GET TO KNOW GREAT BAY

14
New Hampshire wastewater treatment plants that discharge into Great Bay

31%
reduction in Great Bay eelgrass from 1981 to 2016

2050
Projected NH sea level will rise between 0.9 and 2.9 ft.

2005
number of Coastal Training Program events since 2004

11%
New Hampshire population living in a coastal zone municipality

5.6%
IMPERVIOUS SURFACE in the Piscataqua Region Watershed

326 MILES OF SHORELINE IN NH
The Great Bay NERR is a state-federal partnership between NH Fish and Game and the National Oceanic and Atmospheric Administration. We enthusiastically embrace the mission of NHFG to conserve, manage and protect fish, wildlife and marine resources and their habitats; inform and educate the public about these resources; and provide the public with opportunities to use and appreciate them. We also use the goals and purpose of our federal designation as a National Estuarine Research Reserve (NERR) as a guiding path for all we do.

Reserves were created to "gather and make available information necessary for improved understanding and management of estuarine areas". When the Coastal Training Program was created in 2002, the estuarine areas dedicated to research and education gained a critical capacity - a program dedicated to bridging the gap between science and decision making that influences the coast. In Great Bay, that has led to thousands of hours spent with local businesses, municipal leaders, and boards to answer questions like: Which open space is most critical to protect? How can we reduce stormwater in our community? What can we do to be ready for climate impacts? For these decisions to be informed by the best available science, someone has to work hard to find that science and translate it to those who need it most. We have been fortunate to have the best here at GBNERR for the past 17 years in Steve Miller. He has worked tirelessly to ensure the people he works with and for, the municipal decision makers, have access to him, the people and information that can help them solve their thorniest problems. His integrity, hard work, natural ability to facilitate a room full of people and sincere passion for the environment have led to impactful change in the watershed and in our organization.

"Work and live to serve others, to leave the world a little better than you found it, and garner for yourself as much peace of mind as you can. This is happiness." – David Sarnoff, American inventor. Thank you Steve. You deserve the happiest of retirement years.

Cory Riley, Reserve Manager, GBNERR
Social change takes time. The Reserve’s Coastal Training Program (CTP) strives to put science into action, to inform decision making, with the goal of sustainable estuarine resources. The delivery of science-based resources over time, is the instrument of the CTP, and the ability of the program to respond to a new or critical decision maker need is one reason the program is so effective. The process of establishing a CTP within a Reserve provides the program a base-line understanding of local decision maker needs, but with the complexity of societal and governmental decision making, new issues or consequences of past decisions arise constantly. Through continued evaluation of trainings and assessments of audience, the ability of the CTP to respond to new or critical decision maker needs is one reason the program is so effective. The process of establishing a CTP within a Reserve provides the program a base-line understanding of local decision maker needs, but with the complexity of societal and governmental decision making, new issues or consequences of past decisions arise constantly. Through continued evaluation of trainings and assessments of audience, the

How Does the Coastal Training Program Work in Practice?

One of many climate summits held at the reserve.

Coastal Training Program Coordinator (CTPC) is poised to recognize these emerging issues. The following example with climate change illustrates this process.

Recognition
In the mid 2000’s climate change was starting to draw broad national attention. Locally there had been a study on sea level rise, the state was focusing on energy conservation, but local training providers offered little in the way of decision support tools or data to municipal officials regarding climate change. Recognizing this gap in training resources and the rapidly growing need for climate change information and trainings, the CTPC, working with Kathy Mills the Reserve’s Research Coordinator at the time, began cultivating a network of climate researchers and developing climate trainings.

Research and Definition
The workshops that were developed and implemented by GBNERR in the mid to late 2000’s began to discuss New Hampshire’s changing weather conditions, extreme weather events, and the impacts to natural resources. This work started a dialog that was necessary
The Coastal Training Program uses a multi-step collaborative approach to ensure towns and municipalities incorporate new science into management plans.

to better understand the issues from the decision maker perspective(s), and begin to locate the available resources to address the need.

The Climate Project, the organization behind the production of "An Inconvenient Truth", offered educational climate change trainings which provided training resources and science references. The CTPC attended this training, which facilitated the CTP to begin giving climate presentations, and by doing so, learn from audiences about concerns and information needed to take action.

Refinement

During the time period 2006-09 the CTP attended professional development trainings, hosted climate change trainings, applied for grant funding, partnered with researchers and served on NERRS climate committees. These activities helped enrich the communication and science assets available and build a network of local climate training providers. They refined understanding of issues and needs of municipal audiences, built public support, and began the search for research dollars.

The NERRS began the system wide process of making climate change part of their strategic plan, and supported the development of the 2009 'Planning for Climate Change' workshop, developed by the Padilla Bay CTP. This workshop was designed to be modified by each Reserve across the country for their local needs. This workshop was a big advancement in approach, and the GBNERR CTP by organizing the necessary partners to successfully develop and deliver the workshop here in NH, laid the foundation for the formation of the New Hampshire Coastal Adaptation Workgroup (NHCAW). Coastal New Hampshire soon had a dedicated group of researchers, outreach professionals, technical service providers, planners, and municipal stakeholders all collaborating to address local climate change needs.

Trust Building

2010 was a pivotal year; working with Dr. Cameron Wake at the University of New Hampshire, the CTP secured a grant that supported his work to produce the report "Climate Change in the Piscataqua/Great Bay Region: Past, Present, and Future", the first down-scaled set of data and projections for our region. This was a critical decision support tool specifically designed for local municipal decision makers. That same year, NHCAW began the “Water, Weather, Climate, and Community” workshop series, and since, there have been 19 workshops, 8 Climate Summits, and over 100 climate related projects completed by NHCAW members with municipalities in coastal New Hampshire.

Around this time, the CTPC began the development of what was to become the Annual Coastal NH Climate Summit, a collaborative forum among scientists, natural resource agencies, municipal leaders, watershed organizations, and citizens concerned about climate change. The goals of the Summit are to inform participants of climate research and adaptation efforts; identify needs and gaps in knowledge; and to foster and facilitate collaboration. The Summit was first offered in 2011 with strong support from NHCAW. As NHCAW evolved and grew, the Climate Summit became their essential yearly event. “Working with the CTPC has been such a valuable partnership for all of the work NHCAW has been involved in, especially our Annual Coastal Climate Summit, which brings together 100 people annually” said Sherry Godlewski, Co-Chair of NHCAW, representing the NH Department of Environmental Services.

Today, coastal municipalities have incorporated climate change into their Master Plans, and developed new ordinances to address flooding, stormwater management, and development through the lens of climate change. Citizens recognize the need for and support action to protect public health, infrastructure and to build resilience. Towns have taken the lead in initiating new scientific studies to understand climate impacts to ground water, roadways, and infrastructure. When NHCAW first started, no staff within the member organizations had a title or position that specifically had climate in the job title or in the responsibilities. Today there are at least four professionals with these titles and responsibilities and many others who now have incorporated climate into the organizational strategic plans as priorities. So yes, change still takes longer than we wish, but progress will build progress.

Steve Miller
Coastal Training Program Coordinator GBNERR
What is a perfect job for someone who loves science and can’t stop talking about environmental issues? Science is the pursuit of knowledge and truth, the environment provides every physical thing we need and use for life and society, and from a young age these things have been central to who I am. As stewards of estuarine ecosystems across the nation, the NERRS recognized their responsibility to educate those individuals who make land use and natural resource decisions that affect the sustainability of estuarine resources. With support from NOAA, Reserves across the country began hiring Coastal Training Program (CTP) Coordinators (CTPC) in the early 2000s to begin the process of establishing the program at their Reserves to achieve this goal. So the obvious answer to my question is a CTPC.

The process of building a CTP is one of the great things about the program. Essentially each program develops a detailed business plan that must be approved by the NERRS/NOAA. The framework of the business plan was provided by NOAA with national support to help develop it but it was meant to be designed and implemented locally under local conditions and need. This plan had four main parts; a market analysis of the training resources available to the local decision makers (who here in NH are primarily the municipal officials, staff, and citizen volunteers on land use boards), a training needs assessment of the local decision makers, a strategic plan outlining what the CTP would address and how it would be implemented, and a marketing plan on how the CTP would become known and bring in participants. CTP programs are built upon these solid and strategic program processes and documents. Coordinators then work with the results to identify how their program can best address local and Reserve system priority issues. The focus is always on meeting the needs of local decision makers to facilitate decision making based on science.

After two years of conducting the analyses, writing reports for NOAA, testing program formats, and building partnerships the GBNERR CTP was accepted and recognized by the National Estuarine Research Reserve System in 2004 as having met all requirements to establish the program. Reserves are uniquely positioned to deliver pertinent information to local and regional decision-makers given their place-based nature. Coastal Training Program Coordinators know the local people, places, and science and are able to skillfully convene training participants and experts to address coastal management issues.

Partnerships and collaboration are integral to the success of the program. Reserves work closely with state coastal management...
Asiatic Red Algae - (Gracilaria vermiculophylla)

Graceful red weed (Gracilaria Tikvahiae) is a red macroalgae that is commonly found in Great Bay. This majestic and native species has several ecological benefits. There is however another rival algae species lurking in the bay; Gracilaria vermiculophylla, which is an invasive aquatic plant that looks highly similar to the native. The invasive G. vermiculophylla is native to regions of the Northwest Pacific Ocean including Japan and parts of Asia. It is able to survive in a wide range of temperatures, light availability and salinity, making the plant a successful invasive species. The invasive algae was perhaps introduced to Great Bay in the early 2000’s. It was first recorded within the Great Bay Estuarine System in 2003.

G. vermiculophylla has since become more widespread and abundant in the bay. The invasive algae reduces the growth and survival rate of native species like the graceful red weed. Invasives often deplete natural available resources leaving natives with a smaller chance of survival. Although G. vermiculophylla can survive in various climates, it is known to have a higher negative impact on native algae species in higher temperatures. As the temperatures in rivers and oceans surrounding the Great Bay increase, so will the estuarine waters of the Bay. This could cause the invasive Gracilaria to completely wipe out the native species over time. As climate change continues and potentially increases over the years, more invasives could thrive and destroy healthy natives which greatly impacts the ecosystem of Great Bay. Everything in nature is interconnected and even small changes, such as a decrease in graceful red weed, will impact several other species and environments.

Kelsey Hanson, Naturalist, GBNERR

New Hampshire’s oceanic state coastline, at 18-miles, is the shortest in the nation.
Elgrass is a cornerstone species of healthy estuaries, providing excellent habitat for young fish and shellfish as well as improving water quality through filtering nutrients and suspended sediments. In the past couple of decades, Great Bay lost over half of its elgrass due to land use and demographic changes, severe weather patterns, and declining water quality. In response to this elgrass loss, several municipalities in the watershed recently invested in upgrades in their wastewater treatment plants. While there is still more work to be done to improve water quality, there are recent indications that decreased nitrogen loads are creating conditions to support elgrass recovery. A group of local scientists and managers including the Reserve’s Research Coordinator, Chris Peter, were convened last year to help with a recovery strategy, analyzing recent and past trends in elgrass populations and water quality, highlighting monitoring and research gaps, and providing recommendations to help aid increases in elgrass abundance. A final report is expected later this year.

A CASE FOR RESTORATION AND RECOVERY OF ZOSTERA MARINA L. IN THE GREAT BAY ESTUARY

GBNERR’s Coastal Research Specialist, Briana Fischella samples water from an elgrass bed in Great Bay.

GREAT BAY COMMUNITY WILDLIFE GARDEN UP AND RUNNING!

Thanks to 603 Solar, the Great Bay Community Wildlife Garden is up and running with off-grid electricity on site, which means this spring the pond will be cleaned out and the beautiful waterfall will be flowing once again, attracting wildlife of all kinds to the garden.

Come visit and relax in an educational community garden on the shores of Great Bay. The Reserve has been developing the backyard wildlife gardening demonstration area to share ideas about how to enjoy a low maintenance beautiful backyard while providing shelter, food, and water for wildlife too. Other green tips such as using a rain barrel and creating “no mow lawns” will also be part of this new community backyard. This beautiful and high profile property is located in Stratham next to Chapman’s Landing boat launch on the Squamscott River. The property hosts a wildlife viewing platform that overlooks salt marsh and an osprey nest that has produced young each year since 1993. We hope this garden will become a treasured community resource! Thanks to the Great Bay Stewards for their generous funding of this project!
**SUMMER BAYVENTURES**
Program schedule for children ages 6-11

Bayventure programs are held on Wednesdays from 9:30 a.m.-3:00 p.m.

**July 8th**
*My Day at Great Bay*
Join us to discover the thrill of mucking around at low tide and splashing at mid-tide all in the same day! Try your hand at finding a crab under a rock or netting a baby silverside fish. Make a craft to take home.

**July 15th**
*Fabulous Fish Hawk*
Who can spot a penny at the end of a football field? Who can lift a fish that weighs more than they do? Who can build a nest at the top of a telephone pole? The osprey can! Our osprey cam will give us an up close and personal look at our local pair. Make an osprey kite to take home.

**July 22nd**
*“Bee” a Good Neighbor*
What would we do without bees and other pollinators? Scientists say we could not live on earth without them. We will explore the lives of pollinators at our new Living Wall exhibit and have a honey taste test. You will “bee” a good neighbor to pollinators at the end of the day when you build a mason bee house.

**July 29th**
*Turtle Talk*
Did you know there are 7 species of native freshwater turtles in NH? Come learn about the importance of our native turtles and meet Jerry & Lucy, a captive pair of non-native species of turtles! We will also learn about sea turtles and how they are impacted by marine debris. Make a reusable travel mug to take home and reduce your carbon footprint.

**“Once Upon an Estuary”**
For ages 2-5 from 10:30-11:30 a.m. on select Thursdays in July and August.

Children, with an adult, are invited to come listen to a story, play games and make a craft. Many activities will be outside so please come dressed ready for some outdoor fun! $3 per child or $5 per family. Pre-registration is required. Please call 778-0015 and ask for Jay or Beth or email Jay.Sullivan@wildlife.nh.gov.

**July 9th**
*“Seashells by the Seashore” by Marianne Berkes*
Come explore Great Bay as we learn about shells and the animals in them.

**July 16th**
*“Beaks!” by Sneed B. Collard III*
Come bird watching on the bay and find out what makes a bird a bird!

**July 23rd**
*“The Honeybee” by Kirsten Hall*
Did you know bees help us grow our food? Join us as we look for bees and do some taste testing!

**July 30th**
*“One Tiny Turtle” by Nicola Davies*
Use your senses as you play games and learn about how the animals around Great Bay use theirs!

**August 6th**
*“On One Flower” by Anthony Fredericks*
Jumping, flying, hiding, spying – join us as we look for bugs and other creeping crawlies and try to catch them in action!

**August 13th**
*“What’s in the Garden?” by Marianne Berkes*
Come get your hands dirty as we explore our garden and see what’s ready to eat!

Bayventure programs are for children ages 6-11
Call (603) 778-0015 or email beth.heckman@wildlife.nh.gov to register.

Each Bayventure program is $35 for Great Bay Stewards members and $40 per program for non-members. There is a $5/sibling/day discount. The camper to staff ratio is a maximum of 7:1.

Make checks payable to: GREAT BAY STEWARDS
Mail to: Great Bay Discovery Center, 89 Depot Road, Greenland, NH 03840 • ATTN: Beth

Make checks payable to: Great Bay Stewards @ Great Bay National Estuarine Research Reserve Great Bay Discovery Center, 89 Depot Road Greenland, NH 03840
Greatbay.org
A National Perspective: Narragansett Bay NERR Coastal Training Program Engages Local Communities in Climate Change Preparedness

The Town of Portsmouth, Rhode Island is one of the most vulnerable Rhode Island coastal communities to the impacts of climate change, particularly extreme flooding from storms and rising seas. The Narragansett Bay NERR Coastal Training Program, led by Jen West and partners, engaged the neighborhood of Common Fence Point in the Town of Portsmouth, in increasing their emergency preparedness and long-term resilience to flooding and other climate change impacts.

The NBNERR CTP partnered with the University of Rhode Island (URI) Coastal Resources Center (CRC)/RI Sea Grant (RISG), the Town of Portsmouth, and the Common Fence Point Improvement Association (CFPIA) to invite interested residents to join a “tiger team,” a group of volunteers who would begin to shape an approach to engaging their neighbors in becoming more prepared for the acute impacts of natural hazards and more resilient to climate change in the long-term.

After meeting for several months, the team and partners convened a two-part Community Building Resilience (CRB) workshop for the residents of the neighborhood. Over 30 community members, came together to engage in a process that has been applied in over 200 other communities and was in use for the first time in Rhode Island. Three small groups discussed infrastructural, environmental, and social assets; highlighted strengths and vulnerabilities; and identified key actions and priorities. The groups then shared their results with each other, reaching consensus regarding the priority issues and actions for their community. The team proceeded to expand due to an increased interest in the issue, and the larger group continued to meet at least monthly to work on implementing the identified actions. The group committed to becoming an official town committee (the Common Fence Point Preparedness Committee), and drafted a vision, mission, goals, and objectives to guide its activities.

The new committee caught the attention of FEMA, who approached the group about hosting a series of “Prepareathon” events for the neighborhood; this grassroots-driven call to action for community members to increase their emergency preparedness and long-term climate resilience kicked off in November of 2019, along with related activities such as “Are you Ready?,” a free online program that provides individualized information on how to assess risk, make a plan, and build a kit; a local Emergency Preparedness Fair; and participation in a visualization survey where residents may express their concerns about coastal flooding.

Volunteer for Great Bay!

- **Adoption Program**: Do you like to garden? Or maybe you are more into repairs and painting? We have several gardens, and two outdoor play boats, that are in need of adoptees to care for them throughout the season!

- **Exhibit Room**: We are open for the season and always looking for weekend help! If you need community service hours for school, or are just looking for a fun place to donate your time, the Discovery Center might be right for you. Interact with the public, teach them about Great Bay, and help them hold a horseshoe crab in the Center’s Discovery Tank.

- **Phenology**: Do you like to walk the boardwalk? Do you notice when plants begin to flower or drop their leaves, or when animals start to return in the spring? Our phenology program is a great way to contribute while you spend time outside! Training is provided and the program schedule is very flexible.

- **Fall Educator Training**: Educate school groups about the cultural history of Great Bay. All training is provided. Training is September 3rd, 2020 and lunch is provided.

- **Great Bay Trash Patrol**: Interested in helping us keep Great Bay clean? We are building a small trash patrol for a few of our public properties and we are looking for volunteers!

For more information and to sign up contact Melissa Brogle, Volunteer Coordinator: melissa.brogie@wildlife.nh.gov or 603-778-0015.
Become A Great Bay Tide Turner

The intersection of the Great Bay Stewards and the Reserve’s Coastal Training Program is not always obvious: we meet at co-sponsored events, such as the Beaches Conference last spring; and jointly supported programs, such as the Sagamore Creek outreach event coordinated by the Great Bay-Piscataqua Waterkeeper. Yet it has been an ongoing goal of the Stewards to reach residents and homeowners in the region in the same way the CTP coordinator reaches area decision makers, to provide them with the information they need to make decisions that protect the health of the estuary. We’ve watched the successes Steve Miller has had reaching planning boards, conservation commissions, landscapers, snow plow drivers, and others, and we dream of emulating his accomplishments.

This spring we are extremely excited to launch our Tide Turners program, which does exactly that: encourages homeowners to make simple decisions that will have a major impact on the health of Great Bay and its tributaries. We want to show that the dandelion in your yard isn’t a sign of failure, it’s a sign of success: clean stormwater runoff, happy bees, yards that children and pets can play freely in without fear of pesticides.

We hope you will join us in becoming a Tide Turner and proudly displaying your yard sign – find out more on our website (greatbaystewards.org)! And we hope to see you in the coming months, at our Flatbread community supper on August 4th, our annual members meeting – celebrating our 25th anniversary! – on October 8th, or the Great Bay 5K on October 24th. Keep up to date on all our activities in between by following us on Facebook or Instagram.

The mission of the Great Bay Stewards is to “protect and preserve the vitality of the Great Bay estuarine ecosystem”. Come join us in this effort so the estuary can continue to be the enjoyable wonder that it is.

It’s a great time to make a difference.

Deb Alberts, Chair, Great Bay Stewards

The Show Must Go On

At every meeting of the Art of Great Bay committee this year, the question was the same: how could we fit more people and more art in the Hugh Gregg Coastal Conservation Center? It’s a fortunate problem to have: now in its 16th year, Art of Great Bay has become such an iconic event each spring that in 2019 we had over 1000 visitors, and this year more than 100 artists applied to be in the show. We’re so grateful to all the talented artists who apply and wish we had room for them all. This year we expanded the theme to Art Inspired by New England, and so in addition to the beautiful works depicting the marsh in our show, we had cows, fruit, barns, skiers, and surfers.

Of course, this event would not be possible without so many people: our artists generously donate to an amazing raffle table; while volunteers do everything from pour tea to hang paintings to wash tablecloths to bake muffins. And of course we are always so appreciative of the sponsors that make the event a success: Living Innovations, People’s United Bank, RiverWoods, Bay Breeze Dentistry, Piscataqua Savings Bank, Boldwerks, and Coastal Design magazine. Due to the evolving coronavirus situation, we unfortunately had to postpone Art of Great Bay. We hope to see you at a date in early fall!

Allison Knab, Executive Director

PLEASE JOIN US!

All interested parties are cordially invited to become Great Bay Stewards. Members receive Great Bay Matters and other pertinent mailings.

Annual dues may be paid by check made payable to the Great Bay Stewards and sent to: GBS Membership Committee, 89 Depot Road, Greenland, NH 03840

☐ Guardian $150 ☐ Protector $75
☐ Steward/Family $35 ☐ Student $20 ☐ Other $_________

name ____________________________
address ____________________________
town ____________________________
state ____________________________ zip ____________
email ____________________________

Painting by Laura Burbine
Deb Alberts was introduced to the Great Bay Stewards by a fellow school teacher. Since joining, she became the vice chair of the board of trustees, and is now the chair, as well as a volunteer with Art of Great Bay, the Great Bay 5K, and the force behind a revitalized and highly entertaining annual members’ dinner meeting. Deb and her husband Phil Isenberg live in Durham along the Oyster River.

“The Reserve and the Stewards’ mission of protecting Great Bay for generations to come resonates strongly with us. I’m constantly amazed by the incredible work that goes on at the Reserve — the important research into sea level rise and wetland buffers, the thousands of school children that come through on field trips, the stewardship around endangered species and protected lands. Our children and grandchildren love the Great Bay whose protection and health is important to them as a part of our ongoing legacy for their future.”

Great Bay for the Ages members are those supporters who have decided to include the Great Bay Stewards in their estate plans. You may do this through a bequest in your will, trust, or other charitable giving vehicle; by a gift of stocks, real estate, or other assets; by a life insurance beneficiary designation; or by including the Great Bay Stewards as a recipient of memorial gifts “in lieu of flowers.”

When you become a member of Great Bay for the Ages, you are ensuring generations of school children continue to experience the estuary hands-on in field trips and protecting the future health of the estuary. To discuss giving opportunities in confidence, or to request forms contact Allison Knab, executive director, at 603 778-0015 or allison.knab@greatbaystewards.