History of the Boston Harbor Islands

In 1970, the Commonwealth of Massachusetts passed legislation that provided for the acquisition of selected islands in Boston Harbor for recreation and conservation purposes. The Boston Harbor Islands National Park area was established by an Act of Congress in 1996 with a focus to better coordinate the management of the park and to improve visitor programs and access. Boston Harbor Islands national park area features 34 islands and peninsulas with 1,600 acres and 35 miles of undeveloped ocean shoreline all within 10 miles of downtown Boston. Over the millennia the islands were fished, farmed and hunted by the resident Northeast coastal Indians. European settlers used them for the same purposes. Boston Harbor is a large natural harbor and has served as the hub of a thriving transportation network which made Boston a thriving seaport since the 1600’s.

Boston Harbor is part of the Boston Basin, a topographic lowland underlain by sedimentary layers deposited at the end of the Precambrian time. Where bedrock is exposed (Calf Island, the Brewsters, and small islands near Hingham), it is a shaly to slaty formation called Cambridge Argillite which was deposited on the muddy floor of an ocean dating back some 570 million years.

In the past 100,000 years, two separate periods of Pleistocene glaciation formed the hills that cap most islands of Boston Harbor and created the local drainage system, consisting of the Charles, Mystic, and Neponset watersheds. The cores of many harbor islands are drumlins glacier-formed, asymmetrical, elongate masses of till formed into smooth-sloped hills on the Boston Basin lowlands. In profile, they look like upside-down teaspoons. As the climate warmed and the glacier receded from the Boston area some 15,000 years ago, the melting of glacial ice raised the level of the ocean, eventually creating this section of the basin and isolating the islands.

Drumlins may occur as scattered single hills, or in so-called “swarms.” The Boston Harbor Islands are a geological rarity, the only drumlin swarm in the United States that intersects a coastline. This “drowned” cluster of about 30 of more than 200 drumlins in the Boston Basin are not all elongate in shape, as most other drumlins are (molded in the direction of glacial flow). Geologists believe the islands illustrate two separate periods of glacial

(BHI - cont on page 7)
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**Calendar Summer-Fall 2009**

**October 3, 2009**

Boston Harbor Educators Conference  
Thompson Island

Contact: Peg Collins  
ccndpclin@aol.com

**October 22-23, 2009**

MAST Conference  
Holiday Inn, Boxborough

Contact: Pat Harcourt  
pat.harcourt@state.ma.us

**November 18, 2009**

MME Board Meeting  
Swampscott Middle School

Contact: William Andrade  
andrase@swampscott.k12.ma.us

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To access this journal on line, use the information on the back of your membership card. If you have difficulty, contact the editor at dimmick@esteacher.org
President’s Message
A Treasure of Islands

Like many of us who grew up only an hour or so away from Boston, the fact that Boston Harbor is dotted with islands was one that escaped me until the past five to six years. It wasn’t until I started flying in and out of Logan Airport a bit more often that I began to notice the multitude of these little green oases. Now, if at all possible, I make a point of getting a window seat so I can test my knowledge of island location, as I did earlier this month. Next time, I think I’ll bring a map. I failed my own test.

Then, of course, I got involved with MME and started attending the Boston Harbor Educators Conference, the 2009 version of which is coming up at the beginning of October. Getting onto the islands during these conferences with like-minded colleagues and receiving first-hand knowledge from researchers who study them has been a great deal of fun. It’s also an important reminder of how much the geography of these ecosystems changes as nature’s forces work on them daily. The sizes of the islands in the park change every hour, as the ocean tides rise and recede on their shores. According to the National Park Service, all totaled, the islands change from 1,483 to 3,067 acres during the tidal cycle.

The Boston Harbor Islands became part of the National Park Service System in 1996. These 34 islands, which include four peninsulas, have become a recreational haven for urban residents and tourists and are a highly effective laboratory in which to learn about natural change, cultural history, and stewardship. They have clever and mysterious names like Snake, Raccoon, Grape, Hangman and Graves. The channels between some of them have great names too, like Hypocrite Channel (between Calf and Little Calf Islands) and President Roads (south of Deer Island).

These islands each have their own stories to tell. Collectively, human history on these islands includes use by Native Americans for a variety of survival needs, quarantining of immigrants, farming, and housing of orphans, paupers and military personnel. Tens of thousands of prisoners were held at a now-demolished county house of corrections. There has been a religious organization summer camp, a glue factory, resort hotels and landfills.

The most noticeable current use of an island is the Deer Island treatment plant, which treats wastewater for 43 Greater Boston communities. Deer Island used to be an island until the hurricane of 1938. It is now connected to the town of Winthrop. The island on which the Boston Harbor Educators Conference is held, Thompson Island, is now home to Outward Bound. Several other islands have visitor facilities.

I encourage you to plan a couple of trips to the islands. Read the National Park Service web site or www.bostonislands.org to get a sense of the history of the islands you’ll visit. They’ll also explain the rules for visiting each island, so you can maximize your visit and minimize your impact. There are seven sites from which you can choose to park a boat to one of the islands. We’ll be recommending a visit to the islands to those who will be coming to Boston for the National Marine Educators Association annual conference in the summer of 2011. We might even work in a trip for everyone during the conference. Stay tuned. But, in the meantime get out there and enjoy the Boston Harbor Islands.

Bob Rocha
President, Massachusetts Marine Educators

Boston Light, on Little Brewster Island in the Boston Harbor, dates from 1783 and is open to the public for tours. Photo by Doc Sears http://www.flickr.com/photos/docsears/3588142377/
Welcome Educators & Environmental Enthusiasts,

We are excited to be the focus of this issue of F&J. The Boston Harbor Islands National Park Area is a tremendous educational resource that we look forward to sharing with you, the MME community. The 34 islands and peninsula of the park provide insight into the human use and amazing variety of natural environments within the Gulf of Maine region. In this issue, we will share the unique learning and recreational opportunities available to you and we hope that you will return to the islands with your students, family, and friends.

Best Regards,
Kelly Fellner, Youth & Visitor Services Program Manager,
Boston Harbor Islands national park area
Scientists, park staff, and community volunteers are working together to learn about and take care of the Boston Harbor Islands national park area. Participants in stewardship and citizen-science programs take inventories of plants and animals, remove invasive non-native plants, participate in replanting efforts, contribute to scientific papers and symposia, and are active in many other areas. Many local students play a critical role in this effort as part of their summer jobs as youth “Island Ambassadors.”

The season starts in April, May and June with a nesting bird survey. In 2002, the Boston Harbor Islands were designated an Important Bird Area by Mass Audubon because they provide nesting habitat for many colonial water birds (species that breed in colonies such as terns and gulls), and other bird species of conservation concern. Annual monitoring by a team composed of scientists, park staff, and volunteers helps keep track of these species and to determine when new species enter the park. Also, visitors enter their bird observations into the online “eBird” database. These surveys have identified more than 200 species including gulls, terns, herons, ducks, geese, hawks, plovers, sandpipers, owls, woodpeckers, warblers and more. Successful bird populations are good indicators of ecosystem health due to their position in food webs.

Additionally, surveys are underway on Lovells and Bumpkin islands to help understand small mammal populations and their ecological relationships. In 2007, all the eggs from a colony of least terns on Lovells were destroyed by predation, with the non-native Norway rat or native raccoon as the likely culprits. In order to assess potential predators and understand wildlife in the park, two studies were begun. Motion-detection cameras were installed to see what species were visiting the tern nest site area. The photos showed numerous crows but no rats or raccoons, as well as a strange sight – a rabbit trying to bury the decoy eggs! Unfortunately, the terns did not re-nest in 2008 or 2009, which is known to happen in tern colonies that have experienced nest predation.

In a related study, live traps have been set on Lovells and Bumpkin islands to assess small mammal populations, finding high densities of white-footed mouse among other species. Finally, in 2009 ‘exclosures’ were established throughout Lovells Island habitats as part of a three-year study assessing the effects of non-native European rabbit and Norway rat on the vegetation of the island.
The Boston Harbor Islands Partnership and the Harvard Museum of Comparative Zoology are combining their effort to work toward an ‘all taxa biodiversity inventory,’ or ATBI, with an emphasis on insects and invertebrates. The updated results for each island (Worlds End leads with 516 species so far!) can be checked at http://insectdatabases.oeb.harvard.edu/boston_islands/.

Scientists from Boston University are leading another large scale, long term science project in the park, studying changes in the physical islands themselves. Specific components include tracking the erosion of the glacial deposits that comprise many of the islands, the movement of sediments around Boston Harbor, and the location and potential future condition of important low-lying habitats such as salt marshes.

The 2009 season saw the introduction of three long term citizen-science monitoring programs in the park. The MIMIC (Marine Invader Monitoring Information Collaborative) program involves looking carefully at docks, beaches and tidepools for a list of 13 established marine invaders and 7 potential invaders of all different shapes, colors and sizes. We are looking for the potential invaders in order to have the best possible first response to these non-native species and to understand the effects of these invasions on the local intertidal organisms and habitats. A similar effort is underway in the fields, bluffs and forests of the park, where staff and volunteers are searching for invasive non-native plant species and insect pests as part of a regional ‘pest early detection’ effort. Finally, park stewards are helping collect data as part of the multi-park ‘phenology monitoring’ program. Phenology is the study of the timing of biological events, which is important as climate change continues to alter events such as the arrival of birds in the Spring and the flowering times of plants.

Lively “Stewardship Saturdays” programs are held most weeks from May through October, providing opportunities for public volunteers to explore nature and assist in the restoration of the park’s biodiversity. By removing invasive non-native species that can be harmful to the islands’ native biodiversity, volunteers help protect and restore the islands’ ecosystems. Additionally, this year over 200 volunteers participated in a beach grass planting on Spectacle Island.

These and other projects have become great opportunities for the public to explore the natural side of the islands and become acquainted with the park in Boston’s backyard.

To learn more about the science and stewardship activities in the park, or how to help out, visit the Boston Harbor Islands website at bostonharborislands.com.

From the Editor’s Desk

It seems only yesterday that I was working on the summer issue of F&J. Now after a less than stellar summer, school doors are opening and students are returning. The fall issue of F&J comes to you featuring the Boston Harbor Islands Park. We have collected information from many sources on the resources that are available in the park. The history of the park is also featured in the lead article. I would like to thank Dawn Tesorero, Suzanne Gall Marsh, Kelly Fellner and Marc Albert for their help in putting this issue together.

You will also find information in this issue on the Boston Harbor Educators Conference coming up in early October, and two quick marine science activities courtesy of the staff at the park. You will find information about a new Marine Science Textbook, in a paid advertisement in the pages of the journal. If you contact them for a review copy, please mention that you saw their advertisement in F&J.

This is the second issue using our new Masthead. I would like to thank Karen Roberts of Mountain Coast Design, a graphic designer here in the Fort Collins/Denver area, and a friend of our managing editor for her efforts in designing this graphic.

New membership cards were recently mailed to all members who have renewed their membership for the 09-10 year. Please be sure to keep the card in a safe place, as it contains the new passwords to obtain your journal for the coming year. If you have friends who have not renewed their membership, or new teachers in your science department remind them of the benefits of MME.

A reminder to all of you, now that you are back in school: If you have old copies of F&J pre winter 2006 that you do not need, we would request that you consider donating to MME for a permanent archives, please contact your editor at dimmick@esteacher.org for information on getting them to us for the archives.

Howard Dimmick,
Editor
action. Many of the islands have more than one drumlin.

Natural coastal processes continue to reshape the island landforms, from sea level rise (as part of climate changes) to northeast storms. Rates of erosion on the islands can be dramatic. In general, the highest rates of beach erosion occur along beaches facing north and east, which are the dominant directions for winds and seas in these storms. The shifting shores of Thompson Island illustrate this process of erosion and sedimentation. Human use of the islands also affects erosion by removal of vegetative cover promoting erosion, or by structures built to prevent erosion.

Every island within the park, except for those composed largely of bedrock, has beach areas lining portions of its shores. The beaches generally most attractive to recreational users in the park are found on Spectacle (recently restored), Long, Lovells Island and are primarily sandy and possess comparatively few biological resources. Rocky beaches, however, such as at Peddocks, provide excellent habitat for invertebrates and the animals that feed on them. Small barrier beaches have been identified on portions of Great Brewster, Gallops, Peddocks, Bumpkin, Long, Rainsford, and Thompson islands. Two islands within the park, Lovells and Long, have dunes. Lovells has the more extensive dune system, whereas Long Island's dunes are in one discrete area on its southern shore.

The islands were historically places where society set apart unwelcome institutions and people on the margins. American Indians were imprisoned on Deer Island during King Philip’s War in 1675. Other islands were used to isolate quarantined immigrants, prisoners of war and mental patients. They provided refuge in places like the Boston Asylum and Farm school for Indigent Boys on Thompson Island. The harbor was of strategic importance during conflicts from the Revolution to World War II with the remains of forts, gun batteries, and other military installations on the islands.

Georges Island contains the National Historic Landmark, Fort Warren, a 19th-century granite stronghold built to defend Boston. You may walk around the ramparts or along the shore. Tidal pools await explorers and large fields beckon Frisbee players.

On Spectacle Island you can hike along five miles of trails to the islands' highest point, with spectacular views of the Boston skyline and harbor. A "green" visitor center offers cafe amenities and exhibits about island history and nature. Today's metamorphosis is the dramatic re-construction of Spectacle Island with material from the central artery highway tunnel through Boston known as the Big Dig.

Boston Logan International Airport sits upon land that used to be four islands – Apple, Bird, Noodles and Governors Islands. Today, visitors travel past Boston's Logan International Airport on their way to explore Boston Harbor Islands National Recreation Area.

On September 1, 1905, Elliot Hadley lit the most powerful light in Massachusetts at the top of Graves Lighthouse, on the outer edge of Boston Harbor Islands National Recreation Area. The first-order Fresnel lens aided in navigation and allowed for safe passage into Boston Harbor.

The Boston Harbor Islands consists of 13 partners charged with preserving and protecting the island resources. One of our mandates is "to provide education and visitor information programs to increase public understanding of and appreciation for the natural and cultural resources of the Boston Harbor Islands, including the history of the Native Americans use and involvement." For more information, call 617-223-8666 or visit BostonHarborIslands.org

With the biodiversity, geological features and historical background of the islands, this is a perfect setting, close to Boston for field studies carried on by classes of students. Find how you can use the Boston Harbor Islands National Recreation Area at http://www.nps.gov/boha/ At this site you will find information on the history, and culture, as well as the nature and science of the islands. Click on the section for teachers to find curriculum materials that may be adapted for use on many of the islands. This issue of F&J is dedicated to making our teachers aware of the resources available on the harbor islands.
Their names are full of mystery and meaning: Bumpkin, Grape, Gallops, Nix’s Mate, Lovells, Ragged, Sarah, Peddocks, Great Brewster, Graves, Deer… 34 if you count every little rocky outcropping. Travelers flying into Logan International Airport will enjoy a bird’s eye-view of the archipelago from the plane’s windows. Cruise ship passengers and commercial vessel crew will be welcomed by Boston Light on Little Brewster Island – the oldest lighthouse site in the United States. They are a gateway to the city, and for Bostonians they are their front yard. These are the Boston Harbor Islands.

The islands are an integral part of the city’s pre-history, history, present and future. Because of their rich heritage and combination of natural, cultural, and historical resources, in November 1996 they were designated the Boston Harbor Islands National Park Area by an Act of Congress. The “new” park was created on the foundation of the Boston Harbor Islands State Park which originated in the early 1970s. Today the Park is managed as a partnership park, and is one of a few national parks in the country where the National Park Service does not own the land.

Contemporary visitors to the Islands have only to use their imaginations to travel back in time; to whichever century they choose to be on the islands. Archaeologists have established that the islands were used or inhabited by humans at least 8,000 years ago. A 4,100 year-old skeleton unearthed on one of the islands in the late 1960s is the oldest ever excavated in the New England Region. The Boston Harbor Islands are designated an Archaeological District on the National Register of Historic Places because of their important remains from prehistoric use.

There are Native American tribe names and words that have been integrated into our culture. Some examples are: Neponset River, Mystic River, and Ponkapoag Pond. Massachusetts which means “people of the great hills” is the derivative of the state name. Archaeological evidence shows us that the great hills referred to were the Blue Hills, the area where the Native peoples spent their winters. The harbor islands were used as seasonal homes to camp, fish, and hunt. Some Native words that identify local places: Nantasket Beach in Hull, “land of the changing tides” and Shawmut Peninsula “land of clear waters”. This was colonial Boston’s name.

When the European settlers arrived in Massachusetts Bay in the 1600s, Native American tribes were still using the islands on a seasonal basis. In 1626 the first trading post with the Neponset Indians was established on Thompson Island. During the 1630s the first governor of the Massachusetts Bay Colony, John Winthrop, had a second home on Governor’s Island. It was referred to as “Governor’s Garden”. The King’s Handbook of Boston Harbor (1882) states that Winthrop’s rent was a “hogshead of wine and two bushels of apples.”

“From as early as 1634, farms and farm communities existed on at least eight of the islands: Long, Deer, Peddocks, Rainsford, Gallops, Bumpkin, Grape and Thompson. From prehistoric times, the islands were also important to fisherman. Communities of lobster and fin fisherman existed from the 1800s on Long, Bumpkin, Middle Brewster and Calf Islands”. Some of these communities remained through the 1940s.

While the settlement and growth of the fledgling Boston occurred, the need for coastal defense became apparent. In 1634 an earthen works fort was constructed on Castle Island. It is believed that this island is home to the oldest continuously occupied fortification in the country. Simultaneously, the colonists were aware of the need to find ways to safely guide ships into Boston Harbor. Residents of the town of Hull, at the entrance to Boston Harbor, lit giant bonfires known as signal fires on Allerton Hill and on Great Brewster Island. In 1716 the first lighthouse in the United States was built on Little Brewster Island. The British destroyed it in 1776 as they departed Boston Harbor. It was rebuilt in 1783. For historical accuracy
the island is known as the oldest continuously used lighthouse site in the country. It is a National Historic Landmark.

There are many historic aids-to-navigation in the harbor. Nix’s Mate constructed in the 1820s has been restored and is listed on the National Register of Historic Sites. Long Island Lighthouse (1819) was the first cast iron light in the United States. Today, the fourth generation Long Island Light has a solar optic lens. Spectacle and Lovells Islands were home to range lights that operated in harmony to guide ships safely across the Broad Sound. All that remains of them and their inhabitants is the crumbling oil house on Lovells Island. At the end of the Great Brewster sand spit, built on stilts (1856) sat Bug Light. The original Deer Island Light (1890) was a “spark plug” style. The contemporary version resembles a candle on a cupcake. Graves Light was built on ledges in the wind-swept outer harbor. It was called a “tube” style lighthouse because everything was contained inside the structure including the cistern, engine room, keeper’s quarters and lantern room. It took two years to build, 1903–1905, before it became operable.

The coastal defense system among the harbor islands for centuries was unparalleled; starting with the earthen works fort on Castle Island. During the Civil War, Fort Warren on Georges Island (a National Historic Landmark) was used as a Union training camp and Confederate prison. On Gallops Island, the 54th Infantry, the first regiment of free black soldiers spent time. Their fighting heroics in the South were portrayed in the movie “Glory”. Camp Wightman on Long Island was a conscript center and burial ground.

In the era of American expansion and the Spanish-American War, Fort Andrews was built on Peddocks Island and fortifications on Long, Deer, and Lovells islands built before and during the First World War also saw some use in the second. Sailors were housed on Bumpkin Island during World War I. Both Outer and Great Brewster islands were also fortified during the Second World War, and a United States Maritime Service radio school operated on Gallops Island. Finally, Long Island’s third military installation was a Nike missile base during the 1950s.

The social, recreational and institutional use of the islands has an historical thread that continues through the present. During their hey-day of the 19th and early 20th centuries there were hotels, palatial homes, and summer communities. Sprinkle in quarantine stations, schools, prisons, hospitals, a horse rendering factory, dump and a poorhouse. Buried under Logan International Airport are five islands each with rich histories: Apple, Bird, Governors, Noodle, and Wood Islands.

Contemporary institutional uses besides the Airport include the Massachusetts Water Resources Water Authority (MWRA) waste water treatment plant on Deer Island; a fire-fighter training operation and police firing range on Moon Island; and on Long Island a variety of human service programs provided by the City of Boston’s Public Health Commission.

The Kings Handbook of Boston Harbor’s (1882) opening sentence is as relevant today as when it was written one hundred and twenty six years ago: “The perfection of physical comfort is enjoyed, when on a warm day of summer, one leaves the hot and crowded streets and many cares of the city, and passes down Boston Harbor on one of its luxurious excursion steamboats”.


Suzanne Gall Marsh has been island hopping since 1978. She is the founder of Volunteers and Friends of the Boston Harbor Islands and has worked for the Boston Harbor Islands National Park as an interpreter, boat trip narrator and island guide.
Bringing Islands to Classrooms!

When I tell people what I do for a living I almost always get: “What a cool job! You must love your job.” I am very fortunate to work for Boston Harbor Islands National Park. My name is Ranger Dawn, Education Program Specialist, and I have worked at Boston Harbor Islands for more than three years.

Our education programs, like our park, are done as a partnership. I work with Captain David Weinstein, of Thompson Island Outward Bound Education Center. Captain Weinstein created Harbor Connections curriculum some 12 years ago which is used to link students to the islands. We visit classrooms twice providing them with an introduction that includes a survey of what they know about the harbor and her islands. With PowerPoint, we bring Boston Harbor Islands into the classroom and post our Curriculum Materials on-line. We visit a second time and teach the students how to navigate from the mainland to their island destination. As a result, each student creates a personalized Boston Harbor chart that will be laminated and act as their “ticket” to the islands. Often, on our third encounter we travel with students on boats to an outdoor classroom for a field expedition.

Once we reach an island, we are greeted by MA Department of Conservation and Recreation (DCR) Rangers, who assist us with day programs like compass-work on top of Spectacle Island’s highest peak, Civil War stories on Georges Island, or exploration of the tidepools on Lovells Island. When we travel to Thompson Island, students do both day and overnight programs with assistance from instructors from the Thompson Island Outward Bound Education Center. Instructors facilitate activities in teambuilding and character development alongside rangers who teach experiential environmental activities in a pristine salt marsh or on geologic landforms. Using the environment as a context for learning, students become engaged in activities that use science and math to explore the natural world. Our curriculum modules are all tied to Massachusetts Curriculum Frameworks.

We encourage teachers to visit our website and see how your lessons plans naturally meld into an outdoor classroom experience. Please visit For Teachers on the web: http://www.nps.gov/boha/forteachers/ from here, teachers may navigate their way to Plan a field Trip, and we will walk you through your Site Selection, to determine which island(s) offer cultural and natural offerings to enhance your learning opportunities. We link you to local Water Transportation questions and vendors to get you our there. We also provide the required Permit Application on-line for you to fill-out and fax to our island managers.

If this still seems complicated, we also offer workshops for teachers; some are offered in conjunction with our neighbors, like the New England Aquarium. It is always a delight to teach a teacher! I will be at the workshops and I look forward to meeting you and finding a way to get you to the islands. I do love my job!

Best Wishes,
Ranger Dawn
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Bring the Ocean to Your Classroom

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A tidepool is a place where you find lots of ocean life. Can you match the fun facts with the correct animal you find? These animals and plants are found along the rocky shores of many of our beaches. Draw a line from the fun fact to the animal’s name.

A. They live in tiny white limestone houses and eat food (plankton) with their feathery feet. You can find many of these tiny critters attached to the rocks.

B. If it loses one of its 5 "arms" it can grow it back. It also has thousands of tiny suction cups on its arms to help it stick to rock or the pilings on a pier.

C. Sea gulls like to pick it up and drop it on rocks, to crack its hard shell so they can eat it.

D. These animals molt (shed) their exoskeleton (shell) as they grow. When they eat, they use their claws to tear apart their food or open shells to eat.

E. Its prickly outside makes it difficult for other animals to eat. Despite the spines this green critter can be picked up and held carefully. When it dies it usually loses all its spines.

F. This purple seaweed bleaches white in the sun and is used in products such as toothpaste, ice cream, and soup.

G. This little snail may come out for a visit if you hold it gently and hum to it. You may find it on slippery rocks or on salt marsh grass because it eats any algae it finds.

1. Sea Urchin

2. Irish Moss

3. Periwinkles

4. Barnacles

5. Blue Mussels

6. Sea star

7. Crabs

Reprinted with permission from the National Park Service Junior Ranger Activity Book
There are 34 islands in Boston Harbor. See if you can find all their names. They go in all directions.

Bumpkin
Button
Calf
Deer
Gallop
Georges
Grape

The Graves
Great Brewster
Green
Hangman
Langlee
Little Brewster
Little Calf

Lovells
Long
Middle Brewster
Moon
Nixes Mate
Nut
Outer Brewster

Peddocks
Ragged
Rainsford
Sarah
Shag
Sheep

Slate
Snake
Spectacle
Thompson
Webb
World's End

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Background History of Boston Harbor Islands, Inc.

The Volunteers and Friends of the Boston Harbor Islands Inc. evolved out of the efforts of the Boston Harbor Islands Volunteer Corps. The Corps was organized in 1979 by Suzanne Gall Marsh to supplement the program services of the Boston Harbor Islands State Park staff.

When the organization incorporated in 1982 the title was changed to include a variety of members – some who volunteer on land, sea, or the islands, and others who support the Friends mission and love the islands but do not necessarily have time to be volunteers. There is a three-fold mission: direct service to the park, public education programs including boat trips and advocacy efforts, all of which are done by volunteers.

The Friends predate the national park which was authorized by Congress in November 1996. During the years leading to the creation of the national park the Friends were deeply involved in the behind-the-scenes efforts of the feasibility study, the drafting of the legislation, and the advocacy efforts with the Massachusetts Congressional delegation.

Over the years the Friends have been recognized by local, state, and national organizations for their dedicated grassroots efforts to promote the appreciation and preservation of this unique recreational resource, located so near to a major metropolitan area.

Awards

1979 Massachusetts Association of Conservation Commissions "Environmental Leadership Award" to the Boston Harbor Islands Volunteer Corps


1996 Chevron-Times Mirror Magazine Conservation Award to the Friends of the Boston Harbor Islands

2000 George Washington Honor Medal from the Bay State Chapter of the Freedom Foundation to the Friends of the Boston Harbor Islands for “Passionate Stewardship of the Boston Harbor Islands”

2000 Governor’s Award for Leadership from the Island Alliance presented to Suzanne Gall Marsh, Founder, Friends of the Boston Harbor Islands.

2003 National Park Service, The first George B. Hartzog, Jr. Award for Outstanding Volunteers in Parks Program to Friends of the Boston Harbor Islands.

2003 National Association of State Park Directors President’s Award to Friends of the Boston Harbor Islands.

2004 The Boston Harbor Association “Lydia Goodhue Public Service Award” to Friends of the Boston Harbor Islands.

Great Brewster Island, with its barely submerged long tail stretching out into the rising tide. 
Photo by Doc Searls http://www.flickr.com/photos/docsearls/3588229652
A Gift for Your Library!

In Celebration of Our 30th Anniversary,

The Friends of the Boston Harbor Islands

Will donate a copy of three books to neighborhood libraries and to the libraries of the schools whose students have visited the islands with the Harbor Connections Program.

Park brochures and maps will also be given to each library.

**East of Boston: Notes from the Harbor Islands,** by Stephanie Schorow
For the traveler with a sense of humor and a spirit of adventure, Stephanie Schorow proves you can still embark on a voyage through the Boston Harbor Islands. A practical guide, complete with camping tips and driving directions, *East of Boston*’s droll travelogue takes the measure of these gloriously wild Edens, all within sight of the city’s skyline. 158 pages.

**OR**

**Discovering the Boston Harbor Islands,** by Christopher Klein
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Bill describes the plants found on the Boston Harbor Islands and provides identification and tips on what is and is not edible, as well as a wealth of information about the folklore of the plants found on the Islands. 128 pages, with illustrations.

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Attending and Presenting at the NMEA Conference
by Carolyn Sheild

I was very fortunate to attend the 2009 NMEA Conference in California*. It was an enriching and rewarding experience to hear from well-known speakers, and attend informative workshops and field trips. Since I am a middle school teacher, worthwhile information I acquired will be shared with my colleagues and students.

One workshop I attended was entitled, “Rulers of the Reef, the Zooxanthellae”. Zooxanthellae are the symbiotic algae that live inside coral tissues and enhance coral growth. When I teach marine ecology to my students I include this information. The exciting thing about this workshop is that THE MAN that NAMED and studied these symbiotic algae in detail, Hugo Freudenthal, gave it! He explained how he came up with the name, *Symbiodinium microadriaticum.* This is the first scientific name my students learn. He described the life cycle of this dinoflagellate and what may cause the algae to leave the coral or the coral to expel them (known as coral bleaching). When I teach this unit in the future, I will be able to impart even more detailed information to my students since I have heard from this algae’s discoverer!

Some of the other workshops I attended included, “Facing Misconceptions About the Ocean”, “Rising Sea Levels Associated with Climate Change”, and “Sea Change, A Documentary about Ocean Acidification”. These workshops gave me current information about the state of the oceans and a heightened awareness of the magnitude of climate issues. I also attended a fun workshop, “Make a Marine Critter Tee Shirt”.

Professionally, it was a thrill for me to present a workshop during the conference entitled, “Bringing the Deep Sea to Your Classroom: Let’s Dive In”! While giving my presentation and afterward, I was able to interest other educators in deep-sea exploration with the web site, www.divediscover.whoi.edu, and introduce information about the new deep diving submersible under construction at Woods Hole Oceanographic Institution, which will replace *Alvin.*

Another benefit of a national conference is the privilege of hearing prominent speakers. One informative talk was given by Marcia McNutt, the President and CEO of Monterey Bay Aquarium Research Institute (MBARI). Just recently, she was nominated to head the U.S. Geological Survey (USGS). The conference also included an “Exhibitors Session” and a “Share-a-thon” where people from various organizations displayed information about their current endeavors which was very interesting.

Since this Conference was on the west coast, one desire of mine was to learn more about research being conducted there. I was able to do so by attending the Moss Landing Marine Lab (MLML) and Monterey Bay Aquarium Research Institute (MBARI) field workshop. These were modern facilities with state-of-the-art research technologies. Just off the coast, MBARI has deployed an “Eye-in-the-Sea” device that can lure and photograph deep-sea organisms (http://www.mbari.org/earth/mar_tech/EITS/eits.html). I was briefed on several activities related to this research, which could be used with students. Oh, and did I mention we got to stroll around the Monterey Bay Aquarium for three hours when it was closed to the public? Going sailing on an 80’ schooner, which was an optional field trip the last day, was another wonderful experience that capped off the week. I loved watching pelicans dive into the water, seeing sea otters play at the surface, and sea lions hauled out on the rocks. The California coast scenery is spectacular! Networking with colleagues and reconnecting with old friends is an additional advantage of attending this conference. I look forward to more opportunities like this NMEA event.

* I received a Lexington Education Foundation Summer Fellowship Grant to attend this conference.
Gaining a long-term view of ocean acidification

The first long term study to monitor the effects of elevated pCO₂ (partial pressure CO₂) on seawater pH shows that there’s more to ocean acidification than meets the eye.

By Jeremy Jacquot

In a recent interview with Yale Environment 360, Jane Lubchenco, the head of NOAA, called oceanic acidification global warming’s “equally evil twin.” Ocean acidification occurs because carbon dioxide, when dissolved in water, forms a weak acid. Put more CO₂ into the atmosphere, and more will inevitably dissolve into the oceans, lowering their pH. A landmark report published in 2005 by the British Royal Society urged the global community to invest more time and effort into studying this critical issue, warning that “Marine ecosystems are likely to become less robust as a result of the changes to the ocean chemistry and these will be more vulnerable to other environmental impacts.”

While research efforts have since taken off, what has been sorely lacking are datasets that could help scientists document the long-term rate of acidification and understand the underlying physical and chemical processes. That is, until now. In the latest issue of the Proceedings of the National Academy of Sciences, John E. Dore of Montana State University and colleagues from the University of Hawaii, Honolulu, present the results of the first set of longitudinal time-series measurements of seawater pH, spanning an almost twenty-year period (from 1988 to 2007). The data were recorded at ALOHA, a research station off Hawaii.

When CO₂ enters the ocean, a fraction of it reacts with water to form carbonic acid (H₂CO₃), a weak acid, and the rest remains in dissolved form. Some of the carbonic acid dissociates, releasing hydrogen ions that further react to produce either bicarbonate (HCO₃⁻) or carbonate ions (CO₃²⁻). These three forms of dissolved inorganic carbon (DIC) make up the carbonic acid system, a natural buffer that handles slight variations in CO₂ and maintains seawater pH around 8.1-8.2. The loss of this buffer—even its weakening—could have a significant impact on corals and other organisms that build their shells out of calcium carbonate (CaCO₃).

The Hawaiian record shows a long-term decline in surface pH of 0.0019 ± 0.0002 per year—which may not seem like much until you recall that pH units are expressed on a logarithmic scale. This means that a one-unit drop in pH corresponds to a ten-fold increase in the hydrogen ion concentration. To put that into context, the 0.1 decrease in globally averaged pH—from 8.2 to 8.1—over the last 250 years is roughly equivalent to a 30 percent increase in hydrogen ions.

This trend, they emphasize, is “indistinguishable from the rate of acidification expected from equilibration from the atmosphere”—confirming the basic theory that as atmospheric CO₂ increases, more and more of it will be absorbed by the oceans, where it will alter the chemistry. Scientists are worried that this sudden influx of CO₂—they estimate that the oceans have taken up nearly half of all carbon emitted since the beginning of the industrial era—risks overwhelming the delicate buffering system that has kept the ocean’s pH in check for millennia.

Dore and his colleagues also found that the pH cycle displays a strong seasonality, typically reaching a maximum during the winter and a minimum during the summer. There is also interannual variability. The authors attribute these to a combination of photosynthetic activity, air-sea exchange, and the mixing of different layers of water. The surface pH varied by as much as 0.01, largely as a result of diurnal heating and cooling.

Furthermore, they found that pH varied by depth—the deeper the water, the lower its pH tended to be—with pronounced minima around 250 m and 500 m. This makes intuitive sense, because colder water can hold more dissolved gases—and colder water, being denser, and therefore heavier, sinks.
But the authors also reason that it could be due to organic carbon export. When phytoplankton at the surface absorb CO\textsubscript{2} and produce organic carbon (in the form of carbohydrates), it is released and converted back into dissolved inorganic carbon through microbial decomposition in deeper waters. The metabolic activity of vertically migrating plankton could also contribute to the formation of these subsurface strata. These organisms feed at the surface at night and return to deeper water during the day, where they release CO\textsubscript{2} through respiration.

Overall, the results suggest that there is a risk in extrapolating from short-term studies that focus solely on pH and don't consider the range of other biological and chemical processes at play. The discovery of significant seasonal and spatial variability in the pH cycle also demonstrates the need for more longitudinal, full water column pH monitoring. The downside to this, of course, is that because long-term monitoring efforts are still rare—after all, ocean acidification wasn't on scientists' radar until fairly recently—we may need to wait several years, if not decades, before we get another such dataset.

*Proceedings of the National Academy of Sciences, 2009. DOI: 10.1073/pnas.0906044106*

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**NSF Press Release 09-126**

**Sudden Collapse in Ancient Biodiversity: Was Global Warming the Culprit?**

**Scientists discover early warning signs of ecosystems at risk**

*June 18, 2009* - Scientists have unearthed striking evidence for a sudden ancient collapse in plant biodiversity. A trove of 200 million-year-old fossil leaves collected in East Greenland tells the story, carrying its message across time to us today.

Results of the research appear in this week's issue of the journal *Science*.

The researchers were surprised to find that a likely candidate responsible for the loss of plant life was a small rise in the greenhouse gas carbon dioxide, which caused Earth's temperature to rise.

Global warming has long been considered as the culprit for extinctions—the surprise is that much less carbon dioxide gas in the atmosphere may be needed to drive an ecosystem beyond its tipping point than previously thought.

"Earth's deep time climate history reveals startling discoveries that shake the foundations of our knowledge and understanding of climate change in modern times," says H. Richard Lane, program director in the National Science Foundation (NSF)'s Division of Earth Sciences, which partially funded the research.

Jennifer McElwain of University College Dublin, the paper's lead author, cautions that sulfur dioxide from extensive volcanic emissions may also have played a role in driving the plant extinctions.

"We have no current way of detecting changes in sulfur dioxide in the past, so it's difficult to evaluate whether sulfur dioxide, in addition to a rise in carbon dioxide, influenced this pattern of extinction," says McElwain.

The time interval under study, at the boundary of the Triassic and Jurassic periods, has long been known for its plant and animal extinctions.

Until this research, the pace of the extinctions was thought to have been gradual, taking place over millions of years.

It has been notoriously difficult to tease out details about the pace of extinction using fossils, scientists say, because fossils can provide only snap-shots or glimpses of organisms that once lived.

* (Biodiversity - cont on page 20)
Using a technique developed by scientist Peter Wagner of the Smithsonian Institution National Museum of Natural History in Washington, D.C., the researchers were able to detect, for the first time, very early signs that these ancient ecosystems were already deteriorating—before plants started going extinct.

The method reveals early warning signs that an ecosystem is in trouble in terms of extinction risk.

"The differences in species abundances for the first 20 meters of the cliffs [in East Greenland] from which the fossils were collected," says Wagner, "are of the sort you expect. "But the final 10 meters show dramatic loses of diversity that far exceed what we can attribute to sampling error: the ecosystems were supporting fewer and fewer species."

By the year 2100, it’s expected that the level of carbon dioxide in the modern atmosphere may reach as high as two and a half times today’s level.

"This is of course a 'worst case scenario,'" says McElwain. "But it's at exactly this level [900 parts per million] at which we detected the ancient biodiversity crash.

"We must take heed of the early warning signs of deterioration in modern ecosystems. We've learned from the past that high levels of species extinctions--as high as 80 percent--can occur very suddenly, but they are preceded by long interval of ecological change."

The majority of modern ecosystems have not yet reached their tipping point in response to climate change, the scientists say, but many have already entered a period of prolonged ecological change.

"The early warning signs of deterioration are blindingly obvious," says McElwain. "The biggest threats to maintaining current levels of biodiversity are land use change such as deforestation. "But even relatively small changes in carbon dioxide and global temperature can have unexpectedly severe consequences for the health of ecosystems."

The paper, "Fossil Plant Relative Abundances Indicate Sudden Loss of Late Triassic Biodiversity in East Greenland," was co-authored by McElwain, Wagner and Stephen Hesselbo of the University of Oxford in the U.K.

*The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In fiscal year (FY) 2009, its budget is $9.5 billion, which includes $3.0 billion provided through the American Recovery and Reinvestment Act. NSF funds reach all 50 states through grants to over 1,900 universities and institutions. Each year, NSF receives about 44,400 competitive requests for funding, and makes over 11,500 new funding awards. NSF also awards over $400 million in professional and service contracts yearly.*

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**Boston Harbor Educator’s Conference 2009**

Celebrating the Beauty of a Resource Long Forgotten

Join us for a newly reinvigorated Boston Harbor Educator’s Conference on Saturday, October 3, 2009. This year we will use all of our senses as we take part in a land and sea adventure among the Boston Harbor Islands. After an on-the-water tour of these diverse and beautiful islands, we will disembark on Thompson Island for more in-depth studies. See, hear, smell, taste and touch our local marine and coastal resources and discover ways to incorporate regional plants and animals in your lesson plans. This promises to be an exciting day of exploration and hands-on learning. We will leave from the Fox Point Pavilion, the dock site at UMASS Boston at 9:00 and tour the harbor and islands for the first part of the morning. The rest of the day will be on Thompson with its spectacular views, teeming marshland, and wonderful accommodations. Check the MME website for additional information as well as the registration form. You must arrive by 8:50 in order to board the R/V Columbia Point for departure at 9:00. Cost for the all-day program, which includes boat tour, workshops, keynote session with Suffolk University's Dr. Lauren Nolf-Clements, and lunch, is only $40.
SAVE THIS DATE: OCTOBER 3, 2009

“Celebrating the Beauty of a Resource Long Forgotten”

Use all of your senses as we take part in a land and sea adventure among the Boston Harbor Islands. We will visit Thompson Island where a full program of speakers and workshops will be offered. See, hear, smell, taste and touch our local marine resources and discover ways to incorporate regional plants and animals into your lesson plans.

LOCATION: UMass Boston/Fox Point Pavilion for registration at 8am, Boston Harbor Islands cruise to Thompson Island for workshops and keynote presentation -- boat departure at 9am, return to UMass at 5pm

Program fee covers boat tour and transit to and from Thompson Island, all workshops, keynote presentation and lunch.

For more information or to register

Mail to: Gail Brookings, 184 Highland St., Taunton, MA 02780 or visit the MME Web site at: www.massmarineeducators.org

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http://www.massmarineeducators.org/membership.shtml