EPA United States Environmental Protection Agency

Fish and Shellfish Program NEWSLETTER

May 2023
EPA 823N23003

In This Issue

https://www.epa.gov/fish-tech

Recent Advisory News

Kansas Issues Fish Consumption Advisories for 2023

On January 26, 2023, the Kansas Department of Health and Environment (KDHE) and the Kansas Department of Wildlife and Parks (KDWP) issued fish consumption advisories for 2023. The advisories identify types of fish or other aquatic animals that should be eaten in limited quantities or, in some cases, avoided altogether because of contamination. General advice and internet resources are provided to aid the public in making informed decisions regarding the benefits and the risks associated with eating locally-caught fish from Kansas waters.

Definitions:

Bottom-feeding fish: buffaloes, carps, catfishes, sturgeons, and suckers

Shellfish: mussels, clams, and crayfish

Serving size (skinless fish fillets before cooking):

- Adults and children age 13 and older = 8 ounces
- Children age 6 to 12 = 4 ounces
- Children younger than 6 = 2 ounces

Statewide Mercury Advisories for Fish:

Getting outside to catch fish and eating fish has many health benefits, but all fish contain some amount of mercury. Anyone who routinely eats fish or serves fish to their children should carefully consider the types and amounts they eat, including store-bought fish. Too much dietary mercury can harm the development of fetuses, nursing babies and growing children. Therefore, mercury-sensitive individuals **(women who are pregnant, nursing, or may become pregnant, and children younger than 17 years old)** should follow the guidelines presented below for eating fish caught in Kansas.

Fishing and Eating Guidelines:

- Eat smaller portions – a fillet about the size of your palm
- Eat types of fish with less mercury (Preferred Choice Fish in the chart below)
- If you don't know the type or size of fish you are eating, wait at least a week before eating fish again

- When fishing, keep the fish you catch shorter than your forearm (fingertips to elbow) or less than 20 inches as regulations allow

Preferred Choice Fish	Servings
Blue and channel catfish	1 or 2 per week
Common carp	
Crappies	
White bass, white perch, wiper, striped bass	
Walleye, sauger, saugeye	
Bullhead catfish	
Drum	
Sunfish (bluegill, green, redear, etc.)	
Second Choice Fish	**Servings**
Buffaloes (black, bigmouth, and smallmouth)	1 or 2 per month
Flathead catfish	
Bass (largemouth, smallmouth, and spotted)	

Reduce the recommendations above if you tend to keep the **fish you catch larger than about 20 inches** to:

- *Preferred Choice Fish* – **not more than 1 serving per week**
- *Second Choice Fish* – **not more than 1 serving per month**

For specific questions or concerns about mercury in Kansas fish, please contact KDHE. For information about mercury in fish caught in other states, in store bought fish, and in other types seafood please visit the U.S. Environmental Protection Agency (EPA) and U.S. Food and Drug Administration (FDA) websites.

Waterbody specific advisories for all consumers:

Kansas recommends restricting consumption of **bottom-feeding fish and catfishes** to **1 serving per week** from the following locations because of polychlorinated biphenyls (PCBs):

- **Cow Creek** in Hutchinson and downstream to the confluence with the Arkansas River (Reno County)
- **Kansas River** from Lawrence (below Bowersock Dam) downstream to Eudora at the confluence of the Wakarusa River (Douglas and Leavenworth counties)
- **Little Arkansas River** from the Main Street Bridge immediately west of Valley Center to the confluence with the Arkansas River in Wichita (Sedgwick County)

Kansas recommends restricting consumption of **bottom-feeding fish and catfishes** to **1 serving per month** from the following location because of PCBs:

- **K-96 Lake** in Wichita (Sedgwick County)

Kansas recommends **not eating** specified fish or aquatic life from the following locations:

- **Arkansas River** from the Lincoln Street dam in Wichita downstream to the confluence with Cowskin Creek near Belle Plaine (Sedgwick and Sumner counties); **bottom-feeding fish and catfishes** due to PCBs

- **Shoal Creek** from the Missouri/Kansas border to Empire Lake (Cherokee County); **shellfish** due to lead and cadmium
- **Spring River** from the confluence of Center Creek to the Kansas/Oklahoma border (Cherokee County); **shellfish** due to lead and cadmium
- **Antioch Park Lake South** in Antioch Park, Overland Park (Johnson County); **all fish** due to pesticides dieldrin, heptachlor epoxide, chlordane and dichlorophenyltrichloroethanes (DDTs)
- **Arkalon Park Lakes** in Liberal (Seward County) – Kansas recommends not eating **any aquatic life** because the lakes are sustained solely by treated municipal wastewater

Waterbodies affected by Harmful Algal Blooms

To date, measured algal toxin levels in fish samples collected from waters affected by harmful algal blooms (HABs) suggest the fish are safe to eat. However, please take the following precautions:

- Avoid skin contact with water
- Wear gloves when handling wet fish and equipment
- Rinse fish with clean water
- Remove skin from fillets and rinse with clean water prior to cooking or freezing
- Eat only skinless fillets
- Do not eat shellfish

General advice for reducing exposure to chemicals in fish

- Keep smaller fish to eat and let the big ones go
- Avoid eating fish parts other than fillets
- Trim fat from fillets and/or use cooking methods that allows fat to drip away
- Avoid subsistence fishing (relying on wild-caught fish for daily nutritional needs) in rivers within or immediately downstream of large urban/industrial areas
- Do not eat fish or aquatic life from wastewater outfalls, waste treatment lagoons or stormwater retention ponds

Other information from KDHE, KDWPT, EPA, and the American Heart Association

- To view the advisories online and for information about KDHE's Fish Tissue Contaminant Monitoring Program.
- For information about fishing in Kansas including licensing, regulations, fishing reports and fishing forecasts please visit the KDWPT fishing website.
- For information about the health benefits vs. the risks of including fish in your diet please visit this American Heart Association website.
- For technical information regarding the U.S. EPA risk assessment methods used to determine advisory consumption limits please visit http://www2.epa.gov/fish-tech.

For more information, contact Jack Lapin at Jack.Lapin@ks.gov.

Source: https://www.kdhe.ks.gov/CivicAlerts.aspx?AID=552

Massachusetts Department of Public Health Issues New Fish Consumption Advisories Based on Per- and Polyfluorinated Substances (PFAS) in Fish at 13 State Parks

On March 6, 2023, the Massachusetts Department of Public Health (MDPH) issued new fish consumption advisories to provide guidance for people who catch and consume freshwater fish from 13 waterbodies at state parks operated by the Department of Conservation and Recreation (DCR). Recent testing of fish from these locations found levels of PFAS above MDPH-recommended levels for regular consumption.

During recent testing of recreational waterbodies, elevated levels of PFAS were detected in fish sampled from:

- Ashland Reservoir in Ashland
- Chicopee Reservoir in Chicopee
- Lake Cochituate in Natick
- Dennison Lake in Winchendon
- Dunn Pond in Gardner
- Fearing Pond in Plymouth
- Houghtons Pond in Milton
- Pearce Lake in Saugus
- Pequot Pond in Westfield
- Lake Quinsigamond in Worcester
- Walden Pond in Concord
- Wallum Lake in Douglas
- Watsons Pond in Taunton

MDPH also sampled surface water at these locations, and PFAS was not found at levels that would be unsafe for swimming or any other recreational activities at these locations.

PFAS are a group of man-made chemicals manufactured and used in a variety of consumer products and industries worldwide. Based on studies of laboratory animals and people, exposure to certain PFAS has been associated with changes in liver and kidney function, changes in thyroid hormone and cholesterol levels, and immune system effects. In addition, PFAS exposure has been shown to cause developmental effects to fetuses during pregnancy. Some studies also suggest an increased risk of developing cancer following long-term exposures to elevated levels of some PFAS.

MDPH prioritized the testing of fish and surface water at these waterbodies, because they are popular locations for swimming and fishing. They are also located in communities in or near Environmental Justice Populations, where the existing burden of disease and exposure to sources of pollution are greatest. Surface water testing at seven marine beaches, including Carson, Constitution, Savin Hill, and Tenean beaches in Boston Harbor; Revere Beach in Broad Sound; Kings Beach in Nahant Bay; and Wollaston Beach in Quincy Bay, showed that these beaches are safe for swimming.

The fish consumption advisories for the 13 waterbodies include guidance on the amount of fish that can be safely consumed from each individual location. The amount varies depending on the levels of PFAS found in the fish, other contaminants that have been evaluated in the past, and who might consume the fish. Advisories were developed for sensitive populations (including children under 12, people who are or may become pregnant, and nursing people) and for all others in the general population.

Because the new fish consumption advisories are different for each waterbody, recommendations range from consuming two meals per week to no fish consumption. MDPH fish consumption advice applies to the consumption of all native game fish but does not apply to stocked trout at a waterbody. Stocked fish are raised in fish hatcheries and then released. Therefore, they are unlikely to spend enough time in a lake or pond to become contaminated.

MDPH has recommended that DCR work with local health departments in Ashland, Chicopee, Concord, Douglas, Gardner, Milton, Natick, Plymouth, Saugus, Taunton, Westfield, Winchendon, and Worcester to help publicize this information for people in these communities that may visit the local state parks.

For more information about the fish consumption advisories and PFAS from MDPH, please visit: PFAS (Per- and Polyfluoroalkyl Substances) in Recreationally Caught Fish or contact MDPH State Toxicologist Marc A. Nascarella at marc.nascarella@mass.gov.

Source: https://www.mass.gov/news/department-of-public-health-issues-new-fish-consumption-advisories-based-on-pfas-in-fish-at-13-state-parks

EPA News

EPA Announces Proposal to Protect Tribal Reserved Rights in Water Quality Standards and Best Practices for Tribal Treaty and Reserved Rights

Proposed regulatory revisions to recognize Tribal rights reflects Biden-Harris Administration's commitment to deliver clean, safe water for all

On November 30, 2022, during the 2022 White House Tribal Nations Summit, the U.S. Environmental Protection Agency (EPA) Administrator Michael S. Regan announced a proposal to revise the federal water quality standards regulations to better protect Tribal rights under the Clean Water Act. With this action, EPA is working to ensure that state and federal water quality standards will protect tribal rights such as the right to fish or gather aquatic plants—that are reserved through treaties, statutes, executive orders, or other sources of federal law.

"We know that our shared goal of protecting water resources for Tribes is strongest – and most effective – when it's informed by the lived experiences of those impacted by pollution," said EPA Administrator Michael S. Regan. "By explicitly recognizing Tribal reserved rights in water quality standards, this proposal will help EPA ensure Tribal aquatic resources are abundant and safe to consume and reaffirms the Biden-Harris Administration's commitment to our Nation-to-Nation partnership."

This proposal, once final, would create a regulatory framework that would be applied on a case-specific basis to help ensure that water quality standards protect resources reserved to tribes, such as fish and wild rice. Additionally, the proposed regulatory framework would provide transparency and predictability for tribes, states, regulated parties, and the public.

The proposal also carries out the commitments to honor the federal trust responsibility and protect tribal reserved rights related to water resources outlined in EPA's 2021 action plan, *Strengthening the Nation-to-Nation Relationship with Tribes to Secure a Sustainable Water Future*. It also delivers on the Biden-Harris Administration's commitment to uphold the United States' treaty and trust responsibilities to the 574 federally recognized tribes.

The agency accepted comments on this proposal for 90 days. EPA also held two online public hearings in January 2023 on this proposal. Learn more about the proposed rule and public hearings.

Additionally, on November 30, 2022, at the White House Tribal Nations Summit, Administrator Regan together with 16 other federal agencies, announced new best practices for Tribal Treaty and Reserved Rights. This set of documents will further the Biden-Harris Administration's commitment to engage in regular, meaningful, and robust consultation with Tribal governments and strengthen the protection of Tribal treaty rights

The best practices include three documents: (1) Best Practices for Identifying and Protecting Tribal Treaty Rights, Reserved Rights, and other Similar Rights in Federal Regulatory Actions and Federal Decision-Making; (2) a shorter Best Practices Field Guide; and (3) a Decision Flow Chart. These best practices were developed in consultation with Tribal Nations and implements the agencies' Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Tribal Treaty Rights and Reserved Rights.

For more information about the best practices documents visit the EPA's Clean and Safe Water in Indian Country website.

For more information, contact the EPA Press Office at press@epa.gov.

Source: https://www.epa.gov/newsreleases/epa-announces-proposal-protect-tribal-reserved-rights-water-quality-standards-and-best

Other News

Biden-Harris Administration, Trout Unlimited Invest up to $40 Million to Restore Watersheds on National Forests

With funding from the Bipartisan Infrastructure Law, longtime partners will boost climate resilience for trout, salmon and steelhead

On November 16, 2023, the Biden-Harris Administration announced that the U.S. Department of Agriculture's (USDA) Forest Service will provide up to $40 million to Trout Unlimited (TU) as part of a five-year agreement to

improve watersheds on national forests and grasslands – home to many of America's most important trout and salmon species. Projects include clean-up of abandoned mines and removing barriers to improve fish passage, as well as stream habitat improvements.

Made possible by President Biden's Bipartisan Infrastructure Law, this five-year National Watershed and Aquatic Restoration Initiative aims to increase the pace and scale of watershed restoration on national forests and grasslands, with priority given to projects that use local employees and contractors to improve water quality in underserved communities and on Tribal lands.

"Our agreement with TU continues our joint success as stewards of national forests and grasslands," said U.S. Forest Service Chief Randy Moore. "Our partnership is not just about cleaning a stream or increasing fish population. It's life sustaining work that is as vital to aquatic species as it is to people and communities. When our natural resources are healthy, we are healthy as a nation and as individuals."

"It is heartening to see the Bipartisan Infrastructure Law's resources being put to good use," said Chris Wood, president and CEO of TU. "This agreement builds on a long and productive partnership between the U.S. Forest Service and Trout Unlimited. Together over the years, we have already restored more than 400 miles of important fish habitat, reconnected more than 700 miles of habitat by removing barriers to fish migration, and improved hundreds of thousands of acres of National Forest System lands. We are excited to continue and expand on this work over the coming years."

More than 40% of trout streams in the U.S. flow through the 193 million acres of national forests and grasslands. In recent years, TU leveraged $20 million in U.S. Forest Service funding to carry out $62 million worth of projects, improving forest health, water quality and building key partnerships while supporting hundreds of family-wage jobs in rural communities.

Wild and native trout and salmon face countless challenges, including warming fueled by climate change. TU is identifying a national network of priority waters based on the best fisheries science and guided by its strategic plan. Over the coming years, TU will use the funding from this agreement to work alongside partners to protect and restore these waters to improve fish population diversity, resilience and productivity.

In its recent work, TU has worked with Tribes, agricultural landowners, mining companies, and government agencies to reconnect habitat and reduce flood risk on the Chequamegon-Nicolet National Forest in Wisconsin, restore native brook trout habitat on private lands around the Monongahela National Forest in West Virginia, restore streams in the Nez Perce-Clearwater National Forest in Idaho and clean up mines and restore streams in the Chugach National Forest in Alaska.

Additional Resources:

Trout Unlimited and the U.S. Forest Service: A partnership that works
Trout Unlimited: New Directions

For more information, contact the USDA Press at press@usda.gov.
Source: https://www.usda.gov/media/press-releases/2022/11/16/biden-harris-administration-trout-unlimited-invest-40-million

Mount Rainier National Park will Remove Special Fishing Regulation from the Code of Federal Regulations to Conserve Native Fish Populations

On January 20, 2023, the National Park Service (NPS) published a final rule in the Federal Register to help the implement the Mount Rainier National Park 2018 Fish Management Plan and Finding of No Significant Impact that directs long-term management for fish within lakes, rivers, and streams in Mount Rainier National Park. This rule removes fishing restrictions for the park that limit the take of nonnative fish. Removing these restrictions will create new angling opportunities for nonnative species that are currently not authorized.

Previously, the public had to refer to the Code of Federal Regulations to learn about fishing regulations in the park. Members of the public can now find all fishing regulations for Mount Rainier National Park on the park's website and the Superintendent's Compendium.

Park staff are working to restore aquatic ecosystems in the park by reducing or eliminating nonnative fish while providing continued and expanded recreational fishing opportunities and related visitor experiences.

Native fish species, including the threatened bull trout, will be conserved with the continued removal of nonnative fish, including Eastern brook trout and kokanee salmon. Approximately 35 mountain lakes within the park contain breeding populations of nonnative fish; these fish compete with native fish and amphibians for food and habitat. A current Mount Rainier Fish Regulation guide, including images of native and nonnative fish for identification, is posted on the park's website.

For more information on Mount Rainier National Park, please visit the park's website.

For more information, contact the Mount Rainier Press Information Line, 360-569-6510.

Source: https://www.nps.gov/mora/learn/news/mount-rainier-national-park-will-remove-special-fishing-regulation-from-the-code-of-federal-regulations-to-conserve-native-fish-populations.htm

Recently Awarded Research

National Fish and Wildlife Foundation (NFWF) Announces $800,000 in Grants to Support Native Fish Species of Conservation Concern

Grants fund seven projects that will reestablish stream connectivity, restore instream, and riparian habitat and manage invasive species

On December 14, 2022, the NFWF announced $806,000 in grants to restore, protect, and enhance native fish species of conservation concern across the United States. The grants will leverage $4.4 million in matching contributions for a total conservation impact of $5.2 million.

The grants were awarded through Bring Back the Native Fish, a partnership between NFWF, the U.S. Fish and Wildlife Service and the U.S. Forest Service, with additional support provided this year by the Bezos Earth Fund.

"Declining habitat is the central threat to the hundreds of native fish species that live in waters across our country," said Jeff Trandahl, executive director and CEO of NFWF. "The grants funded through the Bring Back the Native Fish program this year will support the survival of species including cutthroat trout, bull trout, and Chinook salmon by mitigating predation from invasive species and improving stream flow for more hospitable spawning, rearing, and refuge habitats."

Leading factors in native fish species decline include habitat alteration, lack of adequate instream flows, and invasive and/or nonnative species. The projects supported by the seven grants announced today will reconnect streams, restore riparian and instream habitat and water quality, and manage invasive species.

The Bring Back the Native Fish 2022 grant recipients are:

Kalispel Tribe of Indians will install low-tech process-based restoration structures and plant native vegetation to restore the wetland ecosystem of Reeder Creek, Idaho. Restoring wetland function including instream habitat and flow connectivity will improve water quality for native cutthroat trout and bull trout.

Confederated Salish and Kootenai Tribes will suppress invasive lake trout in Flathead Lake, Montana, through increased harvesting and management efforts to assist in the recovery of native bull trout.

A Chinook salmon. *(Photo courtesy of the U.S. Fish and Wildlife Service National Digital Library).*

Deschutes Land Trust will restore riparian habitat through the creation of new baseflow stream channels and restoration of floodplains, wetlands, and uplands in Ochoco Preserve, Oregon. Project will renew ecologic functionality of waterways to aid in the reintroduction of Chinook salmon and summer steelhead and improve water quality.

Trout Unlimited will add wood structures in Mill Creek, Montana, encouraging pool formation and increasing channel roughness and complexity for Yellowstone cutthroat trout.

Lower Nehalem Watershed Council will install instream structures to provide vegetative cover for Coho salmon, Chinook salmon, steelhead trout and cutthroat trout, enhancing 0.2 miles and 2.5 acres of in stream habitat at the confluence of the Salmonberry and Nehalem rivers, Oregon.

The University of Tennessee will conduct DNA analysis of Southern Appalachian brook trout to evaluate the success of various source populations and benefit reintroduction and stream management practices.

Turner Endangered Species Fund will remove invasive fish from 1.5 miles of Las Animas Creek in New Mexico and establish refugia to enhance Rio Grande sucker and chub recovery.

Since the Bring Back the Native Fish program was established in 1991 it has awarded more than $27.2 million to 550 projects across the country, leveraging more than $104 million in matching contributions. In the past eight years, projects under this program have remedied more than 112 barriers, reopened more than 680 miles of habitat and engaged more than 4,180 volunteers in the restoration and enhancement of more than 275 miles of stream.

A complete list of the 2022 grants made through Bring Back the Native Fish program is available here.

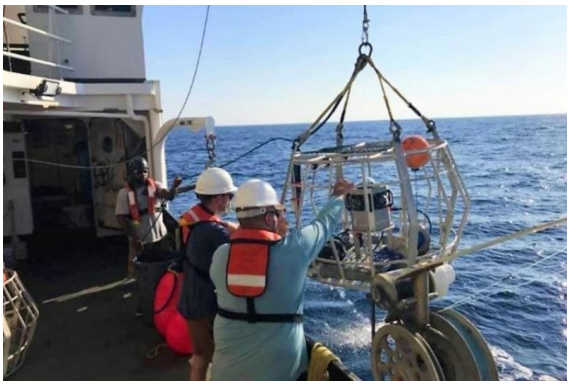
Source: https://www.nfwf.org/media-center/press-releases/nfwf-announces-800000-grants-support-native-fish-species-conservation-concern

Tech and Tools

Increasing Efficiency of Video Surveys with Artificial Intelligence

Using Artificial Intelligence to help provide timely data for fishery assessments and guidance for fishery managers.

On April 6, 2023, the National Oceanic and Atmospheric Administration (NOAA) reported on a new collaborative research paper in a special issue of *Frontiers in Marine Science,* which describes the potential use of artificial intelligence (AI) and machine learning (ML) in fisheries surveys. Specifically, it looks at how it could increase efficiency for operations of two fishery-independent surveys led by the Southeast Fisheries Science Center.



Deployment of the SphereCam system during a video survey of the Gulf of Mexico aboard NOAA Ship Pisces. (*Photo courtesy of NOAA Fisheries).*

NOAA's Southeast Fisheries Science Center has been conducting video surveys in the Gulf of Mexico for more than 30 years. These long-term video surveys help provide scientists insight into the population status of ecologically and economically important species over long time frames. They provide data on habitat and water quality that are critical to maintain the health of the vital snapper-grouper fisheries of the Gulf of Mexico. While video surveys have increased in importance to NOAA Fisheries and the Southeast Fisheries Science Center, processing the video remains a manual process. It represents a significant bottleneck to providing timely guidance for fisheries managers. Recent advancements in automated image analysis show promise to address the processing bottleneck providing timely data for fisheries assessments.

NOAA partnered with Mississippi State University-Northern Gulf Institute and Kitware Inc. to develop AI and ML processes to automate the processing of videos collected in the Gulf. This software system is called Video Image Analytics for the Marine Environment (VIAME). It uses the videos and images to:

- Search for fish
- Detect objects and fish
- Track species movement
- Enhance video
- Annotate video
- Generate products quickly
- Become smarter with the collected data

Matthew Campbell, co-author and co-lead of the project explained, “This AI software system will be a huge stepping stone for us in terms of timeliness and efficiency delivering analytical products from these critical surveys.”

Accelerating Efficiency

Manual processing of video surveys conducted by scientists takes a significant amount of time. For example, combining one year of sampling from the Gulf Fishery Independent Survey of Habitat and Ecosystem Resources video surveys results in approximately 2,000 camera deployments, approximately 1,000 hours of footage, and around 30 terabytes of data. It typically takes a full year of manual video analysis (identifying and enumerating species) to turn the video collections into usable data for assessing fish.

With the new AI in VIAME, video processing is projected to get faster over time as the automation is optimized for specific species. It will be expanded to include additional species. NOAA anticipates that processing will be reduced to only a few months of work. Scientists will still have to ensure the precision and accuracy of that data compared to the manual processes used historically.

Close up view of the camera system with multiple fisheye lenses. (*Photo courtesy of NOAA Fisheries).*

Accessibility and Functions

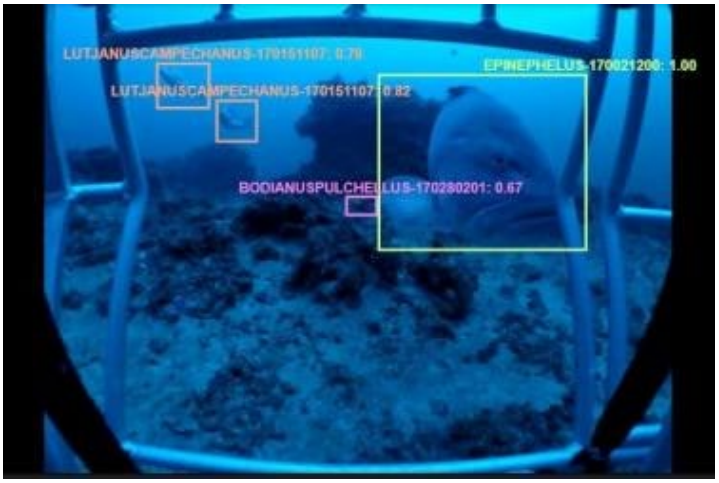
The project is taking an Open Science approach by making the software accessible to anyone who would like to use it. This will allow individuals to access VIAME as an online platform to test and build models, or for download and use on local computing. However, the online platform does not have the server space for large batch processes and is not intended to serve in that regard. The decision to have an open-source format was made by Automated Image Analysis Strategic Initiative to facilitate uptake and use of AI and ML processing. The center is using this open-source model to provide this solution to groups that otherwise wouldn't have the resources to compile the imagery and create models themselves. This is particularly important once the project extends to the Caribbean.

Dr. Campbell explained, “Our team sticks to evaluating fish populations, so I hope by using this open-source format that habitat scientists could access the imagery and begin to create habitat labels to automate that component.”

The software received its original data from the available imagery from previously processed video surveys. It consisted of 600 thousand individual annotations across about 140 fish species in the Gulf of Mexico. This accumulation of imagery data is a strong start for the AI and ML classification pipeline. However, the project will need to establish a cloud-based workflow to be able to store, access, and archive large video collections.

Human Involvement

The establishment and continuous advancements of this software will take the weight off of scientists' shoulders, but not entirely. Due to the critical status of the survey to assess snapper and grouper in the Gulf of Mexico, great care must be taken to assure data processed using automated approaches are consistently accurate. This project is a step towards evaluating the accuracy of the automated system, thereby the authors' team will be manually monitoring it for precision. It is anticipated that, as ML grows to a high confidence level of precision, the human aspect of this process will be minimized. That will free up scientists' time to focus on analysis of the data and providing improved guidance to resource managers.



Interface of the automated image analysis software. It shows colored boxes around detected fish with the AI/ML assigned name and estimated confidence level of the identification. Species in the image include red snapper, warsaw grouper (classified to genus), and spotfin hogfish. (*Photo courtesy of NOAA Fisheries)*

This project is revealing the productivity of integrating AI and ML into NOAA Fisheries' video surveys. The addition of these high computation tools will accelerate the center's ability to understand critical aspects of important natural resources, habitats, and fish populations efficiently.

For more information, contact the NOAA Fisheries Southeast Regional Office at (727)-824-5301.

Source: https://www.fisheries.noaa.gov/feature-story/increasing-efficiency-video-surveys-artificial-intelligence

Recent Publications

Journal Articles

The list below provides a selection of research articles.

- Seafood Consumption During Harmful Algal Blooms: The Impact of Information Regarding Safety and Health.
  Bechard, A., and C. Lang. 2023. Seafood Consumption During Harmful Algal Blooms: The Impact of Information Regarding Safety and Health. *Harmful Algae* 123:102387.

- Nonlethal Detection of PFAS Bioaccumulation and Biomagnification within Fishes in an Urban- and Wastewater-Dominant Great Lakes Watershed.
  George, S.E., T.R. Baker, and B.B. Baker. 2023. Nonlethal Detection of PFAS Bioaccumulation and Biomagnification within Fishes in an Urban- and Wastewater-Dominant Great Lakes Watershed. *Environmental Pollution* 321:121123.

- Pandemic-Driven Changes in the Nearshore Non-Commercial Fishery in Hawai'i: Catch Photos Posted to Social Media Capture Changes in Fisher Behavior.
  Grabowski, T., M.E. Benedum, A. Curley, C. Dill-De Sa, and M. Shuey. 2023. Pandemic-Driven Changes in the Nearshore Non-Commercial Fishery in Hawai'i: Catch Photos Posted to Social Media Capture Changes in Fisher Behavior. *PeerJ*, 11, e14994.

- PFAS Biotransformation Pathways: A Species Comparison Study.
  Kolanczyk, R.C., M.R. Saley, J.A. Serrano, S.M. Daley, and M.A. Tapper. 2023. PFAS Biotransformation Pathways: A Species Comparison Study. *Toxics* 11(1):74.

- Trophic and Spatial Patterns of Contaminants in Fishes from the Republic of the Marshall Islands in the Equatorial Pacific.
  Nalley, E.M., C.M. Pirkle, M.C. Schmidbauer, C.J. Lewis, R. S. Dacks, M.D. Thompson, M.D. Sudnovsky, J.L. Whitney, and M.J. Donahue. 2023. Trophic and Spatial Patterns of Contaminants in Fishes from the Republic of the Marshall Islands in the Equatorial Pacific. *Chemosphere* 314:137593.

- Estimating Precision and Accuracy of Automated Video Post-Processing: A Step Towards Implementation of AI/ML for Optics-Based Fish Sampling.
  Prior, J.H., M.D. Campbell, M. Dawkins, P.F. Mickle, R.J. Moorhead, S.Y. Alaba, C. Shah, J.R. Salisbury, K.R. Rademacher, A.P. Felts, and F. Wallace. 2023. Estimating Precision and Accuracy of Automated Video Post-Processing: A Step Towards Implementation of AI/ML for Optics-Based Fish Sampling. *Frontiers in Marine Science*, 10, 582.

- Reviving the Unique Potential of Recreational Fishers as Environmental Stewards of Aquatic Ecosystems.
  Shephard, S., C.J. List, and R. Arlinghaus. 2022. Reviving the Unique Potential of Recreational Fishers as Environmental Stewards of Aquatic Ecosystems. *Fish and Fisheries*, 24, 339–351.

- Human Shellfish Poisoning: Implementation of a National Surveillance Program in France.
  Sinno-Tellier, S., E. Abadie, S. Guillotin, A. Bossee, M. Nicolas, and N. Delcourt. 2023. Human Shellfish Poisoning: Implementation of a National Surveillance Program in France. *Frontiers in Marine Science*, 9.

- Fish Tissue Conversion Factors for Mercury, Cadmium, Lead and Nine Per- and Polyfluoroalkyl Substances for use within Contaminant Monitoring.
  Soerensen, A.L., S. Faxneld, M. Pettersson, and M. Sköld. 2023. Fish Tissue Conversion Factors for Mercury, Cadmium, Lead and Nine Per- and Polyfluoroalkyl Substances for use within Contaminant Monitoring. *Science of The Total Environment* 858:159740.

- A Research and Monitoring Partnership for Harmful Phytoplankton in Washington State.
  Trainer, V.L., and T.L. King. 2023. SoundToxins: A Research and Monitoring Partnership for Harmful Phytoplankton in Washington State. *Toxins,* 15(3), 189.

Upcoming Meetings and Conferences

ICFAS 2023: 17th International Conference on Fisheries and Aquatic Sciences
June 5–6, 2023
New York City, NY

9th World Fisheries Congress
March 3–9, 2024
Seattle, WA

SETAC North America 44th Annual Meeting
November 12–16, 2023
Louisville, KY and Virtual

Additional Information

This bimonthly newsletter highlights current information about fish and shellfish.

For more information about specific advisories within the state, territory, or tribe, contact the appropriate state agency listed on EPA's National Listing of Fish Advisories website at https://fishadvisoryonline.epa.gov/Contacts.aspx.

For more information about this newsletter, contact Sharon Frey (Frey.Sharon@epa.gov, 202-566-1480).

Additional information about advisories and fish and shellfish consumption can be found at https://www.epa.gov/fish-tech.