
21st Annual State of Wellfleet Harbor Conference



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Saturday, November 4, 2023

9:00 AM–12:30 PM

Wellfleet Adult Community Center
& Online

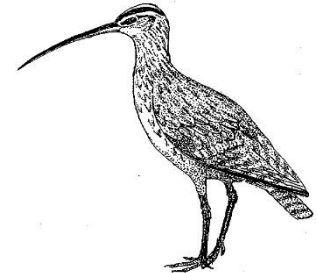


Friends of Herring River
Wellfleet and Truro, Massachusetts



Our thanks to the following for their support of the Conference:

- Center for Coastal Studies
- Friends of Herring River
- Mass Audubon's Wellfleet Bay Wildlife Sanctuary
- Town of Wellfleet, Natural Resources Advisory Board
- Wellfleet Conservation Trust



Conference Planning Committee:

- Abigail Franklin Archer (Committee Chair), Barnstable County Cape Cod Cooperative Extension, Woods Hole Oceanographic Institution Sea Grant
- Barbara Brennessel, Wellfleet Conservation Commission, Friends of Herring River, Wheaton College
- John Duane, Wellfleet Shellfish Advisory Board, Natural Resources Advisory Board
- Mark Faherty, Mass Audubon's Wellfleet Bay Wildlife Sanctuary
- Kathy and Robert Hubby
- Bill Iacuesa, Wellfleet Conservation Trust
- Jenette Kerr, Mass Audubon's Wellfleet Bay Wildlife Sanctuary
- Melissa Lowe, Mass Audubon's Wellfleet Bay Wildlife Sanctuary
- Agnes Mittermayr, Center for Coastal Studies
- John Portnoy, Cape Cod National Seashore (retired), Friends of Herring River

The 2023 State of Wellfleet Harbor Conference is dedicated to Jenette Kerr in recognition of her skilled role as committee chair, deep interest in science, and passion for education.

Conference Agenda

- 9:00–9:20 **Check-in, coffee and continental breakfast, poster viewing**
- 9:20–9:30 **Welcome and Opening Remarks**
Barbara Brennessel, Conference Moderator
Richard Waldo, Wellfleet Town Administrator
- 9:30–9:50 **Herring River Restoration Project Update**
Christa Drew, Friends of Herring River
- 9:50–10:10 **Anomalous Evolution of a Washover Fan at Duck Harbor Beach: System Transition or Tipping Point?**
Mark Borrelli, Center for Coastal Studies
- 10:10–10:20 **Questions & Answers**
- 10:20–10:40 **Break** (poster viewing, etc.)
- 10:40–11:00 **Oyster Recruitment and Sedimentation Monitoring in Wellfleet Harbor**
Katie Castagno, Center for Coastal Studies
- 11:00–11:20 **A Biological Survey of Shell-boring Worms Infecting Oysters from Wellfleet Harbor**
Andrew Davinack, Wheaton College
- 11:20–11:30 **Questions & Answers**
- 11:30–11:50 **The Big, Crabby Year: The State of Horseshoe Crab Research and Advocacy in Wellfleet and Beyond**
Mark Faherty, Mass Audubon
- 11:50–12:10 **Tick and Mosquito Management on the Cape: What are Best Management Practices to Protect Aquatic Resources?**
Larry Dapsis, Cape Cod Cooperative Extension
- 12:10–12:20 **Questions & Answers**
- 12:20–12:30 **Closing Remarks**
Barbara Brennessel, Conference Moderator

Poster Presentations

Seaturtlesightings.org: Vessel Operator Outreach, Education, and Data

Karen Dourdeville and Bob Prescott, Mass Audubon's Wellfleet Bay Wildlife Sanctuary

Bamboo Worm Populations and Shellfish Grants

Agnes Mittermayr, Center for Coastal Studies

What's Up with the Mola Explosion?

Krill Carson, Kathy Miller, Emily Tirone, New England Coastal Wildlife Alliance

Restoration and Recovery: Understanding East Harbor's Horseshoe Crabs

Allison Myers¹, Kelly McCusker², Kta'n Weeden¹, Katie Button³, Rachel Thiet², Sophia E. Fox³

¹American Conservation Experience and Cape Cod National Seashore; ²Antioch University New England;

³Cape Cod National Seashore

Field Trip to Duck Harbor

Saturday, November 4, 2:00-3:15 PM

John Portnoy, retired Cape Cod National Seashore ecologist, will lead a walk to view the overwashed barrier beach, the recent removal of salt-killed trees and shrubs, and the return, after 115 years, of vibrant and extensive salt marsh vegetation. We will also discuss how the natural Duck Harbor overwash, and the changes that it has set in motion, fit into the greater Herring River estuarine restoration project. Topics will include plant ecology, water chemistry, estuarine fish and mosquitoes.

Walk is limited to 15 participants; meet at the Duck Harbor parking lot.

Please pre-register at the check-in desk.

Herring River Restoration Project Update

ABSTRACT: In March 2023 Phase 1 Construction for the Herring River Restoration Project began after more than 15 years of planning. Project proponents, the Town of Wellfleet and Cape Cod National Seashore, as well as numerous funders, partners, and contractors are ensuring that progress continues steadily across several core elements of the project. Come hear about current status of the project's Chequessett Neck Bridge construction, Mill Creek Water Control Structure, vegetation clearing, low-lying road elevation and culvert replacement.

PRESENTER NAME & AFFILIATION: Christa Drew, Executive Director, Friends of Herring River

COLLABORATORS: Carole Ridley, Project Coordinator, Herring River Restoration Project

BIOGRAPHICAL INFORMATION: Christa Drew brings decades of transformative leadership from co-founding and leading nonprofit organizations and consulting firms which advanced systems change and justice across a variety of sectors, including equitable community development, health, food systems, and others. Earned on a full fellowship, she has a Master's in Public Policy & Administration and previously drafted state legislation, conducted field-building research, facilitated nation-wide grantmaking and coalitions, and served as a professor in conflict transformation.

CONTACT: christa@herringriver.org
(508) 214-0656

Anomalous Evolution of a Washover Fan at Duck Harbor Beach: System Transition or Tipping Point?

ABSTRACT: Washover fans are depositional features that typically begin forming during storm events with extreme water levels. Ocean water and sediment are brought into low-lying areas and as the waters subside the elevation of the land is higher than it was prior to the event. This natural phenomenon has been well-studied and long recognized as a vital process by which low-lying coastal areas can keep pace with sea level rise. A washover fan started to develop in 2020 at Duck Harbor Beach, but anomalously has not yet filled in though it continues to overwash frequently during storms, but also during high spring tides. Is this a sign of system transition or something changing at a larger scale?

PRESENTER NAME & AFFILIATION: Mark Borrelli, Center for Coastal Studies

COLLABORATORS: Katie Castagno and Molly Tucker, Center for Coastal Studies

BIOGRAPHICAL INFORMATION: Dr. Mark Borrelli is a Coastal Geologist. He started the Seafloor Mapping Program at the Center for Coastal Studies in 2009. In 2018 he became the founding Director of the Coastal Processes and Ecosystems Laboratory, or CaPE Lab, a joint research effort between the University of Massachusetts at Boston, where he is a Senior Research Fellow, and the Center for Coastal Studies. His research interests include understanding how storms, sea level rise and human alterations affect the coast.

CONTACT: mborrelli@coastastudies.org

Oyster Recruitment and Sedimentation Monitoring in Wellfleet Harbor

ABSTRACT: The Herring River Restoration Project in Wellfleet and Truro, MA, seeks to restore 1,100 acres of estuary and former salt marsh by replacing tidally-restrictive culverts installed in the early 20th century with incrementally-opened tide gates. Wellfleet Harbor is home to abundant and financially viable aquaculture operations—particularly oysters—valued at \$6.8 million in 2018. In collaboration with the Wellfleet Shellfish Department, we developed a study to better understand oyster larval settlement throughout Wellfleet Harbor. In 2022, we tested four different methods of larval recruitment—oyster cultch, surf cultch, river rocks, and a multi-tiered spat collector—at four sites throughout Wellfleet Harbor. We also measured short-term sediment accumulation at each site. The multi-tiered spat collector, the only method that successfully recruited oysters, allowed us to gain insight into the spatial and temporal distributions of oyster recruitment. Two study sites were coupled with sedimentation monitoring sites. These sedimentation monitoring sites are associated with a three-year project monitoring project to better understand the sediment dynamics of Wellfleet Harbor in advance of the Herring River Restoration project. After decades of planning, the restoration project broke ground in spring 2023. As such, the assessment of the pre-restoration baseline conditions in the Herring River system is essential to better understanding and monitoring changes in the system as the restoration progresses.

PRESENTER NAME & AFFILIATION: Katie Castagno, Center for Coastal Studies

COLLABORATORS: Eliza Fitzgerald (APCC), Bryan Legare (CCS), Owen Nichols (CCS), Tim Smith (NPS), Mark Borrelli (CCS)

BIOGRAPHICAL INFORMATION: Katie Castagno is the director of the Land-Sea Interaction Program at the Center for Coastal Studies in Provincetown, MA. Katie's research interests focus on the intersections among coastal resilience, salt marsh restoration, and sediment transport. Katie received a PhD in Geological Oceanography from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography. Katie also holds an MA in Marine Affairs from the University of Rhode Island and a BA in Environmental Geoscience from Smith College. Katie has previously worked as an environmental educator and elementary school science teacher across Cape Cod.

CONTACT: kcastagno@coastalstudies.org

A Biological Survey of Shell-boring Worms Infecting Oysters from Wellfleet Harbor

ABSTRACT: Globally, aquaculture is a multibillion-dollar enterprise and shellfish aquaculture in particular is outpacing all other products. This is largely being driven by a growing demand for cheap protein, especially in emerging economies such as China. However, diseases remain a concern for many shellfish growers, especially as climate change and other factors begin to take effect. In this project, we report the presence of *Polydora websteri* – a shell boring polychaete worm, for the first time infecting both wild and farmed oysters from Wellfleet Harbor. While we did find that parasite load was low to moderate in the farmed oysters, infection levels in wild oysters obtained from the tidally restricted Herring River estuary reached 100%, with every oyster harboring at least one worm. A biogeographical analysis also found that *Polydora websteri* from Wellfleet Harbor oysters were most genetically related to *P. websteri* from Maine oysters – an unsurprising result considering the history of oyster transplantation across New England. We did find a surprisingly strong genetic connection between the worms from Wellfleet and those infecting the Pacific oysters (*Crassostrea gigas*) from the Black Sea in Russia with both populations sharing the same genetic signature. All of these results will be discussed as it pertains to the future of shellfish aquaculture in the United States.

PRESENTER NAME & AFFILIATION: Andrew A. Davinack, Wheaton College

COLLABORATORS: Margaret Strong, Wheaton College and Barbara Brennessel, Wheaton College

BIOGRAPHICAL INFORMATION: Drew Davinack completed his B.S. in Biology at St. Johns University in Queens, NY, his M.S. in Biology from Hofstra University in Long Island, NY and his Ph.D. in Zoology from Stellenbosch University in South Africa where he worked with oyster and abalone farmers to understand the biology of shell-boring worms. Prior to his appointment as Assistant Professor at Wheaton College, he was an Assistant Professor of Biology at Clarkson University in Potsdam, New York where he studied the biology of invasive freshwater snails in the lakes and rivers of the Adirondack Park. When he's not in his lab or in the field, Drew is an avid martial artist, practicing a variety of disciplines including Brazilian Jiu Jitsu and Combat Sambo. He is also a huge pizza snob.

CONTACT: davinack_drew@wheatoncollege.edu

The Big, Crabby Year: The State of Horseshoe Crab Research and Advocacy in Wellfleet and Beyond

ABSTRACT: As other Atlantic coast states have eliminated or reduced their harvest of horseshoe crabs in recent years, Massachusetts allows two fisheries where primarily spawning females are targeted: to be used as bait in the depleted, overfished whelk fishery, and to be bled to make the only FDA approved test for endotoxin in biomedical manufacturing. Mass Audubon has been conducting horseshoe crab surveys on the Cape and Islands for over 20 years, providing at least 50% of the spawning beach data used by the state to assess this fishery. The data consistently shows very low numbers of crabs in areas subject to bait harvest, particularly Cape Cod Bay. Monomoy National Wildlife Refuge in Chatham, where all forms of harvest are prohibited, is the last place in Massachusetts with enough horseshoe crab eggs to provide food for declining shorebirds, particularly the federally protected Red Knot. At the urging of the conservation community, and in response to a major surge in biomedical harvest from a new Charles River Laboratories facility in Harwich, the Mass Division of Marine Fisheries proposed modest new harvest restrictions for spawning crabs in 2022, but despite 1300 public comments in favor, the regulations were rejected by the Mass Marine Fisheries Advisory Commission, a board composed of fishing industry representatives. This talk will cover the long-term spawning data for Wellfleet and the rest of the Cape and discuss the conservation community's efforts of the eventful last year, and into the future, to protect Horseshoe Crabs in Massachusetts.

PRESENTER NAME & AFFILIATION: Mark Faherty, Mass Audubon Cape Cod

BIOGRAPHICAL INFORMATION: Mark is the science coordinator for Mass Audubon Cape Cod, overseeing projects that include horseshoe crab surveys and advocacy, nesting shorebird protection, bird banding, various turtle research and protection projects, pollinator habitat restoration, and multiple community science projects around birds and insects.

CONTACT: mfaherty@massaudubon.org

Tick and Mosquito Management on the Cape: What are Best Management Practices to Protect Public Health?

ABSTRACT: Mosquitos and ticks are species of considerable public health importance. Several programs on the Cape work towards managing these risks through public education and in the case of Cape Cod Mosquito Control, direct intervention efforts. The focus of Cooperative Extension through a three-phase program: Protect Yourself, Protect Your Yard and Protect Your Pet. Cooperative Extension and Mosquito Control subscribe to principles of Integrated Pest Management, IPM. This presentation will review best management practices that work to achieve effective protection from arthropod-borne diseases.

PRESENTER NAME & AFFILIATION: Larry Dapsis, Cape Cod Cooperative Extension

COLLABORATORS: Gabrielle Sakolsky, Cape Cod Mosquito Control

BIOGRAPHICAL INFORMATION: Larry Dapsis has been an entomologist since age five. He earned his B.S. in Environmental Science & Biology at Fitchburg State University and his M.S. in Entomology at the University of Massachusetts – Amherst. He has thirty-four years of professional pest management experience including Vegetables, Cranberries and Household Insects. Larry joined Barnstable County Cape Cod Cooperative Extension in 2011 as Deer Tick Project Coordinator and Entomologist and is a member of the Barnstable County Task Force on Lyme and other Tick-Borne Diseases.

Gabrielle Sakolsky attended the University of Massachusetts where she conducted research on biting flies of northeastern saltmarshes (Tabanidae). Upon completing her M.S. degree in 1993 she was hired as the Staff Entomologist at Cape Cod Mosquito Control Project where she now serves as Superintendent. She conducted and directed the mosquito arbovirus surveillance program in Barnstable County (MA) for over 30 years. In addition to her position at CCMCP, she serves as the Chairperson of the American Mosquito Control Association's Pesticide Environmental Stewardship Program Committee. She is also a former President of the Northeastern Mosquito Control Association.

CONTACT: ldapsis@capecod.gov

POSTER ABSTRACTS

Restoration and Recovery: Understanding East Harbor's Horseshoe Crabs

ABSTRACT: East Harbor, located in North Truro, is a brackish water lagoon that was artificially isolated from Cape Cod Bay for over 100 years. As a result, the system transitioned to a freshwater lake, marine life was extirpated, and water quality declined significantly. In response to the poor conditions, tides were partially restored to the system in 2002 via a 700-foot-long culvert reconnecting East Harbor to Cape Cod Bay. This partial tidal restoration improved water quality and supported a resurgence of marine life, including horseshoe crabs. In recent years, we have undertaken efforts to examine the recovery of East Harbor's marine ecosystem, which is protected from harvest and development. To gain an understanding of the horseshoe crab population dynamics and habitat use of East Harbor, we started a tagging study in 2022. Since, our team has individually tagged 935 crabs within East Harbor. Of these crabs, 61% were adults, and 39% were juveniles, highlighting use of East Harbor as a breeding and nursery site. In addition, we placed radio tags on 25 female crabs to track their movements around the lagoon and into Cape Cod Bay. Over 50% of the radio tagged females were detected at all 5 receivers spanning the entire lagoon, and 3 crabs have moved into Cape Cod Bay. These results show that there is a thriving horseshoe crab population in East Harbor that maintains connection with Cape Cod Bay.

PRESENTER NAMES & AFFILIATIONS: Allison Myers¹, Kelly McCusker², Kta'n Weeden¹, Katie Button³, Rachel Thiet², Sophia E. Fox³

¹American Conservation Experience and Cape Cod National Seashore; ²Antioch University New England; ³Cape Cod National Seashore

Seaturtlesightings.org: Vessel Operator Outreach, Education and Data

ABSTRACT: Four species of sea turtles forage in coastal waters off the northeast coast of the US in late spring, summer and fall: leatherbacks, loggerheads, Kemp's ridleys and greens. Since 2002, Mass Audubon's Wellfleet Bay Wildlife Sanctuary (WBWS), in Wellfleet, Massachusetts, US, has operated a hotline and website, seaturtlesightings.org, aimed at communicating with marine vessel operators about sea turtles. The goals of the hotline/website are: to gather data points of where and when sea turtles are seen in these NW Atlantic foraging grounds and to reduce vessel strikes by educating vessel operators that sea turtles are present in local waters and by conveying information about how to spot them. Vessel strike may be a significantly under-reported cause of leatherback and loggerhead mortality in the coastal NW Atlantic.

PRESENTER NAMES & AFFILIATIONS: Karen Dourdeville and Bob Prescott, Mass Audubon's Wellfleet Bay Wildlife Sanctuary