgated.

³⁴ These States have been determined by the agencies to regulate beyond the scope of the pre-2015 regulatory regime based on the findings of studies mentioned in the economic analysis prepared in support of the 2019 Rule, the 2020 NWPR, and this analysis. For more information regarding the sources these findings were based on, *see* the regulatory compendium.

were already not regulating waters as broadly as the Clean Water Act required before the 2020 NWPR (*see* regulatory compendium).

The agencies are aware that many State dredged and fill programs were designed to complement rather than replace federal permitting programs implemented by the Corps. As a result, States with programs designed to address waters that are not federally jurisdictional may not have comprehensive programs that capture all waters jurisdictional under the federal Clean Water Act section 404 regulatory program implemented by the Corps. For purposes of the economic analysis, the agencies feel it is inaccurate to represent that States that cover waters as broadly or more broadly than the scope set by the pre-2015 regulatory regime would not experience benefits or costs as a result of a change in baseline from the 2020 NWPR to pre-2015 regulatory practice. Simultaneously, the agencies do not have information available to assess what portion of benefits and costs these (or any States) would bear as a result of this final rule. The agencies understand that just because States have the authority to regulate more broadly, it does not mean that they in practice would in the absence of federal protection.

Following promulgation of the 2020 NWPR, some States, in particular Indiana and Ohio, reduced protections for aquatic resources. These two States now appear to protect aquatic resources less broadly than the final rule would require and could experience greater benefits and costs. While some States that have historically protected waters less broadly than the pre-2015 regulatory practice made substantial changes to establish or expand State programs to cover waters no longer addressed under the 2020 NWPR, the agencies do not think these additional protections constitute changes that are substantial enough to define their regulatory practice as being broader than the final rule would require. For purposes of this analysis, Indiana and Ohio, along with the 27 other States (and the District of Columbia) that do not protect waters as broadly as the final rule would definitely receive benefits and costs from implementation of the final rule; however, the agencies do not limit the analyses to just these benefits and costs. Instead, the agencies quantify benefit and costs for all States, which they acknowledge likely overestimates both benefits and costs.

II.B.2 Surface Water Discharge Permitting

Twenty-one States regulate surface water discharges in “waters of the State” that were not subject to federal regulation under the secondary baseline of the 2020 NWPR (Table II-1).³⁵ These States either explicitly cover non-federally jurisdictional waters in the text of their regulations or apply their broad regulatory authority in a way that also captures some waters that would not have been considered “waters of the United States” under the final rule.³⁶ These 21 States include States which made substantial changes to regulatory practice since the 2020 NWPR was promulgated. This included changes to regulatory practice relating to water quality protections, such as changes to standards for issuing section

³⁵ These numbers were compiled from research that was primarily conducted prior to 2015. These States were determined to regulate at least some waters more broadly than the Clean Water Act, including the regulation of surface water discharges. States without authorization for State NPDES programs were assumed to regulate less broadly. Values have been updated based on changes to regulatory practice which occurred since the 2020 NWPR was promulgated.

³⁶ These States have been determined by the agencies to regulate beyond the scope of jurisdiction under the final rule based on the findings of studies mentioned in the economic analyses prepared in support of the 2019 Rule and the 2020 NWPR and this analysis. For more information regarding the sources these findings were based on, *see* U.S. EPA and Department of the Army, 2022a. Supplementary Material to the Economic Analysis for the Final Rule: Compendium of State and Tribal Regulatory Practice. Available in the docket for this rule, Docket ID Number EPA-HQ-OW-2021-0602.

401 certification or issuing orders to applicants to cover gap waters that would otherwise occur as part of section 401 certification. At least 14 States made changes to regulatory practice that are being implemented or will be implemented in a way that would expand the scope of surface water discharge permitting (including changing the regulatory scope for “waters of the State”) compared to prior State practice. The 2020 NWPR economic analysis assumed that Indiana and Ohio would continue to protect waters as or more broadly than the 2020 NWPR; however, as discussed above, they de-regulated certain waters since the 2020 NWPR was promulgated. These States, along with 29 other States (and the District of Columbia) that do not regulate surface waters as broadly as the final rule, would receive benefits and costs from implementation of the final rule. However, the agencies do not have the information needed to assess what proportion of benefits and costs would be received by these States.

II.C Incorporation of State Regulations in Economic Analysis

At present, the agencies do not have the information available to assess what change in environmental benefits or compliance costs that individual States would bear under the final rule. Though, many States already exceed the aquatic resource or surface water discharge protections of the final rule, how States would interpret and apply their own State regulations is unknown. Consequently, the agencies do not have the information to assess what proportion of total benefits and costs these States would receive. States considered as having broader protections than the final rule, listed in Table II-1, would require would still likely receive some benefits and costs from the final rule. Conversely, States listed in Table II-1 with less stringent protections are likely to have higher costs and benefits. The proportions of total costs and benefits within the given States are modeled in Appendix C for transparency purposes.

Table II-1 reports the information described above for each State relative to either baseline, with ‘Yes’ indicating fewer costs and benefits likely associated with the given State and ‘No’ indicating more benefits and costs are likely associated with the given State.

Table II-1: States’ regulatory protections under the final rule		
State	Regulates waters more broadly than the final rule requires	
	Section 404 Program	Surface Waters
Alabama	No	No
Alaska	No	No
Arizona	No	No
Arkansas	No	No
California	Yes	Yes
Colorado	No	No
Connecticut	Yes	Yes
Delaware	No	No
District of Columbia	No	No
Florida	Yes	Yes
Georgia	No	No
Hawaii	No	No
Idaho	No	No
Illinois	Yes	Yes
Indiana	No	No
Iowa	No	No
Kansas	No	No
Kentucky	No	No

Table II-1: States' regulatory protections under the final rule

State	Regulates waters more broadly than the final rule requires	
	Section 404 Program	Surface Waters
Louisiana	No	No
Maine	Yes	Yes
Maryland	Yes	Yes
Massachusetts	Yes	No
Michigan	Yes	Yes
Minnesota	Yes	Yes
Mississippi	No	No
Missouri	No	No
Montana	No	No
Nebraska	No	No
Nevada	No	No
New Hampshire	Yes	No
New Jersey	Yes	Yes
New Mexico	No	No
New York	Yes	Yes
North Carolina	Yes	Yes
North Dakota	No	No
Ohio	No	No
Oklahoma	No	No
Oregon	Yes	Yes
Pennsylvania	Yes	Yes
Rhode Island	Yes	Yes
South Carolina	No	No
South Dakota	No	No
Tennessee	Yes	Yes
Texas	No	No
Utah	No	No
Vermont	Yes	Yes
Virginia	Yes	Yes
Washington	Yes	Yes
West Virginia	Yes	Yes
Wisconsin	Yes	Yes
Wyoming	Yes	Yes

III. Analysis of the Impacts of Clean Water Act Jurisdictional Changes from the Secondary Baseline (2020 NWPR) to Final Rule

This portion of the economic analysis focuses on the impacts of the final rule on major programs under sections 311, 402, and 404 of the Clean Water Act, relative to the secondary baseline of the 2020 NWPR. The level of detail and scope of the analyses depend on the data available to quantify effects. For the Clean Water Act sections 311 and 402 programs, the agencies conducted a qualitative analysis of the impacts to assess the direction and potential magnitude of changes but did not quantify those effects due to data limitations and expectations that these impacts would be small. For the Clean Water Act section 404 program, the agencies quantified the costs and benefits of the final rule relative to the secondary baseline at the national level based on an assessment of permits and other data. Nationally the Clean Water Act jurisdictional changes relative to the secondary baseline are estimated to result in benefits between \$1,402 and \$2,190 million and total social costs ranging from \$218 million to \$548 million using a 3 percent discount rate. Total social costs include cost of compliance (section 404 permitting and mitigation costs) and State costs from an increased section 401 reviews. The agencies note that benefit estimates do not fully account for all benefits, such as the water quality benefits associated with stream mitigation and benefits associated with upstream and downstream connectivity of wetlands that may expand beyond the boundary of the extent of the market used in the analysis (*e.g.*, 100-mile radius from a county centroid) that can be substantial.

This chapter focuses on the potential effects associated with the change from the secondary baseline of the 2020 NWPR to the final rule. The first three Sections (III.A, III.B, III.C) describe the potential effects on the Clean Water Act section 311, section 402, and section 404 programs, respectively. Section III.D covers other Clean Water Act programs.

The agencies anticipate that the impacts of the final rule may be most important for the section 404 program. Accordingly, the agencies estimated increases in required wetland mitigation areas and the associated benefits and costs. The impacts of the final rule relative to the secondary baseline on other Clean Water Act programs are anticipated to be small and are discussed qualitatively.

III.A Clean Water Act Section 311: Oil Spill Prevention, Preparedness, Reporting and Response

Clean Water Act section 311 addresses the risk and harm from oil spills to waters of the “United States” through two main program components:

- **Spill prevention and preparedness**, which has been addressed in the EPA’s Spill Prevention, Control and Countermeasure (SPCC) and Facility Response Plan (FRP) regulations for non-transportation related facilities and in United States Coast Guard and Department of Transportation regulations for vessels and transportation-related facilities.
- **Spill notification and removal**, as described under the National Contingency Plan.

This section describes these program components and discusses the potential impacts of the change in waters subject to Clean Water Act jurisdiction.

III.A.1 Spill Prevention and Preparedness

Under the authority of Clean Water Act section 311, EPA requires certain non-transportation-related facilities to prepare SPCC plans if they have a reasonable potential to have a discharge of oil to navigable waters or adjoining shorelines and meet other applicability criteria including aggregate oil storage capacity (*see* SPCC rule at 40 CFR 112). Specifically, the SPCC rule applies to facilities “engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, and consuming oils and oil products, which due to its location, could reasonably be expected to discharge oil in quantities that may be harmful, as described in part 110 of this chapter, into or upon the navigable waters of the United States or adjoining shorelines...” [40 CFF 112.1(b)] where “navigable waters” (as opposed to “navigable waters of the United States”) are defined at 40 CFR 112.2 as “waters of the United States, including the territorial seas.”³⁷

The agencies estimate that approximately 550,000 facilities in a broad spectrum of industry sectors, including farms, oil production facilities, industrial sites, manufacturing plants, and retail establishments, are currently subject to the SPCC rule and must prepare, implement, and maintain their SPCC Plan (U.S. EPA, 2020). Approximately 40 percent of these facilities (230,000) are in the oil production sector, which includes production, drilling, and workover.³⁸ Other industry sectors with a significant share of facilities include electric utilities (including distribution substations), real estate rental and leasing, and farms. On an ongoing basis, approximately three percent of the universe of SPCC-regulated facilities are new facilities that must develop an SPCC Plan and implement the spill prevention measures required by the regulation (*e.g.*, sized secondary containment, overfill prevention, and employee training) before they start operating and handling oil. The remaining facilities must maintain their existing plan.³⁹

Under the FRP rule at 40 CFR 112.20 *et seq.*, EPA requires a subset of SPCC facilities that could, because of their location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines to prepare and submit an FRP to the EPA Regional Administrator for the State where the facility is located. The EPA maintains an internal database on FRP facilities, including their locations and characteristics. According to EPA’s Emergency Management-Oil Database, approximately 3,800 facilities are subject to FRP requirements.

Spill preparedness requirements also exist for onshore transportation-related facilities such as pipelines and railcars. These programs derive their authority from Clean Water Act section 311 as amended by the Oil Pollution Act of 1990 (OPA) and therefore are affected by changes in the scope of jurisdictional

³⁷ The Clean Water Act [33 U.S.C. 1321(b)] sets as national policy that there “should be no discharges of oil or hazardous substances into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act [43 U.S.C. 1331 *et seq.*] or the Deepwater Port Act of 1974 [33 U.S.C. 1501 *et seq.*], or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act [16 U.S.C. 1801 *et seq.*]).” While Clean Water Act section 311 uses the phrase “navigable waters of the United States,” which traditionally means waters subject to jurisdiction under the RHA, EPA has historically interpreted it to have the same breadth as the phrase “navigable waters” used elsewhere in section 311, and in other sections of the Clean Water Act.

³⁸ Workover refers to various interventions or maintenance activities on oil or gas wells such as replacing the production tubing.

³⁹ Among other requirements, facilities with an existing Plan must amend their Plan when there is a change in operations that materially affects the risk of a discharge and review their Plan at least once every five years.

waters. Under 49 CFR 194, the operator of an onshore oil pipeline that, because of its location, could reasonably be expected to cause substantial harm or significant and substantial harm to the environment by discharging oil into or on any navigable “waters of the United States” or adjoining shorelines must submit an oil spill response plan to the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the Department of Transportation. The pipeline operator needs to identify resources necessary to respond to a worst-case discharge in operator-defined response zones.⁴⁰ PHMSA reports 562 oil spill response plans from pipeline operators (PHMSA, personal communication, as of September 28, 2021).

Under 49 CFR 130, railroad owners or operators must prepare oil spill response plans to cover tank car shipments of petroleum oils. Among other requirements, the basic written plan must describe the manner of response to discharges that may occur during transportation; consider the maximum potential discharge of the contents from the packaging; and identify private personnel and equipment available to respond to a discharge.

Under OPA, States may impose additional requirements for facility response plans as long as these requirements are at least as stringent as the federal standards. For example, both Alaska and Washington State have regulations requiring facility response plans or comprehensive contingency plans for certain large facilities such as refineries, refueling terminals, and pipelines. Both States further require public participation in the planning process to ensure that the plans appropriately reflect community concerns and priorities.

The revisions to the “waters of the United States” definition relative to the secondary baseline could result in additional facilities being subject to planning requirements under section 311 of the Clean Water Act. The following sections describe the potential impacts of the change in waters subject to Clean Water Act jurisdiction on the SPCC and FRP programs and on spill prevention programs for transportation-related sources.

III.A.1.1 Potential Impacts on SPCC Program

Changes in the scope of jurisdictional waters could result in additional facilities being subject to SPCC requirements, as compared to the secondary baseline of the 2020 NWPR.

In determining whether a facility has a reasonable expectation of an oil discharge that could reach a jurisdictional water, facility owners consider solely the geographical and locational aspects of the facility [40 CFR 112.1(d)(1)(i)]. As the EPA describes in its SPCC Guidance, “the owner or operator should consider the location of the facility in relation to a stream, ditch, gully, or storm sewer; the volume of material likely to be spilled; drainage patterns; and soil conditions. An owner or operator may not consider constructed features, such as dikes, equipment, or other manmade structures that prevent,

⁴⁰ The worst-case discharge for planning purposes is the largest foreseeable discharge of oil (e.g., from a pipeline rupture, fire or explosion) in adverse weather conditions (e.g., rain, currents, cold temperatures). 49 CFR 194.5 defines a “response zone” as a “geographic area along a length of pipeline or including multiple pipelines, containing one or more adjacent line sections, for which the operator must plan for the deployment of, and provide, spill response capabilities. The size of the zone is determined by the operator after considering available capability, resources, and geographic characteristics.”

contain, hinder, or restrain a discharge as described in section 112.1(b), when making this determination.” (U.S. EPA, 2013, page 2-34).⁴¹

Typically, natural conveyances or stream channels are principal spill pathways for impacts to aquatic resources in remote and undeveloped inland areas that lack engineered stormwater conveyance systems. Manufacturing facilities and other facilities, such as storage facilities, located in developed areas may also affect streams through discharges to stormwater drains or other engineered conveyance systems. Given this, the agencies anticipate that owners or operators of facilities located in relatively less developed areas would be more likely to base their applicability determination on whether there is a reasonable potential for an oil discharge to reach waterbodies in the immediate proximity of the facility. The agencies lack data on how many facilities used on the 2020 NWPR definition to determine that the facilities did not have reasonable potential for an oil discharge to navigable waters or adjoining shorelines, and would reach a different conclusion given the revised scope of “waters of the United States.” The estimated universe of SPCC-regulated facilities (550,000 facilities) is based on the number of establishments in each industry sector and oil storage capacities and does not explicitly account for the location of the facilities and reasonable potential for a discharge to a jurisdictional water. The agencies anticipate that the inland onshore oil production and farm sectors would be the most likely to be affected by changes to the scope of Clean Water Act jurisdiction given their locations.

This change would lead these facilities to incur compliance costs to develop and maintain their Plan. The implementation of spill prevention measures could reduce the probability of the facility experiencing an oil discharge. The benefits and costs depend on the stringency of applicable State or local requirements and measures the facilities may implement voluntarily (such as following industry standards or recommended practices), in the secondary baseline. Some States have requirements equivalent to those of 40 CFR 112, but these requirements often apply to only a subset of facilities based on aggregate storage volume, facility type (*e.g.*, farms, production, others), and type of oil (*e.g.*, petroleum oils, non-petroleum oils). Other States reference 40 CFR 112 explicitly. While the degree of State program overlap varies,⁴² potential impacts of the revised definition of “waters of the United States” relative to the secondary baseline are expected to be less in States that have some overlapping requirements (*e.g.*, Alaska, California, Colorado, Delaware, Georgia, Hawaii) and which are regulating ephemeral streams and other waters in the baseline.⁴³ The agencies expect no change to compliance costs or spill risk for facilities required to comply with equivalent State or Tribal regulations or that elect to voluntarily implement SPCC measures. The reduction in probability is likely greatest for facilities that are exempt from State

⁴¹ The agencies note that guidance cannot impose legally enforceable requirements.

⁴² The EPA’s regulatory impact analysis for the 2008 amendments to the SPCC regulation researched State regulations affecting the spectrum of facilities subject to the federal SPCC rule and identified some States with complete, substantial, or partial overlap with federal requirements. The degree of State overlap was somewhat higher for larger facilities (33 percent) as compared to smaller facilities (10 percent); overall across the regulated facility universe, the EPA determined that approximately 13 percent of the SPCC burden overlapped with some State requirements (U.S. EPA, 2008; Exhibit 5-22).

⁴³ Ephemeral streams would not be categorically jurisdictional under the final rule. According to the *Rapanos* Guidance, the agencies conduct a significant nexus analysis for certain types of waters referred to as “non-relatively permanent waters,” which includes ephemeral features and some intermittent streams. *See Rapanos* Guidance at 7 (“[R]elatively permanent” waters do not include ephemeral tributaries which flow only in response to precipitation and intermittent streams which do not typically flow year-round or have continuous flow at least seasonally. However, Clean Water Act jurisdiction over these waters will be evaluated under the significant nexus standard[.]”).

requirements. The agencies do not have sufficient data to quantify the benefits of the change in Clean Water Act jurisdiction at this time.

III.A.1.1.1 Potential Impacts on FRP Program

The change in Clean Water Act jurisdiction could lead some facilities to incur FRP compliance costs to maintain their FRP, maintain a contract with an oil spill removal organization (OSRO), and conduct periodic drills and exercises to maintain preparedness. The incremental costs attributable to the final rule depend on the stringency of any applicable State or local requirements and measures the facility may implement voluntarily in the baseline, in accordance with recommended industry practices. The benefits of these measures include enhanced preparedness and response and the associated reduction in the harm caused by oil discharges.

The final rule could potentially affect FRP facilities primarily through changes in the applicability of requirements to the facilities at two stages:

Changes to the overall applicability of 40 CFR 112: Changes in Clean Water Act jurisdiction that makes the facility subject to the SPCC rule because the facility has a reasonable potential of a discharge as described in 40 CFR 112.1(b) make the facility potentially also subject to the FRP requirements if it meets other applicability criteria.

Changes to the FRP-specific self-identification applicability criteria at 40 CFR 112.20(f)(1): As defined in 40 CFR 112.20(f)(1), a non-transportation related onshore facility is required to prepare and implement an FRP if:

1. The facility transfers oil over water to or from vessels and has a total oil storage capacity greater than or equal to 42,000 U.S. gallons, or
2. The facility has a total oil storage capacity of one million U.S. gallons or more, and at least one of the following is true:

The facility does not have secondary containment for each aboveground storage area sufficiently large enough to contain the capacity of the largest aboveground tank within each storage area plus sufficient freeboard for precipitation.

The facility is located at a distance such that a discharge could cause injury to fish and wildlife and sensitive environments.

The facility is located such that a discharge would shut down a public drinking water intake.

The facility has had a reportable discharge greater than or equal to 10,000 U.S. gallons in the last five years.

The criteria related to reportable discharges (item 2d in the list above) and to distance to sensitive environments (2b) could be affected by a change in Clean Water Act jurisdiction.⁴⁴ For example,

⁴⁴ The criterion related to transfers over water to or from vessels is not expected to be affected by changes in Clean Water Act jurisdiction because the involvement of vessels necessarily implies navigation and therefore federally regulated waters. The secondary containment criterion is unrelated to the scope of Clean Water Act jurisdiction. The criterion related to public drinking water intakes refers specifically to the potential for a discharge to shut down an intake. Public drinking water

changing the scope of waters that trigger the “reportable discharge” applicability criterion may mean that additional facilities need to prepare or maintain an FRP based on their spill history as the affected resource would be marginally more likely to be a “water of the United States.” The agencies expect the change in assertions of Clean Water Act jurisdiction to have a small effect on the number of facilities that would trigger FRP applicability due to reportable discharges. This is based on program data available for 3,802 FRP planholders that predate the 2020 NWPR and which show only two facilities with FRPs solely because of reportable discharge history (*i.e.*, no other FRP applicability factor).⁴⁵

A majority of FRP planholders (2,115 facilities) identify the potential to affect sensitive environments as a determinant of FRP applicability. The potential effect of a change in Clean Water Act jurisdiction on sensitive environments is difficult to assess *a priori*. The FRP regulation relies on a definition of “fish and wildlife and sensitive environments” at 40 CFR 112.2 during the applicability evaluation by a facility owner/operator and in the development of the FRP by the planholder (*e.g.*, see Vulnerability Analysis in Appendix F, section 1.4.2 of 40 CFR 112). As described in 40 CFR 112.2 and in Department of Commerce/NOAA Guidance (1994), “fish and wildlife and sensitive environments” may include wetlands, national and State parks, critical habitats for endangered/threatened species, wilderness and natural areas, marine sanctuaries and estuarine reserves, conservation areas, preserves, wildlife areas, wildlife refuges, wild and scenic rivers, recreational areas, national forests, public drinking water intakes, federal and State lands that are research natural areas, heritage program areas, land trust areas, and historical and archeological sites and parks. These areas may also include aquaculture sites, agricultural surface water intakes, and unique habitats, such as bird nesting areas, critical biological resource areas, designated migratory routes, and designated seasonal habitats. The Area Committee and the spill response Unified Command Structure may consult with the natural resource management agencies, to determine additional areas to be considered sensitive environments for the purposes of OPA. 40 CFR 112.20(g)(1) requires FRP to be consistent with the National Contingency Plan and with the applicable Area Contingency Plans. To the extent that Area Committees designate sensitive areas based on federally-regulated waters, it is possible that the changes to Clean Water Act jurisdiction could alter this factor and potentially FRP applicability. The agencies did not have sufficient information about the sensitive environments considered in determining FRP applicability to assess the significance of the change caused by the 2020 NWPR or by this rule.

A change in Clean Water Act jurisdiction may also affect the FRP harm designation assigned by the EPA Regional Administrators. The EPA Regional Administrators may categorize a facility that meets multiple criteria as higher risk, denoted as “significant and substantial harm.” The EPA reviews all FRPs and must approve the FRP for facilities categorized as significant and substantial harm. The EPA’s Emergency Management-Oil Database shows that, of the 55 FRP facilities with reportable discharge history, 52 FRP facilities are categorized as significant and substantial harm facilities. It is uncertain whether the EPA Regional Administrator would have categorized these facilities as lower risk (substantial harm) under the

system intakes are generally expected to draw from perennial streams which will be within scope of Clean Water Act jurisdiction under the final rule (and were also under the scope of the 2020 NWPR).

⁴⁵ Most of the 55 FRP planholders with histories of reportable discharges also triggered one or more of the other applicability criteria, such as transfers over water (39 facilities), inadequate secondary containment (8 facilities), or potential to affect drinking water intakes (28 facilities) or sensitive environments (47 facilities).

secondary 2020 NWPR baseline and how changes to the “waters of the United States” definition could affect the categorization of FRP facilities.

Available data are not sufficiently detailed to estimate the incremental costs and quantify the risk reduction for changes in FRP applicability, but the agencies anticipate that few facilities could be affected by the change in “waters of the United States” definition. To date, EPA received five requests by FRP planholders to reconsider applicability of 40 CFR Part 112 following the promulgation of the 2020 NWPR. In three of these cases, EPA determined that the facilities did not have the potential to affect “waters of the United States” under either the 2020 NWPR or the final rule definitions, leaving two cases where the jurisdictional status of the waters that could potentially be affected by an oil discharge may affect FRP applicability.

III.A.1.1.2 Potential Impacts on Transportation-Related Spill Prevention and Preparedness

The preparation of an FRP for a pipeline facility is based on the potential for a discharge to a jurisdictional water or adjoining shorelines. The existing regulation gives pipeline operators the flexibility to define planning areas and operators generally develop plans that cover response strategies over fairly large geographical areas. Accordingly, the agencies expect marginal changes in the number of jurisdictional water crossings, such as may result from the final rule, to have no material effect on the number of FRPs that pipeline operators may develop or their planned response resources. For similar reasons, the agencies anticipate no material impact on the number of rail operators required to develop a facility response plan.

Pipeline integrity management requirements such as pipeline burial depth and inspection of water crossings are specific to streams at least 100 feet wide and to commercially navigable waters.⁴⁶ Since these waters are jurisdictional under both 2020 NWPR and the final rule, the final rule will not affect these requirements.

III.A.2 Spill Notification and Removal

Section 311(c) of the Clean Water Act as amended by OPA of 1990 authorizes response to discharges or threats of discharges of oil. The Clean Water Act provides that the President shall ensure effective and immediate removal of a discharge or substantial threat of discharge (1) into or on navigable “waters of the United States,” (2) on the adjoining shorelines to such waters, (3) into or on the waters of the exclusive economic zone, or (4) that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States. The Clean Water Act requires that oil discharges and releases of reportable quantities of hazardous substances be reported to the National Response Center (NRC), which in turn notifies the relevant federal on-scene coordinators (FOSC). FOSCs have the authority to conduct, direct and coordinate response efforts to protect the environment, public health, and worker safety and health under Clean Water Act sections 311(c) and (e). Most oil and chemical incidents are addressed by the State, Tribal, or local governments and/or by responsible parties. The FOSC determines the need for federal involvement under the Clean Water Act and the National Contingency Plan.

⁴⁶ Commercially navigable waters as defined by 49 CFR 195.450.

Liability for response and cleanup costs falls to the responsible party if one can be identified. The Oil Spill Liability Trust Fund (OSLTF) provides funding to cover removal costs incurred by the U.S. Coast Guard and the EPA and by State and Tribal governments. The OSLTF may pay for uncompensated removal costs and damages up to \$1 billion per incident, of which no more than \$500 million may be paid for natural resource damages. The National Pollution Funds Center (NPFC), which manages the OSLTF, seeks reimbursement from the responsible party for any response expenses, claims, and damage assessment initiation paid by the Fund. One of the key criteria⁴⁷ the NPFC applies when approving access to the OSLTF is whether the oil spill incident affected or substantially threatened a water subject to Clean Water Act jurisdiction. Accordingly, changes in the scope of jurisdictional waters can potentially affect access to the OSLTF to oversee a responsible party's response to an oil spill or respond to an oil spill.

The jurisdictional status of the water impacted or threatened by a discharge determines oversight authorities under the National Contingency Plan and what resources are available for removal or for compensating damages. For waters that are non-jurisdictional, oversight falls on the States and Tribes, with removal requirements depending on the State or Tribal requirements for the particular aquatic resource. For waters within Clean Water Act jurisdiction under the final rule, the FOSC would oversee the response and removal actions. More than 11,000 oil spills⁴⁸ were reported to the NRC during calendar year 2017 from sources other than offshore vessels or platforms. Of these incidents, more than 7,000 reportedly affected waters in general. The number of incidents that affected or threatened waters that changed jurisdictional status under the 2020 NWPR is uncertain, since notifications to the NRC generally do not provide sufficient detail on the aquatic resources at risk to determine jurisdictional status. This limitation also makes it difficult to quantify the impact of the final rule.

The agencies expect the final rule will have a limited impact on the frequency of NRC notifications. While impact to waters is one of the criteria for notifying the NRC of an incident, the NRC also receives notifications for a wide range of incidents of public concern under CERCLA, Emergency Planning and Community Right-to-Know Act, and other environmental or safety regulations. Because there are potential penalties for failing to notify the NRC of a reportable incident but no adverse consequence from unnecessarily reporting an incident, NRC notification generally has become standard operating procedure for facility owners or operators and the agencies do not expect an increase in the number of notifications.

Changes in Clean Water Act jurisdiction could affect the response to reported incidents as responsibilities for overseeing the response to some incidents shift from State, Tribal, or local governments to the FOSC. During the period of 2001-2017, EPA FOSCs oversaw emergency removal activities for 1,064 incidents involving the discharge of oil or substantial threat of a discharge to jurisdictional waters. The agencies reviewed Pollution Reports for each of these emergency oil removal actions.⁴⁹ These incidents either involved active oil discharges or substantial threat of a discharge to jurisdictional waters.

⁴⁷ Other criteria include whether the substance is an oil as opposed to a hazardous substance (which would be addressed by CERCLA).

⁴⁸ Count reflects NRC's Calendar Year 2017 incident data involving substances with names containing the terms "oil," "gasoline," or "diesel."

⁴⁹ The Pollution Reports are available at <https://response.epa.gov/> (U.S. EPA, n.d.).

There are various possible outcomes of changes to the scope of Clean Water Act jurisdiction, including for oil spill incidents affecting newly jurisdictional waters. These outcomes depend on the State requirements and responsible party actions following the incident, but would tend to facilitate cleanup and reduce environmental damages. They range from no change (in cases where the responsible party assumes full responsibility for response and cleanup), to the transfer of the response burden from the State or Tribe to the OSLTF. The economic implications of these changes are uncertain since they depend on the location of the future spill, the stringency of State and local requirements, and other factors. It is possible that a responsible party for a future spill affecting non-jurisdictional resources would face increased response costs in cases where federal requirements are more stringent than State requirements. State regulations cover the discharge to State waters or land of any substance that may be detrimental to environmental quality and are generally similar to baseline oil discharge prohibition requirements under the Clean Water Act. However, whereas the federal regulations cover spills of non-petroleum oils such as animal fats and vegetable oils (AFVOs), some State requirements focus mainly on petroleum oils and requirements for non-petroleum oils may be less stringent or may not apply. For example, Georgia defines “oil” as “including but not limited to gasoline, crude oil, fuel oil, diesel oil, lubricating oil, sludge, oil refuse, oil mixed with wastes, and another other *petroleum* related product.” (Georgia Oil or Hazardous Material Spills or Releases Act (Official Code of Georgia Annotated, section 12-14-1 [emphasis added])).⁵⁰ The definition explicitly does not include non-petroleum oils such as AFVOs. There may also be higher spill reporting requirement thresholds than provided by the Clean Water Act. Accordingly, some additional discharges could become reportable.

Another key difference, even where the State requirements are otherwise equivalent to those of the Clean Water Act, is the increased availability of resources to help defray removal costs or compensate affected parties for damages not reimbursed by the RP.

There are limited data available for spills that occurred following 2020 NWPR promulgation to assess the degree to which changes in jurisdictional scope may have affected FOSC oversight of incidents or access to OSLTF resources. Information on spills is not typically tracked in a manner that would allow the agencies to readily identify if a water feature impacted by a spill would have a different jurisdictional status, following the 2020 NWPR promulgation. To date, EPA does not have an indication that the definition of “waters of the United States” in the secondary baseline of the 2020 NWPR materially affected the federal government’s ability to oversee and address oil spills.

III.A.3 Uncertainty and Limitations for Assessing Potential Effects on Clean Water Act Section 311 Program

There is significant uncertainty in the universe of facilities that could be affected by the final rule. EPA does not have data on the number of facilities that may have determined that they were not SPCC-regulated under the 2020 NWPR and may need to reconsider this determination under the final definition. The SPCC rule does not require facility owners/operators to identify themselves to the EPA, unless these facilities are subject to the FRP rule, requiring submittal of an oil spill response plan to the EPA. Whereas owners or operators must comply with 40 CFR 112 and prepare and maintain an SPCC Plan, they do not submit this Plan, a Notice of Intent (NOI), or any similar notification to the EPA. No national, State, or

⁵⁰ See <https://law.justia.com/codes/georgia/2010/title-12/chapter-14/12-14-1/>.

industry inventory of SPCC facilities exists, although the EPA has developed estimates of the universe of facilities to support rulemaking and information collection requests (ICRs).

For some sectors, notably onshore oil production, detailed public data provide both the number and location of individual equipment or facility components (*e.g.*, oil wells). This information can be used to characterize the potential distribution of oil production equipment, but this does not necessarily lead to accurate identification of SPCC-regulated facility, since production tank batteries are not necessarily co-located with oil wells and are typically connected to multiple wells. For other sectors, including farms, manufacturing, and other facilities, publicly available data provide counts of facilities per county or State, but does not indicate the aggregate storage capacity to assess SPCC applicability. None of the datasets (except for inspected SPCC facilities and FRP-subject facilities) provide direct information to infer reasonable potential for a discharge.

III.B Clean Water Act Section 402: National Pollutant Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act establishes the NPDES program to authorize the discharge of pollutants⁵¹ from point sources to “waters of the United States,” in compliance with applicable requirements and conditions. The Clean Water Act requires a permit for discharges of pollutants to “waters of the United States” from point sources, defined in the Act as any discernable, confined, and discrete conveyances (*e.g.*, pipes, ditches, channels, or concentrated animal feeding operations). Typically, the compliance point for NPDES permits is the location where the effluent is being discharged from the facility. *See* U.S. EPA, 2010NPDES Permit Writers’ Manual at pages 8-1 to 8-5. NPDES permits may incorporate different statutory and regulatory requirements depending on the source type, volume of discharge, receiving waterbody, and State or Tribal water quality standards.

The NPDES permit program is administered by authorized States or EPA. EPA issues some NPDES permits for discharges from federal facilities,⁵² most of the Tribal reservation lands,⁵³ and U.S. Territories (except the U.S. Virgin Islands) as well as all permits in the three States that have not been authorized to administer the program (Massachusetts, New Hampshire, and New Mexico) and for certain activities in States with only partial authority. EPA has authorized most (47) States to operate all or portions of the Clean Water Act section 402 permitting program, and States assert jurisdiction over “waters of the State” which must be as inclusive as “waters of the United States” but may be more expansive.

Agencies may issue individual or general permits. Individual permits may be issued when site-specific limits, management practices, monitoring and reporting, or other facility-specific permit conditions are needed. One individual permit is issued per one applicant; the individual permit may cover several outfall

⁵¹ Clean Water Act section 402 regulates discharges of the following categories of pollutants: (1) Conventional pollutants: BOD, TSS, oil and grease, fecal coliform, and pH; (2) Toxic pollutants: 126 “Priority Pollutants” (40 CFR part 423), which include metals (*e.g.*, Cu, Pb, Hg) and organic compounds (*e.g.*, PCBs, dioxin); (3) Non-conventional pollutants: all other pollutants (*e.g.*, chlorine, ammonia, nitrogen, phosphorus).

⁵² In general, federal facilities are defined as buildings, installations, structures, land, public works, equipment, aircraft, vessels, other vehicles, and property, owned, constructed or manufactured for leasing to the federal government. (<https://www.epa.gov/enforcement/enforcement-and-compliance-federal-facilities>)

⁵³ The State of Maine has authority to issue NPDES permits on the territory of two Tribes.

points. General permits are issued when multiple dischargers require permit coverage, sources and discharges are similar, and permit conditions are relatively uniform. One general permit is issued for multiple dischargers. The permit identifies coverage area, sources covered, and administrative processes for dischargers to identify that they intend to be covered (*e.g.*, whether the applicant must submit an NOI to seek coverage under the general permit).

EPA's Integrated Compliance Information System (ICIS)-NPDES database contains approximately 250,000 unique permit numbers, including individual and general permits.⁵⁴ Some facilities may have more than one permit (*e.g.*, an individual permit for process wastewater and a general permit for stormwater).⁵⁵

Facilities that currently have a NPDES permit under Clean Water Act section 402 or a State permit under an authorized State program can be assumed to either discharge to a "water of the United States" or to waters designated to be "waters of the State" by the authorized State in which they are located. The 2020 NWPR reduced the number of jurisdictional waters (*i.e.*, certain ephemeral streams), potentially leading to some facilities no longer being required to obtain NPDES coverage where the water to which they discharged was no longer jurisdictional and the pollutants discharged from the point source were not conveyed to a "water of the United States." In the 2020 NWPR analysis, the agencies anticipated such circumstances to be more likely to happen in arid areas of the country (U.S. EPA and Army, 2020a). Dischargers whose receiving waters or downstream waters were not jurisdictional under the Clean Water Act or "waters of the State" could opt to: continue with their existing permit (*status quo*); formally request a permit modification;⁵⁶ or formally request to have their permit terminated, subject to anti-backsliding permit requirements.

EPA does not have information indicating that a significant number of requests for permit modification or termination followed the promulgation of the 2020 NWPR. EPA does acknowledge that there are likely instances where permittees have inquired about potential permit changes and that if the 2020 NWPR were in effect for an extended period of time, these types of inquiries could become more common in certain areas where the 2020 NWPR had a significant effect on the number of jurisdictional water features, such as the arid southwest. However, the agencies also do not expect the jurisdictional changes resulting from the final rule relative to the secondary baseline of the 2020 NWPR to result in a material change in the number of NPDES permits or in modifications to existing permit requirements.

After the 2006 *Rapanos* decision, several NPDES permit holders in the Western United States asserted they no longer required a permit because of the potential non-jurisdictional status of a receiving water. The agencies are aware that in some cases such inquiries have resulted in a permitting authority determining that a discharger no longer needed a permit. There are several potential explanations for this, related to the nature of the permitted activity, State requirements, and facility-level incentives.

⁵⁴ This estimate includes both active and expired permits in ICIS-NPDES since facilities with expired permits can still operate with administratively continued permits. It excludes "terminated" permits that are no longer binding. It also excludes permits that did not have valid latitude/longitude coordinates or were not truly NPDES permits.

⁵⁵ In this section, "facility" refers to plants, construction sites, or other types of point source dischargers.

⁵⁶ This request could happen before or during their permit reissuance process.

First, the nature of a traditional discharge permit where a facility is seeking to discharge wastewater is different from a Clean Water Act section 404 permit (described in Section III.C below) where a developer or landowner is, for example, seeking to fill a portion of a “water of the United States.” There are instances for a Clean Water Act section 402-permitted discharger to contribute to creating a perennial or intermittent water feature where there once was an ephemeral stream because of continuous discharge (*i.e.*, an “effluent-dependent” or “effluent-dominated” water). In these cases, the final rule will not affect jurisdiction if the water meets the conditions of the “tributary” definition.

Second, EPA has authorized most States to administer portions or all of the Clean Water Act section 402 permitting program. In addition, some States assert State law jurisdiction over “waters of the State” which is inclusive of “waters of the United States” but may be more expansive. These State law programs can, and in some cases already do, cover waters that are not considered “waters of the United States.” As discussed in Chapter II, State programs may choose to issue permits for non-federally regulated waters solely based on State authority. States may also revise water quality-based effluent limits (WQBELs) to reflect attenuation or additional dilution farther downstream (to a water subject to the Clean Water Act) from the source of the pollutant if the discharge point is no longer into a “water of the United States,” subject to applicable anti-backsliding permit requirements (*see* Appendix A in U.S. EPA and Army, 2020b).

Additionally, existing facilities may have made the capital investments in wastewater treatment systems that discharge to receiving waters that will no longer be jurisdictional and may willingly continue operating under their permit and see no need to challenge jurisdictional status of the receiving waters. Depending on the individual organization, industry standards or recommended practices, the facility may implement treatment technologies or best management practices voluntarily but could still save on some compliance costs. The following sections discuss the potential impacts of the final rule on the number of permits and on permit requirements. Specifically, the sections describe potential permittee’s responses by permit type (*i.e.*, individual, general) potentially affected by a change in the definition of “waters of the United States.” The agencies anticipate that changes to the scope of jurisdictional waters under the final rule are more likely to affect the scope of facilities covered by general permits (including stormwater), but as discussed below any impacts are expected to be small nationwide.

III.B.1 Potential Impacts on Individual NPDES Permits

The potential benefits and costs of the final rule relative to the secondary baseline of the 2020 NWPR and related to Clean Water Act section 402 permits to discharge to newly jurisdictional receiving waters will depend on multiple factors. One factor is the basis for the NPDES permit, specifically whether the permit is based on technology-based effluent limits (TBEL) or WQBEL.⁵⁷ Another factor is whether the

⁵⁷ The EPA and State NPDES permitting agencies develop TBEL for all applicable pollutants of concern. TBELs are based on national technology based effluent limitations and standards (*i.e.*, effluent limitations guidelines and standards) that are developed to establish minimum levels of pollutant controls for most direct and indirect dischargers for conventional pollutants, non-conventional pollutants, and toxic pollutants and provide equity among dischargers within categories. In the absence of national limitations and standards, TBELs are developed on a case-by-case, best professional judgment (BPJ) basis. Instead of the effluent guidelines approach, the statute provides for the EPA to establish secondary treatment standards for publicly-owned treatment works.

If TBELs are not adequate to protect water quality to meet applicable water quality standards, the Clean Water Act requires the permitting authority to include WQBEL as necessary to meet applicable State or Tribal water quality standards and that

facility's discharge conveys to a "water of the United States" downstream from the newly jurisdictional receiving reach. A third factor is whether the facility has the controls necessary to meet permit limits based on the newly jurisdictional receiving reach.

Permittees may incur higher treatment costs to meet any revised limits based on the newly jurisdictional receiving waters. Existing permittees may already have treatment technologies in place and may be able to meet new permit conditions that reflect the newly jurisdictional receiving waters. New establishments in the industrial categories that are subject to effluent limitations may face higher capital and operational costs. A permittee discharging to a jurisdictional water that is not attaining water quality standards is subject to more stringent limits based on a WQBEL which must also be consistent with any applicable wasteload allocations in a TMDL. The permit could be revised to incorporate WQBELs that reflect lower dilution or attenuation of the pollutant(s) occurring at the point where the effluent enters the newly jurisdictional waters. Under this scenario, the permittee could incur additional costs as compared to meeting the previous permit limits under the secondary baseline of the 2020 NWPR. More stringent effluent limitations could have a positive impact on water quality in the receiving jurisdictional streams, including downstream waters.

In practice, the agencies anticipate impacts of the final rule relative to the secondary baseline of 2020 NWPR on individual permits to be small. EPA did not see significant changes under the 2020 NWPR in permittees seeking revisions to existing permit conditions and similarly does not expect significant changes under the final rule. Given the relatively short period of time that the 2020 NWPR was in effect, any shift that may have occurred during this period was likely marginal. However, if the 2020 NWPR had remained in effect for a longer period of time this shifting effect would have become more pronounced.

III.B.2 Potential Impacts on General Permits

NPDES general permits cover dischargers with similar characteristics (*e.g.*, within the same industry) within a given geographical location. In most cases, a permittee is required to complete and submit an NOI and comply with the terms of the general permit. Each permittee receives a unique NPDES number. Because a large number of facilities can be covered under a single general permit, general permits may offer a cost-effective option for permitting agencies. Nearly 60 percent of the general permits the agencies analyzed are stormwater permits.

Stormwater runoff is generated when precipitation from rain and snowmelt flows over land or impervious surfaces instead of percolating into the ground. As the runoff travels (especially over paved streets, parking lots, and building rooftops), it can accumulate debris, chemicals, sediment, and/or other pollutants that may be detrimental to stream water quality; runoff can also gain velocity and be directed towards waterbodies, thus increasing the probability of these pollutants reaching a stream. Polluted stormwater runoff can harm or kill fish and other wildlife. Excess sedimentation can impair aquatic habitat, and high

are consistent with any EPA-established or EPA-approved TMDLs that may apply to the discharge. Currently, all States have State water quality standards under Clean Water Act section 303, as well as listed impaired waters and TMDLs for those impaired waters under Clean Water Act section 303(d). If a TMDL has been developed for the receiving waterbody, States (or EPA regions) assign a waste load allocation to each point source discharge and a load allocation to nonpoint sources such that predicted receiving water concentrations do not exceed water quality criteria. States and Tribes may develop standards for non-jurisdictional waters under State or Tribal law, but these criteria are not enforceable under the Clean Water Act. Clean Water Act section 402(p)(3)(B)(iii) provides for a unique standard to be used for controls of municipal separate storm sewer systems (MS4s).

volumes of runoff can cause stream bank erosion. Debris can clog waterways and potentially reach the ocean where it can harm marine wildlife and degrade habitats.

Some stormwater discharges have been designated by statute, regulations, or on a case-by-case basis to require coverage under a NPDES permit. Under Clean Water Act section 402(p), the EPA implemented the stormwater program in two phases, with the Phase I rule issued in 1990 and the Phase II rule issued in 1999. The stormwater program regulates stormwater from some construction sites (*i.e.*, those disturbing one or more acres of land, or disturbing less than one acre but part of a common plan of development or sale that will disturb one or more acres), specific industrial sectors specified in the Phase I rule, and discharges from some municipal separate storm sewer systems (MS4s). When the 2020 NWPR was finalized, the EPA’s ICIS-NPDES data used by the agencies included 120,989 stormwater permits, including individual and general permits. Over 20 percent of the permitted dischargers analyzed (26,366) were for stormwater discharges from construction and development activities. Dischargers with unknown industry classification (missing SIC code) and in “other” categories accounted for 51 and 21 percent of the total stormwater permits respectively. Industrial facilities covered under an industrial stormwater permit, such as the EPA’s Multi-Sector General Permit (MSGP) accounted for approximately five percent of stormwater permit holders. MS4s accounted for less than one percent of all permittees covered under the stormwater program.

III.B.2.1 Construction Stormwater

In general, the NPDES stormwater program requires permits for discharges from construction activities that disturb one or more acres, and discharges from smaller sites that are part of a larger common plan of development or sale. The Construction and Development (C&D) effluent limitations guidelines (ELGs) apply to permits for stormwater discharges from all construction activities including clearing, grading, and excavation, except operations that result in the disturbance of less than one acre of land area, unless they are part of a common plan of development or sale that disturbs more than one acre (40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15)). Under 40 CFR part 450 (the C&D ELGs), all covered entities must: (1) design, install, and maintain erosion and sediment controls; (2) initiate soil stabilization in disturbed areas immediately whenever any clearing, grading, excavating, or other earth disturbing activities have ceased; (3) design, install, and maintain pollution prevention measures to minimize the discharge of pollutants to surface waters; (4) prevent the discharge of the wastewater, fuels, oils, or other pollutants used in vehicle and equipment operations and maintenance and equipment washing; and (5) implement other best management practices (BMPs) to minimize adverse effects on surface water.

The agencies considered the potential effect of the revised definition of “waters of the United States” on the issuance of Clean Water Act section 402 permits for stormwater from construction and development sites. Due to data limitations and the lack of a strong basis for the necessary analytical assumptions, it is not feasible to rigorously estimate the potential costs to the construction industry and corresponding benefits of needing a Clean Water Act section 402 permit for stormwater discharges from construction sites to newly jurisdictional waters. Both costs to the industry and the potential benefits from reducing the environmental impacts from construction activities due to a change to the definition of “waters of the United States” would likely be modest. First, projects disturbing at least one acre of land, and which in turn require NPDES permit coverage, are presumed to be large enough to generate stormwater runoff that could reach a jurisdictional water, either directly or through a conveyance such as a municipal storm

sewer, and so would be required to obtain permit coverage under both the 2020 NWPR secondary baseline and the final rule. Procedures typically required by construction stormwater general permits have been widely adopted as normal practices in the construction industry and are frequently required by local ordinances. As a result, the requirements are not usually considered to impose a significant burden. An increase in jurisdictional waters is not likely to change these circumstances for most areas of the country. The exception may be for stormwater discharges from construction sites in arid States where many streams are ephemeral (e.g., Arizona, Nevada, and New Mexico).

Second, many States and Tribes have specific designated uses and water quality criteria for ephemeral streams in their State or Tribal water quality standard (WQS). Under the 2020 NWPR, WQBEL-based NPDES permits still applied if the discharge reached State waters. Finally, even if not required by federal law, developers may implement stormwater BMPs for a variety of reasons, including the need to comply with local erosion and sediment control requirements and/or to operate in a manner consistent with industry standards, the additional time required for obtaining an exemption from Clean Water Act section 402 permit requirements, or concerns about the public perception of operating without a permit. In the 2020 NWPR analysis, the agencies had expected minor changes, mostly at construction sites located in arid States. Accordingly, the agencies also expect minor changes as a result of the final rule.

III.B.2.2 Industrial Stormwater

Available data are not sufficiently detailed to develop quantitative estimates of the potential costs and environmental benefits associated with permits for stormwater discharges from regulated industrial facilities discharging to newly jurisdictional waters under the final rule. However, qualitative analysis suggests that potential impacts may be limited. Most industrial sectors regulated under the Phase I stormwater rule are located in urbanized areas. Under the 2020 NWPR, any permitted entity that is discharging to an ephemeral feature or other non-jurisdictional water is still required to have an NPDES permit if their discharge conveys to a jurisdictional water. Moving the compliance point for NPDES permits upstream may result in lower effluent limitations given the difference in pollutant dilution or attenuation. However, regulated industrial sectors that are likely located near ephemeral streams represent a minority of the regulated industrial stormwater universe. Additionally, these types of facilities are generally large and due to their scale, may be more likely to discharge into perennial streams (outside of the arid West) that are jurisdictional under both the secondary baseline of 2020 NWPR and the final rule. Therefore, the agencies expect no benefits or costs for industrial facilities with stormwater discharges regulated under the Phase I rule.

III.B.2.3 Municipal Separate Storm Sewer Systems (MS4s)

Stormwater runoff in cities and towns is commonly transported through MS4s, from which it is often discharged, untreated, into local waters. To prevent harmful pollutants from being washed or dumped into, and being discharged from, an MS4, certain MS4s are required by law to obtain NPDES permit coverage and develop a stormwater management program (SWMP). The Stormwater Phase I rule, promulgated in 1990, requires operators of medium and large MS4s serving populations of 100,000 or more to obtain NPDES permit coverage for their stormwater discharges. The Stormwater Phase II rule, promulgated in 1999, required most small MS4s serving populations between 10,000 and 100,000 in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by EPA or the State, to obtain NPDES permit coverage for their stormwater discharges. Generally, Phase I MS4s are

covered by individual permits and Phase II MS4s are covered by general permits. MS4 permits include terms and conditions that are adequate to meet the MS4 standard of reducing pollutant discharges from the MS4 to the “maximum extent practicable” (MEP), eliminating non-stormwater discharges to the MS4, and including other such conditions that the permitting authority deems appropriate to protect water quality.

An MS4 may have many different outfalls within its service area, some of which may discharge to waters newly jurisdictional under the final rule. However, MS4s often implement their SWMPs uniformly across their area without regard to the receiving water of a specific outfall. Thus, a change in jurisdictional status of some receiving waters is not expected to have a noteworthy effect in terms of costs or benefits, unless every outfall of a particular MS4 discharged to a non-jurisdictional water in the baseline and that pollutants never reach a jurisdictional water. Therefore, the agencies expect minor change to costs or water quality benefits from MS4s regulated under the EPA Phase I and Phase II stormwater rules.

III.B.3 Potential Impacts on Section 402 State Programs

As discussed in Section II.C, many States already exceed the aquatic resource or surface water discharge protections under the final rule (*see* Table II-1 in Section II.C for a list of States that fall into this category). Accordingly, the agencies anticipate no changes to programs in these States, and no incremental costs. Conversely, the return to status quo from the 2020 NWPR for States with less stringent protections for their waters in comparison to “waters of the United States” may incur administrative costs associated with this action. As discussed in Section II.C, the agencies are not quantifying such costs because of paucity of data on how strictly and to what extent States regulate their given “waters of the State.” The NPDES program comprises five components: the NPDES permit program, authority to regulate federal facilities, State pretreatment program, general permits program, and biosolids program (U.S. EPA, 2019). Forty-seven States are currently authorized for the NPDES permit program and the general permits program. Thirty-seven States are partially authorized for three or four components, and eight States are fully authorized for all components. Only three States and the District of Columbia are not authorized for any NPDES components.

States that continue current practices could experience no change in costs if they already run their own fully authorized NPDES programs and regulate waters more broadly than the 2020 NWPR requires. Other States that return to status quo from the 2020 NWPR could incur additional costs (*e.g.*, staffing costs) from conducting more Clean Water Act section 401 water quality certification reviews of EPA-issued section 402 permits. In all cases except where States will continue to regulate more broadly than required by the Clean Water Act, a higher number of permits issued by federal agencies is likely to increase State costs associated with certification under Clean Water Act section 401.

States that would incur additional costs as a result of increased section 401 reviews on EPA-issued section 402 permits would be 1) States with no authorized NPDES programs and 2) States with NPDES programs that are not authorized for all components of the NPDES program and need to return to status quo. Massachusetts, New Hampshire, and New Mexico are the only three States without NPDES programs. Given that the percentage of section 401 reviews devoted to EPA-issued section 402 permits is quite low, as the vast majority of section 401 reviews are for Corps-issued section 404 permits, the agencies expect total section 401 costs resulting from changes to the section 402 program to be minimal.

III.B.4 Uncertainty and Limitations for Assessing Potential Effects on Clean Water Act Section 402 Program

There are multiple sources of uncertainty inherent in the analysis of the potential impacts of the revised definition of “waters of the United States” on the Clean Water Act section 402 program.

First, there is significant uncertainty in the universe of entities that would be affected by a change in jurisdictional scope. The discussion of the final rule’s impacts in this report is based on the agencies’ 2020 NWPR analysis (U.S. EPA and Army, 2020a) and the anticipated effects of the 2020 NWPR on section 402 permits included in EPA’s ICIS-NPDES database. The database is based on States’ reporting and may not account for all existing facilities and activities that may affect waters whose jurisdictional status changed under the 2020 NWPR and under the final rule. For example, data on facilities or activities subject to general permits or facilities with minor status under the Clean Water Act section 402 program are limited. Some industrial facilities or activities subject to Clean Water Act section 402 requirements may be underrepresented. Some facilities or activities have missing or invalid coordinates and available coordinates for permitted dischargers can be those of the facility and not necessarily the outfall. This limits the agencies’ ability to precisely identify the receiving waterbody. The available data also do not necessarily represent all future activities that could have adverse impacts on such waters. In particular, specific locations of future construction activities as well as the potential for their stormwater discharges to affect ephemeral streams are unknown. Similarly, demand for industrial domestic wastewater treatment is driven by land development, and locations of future industrial domestic wastewater treatment facilities are not known.

Second, there is also significant uncertainty regarding the response of permittees. Some entities have incentives to voluntarily use technologies and best management practices, based on industry standards, public relations, sustainability and related policies. For existing permittees, the time required for obtaining exemption from Clean Water Act section 402 requirements may have served as an extra incentive to maintain existing practices even where the receiving water changed status under the 2020 NWPR.

III.C Clean Water Act Section 404: Discharge of Dredged or Fill Material

Unless the activity is statutorily exempted,⁵⁸ the Clean Water Act prohibits discharges of dredged or fill material from a point source into “waters of the United States,” including wetlands, without a permit. Such discharges are regulated under Clean Water Act section 404, which is administered by the Corps with oversight by the EPA. In addition, the States of Michigan, New Jersey, and Florida have assumed administration of the Clean Water Act section 404 permitting program for certain waters within their borders.

For a project to be permitted under the section 404 program, the permittee must demonstrate that, to the extent practicable, the permittee has taken steps to avoid impacts to wetlands and other aquatic resources,

⁵⁸ The statutory exemptions to Clean Water Act section 404 are set forth in subsection (f)(1). The first and most significant section 404(f)(1) exemption is for normal and ongoing farming, silviculture and ranching activities. Other examples of statutory exemptions are for maintenance, including emergency repair of recently damaged, currently serviceable structures, and for construction or maintenance of farm ponds, irrigation ditches, farm or forest roads, and temporary roads for moving mining equipment. These statutory exemptions may not apply in certain limited circumstances if the otherwise exempted activity brings an area subject to jurisdiction into a use to which it was not previously subject, where the flow or circulation of navigable waters may be impaired or the reach or waters reduced (Clean Water Act section 404(f)(2)).

minimized potential impacts, and compensated for remaining unavoidable impacts if required. *See, e.g.*, 33 U.S.C. 1344(b)(1). This process, commonly referred to as the mitigation sequence, applies the following mitigation steps in sequential order:

- **Avoidance:** Mitigating an aquatic resource impact by selecting the least-damaging project type, spatial location, and extent compatible with achieving the purpose of the project. Avoidance is achieved through an analysis of appropriate and practicable alternatives and a consideration of impact footprint.
- **Minimization:** Mitigating an aquatic resource impact by managing the severity of a project’s impact on resources at the selected site. Minimization is achieved through the incorporation of appropriate and practicable design and risk avoidance measures.
- **Compensatory Mitigation:** Mitigating an aquatic resource impact by replacing or providing substitute aquatic resources for impacts that remain after avoidance and minimization measures have been applied. Compensatory mitigation is achieved through appropriate and practicable restoration, establishment, enhancement, or preservation of aquatic resource functions and services.

Avoidance and minimization steps assure that only projects that are the least environmentally damaging practicable alternative (LEDPA) will receive legal authorization to discharge. The Corps may only permit the LEDPA (40 CFR 230.10(a)). While this sounds straightforward, there are many variables at play and they multiply in complexity depending on the type of project, the local market, the geographic context, and the type, functionality, and local importance of the aquatic resources involved. The agencies were unable to quantify and monetize benefits of the final rule with regard to the avoidance and minimization steps because the steps permittees take are not tracked or recorded in a systematic way. Therefore, the agencies’ analysis focuses on benefits stemming from increases in compensatory mitigation requirements, which is likely to understate the total benefits of the final rule.

Compensatory mitigation may be required to replace the loss of wetland and aquatic resource functions by offsetting unavoidable adverse impacts which remain after appropriate and practicable avoidance and minimization have been achieved. There are three mechanisms for providing compensatory mitigation (as established by the regulations⁵⁹) with mitigation banks and in-lieu fee programs preferable to permittee-responsible mitigation:

- **Mitigation bank:** A site, or suite of sites, where aquatic resources are restored, established, enhanced, or preserved for the purpose of providing compensatory mitigation for impacts authorized by Corps permits. Mitigation banks sell compensatory mitigation credits to permittees with regulatory requirements to offset aquatic resource impacts. The purchase of credits transfers responsibility for compensation from the permittee to the mitigation bank. Large compensatory mitigation banks generally provide compensation for multiple, smaller impacts.
- **In-lieu fee program:** A program involving the restoration, establishment, enhancement, or preservation of aquatic resources through funds paid to a “governmental or non-profit natural resources management entity” to satisfy compensatory mitigation requirements for Corps permits.

⁵⁹ *See* 40 CFR 230-91-230.98 and 33 CFR 332.1-332.8.

The fund payment transfers responsibility for compensation from the permittee to the in-lieu program operator. In-lieu fee programs identify and initiate projects across their service area within set timeframes from when funds are collected.

- **Permittee-responsible mitigation:** Aquatic resource restoration, establishment, enhancement, or preservation activity undertaken by the permittee (or an authorized agent or contractor) to provide compensatory mitigation for which the permittee retains full responsibility.

The agencies generally consider banks and in-lieu fee programs preferable to permittee-responsible mitigation because they consolidate compensatory mitigation projects where ecologically appropriate, use a watershed approach, provide a greater level of financial planning and scientific expertise, reduce temporal losses of ecological functions, increase economic efficiency, and reduce uncertainty over project success.

Two types of permits are available through the section 404 program: individual permits and general permits. Individual permits are required for impacts that are more than minimal, individually and cumulatively. The Corps evaluates potential environmental and socioeconomic effects of the proposed activity and issues a public notice that describes the proposed project. The Corps reviews all comments received and makes a final permit decision. Alternatively, letters of permission, a type of individual permit, may be used to evaluate specific categories of activities with minor impacts that may not qualify for an existing general permit.

General permits are suitable for activities that will have only minimal adverse effects individually or cumulatively. General permits authorize activities the Corps has identified as being substantially similar in nature and causing only minimal individual and cumulative environmental impacts. General permits may authorize activities in a limited geographic area (*e.g.*, county or State), a particular region of the country (*e.g.*, group of contiguous States), or the nation (called Nationwide Permits). The general permit process eliminates individual review and allows certain activities (*e.g.*, minor road maintenance, utility line backfill) to proceed with little or no delay, provided that the conditions for the general permit are met.

EPA and the Corps divide responsibilities for enforcing CWA section 404 in accordance with the “Memorandum of Agreement Concerning Federal Enforcement for the Section 404 Program of the Clean Water Act” entered into on January 19, 1989, as modified by agreement on February 25, 1994.

EPA seeks penalties in enforcement actions that are appropriate to the violations, considering the forgone economic benefit of noncompliance and a gravity amount to deter future violations. Therefore, in those circumstances where EPA collects penalties for CWA section 404 violations, they are designed to be proportionate to the violations. In a recent analysis, EPA evaluated penalties collected for section 404 violations from 2006 to 2022. Based on this analysis, EPA determined that approximately 53% of administrative enforcement actions for section 404 violations resulted in no penalties and that the average penalty for all administrative enforcement actions for section 404 violations was approximately \$17,900. EPA also determined that the average penalty for judicial and administrative enforcement actions was approximately \$40,100 (U.S. EPA, 2022).

The Corps also does not typically collect substantial penalties for CWA section 404 violations. An analysis of the Corps’ enforcement activities in fiscal year 2019 indicates that of all enforcement activities

that the Corps initiated for unauthorized activities under CWA section 404, only approximately 1% of activities were referred to EPA for potential enforcement, approximately 1% were resolved through restoration orders, approximately 19% were resolved through voluntary restoration, and the remainder were resolved using after-the-fact permits, determinations that no permits were required, determinations to pursue no further action, or similar means (U.S. Army Corps of Engineers, 2022).

These potential costs of enforcement are included here for additional perspective, and the agencies do not anticipate that this final rule will result in a change in regulatory violations relative to the secondary baseline. The agencies note that it is long-standing and well-established policy of economic analysis for the agencies to assume full compliance with the regulation; *see, e.g.*, Section 5.4.1 of EPA's *Guidelines for Preparing Economic Analyses* (U.S. EPA, 2010). Including the costs noted above in the summary of this analysis would constitute double counting.

III.C.1 Potential Effects of the Final Rule on the Clean Water Act Section 404 Program

Under the 2020 NWPR, the following features, among others, were no longer jurisdictional: wetlands that are not adjacent to otherwise jurisdictional waters; rivers and streams that do not contribute surface water flow to traditional navigable waters or the territorial seas in a typical year; ephemeral features, including ephemeral streams, isolated lakes, ponds, and impoundments; and certain ditches. While some of these features will similarly not be jurisdictional under the final rule, they will be assessed via significant nexus analyses before such conclusions are reached. The 2020 NWPR also codified twelve exclusions; some of which diverged drastically from pre-2015 regulatory practice and from the codified exclusions in the final rule. Under the 2020 NWPR, permittees no longer needed to obtain section 404 permit coverage for waters whose jurisdictional status has changed and did not need to mitigate impacts from their project activities. The final rule removes these changes made by the 2020 NWPR and returns the federal jurisdiction to approximately the same scope as under the pre-2015 regulatory regime.

At the time 2020 NWPR was promulgated, some States, Tribes, and localities had their own dredged/fill programs already in place regulating these waters. As a result, developers and other permittees affecting these non-jurisdictional waters in these areas could still have been required to take steps to avoid impacts to wetlands and other aquatic resources. In these areas, the final rule will reinstate the federal jurisdiction removed under the 2020 NWPR, but since these State, Tribal, or local program were in place, the final rule does not meaningfully change what waters receive protection in these areas. However, as discussed in Chapter II, the agencies are not quantifying this difference in costs to States with broad regulatory protections.

Several potential overall effects on the Clean Water Act section 404 permit program are possible based on the change in Clean Water Act jurisdiction between the 2020 NWPR and the final rule:

- **Transfers:** Under the 2020 NWPR, projects may have shifted away from areas containing waters that required section 404 permits to areas with waters that were no longer jurisdictional (*e.g.*, non-adjacent wetlands and ephemeral features). All else being constant, profit-maximizing entities will aim to avoid regulatory requirements and the associated costs. Therefore, the agencies expect that during the period when the 2020 NWPR was in effect, there may have been a relative decrease in activity affecting waters that remained jurisdictional and an increase in activity affecting waters that were newly non-jurisdictional. The agencies do not have sufficient information from the period of time when the 2020 NWPR was in effect to estimate how much of this type of shift in project activity

occurred. Given the relatively short period of time that the 2020 NWPR was in effect, any shift that may have occurred during this period was likely marginal. However, if the 2020 NWPR had remained in effect for a longer period of time this shifting effect would have become more pronounced, in areas where State, Tribal, or local programs did not provide regulatory protection for these waters that lost federal jurisdiction under the 2020 NWPR. This potential shift in the types of waters impacted by project activity, is separate from any consideration of changes in overall activity which may have occurred under the 2020 NWPR.

- Permit and administrative costs:** Several possible scenarios could result in changes to permit costs. For projects that only affected waters that lost jurisdiction under the 2020 NWPR and where no State, Tribal, or local permits were required, permitting costs would increase with the final rule. Costs would also increase for the Corps as the overall permit volume would increase, and for States and Tribes in terms of increased Clean Water Act section 401 certification reviews. It is uncertain whether additional time delays associated with the permitting process would occur under the final rule; since, jurisdictional determinations were often required under the 2020 NWPR to assess whether a section 404 permit was required.⁶⁰ For projects that would still have required a permit under 2020 NWPR, there may be additional costs and burden resulting from a larger number of waters affected by their project being jurisdictional due to the final rule. This could lead to a greater likelihood of needing an individual permit, which have higher costs than general permits.
- Mitigation sequence costs:** Those projects that affect a water feature whose jurisdictional status changes between the 2020 NWPR and the final rule will not only have increased permitting costs, but they would also likely incur greater project costs from having to implement the mitigation sequence required by their permit. Similarly, for projects that affect multiple waters, if some of those waters were non-jurisdictional under 2020 NWPR but jurisdictional under the final rule, the permit costs may not differ substantially, but these projects would likely be required to implement greater avoidance, minimization, and compensatory mitigation measures under the final rule than under the 2020 NWPR. Avoidance and minimization measures are not tracked by the Corps, so they are difficult to include in estimates of changes in costs. However, compensatory mitigation measures are tracked by the Corps; as such, changes to mitigation levels and the resulting costs can be estimated.
- Benefits:** Returning federal jurisdictional status lost under the 2020 NWPR to water features such as: non-adjacent wetlands, ephemeral features, certain ditches, and certain lakes and ponds, for example, would reduce impact areas from projects (from the minimization requirements), increase mitigation measures, and reduce loss of wetlands acreage and stream linear feet. Additionally, potential impacts of the final rule on the types of section 404 permits that would be issued (*i.e.*, lower likelihood for general permits; likely more individual permits with public hearings and fewer individual permits with letters of permission) could result in increased protections for waters that were non-jurisdictional under the 2020 NWPR. The protections for these waters from additional avoidance, minimization, or

⁶⁰ The jurisdictional determination data from the one year that the 2020 NWPR was in effect shows an increase in the percentage of jurisdictional determinations that resulted in Approved Jurisdictional Determinations (AJD) relative to the pre-2015 practice. On average, AJDs take more time and effort than other types of jurisdictional determinations. However, it is unclear if this was a temporary effect of a new definition being applied and the percentages would have returned to pre-2020 NWPR levels over time.

compensation requirements would result in benefits to society over time, including wildlife habitat support, recreation, and aesthetic benefits.

III.C.2 Quantitative Assessment of Potential National Impacts

To evaluate the potential impacts of the final rule, the agencies focused on potential Clean Water Act section 404 program impacts for which data are sufficient to develop quantitative estimates at the national level. Inputs for this analysis were derived using section 404 permit data from the Corps' ORM2 database to identify aquatic resources and permits potentially affected by the final rule. To estimate costs, the agencies relied on a similar methodology to that used in the 2020 NWPR analysis (U.S. EPA and Army, 2020a). To estimate benefits of wetland mitigation, the agencies used a meta-analysis of wetland valuation studies described in detail in Appendix B. The agencies evaluated potential impacts of the final rule relative to the secondary baseline of the 2020 NWPR (in the estimates of benefit and costs). National-level estimates of benefits and costs are summarized below. Appendix C provides State-level results of this analysis

III.C.2.1 Estimating Future Activity Requiring Clean Water Act Section 404 Permitting

The agencies started with ten years of Corps ORM2 Clean Water Act section 404 permit data for the years 2010 through 2019 to derive average annual estimates of the: types, amount, and general location of permitted projects; water features such as wetlands, streambanks, and shorelines affected by dredged or fill activities; and the extent of impacts requiring compensatory mitigation under the section 404 permitting process.⁶¹ During much of this ten-year period, the pre-2015 regulatory practice was used to determine the jurisdictional status of waters potentially affected by permitted projects. However, during the years 2015 through 2019, the 2015 Clean Water Rule was in effect at varying time periods in 38 States. The section 404 permits issued in those States during the times that the 2015 Clean Water Rule was in effect were removed from the dataset, so they do not factor into the average annual estimates. Since these average annual estimates of permits, affected waters, and mitigation were derived from the remaining data on permits and jurisdictional determinations based only on the pre-2015 regulatory practice, the agencies consider them to be reasonably representative of future activity and regulatory requirements that would apply on an annual basis under the final rule. The agencies acknowledge that future shifts in land use activity, changing demographics, and even climate change will have an effect on the characteristics and frequency of projects requiring 404 permits. Due to the inherent difficulty in predicting these future effects to 404 permitting, the agencies chose to limit the analysis to 20 years and to estimate changes at the resolution of the 12-digit hydrologic unit code (HUC12) watershed scale.

During this ten-year timeframe, the Corps issued 424,189 permits under the section 404 program that were subject to the *Rapanos* Guidance, were not permits issued for mitigation or restoration activities, had accurate coordinate data that enabled mapping to a HUC12 watershed, and had complete Cowardin information, which remains consistent across regulatory regimes. See Appendix A for summary information on this section 404 permit data analysis. Table III-1 shows the average annual estimated increase in mitigation requirements relative to the secondary baseline of the 2020 NWPR, based on the 424,189 permits issued between 2010 and 2019 (see Appendix C for a breakout of the estimated increase in mitigation requirements by State). The estimated mitigation requirements are based on an assumption

⁶¹ Calendar year 2019 was the most recent complete year of permit data available before the 2020 NWPR was promulgated.

of a 1:1 ratio between authorized impacts and mitigation requirements.⁶² When mitigation required is more than one acre per acre impacted, the additional acreage is generally to ensure that the mitigation acres provide the same ecosystem services that the impacted acres would have, and thus the focus is on the acres of impacts requiring compensatory mitigation rather than the acres of mitigation.

The Cowardin code categorizes individual aquatic resources categorized by their hydromorphic characteristics, such as palustrine features (*e.g.*, wetlands and ponds), lacustrine features (*e.g.*, lakes), and riverine features (*e.g.*, streams and rivers). The Cowardin types with the largest estimated average annual increase in mitigation requirements under the final rule include several palustrine types (general palustrine (P), emergent (PEM), forested (PFO), scrub-shrub (PSS), and open water (POW)) as well as two riverine types (general riverine (R) and ephemeral (R6)).⁶³ The States of Florida, California, Louisiana, Alaska, and Minnesota have the largest estimated average annual increase in mitigation requirements under the final rule. These States are estimated to have the largest benefits and costs under the final rule relative to the secondary baseline (*see* Appendix C).

Table III-1: Estimated average annual increase in mitigation requirements under the final rule relative to the secondary baseline, based on Clean Water Act section 404 permits issued in 2010-2019, by Cowardin code

Cowardin Type	Permanent Impacts ^{1,2,3}			Temporary Impacts ^{1,2,3}		
	Acres	Linear Feet	Total Permanent Impacts (Acres) ⁴	Acres	Linear Feet	Total Temporary Impacts (Acres) ⁴
Estuarine	0.0	2.9	0.0	0.0	0.0	0.0
E1	0.1	4.5	0.1	0.0	0.9	0.0
E2	0.2	6.4	0.2	0.0	2.1	0.0
Lacustrine	6.2	2,018.9	8.5	0.1	0.4	0.1
L1	15.4	827.3	16.3	2.7	42.7	2.8
L2	12.2	1,121.2	13.5	2.3	103.8	2.4
Marine	0.0	-0.1	0.0	0.0	0.0	0.0
M1	0.0	-1.3	0.0	0.0	-0.2	0.0
M2	0.0	-1.4	0.0	0.0	-0.5	0.0
Palustrine	47.0	1,496.9	48.7	2.9	143.6	3.1
PAB	6.7	230.2	6.9	0.3	376.3	0.8
PEM	603.2	16,343.7	622.0	57.1	11,734.9	70.5
PFO	329.9	2,754.7	333.1	40.1	1,403.4	41.7
PML	0.5	0.0	0.5	0.0	0.0	0.0
POW	47.7	539.7	48.4	1.1	42.2	1.2
PRB	0.8	48.7	0.9	0.0	54.8	0.1
PSS	52.5	538.3	53.1	25.5	887.8	26.5
PUB	7.0	1,498.0	8.8	3.7	358.3	4.1
Riverine	3.6	25,397.8	32.7	20.5	6,815.0	28.3

⁶² This assumption helps account for different mitigation options (*e.g.*, on-site, off-site, in-lieu fee, mitigation credits). For example, the number of acres or linear feet per mitigation credit varies among and within Corps Districts, so translating mitigation credit data listed in the ORM2 database into acreage and linear feet values is not straightforward.

⁶³ The Cowardin code, as created by Lewis M. Cowardin et al. in 1979, does not include a category for ephemeral streams; this category was created by the Corps in ORM2 for the sake of tracking ephemeral streams. U.S. Army Corps of Engineers (n.d.) provides definitions for the major Cowardin categories and descriptions of the subcategories listed in Table III-1.

Table III-1: Estimated average annual increase in mitigation requirements under the final rule relative to the secondary baseline, based on Clean Water Act section 404 permits issued in 2010-2019, by Cowardin code

Cowardin Type	Permanent Impacts ^{1,2,3}			Temporary Impacts ^{1,2,3}		
	Acres	Linear Feet	Total Permanent Impacts (Acres) ⁴	Acres	Linear Feet	Total Temporary Impacts (Acres) ⁴
R1	0.0	0.8	0.0	0.0	0.1	0.0
R2	2.2	1,244.2	3.6	1.0	531.9	1.6
R3	0.4	468.5	0.9	0.2	164.3	0.4
R4	3.0	7,560.5	11.7	0.6	1,249.2	2.0
R5	0.9	2,735.6	4.0	0.5	1,262.7	1.9
R6	30.5	104,363.1	150.3	32.3	26,954.3	63.2
Riparian	7.8	2,371.0	10.5	0.3	176.6	0.5
RP1	1.3	348.9	1.7	1.1	342.1	1.5
RP2	2.8	197.8	3.0	0.6	25.8	0.7
Upland	26.0	472.7	26.6	1.9	8,576.0	11.7

Source: Analysis of Corps ORM2 and jurisdictional determination data.

¹ Excludes mitigation type permits, permits issued when the 2015 Clean Water Rule was in effect, permits with missing/inaccurate permit coordinates, and permits with missing or historical Cowardin codes.

² The estimated impact area does not include most projects from New Jersey and Michigan, as they implemented the Clean Water Act section 404 program in their States and so maintain their own separate data. For New Jersey and Michigan, only permits issued on waters for which the Corps still retains jurisdiction are considered in the estimated average annual mitigation requirement increases.

³ Includes 49 States (excludes Hawaii and District of Columbia).

⁴ Impacts in linear feet were converted to acres by multiplying total linear feet by an average total buffer width of 50 feet (25 feet on each side of the stream) and converting square feet to acres.

Under the final rule, the increase in wetland mitigation acres would accumulate over time. The cumulative increases for permanent wetland mitigation acres assumes a linear trend over the 20-year analysis period from 2023 to 2042, while the cumulative increases for temporary wetland mitigation acres assumes a linear trend over a 15-year period from 2028 to 2042.⁶⁴ The 5-year lag for temporary wetland mitigation acres is based on discussions with the Corps and accounts for the time required for temporarily impacted areas to return to their original state. Cumulative changes in avoided wetland losses are used in the benefits assessment (Section III.C.2.3) and the environmental justice analysis (Section IV).

Table III-2 presents national totals for annual average increases in wetland mitigation acres and cumulative increases over the 20-year analysis period.

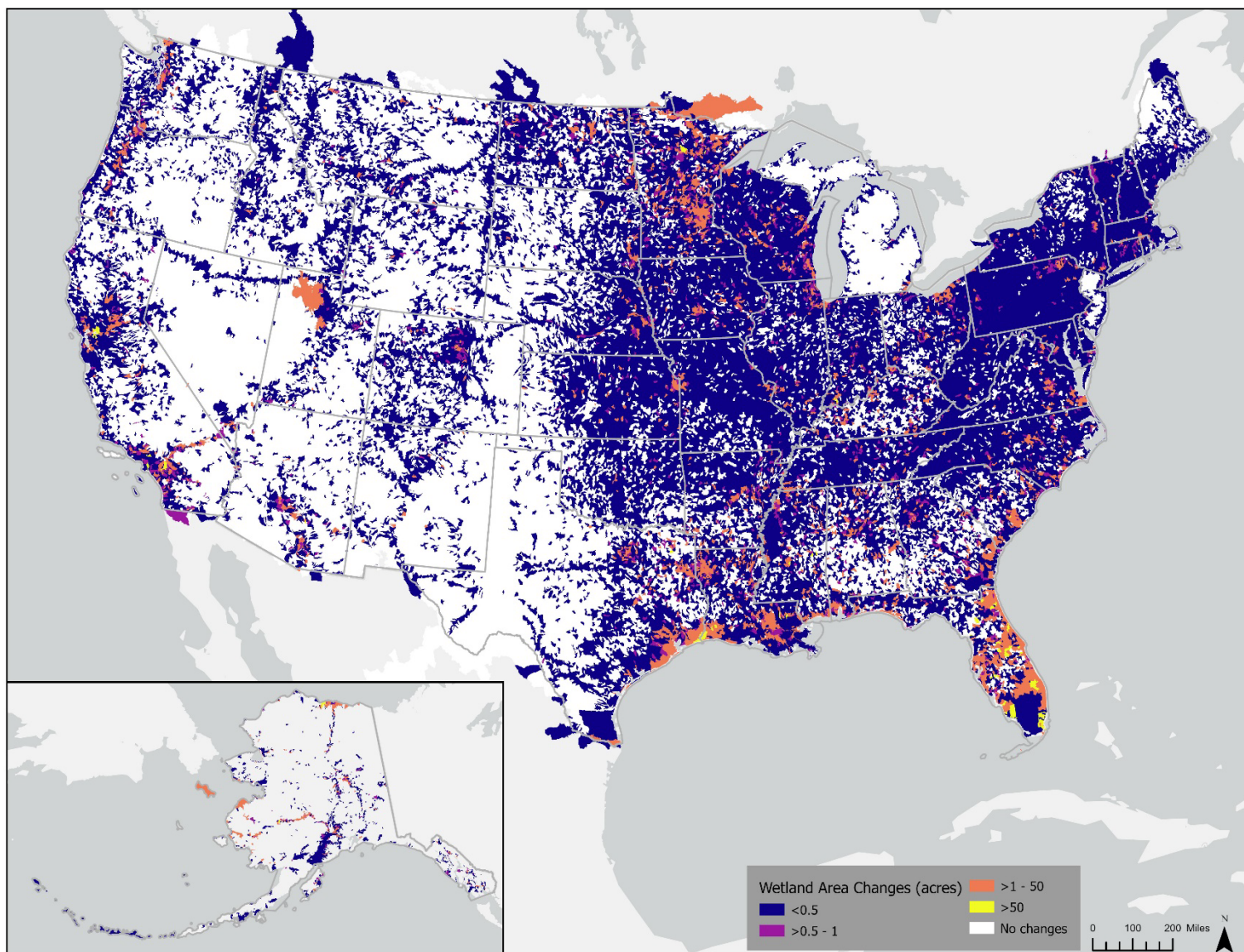
⁶⁴ For the proposal household WTP values used for the benefit estimates were based on a one-time payment for the additional mitigation acres in a given year. However, the agencies received comments suggesting the use of an annual payment approach for household WTP. The annual payment approach requires the accounting for cumulation of the mitigation acre increases over the 2023-2042 analysis period. For further explanation see the lumpsum versus annual payment approach discussions in Appendix B and Appendix D.

Table III-2: Estimated national increase in wetland mitigation acres under the final rule relative to the secondary baseline of 2020 NWPR

Annual Average Increase in Wetland Mitigation Acres			Cumulative Increase in Wetland Mitigation Acres ¹		
Permanent	Temporary	Total	Permanent	Temporary	Total
1,406.3	265.1	1,671.4	28,122.1	3,977.4	32,099.5
¹ The cumulative increase in the permanent wetland mitigation acres assumes a linear trend over a 20-year period from 2023 to 2042. The temporary increase in wetland mitigation acres assumes a linear trend over a 15-year period from 2028 to 2042. The 5-year lag in benefits from mitigation measures for temporary impacts is based on discussion with the Corps and accounts for the time required for temporarily impacted areas to return to their original state.					

Figure III-1 shows the geographic distribution of cumulative increases in mitigation requirements under the final rule during the 20-year analysis period, as compared to the secondary baseline of the 2020 NWPR, by HUC12.

Figure III-1: Cumulative increases in mitigation acres under the final rule during the 20-year analysis period, relative to the secondary baseline of the 2020 NWPR, by HUC12



III.C.2.2 Potential Costs to Section 404 Program

The analysis of the final rule costs follows the same general approach the agencies used in the 2020 NWPR analysis (U.S. EPA and Army, 2020a). The final rule could increase costs in two ways:

1. Increased permit costs, including application costs, permitting time costs, and impact avoidance and minimization costs, for projects affecting newly jurisdictional waters regulated under the final rule, and
2. Increased compensatory mitigation costs when impacts occur on waters regulated under the Clean Water Act.

To estimate permit cost increases, the agencies first determined how many section 404 permitted waters on average are covered by either a single-water individual permit, a single-water general permit, a multi-water individual permit, or a multi-water general permit in a given year, based on permits issued from 2010 to 2019. The agencies then used these averages to estimate what proportion of the waters that became no longer regulated as “waters of the United States” under the 2020 NWPR, would be covered by either a single-water individual or general permit. These single-water individual and general permits were assumed to no longer be needed under the 2020 NWPR and the permit costs would not occur in the baseline.

The number of permits considered in the permit cost analysis may differ from the number considered in the mitigation cost analysis. The permit cost analysis considered only single-water section 404 permits that potentially affect waters that became no longer jurisdictional under the 2020 NWPR. Multiple-water permits were not considered in the permit cost analysis. This is based on the assumption that if one water in a multi-water permit is no longer jurisdictional the permit would still be needed to cover the remaining waters. The mitigation cost analysis considered both single-water and multiple-water permits with mitigation requirements for waters that became no longer jurisdictional under the 2020 NWPR, excluding permits issued for mitigation or restoration activities.

The agencies used the Corps’ ORM2 section 404 permit database to determine the average annual number of single-water permits affecting waters that became no longer jurisdictional under the 2020 NWPR. The agencies then multiplied the average annual increase in the number of individual and general section 404 permits by Corps estimates of permit costs (U.S. EPA and Army, 2015).

The Corps estimated section 404 permit application costs to calculate incremental permit application costs associated with the replacement of Nationwide Permit 26 (NWP 26) with a suite of new and modified nationwide permits in the year 2000 (U.S. EPA and Army, 2015). The Corps analysis, which noted that the costs were developed for “typical” projects affecting up to three acres of jurisdictional waters, estimated costs for individual permits ranging from \$10,000 to \$24,000 and for general permits ranging from \$3,000 to \$10,000 (1999\$). For each permit type, the agencies used the low end of the range as the low estimate and the high end of the range as the high estimate. The Corps’ unit cost estimates are adjusted from 1999\$ to 2021\$ using the CPI-U (\$16,300 to \$39,000 per individual permit; \$4,900 to \$16,300 per general permit). Table III-3 shows the estimated average annual increase in the number of individual and general section 404 permits, Corps unit application costs, and the estimated annualized increase in permit costs for individual and general permits nationwide (estimated over a twenty-year

timeframe from 2023 to 2042). Relative to the secondary baseline of the 2020 NWPR, annualized permit costs range from \$42 million to \$136 million using a 3 percent discount rate and from \$43 million to \$142 million using a 7 percent discount rate. These cost estimates represent permitting costs associated with the incremental change in permits required between the number of permits that would be required under NWPR and the number that would be required under the final rule. These numbers do not reflect total costs for 404 permitting under either regulatory regime, only the incremental difference between the two. Accounting for the full permitting costs of the CWA 404 program is not necessary for estimating the incremental cost and is beyond the scope of this economic analysis.

The estimated annual increase in permits is more than what was presented in the economic analysis for the proposed rule. The estimated increase in permits presented in the proposal analysis did not include permit estimates for those States that the agencies considered to have State-level permitting programs commensurate with the proposed regulations. However, the agencies received public comments recommending that these States should not be excluded from the analysis. As a result, the national estimated increase in annual permits presented here is for the final rule are for all States, except Hawaii and the District of Columbia which lacked sufficient data to base estimates on. The permit estimates in Table III-3 also do not fully account for the change in permits for Michigan and New Jersey, as they implement the Clean Water Act section 404 program in their States and so maintain their own 404 permit data separate from the Corps ORM2 database. For New Jersey and Michigan, only permits issued on waters for which the Corps still retains jurisdiction were available for estimating the increase in permits for those States.

Table III-3: National annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Permit Type	Estimated Average Annual Increase in Permits ^{1,2}	Unit Costs from Corps NWP Analysis (2021\$)		Estimated Increase in Permit Costs (millions 2021\$) ^{1,3}			
				3% Discount Rate		7% Discount Rate	
		Low	High	Low	High	Low	High
IP	151	\$16,300	\$39,000	\$2.5	\$6.1	\$2.6	\$6.3
GP	7,751	\$4,900	\$16,300	\$39.1	\$130.1	\$40.6	\$135.2
Total	7,902			\$41.7	\$136.2	\$43.3	\$141.5

¹ Reflects annual increase in permits in 49 States (excludes Hawaii and District of Columbia).

² Estimated average annual permit increases based on single-water section 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the 2020 NWPR.

³ Permit costs are calculated by multiplying the estimated average annual increase in the number of single-water individual and general permits by the low and high unit costs for each permit type from the Corps NWP analysis (\$16,300 to \$39,000 per individual permit; \$4,900 to \$16,300 per general permit), and annualizing over the 2023-2042 analysis period.

To estimate costs from increases in mitigation requirements, the agencies multiplied the cost of each mitigation acre or linear foot (low and high estimates) by the estimated average annual increase in mitigation requirements and summed the acreage and linear feet values for each scenario. The increase in mitigation requirements includes permanent and temporary impacts. Throughout the analysis period, the agencies assumed that permittees would incur mitigation costs for both permanent and temporary impacts for each project requiring mitigation (*i.e.*, no time lag for temporary impacts is considered in cost analysis). The Corps estimated State-specific per-acre costs of wetland mitigation and per linear foot

estimates of stream mitigation by examining published studies and survey results, making phone inquiries to Corps Districts and mitigation banks, and researching web sites (U.S. EPA and Army, 2015). A team of Corps experts developed a range of values for each State. Costs for mitigation in estuarine environments, whose jurisdictional status will not be affected by this rule, are not included where explicitly identified by mitigation bank and in-lieu fee program fee schedules. Mitigation costs for each State vary widely. Costs vary based on land acquisition costs, the nature of the work being done, demand for mitigation in the State, as well as other factors. The unit costs identified here, based on mitigation bank and in-lieu-fee program fee schedules, represent fully loaded unit costs and include the costs of land acquisition, construction work completed on site, monitoring for mitigation success, and long-term stewardship. While these are the costs assumed in the modeling carried out here, there are instances where no credits are available for purchase from mitigation banks or in-lieu-fee programs, and in these cases a permittee-responsible mitigation project would be required. This could occur on-site or off-site. Due to the boutique nature of permittee responsible mitigation, this type of mitigation can cost more than the purchase of credits from a mitigation bank or in-lieu fee program. In these cases, mitigation costs could be greater than the state averages used for calculating mitigation costs for the analysis. In some cases, where mitigation is occurring on the same tract of land as the permitted impacts and new land would not have to be acquired, costs can be less than the purchase of credits from an off-site compensatory mitigation alternative; however, the latter is often less expensive, because third-party mitigation providers can achieve economies of scale and, therefore, mitigate impacts more efficiently. In this case, the Corps' mitigation costs estimates may be an overestimate if completing a permittee responsible project is feasible on the same tract of land (U.S. EPA and Army, 2015). As mentioned above, for all these cases, the costs associated with mitigation can vary widely on a State, watershed, and even site-specific basis.

Table III-4 provides annualized cost estimates from increased mitigation requirements nationwide, based on a twenty-year timeframe from 2023 to 2042. Under the secondary baseline of the 2020 NWPR, annualized mitigation costs range from \$176 million to \$390 million using a 3 percent discount rate and from \$183 million to \$405 million using a 7 percent discount rate. As with the permitting cost estimates, these mitigation cost estimates do not reflect total costs for mitigation under either regulatory regime, only the incremental difference between the two, calculated by estimating the incremental change in covered projects multiplied by the Corps' cost estimates for such projects. Accounting for the full mitigation costs of the CWA 404 program is not necessary for estimating the incremental cost and is beyond the scope of this economic analysis.

Table III-4: National annualized mitigation costs from increases in mitigation requirements, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Unit	Estimated Average Annual Mitigation Change ^{1,3}	Estimated Increase in Mitigation Costs (Millions 2021\$) ^{1,2}			
		3% Discount Rate		7% Discount Rate	
		Low	High	Low	High
Acres	1,402.9	\$97.1	\$207.0	\$100.9	\$215.1
LF	233,832	\$78.7	\$183.3	\$81.7	\$190.4
Total		\$175.8	\$390.3	\$182.6	\$405.5

¹ Reflects average annual mitigation change in 49 States (excludes Hawaii and District of Columbia).

² Mitigation costs are calculated by multiplying the Corps' State-level costs for each mitigation acre or linear foot (low and high estimates) by the expected increase in average annual mitigation requirements and annualizing the values over the 2023-2042 analysis period.

Table III-4: National annualized mitigation costs from increases in mitigation requirements, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Unit	Estimated Average Annual Mitigation Change ^{1,3}	Estimated Increase in Mitigation Costs (Millions 2021\$) ^{1,2}			
		3% Discount Rate		7% Discount Rate	
		Low	High	Low	High
³ Estimated average annual mitigation increases (both permanent and temporary) based on permits issued in years 2010-2019 with mitigation requirements on waterways that became no longer jurisdictional under the 2020 NWPR, excluding permits issued for mitigation or restoration activities because the main purpose of these activities is to restore or enhance ecosystem services provided by water resources as opposed to dredge and fill activities that lead to permanent or temporary losses of ecosystem services. The increase in mitigation requirements includes permanent and temporary impacts because throughout the analysis period, permittees will incur costs for mitigation of both permanent and temporary impacts (<i>i.e.</i> , no 5-year lag for temporary impacts in mitigation cost estimates).					

Table III-5 provides total annualized section 404 program costs resulting from the final rule, or the sum of permit and mitigation costs, based on a twenty-year timeframe from 2023 to 2042. Relative to the secondary baseline of the 2020 NWPR, total national annualized costs range from \$217 million to \$733 million using a 3 percent discount rate and from \$337 million to \$762 million using a 7 percent discount rate. These estimates are subject to the uncertainty discussed in Section III.C.3. The sources of uncertainty come from data limitations and as well as parameter uncertainty used as input in this analysis (*e.g.*, the ratio used for estimating compensatory mitigation and per unit mitigation costs).

Table III-5: Total national annualized compliance costs, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Cost Category	3% Discount Rate ¹		7% Discount Rate ¹	
	Low	High	Low	High
Mitigation Costs	\$175.8	\$390.3	\$182.6	\$405.5
Permit Costs	\$41.7	\$136.2	\$43.3	\$141.5
Total	\$217.4	\$526.5	\$225.9	\$546.9
¹ Total costs annualized over the 2023-2042 analysis period. Reflects expected costs in 49 States (excludes Hawaii and District of Columbia).				

III.C.2.3 Potential Benefits of Increases in Wetland Mitigation Requirements

III.C.2.3.1 Conceptual value diagram of ecosystem service benefits

Figure III-2 provides a conceptual value diagram of how increased mitigation requirements resulting from the final rule, on the left side of the diagram, can generate public ecosystem service benefits derived from increased wetlands and streams, shown on the right.

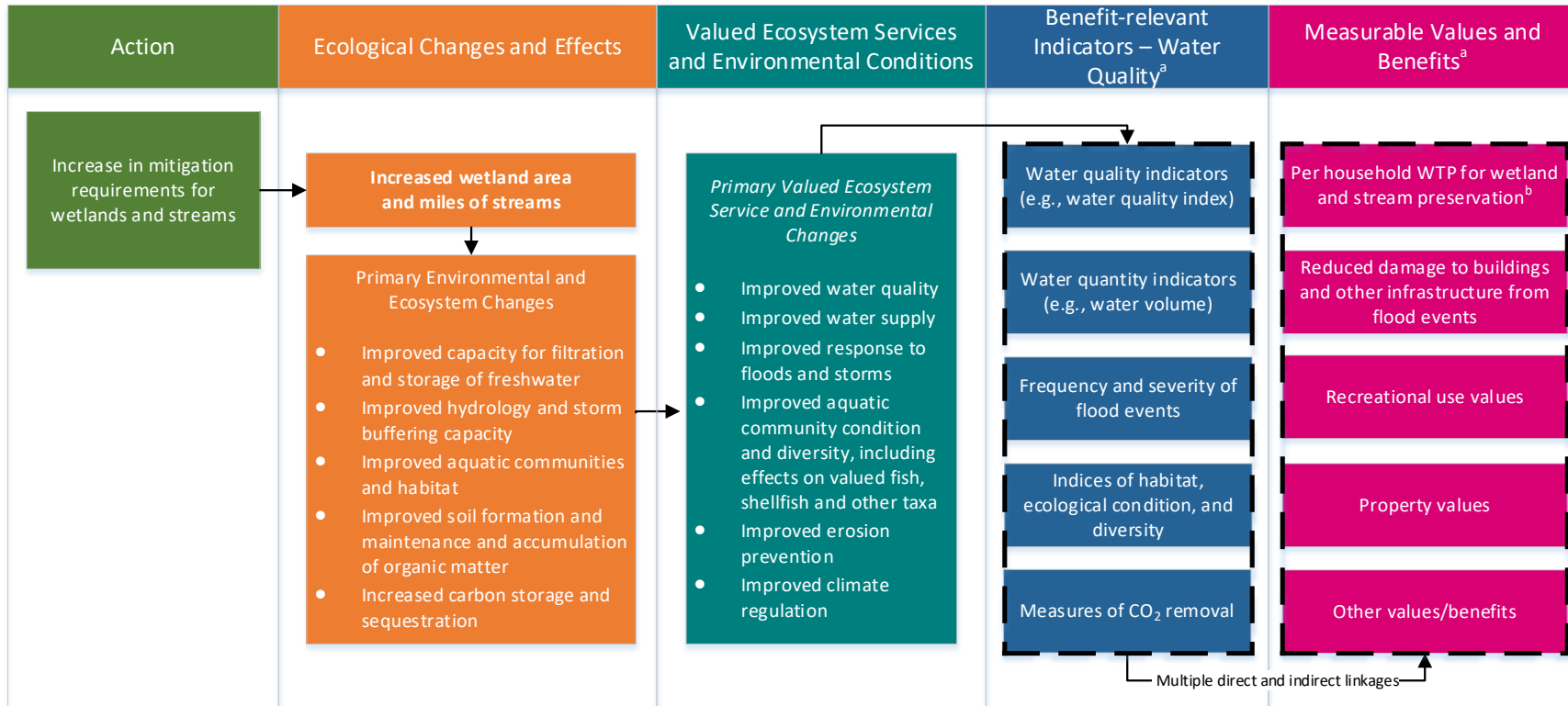
Wetlands provide a wide range of ecosystem services that are directly used or appreciated by people, including regulating, provisioning, cultural, and supporting ecosystem services (*e.g.*, Brander, Bräuer, et al., 2012; Brander, Wagtendonk, et al., 2012; Chaikumbung et al., 2016; De Groot et al., 2018; Ghermandi et al., 2010).

- *Regulating services* include flood protection (Ameli et al., 2019; Evenson et al., 2018; Lawrence et al., 2019; Martinez-Martinez et al., 2014; Tang et al., 2020; Taylor et al., 2022; Watson, 2016; Wu et al., 2008), water purification (Ewel, 1997; Ghermandi et al., 2010), erosion

control/sediment retention (Hopkins et al., 2018; Richardson et al., 2011), groundwater recharge (Cowdery et al., 2019; Harvey et al., 2004; Williams et al., 2015), and carbon sequestration (Nag et al., 2017; Nahlik et al., 2016; Mitsch et al., 2013; Tangen et al., 2020). Some of these services have been monetarily valued. See Lawrence et al. (2019) and Watson (2016) for examples of monetized flood protection benefits via avoided property damages. Additionally, see Hopkins et al. (2018) for an example of monetized sediment-bound nitrogen retention benefits.

- *Provisioning services* relate to the food, water, and other resources provided by wetlands that are consumed. These services include the maintenance of fisheries and wildlife for consumption (and surface and groundwater supply).
- *Cultural services* include all non-material benefits obtained from ecosystems and can include recreational, educational, and spiritual benefits; preservation values (bequest, existence); and aesthetic beauty.
- *Supporting services* are necessary for the production of ecosystem services and include nutrient cycling and soil formation.

Figure III-2: Conceptual value diagram of public ecosystem service values from increased mitigation requirements under the final rule



^a Dashed lines indicate that there are multiple linkages from “valued ecosystem services and environmental conditions” to “benefit-relevant indicators” and from “benefit-relevant indicators” to “measurable values and benefits.”

^b Per household willingness to pay (WTP) for wetland and stream preservation reflects the total amount that a household would be willing to voluntarily pay (their total value) for all improvements that they understand to be caused by a given increase in wetland area/miles of streams, rather than go without those improvements. This is the conceptually correct measure of economic values for households. This total value, in theory, includes all other values that households realize from wetlands and streams, including recreational benefits, flood risk reduction, existence value of wildlife community, and etc. The extent to which per household WTP values include all ecosystem services partly depends on how ecosystem services associated with wetlands/streams were described to respondents in the stated preference studies included in the meta-data.

III.C.2.3.2 Estimated ecosystem service benefits of increased mitigation requirements

The analysis of the benefits of increased wetland mitigation requirements resulting from the final rule follows the same general approach the agencies used in the 2020 NWPR analysis (U.S. EPA and Army, 2020a). This approach updates the meta-analysis of wetland valuation studies that provide data on the public's WTP for wetland preservation developed for the proposed rule analysis (U.S. EPA and Army, 2021). The benefit transfer in the proposed rule analysis (U.S. EPA and Army, 2021) relied on “freshwater only” meta-regression models (MRMs) after Moeltner et al. (2019) determined that pooling saltwater and freshwater observations led to a suboptimal performance relative to the “freshwater only” model.

To improve benefit transfer performance for the final rule, including overall accuracy and model predictions for larger baseline wetland areas, the agencies augmented the meta-data for this economic analysis to include 11 additional saltwater and freshwater wetland valuation studies from the U.S. and Canada. The revised meta-data includes 52 observations—an 85.7 percent increase from the 28-observation meta-data used for the proposal (U.S. EPA and Army, 2021).⁶⁵ Using the augmented meta-data from both freshwater and saltwater studies, the agencies used a stochastic search variable selection (SSVS) procedure and re-estimated the MRM

in a Bayesian framework following Moeltner et al., 2019. Results from the SSVS algorithm indicated freshwater and saltwater contexts to pool well across 5 out of 10 identified interaction dimensions (see Table B-3 of Appendix B) implying that saltwater valuation studies may lend useful information in estimating WTP for freshwater wetlands. In particular, information from saltwater studies may be helpful in estimating the effect of baseline wetland areas and local wetlands on WTP for wetland preservation. Because the output from the SSVS procedure generated a tighter distribution of WTP values due to the increased sample size, the agencies used the pooled MRM (hereafter referred to as the “Pooled Model”) in the benefit transfer application for the final rule, rather than the freshwater only model (hereafter “Freshwater Model”).⁶⁶ Appendix B provides additional detail on the meta-data and model estimation.

Second, following recommendations of the External Environmental Economics Advisory Committee (E-EEAC) (Keiser, 2020), the agencies further refined the benefit transfer approach used in the Proposal EA (for detail *see* Appendix H in U.S. EPA and Army, 2021). Specifically, the agencies used a radius-based approach to estimate annual WTP values for avoiding wetland losses due to increased mitigation requirements under final rule compared to the secondary baseline of the 2020 NWPR. This approach relies on specific radial distances from the county centroid to define the extent of the market in benefit transfer. To generate a range of estimates of benefits, the agencies used 50-, 100- and 200-mile radii around county centroids. The buffer sizes are based only on U.S. studies in the meta-data which valued wetland impacts, whether freshwater or saltwater wetlands. The one national study, Petrolia et al (2014),

⁶⁵ Original studies included in the meta-data provide the total WTP value of wetland preservation and implicitly account for a range of ecosystem services provided by wetlands. However, not all studies specifically mentioned different ecosystem services in the survey instruments. For example, 83 percent (15 studies) valued flood protection, 56 percent (10 studies) valued water purification, and only 22 percent (4 studies) valued carbon sequestration.

⁶⁶ The agencies compared household WTP predictions between the two MRMs at the boundaries of the 95% highest density posterior intervals (HDPI) for all combinations of forested and local wetland acres. Household WTP predictions using the Pooled Model had a smaller range compared to the Freshwater Model.

was not considered for the distance measurements that inform the chosen buffer sizes. For each study, EPA first calculated the average within-study distance to the nearest and furthest wetlands for households in the study, weighting the distance from the centroid of the census unit to the nearest or furthest wetland by the population in each census unit. The census block group was the census unit used for most studies. The agencies used census tracts for some studies that surveyed respondents over a large geographic area.⁶⁷

The 50-mile buffer size is based on the average population-weighted distance to the nearest wetland, based on a U.S. study-weighted average (55 miles).⁶⁸ The 100-mile buffer is based on the average population-weighted distance to the nearest wetland, based on a study-weighted average (104 miles) of only the 11 non-local U.S. studies. The 200-mile buffer is based on the average population-weighted distance to the furthest wetland, based on a study-weighted average (194 miles) of only the 11 non-local U.S. studies. The agencies also estimated benefits assuming that the market extent is limited to the State boundaries.

The radius-based approach has several advantages over a State-specific approach, including the capacity to value wetland impacts which may extend outside of administrative (*e.g.*, State) boundaries, and better representing local resource and demographic characteristics.⁶⁹ Specifically, the estimated WTP for avoided wetland losses accounts for county-specific wetland characteristics (*i.e.*, baseline forested and non-forested wetland areas), and different values for local and non-local wetland areas. The estimated MRM used for benefits estimation indicates larger values generated for forested and local wetlands, as shown by positive and significant coefficients on “forested” and “local” variables (*see* Appendix B for detail). Accordingly, the agencies separated each county’s baseline wetland acreage using the wetland data layer from the Hydrologic and Water Quality System (HAWQS) (*see* Appendix E for baseline wetland acreage by State and wetland type⁷⁰) into four primary prediction wetland categories based on the “local” and “forested” status of baseline wetland acres and the expected change under the final rule relative to the baseline. Because the value of wetland preservation is affected by wetland type and wetland proximity to the affected population, the agencies accounted for these factors in benefits analysis. The agencies defined local wetlands based on the maximum average distance (30 miles) between census block groups within the sampled area of studies valuing local wetlands and the affected resources. The fraction of local wetlands is based on the acreage of wetlands within a 30-mile radius of county centroids relative to the acreage within the entire buffer.⁷¹ To estimate per-household WTP values for avoiding wetland losses for households in a given county, the agencies first obtained four separate WTP estimates for each county, one for the wetland acreage associated with each combination of “local/non-local” and “forested/not-forested.” These values were then aggregated to estimate total WTP per household per year

⁶⁷ The studies that used census tracts for measuring the distances between households and wetlands were: Eastern Research Group (2016); Petrolia & Kim (2011); Hindsley and Yoskowitz, (2020); Loomis et al. (1991).

⁶⁸ A single study may contribute multiple observations to the meta-data. The term, ‘study-weighted’ means that we estimated a weighted average using the number observations contributed by the study as weights.

⁶⁹ *See* Appendix B for more detail on this approach.

⁷⁰ State-level wetland acreage values are used in the sensitivity analysis presented in Appendix D.

⁷¹ The 30-mile radius for local wetlands was based on estimates of the average distance from respondent households to the nearest wetland from those studies that looked at changes to wetlands for areas that did not extend to State boundaries.

for the estimated increases in wetland mitigation areas.⁷² Appendix B presents the detailed methodology for generating benefit-transfer predictions based on the wetland meta-analysis.

To estimate the stream of future benefits from increases in wetland mitigation requirements in each county buffer (*i.e.*, 50, 100, and 200 miles), the agencies multiplied the average per-household WTP for the estimated cumulative change in wetland areas in a given year by the number of households within each county. Benefits from avoided wetland losses are estimated for all years from 2023 through 2042, assuming that all benefits from average annual *permanent* mitigation changes begin accruing in 2023, and benefits from average annual *temporary* mitigation changes begin in 2028.⁷³ As noted, the 5-year lag in benefits from mitigation measures for temporary impacts is based on discussions with the Corps and accounts for the time required for temporarily impacted areas to return to their original state. Once a temporarily affected area returns to its original state, mitigation acres for the temporary impacts represents a net increase in wetland area. The agencies aggregated total discounted WTP values over the 2023 to 2042 period of analysis, using 3 and 7 percent discount rates. For each time period, the total number of households is adjusted to reflect predicted population growth based on 2021 National Aeronautics and Space Administration (NASA) Socioeconomic Data and Applications Center (SEDAC) projections (Hauer et al., 2021).⁷⁴ The agencies then annualized total WTP values for each county, using 3 percent and 7 percent discount rates, and aggregated county-level benefits to the national level (*see* Appendix B for additional detail).⁷⁵

Table III-6 presents total national annualized benefit estimates, based on annual WTP for wetlands for a twenty-year timeframe from 2023 to 2042. Using a 3 percent discount rate, estimates range between \$1,402 million and \$2,190 million under the baseline of the 2020 NWPR. Using a 7 percent discount rate, estimates range between \$1,206 million and \$1,885 million under the baseline of the 2020 NWPR.

⁷² Aggregating over the four WTP values (*i.e.*, four combinations of “local/non-local” and “forested”/ “non-forested”) provides unbiased estimates WTP for the avoided wetland losses valued by the county residents. As shown in Moeltner et al. (2019), the Bayesian linear MRM developed for this analysis approximately satisfies the adding-up condition, a desirable theoretical property.

⁷³ Permanent mitigation changes are based on expected increases in mitigation to address authorized permanent impacts, which permanently change an affected resource to dry land (*e.g.*, for permanent road construction). Temporary mitigation changes are based on expected increases in mitigation to address authorized temporary impacts, which includes impacts necessary for construction activities that do NOT permanently change an affected resource to dry land, such as access fills, dewatering of construction sites, or temporarily side-casting material from trenching.

⁷⁴ These projections are based on Shared Socioeconomic Pathway 2 (SSP2) (Hauer et al., 2021). SSP2 is a “middle-of-the-road” projection, where social, economic, and technological trends do not shift markedly from historical patterns. Projections used for the proposal were based on data from Woods and Pool. The final analysis uses Hauer et al (2021) in place of Woods and Pool for reasons of transparency. The code, methodology, and data used in population projection estimates are all publicly available and easily accessible. Additionally, benefit estimates were compared between models using both population projection data sources and results were similar.

⁷⁵ The agencies chose to use counties rather than smaller geographic units such as census tracts or blocks for computational efficiency. The agencies acknowledge that results would differ based on the geographic unit used but do not believe using counties rather than smaller units makes a meaningful difference in the final results.

Table III-6: Total national annualized benefits, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Extent of the market	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}	Total annualized benefits (millions 2021\$) ^{1,4}	
			3% Discount Rate	7% Discount Rate
50-mile Radius	120.0	\$7.59	\$1,401.7	\$1,205.5
100-mile Radius	120.0	\$2.70	\$1,601.0	\$1,377.2
200-mile Radius	120.0	\$1.41	\$2,189.8	\$1,884.6
State-level	120.0	\$1.24	\$2,034.5	\$1,752.3

¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.

² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period using population projections from Hauer et al. (2021).

³ For buffer-level market extents, benefit estimates are based on a benefit transfer application of the Pooled Model to 50-mile, 100-mile, and 200-mile buffers of county centroids for all counties in conterminous United States except for Hawaii and the District of Columbia (see Appendix B for detail). For the state-level market extent, benefit estimates are based on a benefit transfer application of the Pooled Model to all States except for Hawaii and the District of Columbia (see Appendix D for detail). The household WTP per 100 acres estimates shown are averages across States or Counties.

⁴ Total benefits are annualized over the 2023-2042 analysis period. Given data limitations, benefits could not be calculated for Alaska at a level finer than the State (*i.e.*, at a county-equivalent level) for the 50-mile, 100-mile, and 200-mile buffer market extents. National benefits for the three buffer market extents include estimated benefits for Alaska using a State-specific benefit transfer.

This analysis presents the average, incremental, wetland benefit values presented in Table III-6 based on a meta-analysis of total wetland valuation studies (Appendix B.1). The total valuations should encompass all of the benefits that people derive from wetlands, from recreation to provisioning services to flood-risk mitigation benefits, and, therefore, represent the incremental value to society from a given wetland area. As Appendix Table B-1 indicates, household WTP for wetland preservation varies considerably—from as much as \$8500 per 100 acres in one case (Johnston et al. 2002) to less than \$1 per 100 acres (Blomquist & Whitehead 1998; Hindsley & Yoskowitz 2020; Loomis et al. 1991; Pattison et al. 2011; Poor 1999; Rudd et al. 2016; Whitehead & Blomquist 1991; Petrolia et al. 2014; Petrolia and Kim 2011). With the exception of the Johnston et al. (2002) and Makriyannis et al. (2018) studies, all of the studies included in Table B-1 report WTP values < \$1 per acre.

The average household WTP values used in this analysis reflect this WTP literature. However, the specifics of survey instruments and methods may influence the elicitation of these values. Because survey respondents are asked to value goods and services that are not traded directly in the market, their elicited responses may suffer from many deficiencies that are noted in the economics literature. Specifically for this rule, household respondents may not know the full extent of the ecosystem services that they currently derive from wetlands. In cases where the survey instruments do not describe all of a wetland's attributes, the valuations provided by households may be lower than if such information was provided and understood.

Considering individual ecosystem service benefits provides some perspective on these wetland WTP estimates. As an example, a recent analysis of National Flood Insurance Program (NFIP) payments from

2001-2016 found that each acre of wetland loss increases NFIP claims by over \$700 per year on average, and this annual increase may exceed \$3,000 per acre in developed watersheds (Taylor and Druckenmiller 2022). Many of the largest wetland area changes identified in this analysis occur in developed areas (Figure III-1). Adapting these values for use in this benefit-cost analysis would require understanding the extent to which individuals would pay to avoid these costs, which are currently borne by taxpayers. Taylor and Druckenmiller (2022) note that these costs can be characterized as a transfer—not an incremental cost or benefit. The fact that individuals do not generally bear NFIP costs may partially explain the discrepancy between the household ex ante WTP values and these ex post revealed damages.

These revealed values for a single wetland ecosystem service, nevertheless, suggest that the wetland benefit values presented in this analysis (based on household WTP) may potentially underestimate the true societal benefit from wetland preservation by several orders of magnitude. In addition to flood-risk mitigation, a given acre of wetland also provides other ecosystem services with values that may be additive, including incremental water quality improvements and biomass production that sustains economically valuable fisheries.

III.C.2.4 Potential Impacts to States

Under the 2020 NWPR, States may have expanded existing programs or initiated new programs to protect waters that became non-jurisdictional. With the final rule's return to the status quo, States may choose to continue these program initiations or extensions, or they may choose to return to their procedures prior to the 2020 NWPR. Costs associated with continued program initiations or extensions are not attributable to the final rule since the process began as a response to the 2020 NWPR. However, as discussed in Section III.C.2.2, the agencies anticipate additional section 404 permit volume under the final rule relative to the secondary baseline of the 2020 NWPR, which means that States will either complete additional section 401 reviews for these permits or waive review. Under the secondary baseline of the 2020 NWPR, the additional section 404 permit volume under the final rule will likely increase their section 401 review costs.

The agencies estimated a range of values for cost per additional section 401 review. Values were gathered from case studies conducted by the National Association of Wetland Managers (NAWM) (formerly the Association of State Wetland Managers (ASWM)). NAWM surveyed 11 States⁷⁶ and asked them for estimates regarding the number of full-time equivalents (FTEs) required for Clean Water Act section 401 reviews. The agencies divided FTE estimates by the number of average annual section 404 permits for the State (based on ORM2 data from 2010 to 2019), which yielded a range of estimates for FTEs required per permit. NAWM asked States for FTE estimates for all section 401 reviews of federal permits, including those issued by the Federal Energy Regulatory Commission, those issued under the Rivers and Harbors Act (RHA) sections 9 and 10, and those issued by the Nuclear Regulatory Commission in addition to section 404 permits. Most permits that States review are section 404 permits, although they are typically not the most complex. For example, according to the NAWM case studies, 99 percent and 90 percent of Clean Water Act section 401 certifications are for section 404 permits in Louisiana and North Carolina, respectively (ASWM, 2011). Because most permits reviewed are Clean Water Act section 404 permits

⁷⁶NAWM case studies on resources devoted to section 401 reviews include Delaware, Georgia, Idaho, Kentucky, Louisiana, Missouri, North Carolina, South Carolina, Tennessee, Texas, and Wisconsin (ASWM, 2011).

and there is no additional information for how many FTEs each State requires to only review section 404 permits, the agencies assumed that FTE estimates from NAWM are for section 404 permits only. Dividing FTE estimates by the number of section 404 permits for the NAWM case study States and multiplying by the average State employee salary yielded a range of section 401 review costs per permit ranging between \$79-\$2,582, with an average review cost per permit of \$1,046 (2021\$). The agencies multiplied these low, mean, and high values by the number of additional single-water section 404 permits affecting waters that became no longer jurisdictional under the 2020 NWPR but would be subject to section 401 review under the final rule.

Table III-7 provides estimated annualized State costs from increases in section 401 reviews, based on the secondary baseline of the 2020 NWPR and a twenty-year analysis period from 2023 to 2042.

Table III-7: Estimated annualized State costs from increases in section 401 reviews, relative to the secondary baseline of the 2020 NWPR (million 2021\$)					
3% Discount Rate¹			7% Discount Rate¹		
Low	Mid	High	Low	Mid	High
\$0.6	\$8.5	\$21.0	\$0.7	\$8.8	\$21.8
¹ State costs associated with increased volume of section 401 reviews are annualized over the 2023-2042 analysis period. Includes anticipated costs for 49 States (excludes Hawaii and District of Columbia).					

III.C.2.5 Benefit Cost Comparison

As shown in Table III-8, the benefits range from \$1,402 million to \$2,190 million, while social costs range from \$218 million to \$547 million, both at a 3 percent discount rate. However, the agencies were only able to estimate the benefits associated with impacted acreage, including wetland acres and linear feet impacts converted to acres (*see* Section III.C.2.1), subject to compensatory mitigation and were unable to estimate benefits associated with the avoidance and minimization aspects of the mitigation sequence. For many projects, the avoidance and minimization steps that permittees are required to take are all that is needed to prevent impacts to permitted waters. Furthermore, these benefit estimates do not fully account for all potential benefit categories, and they do not include the changes to downstream water quality and flood avoidance outside of the vicinity of wetlands. The agencies also did not estimate benefits associated with other Clean Water Act programs, though they are not expected to be anywhere near as substantial as the benefits from the section 404 permitting program. The total social cost estimates include direct compliance costs from increases in mitigation requirements, changes in expected number of permits required, and State costs from increases in section 401 reviews. Likewise, the agencies' estimate of social costs does not include costs under other Clean Water Act programs (*e.g.*, section 311 and 402) though these are not expected to be anywhere near as substantial as the costs for the section 404 permitting program. Social cost totals also do not include costs associated with avoidance and minimization measures. The placeholders, A and B, are included in the totals to reflect these categories of costs and benefits, respectively, that the agencies did not monetize.

Table III-8: Total national annualized benefits and costs, relative to the secondary baseline of the 2020 NWPR (millions 2021\$)

Benefit Cost Category	3% Discount Rate ^{1,2,3,4,5}		7% Discount Rate ^{1,2,3,4,5}	
	Low ⁶	High ⁷	Low ⁶	High ⁷
Mitigation costs	\$175.8	\$390.3	\$182.6	\$405.5
Permit costs	\$41.7	\$136.2	\$43.3	\$141.5
State costs from increases in section 401 reviews	\$0.6	\$21.0	\$0.7	\$21.8
Total Social Costs	\$218.0 + A	\$547.5 + A	\$226.6 + A	\$568.7 + A
Total Benefits	\$1,401.7 + B	\$2,189.8 + B	\$1,205.5 + B	\$1,884.6 + B

¹ Total benefits and costs annualized over the 2023-2042 analysis period.

² Reflects estimated benefits and costs for 49 States (excludes Hawaii and District of Columbia).

³ The benefits and costs for the final rule are considerably higher than the estimates in the proposal economic analysis. This is due in large part to the inclusion of cost and benefit estimates for all States. In particular the addition of Florida had a considerable effect on total benefits. Florida has 36% of the total average annual increase in required mitigation acres each year in the country. Florida has an estimated 7.7 million affected households, the third highest State behind California and Texas. Florida counties also have some of the highest estimates of household willingness-to-pay for avoided wetland losses. The Florida counties of Duval, Clay, and Orange have HH WTP per 100 acres above the 90th percentile of the WTP for avoiding local forested wetland losses, at \$49.44, \$51.07, and \$50.12, respectively. Also of note is the large number of households in Orange County and Duval County. The former has 544,593 projected households (ranked 35th/3,062). The latter has 389,893 projected households (ranked 53rd/3,062).

⁴ The “A” represents unquantified costs such as those for avoidance and minimization efforts required under Clean Water Act section 404 permits and those costs that may occur under the Clean Water Act section 311, 401, and 402 programs.

⁵ The “B” represents unquantified benefits such as those for wetlands and streams protected through avoidance and minimization efforts required under Clean Water Act section 404 permits, carbon sequestration benefits, and those benefits that may occur under the Clean Water Act section 311, 401 and 402 programs.

⁶ Low benefit estimates are based on the 50-mile buffer to define the market extent.

⁷ High benefit estimates are based on the 200-mile buffer to define the market extent.

Note that other than discount rates, there are different drivers for the ranges for benefits and costs and it is not necessarily the case that low costs apply to low benefits and high costs to high benefits. Relative to the secondary baseline of the 2020 NWPR, the low estimates for benefits and costs result in net benefits of \$1,184 million at a 3 percent discount rate. Similarly, the high estimates for benefits and costs result in net benefits of \$1,642 million at a 3 percent discount rate. Different factors lead to the ranges for costs and benefits, such that low/high benefits are not necessarily correlated with low/high costs. If uncorrelated, net benefits could thus range from \$854 million to \$1,972 million.⁷⁷ The unquantified costs (A) and unquantified benefits (B) would also contribute B-A to any estimate of net benefits, though this unquantified estimate is not expected to be substantially negative, that is, enough to negate the positive net benefits. Thus, the agencies can reasonably conclude even under the secondary baseline that the benefits would justify the costs.

Both benefit and cost estimates are subject to uncertainty. III.C.3 below documents data limitations and potential sources of uncertainty in the benefit cost analysis (e.g., due to data gaps or necessary methodological simplifications). To assess sensitivity of benefit and cost estimates to variability of underlying parameters, the agencies developed a range of benefit and cost estimates based on alternative

⁷⁷ Low and high estimates of benefits and costs are driven by different factors. Low and high benefit estimates are based on the assumed extent of the market (i.e., 50-mile buffer vs. 100-mile buffer vs. 200-mile buffer), while low and high costs estimates are based on the range of per acre mitigation costs.

assumptions. For costs, the range is based on the low and high mitigation cost values provided by the Corps. For benefits, low and high estimates are based on households' values for wetlands extending up to 50-, 100-, and 200-miles from county centroids. Appendix B provides additional detail on benefit transfer methodology. Appendix D presents sensitivity benefit estimates using (1) a State-level application of the Pooled Model, (2) different payment assumptions (*i.e.*, in the form of a lumpsum or annual payments), (3) and a State-level application of the Freshwater Model.

III.C.3 Uncertainty and Limitations for Assessing Potential Effects on Clean Water Act Section 404 Program

Certain categories of waters are not categorically jurisdictional.⁷⁸ When a proposed project may impact such waters, the Corps can assess jurisdictional status via a jurisdictional determination to determine whether a section 404 permit is required for the project and which affected waters must be covered under the permit. Because jurisdictional determinations are often required to assess the jurisdictional status of affected waters, the scope of waters considered to be jurisdictional under different regulatory regimes is subject to uncertainty. For many of these water features, their jurisdictional status under any regulatory regime is unknown until a project is considered that might impact the water feature and the property owner initiates a jurisdictional determination with the Corps, or State permitting authority. For this analysis, the agencies have relied on jurisdictional determination data organized by Cowardin classifications.

Although jurisdictional determinations are the first part of the overall Clean Water Act section 404 permitting process, not all property owners who request a jurisdictional determination for water features on their property proceed with a project requiring a permit. There is an implicit assumption in applying the jurisdictional probabilities from the AJD data, and the data on the proportion of jurisdictional determinations that result in AJDs to permit data, that the likelihood of proceeding with a permit does not vary depending on the type of jurisdictional determination that occurred.

Mitigation credits complicate efforts to quantify the amount of mitigation that would be required under the final rule. This is because the number of acres or linear feet per credit varies among and within Corps Districts depending on assessment practices. Converting the number of mitigation credits into a consistent unit of measure for a national analysis is thus difficult without consulting individual permits. To avoid conversion errors, the agencies focused on authorized impacts instead of attempting to convert the various mitigation types into acre and linear feet.

The response of regulated entities to the revised definition of “waters of the United States” under the secondary baseline of the 2020 NWPR is also unclear. For instance, regulated entities in some cases may have continued using a protocol that avoids and minimizes impacts to non-jurisdictional waters—regardless of State-level regulations—for example, to standardize their protocol across States. Also, the response of regulated entities in States with less stringent requirements would likely depend on the type of work, the stage of work (*e.g.*, planning, active, completed, an on-going basis), local permitting requirements, and the stringency of permit requirements that the entity faces in other areas.

⁷⁸ Waters that are not categorically jurisdictional include non-navigable tributaries that are not relatively permanent, wetlands adjacent to non-navigable tributaries that are not relatively permanent, and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The 2020 NWPR's effect on permit costs is also unclear. It is expected that there was a reduced permit burden for projects that did not need a permit under the 2020 NWPR but would have under the pre-2015 regulatory practice. The agencies also anticipate that under the 2020 NWPR, some permittees were able to receive a general rather than a more expensive individual permit. However, permit costs depend on many factors, including existing State, Tribal, and local requirements, which may not be as protective as the section 404 permitting process under the *Rapanos* Guidance but still required some protections for water features that became non-jurisdictional under the 2020 NWPR. Project owners still were required to determine the jurisdiction of water features on their property, and there is evidence that the 2020 NWPR resulted in an increase in the number of AJDs, relative to preliminary jurisdictional determination (PJDs) or no JDs, requested by applicants who wanted confirmation that their impacted water features were excluded. This shift towards more AJDs can increase costs and construction delays, all else equal. However, since the 2020 NWPR was implemented for just slightly more than a year, it is difficult to know if the shift to more AJDs would have been permanent or temporary.

Additionally, in keeping with the previous 2020 NWPR analyses, the agencies used a range of cost estimates for section 404 individual and general permits from the most recent Corps analysis performed in 2000 (as described in U.S. EPA and Army, 2015). These Corps permitting costs are considered to be reasonable estimates of the typical costs incurred by the majority of general and individual permittees. There are additional permit cost estimates from Sunding and Zilberman (2002). The agencies consider the Sunding and Zilberman (2002) estimates to be representative of larger and more complex projects that often impact multiple waters, rather than the typical project that only impacts single water features. Permits are still likely to be needed for large projects impacting multiple waters, even if one or more of those waters would have been non-jurisdictional under the 2020 NWPR. As a result, the agencies chose to use the Corps permitting costs rather than those from Sunding and Zilberman (2002) to estimate national permit costs for the final rule. However, for comparative purposes, the agencies calculated permit costs for the final rule using the Sunding and Zilberman (2002) estimates, which are presented in Appendix H.

The estimated increases in mitigation requirements are also subject to uncertainty, which affects both estimated mitigation costs and estimated benefits:

- First, the agencies converted linear feet impacts to acres by multiplying linear feet by an average total buffer width of 50 feet (25 feet on each side of the stream) and converting square feet to acres, but the actual width for linear feet mitigation requirements may differ.
- Second, the ORM2 database that the agencies used to estimate increases in mitigation requirements may have some data entry errors. For example, ORM2 entries for 3,007 single-water permits issued between 2010 and 2019 did not list any authorized impacts but were flagged as requiring mitigation.
- Third, the agencies estimated the increase in mitigation requirements using the proportion of waters from different Cowardin categories that are covered by section 404 permits under the *Rapanos* Guidance and under the 2020 NWPR, which were based on jurisdictional determination data. Since the 2020 NWPR proportions were based on a much shorter time span than the *Rapanos* proportions, the change in the proportions between *Rapanos* and the 2020 NWPR are subject to uncertainty.

When quantifying mitigation costs, the agencies accounted for uncertainty in State-level per acre and linear foot costs by using the Corps' low and high estimates. However, for reasons presented in Section III.C.2.2, the Corps' mitigation costs estimates may be an overestimate (U.S. EPA and Army, 2015).

In addition to typical limitations and uncertainties inherent in benefit transfer (Johnston and Bauer, 2020), key limitations in the agencies' benefit analysis include:

- *Extent of the market assumptions.* Benefit estimates are highly sensitive to the assumed market extent (Johnston and Bauer, 2020). As discussed in Section III.C.2.3, the agencies relied on the information from the meta-data to define the market extent for benefits analysis (*see* Appendix B for details). Because meta-data studies were not designed to test the appropriate market extent for WTP for wetland preservation, they can only serve as examples of what the market extent may be. In addition, this analysis assumed a homogenous market extent across all counties. Because the true market extent is unknown and may differ from the values selected for the benefit transfer application, the estimated benefits could be over- or under-estimated.
- *Meta-data limitations.* The majority of wetland studies included in the meta-data elicited values for wetlands in rural areas (*see* Appendix B for detail). However, wetland values are likely to be higher for urban wetlands compared to rural wetlands (Keiser, 2020). Because development and the associated wetland loss typically occur in urban or suburban areas, the estimated WTP for avoiding wetland losses near population centers may be biased downward. This limitation has been somewhat ameliorated with the addition of studies that value wetlands in an urban setting (*e.g.*, Lantz et al., 2013; Nijhum, 2020).
- *The extent of local wetland impacts.* The estimated WTP for avoiding losses of local wetlands are substantially higher compared to non-local wetlands (*see* Table III-9 for a range of estimated WTP for avoiding losses of 100 acres by wetland type). As noted in Section III.C.2.3, the agencies relied on the average distances between the sampled households and the wetlands valued in the meta-data studies conducted at a sub-State level to define local impacts (*i.e.*, wetlands located within a 30-mile radius from the county centroid). Because the true extent of local effects is unknown and may differ from the selected 30-mile radius, the estimated benefits of avoided local wetland losses may be under- or overstated.

Table III-9: WTP per 100 acres by wetland type (2021\$)

Wetland Type	WTP per 100 Acres ¹		
	Minimum	Mean	Maximum
Local, forested	\$1.62	\$28.55	\$56.35
Local, non-forested	\$0.23	\$3.07	\$6.14
Non-local, forested	\$0.07	\$1.28	\$2.59
Non-local, non-forested	\$0.01	\$0.15	\$0.30

¹The WTP values per 100 acres are based on the estimated minimum, mean, and maximum values across all counties included in the analysis.

- *The affected wetland area that is local and forested within each buffer.* The agencies used the HAWQS wetland data and ORM2 impacts data to identify local, forested, and non-forested wetlands for each HUC12 within 30-, 50-, 100-, and 200-mile buffers circular buffers from county centroids. In

calculating local and forested acres for HUC12s that were partially contained within these buffers, the agencies assumed a homogenous spatial distribution of impacts and baseline wetland acres within each HUC12 and applied the proportion of the HUC12 overlapping the buffer to the total impacts and wetland acres for a given HUC12 to estimate local impacts and forested wetland values for each buffer. The effect of this assumption on the estimated benefits is uncertain due to uncertainty in geographic distribution of future section 404 projects. Three counties in Florida provide a good example of the sensitivity of benefit estimates to estimates of local and forested wetland acres that are protected. The counties of Duval, Clay, and Orange have HH WTP per 100 acres above the 90th percentile of the WTP for avoiding local forested wetland losses, at \$49.44, \$51.07, and \$50.12, respectively. Orange County and Duval County have large numbers of households. The former has 544,593 projected households (ranked 35th/3,062). The latter has 389,893 projected households (ranked 53rd/3,062). A slight increase in the estimates of forested local wetlands that are protected in these counties would produce a disproportionately large increase in benefits.

- *Estimating benefits for the State of Alaska.* Given a limited NWI wetland data availability (only 22% of the State has been mapped) and other differences between Alaska and the conterminous States in terms of its geographic size and the types of wetlands impacted, the agencies used a State-level application of the Pooled Model to estimate WTP for avoiding wetland losses in Alaska (see Appendix C in U.S. EPA and Army, 2021 for detail on the State-level application of MRM). Given significant data limitations and differences in the baseline wetland area (over 94 million acres) and other resource characteristics in Alaska, and other resource characteristics compared to the conterminous States, the estimated benefits for the State of Alaska are uncertain.

The agencies acknowledge that the meta-analysis benefit transfer approach does not account for all potential benefits associated with wetland and stream protection. Beyond limiting the household WTP estimates to just those wetland changes within 50-, 100-, or 200- mile buffers or state boundaries,⁷⁹ there are additional ways that benefits are likely being underestimated. Although the estimated change in wetlands acreage is relatively small and dispersed across the landscape, in the aggregate and over time these changes have potential effects on larger water resources many miles downstream. There are other categories of benefits not likely fully captured by the studies in the meta-analysis. For example, the benefits of wetland carbon sequestration are not included. Wetlands sequester carbon from the atmosphere through plant photosynthesis and by trapping sediment from runoff. The carbon is sequestered in living vegetation as well as in litter, peats, organic soils, and sediments (e.g., Nag et al., 2017; Nahlik et al., 2016; Tangen et al., 2020). Finally, the benefit estimates do not account for the ability of wetlands to help allay the future effects of climate change. Future severe weather events are expected to increase in duration, frequency, and intensity, and the ability of wetlands to reduce soil erosion and retain flood waters will only become more valuable when these events occur (e.g., Bullock et al., 2003; Lawrence et al., 2019; Tang et al., 2020; Watson, 2016; Williams et al., 2015). The agencies expect that these unquantified and unmonetized benefits have the potential to be substantial.

⁷⁹ Appendix D presents alternative benefit estimates calculated at the State level (i.e., household WTP is based on wetland changes within State boundaries).

III.D Other Clean Water Act Sections

III.D.1 Clean Water Act Section 303: Water Quality Standards and Total Maximum Daily Loads

Clean Water Act section 303 includes development of State or Tribal water quality standards, assessment of water quality, and development of total maximum daily loads (TMDLs) for waters that are determined to not meet applicable water quality standards.

States and Tribes typically develop water quality standards for general categories of waters, including wetlands, in addition to creating site-specific standards and general standards that can apply more broadly.

State water quality standards for waters jurisdictional under the Clean Water Act are required to be consistent with the Clean Water Act, for example in terms of designating uses, criteria to protect those uses, and anti-degradation policies. If a feature is not jurisdictional under the Clean Water Act, States and authorized Tribes are not required to develop water quality standards for it under the Clean Water Act. There is also no federal requirement under Clean Water Act section 303(d) for States to assess “non-jurisdictional” waterbodies. Therefore, a change in the scope of Clean Water Act jurisdiction has the potential to increase the number of waters that are assessed or otherwise identified as impaired pursuant to Clean Water Act section 303(d). As a result of the final rule relative to the secondary baseline of the 2020 NWPR, States would be required to develop TMDL restoration plans for waters that were impaired but were not so identified and not jurisdictional under the 2020 NWPR.

Relative to the secondary baseline of the 2020 NWPR, the final rule may affect the number of waterbodies added to the impaired waters list (and subsequent TMDL development). States typically have a set budget for water quality monitoring and assessment and monitor only a subset of waters in any year since water quality sampling needs are often higher than budgets allow. The final rule may increase the number of waters that States choose to monitor. Under the final rule relative to the secondary baseline of the 2020 NWPR, States may need to reallocate monitoring resources to newly jurisdictional waters to collect data in waters that meet the new definition of “tributary,” the definition of “lakes and ponds, and impoundments of jurisdictional waters,” and the revised definition of “adjacent wetlands.”

The development and revision of water quality standards is an ongoing process that operates independent of changes to the definition of “waters of the United States”—absent Clean Water Act jurisdiction, States and Tribes can still choose to regulate waters irrespective of federal mandates and can apply water quality standards to non-federal waters. Therefore, some States continued implementing and/or developing standards for certain categories of waters (*e.g.*, ephemeral features) that were non-jurisdictional under the 2020 NWPR. The agencies have collected information relating to these changes in the regulatory compendium. The agencies were unable to project additional costs related to development or revision of water quality standards as a consequence of the final rule relative to the secondary baseline of the 2020 NWPR.

Changes in Clean Water Act jurisdiction may have in some circumstances led to requests for changes in TMDL waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and related margins of safety. Under the 2020 NWPR, TMDL revisions could have shifted additional pollutant reduction responsibility to those sources discharging to jurisdictional waters downstream. Given

that there are currently more than 73,000 completed TMDLs nationwide, revising even a small percentage of them may require significant resources to complete (U.S. EPA and Army, 2018). However, the agencies are unaware of any TMDL revisions that occurred as a result of the 2020 NWPR.

III.D.2 Clean Water Act Section 401: State and Tribal Roles

Under section 401 of the Clean Water Act, States, authorized Tribes, and interstate agencies have the authority to review, certify, or deny any federal permits or licenses that may result in a discharge to “waters of the United States” within their borders, including wetlands. States, authorized Tribes, and interstate agencies make their decisions to deny, certify, or condition federal permits or licenses primarily by ensuring the activity will comply with applicable water quality standards, effluent limitation guidelines, new source performance standards, toxic pollutants restrictions, and other appropriate water quality requirements of State or Tribal law. Clean Water Act section 401 certification is commonly applied to Clean Water Act section 404 permits and RHA section 10 permits issued by the Corps, Clean Water Act section 402 permits in the States where EPA issues NPDES permits, and Federal Energy Regulatory Commission licenses for non-federal hydroelectric dams. States, authorized Tribes, and interstate agencies may choose to waive their Clean Water Act section 401 certification authority, either explicitly or through the passage of time (up to one year as mandated by section 401(a)(1)).

Under the final rule, the agencies estimate that the number of Clean Water Act section 404 permits will likely increase since non-adjacent wetlands, ephemeral features, certain ditches, and certain lakes and ponds will become jurisdictional based on a significant nexus analysis, whereas some of these waters would have been found to be non-jurisdictional under the 2020 NWPR. As noted before, an increase in section 404 permits could result in increased costs to States and authorized Tribes by increasing the number of section 401 reviews and associated staff time. The vast majority of States have been authorized to administer section 402 of the Clean Water Act, and any cost changes that would result from the final rule due to Clean Water Act section 402 permitting are discussed in Section III.B. States that have not been authorized to administer all or some of the Clean Water Act section 402 program and Tribes authorized to administer Clean Water Act section 401 would continue to provide Clean Water Act section 401 certifications for EPA-issued section 402 permits. An increase in EPA-issued section 402 permits could result in increased costs to States and authorized Tribes by increasing the number of section 401 reviews and associated staff time.

For waters whose jurisdictional status would change under the final rule relative to the secondary baseline of the 2020 NWPR, federal license or permit applicants must obtain a section 401 certification or waiver for the related federal license or permit in those waters. States and authorized Tribes can grant or deny certification or can place additional conditions on these federally-issued permits or licenses through their Clean Water Act section 401 authority, potentially enhancing environmental benefits and increasing costs to permittees.

IV. Environmental Justice Analysis

Executive Order (E.O.) 12898 (59 FR 7629, February 11, 1994) requires that, to the greatest extent practicable and permitted by law, each federal agency must make the achievement of environmental justice (EJ) part of its mission. E.O. 12898 provides that each federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures such programs, policies, and activities do not have the effect of (1) excluding persons (including populations) from participation in, or (2) denying persons (including populations) the benefits of, or (3) subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

Executive Order 14008 (86 FR 7619, January 27, 2021) expands on the policy objectives established in Executive Order 12898 and directs federal agencies to develop programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged, historically marginalized, and overburdened communities, as well as the accompanying economic challenges of such impacts.

Executive Order 13563 (76 FR 3821, January 18, 2021) also indicates that federal agencies may consider equity, human dignity, fairness, and distributional considerations, where appropriate and permitted by law.

EPA also published “Technical Guidance for Assessing Environmental Justice in Regulatory Analysis” (U.S. EPA, 2016) to provide recommendations that encourage analysts to conduct the highest quality analysis feasible, recognizing that data limitations, time and resource constraints, and analytic challenges will vary by media and circumstance.

The pre-2015 regulatory regime is the baseline used to formally meet the directives under E.O.s 12898 and 14008. This environmental justice analysis was conducted to provide the public with additional information on the potential implications of the final rule, based on available data.⁸⁰

IV.A Screening Analysis of the Final Rule using the Secondary Baseline of the 2020 NWPR

For the final rule, the agencies examined whether the change in benefits from the reinstatement of the pre-2015 regime may be differentially distributed among communities with environmental justice concerns⁸¹ in the affected areas when compared to the secondary baseline of the 2020 NWPR.⁸² In determining the potential for EJ concerns in affected areas, the agencies considered the following factors in this analysis: population characteristics, proximity to effects of the final rule, and indicators of vulnerability to

⁸⁰ It should be noted that the baseline (pre-2015 regulatory regime) could have pre-existing impacts for populations of concern but this analysis focuses on the impacts of changes due to the final rule for populations of concern.

⁸¹ EPA’s Technical Guidance for Assessing Environmental Justice in Regulatory Action (U.S. EPA, 2016) defines population groups of concern as those identified under E.O. 12898 (minority, low-income, and indigenous populations) as well as sub-populations that may be at greater risk for experiencing adverse effects, including those that rely on fish/wildlife for subsistence, age groups, and gender groups (p. 6).

⁸² Section V includes a qualitative discussion of how the changes in benefits may affect Tribal areas across the United States.

environmental risk or environmental hazard. The agencies assessed the demographic characteristics of the populations affected by the final rule. The analysis defines the affected population as those residing within the same watershed as wetland area changes anticipated under the final rule, following the approach described in Section I.B. The demographic characteristics match those included in EPA’s EJSCREEN.

The agencies collected population-specific data from the U.S. Census Bureau’s American Community Survey (ACS) from 2015 to 2019 on:

- the percent of the population below twice the poverty threshold,⁸³ referred to as low-income population for the purpose of this analysis;
- the population categorized in various racial/ethnic groups, from which EPA calculated the percent of the total population that belongs to a minority racial/ethnic group;⁸⁴
- the percent of the population age 25 or older whose education is short of a high school diploma;
- the percent of linguistically isolated households where all members age 14 years and over speak a non-English language and also speak English less than “very well;”
- the percent of the population under the age of five;
- the percent of the population over the age of 64; and
- the percent of the population that identifies only as Native American or Alaska Native.

The agencies also utilized environmental indicators included in EJSCREEN⁸⁵:

- lifetime cancer risk from inhalation of air toxics;
- the air toxics respiratory hazard index, which is a ratio of exposure concentration to a health-based reference concentration;
- diesel particulate matter level in air, $\mu\text{g}/\text{m}^3$;
- 2016 average annual $\text{PM}_{2.5}$ levels in air, $\mu\text{g}/\text{m}^3$;

⁸³ Poverty status is based on data from the Census Bureau’s American Community Survey using a rationale established by EPA’s EJSCREEN. The rationale for using twice the poverty threshold rather than just the poverty threshold is described in Appendix B of the EJSCREEN Technical Documentation (U.S. EPA, 2019).

⁸⁴ The racial/ethnic categories are based on the breakout of ethnic/racial populations in Census data, which distinguishes racial groups within Hispanic and non-Hispanic categories. Minority groups include: African American (non-Hispanic); Asian (non-Hispanic); Native Hawaiian/Pacific Islander (non-Hispanic); American Indian/Alaska Native (non-Hispanic); Other non-Hispanic; Hispanic/Latino.

⁸⁵ Full descriptions of the environmental indicators included in EJSCREEN, including the rationale for including them in the screening tool are described in the EJSCREEN Technical Documentation (U.S. EPA, 2019).

- 2016 summer seasonal average of daily maximum eight-hour ozone concentration in air, parts per billion;
- the count of vehicles at major roads within 500 meters, divided by distance in meters;
- the percent of housing units built pre-1960, as an indicator of potential lead paint exposure;
- the count of hazardous waste management facilities within five kilometers (or the nearest neighbor outside of five kilometers), divided by distance to the facilities;
- the count of proposed and listed National Priorities List sites within five kilometers (or the nearest neighbor outside of five kilometers), divided by distance to the sites;
- toxicity weighted stream concentrations divided by distance to the nearest stream segment, as indicator of dischargers with NPDES permits under the Clean Water Act section 402 program; and
- the count of Risk Management Plan (RMP)⁸⁶ facilities within five kilometers (or the nearest neighbor outside of five kilometers), divided by distance to the facilities, as indicator of facilities that may be subject to Facility Response Plan requirements under the Clean Water Act section 311 program.

The agencies compiled these data for all Census block groups across the country.⁸⁷ The agencies then intersected the Census block groups with HUC12 boundaries and used the intersecting area to proportionally adjust the socioeconomic and environmental indicator data.⁸⁸ These data were then compared to national and State data to give context to each socioeconomic and environmental indicator.⁸⁹ The agencies compared the demographic and environmental indicator metrics to national and State metrics to identify communities where EJ concerns may exist for HUC12s affected by the final rule relative to the secondary baseline of the 2020 NWPR.

This first analysis considers the spatial distribution of communities with environmental justice concerns (based on their demographic characteristics only), in relation to estimated cumulative changes in wetland areas and affected waters under the final rule, relative to the 2020 NWPR. Results of the analysis are presented in the context of communities with environmental justice concerns and summarize selected demographic characteristics in relation to national and State statistics. For reference, Figure IV-1 and

⁸⁶ RMP facilities are those facilities required by the Clean Air Act (section 112(r)) to file risk management plans if they maintain a quantity of substance, provided the substance is included on the List of Regulated Substances, that exceeds the defined threshold quantity.

⁸⁷ In line with the economic analysis, Hawaii and the District of Columbia were not included in the environmental justice analysis due to a lack of data in the case of Hawaii and a lack of impacts in the case of the District of Columbia. These States were also excluded from the analyses for the 2015 Clean Water Rule, the 2019 Repeal Rule, and the 2020 NWPR.

⁸⁸ The socioeconomic data (based on population or household counts) was proportionally adjusted based on the ratio of the intersect area to the total census block group or tract area. The environmental risk data were proportionally adjusted based on the ratio of the intersect area to the total HUC12 area.

⁸⁹ The national and State data does not include the population within HUC12 watersheds experiencing wetland area changes or with affected waters.

Figure IV-2 show the spatial distribution of the cumulative changes to wetland area and affected waters presented in the tables.

Figure IV-1: HUC12 watersheds experiencing wetland area changes under the final rule, as compared to the 2020 NWPR

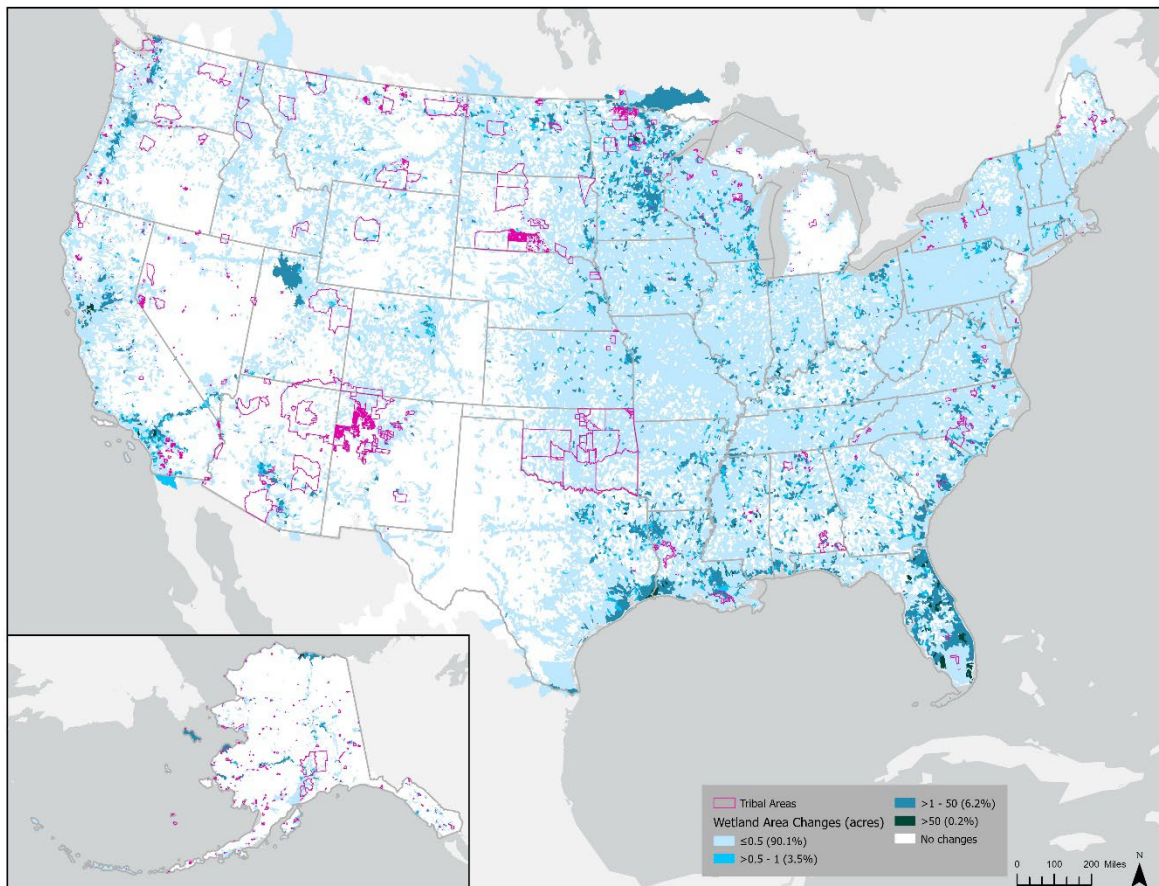


Figure IV-2: HUC12 watersheds experiencing changes in affected waters under the final rule, as compared to the 2020 NWPR

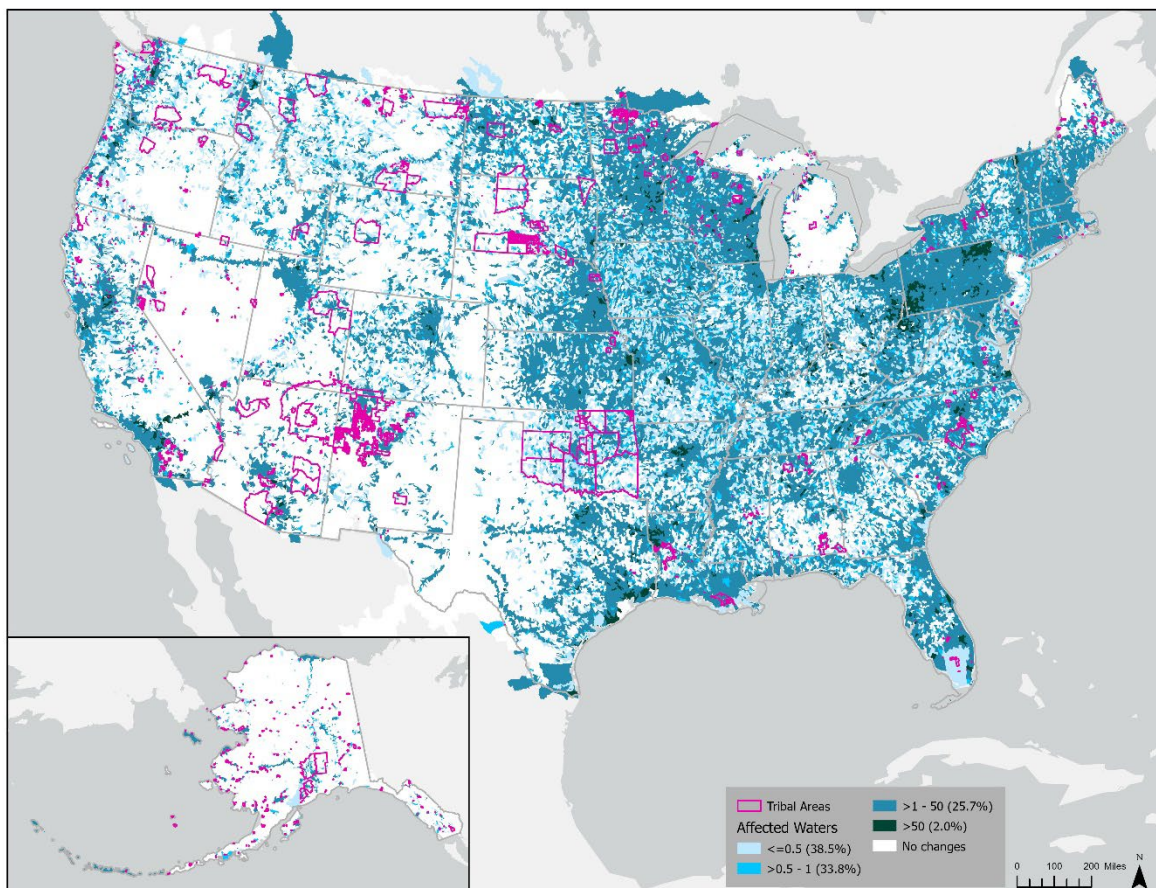


Table IV-1 and Table IV-2 summarize the socioeconomic characteristics of HUC12 watersheds in relation to national averages based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule compared to the secondary baseline of the 2020 NWPR. Appendix F presents comparisons in relation to State averages.

Table IV-1: Socioeconomic characteristics of communities within HUC12 watersheds experiencing wetland area changes, compared to national averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Percentage of Individuals that are Minority ^b	Percentage of Individuals that are Low-Income ^c	Percentage of Individuals with Less than High School Education	Percentage of Households with Linguistic Isolation	Percentage of Individuals under Age 5	Percentage of Individuals over Age 64	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
<= 0.5	38,980 (90.1%)	37.7%	30.9%	12.1%	4.3%	3.1%	15.9%	0.6%
> 0.5 - 1	1,528 (3.5%)	43.2%	29.9%	12.1%	5.0%	3.2%	14.3%	0.5%
> 1 - 50	2,673 (6.2%)	42.5%	30.0%	10.7%	4.1%	3.2%	14.9%	0.5%
> 50	66 (0.2%)	75.3%	38.7%	20.8%	14.7%	3.2%	14.2%	0.2%
National Averages		32.2%	32.6%	12.8%	3.2%	3.1%	16.8%	1.6%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds experiencing wetland area changes.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

c. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2022

Table IV-2: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of Individuals that are Minority ^b	Percentage of Individuals that are Low-Income ^c	Percentage of Individuals with Less than High School Education	Percentage of Households with Linguistic Isolation	Percentage of Individuals under Age 5	Percentage of Individuals over Age 64	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
<= 1	16,647 (38.5%)	38.4%	33.5%	14.1%	5.7%	3.1%	16.6%	0.8%
> 1 - 5	14,634 (33.8%)	37.0%	32.3%	12.7%	3.9%	3.1%	16.3%	0.8%
> 5 - 50	11,105 (25.7%)	41.3%	30.0%	11.4%	4.4%	3.1%	15.0%	0.5%
> 50	861 (2.0%)	40.1%	27.2%	10.2%	4.5%	3.2%	14.5%	0.4%

Table IV-2: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of Individuals that are Minority ^b	Percentage of Individuals that are Low-Income ^c	Percentage of Individuals with Less than High School Education	Percentage of Households with Linguistic Isolation	Percentage of Individuals under Age 5	Percentage of Individuals over Age 64	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
National Averages		32.2%	32.6%	12.8%	3.2%	3.1%	16.8%	1.6%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds with affected waters.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

c. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2022

As shown, socioeconomic characteristics for HUC12s experiencing wetland area changes and changes to affected waters due to the final rule are similar to national averages, the exception being HUC12s with expected wetland area changes greater than 50 acres. For the few HUC12s (<1%) with wetland area changes greater than 50 acres, the percentage of individuals that are minority, individuals that are low-income, individuals with less than high school education, and households with linguistic isolation are much larger than national averages (between eight to 40 percent greater than national averages). Areas that will experience wetland changes due to the final rule all have higher percent people of color regardless of the magnitude of the change. However, as that magnitude increase, so too does percent people of color. The same trend is also evident for affected waters but with only a slight increase in the % as the affected acreage increases.

Table IV-3 and Table IV-4 provide a breakdown of the racial/ethnic categories that comprise the minority population in earlier tables. The tables compare demographic characteristics of HUC12 watersheds in relation to national averages based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule. The racial/ethnic category breakdown highlights the specific population (individuals that identify as Hispanic or Latino alone) that largely influences the large jump in the percentage of individuals that are minority between watersheds with wetland area changes between one and 50 acres and wetland area changes greater than 50 acres. In addition, the breakdown also highlights which racial/ethnic populations, namely individuals that identify as Black or African American alone (non-Hispanic), individuals that identify as Asian alone (non-Hispanic), individuals that identify as some other race alone (non-Hispanic), and individuals that identify as Hispanic or Latino alone, that are above the national average across all watersheds experiencing wetland changes under the final rule.

Table IV-3: Demographic characteristics of communities within HUC12 watersheds experiencing wetland area changes, compared to national averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^b	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
<= 0.5	38,980 (90.1%)	12.0%	0.6%	5.3%	0.1%	0.3%	2.3%	17.0%
> 0.5 - 1	1,528 (3.5%)	11.8%	0.5%	6.6%	0.2%	0.2%	2.5%	21.3%
> 1 – 50	2,673 (6.2%)	15.7%	0.5%	5.7%	0.2%	0.3%	2.6%	17.5%
> 50	66 (0.2%)	12.3%	0.2%	3.8%	0.1%	0.3%	1.3%	57.3%
National Averages		8.6%	1.6%	3.4%	0.1%	0.1%	2.1%	16.3%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds experiencing wetland area changes.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

Source: U.S. EPA analysis, 2022

Table IV-4: Demographic characteristics of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^b	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
<= 1	16,647 (38.5%)	11.6%	0.8%	5.0%	0.1%	0.3%	2.0%	18.6%
> 1 – 5	14,634 (33.8%)	11.6%	0.8%	4.5%	0.1%	0.3%	2.3%	17.4%
> 5 – 50	11,105 (25.7%)	13.8%	0.5%	5.9%	0.1%	0.3%	2.5%	18.3%
> 50	861 (2.0%)	10.8%	0.4%	6.2%	0.1%	0.2%	2.7%	19.8%
National Averages		8.6%	1.6%	3.4%	0.1%	0.1%	2.1%	16.3%

Table IV-4: Demographic characteristics of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^b	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
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a. National averages represent the rest of the United States population, outside of the HUC12 watersheds with affected waters.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

Source: U.S. EPA analysis, 2022

Table IV-5 and Table IV-6 summarize the cumulative socioeconomic and environmental risk characteristics of HUC12 watersheds based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule. In particular, the environmental indicators considered in these tables are proxies for other Clean Water Act programs affected by the final rule, including Clean Water Act sections 402 and 311. For reference, Figure IV-1 and Figure IV-2 show the spatial distribution of the cumulative changes to wetland area and affected waters presented in the tables.

Table IV-5: Socioeconomic characteristics of communities within HUC12 watersheds experiencing wetland area changes, wastewater discharges, and proximity to RMP sites, compared to national averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of Individuals that are Minority ^d	Percentage of Individuals that are Low-Income ^e	Percentage of Individuals with Less than High School Education	Percentage of Households with Linguistic Isolation	Percentage of Individuals under Age 5	Percentage of Individuals over Age 64	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
<= 0.5	30,448 (70.4%)	121.0	0.3	37.6%	30.9%	12.1%	4.3%	3.1%	15.7%	0.5%
> 0.5 – 1	1,287 (3.0%)	13.0	0.4	43.5%	30.1%	12.2%	5.1%	3.2%	14.2%	0.5%
> 1 – 50	2,205 (5.1%)	3.7	0.5	42.7%	30.0%	10.7%	4.1%	3.2%	14.6%	0.4%
> 50	44 (0.1%)	0.5	0.6	72.6%	40.0%	23.5%	9.9%	3.5%	11.7%	0.2%
National Average for Communities with Wastewater Discharges and in Proximity to RMP sites^f		66.3	0.3	31.0%	32.1%	12.5%	3.1%	3.1%	16.7%	1.1%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds experiencing wetland area changes.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

e. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

f. The wastewater discharge and proximity to RMP sites indicators are available at the census block group. As a result, the socioeconomic variables at the same Census boundary level were adjusted to only include communities with nonzero values for these indicators.

Source: U.S. EPA analysis, 2022

Table IV-6: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, wastewater discharges, and proximity to RMP sites, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of Individuals that are Minority ^d	Percentage of Individuals that are Low-Income ^e	Percentage of Individuals with Less than High School Education	Percentage of Households with Linguistic Isolation	Percentage of Individuals under Age 5	Percentage of Individuals over Age 64	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
<= 1	12,349 (28.6%)	294.4	0.3	37.3%	33.2%	14.0%	5.1%	3.0%	16.4%	0.7%
> 1 - 5	11,468 (26.5%)	3.3	0.3	36.9%	32.5%	12.7%	3.9%	3.1%	16.0%	0.7%
> 5 – 50	9,392 (21.7%)	3.7	0.4	41.5%	30.0%	11.4%	4.5%	3.1%	14.9%	0.4%
> 50	775 (1.8%)	1.9	0.4	38.4%	26.7%	9.8%	3.5%	3.2%	14.2%	0.4%
National Average for Communities with Wastewater Discharges and in Proximity to RMP sites^f		66.3	0.3	31.0%	32.1%	12.5%	3.1%	3.1%	16.7%	1.1%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds with affected waters.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

e. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

f. The wastewater discharge and proximity to RMP sites indicators are available at the census block group. As a result, the socioeconomic variables were adjusted to include communities with nonzero values for these indicators.

Source: U.S. EPA analysis, 2022

As shown, the HUC12s with a confluence of changes to wetland areas or impacted waters and environmental risk indicators associated with other programs affected by the final rule have similar community socioeconomic characteristics to HUC12s with just changes to wetland areas or impacted waters. In addition, the proximity to RMP facility indicator is similar across HUC12s, regardless of whether or not there are projected changes in wetland area or impacted waters. Lastly, although the wastewater discharge indicator is highest for HUC12s expected to experience a difference of one or fewer impacted waters or wetland area changes less than 0.5 acres, the associated socioeconomic characteristics are similar to national averages for watersheds with wastewater discharges and in proximity to RMP sites (within five percent). For the few HUC12s with socioeconomic characteristics that differ from national averages (*e.g.*, HUC12s with wetland area changes greater than 50 acres), the wastewater discharge indicator is lower than the national average.

Table IV-7 and Table IV-8 provide a breakdown of the racial/ethnic categories that comprise the minority population in earlier tables in relation to environmental risk. The tables compare demographic characteristics of HUC12 watersheds in relation to national averages based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule. The results do not differ much from the analyses highlighted in Table IV-3 and Table IV-4. In particular, the analysis similarly highlights the specific population (individuals that identify as Hispanic or Latino alone) that largely influences the large jump in the percentage of individuals that are minority between watersheds with wetland area changes between one and 50 acres and wetland area changes greater than 50 acres.

Table IV-7: Demographic characteristics of communities within HUC12 watersheds experiencing wetland area changes, wastewater discharges, and proximity to RMP sites, compared to national averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^d	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
<= 0.5	30,448 (70.4%)	121.0	0.3	12.1%	0.5%	5.3%	0.1%	0.2%	2.3%	16.9%
> 0.5 - 1	1,287 (3.0%)	13.0	0.4	12.0%	0.5%	6.7%	0.2%	0.2%	2.5%	21.4%
> 1 – 50	2,205 (5.1%)	3.7	0.5	16.1%	0.4%	5.9%	0.2%	0.3%	2.6%	17.3%
> 50	44 (0.1%)	0.5	0.6	12.5%	0.2%	4.9%	0.2%	0.3%	1.6%	52.9%
National Average for Communities with Wastewater Discharges and in Proximity to RMP sites^e		66.3	0.3	9.3%	1.1%	3.7%	0.1%	0.1%	2.1%	14.7%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds experiencing wetland area changes.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

e. The wastewater discharge and proximity to RMP sites indicators are available at the census block group. As a result, the socioeconomic variables at the same Census boundary level were adjusted to only include communities with nonzero values for these indicators.

Source: U.S. EPA analysis, 2022

Table IV-8: Demographic characteristics of communities within HUC12 watersheds with affected waters, wastewater discharges, and proximity to RMP sites, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^d	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
<= 1	12,349 (28.6%)	294.4	0.3	11.1%	0.7%	4.8%	0.1%	0.3%	2.1%	18.4%
> 1 - 5	11,468 (26.5%)	3.3	0.3	11.8%	0.7%	4.5%	0.1%	0.2%	2.3%	17.2%
> 5 – 50	9,392 (21.7%)	3.7	0.4	14.0%	0.4%	6.1%	0.1%	0.3%	2.5%	18.1%
> 50	775 (1.8%)	1.9	0.4	11.2%	0.4%	6.4%	0.2%	0.2%	2.8%	17.3%
National Average for Communities with Wastewater Discharges and in Proximity to RMP sites^e		66.3	0.3	9.3%	1.1%	3.7%	0.1%	0.1%	2.1%	14.7%

a. National averages represent the rest of the United States population, outside of the HUC12 watersheds with affected waters.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

e. The wastewater discharge and proximity to RMP sites indicators are available at the census block group. As a result, the socioeconomic variables were adjusted to include communities with nonzero values for these indicators.

Source: U.S. EPA analysis, 2022

While the analyses thus far represent the socioeconomic characteristics and environmental indicators most relevant to the final rule, cumulative exposure to environmental hazards beyond those relevant to the final rule are important considerations for determining a community’s potential for environmental justice concern. Table IV-9 and Table IV-10 summarize the overall cumulative environmental burden for HUC12 watersheds based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule. The environmental indicators used to evaluate cumulative environmental burden are defined at the beginning of this section.

Table IV-9: Cumulative environmental burden, defined by exceedances of environmental indicators, of communities within HUC12 watersheds experiencing wetland area changes, compared to national averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s with...			
		No Exceedances	1-3 Exceedances	4-8 Exceedances	9-11 Exceedances
<= 0.5	38,980 (90.1%)	1.7%	10.8%	70.1%	17.4%
> 0.5 - 1	1,528 (3.5%)	3.7%	5.4%	56.4%	34.4%
> 1 – 50	2,673 (6.2%)	4.8%	6.4%	49.8%	39.1%
> 50	66 (0.2%)	4.5%	3.0%	60.6%	31.8%

a. The exceedances are based on a comparison to national averages that represent the rest of the United States population, outside of the HUC12 watersheds experiencing wetland area changes.

Source: U.S. EPA analysis, 2022

Table IV-10: Cumulative environmental burden, defined by exceedances of environmental indicators, of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s with...			
		No Exceedances	1-3 Exceedances	4-8 Exceedances	9-11 Exceedances
<= 1	16,647 (38.5%)	3.1%	13.3%	73.1%	10.6%
> 1 - 5	14,634 (33.8%)	1.8%	10.4%	70.7%	17.2%
> 5 – 50	11,105 (25.7%)	0.8%	6.5%	59.3%	33.5%
> 50	861 (2.0%)	0.1%	0.9%	52.5%	46.5%

a. The exceedances are based on a comparison to national averages that represent the rest of the United States population, outside of the HUC12 watersheds with affected waters.

Source: U.S. EPA analysis, 2022

As shown, while some watersheds with wetland area changes and affected waters do not have any exceedances of the environmental indicators included in EJScreen, the majority are exposed to environmental risk from between four and eight different indicators. In other words, although we had found that the socioeconomic characteristics and environmental indicators relevant to the rule of affected watersheds weren’t drastically different from national averages, the affected watersheds are already

burdened by exposure to environmental risk. For the most part, the distribution of the environmental indicator values within affected HUC12s is more right-skewed and centered around national average values. However, as wetland area and the number of affected waters increases, the range of environmental indicator values decreases. In other words, the more waters that are affected, the lesser the degree to which the environmental indicator value for the few affected HUC12s on the trailing end of the distribution exceeds the national average. This is, in part, due to the smaller universe of HUC12s with large changes in wetland area and affected waters. This signal is most clearly seen with the environmental indicators that represent proximity to hazardous waste and proximity to toxic wastewater discharges. By contrast, the majority of the affected HUC12s are experiencing small changes and for this subset of affected HUC12s, the few affected HUC12s on the trailing end of the distribution are well above the national average, more so than HUC12s with larger changes. Even these small changes in wetland areas and affected waters may lead to improved water quality and help to reduce cumulative environmental burden where the magnitude of environmental burden from hazardous waste and toxic discharges is well above the national average. Therefore, we may see a potential benefit for communities residing within or in proximity to HUC12s already experiencing exceedances of four or more environmental indicators or experiencing environmental burden to a magnitude far beyond the national average.

However, from the perspective of environmental indicators relevant to the final rule and socioeconomic characteristics, this analysis shows that there isn't much potential for benefits to EJ concerns for a majority of the affected HUC12s. This conclusion is mainly based on the very low percentage of HUC12s that would be affected by the final rule and include communities with environmental justice concerns.

IV.B Uncertainty and Limitations

The analysis is built on the framework of HUC12s with summarized socioeconomic and environmental risk data from a different spatial framework (Census block groups). The summary assumes even population distribution within the respective Census block group to apportion socioeconomic data by the ratio of intersect area to Census block group area. This has an uncertain effect on the results of the analysis. The environmental risk indicator values were calculated for each HUC12 by calculating an area-weighted average. This may mute the presence of Census geographies within the HUC12 with relatively high environmental risk indicator values adjacent to Census geographies with relatively low environmental risk indicator values.

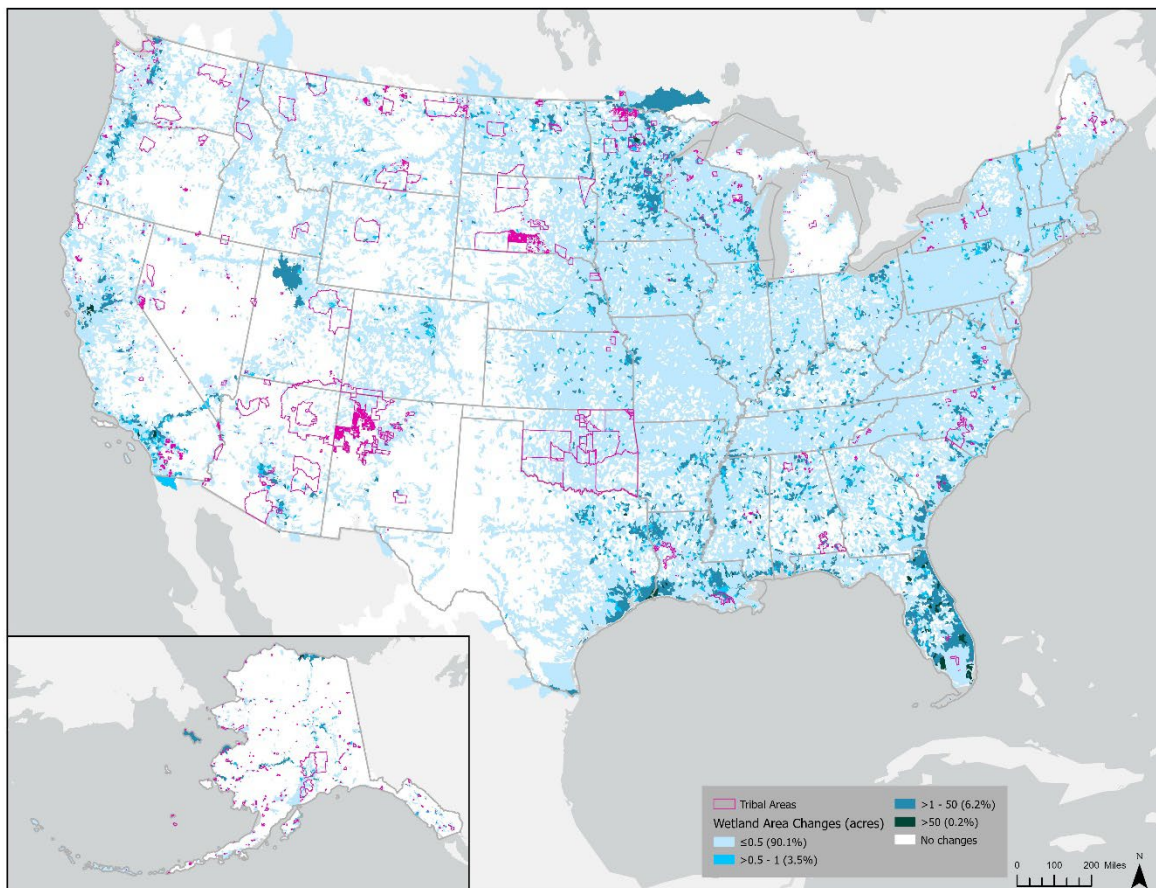
A few of the analyses assume that benefits would be realized for communities living within the same watershed boundaries as wetland area or affected waters changes. Downstream communities from the water body changes could also benefit from the associated water quality changes.

The comparisons between HUC12s with wetland area changes and affected waters and national or State averages do not hold statistical significance, so the conclusions drawn in this section are meant to be informative rather than definitive.

V. Tribal Impact Analysis

In addition to the anticipated Tribal response to the reinstatement of the pre-2015 regulatory regime described in Chapter I, Figure V-1 and Figure V-2 qualitatively summarize the overlap between Tribal areas⁹⁰ and the estimated changes in wetland area and affected waters under the final rule, as compared to the secondary baseline of the 2020 NWPR.

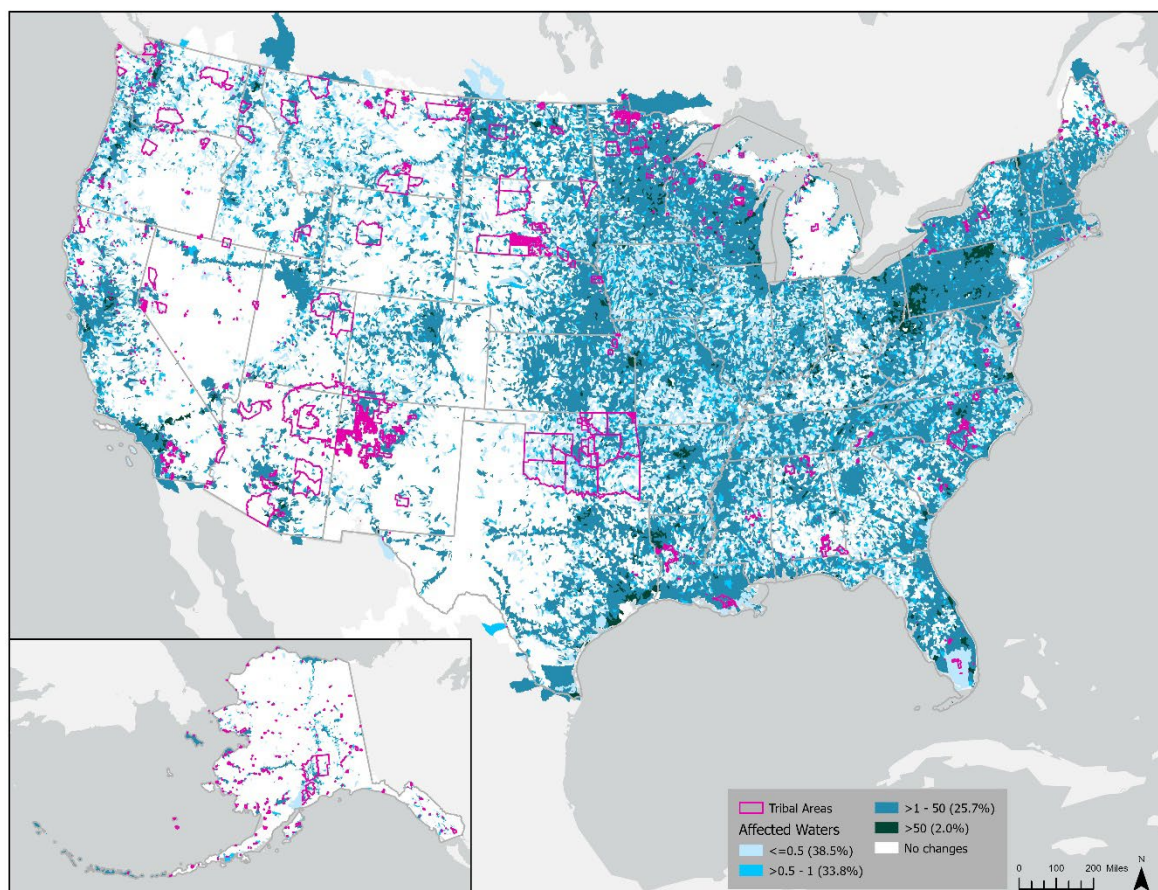
Figure V-1: Tribal areas relative to HUC12 watersheds experiencing wetland area changes under the final rule, as compared to the 2020 NWPR



As shown, Tribal areas overlap with wetland area changes throughout the country. In fact, over 90 percent of Tribal area includes watersheds with wetland area changes or affected waters. In particular, there is a confluence of Tribal area and relatively large estimated wetland area changes in southern California, Arizona, and Minnesota.

⁹⁰ Tribal lands used for this overlay were defined by the US Census TIGER/Line dataset (2020 American Indian/Alaska Native/Native Hawaiian Area; U.S. Census Bureau, n.d.).

Figure V-2: Tribal areas relative to HUC12 watersheds experiencing changes in affected waters under the final rule, as compared to the 2020 NWPR



The overlap between Tribal areas and affected waters follows the same distribution as the wetland area changes map. However, in addition to southern California, Arizona, Minnesota, Washington, and North Dakota also show a confluence of Tribal area and relatively large changes to affected waters.

In addition to changes expected to wetland areas and affected waters (based on the section 404 Dredged and Fill Material Permit program), the final rule will affect other EPA programs, like the Clean Water Act section 311 oil spill prevention, preparedness and response programs (*i.e.*, the SPCC and FRP regulations) and the Clean Water Act section 402 NPDES program. The following tables compare the socioeconomic characteristics and cumulative environmental burden for HUC12s that fall within Tribal areas compared to HUC12s that are outside of any Tribal areas. As shown, the majority of HUC12s across the country (>90 percent) do not overlap with any Tribal areas.

Table V-1: Socioeconomic characteristics of communities within HUC12 watersheds that overlap with Tribal areas, compared to communities that fall outside of Tribal areas

HUC12 Overlap with Tribal Areas	Total Number of HUC12s (% of HUC12s)	Percentage of Individuals that are Minority ^a	Percentage of Individuals that are Low-Income ^b	Percentage of Individuals with Less than High School Education	Percentage of Households with Linguistic Isolation	Percentage of Individuals under Age 5	Percentage of Individuals over Age 64	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
Overlap with Tribal Areas	9,019 (9.6%)	42.2%	35.3%	12.8%	4.8%	3.2%	16.6%	6.1%
No Overlap with Tribal Areas	85,084 (90.4%)	38.4%	30.6%	11.9%	4.2%	3.1%	15.5%	0.4%

a. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

b. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2022

Table V-2: Demographic characteristics of communities within HUC12 watersheds that overlap with Tribal areas, compared to communities that fall outside of Tribal areas

HUC12 Overlap with Tribal Areas	Total Number of HUC12s (% of HUC12s)	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^a	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
Overlap with Tribal Areas	9,019 (9.6%)	7.7%	6.1%	3.0%	0.2%	0.2%	3.7%	21.3%
No Overlap with Tribal Areas	85,084 (90.4%)	12.6%	0.4%	5.4%	0.1%	0.2%	2.3%	17.4%

Table V-2: Demographic characteristics of communities within HUC12 watersheds that overlap with Tribal areas, compared to communities that fall outside of Tribal areas

HUC12 Overlap with Tribal Areas	Total Number of HUC12s (% of HUC12s)	Percentage of Individuals that Identify as Black or African American Alone (non-Hispanic) ^a	Percentage of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)	Percentage of Individuals that Identify as Asian Alone (non-Hispanic)	Percentage of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone (non-Hispanic)	Percentage of Individuals that Identify as Some Other Race Alone (non-Hispanic)	Percentage of Individuals that Identify as Two or More Races	Percentage of Individuals that Identify as Hispanic or Latino Alone
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a. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

Source: U.S. EPA analysis, 2022

Table V-3: Cumulative environmental burden, defined by exceedances of environmental indicators, of communities within HUC12 watersheds that overlap with Tribal areas, compared to communities that fall outside of Tribal areas

HUC12 Overlap with Tribal Areas	Total Number of HUC12s (% of HUC12s)	Percentage of HUC12s with...			
		No Exceedances	1-3 Exceedances	4-8 Exceedances	9-11 Exceedances
Overlap with Tribal Areas	9,019 (9.6%)	11.2%	28.5%	55.7%	4.6%
No Overlap with Tribal Areas	85,084 (90.4%)	13.9%	16.4%	58.8%	10.9%

Source: U.S. EPA analysis, 2022

While the HUC12s that overlap with Tribal areas make up a small percentage (<10 percent) of all HUC12s throughout the country, the socioeconomic characteristics don't widely differ from the HUC12s that fall outside of any Tribal areas. The largest differences (between four to five percent) are with the minority population percentage and low-income percentage. The difference between the minority population percentage is largely driven by the larger proportions of individuals that identify as Hispanic or Latino alone and individuals that identify as American Indian and Alaska Native Alone (non-Hispanic). With regards to cumulative environmental burden, HUC12s that overlap with Tribal areas do have a larger proportion of watersheds with exceedances for one to three environmental indicators, but a smaller proportion of watersheds with exceedances for greater than four environmental indicators. The environmental indicator values are similarly distributed between HUC12s that do and do not overlap with Tribal areas. However, the range of environmental indicator values is generally greater for the HUC12s that do not overlap with Tribal areas. For environmental indicator values above the national average, values can be twice as large while some are several orders of magnitude larger than the national average. In particular, the variables associated with proximity to hazardous waste and proximity to toxic wastewater discharges can be 100,000 to 1,000,000 times larger than the national average. For example, the national average value for the variable representing proximity to hazardous waste⁹¹ for HUC12s without wetland area changes or affected waters is 0.01 while values for HUC12s that do not overlap with Tribal areas can range up to 1,500. Overall, the analyses highlight that the HUC12s that overlap with Tribal areas do not experience significantly greater cumulative environmental risk, either by the magnitude of the individual environmental risk or by the cumulation of environmental risk, or include relatively significant communities with environmental justice concerns.

⁹¹ Specifically defined as the count of hazardous waste management facilities within five kilometers (or the nearest neighbor outside of five kilometers), divided by distance to the facilities

VI. Sector Impact Analysis

The agencies have conducted a sector impact analysis. This analysis identifies which types of entities have historically sought permits associated with the Clean Water Act section 404 program, and how costs to these entities may change in relation to the final rule’s definition of “waters of the United States.” Due to the nature of the data used in this sector impact analysis, differentiation between small and large entities is not feasible. The types of sectors identified for this analysis include: industrial sectors (*e.g.*, mining, residential and commercial development, the energy sector; and public sectors such as State departments of transportation, county governments, stormwater management agencies, and public utilities). The Sector Impact Analysis identifies the different types of entities performing projects that required a section 404 permit, but does not estimate how many of these projects impact waters that change jurisdiction and may no longer need permitting. The approach for estimating changes in permitting requirements is described earlier in Section III.C.2.

The final rule will not impose requirements on entities of any size. Instead, this rule establishes a definition of “waters of the United States,” a foundational term in determining the scope of key Clean Water Act programs. The sector analysis provided herein is used to describe the potential impacts to entities that may be affected by a change in jurisdictional status under the final rule.

As discussed in the Introduction, the agencies lack sufficient information that could be used to identify specific water resources that will experience a jurisdictional change and the different regulated activities that may be affected under the final rule. However, the agencies reviewed available information on the type of entities that are regulated under the Clean Water Act section 404 program, with the purpose of identifying sectors with entities that may be affected by a change in jurisdictional status.

A return to the pre-2015 regulatory regime relative to the secondary baseline of the 2020 NWPR is expected to increase the number of waters under Clean Water Act jurisdiction for the Clean Water Act section 404 program, which may increase the amount of avoidance, minimization, and mitigation measures necessary to obtain Clean Water Act section 404 permit coverage and may increase the total number of future Clean Water Act section 404 permits relative to the 2020 NWPR baseline. The agencies reviewed national section 404 permit data from 2011 through 2020 to identify North American Industrial Classification System (NAICS) codes corresponding to entities that obtained section 404 permit coverage during that period. NAICS codes divide the economic activity into 20 sectors based on production activity. The NAICS codes have a hierarchical structure with the first two digits identifying the sector and the subsequent numbers identifying subsectors and specific activities. The agencies assigned private sector permits to one or more NAICS industry codes.

The ORM2 database does not track the NAICS category of the permit applicant. The agencies categorized the sector for each permit based on the reported project name, type of work performed, and project description. The agencies identified the general category of work based on the listed work type, further refining the sector based on key words in the project name and project description. For non-public categories, the agencies assigned one or more NAICS code. Some permits provided enough information to assign a single 6-digit NAICS code. Others did not provide enough information to be able to assign a single 6-digit NAICS code, and in these cases the agencies assigned a broader industry (one or more 2- to

5-digit NAICS).⁹² Table VI-1 presents the sectors identified and estimated number of affected entities. The agencies were able to assign an industry sector to 98 percent of the Clean Water Act section 404 permits. For two percent of permits, the reported work type, project name, and project description did not provide sufficient information to categorize the permit by a specific NAICS sector. These entities are listed as “Unassigned” in Table VI-1.

Table VI-1: Affected Clean Water Act section 404 permits by industry sector		
NAICS	NAICS industry description	Number of affected permits
11	Agriculture	2,528
11251	Aquaculture	3,125
113310	Logging	1
2111	Oil and gas extraction	19,751
212	Mining (except oil and gas)	2,233
22111	Electric power generation	7,602
22112	Electric power transmission, control, and distribution	9,480
221210	Natural gas distribution	7,055
2361	Residential building construction	12,726
2361, 2362	Mixed use building construction	3,191
23621	Industrial building construction	1,357
23622	Commercial building construction	9,407
237310	Highway, street, and bridge construction	102,052
237990	Dredging	44,791
48211	Rail transportation	9,329
4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products	55,164
488119	Airport	18,116
562211	Hazardous waste treatment and disposal	805
562212	Solid waste landfills	258
713930	Marinas	27,956
Public	Public	73,927
Unassigned	Unassigned	9,344
Total	N/A	420,198

Table VI-2 summarizes the percent of permit records in each identified sector, stratified by Cowardin classification.

Table VI-2: Affected Clean Water Act section 404 permits by Cowardin classification								
NAICS	NAICS industry description	Wetland type¹						
		Estuarine	Lacustrine	Marine	Palustrine	Riparian	Riverine	Uplands
11	Agriculture	1%	1%	0%	20%	1%	78%	0%
11251	Aquaculture	15%	1%	79%	0%	0%	4%	0%
113310	Logging	0%	0%	0%	100%	0%	0%	0%
2111	Oil and gas extraction	2%	0%	0%	34%	0%	63%	0%

⁹² For example, the agencies classified permits identified as single-family residential development, which could fall into either NAICS 236115 or NAICS 236117, as NAICS 2361 Residential Building Construction. The agencies classified permits identified as mining, with no mention of oil or gas but no other material listed, as NAICS 212 Mining (except oil and gas).

Table VI-2: Affected Clean Water Act section 404 permits by Cowardin classification

NAICS	NAICS industry description	Wetland type ¹						
		Estuarine	Lacustrine	Marine	Palustrine	Riparian	Riverine	Uplands
212	Mining (except oil and gas)	9%	1%	2%	31%	2%	54%	1%
22111	Electric power generation	4%	1%	1%	39%	1%	54%	1%
22112	Electric power transmission, control, and distribution	1%	0%	0%	39%	0%	59%	0%
221210	Natural gas distribution	1%	0%	1%	32%	0%	66%	0%
2361	Residential building construction	3%	4%	1%	63%	2%	26%	0%
2361, 2362	Mixed use building construction	2%	3%	1%	49%	2%	43%	1%
23621	Industrial building construction	2%	1%	1%	63%	2%	30%	1%
23622	Commercial building construction	3%	6%	1%	59%	2%	28%	1%
237310	Highway, street, and bridge construction	6%	7%	2%	19%	2%	63%	0%
237990	Dredging	10%	35%	3%	3%	1%	48%	0%
48211	Rail transportation	2%	2%	1%	18%	2%	75%	1%
4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products	4%	0%	1%	37%	1%	57%	0%
488119	Airport	7%	12%	5%	11%	2%	63%	0%
562211	Hazardous waste treatment and disposal	8%	7%	5%	32%	3%	45%	0%
562212	Solid waste landfills	2%	1%	0%	36%	2%	57%	2%
713930	Marinas	17%	47%	10%	3%	0%	23%	0%
Public	Public	3%	4%	2%	23%	1%	66%	0%
Unassigned	Unassigned	4%	8%	2%	48%	1%	36%	1%

¹ Row cells may not add up to 100 percent due to rounding.

The amount of meaningful information within the work type, project name, and project description fields that can be used to inform the NAICS code assignment varies considerably across permits, which adds uncertainty to the characterization of affected entities. In some instances, the work type, project name, and project description fields resulted in limited information on the specific activity that occurred, and the agencies categorized these in broader industry categories (*e.g.*, highway, street, bridge construction) that may be representative of the entity performing the permitted work, but not the entity that would be affected by the return to the pre-2015 regulatory regime. In addition, the agencies relied on keyword

categorization to identify the specific industry associated with the permitted work (*e.g.*, marina, airport, energy generation). The number of permits assigned to specific NAICS codes is limited by the keywords developed, and it is likely that searching with keywords resulted in misclassification of some permits. However, the agencies are unable to determine the number of misclassified permits without reviewing each permit and creating new categories as needed. Therefore, the agencies do not have enough information to quantify uncertainty associated with the analysis. The steps used to assign industry sectors to Clean Water Act section 404 permits, including the key words used, are described further in Appendix G, along with other information on the sector analysis.

The Sector Impact Analysis identifies the types of entities performing the permitted work. However, for many categories such as dredging and road construction, it does not identify the sector category of the actual project owner. This limits the ability of agencies to attribute the costs from the cost analysis to the sectors identified in this analysis. For example, a construction project falls under the NAICS category 237310 for highway, street, and bridge construction. However, the construction firm building the road is likely performing the work for another entity that owns the land, and any section 404 permitting costs for the road construction would likely be passed directly to the property owner.

The agencies expect that the increase in future Clean Water Act section 404 permit obligations may result in cost increases, unless States continued to require permits for waters that were no longer jurisdictional under the 2020 NWPR. These increases are expected to extend to the universe of small entities required to obtain Clean Water Act section 404 permit coverage approximately equal to their existing portion of the overall section 404 regulatory burden.⁹³

⁹³ See EA tables for a discussion of the total estimated avoided costs.

VII. References

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Appendix A Using Cowardin Classification to Assess Change in Jurisdictional Scope

Performing an economic analysis of potential regulations first requires estimating how future activities and outcomes under the final rule differ from future activities and outcomes under the baseline. For the final rule’s secondary baseline this requires predicting future activities and outcomes under the 2020 NWPR as well as the final rule. Since the final rule is intended to codify in regulation a definition of “waters of the United States” that is very similar to the pre-2015 regulatory regime where the *Rapanos* Guidance was used to determine jurisdiction, the agencies can leverage historical permit data to predict future conditions under the final rule. Ten years of Corps Clean Water Act section 404 permit data for the years 2010 through 2019 were used to derive average annual estimates of the: types, amount, and general location of permitted projects; water features such as wetlands, streambanks, and shorelines affected by dredged or fill activities; and the extent of mitigated impacts under the section 404 permitting process. During most of this ten-year period, the pre-2015 regulatory practice was used to determine the jurisdictional status of waters potentially affected by permitted projects. For part of this period, the 2015 Clean Water Rule was in effect in some States. All permits issued under the 2015 Clean Water Rule during this period were removed from the data. Since these average annual estimates of permits, affected waters, and mitigation were derived from data on permits and jurisdictional determinations based on the *Rapanos* Guidance, the agencies consider them to be reasonably representative of future activity and regulatory requirements under the final rule.

To perform the economic analysis the agencies had to first estimate the change in water features that would likely be permitted under the 2020 NWPR if it would have continued to be in effect. The first step in determining the probability of an impacted water being included in a permit is to derive the probabilities that if a water feature receives an AJD that it will be a “waters of the United States.” These probabilities are sensitive to the water feature’s characteristics, so these probabilities need to be derived based on categories of these characteristics, and the Cowardin classification provides a convenient way to categorize these waters.

The Cowardin classification is hierarchical with the highest level, System dividing into Subsystem, Class, and Subclass levels. The Cowardin classification for water features is in two fields in the dataset: COWARDIN_CATEGORY, which represents the System level, and COWARDIN_CODE, which represents the code down to the Subclass level. The agencies calculate probabilities at the System level and the Subsystem level. The Subsystem level can be derived from the COWARDIN_CODE field.

The regulation that the determination was based on is also important. The two regulations that are relevant for our analysis are RAPANOS and 2020 NWPR, which are entries found in the JD_FORM_TYPE field. For the AJDs performed based on RAPANOS the resulting jurisdictional status can be found in the JA field. For the AJDs performed based on 2020 NWPR the resulting jurisdictional status can be found in the WATERS_TYPE field, where those entries beginning with “A” are “waters of the United States” and those beginning with “B” are non-“waters of the United States.” The difference between the *Rapanos* probability and the 2020 NWPR probability for each of the Cowardin codes represents the change in probabilities between two regulatory regimes. The other possible entries in JD_FORM_TYPE are: RAPANOS_FORM used primarily before the *Rapanos* Guidance, and CWR for those areas where 2015 Clean Water Rule was in effect. These entries were not be used for deriving AJD

probabilities needed for the analysis. Table A-1 provides the relevant fields used from the ORM2 database.

Table A-1: Relevant JD data fields for Estimating the Change	
Fields	Description
JD_ID	JD identifier associated with the water
WATERS_ID	Unique identifier for water features
ACTION_FOLDER_ID	
END_DATE	Date the JD action was closed
Year	Added field to sort data by year
JD_FORM_TYPE	Indicates the regulation or guidance used to determine jurisdiction
JD_TYPE_CATEGORY	AJD, PJD, DELIN, NJD, OTHER
JA	Yes is Jurisdictional, No is Non-Jurisdictional
WATERS_TYPE	Army codes used to identify waters, relevant for 2020 NWPR
COWARDIN_CODE	Complete Cowardin code down to the Subclass level.
COWARDIN_CATEGORY	System level Cowardin code identifier

Using the relevant fields from the JD data, the AJD records based on *Rapanos* Guidance and AJDs based on 2020 NWPR were grouped by Cowardin Category and Sub-category and the probabilities of being found to be a “waters of the United States” were derived. Table A-2 shows these probabilities results. For the Marine and Estuarine Cowardin categories there were an insufficient number of records at the subcategory-level to use sub-categories and only the Cowardin category information was used to derive probabilities. For the Upland category there are no corresponding subcategories.

Table A-2: Probability of an AJD Resulting in a “waters of the United States” Determination Under the <i>Rapanos</i> Guidance and the 2020 NWPR						
Water Feature Type Cowardin Category and Sub-Category	Approved Jurisdictional Determination (AJD data based on <i>Rapanos</i> Guidance) ⁹⁴			Approved Jurisdictional Determination (AJD data based on 2020 NWPR) ⁹⁵		
	Jurisdictional	Total	% Jurisdictional	Jurisdictional	Total	% Jurisdictional
Marine	5,927	5,947	100%	4	4	100%
Estuarine	14,061	14,126	100%	177	182	97%
Lacustrine	16,539	18,040	92%	184	1,329	14%
Lacustrine-Limnetic (L1)	4,810	5,585	86%	94	618	15%
Lacustrine-Littoral (L2)	10,191	10,750	95%	90	711	13%
Palustrine	51,864	90,620	57%	6,423	28,312	23%
Palustrine-Aqua Bed (PAB)	711	1,022	70%	11	176	6%
Palustrine-Emergent (PEM)	20,303	49,512	41%	2,639	17,266	15%
Palustrine- Forested (PFO)	21,190	26,583	80%	3,030	7,257	42%

⁹⁴ *Rapanos* Guidance jurisdictional determination data are from the years 2010-2019, and exclude all determinations based on the 2015 Clean Water Rule.

⁹⁵ The 2020 NWPR jurisdictional determination data a from June, 2020 through July of 2021.

Table A-2: Probability of an AJD Resulting in a “waters of the United States” Determination Under the *Rapanos* Guidance and the 2020 NWPR

Water Feature Type Cowardin Category and Sub-Category	Approved Jurisdictional Determination (AJD data based on <i>Rapanos</i> Guidance) ⁹⁴			Approved Jurisdictional Determination (AJD data based on 2020 NWPR) ⁹⁵		
	Jurisdictional	Total	% Jurisdictional	Jurisdictional	Total	% Jurisdictional
Palustrine-Open Water (POW)	1,073	2,305	47%	164	1,331	12%
Palustrine-Scrub Shrub (PSS)	4,658	5,938	78%	477	1,312	36%
Palustrine-Unconsolidated Bottom (PUB)	2,143	2,894	74%	101	953	11%
Riverine	51,695	62,689	82%	5,591	19,596	29%
Riverine-Tidal (R1)	4,215	4,356	97%	68	74	92%
Riverine-Lower Perennial (R2)	11,001	11,117	99%	582	716	81%
Riverine-Upper Perennial (R3)	10,691	10,822	99%	946	1,007	94%
Riverine-Intermittent (R4)	11,111	13,162	84%	3,508	4,547	77%
Riverine-Unknown Perennial (R5)	6,681	6,860	97%	466	734	63%
Riverine-Ephemeral (R6)	4,657	12,644	37%	21	12,518	0%
Riparian	2,895	3,075	94%	158	549	29%
Riparian-Lotic (RP1)	616	638	97%	63	91	69%
Riparian-Lentic (RP2)	249	286	87%	35	134	26%
Uplands	1,572	33,798	5%	0	271	0%

Assuming historical permit data are a good predictor of the type and quantity of future permitted projects, these changes in probabilities can be applied to historical *Rapanos* Guidance permit data to estimate how many water features would receive permit protection if the 2020 NWPR were to remain in place. However, many permittees forgo the AJD process, which can be time consuming and expensive, and instead use a PJD to voluntarily waive or set aside questions regarding Clean Water Act jurisdiction over a particular site and thus move forward assuming all waters will be treated as jurisdictional without making a formal determination. In some cases, the jurisdictional determination process is bypassed altogether and all affected waters are treated as jurisdictional. As a result, applying the change in probabilities estimated from the AJD data to the entirety of the *Rapanos* Guidance permit data would likely overestimate the actual change in waters receiving permit protection under 2020 NWPR. Therefore, the AJD-based probabilities should only be applied to the proportion of historical permit data that likely received an AJD.

Using the historical jurisdictional determination data under both the *Rapanos* Guidance and the 2020 NWPR, the proportion of permits that likely received AJDs under each regulatory regime can be estimated. Table A-3 provides the relative proportion of jurisdictional determinations that

received AJDs or one of the less definitive options such as a PJD or no JD at all for both regulatory regimes. These data are also broken out by the same Cowardin categories and sub-categories as in Table A-2 above.

Table A-3: Proportion of Jurisdictional Determinations that Resulted in AJDs or Non-AJDs under the *Rapanos* Guidance and the 2020 NWPR

Water Feature Type Cowardin Category and Sub-Category	Jurisdictional Determination Type			
	<i>Rapanos</i> Guidance		2020 NWPR	
	AJD%	Non-AJD%	AJD%	Non-AJD%
Marine	24%	76%	2%	98%
Estuarine	25%	75%	7%	93%
Lacustrine	35%	65%	39%	61%
Lacustrine-Limnetic (L1)	34%	66%	45%	55%
Lacustrine-Littoral (L2)	35%	65%	36%	64%
Palustrine	18%	82%	56%	44%
Palustrine-Aqua Bed (PAB)	26%	74%	54%	46%
Palustrine-Emergent (PEM)	19%	81%	65%	35%
Palustrine- Forested (PFO)	20%	80%	43%	57%
Palustrine-Open Water (POW)	24%	76%	68%	32%
Palustrine-Scrub Shrub (PSS)	8%	92%	46%	54%
Palustrine-Unconsolidated Bottom (PUB)	12%	88%	61%	39%
Riverine	13%	87%	51%	49%
Riverine-Tidal (R1)	24%	76%	10%	90%
Riverine-Lower Perennial (R2)	16%	84%	22%	78%
Riverine-Upper Perennial (R3)	14%	86%	24%	76%
Riverine-Intermittent (R4)	10%	90%	40%	60%
Riverine-Unknown Perennial (R5)	13%	87%	21%	79%
Riverine-Ephemeral (R6)	11%	89%	86%	14%
Riparian	23%	77%	55%	45%
Riparian-Lotic (RP1)	18%	82%	49%	51%
Riparian-Lentic (RP2)	22%	78%	56%	44%
Uplands	65%	35%	99%	1%

Appendix B Methodology for Generating Benefit-Transfer Predictions based on Wetland Meta-Analysis

The analysis for estimating the benefits of increases in wetland mitigation requirements that would result from the final rule relative to the baseline of the 2020 NWPR differs from the approach the agencies used in the 2020 NWPR analysis (U.S. EPA and Army, 2020a). That analysis used a meta-analysis of the wetland valuation studies that provide data on the public’s willingness to pay (WTP) for wetland preservation. However, the meta-analysis and benefit transfer have been updated, as explained in this appendix.

The approach is based on the meta-analysis of wetland valuation studies by Moeltner et al. (2019) in which the authors performed a meta-analysis of wetland valuation studies to estimate a benefit function for preserving or restoring acres of wetlands. In their study, the researchers limited the meta-data to U.S. based studies focused on valuation of freshwater wetlands, resulting in 21 observations taken from 11 studies.⁹⁶ The study applies Bayesian estimation techniques (*e.g.*, Moeltner et al., 2007; Moeltner et al., 2009; Moeltner et al., 2014; Moeltner, 2015). They performed a Bayesian non-linear meta-regression that ensures the benefits function meets a set of utility theoretic validity criteria. Those criteria are: sensitivity to scope, a scope elasticity that is not restricted by the functional form of the benefit function, and the adding-up condition which ensures dividing a change into smaller increments does not affect the total benefit. Moeltner et al. (2019) also estimated a linear regression model that closely approximates the adding-up condition.

The agencies used the non-linear model from Moeltner et al. (2019) for estimating foregone benefits under the 2020 NWPR (85 FR 22250; June 22, 2020) and an updated version of the linear model for estimating benefits of increased mitigation requirements for the proposed rule (U.S. EPA and Army, 2021).⁹⁷

The Moeltner et al. (2019) meta-analysis used for estimating foregone benefits under the 2020 NWPR was reviewed by E-EEAC (Keiser, 2020). E-EEAC found that “*The meta-analysis used to estimate the forgone benefits of removing wetlands from Clean Water Act protection is generally well done, but its subsequent use for predicting wetland damages was less so, and the approach would benefit from additional transparency and sensitivity analysis.*” Specifically, E-EEAC suggested several changes to the meta-analysis and its application to benefit transfer, including:

- Augmenting meta-data to include a wide range of studies and, in particular, studies that value wetlands in urban watersheds.

⁹⁶ The original data for the meta-regression consisted of 38 observations from 17 stated preference studies identified in the 2017 Abt Associates wetlands literature review that contained WTP estimates potentially useful in a meta-analysis. Of those observations, 17 observations from 6 studies target salt marshes or, more broadly, “coastal wetlands” and thus were excluded from the freshwater model.

⁹⁷ Both linear and non-linear models provide a good fit for the underlying data and satisfy adding up conditions (Moeltner et al., 2019). Thus, both models are potentially good candidates for benefit transfer. Because it is easier to use and interpret the linear model the agencies choose a linear version of the model over the non-linear version.

- Estimating WTP for avoiding for wetland losses in a State conditional on the size of wetland systems in the State that are affected by the change of jurisdiction.⁹⁸
- Considering dropping ecosystem service indicators from the regression model or considering alternative treatment the ecosystem service indicators in the benefit transfer application.
- Coding the dummy variable “lump sum” to “zero” for benefit estimation.⁹⁹
- Selecting a different extent of the market to estimate the value of changes in wetland acres.

The agencies have addressed many of the E-EEAC comments on application of the meta-analysis in the context of this rule.

B.1. Meta-data

To improve MRM predictions, the agencies first augmented the 2019 meta-data to include additional freshwater valuation studies (Lantz et al., 2013; Nijhum, 2020; Pattison et al., 2011; Rudd et al., 2016; Hindsley and Yoskowitz, 2020). The agencies also added back eight saltwater studies included in the 2019 meta-data (*see* Moeltner et al. (2019) for detail). The revised meta-data includes 52 observations from 24 studies (20 studies from the U.S. and four from Canada).¹⁰⁰ As shown in Table B-1, sixteen studies focused on valuing changes in freshwater wetlands and eight studies focused on saltwater wetlands. Half of the studies (10 U.S. studies and two Canadian studies) value changes in local wetlands (*e.g.*, watersheds or counties) and the other half is focused on the value of changes in non-local wetlands.

The agencies carefully considered suitability of Canadian studies for inclusion in meta-analysis used for valuing benefits of increased wetland protection in the United States. In addition to evaluating the studies’ quality, the agencies assessed similarities of the wetland characteristics, the market extent, and demographic characteristics of the survey respondents in the Canadian studies and U.S. studies included in the meta-data. Three of the four Canadian studies valued freshwater wetlands similar to those found in the Midwest of the U.S. Lantz et al. (2013) valued wetland restoration programs in the Credit River watershed that discharges to Lake Ontario. The study area includes a greater Toronto area that experienced significant urban development pressure and therefore adds information on the value of wetlands in the proximity to urban areas.¹⁰¹ Pattison et al. (2011) focused on valuation of wetland retention and restoration in Manitoba. The southern portion of the province lies in the continental “prairie

⁹⁸ E-EEAC recommends conducting a sensitivity analysis as follows: (1) varying the uniform assumption used the baseline acres variable for all States and/or (2) tailoring the assumption to conditions in individual States.

⁹⁹ Setting lumpsum to zero, requires accounting for cumulation of the mitigation acre increases over the 2023-2042 analysis period. When the lumpsum variable is set to 1, the average annual increase in mitigation is used for each year in the analysis under the assumption that the average annual increase holds constant over the 20-year period. The resulting household WTP values are based on a one-time payment and an assumption that the mitigation acres will be protected in perpetuity.

¹⁰⁰ The memorandum to Todd Doley and Steve Whitlock, U.S. EPA, Office of Water, entitled “Notes on inclusion of source studies and data preparation for wetlands meta-data” (ICF, 2022) details reasons for selecting or excluding specific wetland valuation studies from the meta-data and subsequent development of meta-regression (November 18, 2022; available in the docket for this rule, Docket ID Number EPA-HQ-OW-2021-0602).

¹⁰¹ This is also the case for Nijhum (2020) who valued wetland preservation in the Northeast Swale of Saskatoon in the context of rapid urbanization.

pothole region,” the latter of which also includes north-central Iowa. Lastly, Rudd et al. (2016) focused on the value of wetland preservation in the mixed wood plains ecozone of southern Ontario. The mixed wood plains is also a large ecoregion in the U.S. covering parts of central Minnesota and Wisconsin east through Michigan, New York State, and most of New England.

In addition to similarities of the wetland characteristics valued in the Canadian studies and those valued in the U.S. studies only, these studies also consider a similar extent of the market (*i.e.*, province and watershed level). Finally, the average income of the surveyed population in the Canadian studies (\$74.2 thousand, 2021 USD) is comparable to the average income in population surveyed in the U.S. studies (\$65.8 thousand, \$2021). Adding the U.S. and Canadian studies increases the number of observations for freshwater wetlands by 11 for a total of 32 observations.

The agencies also re-examined the feasibility of pooling freshwater and saltwater wetland studies as an increase in the sample size may lead to improved efficiency of benefit transfer predictions. The eight saltwater wetland studies provide an additional 20 observations. This increases the total number of observations in the meta-data to 52 or by 62.5 percent compared to the freshwater only meta-data.

The following sections describe the results of the regression analysis and its application to the policy context of the final rule.

Table B-1: Studies used in the 2022 saltwater and freshwater wetland pooled MRM

Author	Year	Target population	Wetland type	Change in acres	WTP (2021\$)	WTP/100 acres
Freshwater studies						
Awondo et al.	2011	Maumee Bay SP, OH, visitors	unspec.	2,499	\$212	\$8.48
Beran, L.J.	1995	all SC HHs	forested	2,500	\$40	\$1.60
Beran, L.J.	1995	all SC HHs	forested	2,500	\$30	\$1.20
Beran, L.J.	1995	all SC HHs	forested	2,500	\$36	\$1.44
Blomquist & Whitehead	1998	all KY HHs	unspec.	500	\$3	\$0.60
Blomquist & Whitehead	1998	all KY HHs	forested	500	\$8	\$1.60
Blomquist & Whitehead	1998	all KY HHs	forested	500	\$7	\$1.40
Blomquist & Whitehead	1998	all KY HHs	forested	500	\$21	\$4.20
deZoysa	1995	selected MSAs, OH	unspec.	3,000	\$120	\$4.00
Hindsley & Yoskowitz	2020	Houston-Galveston Bay, TX HHs	unspec.	14,720	\$11	\$0.07
Lantz et al.	2013	Credit River Watershed, Ontario, Canada	unspec.	2,523	\$134 ¹	\$5.31
Lantz et al.	2013	Credit River Watershed, Ontario, Canada	unspec.	3,523	\$137 ¹	\$3.89
Loomis et al.	1991	all CA HHs	unspec.	58,000	\$275	\$0.47
Loomis et al.	1991	all CA HHs	unspec.	40,000	\$455	\$1.14
MacDonald et al.	1998	Atlanta region, GA	unspec.	330	\$119	\$36.06
Mullarkey & Bishop	1999	all WI HHs	forested	110	\$71	\$64.55
Newell & Swallow	2013	Two townships, RI	forested	29	\$9	\$31.03
Newell & Swallow	2013	Two townships, RI	forested	45	\$14	\$31.11
Newell & Swallow	2013	Two townships, RI	forested	69	\$17	\$24.64

Table B-1: Studies used in the 2022 saltwater and freshwater wetland pooled MRM

Author	Year	Target population	Wetland type	Change in acres	WTP (2021\$)	WTP/100 acres
Nijhum	2020	Saskatoon HHs	unspec.	163	\$287 ¹	\$176.07
Pattison et al.	2011	Manitoba province, Canada	unspec.	94,918	\$281 ¹	\$0.30
Pattison et al.	2011	Manitoba province, Canada	unspec.	133,903	\$288 ¹	\$0.22
Pattison et al.	2011	Manitoba province, Canada	unspec.	172,887	\$295 ¹	\$0.17
Pattison et al.	2011	Manitoba province, Canada	unspec.	250,856	\$310 ¹	\$0.12
Pattison et al.	2011	Manitoba province, Canada	unspec.	406,793	\$340 ¹	\$0.08
Poor	1999	all NE HHs	unspec.	16,000	\$52	\$0.33
Poor	1999	all NE HHs	unspec.	41,000	\$46	\$0.11
Poor	1999	all NE HHs	unspec.	66,000	\$52	\$0.08
Rudd et al	2016	Ontario HHs	forested	106,255	\$175 ¹	\$0.16
Rudd et al	2016	Ontario HHs	forested	308,882	\$194 ¹	\$0.06
Whitehead et al.	2009	selected counties, MI	unspec.	1,125	\$80	\$7.11
Whitehead & Blomquist	1991	all KY HHs	forested	5,000	\$21	\$0.42
Saltwater studies						
Bauer et al.	2004	RI HHs	unspec.	33	\$30	\$90.91
Bauer et al.	2004	RI HHs	unspec.	64	\$36	\$56.25
Bauer et al.	2004	RI HHs	unspec.	101	\$43	\$42.57
Bauer et al.	2004	RI HHs	unspec.	135	\$51	\$37.78
Eastern Research Group	2016	regional MSAs in NJ, PA, DE, MD	unspec.	1,000	\$181	\$18.10
Eastern Research Group	2016	regional MSAs in NJ, PA, DE, MD	unspec.	3,000	\$197	\$6.57
Eastern Research Group	2016	regional MSAs in NJ, PA, DE, MD	unspec.	5,000	\$214	\$4.28
Interis & Petrolia	2016	AL and LA HHs	unspec.	1,500	\$197	\$13.13
Interis & Petrolia	2016	AL and LA HHs	unspec.	1,500	\$655	\$43.67
Johnston et al.	2002	RI HHs	unspec.	3	\$256	\$8,533.33
Johnston et al.	2002	RI HHs	unspec.	5	\$271	\$5,420.00
Johnston et al.	2002	RI HHs	unspec.	7	\$284	\$4,057.14
Johnston et al.	2002	RI HHs	unspec.	9	\$299	\$3,322.22
Johnston et al.	2002	RI HHs	unspec.	12	\$324	\$2,700.00
Johnston et al.	2018	RI HHs	unspec.	15	\$22	\$146.67
Johnston et al.	2018	RI HHs	unspec.	5	\$72	\$1,440.00
Makriyannis et al.	2018	Old Saybrook, CT HHs	unspec.	15	\$23	\$153.33
Petrolia et al.	2014	Nationwide	unspec.	251,000	\$2,112	\$0.84
Petrolia et al.	2014	Nationwide	unspec.	251,000	\$1,097	\$0.44
Petrolia and Kim	2011	LA HHs	unspec.	448,000	\$200	\$0.04
HHs = Households						
¹ Agencies converted WTP values reported in the Canadian studies to 2021 USD by first converting to USD using the Canada to U.S. exchange rate and then adjusting for inflation using the U.S. GDP deflator.						

B.2. Regression Results

Given that benefits analysis of this rule focuses on changes in freshwater wetland areas, the agencies first re-estimated the linear MRM in a Bayesian framework using 32 observations from freshwater wetland

studies, with vague prior settings for all coefficients and the error variance (*see* Moeltner et al. (2019) for detail). Because freshwater and saltwater wetlands may share pooled coefficients, the agencies used the SSVS algorithm described in Moeltner et al. (2019) to determine whether pooling freshwater and saltwater coefficients is appropriate.

The dependent variable in the meta-regression is the natural log of household WTP for the specified change, expressed in per-acre terms. WTP is modeled as a function of “context-defining” and “moderator” variables in the log-linear regression equation. Context-defining variables are those that are relevant to the final rule including the baseline number of acres, the number of acres preserved or restored, whether those acres are forested wetlands, whether they were described by the primary study to provide several specific ecosystem services, and the study’s region (*e.g.*, Canada or U.S. Northeast). Moderating variables generally refer to details on how the original study was conducted and are not relevant to benefit transfer but are included to avoid omitted variable bias and to adjust for the study characteristics (*e.g.*, voluntary payment) to ensure that the meta-regression function used in benefit transfer reflects the best benefit transfer practices and desired study characteristics (*e.g.*, non-voluntary payment such as income tax). Table B-2 presents the means and standard deviations of all explanatory variables used in the Pooled and Freshwater Models.¹⁰² The model specification used to estimate the benefit parameters for transfer in the Pooled Model is:

$$\ln y_{js} - \ln(q_{1js} - q_{0js}) = \mathbf{x}'_{fs}\beta_f + \mathbf{x}'_{ms}\beta_m + \gamma\left(\frac{q_{1js} + q_{0js}}{2}\right) + \mathbf{z}'\delta + \varepsilon_s \quad \text{Equation 1}$$

where y_{js} is the estimated WTP to obtain an increase (or avoid a loss) in wetland acres for observation j in study s , q_{0js} and q_{1js} are the corresponding baseline and policy-endpoint acres of wetlands, respectively, and ε_s is a standard error term with zero mean and variance of σ_ε^2 . The left-hand side of the equation [$\ln y_{js} - \ln(q_{1js} - q_{0js})$] corresponds to the estimated per acre value for each observation from the meta-data. This specification ensures that the estimated model meets adding-up requirements, as shown in Moeltner et al. (2019). \mathbf{X} represents explanatory variables in the context of freshwater wetlands and \mathbf{z} represents all identified interactions¹⁰³ between these explanatory variables with an indicator for saltwater wetlands. For ease of exposition, the explanatory variables on the right-hand side of Equation 1 have been separated into *fixed variables* for which specific settings will be inserted for a given prediction context (\mathbf{x}_{fs}), and

¹⁰² To implement the E-EEAC recommendations regarding meta-regression specification, the agencies also estimated a regression model without wetland ecosystem service indicators (*i.e.*, regulating, provisioning, and cultural) and compared the estimation results with the original models. Results of this analysis are not presented in Appendix B (*see* document in the docket for detail). A comparison of the models without and with ecosystem service indicators shows a Bayes Factor of 1001. In other words, the original meta-regression model is 1000 times more probable than the meta-regression without ecosystem service indicators. This is a decisive difference. In addition, error variance essentially doubles for the models that do not include ecosystem service indicators. These models also did not perform well in benefit transfer applications. In summary, dropping wetland ecosystem service indicators leads to clearly inferior models.

¹⁰³ The saltwater interaction terms modify the freshwater coefficients when the interaction terms are deemed important enough to be included in the Bayesian model by the SSVS algorithm. We note that given the small sample size and multitude of interaction terms, not all interactions could be identified (*i.e.*, due to perfect collinearity). For example, the interaction between ‘*nema*’ and ‘*salt*’ could not be identified due to its being collinear with the interaction between ‘*cult*’ and ‘*salt*’. All identified interaction terms are shown in Table B-2.

auxiliary variables whose influence will be averaged out in the prediction process (x_{ms}). β_f , β_m and δ are vectors of estimated parameters. The three ecosystem service indicators (*regulating*, *provisioning*, and *cultural*) are treated as auxiliary variables. All other variables are fixed and will be given a specific setting in benefit transfer prediction. This simple normal regression model with independent, homoscedastic error is the best-fitting specification compared to models with more complex error structure (see Moeltner et al. (2019) for detail on other specifications that allow for unobserved study-level heterogeneity and observation-level heteroskedasticity). The model specification used for the Freshwater Model is similar to the Pooled Model with all saltwater wetland interaction terms (z) excluded.

Table B-2: Meta-regression variable summary

	Description	Pooled Model ¹			Freshwater Model ²		
		Mean	Min	Max	Mean	Min	Max
Dependent variable							
lnwtp	log(total WTP in 2021 dollars)	4.51	1.15	7.66	4.18	1.15	6.15
Context specific variables							
lnyear	log(year of data collection – oldest)	2.39	0	3.43	2.10	0	3.43
lninc	log(income in 2021 dollars)	11.11	10.74	11.58	11.07	10.74	11.58
sagulf	1 = S-Atlantic/Gulf (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX)	0.15	0	1	0.16	0	1
nema	1 = NE/mid-Atlantic (CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	0.35	0	1	0.09	0	1
nmw	N/Mid-West (IA, IL, IN, KS, MI, MN, MO, MT, NE, ND, OH, SD, WI)	0.23	0	1	0.38	0	1
CAN	1 = Canadian study	0.19	0	1	0.31	0	1
local	1 = wetland is within 30 miles, on average, of CBGs or counties in the State	0.44	0	1	0.34	0	1
forest	1 = forested wetland	0.25	0	1	0.41	0	1
q ₀ ³	baseline acres (1000s)	282.6	0	2,131.0	260.1	0	1,307.2
q ₁ ³	policy acres (1000s)	334.6	0.1	2,382.0	314.4	0.5	1,616.1
(q ₀ +q ₁)/2 ³	the midpoint between baseline and policy acres (1000s)	308.6	0	2,256.5	287.3	0.4	1,461.6
lumpsum	1 = a lump sum (single payment)	0.33	0	1	0.28	0	1
volunt	1 = payment mechanism is a voluntary contribution	0.17	0	1	0.28	0	1
Auxiliary variables							
prov	1 = provisioning function affected	0.4	0	1	0.25	0	1
reg	1 = regulating function affected	0.73	0	1	0.69	0	1
cult	1 = cultural function affected	0.67	0	1	0.63	0	1
Saltwater Interaction variables							
salt	1 = saltwater wetland study	0.39	0	1			
lnyear*salt		1.1	0	3.3			
lninc*salt		4.29	0	11.51			
sagulf*salt		0.06	0	1			
local*salt		0.23	0	1			
prov*salt		0.25	0	1			
reg*salt		0.31	0	1			
cult*salt		0.29	0	1			
q ₀ *salt ³		122.6	0	2,131.0			

Table B-2: Meta-regression variable summary

	Description	Pooled Model ¹			Freshwater Model ²		
		Mean	Min	Max	Mean	Min	Max
$q_1 * salt^3$		141.1	0	2,382.0			
$(q_0 + q_1)/2 * salt^3$		131.8	0	2,256.5			

¹ Summary statistics are based on the 52 observations from the U.S. and Canadian freshwater and saltwater valuation studies.

² Summary statistics are based on the 32 observations from the U.S. and Canadian freshwater valuation studies.

³ Models 1 and 2 do not include separate explanatory variables for baseline and policy acres and instead uses a single explanatory variable that is the midpoint between them. Summary statistics for q_0 , q_1 , $q_0 * salt$, and $q_1 * salt$ are provided for informational purposes.

The freshwater model is estimated via Bayesian posterior simulation. The Bayesian estimation routine provides distributions for each of the estimated parameters and is performed using Gibbs sampling (Train, 2009). The pooled model is estimated using the SSVS algorithm described in Moeltner et al. (2019). The SSVS procedure is implemented by allowing for interaction terms of context-specific variables with a binary indicator “saltwater”. Table B-3 presents the posterior means and standard deviations for the parameters of the two MRMs. Based on the estimated distributions of the parameters, the variables *local*, *forest*, *sagulf*, *CAN*, *prov*, *cult*, and $(q_0 + q_1)/2$ are the strongest predictors of WTP with more than 90% of their probability mass on one side of zero (*i.e.*, a $p(>0) > 0.90$ indicates that 90% of the probability mass is to the left of zero and a $p(>0) < 0.10$ indicates that 90% of the probability mass is to the right of zero) as shown in columns four and eight. In other words, these variables either have clear positive effects (*local*, *forest*, *sagulf*, *CAN*, *cult*) or negative effects (*prov*, $(q_0 + q_1)/2$) on WTP. The main purpose of saltwater interaction terms in the Pooled Model is to modify the freshwater coefficients when these terms receive a high posterior probability of inclusion ($p(\text{in})$). Of the 10 interaction terms included in the model, five received low inclusion probabilities of less than 50 percent (*const*salt*, *lnyear*salt*, *lninc*salt*, *local*salt*, $(q_0 + q_1)/2 * salt$) suggesting that the marginal effect of these variables on WTP is similar in two wetland types. Four variables (*prov*salt*, *cult*salt*, *reg*salt*, and *sagulf*salt*) exceeded the inclusion probability of 0.5 suggesting that the two wetland types differ across these four interactive dimensions.

In general, the Pooled and Freshwater Models produce similar results. The regression results indicate that wetland values elicited in a local context (from studies evaluating sub-State changes in wetlands) produce values that, on average, exceed non-local values by a factor of 23.14 based on the Pooled model and by a Factor of 16.6 based on the Freshwater Model.¹⁰⁴ Additionally, when cultural services, and forested wetlands are affected, wetland values respectively increase by factors of 2.35 and 6.72 based on the Pooled Model, and 4.18 and 7.78 based on the Freshwater Model. A negative coefficient on the average wetland area between the baseline and policy scenarios $[(q_0 + q_1)/2]$ aligns with economic theory and indicates that WTP for wetland preservation diminishes as baseline wetland areas increase. However, there are two notable differences between these two models: (1) the magnitude of coefficients on regional indicators *sagulf*, *nema*, *nwm*, and *CAN* is smaller; and (2) the coefficient on the regulating service indicator (*reg*) now has a positive effect on WTP which is in line with prior expectations.

¹⁰⁴ These factors are calculated using $e^{\beta} - 1$.

Although the magnitude of the effects differ between the Pooled and Freshwater Models, both models support the conclusion that WTP for wetlands is greater when wetlands are local or forested and when there is fewer wetlands in the baseline. The implications of the two notable differences are that, relative to the Freshwater Model, (1) the Pooled Model will produce WTP estimates that are less influenced by the region where wetlands reside, and (2) produce WTP estimates that on average increase when regulating ecosystem services are present.

To evaluate models' performance in benefit transfer, the agencies obtained benefit transfer predictions using the Pooled and Freshwater models. Comparison of the two models showed that the SSVS approach (*i.e.*, Pooled Model) resulted in more efficient benefit estimates (*i.e.*, a tighter distribution of household WTP) compared to the Freshwater Model due to a much larger sample size. Therefore, the agencies selected the Pooled Model for estimating benefits from increased mitigation requirements.

Table B-3: Meta-regression results

	Pooled Model ¹				Freshwater Model ²		
	mean	std.	p(> 0) ³	p(in) ⁴	mean	std.	p(> 0) ³
constant	-0.607	3.042	0.421		-1.575	3.089	0.304
Context-specific							
lnyear	-1.263	0.400	0.002		-1.331	0.400	0.002
lninc	0.227	0.291	0.782		0.290	0.292	0.839
sagulf	1.990	1.385	0.921		2.841	1.373	0.976
nema	-1.611	1.163	0.082		-2.061	1.167	0.038
nmw	1.166	1.085	0.857		1.728	1.085	0.940
CAN	3.109	1.649	0.968		4.079	1.648	0.990
local	3.184	0.579	1.000		2.868	0.627	1.000
prov	-3.456	0.693	0.000		-3.968	0.660	0.000
reg	0.349	0.599	0.717		-0.002	0.574	0.485
cult	1.210	0.736	0.945		1.644	0.723	0.983
forest	2.044	0.582	0.999		2.173	0.562	1.000
(q0+q1)/2	-0.001	0.001	0.088		-0.001	0.001	0.056
Moderators							
volunt	-2.090	0.837	0.009		-2.573	0.809	0.002
lumpsum	2.226	0.566	1.000		2.724	0.545	1.000
Interactions							
const*salt	-0.390	2.009	0.439	0.483			
lnyear*salt	-0.097	0.771	0.424	0.304			
lninc*salt	-0.119	0.303	0.339	0.204			
sagulf*salt	-2.141	1.765	0.139	0.748			
local*salt	0.346	0.702	0.660	0.348			
prov*salt	4.951	0.930	1.000	1.000			
reg*salt	6.399	1.154	1.000	1.000			
cult*salt	2.405	2.354	0.832	0.706			
(q0+q1)/2* salt	-0.001	0.001	0.144	0.030			
σ^2	0.775	0.233	1.000		0.693	0.273	1.000

¹ Model 1 is a log-linear model based on the 52 observations from the U.S. and Canadian saltwater and freshwater valuation studies

² Model 2 is a log-linear model based on the 32 observations from the U.S and Canadian freshwater valuation studies.

³ Prob(>0) equals the share of the posterior density to the right of zero.

Table B-3: Meta-regression results

	Pooled Model ¹				Freshwater Model ²		
	mean	std.	p(> 0) ³	p(in) ⁴	mean	std.	p(> 0) ³

⁴ Prob(in) is estimated using the SSVS algorithm and indicates whether freshwater and saltwater contexts pool, rather than deviate, along a particular dimension (the variables interacted with salt). Prob(in) greater than 0.5 indicates that saltwater and freshwater wetlands are different along these interactive dimensions and these coefficients do not pool well.

B.3. WTP prediction

As discussed in Chapter III.C.2.3., the agencies used 50-mile, 100-mile, and 200-mile buffers of county centroids to develop a range of benefit estimates. For comparison, the agencies also estimated benefits using state boundaries as the market extent.¹⁰⁵ The agencies also examined implementing a benefit transfer approach using 100-mile buffers within census tracts, rather than county, centroids. Although theoretically appropriate, this approach, given its finer geospatial scale, proved to be computationally resource intensive and could not be implemented for the final rule. These radial approaches have several advantages over a State-based approach:

- A spatially uniform approach to distance decay replaces the heterogeneous distance decay implied by State-level benefit transfer. In this approach, wetland benefits do not arbitrarily stop at State borders, nor does distance decay depend on States' geographic size.
- The radius-based approach, used to specify an outer distance boundary where benefits decline to zero, also lends itself naturally to measuring wetland change that falls within an inner, local distance boundary. By leveraging the "local" parameter from the meta-regression models, the radius-based approach accounts for additional value that accrues to households when avoided wetland losses are local.¹⁰⁶
- Using counties as unit of analysis allows to better account for local resource and demographic characteristics. Feedback received during recent public listening sessions period suggested probable differences in wetland valuation in rural versus urban areas. For example, in large, western States, where most wetland gains/losses may fall in rural areas that are not well represented by State level average socio-demographics, a radius-based approach is likely to provide a more accurate measure of benefits to the affected households (*e.g.*, county residents). The agencies chose to use counties rather than smaller geographic units such as census tracts or blocks for computational efficiency. The agencies acknowledge that results would differ based on the geographic unit used but do not believe using counties rather than smaller units makes a meaningful difference in the final results. County size is heterogeneous like State boundaries can be. To address potential problems with large counties not fitting within the 50-, 100-, and 200-mile radii, the agencies split large counties predominantly found in western States into smaller areas that readily fell within the radii considered.

¹⁰⁵ For description of the benefit transfer approach that relies on state boundaries to define the market extent see the 2020 NWPR analysis (U.S. EPA and Army, 2020a).

¹⁰⁶ The local buffer distance of 30-miles was based on a maximum distance from households to nearest wetland change in the set of studies used to define the local variable in the regression model.

Given the identical steps taken to calculate WTP for increased mitigation requirements predictions using three different radii (50-miles, 100-miles, and 200-miles), the agencies focus on describing the 100-mile radius approach.

The 100-mile radius approach assumes that households hold a value for preserving wetlands that are up to 100 miles away from their residence (centroids of counties are used as a simplified representation of the distance from a typical residency). Economic theory does not provide guidance as to the appropriate extent of the market, so the meta-data is used to determine this threshold. The study-weighted average distance to (freshwater and saltwater) the nearest wetlands in the meta-data when sub-setting to studies that valued *non-local* wetland impacts is 99.44 miles.¹⁰⁷ When excluding an outlier study by Petrolia et al. (2014),¹⁰⁸ a study-weighted average distance to the nearest wetlands is 51 miles, and the maximum distance to the nearest wetlands is 213.5 miles. Given these results, the agencies estimated a range of benefits using 50-, 100-, and 200-mile radii.

To estimate per-household WTP for a change in wetland acres, the agencies assigned location-specific values to the following independent variables: baseline wetland acres within a 100-mile buffer of a given county centroid (q_0), the expected change in wetland mitigation acres under the final rule ($q_1 - q_0$), median household income ($\ln inc = \log$ of 2021 median income),¹⁰⁹ the proportion of the baseline and change in acres that is forested, the proportion of the baseline and change in acres that is local, and the region of the United States. The agencies defined ‘local’ as the proportion of wetlands within 30 miles of a county centroid relative to wetlands within 100 miles of a county centroid.¹¹⁰ The value of q_0 for each 100-mile buffer of a county is the difference between the current total wetland acres and the expected wetland impacts (in acres) under the 2020 NWPR. The value of q_1 for each 100-mile buffer of a county is the difference between the current total wetland acres and the expected wetland impacts (in acres) under the final rule. The increase in wetland mitigation acres, ($q_1 - q_0$), is estimated as the *reduction in wetland losses* from 2020 NWPR to the final rule. Given the difficulties of displaying all inputs used in the benefit transfer at the county-level, Table B-4 lists the values for each variable at the State-level.¹¹¹

¹⁰⁷ The average is based on 10 U.S. saltwater and freshwater wetland studies that valued non-local wetland impacts. Given the policy context and limitations of Canadian wetland data, the agencies excluded four Canadian studies from these estimates.

¹⁰⁸ Petrolia et al. (2014) conducted a national survey of WTP for a large-scale restoration project in the Barataria-Terrebonne National Estuary in coastal Louisiana.

¹⁰⁹ The agencies evaluated WTP for avoiding wetland losses using both mean and median income values, the resulting WTP estimates were nearly identical.

¹¹⁰ The 30-mile threshold is based on the distance between wetlands and the sampled population within studies that valued wetlands at the sub-state level (e.g., watershed) in the meta-data. A single distance value was calculated for each study by taking the average of the distances between census block group centroids in the sampled area to the nearest wetland. The maximum distance to the nearest wetlands among those studies at the sub-state or province level was 28.4 miles.

¹¹¹ These parameters are applied in alternative State-level benefit transfer applications presented in Appendix D. The county-level inputs used in the radial benefit transfer approaches can be found in the docket.

Table B-4: State-specific benefit transfer variables

State ¹	Median HH income (thous. 2021\$) ²	Region ³	Baseline acres (thous.)	Prop. forested acres	Prop. Local Wetlands – Baseline ⁴	Proportion local wetlands – <i>Raplanos</i> impacts ⁴		Proportion local wetlands – NWPR impacts ⁴		Annual increase in wetland mitigation acres ⁵		Cumulative increase in wetland mitigation acres ^{5,6}	
						Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
AK	81.9	NMW	-	0.43	0.09	0.09	0.09	0.09	0.09	98.0	13.6	1,960.1	203.4
AL	53.3	SAG	4,204.0	0.96	0.09	0.09	0.09	0.08	0.08	32.3	5.4	646.4	80.5
AR	50.2	SAG	2,408.5	0.97	0.08	0.07	0.06	0.08	0.07	12.0	2.5	239.2	37.7
AZ	62.1		354.1	0.82	0.10	0.06	0.06	0.13	0.12	12.9	1.5	258.8	22.2
CA	79.3		3,028.6	0.29	0.11	0.09	0.08	0.10	0.10	51.7	76.1	1,033.2	1,141.3
CO	76.3		2,002.3	0.16	0.10	0.12	0.12	0.09	0.09	4.2	0.7	83.7	11.0
CT	82.7	NMA	310.5	0.91	0.12	0.20	0.20	0.08	0.08	0.2	1.8	3.4	26.3
DE	72.0	SAG	263.3	0.93	0.14	0.15	0.15	0.08	0.08	0.7	0.2	13.3	3.4
FL	58.7	SAG	12,183.1	0.69	0.12	0.12	0.11	0.14	0.14	511.8	4.2	10,235.1	62.6
GA	61.9	SAG	6,548.3	0.95	0.08	0.08	0.07	0.09	0.09	25.7	1.2	514.6	18.1
IA	63.8	NMW	1,088.4	0.52	0.08	0.07	0.07	0.09	0.09	16.2	0.3	325.0	4.6
ID	58.8		1,324.8	0.23	0.08	0.09	0.10	0.14	0.14	1.9	0.1	37.7	1.5
IL	69.5	NMW	1,301.3	0.80	0.08	0.08	0.08	0.06	0.06	13.5	0.9	270.0	13.2
IN	59.4	NMW	1,055.9	0.78	0.09	0.11	0.11	0.10	0.10	62.0	0.7	1,239.7	10.3
KS	62.8	NMW	1,899.9	0.36	0.09	0.10	0.10	0.09	0.09	34.1	1.7	681.5	26.0
KY	53.3	NMW	465.6	0.92	0.06	0.07	0.07	0.10	0.10	49.6	0.9	992.4	14.2
LA	52.2	SAG	8,028.3	0.69	0.11	0.12	0.13	0.16	0.17	93.8	19.1	1,876.5	285.8
MA	85.6	NMA	695.8	0.91	0.13	0.11	0.11	0.07	0.07	0.3	1.2	5.6	17.6
MD	89.4	SAG	814.7	0.92	0.11	0.10	0.10	0.12	0.11	2.5	0.6	49.5	9.2
ME	61.1	NMA	2,548.3	0.90	0.13	0.11	0.11	0.11	0.11	2.1	0.1	41.7	1.9
MI	60.2	NMW	7,797.0	0.90	0.11	0.04	0.04	0.07	0.07	1.9	0.0	37.7	0.6
MN	75.2	NMW	10,854.6	0.71	0.08	0.09	0.09	0.10	0.11	69.9	34.0	1,397.2	510.1
MO	58.5	NMW	1,386.5	0.81	0.08	0.06	0.06	0.06	0.06	9.5	1.0	190.6	15.4
MS	47.5	SAG	3,968.6	0.96	0.08	0.07	0.07	0.08	0.08	27.3	15.3	545.7	229.2
MT	58.0		3,227.1	0.14	0.10	0.06	0.07	0.10	0.10	5.6	0.1	112.6	1.7
NC	57.6	SAG	4,366.5	0.97	0.08	0.09	0.09	0.08	0.08	14.7	4.1	295.0	61.7
ND	68.4	NMW	1,509.0	0.02	0.09	0.11	0.11	0.10	0.10	23.2	5.1	464.1	76.2
NE	64.8	NMW	1,314.9	0.18	0.08	0.06	0.07	0.07	0.08	9.3	0.3	185.6	4.3
NH	80.9	NMA	310.2	0.84	0.11	0.05	0.05	0.11	0.11	0.8	0.2	15.7	3.0
NJ	87.0	NMA	889.2	0.90	0.17	0.05	0.05	0.09	0.09	0.3	0.0	5.9	0.6

Table B-4: State-specific benefit transfer variables

State ¹	Median HH income (thous. 2021\$) ²	Region ³	Baseline acres (thous.)	Prop. forested acres	Prop. Local Wetlands – Baseline ⁴	Proportion local wetlands – <i>Raplanos</i> impacts ⁴		Proportion local wetlands – NWPR impacts ⁴		Annual increase in wetland mitigation acres ⁵		Cumulative increase in wetland mitigation acres ^{5,6}	
						Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary
NM	52.5		363.0	0.44	0.08	0.09	0.09	0.09	0.09	1.0	2.7	19.7	40.1
NV	63.6		1,033.2	0.25	0.07	0.03	0.03	0.05	0.05	1.5	0.1	29.3	2.1
NY	72.2	NMA	2,207.9	0.84	0.10	0.09	0.09	0.11	0.11	4.5	2.7	89.5	40.1
OH	59.7	NMW	538.9	0.80	0.09	0.08	0.08	0.10	0.10	21.2	1.8	424.0	27.1
OK	55.8	SAG	1,379.6	0.81	0.09	0.06	0.06	0.07	0.07	1.7	0.1	34.1	1.7
OR	66.2		1,895.8	0.20	0.09	0.10	0.11	0.10	0.10	33.7	0.7	673.0	11.1
PA	65.1	NMA	544.5	0.84	0.06	0.10	0.10	0.07	0.07	3.0	6.9	60.3	103.4
RI	70.8	NMA	60.7	0.95	0.16	0.28	0.27	0.10	0.09	0.1	1.2	1.6	17.3
SC	56.1	SAG	3,932.6	0.94	0.10	0.09	0.09	0.09	0.09	21.7	0.6	434.1	8.7
SD	61.4	NMW	2,065.2	0.03	0.09	0.09	0.09	0.08	0.08	7.1	0.7	142.4	11.1
TN	56.2	SAG	1,165.7	0.94	0.09	0.08	0.07	0.06	0.06	8.5	0.5	169.1	8.2
TX	65.2	SAG	4,630.6	0.46	0.09	0.08	0.08	0.08	0.07	58.9	30.8	1,177.1	461.4
UT	75.5		758.8	0.11	0.08	0.13	0.13	0.15	0.14	4.9	1.6	98.8	23.6
VA	78.2	SAG	1,455.0	0.89	0.07	0.09	0.10	0.11	0.11	10.7	3.6	213.4	53.8
VT	65.3	NMA	86.1	0.79	0.03	0.12	0.15	0.15	0.15	0.7	0.4	14.1	6.3
WA	77.8		959.6	0.48	0.11	0.10	0.09	0.09	0.09	12.1	4.1	242.6	61.8
WI	65.1	NMW	6,868.3	0.79	0.09	0.07	0.07	0.09	0.09	19.5	11.9	390.8	178.8
WV	49.2	SAG	57.1	0.64	0.05	0.12	0.09	0.07	0.07	4.4	1.7	87.9	25.8
WY	67.5		1,852.4	0.21	0.09	0.08	0.08	0.12	0.13	3.1	0.1	62.8	1.4

¹ Hawaii and District of Columbia are excluded from the analysis. Wetlands have not been fully mapped for the State of Alaska. Based on current, incomplete wetland mapping, Alaska has 93,821,779 million acres of baseline wetlands. Because this value greatly exceeds the maximum baseline acreage value in the meta-data (2,131,000), using this value in the model produces large and unreliable results. Although the mean coefficient for the midpoint between the baseline and policy wetland area is negative, approximately 9 percent of the distribution of coefficients fall within the positive value range. Thus, average benefit estimates based on the full range of potential midpoint coefficient values are significantly higher when using actual baseline wetland acres in Alaska versus using the 2-million-acre cutoff. Therefore, the baseline wetlands value is set to a threshold value of 2 million acres. The proportion of forested wetlands was calculated from currently available NWI wetland data in the State and the proportion of local acres is set to the national average.

² Median household income is taken from the 2019 American Community Survey (ACS) and converted to 2021\$ using the Bureau of Economic Analysis' GDP deflator.

³ SAG = South Atlantic/Gulf, NMA = Northeast/Mid-Atlantic, NMW = Northern/Mid-West. The omitted category includes States in the Arid or semi-Arid West and Pacific North-West.

Table B-4: State-specific benefit transfer variables

State ¹	Median HH income (thous. 2021\$) ²	Region ³	Baseline acres (thous.)	Prop. forested acres	Prop. Local Wetlands – Baseline ⁴	Proportion local wetlands – <i>Rapanos</i> impacts ⁴		Proportion local wetlands – NWPR impacts ⁴		Annual increase in wetland mitigation acres ⁵		Cumulative increase in wetland mitigation acres ^{5,6}	
						Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary

⁴ Proportions of local baseline wetlands, *Rapanos* impacts, and NWPR impacts are based on the county-level averages of wetland areas within 30-mile buffer radii of county centroids relative to 100-mile circular buffers.

⁵ In most cases, wetland impact mitigation requirements increase when moving from the secondary baseline of the 2020 NWPR to the final rule. However, there are a few exceptions where mitigation requirements decrease. To calculate the difference in mitigation requirements between the 2020 NWPR and the final rule, the agencies use “percent permitted” values estimated for major Cowardin categories under the 2020 NWPR and the final rule. For most Cowardin categories, the “percent permitted” increases under the final rule relative to the 2020 NWPR. However, the “percent permitted” decreases under the final rule relative to 2020 NWPR for three Cowardin categories: Marine, Sub-tidal Marine, and Intertidal Marine. Under the rulemaking, HUC12s in which section 404 permits primarily affect these three Cowardin categories may have small decreases in mitigation requirements. This is the case for less than 1 percent of impacted HUC12s.

⁶ Cumulative wetland mitigation acres are the sum of permanent and temporary mitigation acres over the 20-year period of analysis, assuming linear trends and a 5-year delay for temporary mitigation acres. This delay is based on discussions with the Corps and accounts for the time required for temporarily impacted areas to return to their original state.

Source: EPA analysis

For each 100-mile buffer of a county the agencies consider different valuation scenarios based on the "local" and "forested" status of acres for the baseline (q_0) and the estimated reduction in losses under the final regulation. Wetlands located within a 30-mile buffer from county centroids are assumed to be "local". In the equations provided below, the fractions of local wetlands and forested wetlands in a given county buffer are given by (α) and (λ). The agencies assume that (i) the share of forested wetlands is homogeneous across local and nonlocal acres, and that (ii) the share of forested wetlands applies equally to the baseline acres and the reduction in acreage losses under the final regulation. The distribution of local and non-local wetlands is, however, different between the baseline acres and the changes in wetland losses under the final regulation because development projects tend to be located closer to populated areas. Since the locations of baseline wetlands and reduced wetland losses under NWPR and under the final rule differ, separate fractions of local wetlands are estimated for each. α_{base} represents the fraction of local baseline wetlands, α_{Nperm} and α_{Ntemp} represent the fractions of local permanent and local temporary impacts under NWPR, and α_{Rperm} and α_{Rtemp} represent the fractions of local permanent and local temporary impacts under the final rule.

The agencies relied on HAWQS wetland data and ORM2 impacts data to estimate baseline wetland areas, forested and non-forested wetlands, and impacts within 30-mile (i.e., local wetlands) and 100-mile circular buffers from county centroids. HAWQS wetlands data and ORM2 impacts data are spatially aggregated to 12-digit hydrologic unit code (HUC) watershed boundaries. Spatial distribution of both wetlands and impacts within 12-digit HUC watershed boundaries were assumed to be consistent across the watershed. To determine the baseline wetland areas and impacts within each buffer, the agencies intersected the 30-mile and 100-mile circular buffers with the 12-digit HUC watershed boundaries. The proportion of the total area of the 12-digit HUC watershed within the buffer determined the proportion of the baseline wetland area from the HAWQS and impacts from ORM2 data attributed to being within that buffer. The agencies then estimated the fractions of local baseline wetland areas and local impacts by dividing the baseline wetland areas and impacts within 30-mile buffers by the corresponding areas within 100-mile buffers.

Given these assumptions, the agencies estimate four per household WTP values for each area, one for each combination of "local" and "forested." Each of these valuation scenarios is characterized by the baseline acres (q_0), policy acres (q_1), and indicator settings for *local* and *forested*.

Additionally, the agencies estimate household WTP for each of these scenarios *at each point in time* throughout the period of analysis. This is because q_0 and q_1 vary with the number of years that have accumulated during the years in which permanent (j) and temporary (l) wetland impacts (under the 2020 NWPR and the final rule) are expected to occur.

Under the baseline scenario, baseline wetland acres are reduced over time given the wetland mitigation acres that are expected to occur under 2020 NWPR, where permanent wetland mitigation acres accumulate throughout the entire analysis period (i.e., all 20 years, starting in 2023) and temporary wetland mitigation acres accumulate after a 5-year delay (i.e., 15 years, starting in 2028). Under the policy scenario, baseline wetland acres are reduced over time given the wetland mitigation acres that are expected to occur under the final rule (i.e., a return to *Rapanos* Guidance), with permanent and temporary wetland mitigation acres occurring over the same described time frames. Since the wetland mitigation acres under the final rule are smaller relative to the 2020 NWPR, the change between q_1 and q_0 in a given

year represents the cumulative acres of wetland preserved under the final rule up to that point in time. Due to the compounding nature of these impacts, the acres of wetland preserved increases throughout the period of analysis.¹¹²

Specifically, letting the total wetland acres be (q_{0T}) and suppressing county-specific subscripts for convenience), the four primary valuation scenarios are as follows:

Scenario I: Local, forested wetlands (local = 1 and forested = 1 in \mathbf{x}_{fs})

$$q_0 = \lambda(\alpha_{base}q_{0T} - \alpha_{Nperm}NWPR_{perm} * j - \alpha_{Ntemp}NWPR_{temp} * l)$$

$$q_1 = \lambda(\alpha_{base}q_{0T} - \alpha_{Rperm}Rapanos_{perm} * j - \alpha_{Rtemp}Rapanos_{temp} * l)$$

Scenario II: Local, non-forested wetlands (local = 1 and forested = 0 in \mathbf{x}_{fs})

$$q_0 = (1 - \lambda)(\alpha_{base}q_{0T} - \alpha_{Nperm}NWPR_{perm} * j - \alpha_{Ntemp}NWPR_{temp} * l)$$

$$q_1 = (1 - \lambda)(\alpha_{base}q_{0T} - \alpha_{Rperm}Rapanos_{perm} * j - \alpha_{Rtemp}Rapanos_{temp} * l)$$

Scenario III: Non-local, forested wetlands (local = 0 and forested = 1 in \mathbf{x}_{fs})

$$q_0 = \lambda[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Nperm})NWPR_{perm} * j - (1 - \alpha_{Ntemp})NWPR_{temp} * l]$$

$$q_1 = \lambda[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Rperm})Rapanos_{perm} * j - (1 - \alpha_{Rtemp})Rapanos_{temp} * l]$$

Scenario IV: Non-local, non-forested wetlands (local = 0 and forested = 0 in \mathbf{x}_{fs})

$$q_0 = (1 - \lambda)[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Nperm})NWPR_{perm} * j - (1 - \alpha_{Ntemp})NWPR_{temp} * l]$$

$$q_1 = (1 - \lambda)[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Rperm})Rapanos_{perm} * j - (1 - \alpha_{Rtemp})Rapanos_{temp} * l]$$

WTP estimates are dependent on the regional indicator settings for each State (*sagulf*, *nema*, and *nmw*).

The remaining variables in (\mathbf{x}_{fs}) are set as follows: *lyear* = 3.4965 (log (2021-1988)), *CAN* = 0 since the analysis focuses on the U.S. households, *lumpsum* = 0 resulting in household WTP values that are based on annual payments (for cumulative changes in wetland acres), *volunt* = 0 since voluntary payments are not incentive compatible and generally not supported in by economic literature (Carson and Groves, 2007; Johnston et al., 2017), with the three regional indicators (*sagulf*, *nema*, and *nmw*) taking county-specific settings as applicable. Lastly, since only freshwater wetlands are affected by the change from 2020 NWPR to the final rule, all saltwater wetland interactions in (\mathbf{z}) are set to zero.

WTP for each of the four primary scenarios are estimated as a weighted average over WTP predictions corresponding to all 8 combinations of the three auxiliary variables in \mathbf{x}_{ms} . After setting wetland acreage, *forested*, and *local* to correspond to one of the four scenarios discussed above, the agencies estimate WTP values corresponding to this primary scenario for all 8 combinations of the auxiliary variables. We then

¹¹² Wetland mitigation acres are assumed to accumulate linearly over time. These cumulative wetland impacts align with the assumption of annual payments in the benefit transfer approach (*i.e.*, a WTP is calculated for every county and every year for the avoidance of the cumulative wetland impacts in a given year).

assign a probability weight to each combination, based on sample proportions for the wetland service indicators (prob (*prov*=1)=0.404; prob (*reg*=1)=0.731; and prob (*cult*=1)=0.673)).

The WTP estimate for a given primary scenario is calculated as the weighted sum of these 8 individual predictions, with weights determined by the joint probability of observing a given combination for the auxiliary variables. For example, the weight for the combination of "all 1's" for the ecosystem service indicators is derived as follows:

$$\text{prob}(\text{prov}=1, \text{reg}=1, \text{cult}=1) = 0.404 * 0.731 * 0.673 = 0.199.$$

The sum of all weights for 8 combinations of auxiliary variables is equal to "1".

The agencies use the variable settings described above to develop the posterior mean of the predictive WTP distribution, as well as the lower and upper bound of the corresponding highest posterior density interval. Mathematically, the probability-weighted prediction of WTP for primary scenario *p* (*p* =1 through 4), for the *r*-th draw of parameters from the original Gibbs Sampler, can be expressed as:

$$y_{p,r} = \sum_{m=1}^M \left(\pi_m * \exp \left(x'_{fp} \beta_{f,r} + x'_m \beta_{m,r} + \gamma_r \left(\frac{q_{1,p} - q_{0,p}}{2} \right) + \varepsilon_r \right) (q_{1,p} - q_{0,p}) \right) \quad \text{Equation 2}$$

where now subscript *m* denotes a specific combination of auxiliary variable settings, *M* is the total number of variable setting combinations (8), and π_m is the probability weight for combination *m*, as described above.

The scenario-specific settings for a given wetland type (*e.g.*, "*nonlocal*," "*forested*", etc.) are based on the corresponding acreage amounts $q_{0,p}$ and $q_{1,p}$, and the settings for *local* and *forested* in x_{fp} , as discussed above. All predictions for Gibbs Sampler iteration *r* receive the same error term ε_r , drawn from a zero-mean normal density with iteration-specific variance σ_r^2 .

This process is repeated for all *r*=1...*R* draws of coefficients and variances from the original Gibbs Sampler. The resulting set of draws characterizes the full posterior predictive distribution of the WTP for y_p . The agencies then obtained the posterior mean as well as the lower and upper bound of the corresponding highest posterior density interval from the posterior distribution, as described in Moeltner et al. (2019).

The end results of this analysis are full predictive distributions for WTP corresponding to each of the four *local* / *nonlocal* and *forested* / *non-forested* combinations of wetland types for each State in the U.S. These distributions can be further added up to obtain WTP for all local acres, all forested acres, all nonlocal acres, and all non-forested acres, respectively. For the purpose of this analysis, the agencies obtained the full posterior distribution of grand total WTP for the entire increase in wetland acres in a given State by adding up each predictive draw over all four wetland types.

Following the best practices from the economic literature, the agencies truncated the WTP distribution at the 99th percentile prior to estimating the mean, and lower and upper bounds of WTP (Moeltner and Woodward, 2009).

Estimating Total WTP

To estimate total WTP (TWTP) for water quality improvements for each 100-mile buffer of a county, the agencies multiplied the per-household WTP values for the estimated average annual increases in wetland areas protected as jurisdictional by the number of households within each county in a given year. Annual benefits (TWTP) from avoided wetland losses are estimated for all years between 2023 and 2042. For each time period, the total number of households is adjusted to reflect predicted population growth, so it takes a different value for each year and county.¹¹³ The agencies then aggregate county-specific TWTP for all time periods of interest to account for the following: (1) annual WTP accrual over time and (2) the additional wetland acres that are protected as jurisdictional. A discount factor is applied to each time period before aggregating over years to derive the present value (PV) of future streams of WTP, where i is the chosen discount rate. The agencies then calculated annualized total WTP values for each county with both a 3 percent and 7 percent discount rate as shown below in Equation 3. Benefits from avoided wetland losses are estimated for all years between 2023 and 2042. For this analysis, the agencies used a simplified assumption that all benefits from mitigation measure to address permanent impacts on wetland areas begin accruing in 2023. The agencies further assumed a 5-year lag in benefits from mitigation measures to minimize temporary impacts on wetlands.

$$TWTP_{T,C} = \left(\sum_{T=2023}^{2042} \frac{HWTP_{T,C} \times HH_{T,C}}{(1+i)^{T-2023}} \right) \times \left(\frac{i \times (1+i)^n}{(1+i)^{n+1} - 1} \right) \quad \text{Equation 3}$$

where:

$TWTP_{T,S}$	= Total household WTP in 2021\$ for households in county (C) in year (T),
$HWTP_{T,S}$	= Annual household WTP in 2021\$ for households in county (C) in year (T),
$HH_{T,S}$	= The number of households residing in county (C) in year (T),
T	= Year when benefits are realized,
i	= Discount rate (3 or 7 percent),
n	= Duration of the analysis (20 years).

¹¹³ Values will also differ for each year since per household WTP is dependent on the cumulative wetland mitigation acres under the 2020 NWPR and the final rule.

The agencies generated annual household counts for each county throughout the period of analysis based on projected population growth, using 2021 NASA Socioeconomic Data and Applications Center (SEDAC) projections (Hauer et al., 2021).¹¹⁴

¹¹⁴ These household projections are based on population projections from Shared Socioeconomic Pathway 2 (SSP2) (Hauer et al., 2021) and persons per household estimates from the 2019 American Community Survey (ACS). SSP2 is a “middle-of-the-road” projection, where social, economic, and technological trends do not shift markedly from historical patterns. Projections are only provided every 5 years. The agencies assumed linear extrapolation to impute projected values in remaining years. Household projections were calculated by dividing the population projections by the persons per household. Projections used for the proposal were based on data from Woods and Pool. The final analysis uses Hauer et al (2021) in place of Woods and Pool for reasons of transparency. The code, methodology, and data used in population projection estimates are all publicly available and easily accessible. Additionally, benefit estimates were compared between models using both population projection data sources and results were similar.

Appendix C Final Rule Analysis: State-level Results

This appendix provides State-level results of the agencies' estimates of the benefits and costs relative to the secondary baseline of the 2020 NWPR. The estimated benefits and costs are based on the 2023-2042 analysis period. Table C-1 presents average annual increases in Clean Water Act section 404 program-related permit and mitigation requirements (permanent and temporary) relative to the secondary baseline of the 2020 NWPR, by State. Table C-2, Table C-3, and Table C-4 present permit costs, mitigation costs, and total costs (sum of permit costs and mitigation costs), respectively, by State.

Table C-5 and Table C-6 present annualized benefits (in millions 2021\$), using 3 percent and 7 percent discount rates, respectively, from increased Clean Water Act section 404-related mitigation requirements (and associated reductions in wetland losses) by State. Benefits are estimated using a benefit transfer application of the Pooled Model to 50-mile, 100-mile, and 200-mile buffers of county centroids for counties in the conterminous United States (excluding Hawaii, Alaska, and the District of Columbia). To estimate State-level benefits, the agencies aggregated benefits across all counties in a given State (*i.e.*, State-level benefits are estimated for all households residing in a given State but include wetlands outside of the State boundaries). Appendix D provides estimated benefits using state boundaries as the extent of the market.

Table C-1: Estimated average annual increase in Clean Water Act section 404-related permits and mitigation requirements (permanent + temporary) by State, relative to the secondary baseline of the 2020 NWPR

State	Average Annual Increase in Number of Permits ^{1,3}		Average Annual Increase in Mitigation Requirements ^{2,3}	
	Individual Permits	General Permits	Acres	Linear Feet
AK	11.4	63.9	110.9	551
AL	2.6	69.1	20.8	14,725
AR	2.0	268.1	11.5	2,606
AZ	1.8	108.1	13.3	963
CA	6.2	583.3	78.2	43,132
CO	1.4	104.1	3.9	863
CT	0.3	22.2	1.9	8
DE	0.2	5.6	0.7	154
FL	20.5	121.2	512.0	3,437
GA	2.4	89.3	24.4	2,243
IA	2.3	94.7	13.8	2,441
ID	0.5	61.9	1.2	717
IL	2.9	197.6	8.8	4,859
IN	2.1	131.9	27.3	30,776
KS	1.9	264.1	9.7	22,777
KY	0.8	69.1	16.2	29,905
LA	23.8	260.9	110.1	2,437
MA	0.3	28.8	1.4	48
MD	0.8	39.5	2.2	786
ME	1.2	84.4	2.2	1
MI	10.8	167.3	1.8	92
MN	8.9	127.4	96.0	6,870
MO	2.2	404.1	7.9	2,300
MS	3.3	107.1	40.3	1,954
MT	0.6	53.8	5.1	561
NC	2.5	133.0	17.2	1,461
ND	1.2	105.2	23.7	3,997
NE	0.6	60.0	8.4	1,043
NH	0.3	70.8	1.0	7
NJ	0.1	1.6	0.3	12
NM	0.6	90.5	3.5	157
NV	0.3	78.4	1.0	484
NY	2.5	199.9	6.0	973
OH	2.0	258.1	14.4	7,498
OK	0.5	86.1	1.6	222
OR	2.6	47.1	31.9	2,194
PA	1.2	809.9	7.4	2,177
RI	0.1	5.3	1.2	28
SC	1.5	39.8	21.5	669
SD	1.0	58.9	6.8	893
TN	3.7	182.1	5.7	2,908
TX	6.2	1,030.2	74.0	13,617
UT	0.7	88.4	5.1	1,224
VA	1.6	89.4	9.9	3,753

Table C-1: Estimated average annual increase in Clean Water Act section 404-related permits and mitigation requirements (permanent + temporary) by State, relative to the secondary baseline of the 2020 NWPR

State	Average Annual Increase in Number of Permits ^{1,3}		Average Annual Increase in Mitigation Requirements ^{2,3}	
	Individual Permits	General Permits	Acres	Linear Feet
VT	0.6	36.5	1.1	12
WA	4.6	55.3	10.7	4,831
WI	5.3	236.5	23.3	7,085
WV	0.5	424.8	2.6	3,034
WY	0.1	36.2	2.8	347
Total	150.9	7,751.3	1,402.9	233,832

¹ Estimated average annual permit increases based on single-water section 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the 2020 NWPR.

² Estimated average annual mitigation increase (both permanent and temporary) based on permits issued in years 2010-2019 with mitigation requirements on waterways that became no longer jurisdictional under the 2020 NWPR, excluding permits issued for mitigation or restoration activities because the main purpose of these activities is to restore or enhance ecosystem services provided by water resources as opposed to dredge and fill activities that lead to permanent or temporary losses of ecosystem services. The increase in mitigation requirements includes permanent and temporary impacts because throughout the analysis period, permittees will incur costs for mitigation of both permanent and temporary impacts (*i.e.*, no 5-year lag for temporary impacts in mitigation cost estimates).

³ Reflects increases in permit numbers and mitigation requirements in 49 States (excludes Hawaii and District of Columbia).

Table C-2: Estimated annualized permit costs by State, relative to the secondary baseline of the 2020 NWPR (thousands 2021\$)

State	3% Discount Rate ^{1,2}		7% Discount Rate ^{1,2}	
	Low	High	Low	High
AK	\$513	\$1,529	\$533	\$1,589
AL	\$392	\$1,264	\$407	\$1,313
AR	\$1,386	\$4,580	\$1,440	\$4,757
AZ	\$576	\$1,887	\$598	\$1,960
CA	\$3,048	\$10,042	\$3,167	\$10,432
CO	\$548	\$1,802	\$570	\$1,872
CT	\$117	\$384	\$121	\$399
DE	\$32	\$103	\$33	\$107
FL	\$955	\$2,857	\$992	\$2,968
GA	\$491	\$1,595	\$510	\$1,657
IA	\$517	\$1,683	\$537	\$1,748
ID	\$320	\$1,058	\$333	\$1,099
IL	\$1,046	\$3,433	\$1,086	\$3,566
IN	\$701	\$2,298	\$728	\$2,387
KS	\$1,365	\$4,512	\$1,418	\$4,687
KY	\$363	\$1,193	\$377	\$1,240
LA	\$1,716	\$5,337	\$1,783	\$5,544
MA	\$151	\$497	\$157	\$516
MD	\$213	\$697	\$222	\$724
ME	\$445	\$1,463	\$463	\$1,520
MI	\$1,025	\$3,242	\$1,065	\$3,367
MN	\$793	\$2,497	\$823	\$2,594
MO	\$2,076	\$6,872	\$2,157	\$7,139
MS	\$596	\$1,930	\$619	\$2,004
MT	\$282	\$928	\$293	\$964
NC	\$714	\$2,334	\$741	\$2,425
ND	\$550	\$1,813	\$572	\$1,883
NE	\$313	\$1,032	\$325	\$1,072
NH	\$363	\$1,201	\$377	\$1,248
NJ	\$9	\$29	\$9	\$30
NM	\$467	\$1,544	\$485	\$1,604
NV	\$401	\$1,329	\$417	\$1,381
NY	\$1,051	\$3,456	\$1,091	\$3,590
OH	\$1,336	\$4,412	\$1,387	\$4,583
OK	\$443	\$1,466	\$460	\$1,523
OR	\$280	\$892	\$291	\$927
PA	\$4,107	\$13,645	\$4,267	\$14,175
RI	\$28	\$91	\$29	\$95
SC	\$226	\$729	\$235	\$757
SD	\$314	\$1,030	\$327	\$1,070
TN	\$980	\$3,204	\$1,018	\$3,328
TX	\$5,303	\$17,544	\$5,509	\$18,225
UT	\$457	\$1,511	\$475	\$1,570
VA	\$478	\$1,564	\$496	\$1,625

Table C-2: Estimated annualized permit costs by State, relative to the secondary baseline of the 2020 NWPR (thousands 2021\$)

State	3% Discount Rate ^{1,2}		7% Discount Rate ^{1,2}	
	Low	High	Low	High
VT	\$194	\$636	\$202	\$661
WA	\$357	\$1,114	\$371	\$1,157
WI	\$1,282	\$4,182	\$1,332	\$4,344
WV	\$2,151	\$7,149	\$2,235	\$7,427
WY	\$184	\$610	\$191	\$634
Total	\$41,655	\$136,200	\$43,272	\$141,489

¹ For each State, permit costs are calculated by multiplying the estimated average annual increase in the number of single-water individual and general permits (see Table C-1) by the low and high unit costs for each permit type from the Corps NWP analysis (\$16,300 to \$39,000 per individual permit; \$4,900 to \$16,300 per general permit), summing the individual permit and general permit values, and annualizing the values over the 2023-2042 analysis period.

² Reflects expected costs in 49 States (excludes Hawaii and District of Columbia).

Table C-3: Estimated annualized mitigation costs by State, relative to the secondary baseline of the 2020 NWPR (thousands 2021\$)

State	Cost Per Acre (2021\$)		Cost Per LF (2021\$)		Annualized Mitigation Costs ^{1,2} (Thousands 2021\$)			
					3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High
AK	\$61,021	\$119,104	\$332	\$763	\$7,161	\$14,041	\$7,439	\$14,587
AL	\$61,021	\$119,104	\$301	\$763	\$5,865	\$14,119	\$6,093	\$14,667
AR	\$33,946	\$61,468	\$273	\$610	\$1,136	\$2,365	\$1,180	\$2,457
AZ	\$61,021	\$94,921	\$332	\$763	\$1,166	\$2,058	\$1,212	\$2,138
CA	\$237,304	\$434,209	\$332	\$763	\$33,883	\$68,878	\$35,199	\$71,552
CO	\$58,591	\$81,915	\$102	\$407	\$327	\$693	\$340	\$720
CT	\$371,963	\$531,819	\$332	\$763	\$737	\$1,055	\$765	\$1,096
DE	\$38,421	\$282,504	\$424	\$791	\$95	\$333	\$99	\$346
FL	\$61,021	\$119,104	\$332	\$763	\$33,355	\$65,508	\$34,650	\$68,052
GA	\$194,363	\$307,365	\$992	\$1,102	\$7,169	\$10,258	\$7,448	\$10,656
IA	\$41,555	\$91,205	\$102	\$433	\$844	\$2,380	\$877	\$2,473
ID	\$47,743	\$91,627	\$332	\$763	\$302	\$673	\$314	\$699
IL	\$72,834	\$119,054	\$258	\$677	\$1,949	\$4,466	\$2,025	\$4,640
IN	\$56,501	\$80,231	\$332	\$719	\$12,123	\$25,042	\$12,593	\$26,014
KS	\$61,021	\$119,104	\$102	\$407	\$2,993	\$10,729	\$3,110	\$11,146
KY	\$124,320	\$186,480	\$339	\$853	\$12,522	\$29,399	\$13,008	\$30,540
LA	\$11,300	\$67,801	\$332	\$763	\$2,115	\$9,603	\$2,197	\$9,975
MA	\$673,537	\$702,114	\$113	\$226	\$978	\$1,025	\$1,016	\$1,064
MD	\$70,815	\$256,138	\$624	\$862	\$664	\$1,274	\$690	\$1,323
ME	\$283,528	\$423,323	\$332	\$763	\$647	\$966	\$672	\$1,004
MI	\$59,628	\$147,806	\$260	\$1,122	\$136	\$382	\$141	\$397
MN	\$10,502	\$86,382	\$332	\$763	\$3,389	\$13,937	\$3,521	\$14,478
MO	\$30,510	\$91,531	\$102	\$458	\$490	\$1,831	\$509	\$1,902
MS	\$29,380	\$36,726	\$301	\$763	\$1,825	\$3,061	\$1,896	\$3,180
MT	\$33,901	\$41,811	\$332	\$763	\$370	\$660	\$384	\$686
NC	\$29,883	\$80,540	\$336	\$442	\$1,034	\$2,091	\$1,074	\$2,172
ND	\$45,201	\$67,801	\$332	\$763	\$2,471	\$4,795	\$2,567	\$4,981
NE	\$61,021	\$119,104	\$102	\$407	\$635	\$1,464	\$660	\$1,521
NH	\$176,603	\$249,008	\$277	\$831	\$180	\$257	\$187	\$267
NJ	\$42,941	\$339,005	\$332	\$763	\$18	\$123	\$19	\$128
NM	\$58,591	\$81,915	\$332	\$763	\$264	\$417	\$274	\$433
NV	\$119,971	\$223,524	\$332	\$763	\$295	\$621	\$306	\$645
NY	\$81,361	\$103,487	\$350	\$475	\$857	\$1,119	\$890	\$1,162
OH	\$42,376	\$244,084	\$186	\$1,526	\$2,069	\$15,403	\$2,149	\$16,001
OK	\$56,162	\$68,907	\$266	\$627	\$151	\$254	\$157	\$264
OR ³	\$61,586	\$141,444	\$332	\$763	\$2,773	\$6,367	\$2,880	\$6,615
PA	\$75,429	\$222,495	\$453	\$977	\$1,592	\$3,890	\$1,653	\$4,041
RI	\$522,751	\$616,967	\$332	\$763	\$656	\$785	\$682	\$816
SC	\$112,124	\$193,953	\$664	\$772	\$2,943	\$4,831	\$3,057	\$5,018
SD	\$45,201	\$67,801	\$332	\$763	\$624	\$1,179	\$648	\$1,225
TN	\$42,376	\$42,376	\$271	\$409	\$1,059	\$1,472	\$1,101	\$1,529
TX	\$61,021	\$119,104	\$593	\$1,017	\$12,971	\$23,340	\$13,474	\$24,246
UT	\$61,021	\$119,104	\$332	\$763	\$740	\$1,588	\$769	\$1,650
VA	\$33,901	\$226,004	\$424	\$791	\$1,985	\$5,373	\$2,062	\$5,582

Table C-3: Estimated annualized mitigation costs by State, relative to the secondary baseline of the 2020 NWPR (thousands 2021\$)

State	Cost Per Acre (2021\$)		Cost Per LF (2021\$)		Annualized Mitigation Costs ^{1,2} (Thousands 2021\$)			
					3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High
VT	\$124,302	\$148,653	\$332	\$763	\$146	\$180	\$152	\$187
WA ⁴	\$78,337	\$1,259,398	\$332	\$763	\$2,517	\$17,679	\$2,615	\$18,366
WI	\$80,005	\$119,104	\$332	\$763	\$4,347	\$8,428	\$4,516	\$8,755
WV	\$135,602	\$203,403	\$823	\$933	\$2,938	\$3,468	\$3,053	\$3,603
WY	\$47,084	\$57,255	\$332	\$763	\$256	\$440	\$266	\$457
Total					\$175,763	\$390,299	\$182,589	\$405,457

¹ For each State, costs are calculated by multiplying the cost of each mitigation acre or linear foot (low and high estimates) by the expected increase in annual mitigation requirements (see Table C-1), summing the acreage and linear feet values, and annualizing the values over the 2023-2042 analysis period.

² Reflects expected costs in 49 States (excludes Hawaii and District of Columbia).

³ The values for price per linear feet in Oregon have been updated since the Economic Analysis for the Proposed Rule to reflect the national median values. Prior values had used price per acre of stream rather than linear feet.

⁴ The values for acres in Washington are comparatively higher than other States. In Washington, the prices per acre are conversions based on application of Credit-Debit methodology.

Table C-4: Total estimated annualized costs by State, relative to the secondary baseline of the 2020 NWPR (thousands 2021\$)

State	3% Discount Rate ¹		7% Discount Rate ¹	
	Low	High	Low	High
AK	\$7,674	\$15,571	\$7,972	\$16,175
AL	\$6,258	\$15,383	\$6,501	\$15,980
AR	\$2,521	\$6,945	\$2,619	\$7,214
AZ	\$1,742	\$3,945	\$1,810	\$4,098
CA	\$36,931	\$78,920	\$38,365	\$81,985
CO	\$876	\$2,495	\$910	\$2,592
CT	\$853	\$1,439	\$886	\$1,495
DE	\$127	\$436	\$132	\$453
FL	\$34,310	\$68,365	\$35,643	\$71,020
GA	\$7,660	\$11,852	\$7,957	\$12,313
IA	\$1,361	\$4,063	\$1,414	\$4,221
ID	\$623	\$1,731	\$647	\$1,798
IL	\$2,995	\$7,899	\$3,111	\$8,206
IN	\$12,823	\$27,340	\$13,321	\$28,402
KS	\$4,359	\$15,241	\$4,528	\$15,833
KY	\$12,884	\$30,592	\$13,384	\$31,780
LA	\$3,832	\$14,939	\$3,981	\$15,519
MA	\$1,129	\$1,522	\$1,173	\$1,581
MD	\$878	\$1,971	\$912	\$2,047
ME	\$1,092	\$2,429	\$1,135	\$2,524
MI	\$1,161	\$3,624	\$1,206	\$3,765
MN	\$4,182	\$16,434	\$4,344	\$17,072
MO	\$2,566	\$8,703	\$2,666	\$9,041
MS	\$2,421	\$4,990	\$2,515	\$5,184
MT	\$652	\$1,588	\$677	\$1,650
NC	\$1,748	\$4,425	\$1,816	\$4,597
ND	\$3,021	\$6,608	\$3,139	\$6,865
NE	\$948	\$2,496	\$985	\$2,593
NH	\$543	\$1,459	\$564	\$1,515
NJ	\$27	\$152	\$29	\$158
NM	\$731	\$1,961	\$759	\$2,037
NV	\$696	\$1,951	\$723	\$2,026
NY	\$1,907	\$4,575	\$1,981	\$4,752
OH	\$3,404	\$19,815	\$3,536	\$20,585
OK	\$594	\$1,720	\$617	\$1,787
OR	\$3,053	\$7,260	\$3,172	\$7,542
PA	\$5,699	\$17,534	\$5,920	\$18,215
RI	\$684	\$877	\$711	\$911
SC	\$3,169	\$5,559	\$3,292	\$5,775
SD	\$938	\$2,209	\$975	\$2,294
TN	\$2,040	\$4,676	\$2,119	\$4,858
TX	\$18,274	\$40,884	\$18,983	\$42,472
UT	\$1,197	\$3,100	\$1,244	\$3,220
VA	\$2,463	\$6,937	\$2,559	\$7,207
VT	\$341	\$816	\$354	\$848
WA	\$2,874	\$18,793	\$2,985	\$19,523

Table C-4: Total estimated annualized costs by State, relative to the secondary baseline of the 2020 NWPR (thousands 2021\$)

State	3% Discount Rate ¹		7% Discount Rate ¹	
	Low	High	Low	High
WI	\$5,629	\$12,610	\$5,847	\$13,100
WV	\$5,090	\$10,618	\$5,287	\$11,030
WY	\$440	\$1,050	\$457	\$1,090
Total	\$217,418	\$526,499	\$225,861	\$546,946

¹ Reflects expected costs in 49 States (excludes Hawaii and District of Columbia).

Table C-5: Total national annualized benefits by State, relative to the baseline of the 2020 NWPR (millions 2021\$, 3% discount rate)

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Annualized benefits (millions 2021\$, 3% discount rate) ^{1,3,4}		
		50-mile radius	100-mile radius	200-mile radius	50-mile radius	100-mile radius	200-mile radius
AK	0.3	\$1.12	\$1.12	\$1.12	\$3.3	\$3.3	\$3.3
AL	1.9	\$16.14	\$5.59	\$3.22	\$35.4	\$41.2	\$59.9
AR	1.2	\$16.19	\$5.35	\$2.76	\$5.4	\$6.7	\$13.8
AZ	2.6	\$3.84	\$1.57	\$0.87	\$2.8	\$3.2	\$4.3
CA	13.0	\$2.06	\$0.77	\$0.46	\$63.6	\$70.6	\$78.4
CO	2.1	\$1.63	\$0.67	\$0.44	\$1.3	\$1.4	\$1.5
CT	1.4	\$0.63	\$0.19	\$0.10	\$0.1	\$0.1	\$0.2
DE	0.4	\$0.56	\$0.16	\$0.09	\$0.0	\$0.0	\$0.1
FL	7.7	\$14.60	\$6.52	\$3.61	\$775.4	\$873.3	\$1,062.7
GA	3.8	\$17.27	\$5.96	\$2.60	\$42.1	\$48.5	\$93.8
IA	1.3	\$4.12	\$1.52	\$0.73	\$2.4	\$2.9	\$5.2
ID	0.6	\$2.13	\$0.91	\$0.48	\$0.1	\$0.1	\$0.1
IL	4.8	\$5.98	\$1.78	\$0.99	\$11.0	\$13.6	\$25.7
IN	2.6	\$6.90	\$2.42	\$1.42	\$16.4	\$21.6	\$34.4
KS	1.1	\$2.50	\$1.05	\$0.64	\$4.2	\$4.5	\$6.1
KY	1.7	\$14.63	\$5.31	\$3.10	\$31.9	\$43.9	\$72.8
LA	1.7	\$16.06	\$7.39	\$3.40	\$58.1	\$66.8	\$91.7
MA	2.6	\$0.50	\$0.18	\$0.10	\$0.2	\$0.3	\$0.4
MD	2.2	\$0.55	\$0.24	\$0.13	\$0.5	\$0.5	\$0.8
ME	0.6	\$0.58	\$0.23	\$0.12	\$0.0	\$0.0	\$0.0
MI	3.9	\$5.51	\$2.05	\$0.84	\$1.2	\$1.9	\$6.3
MN	2.2	\$3.84	\$1.38	\$0.88	\$17.3	\$19.8	\$29.0
MO	2.4	\$4.98	\$1.67	\$0.87	\$8.7	\$9.4	\$17.2
MS	1.1	\$16.45	\$5.51	\$2.68	\$17.1	\$21.4	\$35.4
MT	0.4	\$3.33	\$1.05	\$0.55	\$0.1	\$0.1	\$0.2
NC	4.0	\$17.05	\$5.74	\$2.91	\$26.1	\$32.6	\$62.0

Table C-5: Total national annualized benefits by State, relative to the baseline of the 2020 NWPR (millions 2021\$, 3% discount rate)

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Annualized benefits (millions 2021\$, 3% discount rate) ^{1,3,4}		
		50-mile radius	100-mile radius	200-mile radius	50-mile radius	100-mile radius	200-mile radius
ND	0.3	\$1.03	\$0.46	\$0.32	\$0.5	\$0.5	\$1.1
NE	0.8	\$2.42	\$0.90	\$0.38	\$2.7	\$2.9	\$3.7
NH	0.5	\$0.58	\$0.24	\$0.14	\$0.0	\$0.0	\$0.1
NJ	3.2	\$0.56	\$0.21	\$0.10	\$0.1	\$0.2	\$0.4
NM	0.8	\$2.10	\$0.65	\$0.29	\$0.0	\$0.1	\$0.1
NV	1.1	\$1.61	\$0.53	\$0.27	\$1.3	\$1.5	\$2.0
NY	7.3	\$0.61	\$0.24	\$0.12	\$0.4	\$0.5	\$1.0
OH	4.7	\$5.96	\$2.22	\$1.23	\$17.8	\$21.1	\$36.1
OK	1.5	\$12.29	\$4.14	\$1.74	\$2.2	\$2.6	\$7.5
OR	1.6	\$2.25	\$0.86	\$0.52	\$4.8	\$5.3	\$6.1
PA	5.1	\$0.53	\$0.17	\$0.09	\$0.4	\$0.5	\$1.0
RI	0.4	\$0.74	\$0.23	\$0.11	\$0.1	\$0.1	\$0.1
SC	1.9	\$15.88	\$5.83	\$3.20	\$25.1	\$30.1	\$47.0
SD	0.3	\$1.10	\$0.40	\$0.21	\$0.2	\$0.3	\$0.5
TN	2.6	\$15.66	\$4.32	\$2.39	\$14.0	\$20.6	\$64.7
TX	9.7	\$8.71	\$3.12	\$1.73	\$188.5	\$205.4	\$283.3
UT	1.0	\$1.12	\$0.57	\$0.32	\$0.2	\$0.2	\$0.3
VA	3.2	\$3.64	\$1.51	\$0.82	\$4.6	\$5.1	\$6.6
VT	0.3	\$0.72	\$0.30	\$0.13	\$0.0	\$0.0	\$0.0
WA	2.8	\$2.76	\$0.90	\$0.55	\$6.5	\$7.0	\$8.0
WI	2.4	\$5.46	\$1.92	\$1.10	\$6.9	\$8.4	\$13.2
WV	0.7	\$2.35	\$0.79	\$0.48	\$0.4	\$0.6	\$1.4
WY	0.2	\$1.50	\$0.45	\$0.22	\$0.0	\$0.0	\$0.0
Total	120.0	-	-	-	\$1,401.7	\$1,601.0	\$2,189.8

Table C-5: Total national annualized benefits by State, relative to the baseline of the 2020 NWPR (millions 2021\$, 3% discount rate)

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Annualized benefits (millions 2021\$; 3% discount rate) ^{1,3,4}		
		50-mile radius	100-mile radius	200-mile radius	50-mile radius	100-mile radius	200-mile radius
<p>¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.</p> <p>² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period using population projections from Hauer et al. (2021).</p> <p>³ Benefit estimates are based on a benefit transfer application of the Pooled Model to 50-mile, 100-mile, and 200-mile buffers of county centroids for counties in the conterminous United States (excluding Hawaii, Alaska, and the District of Columbia; see Appendix B for detail).</p> <p>⁴ Total benefits are annualized over the 2023-2042 analysis period. Given data limitations, benefits could not be calculated for Alaska at a level finer than the State (<i>i.e.</i>, at a county-equivalent level) for the 50-mile, 100-mile, and 200-mile buffer market extents. National benefits for the three buffer market extents include estimated benefits for Alaska using a State-specific benefit transfer (<i>see</i> Appendix D for details). Total annualized benefits for some states display as zero due to rounding.</p>							

Table C-6: Total national annualized benefits by State, relative to the baseline of the 2020 NWPR (millions 2021\$, 7% discount rate)

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Annualized benefits (millions 2021\$; 7% discount rate) ^{1,3,4}		
		50-mile radius	100-mile radius	200-mile radius	50-mile radius	100-mile radius	200-mile radius
AK	0.3	\$1.12	\$1.12	\$1.12	\$2.9	\$2.9	\$2.9
AL	1.9	\$16.14	\$5.59	\$3.22	\$30.7	\$35.6	\$51.8
AR	1.2	\$16.19	\$5.35	\$2.76	\$4.6	\$5.8	\$11.9
AZ	2.6	\$3.84	\$1.57	\$0.87	\$2.4	\$2.8	\$3.7
CA	13.0	\$2.06	\$0.77	\$0.46	\$52.3	\$58.1	\$64.6
CO	2.1	\$1.63	\$0.67	\$0.44	\$1.1	\$1.2	\$1.2
CT	1.4	\$0.63	\$0.19	\$0.10	\$0.1	\$0.1	\$0.2
DE	0.4	\$0.56	\$0.16	\$0.09	\$0.0	\$0.0	\$0.1
FL	7.7	\$14.60	\$6.52	\$3.61	\$669.0	\$753.5	\$917.1
GA	3.8	\$17.27	\$5.96	\$2.60	\$36.3	\$41.8	\$81.0
IA	1.3	\$4.12	\$1.52	\$0.73	\$2.1	\$2.5	\$4.5
ID	0.6	\$2.13	\$0.91	\$0.48	\$0.1	\$0.1	\$0.1
IL	4.8	\$5.98	\$1.78	\$0.99	\$9.6	\$11.9	\$22.5
IN	2.6	\$6.90	\$2.42	\$1.42	\$14.3	\$18.8	\$30.0
KS	1.1	\$2.50	\$1.05	\$0.64	\$3.6	\$3.9	\$5.3
KY	1.7	\$14.63	\$5.31	\$3.10	\$27.8	\$38.2	\$63.3
LA	1.7	\$16.06	\$7.39	\$3.40	\$50.1	\$57.6	\$78.9
MA	2.6	\$0.50	\$0.18	\$0.10	\$0.2	\$0.2	\$0.3
MD	2.2	\$0.55	\$0.24	\$0.13	\$0.4	\$0.5	\$0.7
ME	0.6	\$0.58	\$0.23	\$0.12	\$0.0	\$0.0	\$0.0
MI	3.9	\$5.51	\$2.05	\$0.84	\$1.1	\$1.6	\$5.5
MN	2.2	\$3.84	\$1.38	\$0.88	\$14.9	\$17.1	\$25.0
MO	2.4	\$4.98	\$1.67	\$0.87	\$7.6	\$8.2	\$15.0
MS	1.1	\$16.45	\$5.51	\$2.68	\$14.8	\$18.4	\$30.5
MT	0.4	\$3.33	\$1.05	\$0.55	\$0.1	\$0.1	\$0.1
NC	4.0	\$17.05	\$5.74	\$2.91	\$22.4	\$28.0	\$53.3

Table C-6: Total national annualized benefits by State, relative to the baseline of the 2020 NWPR (millions 2021\$, 7% discount rate)

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Annualized benefits (millions 2021\$; 7% discount rate) ^{1,3,4}		
		50-mile radius	100-mile radius	200-mile radius	50-mile radius	100-mile radius	200-mile radius
ND	0.3	\$1.03	\$0.46	\$0.32	\$0.4	\$0.4	\$0.9
NE	0.8	\$2.42	\$0.90	\$0.38	\$2.4	\$2.5	\$3.2
NH	0.5	\$0.58	\$0.24	\$0.14	\$0.0	\$0.0	\$0.0
NJ	3.2	\$0.56	\$0.21	\$0.10	\$0.1	\$0.2	\$0.4
NM	0.8	\$2.10	\$0.65	\$0.29	\$0.0	\$0.0	\$0.1
NV	1.1	\$1.61	\$0.53	\$0.27	\$1.1	\$1.3	\$1.7
NY	7.3	\$0.61	\$0.24	\$0.12	\$0.3	\$0.4	\$0.8
OH	4.7	\$5.96	\$2.22	\$1.23	\$15.5	\$18.4	\$31.4
OK	1.5	\$12.29	\$4.14	\$1.74	\$1.9	\$2.3	\$6.4
OR	1.6	\$2.25	\$0.86	\$0.52	\$4.1	\$4.6	\$5.3
PA	5.1	\$0.53	\$0.17	\$0.09	\$0.3	\$0.5	\$0.9
RI	0.4	\$0.74	\$0.23	\$0.11	\$0.1	\$0.1	\$0.1
SC	1.9	\$15.88	\$5.83	\$3.20	\$21.6	\$26.0	\$40.5
SD	0.3	\$1.10	\$0.40	\$0.21	\$0.2	\$0.2	\$0.4
TN	2.6	\$15.66	\$4.32	\$2.39	\$12.1	\$17.8	\$55.9
TX	9.7	\$8.71	\$3.12	\$1.73	\$161.0	\$175.3	\$241.5
UT	1.0	\$1.12	\$0.57	\$0.32	\$0.2	\$0.2	\$0.2
VA	3.2	\$3.64	\$1.51	\$0.82	\$4.0	\$4.4	\$5.7
VT	0.3	\$0.72	\$0.30	\$0.13	\$0.0	\$0.0	\$0.0
WA	2.8	\$2.76	\$0.90	\$0.55	\$5.6	\$6.0	\$6.9
WI	2.4	\$5.46	\$1.92	\$1.10	\$5.9	\$7.3	\$11.4
WV	0.7	\$2.35	\$0.79	\$0.48	\$0.3	\$0.5	\$1.2
WY	0.2	\$1.50	\$0.45	\$0.22	\$0.0	\$0.0	\$0.0
Total	120.0	-	-	-	\$1,205.5	\$1,377.2	\$1,884.6

Table C-6: Total national annualized benefits by State, relative to the baseline of the 2020 NWPR (millions 2021\$, 7% discount rate)

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Annualized benefits (millions 2021\$; 7% discount rate) ^{1,3,4}		
		50-mile radius	100-mile radius	200-mile radius	50-mile radius	100-mile radius	200-mile radius
<p>¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.</p> <p>² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period using population projections from Hauer et al. (2021).</p> <p>³ Benefit estimates are based on a benefit transfer application of the Pooled Model to 50-mile, 100-mile, and 200-mile buffers of county centroids for counties in the conterminous United States (excluding Hawaii, Alaska, and the District of Columbia; see Appendix B for detail).</p> <p>⁴ Total benefits are annualized over the 2023-2042 analysis period. Given data limitations, benefits could not be calculated for Alaska at a level finer than the State (<i>i.e.</i>, at a county-equivalent level) for the 50-mile, 100-mile, and 200-mile buffer market extents. National benefits for the three buffer market extents include estimated benefits for Alaska using a State-specific benefit transfer (<i>see</i> Appendix D for details). Total annualized benefits for some states display as zero due to rounding.</p>							

Appendix D Sensitivity Analysis of National Benefits

The approach for estimating benefits used for the final analysis follows the same basic approach used for the proposal analysis, but does include some changes to the valuation function. To assess the sensitivity of national benefits estimates to changes in the valuation function (*i.e.*, inclusion of saltwater studies in MRM) and benefit transfer approach, the agencies estimated WTP for increased wetland mitigation requirements using both the Pooled and Freshwater models in conjunction of alternative settings for the lumpsum variable using the State-level approach to benefit transfer. A comparison of the national benefits estimates across these alternatives is presented in Table D-3 below. Table D-3 also includes estimates from the proposed rule analysis for comparative purposes. Although Table D-3 includes total national benefits annualized using both 3 percent and 7 percent discount rates, the discussion below focuses on the results based on the 3 percent discount rates.

To address the potential effects of (1) using a radius-based, rather than a State-specific, benefit transfer approach and (2) using annual payments for the cumulative avoided wetland loss (from an increase in mitigation requirements), rather than a lumpsum payment for the average annual avoided wetland losses from one year to the next, the agencies analyzed the benefits from the Pooled Model using State-specific benefit transfers and each payment assumption (*i.e.*, applying the State-level MRM settings from Table B-4, Lumpsum=0 and Lumpsum=1). State-level annualized benefits based on the Pooled Model are presented in Table D-1. Total national annualized benefits are presented in Table D-3 under the panel “Pooled model using a State-specific benefit transfer approach”.

For the lumpsum approach, the calculations for $(\frac{q_0+q_1}{2})$ are described in Scenarios I through IV in Appendix C (U.S. EPA and Army, 2021)). However, the proposed rule analysis assumed a static baseline. In the final rule analysis, the agencies accounted for potential changes to the baseline wetland areas from year to year and adjusted calculations in scenarios I through IV as follows:

Scenario I: Local, forested wetlands (local = 1 and forested = 1 in \mathbf{x}_{fs})

$$q_0 = \lambda(\alpha_{base}q_{0T} - \alpha_{Nperm}NWPR_{perm} - \alpha_{Ntemp}NWPR_{temp} * I)$$

$$q_1 = \lambda(\alpha_{base}q_{0T} - \alpha_{Rperm}Rapanos_{perm} - \alpha_{Rtemp}Rapanos_{temp} * I)$$

Scenario II: Local, non-forested wetlands (local = 1 and forested = 0 in \mathbf{x}_{fs})

$$q_0 = (1 - \lambda)(\alpha_{base}q_{0T} - \alpha_{Nperm}NWPR_{perm} - \alpha_{Ntemp}NWPR_{temp} * I)$$

$$q_1 = (1 - \lambda)(\alpha_{base}q_{0T} - \alpha_{Rperm}Rapanos_{perm} - \alpha_{Rtemp}Rapanos_{temp} * I)$$

Scenario III: Non-local, forested wetlands (local = 0 and forested = 1 in \mathbf{x}_{fs})

$$q_0 = \lambda[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Nperm})NWPR_{perm} - (1 - \alpha_{Ntemp})NWPR_{temp} * I]$$

$$q_1 = \lambda[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Rperm})Rapanos_{perm} - (1 - \alpha_{Rtemp})Rapanos_{temp} * I]$$

Scenario IV: Non-local, non-forested wetlands (local = 0 and forested = 0 in \mathbf{x}_{fs})

$$q_0 = (1 - \lambda)[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Nperm})NWPR_{perm} - (1 - \alpha_{Ntemp})NWPR_{temp} * I]$$

$$q_1 = (1 - \lambda)[(1 - \alpha_{base})q_{0T} - (1 - \alpha_{Rperm})Rapanos_{perm} - (1 - \alpha_{Rtemp})Rapanos_{temp} * I]$$

where I is an indicator variable equal to zero in the first 5 years of the analysis period and equal to 1 in the last 15 years. Average annual increases in mitigation acres are calculated from the difference in permanent wetland mitigation acres between the 2020 NWPR and the final rule, with temporary mitigation acres included after a 5-year delay. Using the State of Texas in Table B-4 as an example, the average annual increase in permanent mitigation acres in years 2023 through 2027 is 65.1, and the average annual increase in permanent and temporary mitigation acres in years 2028-2042 is 104.0.

To address the potential effect of including saltwater studies in the meta-data, the agencies also estimated WTP for increased mitigation requirements using the Freshwater Model. Appendix B presents a comparison of the meta-regression results (which can be found in Table B-3) and describes the benefit transfer methodology used in benefits estimation. State-level annualized benefits are presented in Table D-2. Total national annualized benefits for both settings of lumpsum are presented in Table D-3 under the panel “Freshwater Model using a State-specific benefit transfer approach”.

Effects of using the lumpsum approach versus annual payments. Using the “Pooled Model and a State-specific benefit transfer approach” (panel in Table D-3) the total national annualized benefits are slightly lower, when payments are assumed to be made as a lumpsum (\$1,965.5 million) compared to annual payments (\$2,034.5 million).

Effects of using the radius-based approach versus the State-level approach. The estimated national benefits using the 50- and 100-mile radius approaches are approximately 31 and 21 percent lower than the State-level benefit transfer application, and the 200-mile radius approach is approximately 8 percent higher than the State approach. These differences are primarily driven by annualized benefits in the State of Florida which has the largest increase in wetland mitigation acres (an increase in average annual wetland mitigation acres of 516.0). For example, benefits for the State of Florida are 1.6 times as large when compared to benefits estimates for this State using the 100-mile radius approach. The difference in the total national annualized benefits estimates is directly attributable to the difference in benefit transfer approaches.

Effects of adding saltwater studies to the meta-data. As shown in the “Freshwater Model using a State-specific benefit transfer approach” panel in Table D-3, the total national annualized benefits (\$2,274.2 million) are 12 percent higher compared to the national benefits estimated using the application of the “Pooled Model” and lumpsum=0 (82 percent higher when comparing results based on $lumpsum=1$).¹¹⁵

The effects of using augmented meta-data and re-estimated MRMs. The agencies compared the estimated national annualized benefits using the benefit transfer approach described in the proposed rule EA (Model 1) to the estimated national benefits using the Pooled Model and the identical benefit transfer approach

¹¹⁵ The substantial increase in total national annualized benefits under a lumpsum=1 scenario is due to the relatively large coefficient on the lumpsum variable in the Freshwater Model. Using the mean coefficient, payments made in the form of a lumpsum result in an increase in WTP by a factor of 14.2 (when using the Pooled Model, the increase in WTP is by a factor of 8.3).

(i.e., using the State-specific benefit transfer application and *lumpsum=1*).¹¹⁶ As shown, in the “Original model using a State-specific benefit transfer approach” panel of Table D-3, The total national benefits based on the 2021 MRM (\$1,987.5 million) are one percent higher compared to the Pooled Model results using a State-specific benefit transfer and *lumpsum=1* (\$1,965.5 million).

¹¹⁶ The MRM was re-estimated after WTP values and household income in the meta-data were adjusted to 2021\$. The impacted acres applied in the benefits transfer, which can be found in Table B-4, are identical to all other State-level benefit transfer runs.

Table D-1: Total national annualized benefits by State, from the Pooled Model using a State-specific benefit transfer approach

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Total annualized benefits (millions 2021\$) ^{1,3,4}			
				3% Discount rate		7% Discount rate	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1
AK	0.3	\$1.12	\$10.17	\$3.3	\$3.2	\$2.9	\$3.1
AL	1.9	\$3.09	\$29.08	\$20.9	\$20.9	\$18.1	\$20.7
AR	1.2	\$3.54	\$33.22	\$5.8	\$5.8	\$5.0	\$5.7
AZ	2.6	\$1.59	\$11.80	\$6.7	\$5.1	\$5.7	\$5.0
CA	13.0	\$0.50	\$3.70	\$70.0	\$60.7	\$58.6	\$56.7
CO	2.1	\$0.33	\$2.44	\$0.4	\$0.3	\$0.4	\$0.3
CT	1.4	\$0.15	\$1.05	\$0.0	\$0.0	\$0.0	\$0.0
DE	0.4	\$0.17	\$1.20	\$0.0	\$0.0	\$0.0	\$0.0
FL	7.7	\$2.94	\$28.03	\$1,426.8	\$1,376.4	\$1,232.4	\$1,356.6
GA	3.8	\$3.28	\$30.91	\$38.0	\$36.8	\$32.9	\$36.3
IA	1.3	\$1.40	\$12.69	\$3.2	\$3.0	\$2.8	\$3.0
ID	0.6	\$1.09	\$9.88	\$0.2	\$0.1	\$0.1	\$0.1
IL	4.8	\$1.29	\$11.66	\$8.5	\$8.2	\$7.4	\$8.1
IN	2.6	\$1.74	\$15.71	\$29.3	\$27.5	\$25.5	\$27.4
KS	1.1	\$0.96	\$8.70	\$4.0	\$3.8	\$3.5	\$3.8
KY	1.7	\$2.30	\$20.72	\$20.9	\$19.7	\$18.2	\$19.6
LA	1.7	\$4.09	\$38.61	\$82.4	\$82.5	\$71.0	\$80.9
MA	2.6	\$0.15	\$1.02	\$0.0	\$0.0	\$0.0	\$0.0
MD	2.2	\$0.23	\$1.61	\$0.2	\$0.1	\$0.1	\$0.1
ME	0.6	\$0.15	\$1.04	\$0.0	\$0.0	\$0.0	\$0.0
MI	3.9	\$1.02	\$9.37	\$0.8	\$0.7	\$0.7	\$0.7
MN	2.2	\$1.25	\$11.49	\$26.4	\$26.5	\$22.6	\$25.6
MO	2.4	\$1.17	\$10.64	\$2.9	\$2.8	\$2.5	\$2.8
MS	1.1	\$3.13	\$29.40	\$12.5	\$13.1	\$10.7	\$12.6
MT	0.4	\$0.34	\$2.53	\$0.1	\$0.1	\$0.1	\$0.1
NC	4.0	\$3.22	\$30.25	\$24.9	\$24.8	\$21.4	\$24.1

Table D-1: Total national annualized benefits by State, from the Pooled Model using a State-specific benefit transfer approach

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Total annualized benefits (millions 2021\$) ^{1,3,4}			
				3% Discount rate		7% Discount rate	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1
ND	0.3	\$0.28	\$2.58	\$0.4	\$0.3	\$0.3	\$0.3
NE	0.8	\$0.56	\$5.10	\$0.5	\$0.4	\$0.4	\$0.4
NH	0.5	\$0.25	\$1.75	\$0.0	\$0.0	\$0.0	\$0.0
NJ	3.2	\$0.19	\$1.33	\$0.0	\$0.0	\$0.0	\$0.0
NM	0.8	\$0.71	\$5.27	\$0.1	\$0.1	\$0.1	\$0.1
NV	1.1	\$0.31	\$2.34	\$0.1	\$0.0	\$0.1	\$0.0
NY	7.3	\$0.17	\$1.21	\$0.8	\$0.6	\$0.7	\$0.6
OH	4.7	\$2.06	\$18.53	\$21.2	\$20.3	\$18.4	\$20.2
OK	1.5	\$3.40	\$31.91	\$1.0	\$1.0	\$0.9	\$1.0
OR	1.6	\$0.39	\$2.93	\$2.5	\$1.9	\$2.1	\$1.9
PA	5.1	\$0.14	\$0.98	\$0.5	\$0.4	\$0.4	\$0.4
RI	0.4	\$0.19	\$1.32	\$0.0	\$0.0	\$0.0	\$0.0
SC	1.9	\$3.47	\$32.59	\$17.2	\$16.5	\$14.9	\$16.3
SD	0.3	\$0.23	\$2.14	\$0.1	\$0.1	\$0.1	\$0.1
TN	2.6	\$3.04	\$28.58	\$7.7	\$7.5	\$6.7	\$7.4
TX	9.7	\$1.91	\$17.97	\$182.3	\$182.9	\$154.5	\$174.5
UT	1.0	\$0.45	\$3.36	\$0.3	\$0.3	\$0.3	\$0.2
VA	3.2	\$0.20	\$1.38	\$0.9	\$0.7	\$0.8	\$0.6
VT	0.3	\$0.28	\$1.95	\$0.0	\$0.0	\$0.0	\$0.0
WA	2.8	\$0.75	\$5.57	\$3.7	\$2.9	\$3.1	\$2.8
WI	2.4	\$1.13	\$10.31	\$7.1	\$7.2	\$6.1	\$7.0
WV	0.7	\$0.12	\$0.84	\$0.0	\$0.0	\$0.0	\$0.0
WY	0.2	\$0.54	\$4.02	\$0.0	\$0.0	\$0.0	\$0.0
Total	120.0			\$2,034.5	\$1,965.5	\$1,752.3	\$1,927.3

Table D-1: Total national annualized benefits by State, from the Pooled Model using a State-specific benefit transfer approach

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Total annualized benefits (millions 2021\$) ^{1,3,4}			
				3% Discount rate		7% Discount rate	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1

¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.

² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period (Hauer et al., 2021).

³ Benefit estimates are based on a benefit transfer application of the Pooled Model to all States except for Hawaii, and the District of Columbia (see Appendix B for detail). When lumpsum = 0, the benefit transfer estimates the household WTP for the cumulative increase in wetland mitigation acres between the 2020 NWPWR and the final rule. When lumpsum = 1, the benefit transfer estimates the household WTP for the year-to-year increase in wetland mitigation acres between the 2020 NWPWR and the final rule.

⁴ Total benefits are annualized over the 2023-2042 analysis period. Total annualized benefits for some states display as zero due to rounding.

Table D-2: Total national annualized benefits by State, from the Freshwater Model using a State-specific benefit transfer approach

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Annualized benefits (millions 2021\$) ^{1,3,4}			
				3% Discount rate		7% Discount rate	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1
AK	0.3	\$1.26	\$18.91	\$3.7	\$5.9	\$3.2	\$5.8
AL	1.9	\$4.07	\$62.47	\$27.4	\$45.0	\$23.8	\$44.4
AR	1.2	\$4.87	\$74.83	\$8.0	\$13.0	\$6.9	\$12.8
AZ	2.6	\$1.06	\$13.32	\$4.5	\$5.8	\$3.8	\$5.6
CA	13.0	\$0.32	\$4.00	\$44.7	\$65.4	\$37.4	\$61.1
CO	2.1	\$0.21	\$2.69	\$0.3	\$0.3	\$0.2	\$0.3
CT	1.4	\$0.06	\$0.76	\$0.0	\$0.0	\$0.0	\$0.0
DE	0.4	\$0.07	\$0.85	\$0.0	\$0.0	\$0.0	\$0.0
FL	7.7	\$3.21	\$49.52	\$1,557.8	\$2,431.7	\$1,345.5	\$2,396.5
GA	3.8	\$4.09	\$62.91	\$47.5	\$75.0	\$41.1	\$73.9
IA	1.3	\$1.58	\$23.79	\$3.6	\$5.6	\$3.1	\$5.6
ID	0.6	\$1.19	\$17.94	\$0.2	\$0.3	\$0.1	\$0.3
IL	4.8	\$1.45	\$21.75	\$9.5	\$15.2	\$8.3	\$15.2
IN	2.6	\$1.94	\$29.03	\$32.6	\$50.8	\$28.4	\$50.6
KS	1.1	\$1.06	\$15.97	\$4.4	\$7.0	\$3.9	\$6.9
KY	1.7	\$2.62	\$39.16	\$23.8	\$37.2	\$20.7	\$37.0
LA	1.7	\$5.16	\$79.56	\$104.0	\$170.1	\$89.6	\$166.6
MA	2.6	\$0.06	\$0.70	\$0.0	\$0.0	\$0.0	\$0.0
MD	2.2	\$0.09	\$1.06	\$0.1	\$0.1	\$0.1	\$0.1
ME	0.6	\$0.05	\$0.61	\$0.0	\$0.0	\$0.0	\$0.0
MI	3.9	\$0.89	\$13.32	\$0.7	\$1.0	\$0.6	\$1.0
MN	2.2	\$1.12	\$16.83	\$23.8	\$38.9	\$20.3	\$37.5
MO	2.4	\$1.30	\$19.53	\$3.2	\$5.2	\$2.8	\$5.1
MS	1.1	\$4.11	\$63.20	\$16.4	\$28.1	\$14.0	\$27.1

Table D-2: Total national annualized benefits by State, from the Freshwater Model using a State-specific benefit transfer approach

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Annualized benefits (millions 2021\$) ^{1,3,4}			
				3% Discount rate		7% Discount rate	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1
MT	0.4	\$0.21	\$2.64	\$0.1	\$0.1	\$0.0	\$0.1
NC	4.0	\$4.26	\$65.35	\$32.9	\$53.6	\$28.3	\$52.1
ND	0.3	\$0.28	\$4.27	\$0.4	\$0.6	\$0.3	\$0.5
NE	0.8	\$0.63	\$9.60	\$0.5	\$0.8	\$0.4	\$0.8
NH	0.5	\$0.10	\$1.19	\$0.0	\$0.0	\$0.0	\$0.0
NJ	3.2	\$0.07	\$0.87	\$0.0	\$0.0	\$0.0	\$0.0
NM	0.8	\$0.48	\$6.01	\$0.1	\$0.1	\$0.1	\$0.1
NV	1.1	\$0.21	\$2.70	\$0.0	\$0.1	\$0.0	\$0.1
NY	7.3	\$0.06	\$0.74	\$0.3	\$0.4	\$0.2	\$0.4
OH	4.7	\$2.35	\$35.27	\$24.2	\$38.6	\$21.1	\$38.4
OK	1.5	\$4.94	\$76.36	\$1.5	\$2.4	\$1.3	\$2.4
OR	1.6	\$0.25	\$3.20	\$1.6	\$2.1	\$1.4	\$2.0
PA	5.1	\$0.06	\$0.67	\$0.2	\$0.3	\$0.2	\$0.3
RI	0.4	\$0.08	\$0.96	\$0.0	\$0.0	\$0.0	\$0.0
SC	1.9	\$4.60	\$70.78	\$22.8	\$35.9	\$19.8	\$35.5
SD	0.3	\$0.23	\$3.57	\$0.1	\$0.1	\$0.1	\$0.1
TN	2.6	\$4.48	\$69.28	\$11.4	\$18.2	\$9.8	\$18.0
TX	9.7	\$2.64	\$40.77	\$252.1	\$414.9	\$213.6	\$395.9
UT	1.0	\$0.29	\$3.62	\$0.2	\$0.3	\$0.2	\$0.3
VA	3.2	\$0.07	\$0.87	\$0.3	\$0.4	\$0.3	\$0.4
VT	0.3	\$0.11	\$1.32	\$0.0	\$0.0	\$0.0	\$0.0
WA	2.8	\$0.50	\$6.34	\$2.5	\$3.3	\$2.1	\$3.2
WI	2.4	\$1.10	\$16.43	\$6.9	\$11.5	\$5.9	\$11.1
WV	0.7	\$0.05	\$0.60	\$0.0	\$0.0	\$0.0	\$0.0
WY	0.2	\$0.34	\$4.34	\$0.0	\$0.0	\$0.0	\$0.0
Total	120.0			\$2,274.2	\$3,585.2	\$1,958.9	\$3,515.2

Table D-2: Total national annualized benefits by State, from the Freshwater Model using a State-specific benefit transfer approach

State	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Annualized benefits (millions 2021\$) ^{1,3,4}			
				3% Discount rate		7% Discount rate	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1

¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.

² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period (Hauer et al., 2021).

³ Benefit estimates are based on a benefit transfer application of the Freshwater Model to all States except for Hawaii, and the District of Columbia (see Appendix B for detail). When lumpsum = 0, the benefit transfer estimates the household WTP for the cumulative increase in wetland mitigation acres between the 2020 NWPWR and the final rule. When lumpsum = 1, the benefit transfer estimates the household WTP for the year-to-year increase in wetland mitigation acres between the 2020 NWPWR and the final rule.

⁴ Total benefits are annualized over the 2023-2042 analysis period. Total annualized benefits for some states display as zero due to rounding.

Table D-3: Comparison of the total national annualized benefits across the alternative models and benefit transfer approaches

Discount rate	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}			Total annualized benefits (millions 2021\$) ^{1,3,4}	
		Lumpsum=0		Lumpsum=1	Lumpsum =0	Lumpsum =1
Pooled Model using a 50-mile radius benefit transfer approach						
3%	120.0	\$7.59		\$1,401.7		
7%	120.0	\$7.59		\$1,205.5		
Pooled Model using a 100-mile radius benefit transfer approach						
3%	120.0	\$2.70		-	\$1,601.0	-
7%	120.0	\$2.70		-	\$1,377.2	-
Pooled Model using a 200-mile radius benefit transfer approach						
3%	120.0	\$1.41		-	\$2,189.8	-
7%	120.0	\$1.41		-	\$1,884.6	-
Pooled Model using a State-specific benefit transfer approach						
3%	120.0	\$1.24		\$11.24	\$2,034.5	\$1,965.5
7%	120.0	\$1.24		\$11.24	\$1,752.3	\$1,927.3
Freshwater Model using a State-specific benefit transfer approach						
3%	120.0	\$1.43		\$21.64	\$2,274.2	\$3,585.2
7%	120.0	\$1.43		\$21.64	\$1,958.9	\$3,515.2
2021 Model using a State-specific benefit transfer approach ⁵						
3%	120.0	-		\$61.94	-	\$1,987.5
7%	120.0	-		\$61.94	-	\$1,928.1

¹ Based on the number of households in all States excluding Hawaii and the District of Columbia.

² Number of households is based on 2019 American Community Survey data. The agencies accounted for population growth and the change in the number of households throughout the 2023-2042 study period (Hauer et al., 2021).

³ Benefit estimates are based on benefit transfer applications to all States except for Hawaii, and the District of Columbia (see Appendix B for detail). When lumpsum = 0, the benefit transfer estimates the household WTP for the cumulative increase in wetland mitigation acres between the 2020 NWPWR and the final rule. When lumpsum = 1, the benefit transfer estimates the household WTP for the year-to-year increase in wetland mitigation acres between the 2020 NWPWR and the final rule. The household WTP per acre estimates shown are averages across the States.

Table D-3: Comparison of the total national annualized benefits across the alternative models and benefit transfer approaches

Discount rate	Number of affected households in 2019 (millions) ^{1,2}	Average household WTP per 100 acres (2021\$) ^{1,3}		Total annualized benefits (millions 2021\$) ^{1,3,4}	
		Lumpsum=0	Lumpsum=1	Lumpsum=0	Lumpsum=1

⁴ Total benefits are annualized over the 2023-2042 analysis period.

⁵ The original model used for the proposal was based on 28 observations from freshwater wetland valuation studies. The benefit transfer is based on Scenario 0 (U.S. EPA and Army, 2021) and is applied to all States (except for Hawaii, and the District of Columbia) and assumes payments in the form of a lumpsum. The proportion of local wetlands is assumed to be 0.0318 across all States. Furthermore, the approach does not account for changes in the baseline wetland acreage over time. Lastly, given the model has a positive coefficient on $\frac{q_0+q_1}{2}$, to produce reasonable WTP results, baseline wetland acreage is truncated at 1 million acres.

Appendix E Mapped NHD Stream Mileage and NWI Wetland Acreage by State

This appendix summarizes stream and wetland resources in each State, based on an analysis of available national-level data. We first describe the data and highlight uncertainty and limitations for the agencies' ability to conduct a national-level analysis to evaluate 1) waters changing jurisdictional status; 2) the relationship between these waters and facilities and activities covered under the Clean Water Act; and 3) the potential impacts of changes in the level of regulation of jurisdictional and non-jurisdictional waters.

High-resolution NHD

For the final rule, the agencies considered using the U.S. Geological Survey's (USGS) NHD at high resolution and the U.S. Fish and Wildlife Service's (U.S. FWS) NWI to estimate the potential effect of the final rule on certain water types across the country. The agencies often refer to these national datasets to ascertain the potential location and extent of streams, rivers, lakes, ponds, and wetlands. The high-resolution NHD represents the water drainage network of the United States as mapped at a scale of 1:24,000 or better (1:63,360 or better in Alaska). The data are maintained in partnership with States and other stewards. The NHD is not a regulatory dataset and does not indicate whether streams and other features are jurisdictional for Clean Water Act purposes. The agencies determined that they could not easily approximate the categories of waters that the 2020 NWPR does and does not regulate using the NHD. For example, certain tributaries are not categorically jurisdictional under the 2020 NWPR as implemented (*e.g.*, non-relatively permanent waters such as all ephemeral streams and some intermittent streams), and the jurisdictional status of such waters must be determined using a case-specific significant nexus analysis under the final rule.

A summary of High Resolution NHD mapping by State is presented in Table E-1. However, for the reasons discussed here, the agencies were not able to accurately identify waters that could change jurisdictional status under the final rule using the NHD.

NWI

The agencies considered relying on a combination of the NWI and high-resolution NHD to identify wetlands that may change jurisdictional status under the final rule. Like the NHD, while the NWI is the best national dataset of the potential extent of wetlands across the country of which the agencies are aware, it was not intended or designed for regulatory purposes. The agencies determined that they could not easily approximate the categories of wetlands that the 2020 NWPR does and does not regulate using the NWI. For example, wetlands must meet certain criteria to be jurisdictional as "adjacent wetlands" under the 2020 NWPR, and it is difficult to model wetlands that would likely meet the 2020 NWPR's criteria using the national datasets. In addition, not all adjacent wetlands are categorically jurisdictional under the final rule, and the jurisdictional status of such waters must be determined using a case-specific significant nexus analysis. Thus, the agencies did not use the NWI to assess potential changes in jurisdiction as a result of replacing the 2020 NWPR with the final rule.

Jurisdictional status of certain waters under the final rule

In addition to the limitations of the NHD and NWI datasets, the agencies face the confounding factor of not being able to map under the final rule the jurisdictional status of certain waters as a category, including:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

According to the *Rapanos* Guidance, such waters are not categorically jurisdictional. Rather, the agencies must conduct a case-specific significant nexus analysis to determine their jurisdictional status. Thus, for purposes of this EA the agencies did not attempt to conduct a comprehensive national-scale analysis of waters that would be jurisdictional based on a significant nexus analysis.

Table E-1: Mapped NHD Stream Mileage and NWI Wetland Acreage by State: The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the final rule. The data are presented to illustrate the incomplete national coverage of the NHD data with regard to ephemeral streams.

State	NHD Streams								NWI Wetlands
	Perennial		Intermittent		Ephemeral ¹		Other ²		
	Miles	% of Total	Miles	% of Total	Miles	% of Total	Miles	% of Total	Acres
AK	666,417	48%	18,624	1%	82	0%	700,893	51%	-
AL	48,075	23%	69,415	33%	0	0%	95,602	45%	4,203,980
AR	20,915	9%	89,091	40%	30	0%	111,599	50%	2,408,523
AZ	4,194	1%	35,305	7%	249,591	51%	202,384	41%	354,060
CA	44,290	7%	85,290	13%	213,359	34%	291,058	46%	3,028,618
CO	32,715	7%	151,915	34%	66,955	15%	197,296	44%	2,002,309
CT ³	7,593	35%	1,892	9%	-	0%	12,035	56%	310,505
DC ³	26	19%	6	4%	-	0%	103	76%	319
DE ³	2,404	26%	1,112	12%	-	0%	5,838	62%	263,327
FL	19,337	12%	8,123	5%	2	0%	127,332	82%	12,183,132
GA ³	44,081	23%	53,965	28%	-	0%	93,464	49%	6,548,298
HI									
IA	27,730	15%	72,310	39%	2,396	1%	82,259	45%	1,088,441
ID	54,355	30%	96,072	53%	8,551	5%	22,010	12%	1,324,822
IL	26,033	22%	78,490	65%	287	0%	15,676	13%	1,301,283
IN ^{3,4}	15,030	6%	33,453	13%	-	0%	217,363	82%	1,055,925
KS	19,065	10%	153,419	83%	316	0%	11,687	6%	1,899,863
KY	26,118	26%	59,695	60%	3	0%	13,133	13%	465,603
LA	34,365	25%	59,755	44%	24	0%	41,649	31%	8,028,273
MA ³	8,519	51%	3,734	23%	-	0%	4,328	26%	695,752
MD ³	13,399	53%	3,872	15%	-	0%	8,191	32%	814,720
ME	25,864	50%	13,413	26%	0	0%	12,893	25%	2,548,325
MI ³	29,251	36%	15,136	18%	-	0%	37,753	46%	7,796,982
MN	26,461	26%	38,028	37%	1	0%	38,269	37%	10,854,648
MO ³	22,323	12%	141,077	76%	-	0%	21,160	11%	1,386,533
MS ³	24,376	15%	114,831	70%	-	0%	23,982	15%	3,968,569
MT	49,899	13%	304,329	78%	3,627	1%	32,901	8%	3,227,102

Table E-1: Mapped NHD Stream Mileage and NWI Wetland Acreage by State: The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the final rule. The data are presented to illustrate the incomplete national coverage of the NHD data with regard to ephemeral streams.

State	NHD Streams								NWI Wetlands
	Perennial		Intermittent		Ephemeral ¹		Other ²		
	Miles	% of Total	Miles	% of Total	Miles	% of Total	Miles	% of Total	Acres
NC ⁴	43,069	31%	49,442	35%	1	0%	47,726	34%	4,366,486
ND	5,926	7%	73,640	81%	0	0%	11,165	12%	1,508,999
NE	13,472	11%	98,408	77%	521	0%	15,144	12%	1,314,903
NH	8,281	44%	6,861	37%	3	0%	3,592	19%	310,193
NJ ³	12,834	54%	1,064	4%	-	0%	10,081	42%	889,188
NM	7,124	3%	60,237	25%	156,822	66%	13,182	6%	363,015
NV	10,741	3%	26,141	8%	267,153	85%	11,487	4%	1,033,171
NY ³	56,516	57%	20,921	21%	-	0%	21,236	22%	2,207,886
OH	26,905	29%	53,172	58%	9	0%	11,627	13%	538,919
OK	33,924	20%	115,235	69%	482	0%	17,777	11%	1,379,591
OR	77,102	24%	192,672	61%	23,402	7%	22,322	7%	1,895,761
PA ³	43,800	51%	30,131	35%	-	0%	12,065	14%	544,458
RI ³	1,224	62%	92	5%	-	0%	647	33%	60,714
SC ³	25,819	33%	31,934	41%	-	0%	19,731	25%	3,932,560
SD	12,070	7%	135,766	82%	2,809	2%	13,957	8%	2,065,241
TN	68,240	60%	32,065	28%	254	0%	12,984	11%	1,165,666
TX	36,044	7%	346,494	65%	84,783	16%	62,472	12%	4,630,573
UT	15,117	8%	83,888	45%	71,561	39%	13,927	8%	758,798
VA	36,123	33%	55,846	51%	4	0%	17,581	16%	1,454,954
VT ³	22,677	86%	11	0%	-	0%	3,757	14%	86,122
WA	69,058	29%	148,082	62%	2,330	1%	21,204	9%	959,626
WI ³	27,876	32%	42,114	49%	-	0%	16,745	19%	6,868,324
WV	21,230	39%	27,505	50%	11	0%	6,220	11%	57,052
WY	34,404	12%	197,979	69%	35,683	12%	20,774	7%	1,852,425
Total	2,002,413	21%	3,532,050	37%	1,191,051	12%	2,828,260	30%	118,004,537

Table E-1: Mapped NHD Stream Mileage and NWI Wetland Acreage by State: The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the final rule. The data are presented to illustrate the incomplete national coverage of the NHD data with regard to ephemeral streams.

State	NHD Streams								NWI Wetlands
	Perennial		Intermittent		Ephemeral ¹		Other ²		
	Miles	% of Total	Miles	% of Total	Miles	% of Total	Miles	% of Total	Acres
<i>Source: Based on the 2018 adjacency analysis of NHD at high resolution and NWI data completed for 2020 NWPR, using data extracted in 2017. See Section I.A for a description of the limitations of the NHD and NWI data in characterizing the waters that may be potentially affected by the changes to the definition of “waters of the United States” under the final rule as compared to the secondary baseline. The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the final rule.</i>									
¹ The percentages for this category represent the percentages of streams in each State that the NHD at high resolution maps as ephemeral. Zero percent for this category does not mean that the State has no ephemeral streams. Ephemeral streams are not independently mapped in many States. Often ephemeral streams are mapped in the intermittent stream category or are not mapped at all, which can result in an overstatement of intermittent streams and an understatement of ephemeral streams. This table is a summary of the available NHD data and may not accurately represent the types of waters in any given State.									
² Includes unclassified streams, artificial paths, canal, ditches, aqueducts, and other feature without attributes.									
³ NHD has no stream miles mapped as ephemeral for these States. See FN 1 above.									
⁴ NHD has a high percentage of streams that are not classified as perennial, intermittent, or ephemeral (unclassified streams) for these States.									

Appendix F Environmental Justice Analysis State-level Results

The following tables use State-level averages as a comparison point against socioeconomic characteristics and considerations of environmental risk for watersheds with wetland area changes or affected waters. Table F-1 and Table F-2, similar to the comparisons made in Table IV-1 and Table IV-2, summarize the exceedances of socioeconomic characteristics for HUC12 watersheds in relation to State averages based on estimated changes in wetland area and affected waters, respectively, under the final rule.

Table F-1: Socioeconomic characteristics of communities within HUC12 watersheds experiencing wetland area changes, compared to State averages ^a								
Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s that...						
		Have a Higher Proportion of Individuals that are Minority ^b	Have a Higher Proportion of Individuals that are Low-Income ^c	Have a Higher Proportion of Individuals with Less than High School Education	Have a Higher Proportion of Households with Linguistic Isolation	Have a Higher Proportion of Individuals under Age 5	Have a Higher Proportion of Individuals over Age 64	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
		... than the State Average						
<= 0.5	38,980 (90.1%)	30.0%	47.2%	39.0%	25.1%	39.7%	57.3%	24.3%
> 0.5 - 1	1,528 (3.5%)	43.8%	44.4%	36.8%	35.7%	45.8%	45.2%	23.4%
> 1 – 50	2,673 (6.2%)	50.7%	41.7%	34.4%	40.0%	49.8%	40.3%	24.6%
> 50	66 (0.2%)	59.1%	34.8%	43.9%	60.6%	50.0%	34.8%	13.6%
<p>a. State averages represent the State population outside of the HUC12 watersheds experiencing wetland area changes.</p> <p>b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.</p> <p>c. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.</p> <p>Source: U.S. EPA analysis, 2022</p>								

Table F-2: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, compared to State averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s that...						
		Have a Higher Proportion of Individuals that are Minority ^b	Have a Higher Proportion of Individuals that are Low-Income ^c	Have a Higher Proportion of Individuals with Less than High School Education	Have a Higher Proportion of Households with Linguistic Isolation	Have a Higher Proportion of Individuals under Age 5	Have a Higher Proportion of Individuals over Age 64	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
		... than the State Average						
<= 1	16,647 (38.5%)	27.7%	48.2%	40.5%	22.2%	38.3%	61.0%	24.3%
> 1 - 5	14,634 (33.8%)	30.6%	47.4%	40.2%	26.2%	40.4%	56.3%	24.2%
> 5 – 50	11,105 (25.7%)	38.6%	44.1%	34.8%	32.9%	43.9%	48.0%	24.3%
> 50	861 (2.0%)	44.8%	41.3%	27.4%	30.7%	45.8%	44.5%	25.4%

a. State averages represent the State population outside of the HUC12 watersheds with affected waters.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

c. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2022

As shown, not all of the socioeconomic characteristics trend in the same direction as wetland area changes and affected waters. In general, the minority population, population with linguistic isolation, and population under five tends to trend with wetland area changes and affected waters. In other words, as more wetland area changes or more waters are affected, there are more individuals under five, more individuals that are minority, and more individuals that experience linguistic isolation. The opposite is true for the low-income population, population over 64, and population with less than high school education.

Similar to Table IV-3 and Table IV-4, Table F-3 and Table F-4 provide a breakdown of the racial/ethnic categories that comprise the minority population in earlier tables. The tables compare demographic characteristics of HUC12 watersheds in relation to State averages based on estimated

changes in wetland area and affected waters, respectively, under the final rule. Although not always linear and not applicable to all racial/ethnic categories, the racial/ethnic category breakdown generally shows that as wetland area changes and the number of affected waters increases, the greater the chance that the proportion of individuals that identify as a minority category exceeds the State average.

Table F-3: Demographic characteristics of communities within HUC12 watersheds experiencing wetland area changes, compared to State averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s that...						
		Have a Higher Proportion of Individuals that Identify as Black or African American Alone ^b	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone	Have a Higher Proportion of Individuals that Identify as Asian Alone	Have a Higher Proportion of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone	Have a Higher Proportion of Individuals that Identify as Some Other Race Alone	Have a Higher Proportion of Individuals that Identify as Two or More Races	Have a Higher Proportion of Individuals that Identify as Hispanic or Latino
		... than the State Average						
<= 0.5	38,980 (90.1%)	25.5%	24.3%	25.3%	12.5%	16.5%	39.8%	27.4%
> 0.5 - 1	1,528 (3.5%)	40.8%	23.4%	39.9%	18.8%	26.0%	50.4%	37.9%
> 1 – 50	2,673 (6.2%)	44.2%	24.6%	45.5%	19.0%	31.8%	53.8%	38.9%
> 50	66 (0.2%)	42.4%	13.6%	48.5%	21.2%	43.9%	45.5%	48.5%

a. State averages represent the rest of the United States population, outside of the HUC12 watersheds experiencing wetland area changes.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

Source: U.S. EPA analysis, 2022

Table F-4: Demographic characteristics of communities within HUC12 watersheds with affected waters, compared to State averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s that...						
		Have a Higher Proportion of Individuals that Identify as Black or African American Alone ^b	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone	Have a Higher Proportion of Individuals that Identify as Asian Alone	Have a Higher Proportion of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone	Have a Higher Proportion of Individuals that Identify as Some Other Race Alone	Have a Higher Proportion of Individuals that Identify as Two or More Races	Have a Higher Proportion of Individuals that Identify as Hispanic or Latino
		... than the State Average						
<= 1	16,647 (38.5%)	23.1%	24.3%	20.2%	10.9%	12.9%	37.0%	23.9%
> 1 - 5	14,634 (33.8%)	25.4%	24.2%	25.3%	12.2%	16.8%	39.3%	27.7%
> 5 – 50	11,105 (25.7%)	34.6%	24.3%	38.4%	16.9%	25.6%	48.2%	35.8%
> 50	861 (2.0%)	41.6%	25.4%	44.4%	22.5%	29.7%	57.7%	37.6%

a. State averages represent the rest of the United States population, outside of the HUC12 watersheds with affected waters.

b. The socioeconomic characteristic data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

Source: U.S. EPA analysis, 2022

Table F-5 and Table F-6, similar to the comparisons made in Table IV-9 and Table IV-10, summarize the cumulative socioeconomic and environmental risk characteristics of HUC12 watersheds based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule. In particular, the environmental indicators considered in these tables are proxies for other Clean Water Act programs affected by the final rule, including Clean Water Act sections 402 and 311.

Table F-5: Socioeconomic characteristics of communities within HUC12 watersheds experiencing wetland area changes, wastewater discharges, and proximity to RMP sites, compared to State averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of HUC12s that...						
				Have a Higher Proportion of Individuals that are Minority ^d	Have a Higher Proportion of Individuals that are Low-Income ^e	Have a Higher Proportion of Individuals with Less than High School Education	Have a Higher Proportion of Households with Linguistic Isolation	Have a Higher Proportion of Individuals under Age 5	Have a Higher Proportion of Individuals over Age 64	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
				... than the State Average						
<= 0.5	30,448 (70.4%)	121.0	0.3	38.1%	61.5%	50.9%	30.6%	49.9%	72.6%	32.5%
> 0.5 - 1	1,287 (3.0%)	13.0	0.4	50.7%	51.7%	43.4%	40.7%	51.7%	52.0%	28.4%
> 1 - 50	2,205 (5.1%)	3.7	0.5	57.4%	48.0%	39.9%	45.2%	56.2%	46.3%	28.1%
> 50	44 (0.1%)	0.5	0.6	86.4%	47.7%	61.4%	88.6%	72.7%	50.0%	22.7%

a. State averages represent the State population outside of the HUC12 watersheds experiencing wetland area changes.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.

e. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2022

Table F-6: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, wastewater discharges, and proximity to RMP sites, compared to State averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of HUC12s that...						
				Have a Higher Proportion of Individuals that are Minority ^d	Have a Higher Proportion of Individuals that are Low-Income ^e	Have a Higher Proportion of Individuals with Less than High School Education	Have a Higher Proportion of Households with Linguistic Isolation	Have a Higher Proportion of Individuals under Age 5	Have a Higher Proportion of Individuals over Age 64	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone (non-Hispanic)
				... than the State Average						
<= 1	12,349 (28.6%)	294.4	0.3	26.5%	48.1%	40.3%	20.5%	37.1%	59.4%	24.3%
> 1 - 5	11,468 (26.5%)	3.3	0.3	30.2%	48.5%	41.0%	24.8%	39.3%	56.0%	25.3%
> 5 - 50	9,392 (21.7%)	3.7	0.4	39.0%	45.1%	36.1%	32.2%	43.1%	48.2%	26.3%
> 50	775 (1.8%)	1.9	0.4	44.7%	42.0%	28.5%	30.3%	45.9%	44.6%	26.6%

a. State averages represent the State population outside of the HUC12 watersheds with affected waters.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

e. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2022

As with the analysis comparing all the HUC12s with affected waters or wetland area changes, the minority population, population with linguistic isolation, and population under five similarly tends to trend with wetland area changes and, to a lesser degree, affected waters. In other words, as more wetland area changes or more waters are affected, there are more individuals under five, more individuals that are minority, and more

individuals that experience linguistic isolation. The opposite is true for the low-income population and population over 64. In addition, for HUC12s with wetland area changes greater than 50 acres, the majority of the population exceeds State averages for percent minority, the percentage of households experiencing linguistic isolation, and the proportion of individuals under age five.

The following tables (Table F-7 and Table F-8) provide a breakdown of the racial/ethnic categories that comprise the minority population in earlier tables. They follow a similar trend in that the racial/ethnic category breakdown generally shows that as wetland area changes and the number of affected waters increases, the greater the chance that the proportion of individuals that identify as a minority category exceeds the State average. Table F-7, in particular, shows that the large proportion of HUC12s with wetland area changes greater than 50 acres and minority populations that exceed State averages are likely driven by Hispanic or Latino and Asian populations.

Table F-7: Demographic characteristics of communities within HUC12 watersheds experiencing wetland area changes, wastewater discharges, and proximity to RMP sites, compared to State averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of HUC12s that...						
				Have a Higher Proportion of Individuals that Identify as Black or African American Alone ^d	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone	Have a Higher Proportion of Individuals that Identify as Asian Alone	Have a Higher Proportion of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone	Have a Higher Proportion of Individuals that Identify as Some Other Race Alone	Have a Higher Proportion of Individuals that Identify as Two or More Races	Have a Higher Proportion of Individuals that Identify as Hispanic or Latino
				... than the State Average						
<= 0.5	30,448 (70.4%)	121.0	0.3	31.3%	32.5%	31.0%	15.5%	20.8%	49.6%	33.7%
> 0.5 - 1	1,287 (3.0%)	13.0	0.4	45.7%	28.4%	45.1%	21.4%	30.2%	54.7%	41.9%
> 1 – 50	2,205 (5.1%)	3.7	0.5	51.7%	28.1%	53.1%	21.8%	38.3%	59.6%	45.4%
> 50	44 (0.1%)	0.5	0.6	61.4%	22.7%	72.7%	27.3%	65.9%	63.6%	77.3%

a. State averages represent the State population outside of the HUC12 watersheds experiencing wetland area changes.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

Table F-7: Demographic characteristics of communities within HUC12 watersheds experiencing wetland area changes, wastewater discharges, and proximity to RMP sites, compared to State averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of HUC12s that...						
				Have a Higher Proportion of Individuals that Identify as Black or African American Alone ^d	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone	Have a Higher Proportion of Individuals that Identify as Asian Alone	Have a Higher Proportion of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone	Have a Higher Proportion of Individuals that Identify as Some Other Race Alone	Have a Higher Proportion of Individuals that Identify as Two or More Races	Have a Higher Proportion of Individuals that Identify as Hispanic or Latino
				... than the State Average						
d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s experiencing wetland area changes under the final rule.										
Source: U.S. EPA analysis, 2022										

Table F-8: Demographic characteristics of communities within HUC12 watersheds with affected waters, wastewater discharges, and proximity to RMP sites, compared to State averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio ^b	Average RMP Site Count-Distance Ratio ^c	Percentage of HUC12s that...						
				Have a Higher Proportion of Individuals that Identify as Black or African American Alone ^d	Have a Higher Proportion of Individuals that Identify as American Indian and Alaska Native Alone	Have a Higher Proportion of Individuals that Identify as Asian Alone	Have a Higher Proportion of Individuals that Identify as Native Hawaiian and Other Pacific Islander Alone	Have a Higher Proportion of Individuals that Identify as Some Other Race Alone	Have a Higher Proportion of Individuals that Identify as Two or More Races	Have a Higher Proportion of Individuals that Identify as Hispanic or Latino
				... than the State Average						
<= 1	12,349 (28.6%)	294.4	0.3	22.1%	24.3%	19.3%	10.3%	12.8%	35.3%	22.3%
> 1 - 5	11,468 (26.5%)	3.3	0.3	24.4%	25.3%	24.1%	11.8%	16.4%	38.1%	26.6%
> 5 – 50	9,392 (21.7%)	3.7	0.4	33.2%	26.3%	36.9%	16.7%	25.3%	47.1%	35.1%
> 50	775 (1.8%)	1.9	0.4	41.0%	26.6%	43.7%	22.6%	28.8%	56.3%	38.1%

a. State averages represent the State population outside of the HUC12 watersheds with affected waters.

b. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

c. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

d. The socioeconomic characteristic and environmental indicator data is calculated based on the proportion of the area of CBGs that intersects with HUC12s with affected waters under the final rule.

Source: U.S. EPA analysis, 2022

Table F-9 and Table F-10 summarize the overall cumulative environmental burden, as compared to State averages, for HUC12 watersheds based on estimated cumulative changes in wetland area and affected waters, respectively, under the final rule. As shown, while some watersheds with wetland area changes and affected waters do not have any exceedances of the environmental indicators included in EJScreen, the majority are exposed to environmental risk from between four and eight different indicators. In addition, HUC12 watersheds experiencing the greatest cumulative environmental burden (exceedances of between nine and 11 different indicators) tend to increase with affected waters. While the prior

tables indicate that the socioeconomic characteristics and environmental indicators relevant to the rule of affected watersheds are not drastically different from State averages, the affected watersheds with the largest wetland area changes and changes to affected waters are those most burdened by exposure to environmental risk. As such, since the final rule is expected to ease the environmental burden on the affected watersheds, we may see a potential benefit for those watersheds. These conclusions do not vary when drawing conclusions based on State or national averages. As a result, the conclusion discussed in Section IV that there isn't much potential for benefits to EJ concerns for a majority of the affected HUC12s still applies.

Table F-9: Cumulative environmental burden, defined by exceedances of environmental indicators, of communities within HUC12 watersheds experiencing wetland area changes, compared to State averages^a

Cumulative Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s with...			
		No Exceedances	1-3 Exceedances	4-8 Exceedances	9-11 Exceedances
<= 0.5	38,980 (90.1%)	2.6%	27.4%	58.8%	11.2%
> 0.5 - 1	1,528 (3.5%)	1.7%	18.1%	55.7%	24.5%
> 1 – 50	2,673 (6.2%)	3.9%	16.2%	54.8%	25.2%
> 50	66 (0.2%)	0.0%	16.7%	68.2%	15.2%

a. The exceedances are based on a comparison to State averages that represent the State population outside of the HUC12 watersheds experiencing wetland area changes.

Source: U.S. EPA analysis, 2022

Table F-10: Cumulative environmental burden, defined by exceedances of environmental indicators, of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s with...			
		No Exceedances	1-3 Exceedances	4-8 Exceedances	9-11 Exceedances
<= 1	16,647 (38.5%)	3.2%	33.6%	57.5%	5.6%
> 1 – 5	14,634 (33.8%)	2.4%	26.0%	60.6%	11.1%
> 5 – 50	11,105 (25.7%)	2.4%	16.8%	57.2%	23.6%
> 50	861 (2.0%)	0.7%	14.4%	53.5%	31.4%

a. The exceedances are based on a comparison to State averages that represent the State population outside of the HUC12 watersheds with affected waters.

Table F-10: Cumulative environmental burden, defined by exceedances of environmental indicators, of communities within HUC12 watersheds with affected waters, compared to national averages^a

Cumulative Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Percentage of HUC12s with...			
		No Exceedances	1-3 Exceedances	4-8 Exceedances	9-11 Exceedances
Source: U.S. EPA analysis, 2022					

Appendix G Sector Impact Analysis State-level Results

The agencies used the following steps to assign a sector to each affected section 404 permit, based on the reported work type, project name, and project description. The agencies applied the steps in order, unless otherwise noted.

Projects with any of the following terms in the project name are classified as “Public”: city of, town of, county, State, parish, township, municipality, municipal, department of, dept of, dot, usdot, usda, dpw, village, Caltrans, nysdot, division of, dnr, odnr, md sha, kdfwr, agfc, ag&fc, ahtd, nceep, achd, adcnr

Projects with “INDIAN TRIBE OR STATE 404 PROGRAM” in worktype are classified as “TSP”

Projects with “DEVELOPMENT” as first worktype are classified as Development (“D”). Projects with “TRANSPORTATION” as first worktype and “DEVELOPMENT” as another worktype classified as Development (“D”). Projects are further classified as:

C if Commercial is only work type listed, if recreational project that doesn’t include residential, or if AI and C are the only work types listed.

I in Industrial is only work type listed, or if AI and I are only work types listed.

R (-M, -S, -X) if Residential is only work type listed, if AI and R are only work types listed, or if R and Recreational are only work types listed. Project is mixed used (-X) if both single- and multi-family listed. Otherwise, either single family (-S) or multi-family (-M).

X (Mixed Use) if more than one of Commercial, Industrial, and Residential work types listed.

AI if Associated Infrastructure is only work type listed.

Exceptions: If Industrial or Commercial or Associated Infrastructure development is listed with Agriculture, Logging, Mining and Drilling, Energy Production (including generation, transmission, pipelines), Airport, Marina, or Landfill then development is considered secondary.

If D-I or D-C and “agriculture” appears in worktype, classified as Agriculture (“Ag”).

If D-I or D-C and “logging” appears in worktype, classified as Logging (“Lg”).

If D-I or D-C and “mining and drilling” appears in worktype, classified as Mining and Drilling (“MD”). Classified as drilling (“MD-D”) if “mining and drilling drilling” is listed before “mining and drilling mining”; mining (“MD-M”) if opposite; unknown (“MD-UK”) otherwise.

If D-I or D-C and “energy generation” appears in the worktype, classified as Energy Generation (“EG”).

If D-I or D-C and “pipeline” appears in worktype, project name, or project description, classified as Pipeline (“PL”).

If D-I or D-C and “transmission” appears in worktype, project name, or project description, classified as Transmission (“Trans”).

If D-I or D-C and “distribution” appears in worktype, project name, or project description, classified as Distribution (“Dist”).

If D-I or D-C and “airport” appears in worktype, project name, or project description, classified as Airport (“Airport”).

If D-I or D-C and either “yacht club” or “marina” appears in worktype, project name, or project description or “boat” or “dock” appears but not “residential”, classified as Marina (“Marina”).

If D-I or D-C and “landfill” appears in worktype, project name, or project description, classified as Landfill (“Landfill”).

In addition to projects classified as Agriculture in 3(f)(i) above, projects with “AGRICULTURE” as first worktype listed are classified as Agriculture (“Ag”).

Projects with “AQUACULTURE” as first worktype listed are classified as:

“Aquaculture-Plants” if “plant” appears in worktype.

“Aquaculture-Finfish” if “finfish” appears in worktype.

“Aquaculture-Shellfish” if “shellfish” appears in worktype.

“Aquaculture-UK” otherwise.

In addition to projects classified as Logging in 3(f)(ii) above, projects with “logging” in worktype are classified as Logging (“Lg”).

In addition to projects classified as “EG” in 3(f)(iv) above, projects with “ENERGY GENERATION” as first worktype listed are classified as Energy Generation (“EG”).

All EG projects with “utility” in worktype are further classified as Utility (“UL-EG”). *See* #14, below.

Projects are further classified if following terms appear in worktype, project name, or project description: coal, cogen, geothermal, hydropower, natural gas, nuclear, oil, solar, wind.

Otherwise considered unknown (-UK).

In addition to projects classified as MD in 3(f)(iii) above, projects with “MINING AND DRILLING” as first worktype listed and

“MINING” as second worktype listed are classified as Mining (“MD-M”).

“DRILLING” as second worktype listed are classified as Drilling (“MD-D”).

Projects are further classified if following terms appear in worktype, project name, or project description: shale gas, oil, gas, coal, gravel, peat, phosphate, rock, sand, other mineral.

Otherwise considered unknown (-UK).

In addition to projects classified as Trans in 3(f)(vi) above, projects with “transmission” in worktype, project name, or project description are classified as Transmission (“Trans”).

All Trans projects with “utility” in worktype are further classified as Utility (“UL-TD”).

Projects with “TRANSPORTATION” as first worktype listed and “RAIL” as second worktype listed, or with any of the following terms in the project name are classified as “Rail”: rail, railway, rr.

Projects with “CLEANUP HAZARDOUS OR TOXIC WASTES” listed in worktype are classified as Cleanup of Hazardous or Toxic Waste (“CHTW”).

In addition to projects classified as Pipeline in 3(f)(v) above, projects with

“TRANSPORTATION” as first worktype listed and “PIPELINE” as second worktype listed, or with “pipeline” in worktype, project name, or project description are classified as Pipeline (“PL”).

All PL projects with “utility” in worktype are further classified as Utility (“UL-PL”).

If “gas” appears in worktype, project name, or project description but “oil” does not, further classified as Natural Gas Pipeline (“PL-NG”). If “oil” but not “gas”, Oil Pipeline (“PL-OIL”).

Otherwise considered unknown (“PL-UK”).

Projects with “utility” in worktype classified as Utility (“UL”). Further classified as:

If “water”, “wwtp”, or “interceptor” appears in worktype, project name, or project description, classified as Water Utility (“UL-W”).

If “sewer” or “sewage” appears in worktype, project name, or project description, classified as Sewer Utility (“UL-S”).

If “gas” or “pipeline” appears in worktype, project name, or project description, classified as Natural Gas Distribution Utility (“UL-NG”).

If any of the following appears in worktype, project name, or project description, classified as EG Utility (“UL-EG”): energy generation, power, electric, generation, substation, energy, kv, entergy, national grid.

In addition to projects classified as Marina in 3(f)(ix) above, if either “yacht club” or “marina” appears in worktype, project name, or project description or “boat” or “dock” appears but not “residential”, classified as Marina (“Marina”).

In addition to projects classified as Airport in 3(f)(viii) above, projects with “airport” or “air” in worktype, project name, or project description classified as Airport (“Airport”).

In addition to projects classified as Landfill in 3(f)(x) above, projects with “landfill” in worktype, project name, or project description classified as Landfill (“Landfill”).

Projects with “DREDGING” as first worktype listed or “bank stabilization” or “channelization” in worktype are classified as Dredging (“Dr”).

Projects with any of the following search terms in worktype, project name, or project description are classified as Highway, Street, Bridge (“HSB”): highway, hwy, road, rd, roads, street, st, bridge, culvert.

Remaining projects are unclassified (“Unknown”).

The agencies then assigned an industry sector to each classification ID, as summarized in Table G-1.

Table G-1: NAICS classification crosswalk		
Classification ID	NAICS	NAICS industry description
Ag	11	Agriculture
Airport	488119	Airport
Aquaculture-Finfish	11251	Aquaculture
Aquaculture-Plants	11251	Aquaculture
Aquaculture-Shellfish	11251	Aquaculture
CHTW	562211	Hazardous waste treatment and disposal
D-AI	2361, 2362	Mixed use building construction
D-C	23622	Commercial building construction
D-I	23621	Industrial building construction
D-R-M	2361	Residential building construction
D-R-S	2361	Residential building construction
D-R-UK	2361	Residential building construction
D-R-X	2361	Residential building construction
D-X	2361, 2362	Mixed use building construction
Dr	237990	Dredging
EG-COAL	22111	Electric power generation
EG-COGEN	22111	Electric power generation
EG-GEOTHERMAL	22111	Electric power generation
EG-HYDROPOWER	22111	Electric power generation
EG-NATURAL GAS	22111	Electric power generation
EG-NUCLEAR	22111	Electric power generation
EG-OIL	22111	Electric power generation
EG-SOLAR	22111	Electric power generation
EG-UK	22111	Electric power generation
EG-WIND	22111	Electric power generation
HSB	237310	Highway, street, and bridge construction
Landfill	562212	Solid waste landfills
Logging	113310	Logging
Marina	713930	Marinas
MD-D-COAL	212	Mining (except oil and gas)
MD-D-GAS	2111	Oil and gas extraction
MD-D-GRAVEL	212	Mining (except oil and gas)
MD-D-OIL	2111	Oil and gas extraction
MD-D-OTHER MINERAL	212	Mining (except oil and gas)
MD-D-ROCK	212	Mining (except oil and gas)
MD-D-SAND	212	Mining (except oil and gas)
MD-D-SHALE GAS	2111	Oil and gas extraction
MD-D-UK	212	Mining (except oil and gas)
MD-M-COAL	212	Mining (except oil and gas)
MD-M-GAS	2111	Oil and gas extraction
MD-M-GRAVEL	212	Mining (except oil and gas)
MD-M-OIL	2111	Oil and gas extraction
MD-M-OTHER MINERAL	212	Mining (except oil and gas)
MD-M-PEAT	212	Mining (except oil and gas)
MD-M-PHOSPHATE	212	Mining (except oil and gas)
MD-M-ROCK	212	Mining (except oil and gas)

Table G-1: NAICS classification crosswalk		
Classification ID	NAICS	NAICS industry description
MD-M-SAND	212	Mining (except oil and gas)
MD-M-SHALE GAS	2111	Oil and gas extraction
MD-M-UK	212	Mining (except oil and gas)
PL-NG	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
PL-OIL	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
PL-UK	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
PL-X	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
Public	Public	Public
Rail	48211	Rail transportation
Trans	22112	Electric power transmission, control, and distribution
TSP	Public	Public
UL-EG-COAL	22111	Electric power generation
UL-EG-COGEN	22111	Electric power generation
UL-EG-HYDROPOWER	22111	Electric power generation
UL-EG-NATURAL GAS	22111	Electric power generation
UL-EG-OIL	22111	Electric power generation
UL-EG-SOLAR	22111	Electric power generation
UL-EG-UK	22111	Electric power generation
UL-EG-WIND	22111	Electric power generation
UL-PL-NG	221210	Natural gas distribution
UL-PL-OIL	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
UL-PL-UK	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
UL-PL-X	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
UL-TD	22112	Electric power transmission, control, and distribution
Unknown	Unassigned	Unassigned

Table G-2 summarizes the percent of permit costs in each identified sector, stratified by Cowardin classification.

Table G-2: Permit costs by Cowardin classification								
NAICS	NAICS industry description	Estuarine	Lacustrine	Marine	Palustrine	Riparian	Riverine	Uplands
11	Agriculture	1%	1%	0%	20%	1%	78%	0%
11251	Aquaculture	15%	1%	79%	0%	0%	4%	0%
113310	Logging	0%	0%	0%	100%	0%	0%	0%
2111	Oil and gas extraction	2%	0%	0%	34%	0%	63%	0%
212	Mining (except oil and gas)	9%	1%	2%	31%	2%	54%	1%

Table G-2: Permit costs by Cowardin classification

NAICS	NAICS industry description	Estuarine	Lacustrine	Marine	Palustrine	Riparian	Riverine	Uplands
22111	Electric power generation	4%	1%	1%	39%	1%	54%	1%
22112	Electric power transmission, control, and distribution	1%	0%	0%	39%	0%	59%	0%
221210	Natural gas distribution	1%	0%	1%	32%	0%	66%	0%
2361	Residential building construction	3%	4%	1%	63%	2%	26%	0%
2361, 2362	Mixed use building construction	2%	3%	1%	49%	2%	43%	1%
23621	Industrial building construction	2%	1%	1%	63%	2%	30%	1%
23622	Commercial building construction	3%	6%	1%	59%	2%	28%	1%
237310	Highway, street, and bridge construction	6%	7%	2%	19%	2%	63%	0%
237990	Dredging	10%	35%	3%	3%	1%	48%	0%
48211	Rail transportation	2%	2%	1%	18%	2%	75%	1%
4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products	4%	0%	1%	37%	1%	57%	0%
488119	Airport	7%	12%	5%	11%	2%	63%	0%
562211	Hazardous waste treatment and disposal	8%	7%	5%	32%	3%	45%	0%
562212	Solid waste landfills	2%	1%	0%	36%	2%	57%	2%
713930	Marinas	17%	47%	10%	3%	0%	23%	0%
Public	Public	3%	4%	2%	23%	1%	66%	0%
Unassigned	Unassigned	4%	8%	2%	48%	1%	36%	1%

Table G-3 summarizes the number of potentially affected permits by State and Cowardin classification, stratified by industry sector.

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
AK	Estuarine	0%	0%	0%	1%	3%	6%	0%	0%	16%	2%	1%	6%	18%	10%	1%	5%	3%	1%	0%	11%	18%	1%
AK	Lacustrine	0%	0%	0%	0%	0%	1%	0%	0%	12%	4%	0%	5%	10%	17%	0%	0%	5%	1%	0%	28%	13%	3%
AK	Marine	0%	1%	0%	0%	4%	3%	0%	0%	7%	1%	1%	3%	15%	11%	1%	13%	2%	1%	0%	21%	14%	1%
AK	Palustrine	0%	0%	0%	2%	11%	5%	0%	0%	25%	4%	3%	9%	15%	1%	1%	2%	3%	1%	0%	1%	15%	2%
AK	Riparian	0%	0%	0%	0%	36%	1%	0%	0%	15%	2%	1%	3%	20%	5%	3%	1%	2%	0%	0%	1%	8%	0%
AK	Riverine	0%	0%	0%	0%	11%	4%	0%	0%	2%	1%	0%	3%	23%	19%	2%	3%	4%	0%	0%	3%	22%	2%
AK	Uplands	0%	0%	0%	0%	53%	0%	6%	0%	12%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	12%	0%
AK	All water types	0%	0%	0%	1%	10%	5%	0%	0%	16%	2%	2%	7%	17%	7%	1%	4%	3%	0%	0%	5%	16%	1%
AL	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	19%	11%	0%	1%	3%	0%	0%	57%	6%	0%
AL	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	31%	0%	0%	1%	0%	0%	46%	6%	5%
AL	Marine	0%	1%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	24%	11%	0%	1%	2%	0%	0%	52%	6%	1%
AL	Palustrine	0%	0%	0%	0%	1%	1%	2%	4%	19%	2%	2%	8%	26%	1%	3%	4%	4%	1%	0%	3%	14%	3%
AL	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	10%	2%	2%	6%	28%	6%	0%	0%	12%	0%	0%	14%	20%	0%
AL	Riverine	0%	0%	0%	0%	2%	0%	0%	3%	4%	1%	1%	4%	31%	8%	3%	4%	5%	0%	0%	15%	17%	3%
AL	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	45%	9%	0%	0%	0%	0%	0%	0%	36%	0%
AL	All water types	0%	0%	0%	0%	1%	0%	0%	2%	5%	1%	1%	3%	22%	14%	2%	2%	3%	0%	0%	28%	11%	3%
AR	Lacustrine	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	21%	48%	4%	1%	6%	0%	0%	12%	7%	0%
AR	Palustrine	3%	0%	0%	1%	0%	0%	18%	1%	1%	0%	0%	4%	16%	0%	2%	41%	1%	0%	0%	0%	9%	2%
AR	Riparian	2%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%	16%	39%	0%	6%	3%	0%	0%	0%	3%	26%	0%
AR	Riverine	1%	0%	0%	8%	0%	0%	4%	3%	0%	0%	0%	1%	23%	6%	1%	28%	7%	0%	0%	1%	17%	1%
AR	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	18%	18%	0%	0%	0%	0%	0%	0%	55%	0%
AR	All water types	1%	0%	0%	7%	0%	0%	5%	2%	0%	0%	0%	1%	22%	7%	1%	28%	6%	0%	0%	2%	16%	1%
AZ	Lacustrine	0%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	7%	0%	0%	0%	0%	0%	13%	7%	0%
AZ	Palustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	78%	0%	0%	0%	11%	0%	0%	0%	11%	0%
AZ	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	14%	5%	5%	14%	5%	0%	0%	10%	0%
AZ	Riverine	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	0%	1%	54%	6%	8%	13%	3%	0%	0%	2%	8%	1%
AZ	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	50%	17%	0%	0%	0%	0%	0%	0%	17%	0%
AZ	All water types	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	0%	1%	54%	6%	8%	12%	3%	0%	0%	2%	8%	1%
CA	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	13%	37%	17%	1%	1%	6%	1%	0%	11%	2%	8%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
CA	Lacustrine	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	2%	18%	14%	0%	3%	14%	0%	0%	22%	21%	3%
CA	Marine	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	17%	14%	1%	4%	20%	2%	0%	29%	8%	1%
CA	Palustrine	0%	0%	0%	0%	0%	2%	2%	1%	5%	1%	1%	16%	46%	1%	2%	7%	4%	1%	0%	0%	7%	1%
CA	Riparian	1%	0%	0%	0%	1%	0%	0%	0%	8%	3%	0%	4%	38%	12%	2%	5%	16%	0%	0%	0%	7%	1%
CA	Riverine	0%	0%	0%	0%	0%	1%	11%	1%	2%	1%	0%	1%	22%	5%	22%	3%	9%	0%	0%	1%	15%	7%
CA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	2%	80%	0%	0%	2%	4%	0%	0%	0%	7%	0%
CA	All water types	0%	0%	0%	0%	0%	1%	8%	1%	2%	1%	0%	4%	27%	6%	16%	3%	9%	0%	0%	3%	13%	6%
CO	Lacustrine	0%	0%	0%	0%	1%	0%	0%	1%	2%	1%	0%	5%	29%	17%	2%	2%	9%	0%	0%	18%	8%	4%
CO	Palustrine	0%	0%	0%	1%	1%	4%	2%	2%	6%	3%	0%	6%	36%	2%	5%	15%	3%	0%	0%	0%	11%	2%
CO	Riparian	1%	1%	0%	0%	1%	2%	0%	2%	3%	4%	1%	5%	13%	8%	6%	25%	6%	2%	0%	2%	21%	0%
CO	Riverine	0%	0%	0%	1%	0%	2%	0%	4%	1%	0%	0%	1%	35%	15%	4%	5%	13%	0%	0%	1%	16%	1%
CO	Uplands	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	14%	7%	7%	36%	0%	0%	0%	0%	7%	14%
CO	All water types	0%	0%	0%	1%	0%	2%	1%	3%	2%	1%	0%	2%	35%	12%	4%	8%	10%	0%	0%	1%	15%	1%
CT	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	8%	1%	0%	16%	1%	0%	28%	18%	4%
CT	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	14%	4%	0%	0%	35%	0%	0%	0%	33%	12%
CT	Marine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	18%	9%	0%	0%	23%	0%	0%	30%	15%	2%
CT	Palustrine	1%	0%	0%	0%	0%	0%	4%	0%	2%	1%	0%	2%	55%	1%	0%	2%	4%	1%	0%	0%	20%	6%
CT	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	0%	9%	0%	0%	18%	18%	0%	0%	36%	9%
CT	Riverine	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	21%	6%	1%	1%	9%	0%	0%	17%	40%	2%
CT	All water types	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	1%	30%	5%	1%	1%	12%	1%	0%	16%	26%	4%
DE	Estuarine	0%	2%	0%	0%	0%	0%	0%	0%	8%	0%	0%	5%	14%	16%	5%	7%	4%	3%	0%	18%	18%	0%
DE	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	63%	0%
DE	Marine	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	21%	23%	2%	3%	10%	0%	0%	31%	10%	0%
DE	Palustrine	1%	0%	0%	0%	0%	1%	0%	0%	39%	2%	1%	10%	11%	4%	1%	4%	3%	1%	2%	3%	20%	1%
DE	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	25%	0%	0%	0%	0%	0%	25%	0%	25%	0%
DE	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	13%	2%	0%	3%	17%	10%	1%	3%	4%	1%	0%	1%	45%	0%
DE	Uplands	0%	0%	0%	0%	0%	33%	0%	0%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DE	All water types	0%	0%	0%	0%	0%	0%	0%	0%	20%	1%	0%	6%	14%	11%	2%	4%	4%	1%	1%	9%	25%	0%
FL	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	1%	22%	19%	1%	0%	4%	0%	0%	36%	13%	1%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
FL	Lacustrine	0%	1%	0%	0%	0%	0%	0%	0%	5%	2%	0%	4%	21%	8%	1%	0%	4%	0%	0%	25%	25%	1%
FL	Marine	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%	0%	0%	11%	8%	1%	0%	10%	0%	0%	59%	7%	1%
FL	Palustrine	0%	0%	0%	0%	0%	0%	3%	0%	29%	4%	1%	10%	22%	2%	1%	1%	4%	0%	0%	2%	18%	2%
FL	Riparian	0%	0%	0%	0%	2%	0%	2%	0%	9%	0%	1%	2%	34%	4%	4%	1%	3%	0%	0%	7%	26%	3%
FL	Riverine	0%	0%	0%	0%	0%	0%	1%	0%	6%	2%	0%	2%	29%	8%	2%	1%	5%	0%	0%	20%	22%	1%
FL	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	14%	4%	4%	4%	29%	25%	4%	0%	0%	0%	0%	4%	14%	0%
FL	All water types	0%	0%	0%	0%	0%	0%	1%	0%	13%	2%	1%	5%	22%	9%	1%	1%	5%	0%	0%	23%	16%	1%
GA	Estuarine	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	1%	25%	22%	1%	1%	20%	1%	0%	19%	5%	2%
GA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	1%	11%	11%	0%	2%	6%	0%	0%	60%	2%	2%
GA	Marine	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	20%	2%	0%	4%	0%	0%	16%	4%	18%
GA	Palustrine	0%	0%	0%	0%	1%	1%	4%	7%	10%	2%	2%	11%	30%	1%	2%	7%	3%	0%	0%	0%	9%	9%
GA	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	3%	27%	7%	20%	7%	3%	0%	0%	23%	0%	0%
GA	Riverine	0%	0%	0%	0%	0%	1%	1%	12%	7%	2%	1%	4%	33%	7%	2%	7%	6%	0%	0%	4%	11%	2%
GA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
GA	All water types	0%	0%	0%	0%	0%	1%	2%	9%	7%	2%	1%	6%	30%	6%	2%	6%	6%	0%	0%	8%	9%	5%
HI	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	20%	0%	0%	30%	0%	0%	0%	10%	0%
HI	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
HI	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	7%	0%	0%	21%	0%	0%	19%	21%	0%
HI	Palustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	33%	33%	0%	0%	0%	0%	0%	0%	0%	0%
HI	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
HI	Riverine	1%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	43%	16%	2%	2%	22%	0%	0%	0%	12%	2%
HI	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
HI	All water types	1%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	0%	39%	14%	1%	1%	24%	0%	0%	4%	13%	1%
IA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%	63%	0%	0%	5%	0%	0%	3%	19%	0%
IA	Palustrine	2%	0%	0%	0%	1%	0%	0%	1%	4%	1%	1%	10%	26%	3%	3%	6%	3%	0%	0%	0%	37%	2%
IA	Riparian	1%	0%	0%	0%	1%	1%	0%	0%	2%	1%	1%	4%	27%	15%	15%	7%	2%	0%	0%	4%	20%	4%
IA	Riverine	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	37%	23%	3%	4%	8%	0%	0%	2%	17%	1%
IA	Uplands	0%	0%	0%	0%	2%	0%	0%	2%	2%	0%	0%	2%	60%	7%	5%	2%	7%	2%	0%	0%	5%	2%
IA	All water types	1%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	2%	33%	24%	3%	4%	7%	0%	0%	2%	19%	1%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
ID	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	12%	30%	1%	0%	6%	0%	0%	40%	6%	1%
ID	Palustrine	4%	0%	0%	0%	1%	0%	1%	0%	28%	2%	0%	7%	33%	3%	2%	4%	3%	0%	0%	2%	10%	1%
ID	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	83%	1%	2%	1%	8%	0%	0%	0%	2%	0%
ID	Riverine	1%	0%	0%	0%	0%	0%	0%	0%	6%	1%	0%	2%	38%	21%	2%	1%	9%	0%	0%	5%	13%	1%
ID	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%
ID	All water types	1%	0%	0%	0%	0%	0%	0%	0%	7%	1%	0%	2%	36%	19%	2%	1%	8%	0%	0%	9%	11%	1%
IL	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	31%	46%	1%	0%	4%	0%	0%	8%	4%	3%
IL	Palustrine	1%	0%	0%	0%	0%	0%	3%	0%	2%	2%	2%	6%	39%	3%	5%	22%	4%	1%	0%	0%	7%	2%
IL	Riparian	1%	0%	0%	0%	0%	0%	0%	1%	2%	2%	1%	6%	38%	9%	4%	17%	4%	1%	0%	2%	11%	2%
IL	Riverine	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	44%	14%	4%	13%	5%	0%	0%	2%	12%	2%
IL	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	47%	7%	0%	7%	0%	0%	0%	7%	20%	7%
IL	All water types	1%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	2%	41%	17%	4%	13%	5%	0%	0%	2%	10%	2%
IN	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	7%	1%	0%	5%	16%	58%	0%	0%	2%	0%	0%	5%	3%	2%
IN	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	67%	0%	0%
IN	Palustrine	1%	0%	0%	0%	0%	3%	10%	0%	8%	3%	2%	7%	26%	2%	4%	13%	2%	0%	1%	1%	15%	4%
IN	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	34%	7%	7%	0%	2%	0%	0%	0%	46%	1%
IN	Riverine	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	0%	2%	34%	12%	3%	7%	5%	0%	0%	1%	30%	1%
IN	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
IN	All water types	0%	0%	0%	0%	0%	1%	2%	0%	3%	1%	0%	3%	29%	21%	3%	6%	4%	0%	0%	2%	22%	2%
KS	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
KS	Lacustrine	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	23%	17%	0%	2%	9%	0%	0%	22%	18%	4%
KS	Palustrine	4%	0%	0%	0%	1%	3%	19%	15%	1%	0%	1%	3%	9%	1%	2%	29%	0%	1%	0%	0%	10%	1%
KS	Riparian	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%
KS	Riverine	16%	0%	0%	0%	0%	1%	4%	2%	1%	1%	0%	0%	30%	4%	4%	12%	2%	0%	0%	0%	21%	1%
KS	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	50%	0%
KS	All water types	14%	0%	0%	0%	0%	1%	6%	3%	1%	1%	0%	1%	28%	4%	3%	14%	2%	0%	0%	1%	20%	1%
KY	Estuarine	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%
KY	Lacustrine	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	14%	51%	0%	0%	0%	3%	0%	17%	8%	5%
KY	Palustrine	0%	0%	0%	0%	0%	0%	7%	10%	2%	0%	2%	4%	39%	0%	3%	27%	1%	0%	0%	0%	3%	1%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
KY	Riparian	4%	0%	0%	0%	19%	0%	0%	0%	0%	0%	0%	4%	44%	11%	7%	0%	4%	0%	0%	0%	7%	0%
KY	Riverine	0%	0%	0%	0%	1%	0%	1%	7%	1%	1%	0%	2%	49%	7%	2%	11%	2%	0%	0%	3%	6%	3%
KY	All water types	0%	0%	0%	0%	1%	0%	2%	7%	1%	1%	0%	2%	46%	9%	2%	12%	2%	0%	0%	3%	6%	3%
LA	Estuarine	0%	0%	0%	7%	4%	5%	1%	1%	1%	0%	0%	1%	21%	8%	1%	32%	2%	0%	0%	5%	8%	1%
LA	Lacustrine	0%	1%	0%	4%	1%	5%	1%	1%	0%	0%	0%	1%	13%	5%	1%	16%	1%	0%	0%	10%	37%	1%
LA	Marine	0%	1%	0%	10%	3%	7%	1%	5%	1%	0%	0%	0%	16%	6%	0%	34%	2%	0%	0%	3%	8%	3%
LA	Palustrine	0%	0%	0%	2%	2%	2%	1%	1%	5%	1%	1%	3%	11%	2%	1%	21%	2%	1%	0%	2%	42%	1%
LA	Riparian	0%	0%	0%	2%	0%	4%	1%	1%	6%	1%	0%	3%	19%	5%	5%	26%	1%	0%	0%	6%	18%	1%
LA	Riverine	0%	0%	0%	2%	1%	2%	0%	4%	0%	0%	0%	0%	10%	5%	1%	25%	1%	0%	0%	7%	40%	1%
LA	Uplands	0%	0%	0%	3%	1%	5%	3%	0%	3%	2%	2%	5%	18%	3%	3%	15%	2%	0%	0%	5%	23%	5%
LA	All water types	0%	0%	0%	4%	2%	3%	1%	2%	2%	1%	0%	1%	14%	5%	1%	25%	2%	0%	0%	5%	30%	1%
MA	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	26%	10%	1%	1%	10%	1%	0%	11%	30%	7%
MA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	5%	15%	6%	2%	1%	5%	1%	0%	4%	54%	6%
MA	Marine	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	24%	11%	0%	0%	8%	0%	0%	18%	32%	3%
MA	Palustrine	0%	0%	0%	0%	0%	2%	1%	0%	5%	1%	1%	2%	61%	0%	1%	1%	3%	0%	0%	0%	15%	6%
MA	Riparian	0%	2%	0%	0%	0%	0%	4%	0%	12%	0%	0%	2%	37%	2%	0%	0%	0%	9%	2%	0%	21%	11%
MA	Riverine	0%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	2%	36%	3%	2%	1%	3%	1%	0%	3%	43%	3%
MA	All water types	0%	0%	0%	0%	0%	1%	1%	0%	3%	0%	0%	2%	40%	4%	1%	1%	4%	1%	0%	4%	34%	4%
MD	Estuarine	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	21%	0%	0%	11%	0%	0%	14%	6%	0%
MD	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	53%	0%	0%	5%	0%	5%	11%	11%	0%
MD	Marine	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	30%	1%	0%	2%	0%	0%	15%	15%	0%
MD	Palustrine	3%	0%	0%	0%	0%	1%	2%	0%	10%	13%	1%	5%	25%	7%	1%	1%	6%	0%	0%	0%	22%	1%
MD	Riparian	0%	0%	0%	0%	0%	2%	1%	0%	8%	6%	1%	5%	10%	9%	3%	0%	20%	1%	0%	0%	34%	1%
MD	Riverine	0%	3%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	26%	12%	0%	1%	6%	0%	0%	6%	40%	0%
MD	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MD	All water types	0%	4%	0%	0%	0%	0%	0%	0%	2%	2%	0%	1%	33%	16%	0%	0%	9%	0%	0%	9%	22%	0%
ME	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	2%	20%	24%	0%	0%	10%	0%	0%	10%	29%	2%
ME	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	11%	37%	0%	0%	5%	0%	0%	28%	14%	2%
ME	Marine	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	35%	23%	0%	0%	4%	0%	0%	16%	12%	1%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unsigned
ME	Palustrine	0%	0%	0%	0%	0%	5%	2%	0%	17%	1%	1%	12%	16%	1%	0%	0%	3%	0%	0%	1%	39%	1%
ME	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	20%	40%	0%	0%	0%	0%	0%	0%	0%	0%
ME	Riverine	0%	1%	0%	0%	0%	1%	0%	0%	5%	1%	0%	2%	23%	5%	1%	3%	4%	0%	0%	6%	48%	0%
ME	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%
ME	All water types	0%	3%	0%	0%	0%	3%	1%	0%	10%	1%	1%	7%	22%	10%	0%	0%	4%	0%	0%	7%	30%	1%
MI	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	50%	0%	0%
MI	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	18%	46%	0%	0%	3%	0%	0%	26%	4%	1%
MI	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	24%	1%	1%	8%	32%	7%	1%	2%	3%	1%	0%	11%	6%	2%
MI	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	7%	0%	0%	7%	0%	0%	7%	27%	7%
MI	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	26%	22%	0%	1%	3%	0%	0%	31%	12%	2%
MI	All water types	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	20%	40%	0%	0%	3%	0%	0%	26%	5%	1%
MN	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	5%	20%	44%	0%	0%	4%	0%	0%	10%	12%	1%
MN	Palustrine	2%	0%	0%	0%	1%	2%	1%	0%	9%	2%	0%	7%	36%	4%	4%	3%	3%	0%	0%	1%	24%	2%
MN	Riparian	12%	0%	0%	0%	0%	0%	0%	2%	5%	0%	0%	4%	40%	11%	0%	5%	5%	0%	0%	0%	16%	0%
MN	Riverine	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	42%	18%	3%	1%	5%	0%	0%	2%	24%	1%
MN	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	44%	0%	0%	0%	22%	0%	0%	0%	22%	0%
MN	All water types	2%	0%	0%	0%	1%	1%	1%	0%	6%	1%	0%	5%	36%	12%	3%	2%	4%	0%	0%	2%	23%	1%
MO	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	32%	0%	0%	1%	0%	0%	38%	1%	1%
MO	Palustrine	1%	0%	0%	0%	0%	13%	1%	3%	1%	1%	0%	4%	25%	1%	2%	27%	4%	0%	0%	1%	12%	2%
MO	Riparian	1%	0%	0%	0%	0%	14%	1%	0%	0%	0%	0%	0%	27%	0%	4%	3%	4%	0%	0%	0%	44%	3%
MO	Riverine	0%	0%	0%	0%	1%	3%	2%	1%	1%	0%	0%	1%	38%	10%	2%	9%	11%	0%	0%	1%	18%	2%
MO	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	20%	20%	0%	0%	0%	0%	0%	0%	40%	0%
MO	All water types	0%	0%	0%	0%	1%	3%	1%	1%	1%	0%	0%	1%	34%	16%	1%	8%	7%	0%	0%	12%	13%	2%
MS	Estuarine	1%	5%	0%	0%	0%	0%	0%	0%	2%	1%	1%	2%	22%	7%	2%	8%	3%	0%	0%	27%	17%	1%
MS	Lacustrine	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	2%	18%	18%	1%	1%	5%	0%	0%	27%	22%	5%
MS	Marine	0%	10%	0%	0%	0%	0%	0%	0%	2%	0%	2%	2%	25%	12%	2%	0%	6%	0%	0%	17%	19%	4%
MS	Palustrine	0%	0%	0%	0%	0%	1%	21%	0%	7%	2%	1%	8%	20%	1%	2%	18%	1%	0%	0%	0%	14%	3%
MS	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	4%	11%	26%	1%	3%	21%	5%	0%	0%	0%	22%	1%
MS	Riverine	0%	0%	0%	0%	0%	0%	15%	1%	1%	0%	0%	1%	24%	8%	3%	9%	2%	0%	0%	3%	30%	2%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
MS	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	43%	0%	0%	0%	0%	0%	0%	0%	29%	0%
MS	All water types	0%	0%	0%	0%	0%	0%	16%	0%	3%	1%	1%	4%	23%	6%	3%	13%	2%	0%	0%	3%	23%	2%
MT	Estuarine	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%
MT	Lacustrine	0%	0%	0%	0%	0%	1%	0%	0%	13%	0%	0%	4%	10%	32%	0%	0%	5%	0%	0%	30%	4%	0%
MT	Palustrine	1%	0%	0%	0%	0%	1%	3%	0%	6%	1%	0%	5%	35%	1%	3%	29%	1%	0%	0%	1%	13%	0%
MT	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	8%	8%	17%	0%	0%	0%	33%	8%
MT	Riverine	1%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	1%	32%	18%	5%	11%	12%	0%	0%	4%	13%	0%
MT	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	50%	0%
MT	All water types	1%	0%	0%	0%	0%	1%	1%	0%	3%	0%	0%	2%	31%	16%	4%	13%	9%	0%	0%	5%	12%	0%
NC	Estuarine	0%	1%	0%	0%	0%	0%	0%	0%	6%	0%	0%	1%	23%	9%	0%	0%	2%	0%	0%	33%	23%	1%
NC	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	13%	28%	0%	0%	6%	0%	0%	39%	6%	2%
NC	Marine	0%	0%	0%	0%	0%	0%	0%	0%	28%	1%	0%	1%	10%	18%	1%	0%	6%	0%	0%	9%	26%	0%
NC	Palustrine	0%	0%	0%	0%	0%	2%	0%	4%	23%	4%	1%	9%	22%	1%	0%	8%	1%	0%	0%	1%	20%	2%
NC	Riparian	0%	0%	0%	0%	0%	1%	0%	0%	11%	1%	1%	6%	18%	3%	0%	5%	2%	0%	0%	1%	50%	1%
NC	Riverine	0%	0%	0%	0%	0%	2%	0%	2%	10%	3%	0%	5%	14%	8%	1%	4%	3%	0%	0%	2%	44%	1%
NC	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%	0%	0%	14%	14%	14%	0%	0%	0%	0%	14%	14%	0%
NC	All water types	0%	0%	0%	0%	0%	2%	0%	2%	13%	3%	1%	6%	17%	8%	1%	5%	2%	0%	0%	6%	34%	1%
ND	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	18%	16%	2%	5%	4%	0%	0%	42%	8%	2%
ND	Palustrine	1%	0%	0%	0%	0%	5%	5%	1%	0%	0%	0%	1%	30%	0%	11%	7%	3%	0%	0%	1%	34%	0%
ND	Riparian	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	1%	45%	1%	25%	4%	3%	0%	0%	0%	16%	1%
ND	Riverine	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	32%	12%	3%	5%	8%	0%	0%	4%	31%	1%
ND	Uplands	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%	33%	11%	0%	0%	0%	0%	0%	22%
ND	All water types	1%	0%	0%	0%	0%	3%	3%	1%	0%	0%	0%	1%	29%	5%	8%	6%	4%	0%	0%	7%	29%	1%
NE	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	22%	55%	1%	1%	4%	0%	0%	11%	1%	3%
NE	Palustrine	2%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	2%	40%	4%	3%	4%	3%	0%	0%	1%	32%	3%
NE	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE	Riverine	2%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	47%	23%	5%	4%	5%	0%	0%	2%	7%	2%
NE	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE	All water types	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	40%	24%	3%	3%	4%	0%	0%	4%	13%	3%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
NH	Estuarine	0%	15%	0%	0%	0%	0%	0%	0%	9%	0%	0%	2%	11%	7%	0%	0%	4%	0%	0%	24%	25%	4%
NH	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	6%	17%	13%	0%	0%	17%	0%	0%	32%	11%	2%
NH	Marine	0%	7%	0%	0%	0%	0%	0%	0%	4%	2%	0%	4%	27%	9%	0%	0%	7%	0%	0%	22%	18%	0%
NH	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	15%	1%	1%	12%	39%	2%	0%	0%	3%	0%	0%	3%	19%	3%
NH	Riparian	1%	0%	0%	0%	0%	1%	0%	0%	5%	4%	1%	8%	22%	8%	1%	1%	5%	0%	0%	4%	29%	9%
NH	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	20%	6%	0%	0%	2%	0%	0%	2%	62%	1%
NH	All water types	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%	1%	7%	28%	6%	0%	0%	6%	0%	0%	9%	30%	2%
NJ	Estuarine	0%	1%	0%	0%	0%	1%	0%	1%	2%	0%	0%	0%	27%	8%	1%	1%	3%	1%	0%	40%	14%	0%
NJ	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	25%	50%	0%
NJ	Marine	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	24%	6%	0%	1%	7%	0%	0%	51%	10%	0%
NJ	Palustrine	0%	0%	0%	0%	0%	0%	0%	3%	20%	3%	0%	3%	28%	0%	3%	8%	10%	8%	0%	0%	18%	0%
NJ	Riparian	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%	10%	10%	10%	20%	0%	10%	0%	0%	10%	0%
NJ	Riverine	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	2%	40%	8%	0%	2%	7%	3%	1%	19%	13%	0%
NJ	All water types	0%	1%	0%	0%	0%	1%	0%	1%	2%	0%	0%	1%	29%	8%	1%	2%	5%	2%	0%	35%	13%	0%
NM	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	13%	4%	0%	2%	15%	4%	0%	30%	28%	0%
NM	Palustrine	0%	0%	0%	0%	0%	0%	8%	0%	0%	3%	0%	3%	46%	3%	3%	11%	0%	0%	0%	0%	24%	0%
NM	Riparian	0%	0%	0%	0%	0%	0%	4%	2%	0%	0%	0%	0%	41%	12%	0%	2%	16%	0%	2%	0%	18%	2%
NM	Riverine	0%	0%	0%	1%	0%	1%	5%	0%	0%	0%	0%	0%	39%	6%	3%	25%	6%	1%	1%	1%	9%	1%
NM	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NM	All water types	0%	0%	0%	1%	0%	1%	5%	0%	0%	0%	0%	0%	41%	6%	3%	23%	6%	1%	1%	1%	9%	1%
NV	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NV	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	43%	4%	0%	1%	4%	0%	0%	31%	12%	3%
NV	Palustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	9%	1%	0%	87%	1%	0%	0%	0%	0%	1%
NV	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	50%	0%
NV	Riverine	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	31%	2%	15%	37%	1%	0%	0%	0%	5%	0%
NV	All water types	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	30%	2%	14%	39%	1%	0%	0%	1%	5%	0%
NY	Estuarine	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	39%	16%	0%	0%	13%	0%	0%	13%	17%	0%
NY	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	18%	35%	0%	0%	11%	0%	0%	24%	8%	1%
NY	Marine	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	11%	0%	0%	10%	0%	0%	16%	12%	0%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
NY	Palustrine	0%	0%	0%	0%	3%	11%	3%	7%	12%	2%	2%	11%	14%	1%	1%	9%	1%	1%	0%	1%	21%	2%
NY	Riparian	0%	0%	0%	0%	0%	2%	0%	2%	1%	0%	0%	2%	22%	11%	1%	7%	5%	0%	0%	0%	46%	0%
NY	Riverine	0%	0%	0%	0%	1%	2%	1%	2%	1%	0%	0%	1%	16%	12%	2%	3%	4%	0%	0%	5%	49%	1%
NY	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	43%	0%
NY	All water types	0%	0%	0%	0%	1%	3%	1%	2%	3%	0%	0%	3%	21%	14%	1%	3%	6%	0%	0%	9%	31%	1%
OH	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
OH	Lacustrine	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	1%	12%	45%	0%	0%	3%	0%	0%	17%	19%	1%
OH	Palustrine	0%	0%	0%	16%	0%	6%	14%	7%	3%	0%	0%	5%	9%	0%	1%	23%	1%	0%	0%	0%	13%	1%
OH	Riparian	0%	0%	0%	70%	0%	0%	0%	0%	4%	0%	0%	0%	17%	0%	0%	4%	0%	0%	0%	0%	4%	0%
OH	Riverine	0%	0%	0%	16%	0%	4%	8%	4%	1%	0%	0%	1%	17%	3%	1%	21%	3%	0%	0%	1%	16%	1%
OH	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%
OH	All water types	0%	0%	0%	16%	0%	5%	10%	5%	2%	0%	0%	2%	14%	4%	1%	21%	2%	0%	0%	1%	16%	1%
OK	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	15%	9%	4%	0%	3%	0%	0%	17%	22%	25%
OK	Palustrine	0%	0%	0%	1%	0%	4%	0%	3%	1%	0%	0%	5%	14%	1%	0%	38%	1%	0%	0%	0%	33%	0%
OK	Riparian	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	17%	0%	0%	0%	17%	0%
OK	Riverine	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	1%	25%	3%	2%	16%	4%	0%	0%	1%	43%	2%
OK	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	0%	0%	0%	0%	0%	0%	25%	0%
OK	All water types	0%	0%	0%	0%	0%	1%	1%	1%	1%	0%	0%	1%	24%	3%	2%	17%	4%	0%	0%	1%	42%	2%
OR	Estuarine	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	12%	1%	1%	6%	2%	0%	30%	17%	1%
OR	Lacustrine	2%	0%	0%	0%	0%	4%	2%	0%	0%	0%	0%	0%	16%	14%	2%	0%	10%	0%	0%	27%	22%	2%
OR	Marine	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	59%	0%	9%	0%	0%	0%	0%	18%	5%	5%
OR	Palustrine	0%	0%	0%	0%	0%	1%	22%	2%	6%	1%	1%	6%	16%	1%	2%	21%	1%	0%	0%	0%	18%	1%
OR	Riparian	0%	0%	0%	0%	0%	0%	0%	3%	3%	0%	0%	6%	23%	20%	0%	3%	17%	3%	0%	0%	23%	0%
OR	Riverine	0%	0%	0%	0%	0%	0%	6%	1%	1%	0%	0%	1%	30%	10%	1%	14%	6%	1%	0%	5%	22%	1%
OR	All water types	0%	0%	0%	0%	0%	1%	10%	1%	2%	1%	0%	2%	26%	8%	1%	15%	5%	1%	0%	5%	20%	1%
PA	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	9%	0%	0%	0%	0%	0%	9%	69%	3%
PA	Lacustrine	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	14%	17%	0%	0%	4%	0%	0%	57%	3%	2%
PA	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	20%	0%	20%	0%	0%	0%	0%	0%	0%
PA	Palustrine	0%	0%	0%	57%	0%	2%	2%	2%	0%	0%	0%	1%	6%	0%	0%	13%	1%	0%	0%	0%	15%	0%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
PA	Riparian	0%	0%	0%	22%	1%	1%	0%	1%	4%	0%	0%	0%	35%	5%	1%	1%	4%	1%	0%	0%	23%	0%
PA	Riverine	0%	0%	0%	23%	0%	1%	1%	2%	0%	0%	0%	0%	24%	7%	1%	7%	4%	0%	0%	2%	27%	0%
PA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	25%	25%	0%	0%	0%	0%	25%	0%	0%	0%
PA	All water types	0%	0%	0%	30%	0%	1%	1%	2%	0%	0%	0%	0%	21%	6%	1%	8%	3%	0%	0%	2%	24%	0%
RI	Estuarine	0%	8%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	25%	0%	0%	0%	5%	0%	0%	10%	50%	0%
RI	Lacustrine	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	8%	0%	0%	8%	50%	0%
RI	Marine	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	10%	0%	0%	9%	3%	0%	35%	21%	10%
RI	Palustrine	0%	0%	0%	0%	0%	1%	6%	0%	3%	0%	0%	1%	56%	0%	0%	0%	6%	3%	0%	0%	17%	5%
RI	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	0%	0%	0%	0%	0%	0%	9%	27%	0%
RI	Riverine	0%	0%	0%	0%	0%	1%	1%	2%	1%	0%	0%	0%	19%	4%	0%	1%	6%	1%	0%	3%	58%	4%
RI	All water types	0%	1%	0%	0%	0%	1%	3%	1%	1%	0%	0%	1%	35%	3%	0%	0%	6%	2%	0%	9%	31%	5%
SC	Estuarine	0%	4%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	40%	14%	0%	2%	6%	0%	0%	20%	8%	3%
SC	Lacustrine	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	2%	41%	17%	1%	1%	7%	0%	0%	18%	5%	4%
SC	Marine	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	29%	41%	1%	0%	3%	0%	0%	10%	13%	1%
SC	Palustrine	0%	0%	0%	0%	0%	1%	2%	2%	16%	3%	2%	14%	39%	1%	1%	5%	3%	0%	0%	1%	6%	5%
SC	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	0%	52%	0%	4%	0%	0%	0%	0%	13%	4%	17%
SC	Riverine	0%	0%	0%	0%	0%	0%	2%	1%	6%	1%	1%	2%	40%	7%	1%	6%	5%	0%	0%	17%	9%	3%
SC	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	20%	0%	0%	53%	0%	0%	0%	0%	0%	13%
SC	All water types	0%	1%	0%	0%	0%	0%	1%	1%	8%	1%	1%	6%	39%	8%	1%	5%	4%	0%	0%	12%	7%	4%
SD	Lacustrine	0%	2%	0%	0%	0%	0%	1%	0%	5%	0%	0%	2%	21%	23%	2%	1%	7%	0%	0%	25%	9%	1%
SD	Palustrine	0%	0%	0%	0%	0%	2%	13%	4%	3%	3%	0%	3%	20%	0%	0%	11%	1%	0%	0%	0%	39%	0%
SD	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	33%	33%	0%	0%	0%	0%	0%
SD	Riverine	3%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	34%	6%	1%	4%	6%	0%	0%	2%	40%	1%
SD	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	50%	0%
SD	All water types	2%	0%	0%	0%	0%	1%	4%	1%	2%	1%	0%	2%	29%	6%	1%	6%	5%	0%	0%	3%	37%	1%
TN	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	11%	1%	0%	0%	0%	0%	72%	9%	1%
TN	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	5%	4%	1%	11%	25%	0%	2%	6%	4%	0%	0%	0%	36%	3%
TN	Riparian	0%	0%	0%	2%	2%	0%	2%	2%	0%	2%	0%	4%	22%	14%	4%	0%	2%	0%	0%	2%	42%	0%
TN	Riverine	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	30%	22%	1%	3%	7%	0%	0%	4%	26%	1%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
TN	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	0%	0%	0%	0%	0%	20%	0%	0%
TN	All water types	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	19%	16%	1%	2%	4%	0%	0%	35%	19%	1%
TX	Estuarine	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	16%	12%	1%	26%	2%	0%	0%	15%	17%	7%
TX	Lacustrine	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	0%	2%	32%	18%	1%	7%	5%	0%	0%	23%	5%	3%
TX	Marine	0%	1%	0%	0%	0%	0%	1%	0%	3%	0%	0%	2%	25%	16%	1%	10%	3%	1%	0%	27%	8%	1%
TX	Palustrine	0%	0%	0%	0%	0%	3%	0%	3%	0%	0%	0%	1%	4%	0%	1%	65%	1%	0%	0%	0%	5%	16%
TX	Riparian	0%	0%	0%	1%	0%	1%	1%	0%	2%	2%	1%	1%	20%	8%	7%	36%	4%	0%	0%	0%	16%	1%
TX	Riverine	0%	0%	0%	0%	0%	5%	1%	4%	1%	1%	0%	1%	12%	2%	3%	60%	1%	0%	0%	1%	7%	1%
TX	Uplands	0%	0%	0%	0%	0%	6%	0%	0%	3%	3%	0%	6%	22%	13%	6%	6%	0%	0%	0%	9%	25%	0%
TX	All water types	0%	0%	0%	0%	0%	4%	1%	3%	1%	0%	0%	1%	9%	2%	1%	59%	1%	0%	0%	2%	6%	9%
UT	Estuarine	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
UT	Lacustrine	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	16%	40%	0%	4%	2%	0%	0%	20%	13%	0%
UT	Marine	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
UT	Palustrine	1%	0%	0%	2%	0%	3%	1%	5%	9%	2%	1%	6%	21%	0%	3%	36%	0%	0%	0%	1%	6%	3%
UT	Riparian	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	2%	40%	27%	2%	15%	6%	1%	0%	0%	2%	1%
UT	Riverine	1%	0%	0%	1%	0%	0%	12%	4%	1%	0%	0%	0%	28%	14%	1%	27%	4%	0%	0%	0%	4%	1%
UT	All water types	1%	0%	0%	1%	0%	1%	9%	4%	2%	1%	0%	1%	28%	14%	2%	27%	4%	0%	0%	1%	4%	1%
VA	Estuarine	0%	5%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	26%	38%	0%	0%	5%	0%	0%	21%	3%	0%
VA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	15%	47%	0%	0%	5%	0%	0%	24%	3%	1%
VA	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	0%	0%	0%	7%	0%	0%	14%	14%	0%
VA	Palustrine	1%	0%	0%	0%	0%	1%	3%	0%	14%	6%	4%	9%	29%	5%	1%	2%	3%	0%	0%	1%	15%	4%
VA	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	14%	36%	0%	0%	0%	7%	0%	0%	0%	21%	7%
VA	Riverine	1%	0%	0%	0%	0%	2%	1%	0%	3%	2%	1%	2%	39%	10%	1%	3%	4%	0%	0%	5%	21%	4%
VA	Uplands	0%	0%	0%	0%	0%	0%	14%	0%	14%	0%	0%	0%	29%	14%	0%	0%	0%	0%	0%	14%	14%	0%
VA	All water types	0%	2%	0%	0%	0%	1%	1%	0%	4%	2%	1%	3%	32%	20%	1%	2%	4%	0%	0%	10%	13%	3%
VT	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	12%	29%	0%	0%	8%	0%	0%	21%	26%	3%
VT	Palustrine	2%	0%	0%	0%	0%	6%	0%	0%	20%	4%	2%	10%	18%	0%	2%	2%	2%	0%	1%	0%	18%	15%
VT	Riverine	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	25%	11%	2%	0%	9%	0%	0%	1%	47%	2%
VT	All water types	1%	0%	0%	0%	0%	2%	0%	0%	6%	1%	0%	3%	21%	10%	2%	1%	7%	0%	0%	3%	35%	6%

Table G-3: Affected Clean Water Act section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unsigned
WA	Estuarine	0%	11%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	36%	6%	1%	2%	16%	0%	0%	7%	18%	1%
WA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	21%	7%	1%	1%	18%	0%	0%	33%	16%	2%
WA	Marine	0%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%	0%	0%	4%	0%	0%	4%	6%	1%
WA	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	19%	5%	2%	8%	23%	1%	6%	5%	3%	1%	0%	0%	21%	3%
WA	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	37%	4%	10%	5%	6%	1%	0%	0%	34%	1%
WA	Riverine	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	1%	35%	9%	2%	1%	9%	0%	0%	6%	31%	3%
WA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%	0%	0%	0%	0%	0%	0%	20%	0%
WA	All water types	0%	33%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	20%	4%	2%	1%	7%	0%	0%	7%	17%	2%
WI	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	25%	0%	0%	25%	0%	0%	0%	0%	0%
WI	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	11%	57%	0%	0%	14%	0%	0%	8%	6%	2%
WI	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	60%	0%	0%	10%	0%	0%	0%	20%	0%
WI	Palustrine	1%	0%	0%	0%	0%	0%	2%	0%	8%	1%	1%	11%	35%	2%	2%	4%	3%	0%	0%	0%	23%	3%
WI	Riparian	0%	0%	0%	1%	0%	1%	1%	0%	3%	0%	1%	2%	55%	15%	3%	0%	3%	0%	0%	1%	15%	1%
WI	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	28%	35%	2%	1%	5%	0%	0%	3%	22%	1%
WI	Uplands	0%	0%	0%	0%	0%	0%	6%	0%	11%	0%	0%	14%	20%	23%	3%	3%	11%	0%	0%	0%	6%	3%
WI	All water types	0%	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	5%	25%	31%	2%	2%	7%	0%	0%	4%	18%	2%
WV	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%
WV	Lacustrine	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	4%	22%	30%	4%	0%	7%	0%	0%	15%	11%	0%
WV	Palustrine	0%	0%	0%	39%	1%	13%	12%	5%	0%	0%	0%	1%	5%	0%	0%	22%	0%	0%	0%	0%	1%	0%
WV	Riparian	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	54%	8%	0%	0%	0%	8%	0%
WV	Riverine	0%	0%	0%	22%	2%	7%	4%	4%	0%	0%	0%	0%	25%	5%	0%	23%	1%	0%	0%	0%	4%	1%
WV	Uplands	0%	0%	0%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
WV	All water types	0%	0%	0%	25%	2%	8%	5%	4%	0%	0%	0%	0%	21%	4%	0%	23%	1%	0%	0%	0%	4%	1%
WY	Lacustrine	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	21%	23%	0%	0%	2%	2%	0%	39%	5%	5%
WY	Palustrine	0%	0%	0%	0%	1%	1%	0%	0%	3%	0%	0%	2%	27%	1%	3%	26%	1%	0%	0%	0%	31%	3%
WY	Riverine	1%	0%	0%	0%	1%	12%	0%	0%	0%	0%	0%	0%	17%	16%	2%	24%	4%	0%	0%	1%	20%	1%
WY	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%
WY	All water types	1%	0%	0%	0%	1%	9%	0%	0%	1%	0%	0%	1%	20%	12%	2%	24%	3%	0%	0%	2%	23%	2%

Appendix H Alternative Permit Cost Estimates using Sunding and Zilberman (2002) Values

Sunding and Zilberman’s cost data is based on 103 individual and general permit applications. It is not clear if these are from a single or multiple years and what specific time period is covered. However, in a typical year the Corps issues tens of thousands of permits, so the Sunding and Zilberman sample size is almost certainly insufficiently large to represent the different types of projects covered. Furthermore, the permit applications were not a randomly drawn sample. Instead, the study relied on outside parties that must comply with 404 permitting requirements to provide permits to represent costs. Sunding and Zilberman write, “[a] list of permitted projects was obtained from the National Association of Counties (since county governments conduct the vast majority of road maintenance, flood control, and stormwater management work) and from phone interviews with private developers and wetlands consultants.”

Although Sunding and Zilberman point out that “[t]he final data come from a roughly even mix of private and public applicants (52% public agency applicants and 48% private entities),” municipal projects are often much larger and complex than typical permitted projects. Likewise, private developers often perform projects where large tracts of land are subdivided into dozens of parcels.

The Sunding and Zilberman (2002) permit unit cost values have a wide range, as shown in Table H-1. Their low values are lower than the Corps’ low permit unit cost estimates, but their high values are 14 and 60 times greater than the Corps’ high estimates for general and individual permits, respectively. Because Sunding and Zilberman did not provide a cost breakdown by category for their estimates, their values may include cost components that will remain under the final rule (e.g., costs associated with completing a jurisdictional determination to determine whether a section 404 permit is required). The high-end estimates from the Sunding and Zilberman (2002) paper also very likely represent large permits covering multiple water features. These types of permits are still likely to be needed even if one or more of those waters would have been non-jurisdictional under the 2020 NWPR. Thus, the agencies used the Corps’ low and high permit cost values to estimate the range of costs associated with the increase in required section 404 permits (Section III.C.2.2).

Table H-1: Range of section 404 permit values (2021\$) from Sunding and Zilberman (2002)					
Permit Type	Low	High	Mean	Median	Base + Acre
General	\$3,300	\$227,800	\$47,000	\$19,200	\$27,400 plus \$15,100/acre
Individual	\$11,400	\$2,488,500	\$441,700	\$252,100	\$71,100 plus \$19,200/acre

This appendix presents alternative permit cost estimates resulting from the final rule using the “Base + Acre” estimates from Sunding & Zilberman (2002). The “Base + Acre” estimates allow EPA to account for the smaller, single-water projects for which the final rule will affect permit costs, relative to the 2020 NWPR, although the unit cost estimates may still include cost components that will remain under the final rule. To apply the “Base + Acre” permit cost estimates from Sunding & Zilberman (2002), the agencies estimated annual average acre impacts, with linear feet impacts converted to acres, of single-water general and single-water individual permits for each HUC2 and Cowardin category. The agencies used the Corps’ ORM2 section 404 permit database for years 2010-2019, removing permits issued under the Clean Water Rule and permits issued with a mitigation work type. The agencies reviewed the impact entries and

removed: (1) outliers likely caused by data entry issues and (2) projects associated with activities such as oyster reef cultivation or restoration. In total, the agencies removed 362 records from the analysis of “annual average acre impacts” by HUC2 and Cowardin category.

For the alternative permit cost estimates, the agencies needed to adjust the estimated “annual average acre impacts” by HUC2 and Cowardin category to account for blank value issues. First, the estuarine values were used for both estuarine and marine permit count change estimates. Second, when the “annual average acre impacts” value was blank for a Cowardin subcategory (*e.g.*, Palustrine – Moss-Lichens (PML)) for a particular HUC2, the agencies used the estimate for the higher-level Cowardin category (*e.g.*, Palustrine) for the applicable HUC2. Lastly, if the value for the higher-level Cowardin category for a particular HUC2 was still blank, the agencies used the average value for the higher-level Cowardin category across all HUC2s. The final “annual average acre impacts” values for each HUC2/Cowardin category can be found on the “Revised Average Impact Acres” tab in the “Alternative Permit Costs” calculation spreadsheet.¹¹⁷

The agencies calculated the alternative permit costs resulting from the final rule following the same methodology as described in Section III.C.2.2, except using the Sunding & Zilberman (2002) “Base + Acre” unit cost estimates plus the “annual average impact acre” values instead of the Corps’ unit cost estimates. Table H-2 presents alternative annualized permit costs from increases in section 404 permits at the national level, while Table H-3 presents alternative annualized permit costs at the HUC2/major Cowardin category level. The estimated alternative national annualized permit costs are \$268 million using a 3 percent discount rate and \$279 million using a 7 percent discount rate. These values are approximately two times higher than the high estimates using the Corps’ unit cost estimates (\$136 million using a 3 percent discount rate and \$142 million using a 7 percent discount rate; *see* Section III.C.2.2 for details).

Table H-2: Alternative national annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR

Permit Type	Estimated Average Annual Increase in Permits ^{1,2}	Unit Costs from Sunding & Zilberman (2002) (Base + Acre, 2021\$)	Estimated Increase in Annualized Permit Costs (millions 2021\$) ^{1,3}	
			3% Discount Rate	7% Discount Rate
GP	7,751	\$27,400 plus \$15,100/acre	\$242.5	\$252.0
IP	151	\$71,100 plus \$19,200/acre	\$25.7	\$26.7
Total	7,902		\$268.2	\$278.6

¹ Reflects annual increase in permits in 49 States (excludes Hawaii and District of Columbia).

² Estimated average annual permit increases based on single-water section 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the 2020 NWPR.

³ Permit costs are calculated using the estimated average annual increase in the number of single-water general and individual permits, the estimated “annual average impact acres” calculated at the HUC2/Cowardin category for general and individual permits, and the applicable Sunding & Zilberman (2002) “Base + Acre” unit costs: (increases in # permits) * (base cost + (acre cost * annual average impact acres)). The permit costs are annualized over the 2023-2042 analysis period, discounting to year 2023.

¹¹⁷ Available in the docket for this rule, Docket ID Number EPA-HQ-OW-2021-0602.

Table H-3: Alternative annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR, by HUC2/Cowardin category

HUC2	Major Cowardin Category	Annual Average Increase in Permits with Final Rule ^{1,2}		Annualized Permit Costs (Thousands 2021\$) ^{1,3}			
				3% Discount Rate		7% Discount Rate	
		General	Individual	General	Individual	General	Individual
01	Estuarine	-0.1	0.0	-\$2	\$0	-\$3	\$0
01	Lacustrine	35.5	0.2	\$1,033	\$27	\$1,073	\$28
01	Palustrine	151.7	1.7	\$4,713	\$174	\$4,896	\$180
01	Riverine	27.1	0.3	\$925	\$23	\$961	\$24
01	Riparian	5.3	0.1	\$194	\$10	\$201	\$10
01	Upland	0.0	0.0	\$0	\$0	\$0	\$0
02	Estuarine	0.7	0.0	\$25	\$4	\$26	\$4
02	Lacustrine	28.2	0.2	\$940	\$19	\$976	\$20
02	Palustrine	238.2	2.5	\$7,267	\$262	\$7,549	\$273
02	Riverine	399.0	0.5	\$12,069	\$46	\$12,538	\$48
02	Riparian	8.7	0.2	\$278	\$15	\$289	\$16
02	Upland	0.8	0.0	\$24	\$3	\$25	\$3
03	Estuarine	0.3	0.0	\$14	\$1	\$14	\$1
03	Lacustrine	60.4	2.9	\$1,865	\$315	\$1,938	\$327
03	Palustrine	274.0	25.5	\$9,070	\$6,661	\$9,422	\$6,919
03	Riverine	108.7	1.5	\$3,315	\$221	\$3,443	\$229
03	Riparian	18.7	0.6	\$563	\$79	\$585	\$82
03	Upland	1.8	0.2	\$65	\$84	\$67	\$87
04	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
04	Lacustrine	289.2	13.8	\$8,484	\$1,134	\$8,813	\$1,178
04	Palustrine	160.1	7.2	\$5,184	\$778	\$5,385	\$809
04	Riverine	67.9	1.5	\$2,031	\$131	\$2,110	\$136
04	Riparian	7.1	0.1	\$216	\$14	\$224	\$15
04	Upland	0.7	0.1	\$22	\$7	\$23	\$7
05	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
05	Lacustrine	60.0	1.0	\$1,813	\$99	\$1,883	\$103
05	Palustrine	337.0	0.5	\$9,878	\$59	\$10,262	\$61
05	Riverine	749.3	2.1	\$21,882	\$179	\$22,732	\$186

Table H-3: Alternative annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR, by HUC2/Cowardin category

HUC2	Major Cowardin Category	Annual Average Increase in Permits with Final Rule ^{1,2}		Annualized Permit Costs (Thousands 2021\$) ^{1,3}			
				3% Discount Rate		7% Discount Rate	
		General	Individual	General	Individual	General	Individual
05	Riparian	7.2	0.0	\$214	\$6	\$222	\$6
05	Upland	0.8	0.0	\$22	\$0	\$23	\$0
06	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
06	Lacustrine	170.6	3.1	\$5,090	\$270	\$5,287	\$280
06	Palustrine	9.1	0.7	\$273	\$88	\$284	\$92
06	Riverine	25.0	0.3	\$754	\$41	\$783	\$43
06	Riparian	2.1	0.0	\$62	\$10	\$65	\$10
06	Upland	0.0	0.0	\$1	\$0	\$1	\$0
07	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
07	Lacustrine	152.3	2.1	\$4,572	\$246	\$4,750	\$255
07	Palustrine	173.5	6.6	\$5,665	\$992	\$5,885	\$1,030
07	Riverine	190.0	2.8	\$5,907	\$289	\$6,137	\$300
07	Riparian	17.0	0.7	\$634	\$78	\$659	\$81
07	Upland	2.4	0.0	\$85	\$0	\$89	\$0
08	Estuarine	0.3	0.0	\$15	\$4	\$15	\$4
08	Lacustrine	19.1	0.8	\$640	\$124	\$665	\$128
08	Palustrine	132.9	13.3	\$5,097	\$2,658	\$5,295	\$2,762
08	Riverine	130.6	2.1	\$3,821	\$206	\$3,970	\$214
08	Riparian	6.3	1.4	\$232	\$365	\$241	\$379
08	Upland	29.3	7.8	\$914	\$1,045	\$949	\$1,085
09	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
09	Lacustrine	12.2	0.1	\$390	\$18	\$406	\$18
09	Palustrine	39.8	1.6	\$1,265	\$211	\$1,314	\$219
09	Riverine	3.9	0.2	\$125	\$21	\$130	\$21
09	Riparian	0.6	0.0	\$16	\$0	\$17	\$0
09	Upland	0.1	0.0	\$4	\$0	\$4	\$0
10	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
10	Lacustrine	207.6	1.1	\$6,327	\$228	\$6,572	\$237

Table H-3: Alternative annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR, by HUC2/Cowardin category

HUC2	Major Cowardin Category	Annual Average Increase in Permits with Final Rule ^{1,2}		Annualized Permit Costs (Thousands 2021\$) ^{1,3}			
				3% Discount Rate		7% Discount Rate	
		General	Individual	General	Individual	General	Individual
10	Palustrine	181.9	2.2	\$5,579	\$240	\$5,796	\$249
10	Riverine	374.1	2.2	\$12,243	\$223	\$12,719	\$231
10	Riparian	6.2	0.1	\$204	\$9	\$212	\$9
10	Upland	1.0	0.1	\$31	\$8	\$32	\$8
11	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
11	Lacustrine	15.8	0.5	\$490	\$44	\$510	\$46
11	Palustrine	61.3	0.9	\$2,061	\$113	\$2,141	\$118
11	Riverine	443.2	1.9	\$13,719	\$324	\$14,252	\$337
11	Riparian	1.8	0.1	\$53	\$14	\$56	\$14
11	Upland	0.6	0.1	\$17	\$5	\$17	\$6
12	Estuarine	0.1	0.0	\$8	\$1	\$8	\$1
12	Lacustrine	18.2	2.6	\$654	\$406	\$680	\$421
12	Palustrine	566.7	2.5	\$19,163	\$626	\$19,908	\$650
12	Riverine	415.1	0.8	\$12,217	\$83	\$12,692	\$86
12	Riparian	5.8	0.0	\$182	\$6	\$189	\$6
12	Upland	0.8	0.1	\$25	\$11	\$26	\$11
13	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
13	Lacustrine	1.3	0.1	\$40	\$18	\$41	\$18
13	Palustrine	3.5	0.1	\$112	\$11	\$117	\$11
13	Riverine	103.8	0.4	\$3,158	\$36	\$3,281	\$37
13	Riparian	1.0	0.0	\$30	\$0	\$31	\$0
13	Upland	3.3	0.0	\$95	\$0	\$98	\$0
14	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
14	Lacustrine	2.3	0.2	\$68	\$49	\$71	\$51
14	Palustrine	23.2	0.3	\$739	\$55	\$767	\$57
14	Riverine	72.7	0.4	\$2,150	\$55	\$2,233	\$57
14	Riparian	3.2	0.0	\$100	\$0	\$104	\$0
14	Upland	0.3	0.0	\$9	\$0	\$9	\$0

Table H-3: Alternative annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR, by HUC2/Cowardin category

HUC2	Major Cowardin Category	Annual Average Increase in Permits with Final Rule ^{1,2}		Annualized Permit Costs (Thousands 2021\$) ^{1,3}			
				3% Discount Rate		7% Discount Rate	
		General	Individual	General	Individual	General	Individual
15	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
15	Lacustrine	0.5	0.0	\$30	\$2	\$31	\$2
15	Palustrine	0.4	0.1	\$12	\$7	\$12	\$7
15	Riverine	153.1	1.9	\$5,074	\$301	\$5,271	\$313
15	Riparian	0.5	0.1	\$16	\$5	\$17	\$6
15	Upland	0.2	0.0	\$7	\$0	\$8	\$0
16	Estuarine	0.0	0.0	\$0	\$0	\$0	\$0
16	Lacustrine	5.7	0.5	\$431	\$42	\$448	\$43
16	Palustrine	16.3	0.3	\$720	\$28	\$748	\$29
16	Riverine	77.1	0.1	\$2,211	\$11	\$2,297	\$11
16	Riparian	8.9	0.0	\$271	\$1	\$281	\$1
16	Upland	0.0	0.0	\$0	\$0	\$0	\$0
17	Estuarine	-0.2	0.0	-\$8	-\$1	-\$8	-\$1
17	Lacustrine	41.1	2.8	\$1,282	\$226	\$1,331	\$235
17	Palustrine	58.3	3.0	\$2,022	\$351	\$2,101	\$365
17	Riverine	55.5	1.8	\$1,822	\$323	\$1,893	\$335
17	Riparian	14.6	0.2	\$470	\$28	\$489	\$29
17	Upland	0.2	0.0	\$7	\$0	\$7	\$0
18	Estuarine	0.0	0.0	\$3	\$1	\$4	\$1
18	Lacustrine	8.3	0.6	\$334	\$77	\$347	\$80
18	Palustrine	45.6	1.5	\$2,284	\$209	\$2,373	\$217
18	Riverine	504.0	3.0	\$15,276	\$543	\$15,869	\$564
18	Riparian	25.1	0.7	\$805	\$95	\$836	\$99
18	Upland	1.9	0.0	\$57	\$6	\$59	\$6
19	Estuarine	0.0	0.0	-\$1	-\$1	-\$1	-\$1
19	Lacustrine	3.9	0.3	\$116	\$78	\$120	\$81
19	Palustrine	51.1	10.8	\$1,809	\$3,702	\$1,879	\$3,846
19	Riverine	6.4	0.2	\$248	\$68	\$258	\$71

Table H-3: Alternative annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the 2020 NWPR, by HUC2/Cowardin category

HUC2	Major Cowardin Category	Annual Average Increase in Permits with Final Rule ^{1,2}		Annualized Permit Costs (Thousands 2021\$) ^{1,3}			
				3% Discount Rate		7% Discount Rate	
		General	Individual	General	Individual	General	Individual
19	Riparian	2.0	0.0	\$67	\$6	\$69	\$6
19	Upland	0.5	0.0	\$31	\$5	\$32	\$5
Total		7,751.3	150.9	\$242,537	\$25,692	\$251,956	\$26,690

¹ Reflects annual increase in permits in 49 States (excludes Hawaii and District of Columbia).

² Estimated average annual permit increases based on single-water section 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the 2020 NWPR.

³ Permit costs are calculated using the estimated average annual increase in the number of single-water general and individual permits, the estimated “annual average impact acres” calculated at the HUC2/Cowardin category for general and individual permits, and the applicable Sunding & Zilberman (2002) “Base + Acre” unit costs: (increases in # permits) * (base cost + (acre cost * annual average impact acres)). The permit costs are annualized over the 2023-2042 analysis period, discounting to year 2023.