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Community
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Living Observatory Community Platform

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Living Observatory Community Platform

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LO is a learning collaborative of researchers, wetland restoration practitioners, artists, landowners who are engaged in wetland restoration of retired farmland and who want to share expertise and learn together.

The platform provides a central hub for the LO community to share profiles, projects, sites, and data about these projects.

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Database includes people, projects, properties, and partners, & institutions. UI indicates relationships between these entities at-a-glance.

Project owner is responsible for posting: main page, updates, data, and associated files such as project designs, etc.

Platform is fully accessed on desktop or mobile device to allow researchers to post updates, photos, and in the future data from the field.

Geocoded data can be stored in a geo-database and visualized on the map component.

Modes of use:

- Individual projects
- Team portal (ver. 1 release anticipated this month)

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[Home](#)
[Projects](#)
[Sites](#)
[People](#)
[Partners](#)
[Publications](#)
[Donations](#)
[Log In](#)

People

Researchers

 Adrian Wingman UCDA AHS	 Alan D. Christian Clarkson University, Illinois Biology	 Alan Kneidel Wormwood Bld Observatory	 Alex Hackman Wren Publishing	 Brian Wighton Living Observatory
 Caitlyn Kennedy UCDA AHS	 Chris Neill Montclair State University Larvae	 Christina Vagstad Boston College	 Christine Harsh Ulmae Animal	 Chloeann Dackiw The Ohio Innovation Center
 David J. Beatt Living Observatory	 Elizabeth Bone Ohio Wesleyan	 Elizabeth Guelcher West of Pittsburgh	 Florence Sangermano Clark University	 Gerhoun Dalmon Bryn Mawr
 Giordana Donovost Living Observatory	 Jesse Andrus Montclair University Larvae	 Jim Kierberg Northwestern Connecticut Pondwater	 Joe Krasinski Left Coast Lab	 Julie Perle Bringham Young University
 Kara Ballentine Montclair College	 Kimberly Snyder Ulmae Animal	 Kunwar K. Singh	 Laural Tashjan Wormwood Bld Observatory	 Lisa Schilling University of Connecticut
 Lou Anne Censky	 Lyn Watts Ulmae Animal	 Martin Briggs UCDA	 Molly Welch UCDA AHS	 Nick Deshaies
 Oleander Moritt Montclair College	 Olivia Kurz	 Olivia Wison	 Patrick Farrer Wormwood Bld Observatory Center	 Sarah Klenzky University of Connecticut
 Sara P. Grady UCDA	 Sara Quintal	 Thilina D. Sumanasinghe Bringham Young University		

Partners

 Emily Renaud	 Jessica Cohn Wren Publishing	 Karen Beattie Wormwood Bld Observatory Foundation	 Lauren Kras Wren Publishing	 Martin Menchior
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projects

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Projects
Site
People
Partners
Publications
Donate
Log In >

Featured Projects



Fear to Hope Atlantic White Cedar Research at Plymouth South H.S.

Nat. Geog. AP Biology class at Plymouth South H.S. is participating in an ecological study across multiple sites to understand how temperature regime and soil water saturation rate affect growth of Atlantic Seaside. The project designed by the Atlantic Faculty of Christopher Newport College. We plan to come to campus for help.



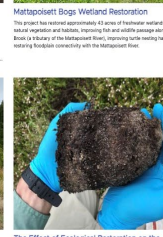
Mattaponi/Bogs Wetland Restoration

This project has restored approximately 42 acres of freshwater wetlands, benefiting nature migration and wildlife, improving fish and wildlife spawning along Tappan Brook in a tributary of the Mattaponi River, increasing turtle nesting habitat, and restoring birdhabitat (conservancy) with the Mattaponi Forest.



Stuart Bogs Restoration Project

Bureau of Land Management is working with the Center of Environmental Protection and the USDA Natural Resources Conservation Service to permanently protect and restore natural wetlands of the formerly logged Stuart Bog in Scotland. The purpose includes the protection of approximately 200 acres of land, which include wetlands that ha-



The Effect of Ecological Restoration on the Structure and Function of Soil Microbial Communities in Cranberry Bogs

Restoration efforts seek to improve degraded ecosystem functions such as carbon storage, removal of nutrient pollutants, and mitigation of greenhouse gas emissions. These functions are primarily governed by microbes living in the soil, yet few microbial communities are not equally considered or monitored as part of

All Projects



An Environmental and Ecosystem Systems Analysis of Land Use Decisions in the Massachusetts Cranberry Industry

This project uses a systems approach to explore environmental and economic trade-offs and synergies connected to land use decisions in the Massachusetts cranberry industry. Building upon ongoing research on sources of carbon for long restoration, this work integrates socioeconomic data with environmental impact modeling, and presents the results in a web-based decision support tool that allows stakeholders to interact w-



Bird Monitoring at Select Cranberry Bog Restoration Sites in Southeastern Massachusetts

This project involves using aircraft and video broadcast survey techniques to document bird populations at cranberry bog restoration sites in SE Massachusetts. Initial surveys began in May 2022, with priority sites including Indian Brook Cranberry Bog, Tahquamenon Wildlife Sanctuary, Fortville Preserve, South Meadows, and Ploverville Wetlands.

COSMOS: Landscape-Scale Soil Moisture

This project explores the utility of a COSMOS sensor to measure landscape-scale moisture. COSMOS measures the cosmic rays per penetrator and counts of the top 10 cm of soil surface in a radius of 800 meters. The signal is changing in the presence of liquid water, standing water, ice water, and plant water - and returns an integrated signal of all water in the zone, both above and below the shallow surface. As the landscape changes, th-



Distributed Temperature Sensing in the Hydrologic Understory

This project involves groundwater thermate, surface water sensing, underground thermal regimes and soil moisture monitoring. We use distributed temperature sensing (DTS) along fiber optic cables at multiple depths beneath the ground to uncover the interconnected webs of hydrology and ecology beneath the surface.

Ecological Restoration Masterclass: Engaging, Educating, and Connecting Disease Resistant

This project involves research and development of a web-based educational program designed to help stakeholders learn about wetland restoration in a way that's relevant to them. The primary goal of the restoration masterclass is to blend findings from the latest research with evidence from a variety of perspectives and experiences, and provide people from a range of backgrounds their own what ecological restoration is, how and why they can do it, and

sites







Windswept Bog

Property

Property Owner: Nantucket Conservation Foundation, Inc.

Overview Photos

Windswept Bog is located on Polpis Road in the northeastern portion of Nantucket Island MA. This 231-acre property owned by the Nantucket Conservation Foundation contains 225 acres of retired cranberry bogs, lowland forests, shrub swamps and freshwater ponds that provide habitat for a wide variety of animals and plants.

Once a certified organic cranberry bog operated by the Foundation, Windswept Bog is in the process of being restored to a naturally functioning wetland. Working with MassDEP's Cranberry Bog Program and consultants at Fum & O'Hall, as well as staff from NCF's Department of Ecological Research, Stewardship and Restoration, the overall goals for this project include restoring wetland flow and connectivity, creating natural gradients between restored wetlands and surrounding uplands, maintaining or establishing valuable plant and wildlife habitats, perpetuating and enhancing public access and maximizing the restored wetland's ability to filter excess nutrients to improve water quality.



For more information: <https://www.nantucketconservation.org/science-stewardship/research-projects/windswept-bog-wetland-restoration/>

Projects



Monitoring Plan for the DER Cranberry Bog Restoration Program



Windswept Bog, Nantucket Island MA: Watershed-scale Wetland Restoration and...

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[Home](#)
[About](#)
[Academics](#)
[Research](#)
[Engagement](#)

[Projects](#)
[Sites](#)
[People](#)
[Partners](#)
[Publications](#)
[Donate](#)

Governmental Partners

Cape Cod Conservation District

Clerk University

Gulf of Maine Council on the Marine Environment

Massachusetts Bay National Estuary Partnership

Massachusetts Department of Fish and Game – Division of Ecological Restoration

Massachusetts Division of Fisheries and Wildlife

Massachusetts Environmental Trust

Massachusetts Municipal Vulnerability Preparedness Program

National Fish and Wildlife Foundation

National Oceanic and Atmospheric Administration

Town of Falmouth, MA

Town of Plymouth – Department of Marine and Environmental Affairs

Town of Plymouth, MA

USDA Agricultural Research Service

United States Department of Agriculture – Natural Resources Conservation Service

US Environmental Protection Agency

US Fish and Wildlife Service

US Geological Survey

Conservation Partners

American Birdeas

Association to Preserve Cape Cod

Barnstable Clean Water Coalition

Buzzards Bay Coalition

Cape Cod Cranberry Growers Association

Ducks Unlimited

Falmouth Rod & Gun Club

FishAmerica Foundation

Gateway

Interflum, Inc.

Massena Bird Observatory

Mass Audubon

Nantucket Conservation Foundation

Native Land Conservancy

North and South Rivers Watershed Association

Plymouth South High School

Public Lib

Richard King Mellon Foundation

Safefish.com

Sea View Inn/Bed&B

Stinson Studios

SWICA Environmental Consultants

The 300 Committee Land Trust

The Coomassett River Trust

The Natick Conservancy

Tidewater Farms

Tighe and Bond

Upstream Tech

Wildlands Trust, Inc.

Woodwell Climate Research Center

University Partners

Amherst College

Boston College

Bridgewater State University

Clemson University

De Vincl Innovation Center

Emerson College

Le Mans Université

MIT Media Lab

MIT Sea Grant

Mount Holyoke College

Northeastern University

Oregon State University – Center for Transformative Environmental Monitoring Programs

Smith College

Tufts University

University of Connecticut

University of Massachusetts – Amherst

University of Massachusetts – Boston

University of Massachusetts – Dartmouth

University of Massachusetts – UMass/Ed

University of North Carolina

Implementation Partners

Charter Construction

Lucaschi Scavenging

SimCo's Eco-Contracting, Inc.

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Brian Mayton

Brian Mayton works with Living Observatory to develop new technologies and systems for tracking, sharing, and learning from the arc of change on restored wetlands. He graduated from the MIT Media Lab in 2020. In his Ph.D., he designed, built, and deployed a large-scale low-power sensor network at Tidmarsh, and explored how sensor data combined with rich audio and video streams can help us learn from and enjoy our wetlands.



Living Observatory
Sensor Network Specialist
MIT Media Lab
Research Affiliate, Alumni

Research Questions

- How can sensor networks serve the multiple roles of providing long-term data for ecological research to improve the practice of wetland restoration, as well as a tool for artistic expression and the creation of novel experiences to effectively engage visitors and the public? (I explore this question in depth in my Ph.D. dissertation).
- What kinds of tools can Living Observatory provide to facilitate collaboration, data sharing, and outreach to the public among a diverse group of projects and researchers?

More About Brian

- My personal blog
- My Media Lab page

Projects



Monitoring Plan for the DER Cranberry Bog Restoration...



Soil Moisture in the Wetland



Living Observatory Sensor Network



Tidzam: AI-based Wildlife detection, identification and...



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Publications

Kate Ballantine, Glorianna Davenport, Linda Deegan, et al. *Learning from the Restoration of Wetlands on Cranberry Farmland: Preliminary Benefits Assessment*, Technical report, Living Observatory, Plymouth, MA, December 2020.
[Download PDF](#) [View Online](#)

Brian Mayton. *Sensor Networks for Experience and Ecology*, Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, MA, September 2020.
[Download PDF](#)

Clement Duhart, Gershon Dublon, Brian Mayton, et al. "Deep Learning Locally Trained Wildlife Sensing in Real Acoustic Wetland Environment," *Advances in Signal Processing and Intelligent Recognition Systems. SIRS 2018. Communications in Computer and Information Science*, Singapore, January 2019. DOI: https://doi.org/10.1007/978-981-13-5758-9_1.
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How to join:

- Send me mail requesting an account Glorianna@livingobservatory.org
- I will send you an invitation to join
- You enter your password and you are ready to build your profile.
- Make sure to have a couple of images handy for the banner and the person ID
- Your profile is private until you click publish.

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Vegetation Responses to Restoration of Massachusetts Cranberry Bogs

[Home](#) [Updates](#) [Data](#)

This project quantifies the species composition and cover of plants before and after active restoration of cranberry bogs. We measure vegetation in fixed 3 x 3 meter plots located on the former bog surfaces and return to these plots year after year. We classify plant life history, origin (native, non-native) and wetland statuses to evaluate the success of restoration in promoting native and wetland-dependent plant species.

Contributors

[Chris Neill](#)
[Sarah Klionsky](#)
[Patrick Farrar](#)



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Vegetation Responses to Restoration of Massachusetts Cranberry Bogs

Home

Updates

Data

Vegetation Plots

View Map

Name	County	Town	Site Name	Habitat	Bog Type	Age Class	Retirement Age	Retirement Year	Restoration Year	Veg. Sampling Years	Soil Sampling Years
MB-5	Plymouth	Mattapoisett	Mattapoisett Bog (MB)	Bog	Wetland	1	9	2011		2019	2018
MB-6	Plymouth	Mattapoisett	Mattapoisett Bog (MB)	Bog	Wetland	1	9	2011		2019	2018
MB-7	Plymouth	Mattapoisett	Mattapoisett Bog (MB)	Bog	Wetland	1	9	2011		2019	2018
MB-8	Plymouth	Mattapoisett	Mattapoisett Bog (MB)	Bog	Wetland	1	9	2011		2019	2018
MB-9	Plymouth	Mattapoisett	Mattapoisett Bog (MB)	Bog	Wetland	1	9	2011		2019	2018
MCB-1	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-10	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-11	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-12	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-13	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-14	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-15	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-16	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-17	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-18	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-19	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-2	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-20	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2019, 2020, 2021	
MCB-3	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-4	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-5	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-6	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-7	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-8	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018
MCB-9	Barnstable	Falmouth	Coonamessett River	Bog	FlowThrough	1	7	2013	2020	2018, 2019, 2020, 2021	2018

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1

2

3

4

5

6

7

8

9

10

11

...

»

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Mattapoisett Bogs



Property

[Overview](#)
[Notebook](#)
[Photos](#)

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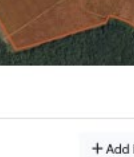
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Mattapoisett Bogs
Wetland Restoration



Monitoring Plan for the
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[Partners](#)
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Quantifying Nutrient Transport and Transformation in Stream Channels Associated with Active, Retired, and Restored Cranberry Farms

[Home](#)
[Updates](#)
[Files](#)

By Molly Welsh

January 25, 2024

Surveying Restored Wetlands and Streams to Inform Research on Ecosystem Function

As part of an ongoing project to assess changes in ecosystem structure and function following wetland restoration, scientists from the United States Department of Agriculture's Agricultural Research Service (USDA-ARS) have been measuring water chemistry, streamflow, water storage, and topography at a range of active cranberry farms and those that have been retired and converted into wetlands. As part of these assessments, post-restoration surveying has been conducted at two sites, Monson Brook and El River.

The restored wetland complex in the El River preserve is one of the sites that were surveyed.

Surveying is conducted so scientists can map points of interest, such as restoration features like stream meanders and in-stream woody habitat structures. At each point surveyed, three measurements are collected: x and y coordinates, called a northing and easting, and an elevation. This allows for the land surface to be mapped in three dimensions. To obtain this information, one person operates a total station, which is an electronic instrument equipped with a movable telescope capable of measuring precise angles and storing information. A second person positions a survey rod containing a prism at each point of interest. A beam is sent out from the total station, hits the prism, and is reflected to its source to provide an accurate measurement of the distance.

USDA-ARS physical science technician Joey LaRhedo sets up the total station (left) and adjusts the survey rod (right) to ensure the prism can be seen.

At each site, a 125 m stream segment was selected for study. Cross-sectional surveys were conducted every 10 m along the reach, which provide information on floodplain topography, streambank slope, and stream depth.

Joey operates the total station (left) for cross-sectional stream surveys (right).

Survey data enable scientists to derive a variety of stream metrics, such as average width and depth, channel slope, and sinuosity (i.e., curvature of the stream). These factors can help us assess stream capacity for water retention and nutrient processing. Greater channel complexity, such as the presence of meanders, woody debris, and connectivity between the stream and the floodplain can reduce stream velocity, resulting in longer water retention times. These longer water residence times allow for more contact of nutrient-rich water with biologically

[Projects](#)
[Sites](#)
[People](#)
[Partners](#)
[Publications](#)
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Quantifying Nutrient Transport and Transformation in Stream Channels Associated with Active, Retired, and Restored Cranberry Farms

[Home](#)
[Updates](#)
[Files](#)

Surveying Restored Wetlands and Streams to Inform Research on Ecosystem Function

By Molly Welsh on January 25, 2024

As part of an ongoing project to assess changes in ecosystem structure and function following wetland restoration, scientists from...

Read more...

How to create a project :

- Email me the project name and a short abstract.
- Build and publish main page (projects are private until you click publish.)
- Add regular updates to let the community how your project is progresssing.
- Add photos, data (spreadsheet or geocoded for database), and files.

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Monitoring Plan for the DER Cranberry Bog Restoration Program

[Home](#) [Updates](#) [Data](#) [Files](#)

This project involves development of a standardized monitoring plan for physical, chemical, and biological monitoring of cranberry bog wetland restoration projects in DER's Cranberry Bog Program. The plan is being developed by a team of Living Observatory researchers under a contract with the Massachusetts Division of Ecological Restoration.

Standard Monitoring

Long-Term Development and Ecosystem Functions of Restored Cranberry Bogs

Vegetation Trajectories in Restored Cranberry Bogs in Southeastern Massachusetts

Extensive Monitoring

Bird Monitoring at Select Cranberry Bog Restoration Sites in Southeastern Massachusetts

Potential Nitrogen Removal by Restoring Wetlands on Restored Cranberry Bogs

Quantifying Nutrient Transport and Transformation in Stream Channels Associated with Active, Retired, and Restored Cranberry Farms

Using Thermal Mapping to Identify Groundwater Inflows in the Wetland

Growing Atlantic White Cedars for Wetland Restoration Sites

Properties

Century Bog

Cold Brook Preserve

Cummaquessett Lower River

Upper Cummaquessett Wetlands

Concomasset Bogs

Mid Brook Bogs

South Meadow Preserve

Tidewater Wildlife Sanctuary

Contributors

Jessica Cohn

Jason Andras

Kate DeLorenzo

Charlotte Davenport

Christine Hatch

Sarah Klonosky

Alan Kneidel

Brian Mayhew

Chris Neill

Thelma O. Suraningsih

Lisa Schibley

Institutions

Massachusetts Department of Fish and Game - Division of Ecological Restoration

Living Observatory

Mount Holyoke College

University of Massachusetts - Amherst

Bridgewater State University

Woodwell Climate Research Center

Marine Bird Observatory

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Cranberry Bog

Cold Brook Preserve

Cummaquessett Lower River

Upper Cummaquessett Wetlands

Concomasset Bogs

Mid Brook Bogs

South Meadow Preserve

Tidewater Wildlife Sanctuary

Recent Updates

Visit to Windswept Bogs on Nantucket

By: Katherine Davenport on September 13, 2022

On September 8, 2022, Ann and Melissa from DER and I took the 9:00 ferry from Hyannis to Nantucket to visit Windswept Bogs, a 100-acre bog.

Visit to Upper Bass River with Kate, Jason, and team - May 23

By: Charlotte Davenport on May 20, 2022

On May 23, 2022, I joined a team from the Massachusetts Department of Fish and Game to visit the Upper Bass River in Nantucket.

LO News:

Team portal features (ver. 1 release anticipated this month).

LO is growing: Adrian Wiegman will be working with us beginning in January.

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Adrian Wiegman

My work focuses on the intersection between wetlands, water quality, agriculture, and human development. I apply biogeochemistry, ecosystem ecology, geospatial analysis, process modeling and data science to conduct research that informs decision making for natural resource management. I am interested in telling stories about how trends in global change influence the relationship between local communities and the landscape.

Current Projects

- Modeling watershed nitrogen load attenuation resulting from wetland restoration of cranberry bogs in southeastern Massachusetts
- Factors that influence nutrient loading in renovated cranberry farms planted with high yielding hybrid varieties

USDA ARS
Postdoctoral Research Associate

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