



Photo credit: Kevin Friel

“The Osprey Project”

OPET Annual Meeting
Thursday, August 18, 7 pm

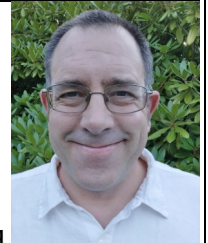
Sea Education Association
171 Woods Hole Road, Falmouth

Kevin Friel is a professional photographer and naturalist whose images of wildlife are stunning. Together with Barbara Schneider, animal welfare activist, journalist, and educator, he founded The Osprey Project in Falmouth. The Osprey Project’s goal is to provide Ospreys with nesting platforms as an alternative to nesting on powerline poles where their nests may catch on fire, killing the adults or young. As well, the Osprey Project is working with Eversource to install deterrents to keep the birds from returning to nest on the poles. Their talk will describe these efforts as well as the natural history of Ospreys, whose populations once suffered steep declines, and are now emblematic of Cape Cod.

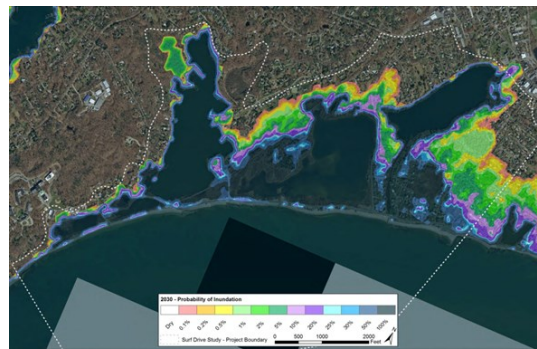
A Message from Alfredo Aretxabaleta,

OPET President

Welcome to summer at Oyster Pond! The trails and pond are looking great and are ready as ever to be enjoyed! At the Fells Road entrance kiosk, you can take a copy of the trail brochure, with its map of the hiking trails of the Headwaters and Zinn Park properties and link to OPET’s website. This guide has become extremely popular!



During these crazy last two years we have learned that we need to keep adapting to new realities and that the best way to confront a challenge is by being well prepared and working together. One such challenge is coastal vulnerability in response to climate change. OPET has been collaborating with the Town of Falmouth’s efforts as part of the Coastal Resiliency Planning for the Surf Drive area, which includes Oyster Pond. The Woods Hole Group presented the findings in a report and during a set of public meetings (a story map with details is available at <https://arcg.is/OS5GoZ>). The main finding of the report is that, while the probability of flooding especially during extreme events is predicted to increase, the Town has the opportunity to adapt by working toward a more resilient future.



Probability of inundation for the Surf Drive region for the year 2030 based on the Woods Hole Group report to the Town of Falmouth Conservation Department.

Another such challenge is water quality in response to increased human activity. In the Oyster Pond watershed, nitrogen sources are primarily associated with wastewater from septic systems and to a lesser degree with storm-water runoff and garden fertilizers. While the Town is considering multiple alternatives, the ultimate goal is that wastewater must be removed from the watershed by a sewer system or upgraded septic systems to limit nitrogen released to the groundwater.

Some relatively simple actions can definitely help the health of the pond. For the lucky owners that border the pond, keeping the vegetation along the shoreline in as natural a state as possible will help create a buffer that acts as a filter of pollutants before they can enter the pond. These vegetation buffers also become habitats for wildlife, birds, and fish. Additionally, we can limit the use of lawn fertilizers. For coastal ponds, including Oyster Pond, the nitrogen contained in fertilizers is directly linked with many potential adverse consequences: harmful algal blooms, decreased biodiversity, new species invasion, and, in extreme cases, hypoxia and anoxia leading to fish kills. Monitoring and protecting the pond and its headwaters land is a long-term effort, and we at OPET are committed to it.

Join OPET Today!

Your donations make it possible to continue our work to conserve and protect the natural environment and ecological systems of Oyster Pond.

Officers & Directors 21-22

President - Alfredo Aretxabaleta

Treasurer - Matt O'Connor

Clerk - Meredith Golden

Directors:

John Dowling	Dana Rodin
Jennifer Goebel	Jonathan Smith
William Kerfoot	Mike Spall
Teresa MacRae	James Wilson

Administrator - Chris Brothers

Visit our web site at

www.opet.org

Or send us an email at
info@opet.org

OPET Board meetings are open to all OPET members. Meetings are at 4:30 pm on the second or third Sunday of the month at the Treetops Clubhouse or virtually through Zoom.

We are a 501(c)(3) organization.
Contributions are tax deductible.
Tax Id number—04-3278142



Monitoring the Health of Oyster Pond

By Alfredo Aretxabaleta, OPET President

The health of Oyster Pond is controlled by two physical factors: temperature and salinity. Optimal pond health corresponds with surface waters with salinity levels between 2 and 4 ppt. Under those salinities, toxic blooms are prevented. The sources of freshwater to the pond include rainfall, groundwater from the Oyster Pond watershed and flow from Mosquito Creek. Under normal conditions, water flows from Oyster Pond through the adjustable weir and out Trunk River into Vineyard Sound. During strong storms and king tides, the flow in Trunk River reverses direction from the Sound, continuing through the lagoon, and over the weir into the pond. The combination of freshwater input and sporadic high-salinity influx during storms results in a stratified pond with warm, low-salinity water near the surface over most of the pond and colder, higher salinity water in the deeper part of the pond.

In 2016, the exchange between Trunk River and Vineyard Sound was inhibited causing limited inflow of salty water. As a result the salinity of the pond dropped below 1 ppt. Under those conditions, freshwater cyanobacteria proliferated resulting in a harmful algal bloom. In response, the Town of Falmouth dredged Trunk River to increase exchange with the Sound to maintain the pond salinity within the desired range. Storms tend to clog the river with accumulated silt and debris, limiting the exchange. Occasional dredging of the river, which OPET coordinates with the Town of Falmouth, is critical to maintaining optimal salinity.

OPET board member Mike Spall has been conducting monthly surveys of temperature and salinity throughout the pond since 2016. One missing component to our understanding of the Pond-Sound exchange is a determination of the direction and magnitude of the flow over the weir. Most of the events dominating water exchange occur during storms; therefore, it is difficult to characterize their effects without continuously measuring water flow. Such measurements will also provide the long-term information needed for decision-making in response to the changes occurring along the coastal environment from sea level rise.



The adjustable weir in Trunk River can be used to control water flow out of Oyster Pond.

OPET is partnering with Lowell Instruments LLC, a local company, to install one of their current meters near the weir. It can be programmed to collect data at set intervals for extended time periods, making it easier and more affordable to collect reliable and more frequent data than sampling in person. The funds to purchase the current meter were granted by the Cape Cod Foundation's Falmouth Fund as part of its priority area of protecting the health of local waters and wetlands. We expect to deploy the instruments this summer and, using the information gained, work toward an updated Oyster Pond Management Plan.

2022 Herring Count on the Trunk River

by Matt O'Connor, OPET Treasurer

On April 1, thirteen dedicated volunteers began the OPET annual river herring count on the Trunk River, one of more than 100 river herring runs in Massachusetts. This is a spring-time effort to estimate the number of herring migrating back from the ocean to Oyster Pond via the Trunk River to spawn. Over the next eight weeks, following guidelines recommended by the Massachusetts Department of Marine Fisheries (DMF), this group completed a total of 319 ten-minute random counts conducted between the hours of 9 a.m. and 9 p.m. each day. A grand total of 945 herring were counted heading up Trunk River during 63 (20%) of these ten-minute counts. Most of the sightings were of 1 to 10 herring, but there were a few counts that exceeded 100 herring. In keeping with our counting experience in prior years, most of the sightings occurred during the evening hours when the cover of darkness makes it easier for the herring to avoid being picked off by predators on their way up river.

We concluded the count on June 1 and sent our data to The Association to Protect Cape Cod which coordinates the herring counts on the Cape. APCC then forwarded our data to the DMF. DMF uses a mathematical algorithm to convert the sample data into an estimate of the size of the entire herring run for Trunk River this year. We are awaiting the estimated results.

Not surprisingly, most of our counts (80%) resulted in seeing zero herring. But that doesn't mean that those counts were boring or uneventful. Besides simply being outdoors in a beautiful setting, there is often much to see. Black-backed, Herring, and Laughing Gulls, Double-crested Cormorants, Osprey and Great Blue Herons can be seen in Vineyard Sound at the mouth of the river, in the river, along the shoreline, as well as from above, all looking for the opportunity to feast on the migrating herring. Harbor seals

also frequent the area. Several of our counters watched as predators plucked herring from the river in their failed attempt to complete the migration. One volunteer even reported seeing a coyote plunder a swan's nest of eggs. This all may sound terrible, but it's a reminder of the realities and complexities of the food chain that allows all these animal species to survive in our beautiful corner of the world.

We'd like to take this opportunity to thank this year's dedicated counters. They were Alfredo Aretxabaleta, Jay Burnett, Brad Butman, Michael Casso, Elizabeth Davies, Jennifer Goebel, Pat Keoughan, Terri MacRae, Margot McKlveen, Cindy Moore, Kate Morkeski, Matt O'Connor, and Natalie Renier. If you would like to participate in next year's count, please contact Matt O'Connor at oconnorscape-cod@gmail.com.



Great Egrets are one of the many predators awaiting herring as they migrate upstream to spawn. *Photo credit: © Spectrum Inspired Photography by Connor S. Thompson*

Gifts to OPET in memory of Louis Turner

- ♥ Anonymous
- ♥ Falmouth Democratic Town Committee
- ♥ Janet Fay
- ♥ Delia Flynn
- ♥ John Frank
- ♥ Meredith Golden
- ♥ Richard Hardej
- ♥ Rodney Hinkle and Kristin Moritz
- ♥ Richard Jones
- ♥ Frank Kaylor
- ♥ Roger and Cathy Kligler
- ♥ Mary Ellen Coburn Kresel
- ♥ Rick and Carol Laub
- ♥ Ellen LeBeau
- ♥ Alison Leschen and Scott Lindell
- ♥ Victoria Lowell
- ♥ Matt and Kit O'Connor
- ♥ Chris and Pam Polloni
- ♥ Ann-Marie Runfola and Ken Kostel
- ♥ Michael Sheridan and Anuradha Desai
- ♥ Mary and Edward Sholkovitz
- ♥ Tom and Ann Stone
- ♥ Stephen Turner
- ♥ Robert Wiskind
- ♥ Judith Ziss

Summer Students Visit Oyster Pond

By Chris Brothers, OPET Administrator and Alfredo Aretxabaleta, OPET President

Each summer since 2009, a talented group of 15 young scientists has had the opportunity to spend ten weeks in Woods Hole conducting research under the mentorship of scientists from the town's six research institutions. The Partnership in Education Program is conducted under the auspices of the Woods Hole Diversity Advisory Committee (of which OPET President Alfredo Aretxabaleta is a member). The goal of the program is to provide first-hand experience in marine and environmental science for students from underrepresented groups. While in Woods Hole, the college juniors, seniors, or recent graduates also take a course on climate change, attend seminars, and tour the institutions.

Students live in Sea Education Association housing and have a little bit of free time during their stay to explore nearby areas; some of the students have never seen the ocean! PEP students are among the most avid users of OPET trails on their way back and forth to Woods Hole and Surf Drive Beach. In the past, PEP students have used Oyster Pond as their sampling location studying its water quality and fish populations. We hope they continue using our Pond as a research site in future years.

In 2020 and 2021, the PEP program was conducted virtually due to COVID, but some students had the chance to spend two weeks in August 2021 in Woods Hole, working with their mentors whom they had only previously met through Zoom. This year the PEP program is back in person. At the culmination of their research experience, the students present their work at a one-day forum open to the public. This year's hybrid event will be held August 12.

Last year, five Falmouth science teachers worked with the PEP II students, who were returning to the program for a second year, helping them develop lessons based on their research. OPET Administrator and science teacher Chris Brothers worked with Tiffany Windholz from Oklahoma State University, who was using ArcGIS to study permafrost thawing resulting from climate change. Tiffany graduated this spring and will begin working at the Woodwell Climate Research Center in late August. Her success, and that of the other early-career scientists in the PEP program, is testament to the value of such programs in increasing the diversity of those entering the scientific community.

Additionally, students from the Woods Hole Children's School of Science will be visiting Oyster Pond this summer as part of their science curriculum. The

School of Science has been educating children since 1913 building their appreciation of science through inquiry-based learning. This year the students will learn about OPET's efforts to preserve Oyster Pond and its surrounding ecosystems. Perhaps one of them will be a PEP student in the future.



Chris Brothers, OPET Administrator and Tiffany Windholz, PEP II student at SEA,

Gifts to OPET in honor of:

- ♥ Wendi Buessler from Alston Leschen and Scott Lindell
- ♥ Michael Casso from Jean and Joe Sanger
- ♥ Fellow Residents at Treetops
- ♥ Mindy Hall from Leslie Hall
- ♥ Mindy Hall from Leonard and Patricia Johnson
- ♥ Donna Hamilton from Alexia Hamilton
- ♥ Friederun and Holger Jannasch from Hans and Elizabeth Jannasch
- ♥ Barbara A. Lankow from Richard A. Lankow
- ♥ Birgit and Werner Loewenstein from Laurie Baefsky
- ♥ The Moors Association from the Falmouth Road Race, Inc.
- ♥ Susan Morrison from Nancy K. Barnett
- ♥ Dr. Norman Starosta from Peter Starosta
- ♥ Lee Turner from Judith Ziss

- ♥ Virginia Valiela from Olivann and John Hobbie
- ♥ Ann Wolford from Nancy Barnett

Gifts to OPET in memory of:

- ♥ Nancy Belcher from Meredith Golden and Bob Chen
- ♥ Irwin and Liz Golden from Meredith Golden and Bob Chen
- ♥ JB and Madalyn Hamilton from Jeff and Alexia Hamilton
- ♥ Francis Huxley from Meredith Golden and Bob Chen
- ♥ Francis R. Powers from Martha Powers
- ♥ Dr. and Mrs. Norman M. Starosta from Peter and Cynthia Starosta
- ♥ Myrna Weiss from Donald Weiss
- ♥ Mary Lou Welch from Meredith Golden and Bob Chen
- ♥ Dr. Martin Kaister White from Tanya White
- ♥ Dr. Roland L. Wigley from Nancy Wigley

OPET Celebrates its 25-Year History

Excerpted from a book celebrating OPET's 25th anniversary being written by board members William Kerfoot, Dana Rodin, and John Dowling.

Oyster Pond is one of the most celebrated and studied ponds in the United States. Falmouth resident Katharine Lee Bates, author of "America the Beautiful" drew inspiration from the "shining seas" she frequently viewed near the mouth of Oyster Pond.

The Oyster Pond Trust was set up in 1990 to protect the pond and acquire land within its watershed. The group expanded in the mid-1990s to become the Oyster Pond Environmental Trust (OPET). Over the past 25 years, OPET has done the following to protect and preserve the pond:

- Purchased 7.5 acres of land, now Zinn Park, at the inflow at the north end of the pond;
- Worked with the Department of Public Works to design a weir to control the pond's salinity;
- Started control programs for phragmites, purple loosestrife and other invasive plant species;
- Repaired and upgraded the outflow groins at the mouth of Trunk River;
- Set up an annual monthly water quality monitoring program for the pond;
- Began maintaining the herring run and monitoring the migration of herring in Trunk River;
- Purchased 22 acres of additional land from WHOI and constructed 1.5 miles of accessible trails;
- Partnered with the Association to Protect Cape Cod to test Oyster Pond bimonthly from June to November for cyanobacteria blooms;
- Reviewed the watershed management plan produced by Wright-Pierce Engineering; and
- Updated K. O. Emery's book on Oyster Pond documenting the pond's progressive rise of nitrogen.

Emery's 1969 book *A Coastal Pond, Studied by Oceanographic Methods* documents over 200 years of the history of Oyster Pond. Emery wrote, "The proximity of the pond to several marine institutions at Woods Hole has permitted it to serve a rather unique function – as a model environment for investigating processes...with modern techniques."

Coring to study the bottom sediments of the pond began in the 1940s. In 1963, Emery and Harold "Doc" Edgerton (aka Papa Flash, the inventor of the strobe light) profiled the depth of the pond using acoustic profiling. Emery would have been proud to see his traditions continue. In 1980 the first groundwater flowmeter "GeoFlo" was used to measure groundwater flow and direction into the pond along with groundwater elevations, allowing an estimate of the pond's recharge zone. Combining these measurements with those of nutrient mass loading led to the concept of cumulative mass loading of nutrients in protecting surface water bodies. This concept was adopted first by the Town of Falmouth, then the County and the U.S. Geological Survey, and now is commonplace across the U.S.

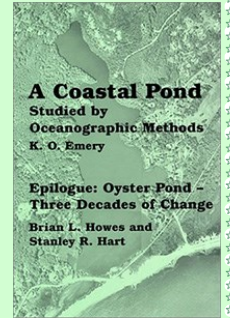
In 1985, a Salt Pond Committee, chaired by William Kerfoot, with members from the Marine Biological Laboratory and Woods Hole Oceanographic Institution, set forth a maximum recommended concentration of total nitrogen (.5 ppm) for the pond and developed a recharge zone for the pond, based upon rainwater recharge, runoff topography, and estimated volume discharge. David Ross at WHOI volunteered to set up a Sea Grant program for monitoring the pond.

Out of these efforts, in 1987, with the help of Brian Howes and Dale Goehringer, came the Pond Watchers volunteer program with John Dowling, Barry Norris, Bob Livingstone, Don Zinn, and others participating to take samples at three locations in the pond during the summer. In 1997 Brian Howes and Stan Hart republished Emery's book with an epilogue containing 30 years of additional information about the pond from Woods Hole scientists, the Oyster Pond Trust, and the newly-formed OPET.



Painted turtles sunning themselves in Oyster Pond. *Photo credit: Andy Wexler*

For its size, Oyster Pond is one of the best studied coastal ponds on Earth. It all started with K.O. Emery who in 1969 wrote the classic study of Oyster Pond titled *A Coastal Pond Studied by Oceanographic Methods*. This important book traces the history of the pond from pre-European and early settler days to the middle of the twentieth century. It describes in detail the pond's topography, geology and biological characteristics. Numerous studies have followed since then. We are fortunate have as neighbors many preeminent scientific institutions whose scientists use Oyster Pond as a model site for investigating ecological processes. Learn more about research conducted in Oyster Pond at our website (opet.org).



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 Kevin Friel and
 Barbara Schneider
 Sea Education Association
 171 Woods Hole Road,
 Falmouth



Photo credit: Kevin Friel

The Osprey Project

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The Oyster Pond Environmental Trust

P.O. Box 496
 Woods Hole, MA 02543

