Narragansett Bay Research Reserve

The Narragansett Bay Research Reserve is a partnership program between NOAA and RIDEM and works closely with the Audubon Society of Rhode Island.

Winter 2009 Newsletter

NBNERR NEWS 1 Volume 11.

Monitoring Salt Marsh Responses to Global Climate Change

By Kenneth Raposa, Ph.D., Research Coordinator

Salt marshes provide valuable habitat for fish, shrimp, and crabs. They protect shorelines from storms and filter pollutants out of the water. They are also some of the most beautiful coastal habitats in Narragansett Bay. Unfortunately, over 50% of all the original marshes in the Bay have been destroyed by human activities. Roads, dikes, berms, invasive species, and an overload of nutrients have impacted most of the remaining marshes. In an effort to change this trend, recent restoration efforts throughout the Bay have improved the condition of many of these marshes.

Above: Vegetation monitoring in a Prudence Island salt marsh

Recently restored marshes include Potter Pond (Prudence I.), Gooseneck Cove (Newport), Walker Farm (Barrington), and Silver Creek (Bristol). Other marshes such as Galilee (Narragansett) and Sachuest Point (Middletown) were restored over 10 years ago and have shown remarkable improvements. However, all of these marshes face a larger threat as the global climate changes. Warming temperatures, rising sea levels and an increase in coastal storms can act in concert to damage the remaining marshes in the Bay.

One of the first steps in understanding if and how our marshes are responding to these changing conditions is to establish long-term ecological monitoring programs in some of the healthiest marshes in the Bay. The Narragansett Bay Research Reserve is doing just that at the Coggeshall and Nag salt marshes in the Reserve on Prudence Island.

This project is part of a national effort at five National Estuarine Research Reserves around the country to establish salt marshes as long-term reference, or "sentinel" sites. Participating Reserves are Wells, Maine; Narragansett Bay, Rhode Island; Chesapeake Bay, Virginia; North Carolina; and South Slough, Oregon. One goal of this project is to use natural marshes as reference sites so that we can understand what is happening at our restored marshes. A second goal is to use these long-term monitoring sites to understand how marshes around the country are responding to the effects of global climate change. To do this, Reserve scientists are monitoring vegetation, water flow patterns, and soils at all the Sentinel Site marshes each year. We are also tracking water levels and the height of each marsh to understand if these marshes are able to keep up with sea level rise, or if they will start to erode and vanish.

Although this project is only in its second year, the goal is to continue our monitoring at all of these sites, and hopefully incorporate more sites at the remaining 22 Reserves around the country, indefinitely. Over time, these datasets will allow Reserve scientists to understand whether or not our valuable marshes will be able to withstand the effects of global climate change.

Reserve News

Native Tree and Shrub Fundraising Sale

Through a joint fundraising effort,* the Research Reserve and the Prudence Conservancy invite you to plant a tree to increase species diversity on Prudence Island and support stewardship programs. We are offering a selection of native trees and shrubs available for a spring 2010 planting.

Purchased trees and shrubs may be planted on your own property or donated for planting in the first of two planned forest restoration plots. The locations of donated trees/shrubs on the restoration plot will be mapped so you can watch your gift grow in this forested setting through the years. Once established, these trees/shrubs will provide a source of new seedlings for both future plantings (as needed elsewhere in the landscape) and natural regeneration in the restoration plot.

You may purchase trees and shrubs as a legacy gift in your own name or to honor a loved one.

You can select from the list of available species on the order form or, if you prefer, indicate the number of trees you wish to purchase and we will make the selection for you to ensure the greatest variety of species in the initial planting.

To place your order, simply mail an order form with your payment (payable to the Prudence Conservancy) to: Prudence Conservancy, PO Box 115, Prudence Island, RI 02872.

Order forms are available:

- By download from www.nbnerr.org or www.prudenceconservancy.org

- By pick-up at the Reserve's Learning Center or the Hope Brown Center

- Upon request by contacting Robin Weber (robin@nbnerr.org, 401-683-7369)

Orders must be received by February 15th, 2010.

*Proceeds from this sale will be applied toward future Prudence Island stewardship activities conducted by both organizations.

Forests in Time

By Robin Weber, Natural Resources/GIS Specialist

Throughout Rhode Island, the area covered by forest has varied over the past 300 years. The greatest coverage (~90%) was prior to European settlement and the least coverage (~25%) occurred during the peak of agricultural land use in the mid-1800s.* Due to the wide-scale abandonment of farmland, forests returned to approximately 60% of the state by the 1990s. The majority of trees in today's forests are roughly 60-80 years old, which is young by forest standards. As forests mature they provide greater mast (fruit and nuts) to support wildlife and both fallen dead and standing dead trees (snags) provide homes for cavity-dwelling animals.

Like other places in the state, there has been extensive forest recovery on Prudence Island and these relatively young forests lack both the structural and compositional diversity that would have been found in older, pre-colonial forests. Disturbances responsible for influencing diversity can be either natural (fire, wind damage, insect outbreaks) or the result of human activity (land clearing, harvesting). The introduction of non-native insects and disease can also greatly influence forest composition. For example, the American chestnut, which was at one time the dominant tree species, was almost completed eradicated throughout its range by the chestnut blight.

Greater tree species diversity not only provides food and shelter to a broader range of wildlife, but it may ensure the persistence of a forest when new conditions and/or threats arise. For instance, climate change will alter temperature and precipitation patterns, which may negatively impact native tree species to varying degrees. The spread of invasive Asian long-horned beetles could potentially eradicate dominant species such as red maple from Prudence Island forests. However, if care is taken to avoid the transportation of infected wood products like firewood to the island, our forests may escape dangerous pest and disease infestations, providing a refuge for forest-dependent species.

Whatever the reasons for their current absence or limited extent, native tree species are not able to return to the forest once they have been wiped out. With this in mind, the Reserve has started a forest restoration program to increase the diversity of tree species in our island forests. With more types of trees in the forest, we stand a better chance of sustaining healthy woods into the future that will enhance and support a greater range of wildlife species.

*Source: The Forests of Rhode Island (USDA-Forest Service, 2003).

Reserve News

A Rapid Assessment Technique for Monitoring Algae

By Brandon Russell, Seasonal Research Assistant

In June of 2009, scientists at the Narragansett Bay Research Reserve began a study to quickly evaluate the diversity and abundance of macroalgae (seaweeds) around Prudence Island. Known as the Rapid Macroalgal Assessment (RMA), it provides a fast, efficient way of determining relative amounts and kinds of algae.

Each month, Reserve staffers visit 31 sites scattered around the island and grade the amount of algae present on a scale of 0 (absent) to 5 (severe). Sites are visited during low tide, so that algae can be measured in both the intertidal and subtidal zones. The different types of algae that are present at each site are also recorded. While more intensive sampling techniques were already in use at several locations in the Reserve, the RMA gathers data over a much larger area. This provides a "snapshot" of algae on Prudence Island, helping scientists to observe growth and distribution patterns that were previously unobserved. Despite being in use for only a few months, the RMA is already providing valuable data and demonstrating how quickly macroalgae can respond to changing conditions in Narragansett Bay.

Like many coastal areas with large population centers, the water in Narragansett Bay has high levels of dissolved nutrients. This typically leads to dense blooms of macroalgae. While some fish and crustaceans use the algae as habitat, when macroalgae decomposes it pulls oxygen out of the water, killing ecologically and commercially important animals in the area and giving off a noxious smell. Algal blooms can have significant impacts on not only the natural health and beauty of an area, but also on the local economy and human enjoyment.

The goal of the RMA is to give as broad a view as possible of macroalgae along the entire coast of Prudence Island. By conducting an assessment every month, scientists will be able to track changes in how much and what types of algae are growing in different areas. Coupled with water quality and nutrient data, this information will increase our understanding of seasonal algae fluctuations in Narragansett Bay. The RMA is a new component of ongoing monitoring efforts aimed at understanding the impacts of altering nutrient inputs from human sources. As an easy, efficient method for gathering data, the techniques used in the Rapid Macroalgal Assessment could be adapted to other parts of the Bay or any location where ecologists are interested in tracking large-scale changes in macroalgal populations.

July 2009 Rapid Macroalgae Algae Assessment Results

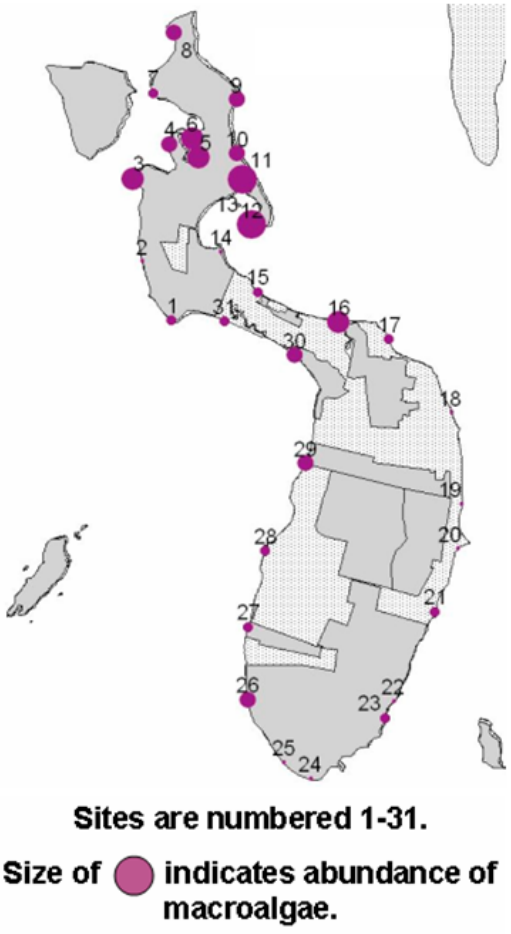


Image Credit: Kenny Raposa and Brandon Russell

Reserve News

The Reserve Exhibits a Local Artist's Works

By Cheryl Tavares, Seasonal Naturalist

Each year, the Research Reserve's Lab & Learning Center hosts an exhibit of works from a local artist. This year's artist is Prudence Islander Arline Cram Butler. The exhibit displays 28 pieces on loan from several islanders. The collection includes a church program, postcards, sketches and paintings of Prudence Island scenes. The scenes highlight the beauty of nature as well as yachts, ferries, and island homes. Cram Butler worked in many mediums ranging from oils and watercolors to pen and ink, pastels, and charcoal.

The exhibit has been well received by the island community as many remember Arline fondly.

As friend Joe Bains stated in his biography of her:

"Although Arline passed away in 1990, her memory lives on in the hearts of those who knew her and also through the art that she created. She is remembered fondly by Prudence Islanders to this day, not just as an artist, but as a friend."

The exhibit will be on display through the winter and well into the spring of 2010. The Reserve wishes to thank everyone who contributed their artwork to this exhibit.

The summer of 2010 marks the Reserve's 30th anniversary. In anticipation of this anniversary celebration, the Reserve will once again feature the artwork of Joan Smith McLellen who is well known for her talent with Gyotaku, the ancient art of fish printing.

Anyone wishing to loan the Reserve any of Joan McLellen's fish prints or other artwork next summer, please contact Kristin by email at: kristin@nbnerr.org or by phone at 401-683-1478.

In the meantime, swing by the south end of Prudence Island and see the latest exhibit!

2009 Fishing Contest

By Cheryl Tavares, Seasonal Naturalist

August 16, 2009 marked the Research Reserve's 7th Annual Sustainable Fishing Contest. Each year this little contest grows, and this year was no exception with over 130 registered anglers and many new sponsors. The Prudence community, local businesses and organizations showed their support for this increasingly popular family event with their generous contributions. This enabled participants to receive a free t-shirt and the possibility of winning one of more than 70 door prizes. The Reserve's Seasonal Education Assistant, Mark Pfeifer created an inspired contest t-shirt design that was a huge hit with islanders. The design features people fishing on the T-wharf and lists the names of the many island businesses and organizations. Thank you sponsors!

The sun was shining, the breeze was blowing, but most importantly, the fish were biting. Many practiced catch-and–release fishing, which kept our staff busy measuring, weighing, and recording. Several caught their first fish ever, including 2 ½ year old Riley Phillips. Some anglers even took home trophies for their efforts.

All previous Scupmasters were present at the contest this year. However, only one of them would earn this title again in 2009. There were several age categories for the most scup caught. Trophies went to Bryanna Follett, Jerred Tattersall, and Gia LaVista for their age groups. Glen MacLaughlin recorded the largest fish, and Tyler Smith managed to catch the most fish one more year. But, Bill Follett earned the title of Scupmaster for the third time! Congratulations to everyone.

Contestants are already anticipating next year's big event. The annual contest is on the calendar for Sunday, August 15, 2010. The first 100 people to register on the day of the contest will receive a free t-shirt. New sponsors are always welcome and can leave their contact information with Cheryl: cheryl@nbnerr.org

Fishing For More Than You Bargained For

By Kristin Van Wagner

Forty-eight volunteers from Prudence Island and the mainland turned out on a beautiful sunny Saturday, September 26, 2009, to clean the beaches and marshes of Prudence Island and the Narragansett Bay Research Reserve. Thank you to everyone who come out in support of National Estuaries Day (always the last Saturday in September) and to participate in the Ocean Conservancy's International Coastal Cleanup organized locally by the Audubon Society of Rhode Island.

Focusing on one component of the trash stream each year, Audubon's cleanup draws attention to ways citizens can help reduce the problem. In 2009, stray fishing line that entangles birds and turtles is targeted in Audubon's "Hold the Line" campaign. DEM Director Sullivan and Audubon Director Taft announced a pilot project of boxes installed at DEM fishing access locations to collect unwanted pieces of monofilament fishing line. There is also a new fishing line collection bin made of PVC pipe on the T-Wharf at the south end of Prudence Island. Students from the Prudence Island School constructed and installed the bin last spring.

Most fishing line that you can buy today is made of monofilament; a single-strand, strong, flexible plastic that is clear or tinted blue, pink or green. Most monofilament is non-biodegradable and can last hundreds of years depending on environmental conditions. Because fishing line is thin and often clear, it is difficult for birds and animals to see, and they can easily become entangled. Discarded fishing line most frequently harms birds, turtles, fish, dolphin, and even manatee in southern latitudes. Almost any animal you can imagine can be entangled in line, or will try to consume it. Once entangled, wildlife may become injured, drown, or strangle. Many animals also ingest fishing line, which may kill them outright or lead to a slow, painful starvation with a belly full of plastic. One recovered sea turtle in New York State was found to have consumed 590 feet of heavy-duty fishing line.

Much of the fishing line that ends up in the water has broken after an angler's hook is snagged underwater. Sometimes fishing line gets caught in trees and on power lines. Unfortunately, monofilament is also purposely discarded. Even fishing line that is thrown in the garbage may end up back in the environment. It can blow back out of the garbage can or landfill, or may be taken out by birds or animals looking for a meal or nesting materials. Whenever and wherever you throw out fishing line, be sure to cut it into short (6-12 inch) lengths so it is no longer an entanglement risk.

A Camp-Packed Summer

By Heather Woodhams, Seasonal Naturalist

Camp has long been a fixture of summer for families all over the United States. This summer the Reserve was proud to partner with and support camp programs from the Prudence Conservancy, Save The Bay, the Carnegie Abbey Club, and the URI W.Alton Jones Camp. Campers participated in many marine science activities including seining for fish, monitoring invasive Asian short crabs, and using minnow traps to sample for critters in eelgrass beds. While programs with the Prudence Conservancy, Save The Bay, and the Carnegie Abbey Club were usually a few hours long, W. Alton Jones' Bay Mania campers stayed in the Research Reserve's "Limulus Lodge" for two nights at a time with their counselors. The Bay Mania campers were able to snorkel over eelgrass down by the T-Wharf, study salt marshes and the plants found in them, and learn about the amazing adaptations of shoreline and salt marsh creatures. A new program was added to the Bay Mania program this summer, as the Reserve was able to purchase new microscopes for the campers to look at plankton they collected from the Bay with a plankton tow net.

Approximately 100 children participated in camps on Prudence this summer and with guidance and instruction from the Research Reserve, they learned a great deal about Narragansett Bay.

To find out more about Bay Mania Camp through W. Alton Jones check out this link: www.uri.edu/ajc/eec/camp/summer/earth/baymania.html

Above: Campers use marine research techniques to monitor invasive crab populations on Prudence Island.

Measuring Emerging Pollutants in Narragansett Bay

By Victoria Sacks, URI Graduate Student

If you were down on the T-Wharf this summer at the southern tip of Prudence Island, you might have noticed an addition to the Research Reserve's water quality monitoring station in the form of a new plank located next to the Reserve's water quality monitoring station. This plank is actually a mechanism for hanging small sheets of plastic into the Bay and keeping them from tangling around the pier. Victoria Sacks, currently a graduate student at the University of Rhode Island, along with Dr. Rainer Lohmann at the URI Graduate School of Oceanography, is using these polyethylene (PE) plastic passive sampling devices, to detect emerging organic pollutants in the Narragansett Bay as part of their research funded by the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) at the University of New Hampshire.

Narragansett Bay and its watershed have a long history of exposure to potential contaminants. From industrial operations to agriculture and coastal development, human activity along the Bay and in its watershed contributes a host of pollutants to this ecologically and economically important estuary. Certain contaminants such as petroleum products and PCBs have long been recognized as detrimental to the environment and to human health. However, a new list of pollutants is emerging as we increase our understanding of how human-made compounds react in the environment. Several compounds that are commonly used in personal care products, pharmaceuticals, and industrial processes were not previously known as pollutants, but are now proving to be of concern when they find their way into the environment and the human food chain.

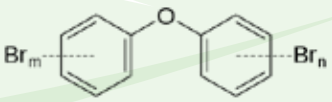
Above: Personal care products containing triclosan. Photo courtesy of Voice of Freedom.com

Sacks is working to develop methods for using polyethylene plastic strips as an inexpensive and simple tool to measure the presence of key groups of emerging contaminants of concern. These include polybrominated diphenyl ethers (PBDEs), which are flame retardants used in everything from building materials to electronics, and from furnishings to motor vehicles. Personal care products are also the source of alkylphenols and triclosan, which are used as surfactants and antibacterial agents respectively.

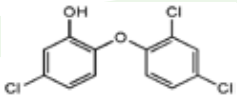
Above: The sampling film prepared and tied to a wire.

For the compounds Lohmann and Sacks chose to study, there is currently a glaring lack of simple, effective tools and methods to measure their concentrations in the environment. For this reason, a major focus of their research is to test the use of a novel, low-tech method of sampling these compounds and to determine the bioavailability of these emerging contaminants in local waters. Not many of us would have thought that small sheets of polyethylene plastic could help measure modern pollutants in the Bay, Lohmann and Sacks hope to determine if this is the case.

Polyethylene (PE) passive samplers consist of a thin piece of polyethylene plastic film, pre-cleaned and treated, strung on a wire and set out in the water column. The PE then absorbs contaminants that are dissolved in the water. Back in the lab, Sacks is able to measure concentrations of the pollutants in the PE and deduce the contaminant concentrations in the water.



Above: PBDE molecule



Left: Triclosan molecule

Updates from the Coastal Training Program (CTP)

By Jennifer West, CTP Coordinator

The CTP delivered several workshops since the last edition of the Reserve News. The most recent was entitled "Rhode Island Stormwater Manual Overview Workshop" that attracted planners, municipal officials, environmental groups, and others. Speakers from the Rhode Island Department of Environmental Management (DEM) and the Rhode Island Coastal Resources Management Council (CRMC) provided participants with a brief, non-technical overview of the public review draft of the Manual, including an explanation of how it differs from the existing manual (adopted in 1993), what new requirements will apply to projects, and how municipalities can help meet the standards through changes in local regulations. Additionally, in partnership with DEM, the CTP helped develop and deliver a workshop entitled "Avoiding and Minimizing Impacts to Wetlands" to private consultants. The workshop provided attendees with information and examples on how to improve compliance with wetland avoidance and minimization requirements.

Back by popular demand, the CTP partnered with RIDEM to hold yet another presentation on the Scituate Reservoir Watershed Greenspace Plan to the town of Scituate, RI. Planning board members and other participants learned about zoning strategies to protect water quality and community character and reviewed detailed resource maps that were prepared for the town. The CTP and RIDEM also held another Conservation Development workshop for town planners, planning board and town council members, designers and developers. Since the last CTP update, another town has expressed interest in adopting Conservation Development. To date, nine towns have adopted Conservation Development ordinances, eight towns have completed draft ordinances, and five towns are pending. Therefore, 22 out of the 28 "eligible" (non-urban and not fully developed) Rhode Island communities are implementing Conservation Development at one stage or another.

The CTP Coordinator continued to work with various partner organizations to plan upcoming trainings and products on such topics as low-impact development site planning and design and estuarine invasive species. Also, the Rhode Island Conservation Easement Guidance Manual is complete and a workshop has been scheduled! Please see announcement below. And don't forget to visit www.communityconnectionri.org to find out more about CTP and other organizations' training opportunities!

SAVE THE DATE!

Workshop on the New RI Conservation Easement Guidance Manual

When: Monday, November 30, 2009, 5:30-7:30 pm
Where: RI Dept of Environmental Management
Who: Municipal officials, land trusts, conservation commissions… *
Cost: FREE (but registration required).
Pizza will be served!

(*attorneys and planners please note: additional presentations will be provided (date TBD) for those seeking RI Bar Assn and AICP CEUs)

Conservation development is an effective way for communities to preserve meaningful open space in perpetuity as land is developed. To ensure that conservation values are preserved, a conservation easement must be carefully written and follow prescribed procedures to maintain the desired conservation restrictions.

Peter Ruggiero, Esq., AICP, Exeter town solicitor and attorney with Ruggiero, Orton & Brochure, will explain how conservation easements are drafted, reviewed, put into action, and enforced to ensure that conservation parcels remain protected in perpetuity. Topics to be covered include ownership and management of conservation parcels, developing, writing and recording conservation easements, and monitoring and insurance considerations. There will ample time for questions and answers.

Hardcopies of the Conservation Easment Guidance Manual will be available at the workshop.

For more information contact:
Jennifer West
401-222-4700 x7413
jennifer@nbnerr.org

Reserve News

Our Wish List

The Reserve has a growing wish list. If you are able to donate any of the following items, please contact:

Nancy Jurnak at nan@nbnerr.org or call 401-683-4476

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Bicycles

Fishing poles and gear

Blade weed whacker (gas powered)

5-gallon buckets

1-gallon planting pots

T Fence post driver (manual)

Post hole digger

Golf cart

Mulch and/or topsoil

Wheel barrow

You are Invited to a 'Holiday Open House' at the Narragansett Bay Research Reserve

Please join us in celebrating the holiday season at the Lab & Learning Center on Prudence Island's south end.

To enjoy treats and sweets drop in anytime between:

11am -1 pm Wednesday December 16, 2009.

We look forward to seeing you!

Narragansett Bay Research Reserve

P.O. Box 151
55 South Reserve Drive
Prudence Island, RI 02872

BE GREEN !
Please circulate this newsletter around your home and office.
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