

State of New Jersey • Department of Environmental Protection

Governor Christie's Comprehensive Action Plan to Address the Ecological Decline of Barnegat Bay

2014 Update

April 25, 2014

presented by
NJDEP Commissioner Bob Martin



barnegatbay.nj.gov



Comprehensive Action Plan to Address the Ecological Decline of Barnegat Bay

We have many accomplishments to celebrate as we continue to drive the goals of the Governor's Comprehensive Action Plan for Barnegat Bay. From progress in scientific research, water quality monitoring and analysis, and implementation of stewardship projects, the Barnegat Bay watershed has seen a network of dedicated people, working towards the common goal of protecting and restoring this valuable resource.

Superstorm Sandy, however, further challenged this already impacted estuary. Barnegat Bay was one of the hardest hit areas in the state. Every municipality in the watershed was affected by the storm. As a result, the Department reevaluated each action item to ensure the goals remained appropriate in a "post-Sandy" world. Further, given the Department's role in the recovery, we also needed to reallocate many of our resources to the recovery effort. Despite this, DEP and its partners remain committed to fulfilling and carrying out the objectives of the Governor's Action Plan.

Some of the achievements since our last update include:

- A comprehensive water quality monitoring network was established in Barnegat Bay for both fresh and marine water quality. Data collected will establish the baseline conditions of the Bay and assess these conditions against water quality standards.
- Three green boater compliance sweeps were conducted by State Park Police with the assistance of Conservation Officers, State Police and local police resulting in hundreds of stops where either warnings or summonses were issued.
- More than 1,000 youths from 37 schools and groups participated in the 2013 Blitz Rain Barrel Challenge. Participation has more than doubled this year.
- Island Beach State Park, the crown jewel of the Bay, once again has a full-time naturalist on staff. The Park is continuing its commitment to add hands-on environmental education programs focused on the ecology of the Bay.
- More than 3,350 acres in the Barnegat Bay watershed has been acquired by the State since 2011. Another 300 acres are targeted for preservation this Spring.
- Three Barnegat Bay Blitz cleanups were conducted engaging many thousands of volunteers who cleaned up more than 1,000 cubic yards of trash and recyclables.
- Tens of millions of dollars for stormwater infrastructure and upgrades were made available to municipalities and the county. It is anticipated that over \$3 million will be awarded this fiscal year. The program has received ten applications worth more than \$12 million for State Fiscal Year 2015 financing.
- Ten research projects were funded, the results of which will create one of the most comprehensive compilations of research on a single estuary.

Going forward, in collaboration with our partners, DEP staff will continue to work in each action area. Stewardship programs are being implemented each year. For more information on the Governor's Comprehensive Action Plan for Barnegat Bay, visit barnegatbay.nj.gov.

BARNEGAT BAY ACTION ITEM #1

Close Oyster Creek Nuclear Power Plant



COMPLETED ACTIONS

- Oyster Creek plant will cease all operations by 2019.
www.nj.gov/dep/docs/ao201106.pdf
- Advisory Panel Report issued in December 2013.
www.nj.gov/dep/barnegatbay/docs/oyster-creek-dec2013-panel-report.pdf
- Oyster Creek FAQs document available on DEP website.
www.nj.gov/dep/barnegatbay/docs/oyster-creek-faqs.pdf
- Exelon is in full compliance with the Administrative Consent Order (ACO) as they approach the December 2019 closing.



CONTINUING ACTIONS

- 2014 Panel meetings with NRC and Exelon.
- Oversight of plant operations and maintaining compliance with all of the conditions stipulated in the ACO.
- Timetable for closure - www.nj.gov/dep/barnegatbay/docs/aco_oystercreek_a.pdf



The Oyster Creek Nuclear Power Plant will cease all operations by 2019.

The Oyster Creek Nuclear Generating Station withdraws water from Forked River in an amount up to 662 million gallons per day (MGD) for the purpose of cooling the main condenser. In addition, up to 748.8 MGD is withdrawn for moderating thermal effects of the cooling water. Shutdown of the nuclear plant ends Oyster Creek withdrawals from Barnegat Bay for cooling purposes and ensures that discharges from the plant do not damage the ecological health of the Bay.

COMPREHENSIVE MANAGEMENT



The closure of the Oyster Creek Nuclear Generating Station in 2019 will create changes in the flow, temperature and other water quality parameters. The United States Geological Survey will develop a closure scenario as part of the computer model of Barnegat Bay.

Fund Stormwater Mitigation Projects



COMPLETED ACTIONS

- Since 2012, DEP and Environmental Infrastructure Trust (EIT) has reserved more than \$77 million to finance stormwater projects.
- In SFY 2012, \$32 million was reserved in grants and loans, and twenty projects totaling \$9,963,900 were funded focusing on street sweepers and gravel wetlands.
- In SFY 2013, \$13.3 million was reserved for grants and loans but due to Sandy no projects were submitted.



CONTINUING ACTIONS

- For SFY 2014, DEP and EIT reserved \$20 million to provide principal forgiveness loans for up to 50% of the allowable project costs. Three projects have been approved for funding totaling \$3.1 million.
- For SFY 2015, DEP and EIT reserved \$12.3 million to provide principal forgiveness loans for up to 50% of the allowable project costs. Ten projects were submitted and are currently under review.



Forecastle Basin, Stafford Township

Much of the deterioration of the Bay can be traced to pollutants that runoff from lawns and streets. Through this Action Item, NJDEP established funding for capital improvement projects and equipment designed to remove pollutants that adversely impact Barnegat Bay. Our focus has been and continues to be on green infrastructure projects, such as gravel wetlands, porous pavements and rain gardens that can help reduce stormwater runoff and treat the runoff that makes it to the Bay.

Reduce Nutrient Content from Fertilizer



ACTION ITEM COMPLETED

- Rutgers administered online Training and Certification.
- All fertilizer products for turf sold in New Jersey contain at least 20% slow release nitrogen and zero phosphorus.
- New Certified Fertilizer Applicators = 317
- Certified Fertilizer Applicators Renewals = 2,000
- Trained Fertilizer Applicators = 691

“ I think the law is one that was developed in concert with the professionals it affects. I do not look at it as being the “most restrictive” fertilizer law in the country even though it may be. The law provides the framework for the sustainability of turfgrass and the protection of our precious watershed. ”

Joe Kinlin,
Superintendent Bea Ley Golf Course



Strictest Fertilizer Rule in the Nation.

Nitrogen and phosphorus are nutrients required for plant growth. An overabundance of these nutrients not only can harm lawns, but also when washed into our waterways stimulates excessive algae and weed growth. The new fertilizer law signed by Governor Chris Christie establishes the most restrictive standards in the nation for nitrogen content in fertilizer. These standards will reduce nutrient pollution in all of New Jersey’s water bodies.

COMPREHENSIVE MANAGEMENT



A water monitoring protocol is being developed to determine what effect the fertilizer rule has had in certain tributaries of Barnegat Bay.

BARNEGAT BAY ACTION ITEM #4

Require Post-Construction Soil Restoration



COMPLETED ACTIONS

- Governor Christie signed Soil Restoration Act P.L. 2010 Chap. 113 into law on January 5, 2011.
- The law requires the State Soil Conservation Committee (SSCC) to adopt standards that include soil restoration measures.
- A subcommittee was formed that is made up of soil scientists and representatives from NJDEP, NJDA, NJDOT, Rutgers University, NRCS, NJ Landscapers Association, NJ Builders Association, Pinelands Commission, Pine-land Preservation Alliance, and the Site Improvement Advisory Board of the Department of Community Affairs.
- The subcommittee is finalizing revised design requirements for the Topsoiling and Landgrading Standards which contain the elements of soil restoration measures. Revisions are anticipated to be complete in Spring 2014.



CONTINUING ACTIONS

- Draft revised soil standards are under internal review.
- Publication of revised soil standards anticipated in the Summer of 2014.
- Adoption of revised soil standards in late 2014.



Soil compaction contributes to an increase in stormwater runoff and nonpoint source pollution in New Jersey's waterways. By improving methods of soil management on construction sites, soils will be more effective in producing and sustaining vegetation, which aides in runoff reduction. On January 5, 2011 Governor Chris Christie signed into law a measure that requires the State Soil Conservation Committee, in consultation with the NJ Agriculture Experiment Station - Rutgers University, the Secretary of Agriculture and the Commissioner of Environmental Protection to propose modifications to the existing soil erosion and sediment control standards.

These modifications and standards will address the potential for soil compaction on all **new** construction regulated by New Jersey soil conservation districts. The new standards will ensure that soil is restored to the greatest extent possible through aeration and re-vegetation.

BARNEGAT BAY ACTION ITEM #5

Acquire Land in the Watershed



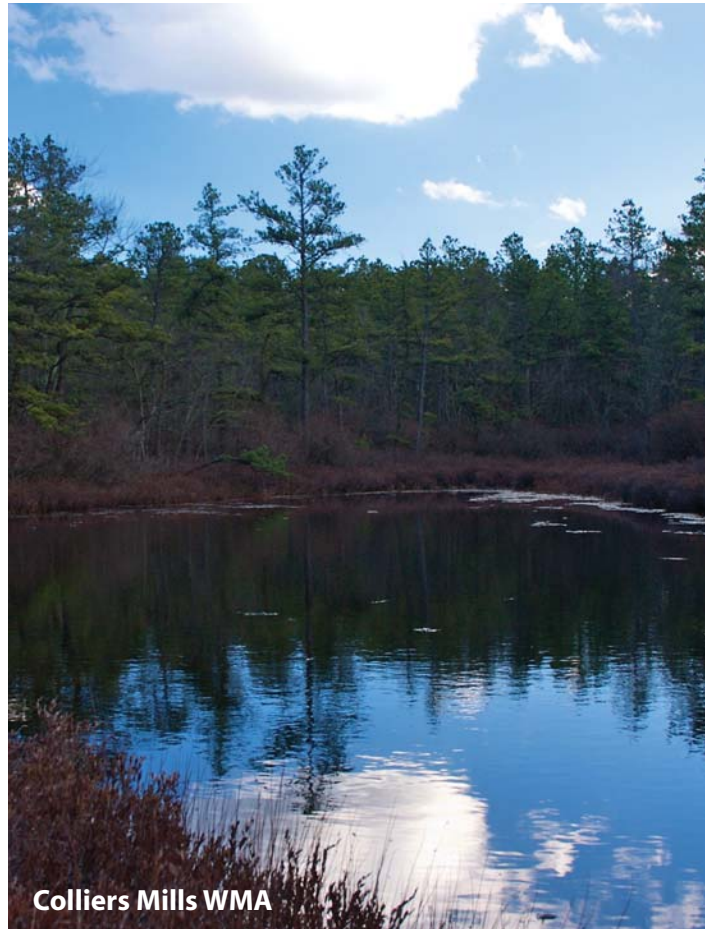
COMPLETED ACTIONS

- Over 3,350 acres in the Barnegat Bay watershed have been acquired by the State since 2011.
- Land has been acquired in Jackson Township, Plumsted Township, Lacey Township, Manchester Township, Ocean Township, Stafford Township, Eagleswood Township and Bass River Township in Burlington County.
- The new acreage includes additions to Colliers Mills WMA (Plumsted and Jackson Township), NJ Forest Resource Education Center (Jackson Township), Manchester WMA (Manchester Township), Double Trouble State Park (Lacey Township), Forked River Mountain WMA (Lacey Township), Wells Mills County Park (Ocean Township), Stafford Forge WMA (Stafford and Eagleswood Township), Bass River State Forest (Bass River Township, Burlington County) and the Joseph A. Citta Scout Reservation (Ocean Township).



CONTINUING ACTIONS

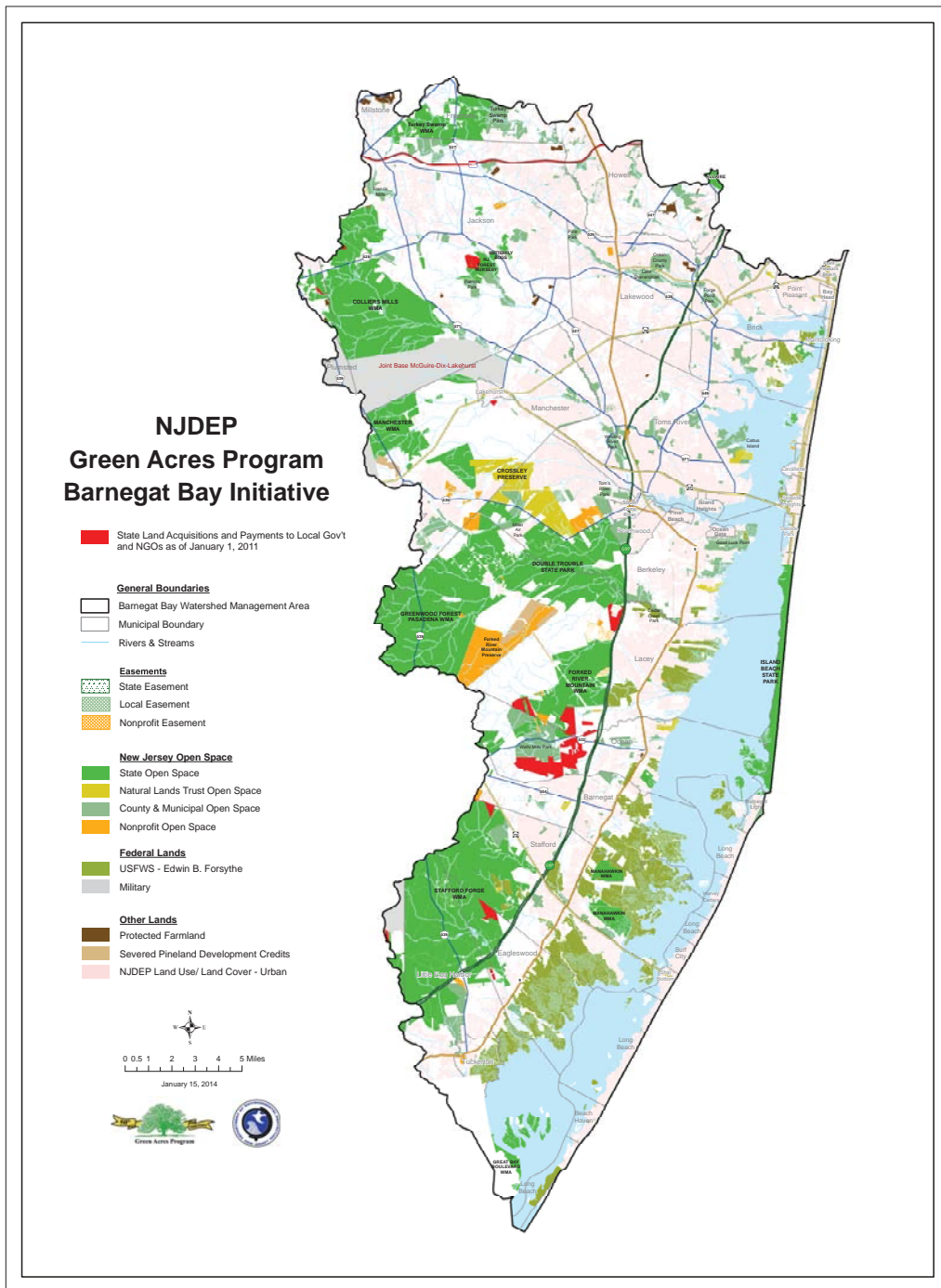
- 1,015 acres targeted for preservation over the next year.
- Targeted acres are located in Plumsted Township, Little Egg Harbor Township, Berkeley Township, Manchester Township, Jackson Township, Lacey Township, Barnegat Township and Freehold Township in Monmouth County.



Colliers Mills WMA

Acquiring available, ecologically sensitive lands along the Barnegat Bay and its tributaries is a cost-effective and critical measure to prevent development activities that could further degrade the Bay's water and ecological quality. The Green Acres program will continue to identify and prioritize these lands for acquisition and will work with willing sellers to purchase them.

Acquire Land in the Watershed



BARNEGAT BAY ACTION ITEM #6

Special Area Regional Planning

SUPERSTORM SANDY

DEP will assess environmental and land use planning data throughout the watershed and work with municipalities to help guide land use policies and practices that will have the greatest impact on improving and maintaining the health of the Barnegat Bay. All areas in the Barnegat Bay watershed were affected by the superstorm, some much more than others. The recovery and rebuilding to resiliency process offers an opportunity to take into account new priorities and the needs of these municipalities.



Because the pattern and intensity of development - and thus the water quality impacts - vary across the Barnegat Bay watershed, a strategy that includes a combination of innovative and condition-specific approaches is the most likely to succeed in improving and maintaining the health of the region.

Combining DEP's environmental data from throughout the watershed with current information on land use practices and policies will allow us to share information with municipalities, counties and other regional partners. This collaborative effort gives us the ability to evaluate the effectiveness of current land use practices and policies to support sustainability and resiliency of the watershed. This will lead to a set of recommendations and strategies for improving and maintaining the health of the Bay through municipal land use planning as well as the continued identification of any barriers preventing the use of sustainable and resilient land practices.

CONTINUING ACTIONS

- Recognize and work within a regional context to identify successful strategies that better align and integrate environmental protection, land preservation and economic development.
- Data collection on current land use policies and practices.
- Continual coordination with Barnegat Bay Partnership.
- Provide municipalities with coastal vulnerability assessments and recommendations on resiliency actions.
- Implementation of regional hazardous mitigation strategies.

BARNEGAT BAY ACTION ITEM #7

Adopt More Rigorous Water Quality Standards



COMPLETED ACTIONS

- 2-year ambient monitoring including three intensive monitoring events.
 - 4,100 samples taken
 - 51,809 laboratory measurements
 - 30,531 field measurements
- Mapping of the Bay bottom (bathymetry), both pre- and post-Sandy.
- Installed continuous flow monitoring gaging stations on 3 tributaries, 3 inlets to the Bay and 3 bridges on the Bay in partnership with USGS.
- Established two continuous-record water quality monitoring stations, one in Toms River Basin and one in Mantoloking.
- Deployed water quality monitoring buoys during the growing season at four locations throughout the Bay.
- Deployed continuous temperature loggers at the outlet of Oyster Creek.
- Constructed flow model and preliminary simulation was successfully conducted.
- Four ongoing sediment characterization projects were initiated in partnership with USGS.
- Initiated a five-year long-term monitoring program in July 2013 to assess the effectiveness of restoration actions.



The flow and water quality models, currently under development, along with data from the research projects under Action Item 9, will provide important scientific tools that can be used to:

- Determine the relationship between water quality and the ecological health of the Bay.
- Set up the appropriate water quality targets.
- Determine the locations and extent of water quality impairments.
- Make decisions on how to restore Barnegat Bay.

BARNEGAT BAY ACTION ITEM #7

Adopt More Rigorous Water Quality Standards

▶ CONTINUING ACTIONS

- Analysis of bathymetry information to be completed for use in model development in 2014.
- Completion of the water quality model in 2016.
- Assessment of water quality data and evaluation of research projects anticipated in 2016 to:
 - Determine relationship between water quality and the ecological health of the Bay.
 - Set up appropriate water quality targets.
 - Determine locations and extent of water quality impairments.
 - Make decisions on how to restore Barnegat Bay.



COMPREHENSIVE MANAGEMENT



ACTION ITEM

2



ACTION ITEM

3

Long-term monitoring program will provide data related to the effectiveness of the fertilizer rule and Stormwater project implementation on tributaries and Bay. When the model is fully and successfully developed, the simulation of a range of scenarios will inform the management responses to improve the water quality and increase resiliency in planning.



ACTION ITEM

8

Produced an educational video about the ambient monitoring partnership, which can be found online at www.nj.gov/dep/barnegatbay/bbvids.htm.



ACTION ITEM

9

DEP scientists and water monitoring experts meet on a regular basis to discuss their respective projects and how to coordinate restoration efforts when final results are obtained.

BARNEGAT BAY ACTION ITEM #8

Educate the Public



COMPLETED ACTIONS

- 4 Barnegat Bay Blitz events
 - Over 5,000 bags of trash and recyclables collected.
 - Over 75 dumpsters and bagsters filled.
 - 100 school groups and scout troops participated.
- Rain Barrel Challenge 2013 and 2014.
- Nearly 50 press releases and announcements were released on Barnegat Bay listserv.
- DEP worked with Comcast, Inc - Ocean County in 2012 to develop five *Eye on Ocean County* 30-minute cable television programs on Barnegat Bay topics.
- Island Beach State Park
 - Hired full-time naturalist in 2013.
 - Planted over 2,500 dune grass plugs and installed more than 10,000 feet of sand fencing.
 - Conducted *Harvest the Bay* program series for more than 1,500 visitors over three days.
- WILD Outdoor Expo in Jackson; attendance in 2012 was 7,600 and in 2013 over 8,700.
- Sedge Island Education Center conducted 31 programs for youth and adults in 2012.
- Annual Governor's Surf Fishing Tournament held at Island Beach State Park.



2013 Barnegat Bay Blitz

Changing the daily actions of residents and visitors in the Barnegat Bay watershed can have significant positive impacts on the bay and local environment; such actions include how people landscape their homes, maintain their yards, use water and operate their boats. These actions can impact the Bay's water quality and ecology and in turn, can affect the economy and tourism. Education and stewardship activities offered by DEP (with several partners) include interpretive programs, trail walks, cleanups, competitions, school seminars, curricula, public events, volunteer monitoring, website and listserv communications, and media announcements. These offerings target all ages and audiences and are designed to engage people in hands-on science-based learning about the Bay.

BARNEGAT BAY ACTION ITEM #8

Educate the Public



COMPLETED ACTIONS

- Forest Resource Education Center hosted Fall Forestry Festival with 1,200 attendees.
- Trout in Classroom program of 200 students raised and released trout fingerlings in the Toms River.
- Barnegat Bay Business Forum held in March 2014, in partnership with the Barnegat Bay Partnership and Conserve Wildlife Foundation of New Jersey.
- Double Trouble State Park and Village hosted hikes for students, conducted park cleanups and provided 30 Bay programs at local meetings.



CONTINUING ACTIONS

- Three summer programs at Sedge Island Education Center for high school youth focusing on fishing, field experiences and research.
- Island Beach State Park has new programs focused on seafood preparation and cooking.
- Forest Resource Education Center will offer Full Moon Hike (August) and Fall Forestry Festival (October).
- Illegal Dumping program with increased enforcement and education.



Rain Barrel Challenge



WILD Outdoor Expo

BARNEGAT BAY ACTION ITEM #9

Produce More Comprehensive Research

✓ COMPLETED ACTIONS

- Ten multi-year research projects were funded in 2012, 2013 and 2014.

▶▶ CONTINUING ACTIONS

- The field collections for the first two years (2012 and 2013) are complete and data is being evaluated. Field work in 2014 is underway.
- In 2015, the ten research projects will be evaluated independently and together for a comprehensive assessment of Barnegat Bay with recommendations for follow-up actions, additional research, and possible management measures as indicated by this technical review.



Over the years, extensive research was conducted on Barnegat Bay, however, the work was not fully coordinated, resulting in key data gaps. To bridge these gaps, NJDEP funded ten research projects with state and private universities, as well as the New Jersey Sea Grant Consortium. These projects were designed as three-year studies to account for the seasonal and inter-annual variability of the natural ecosystems.

COMPREHENSIVE MANAGEMENT



DEP scientists and water monitoring experts meet on a regular basis to discuss their respective projects and how to coordinate restoration efforts when final results are obtained.



Research by Rutgers University was initiated in 2013: An Evaluation of Water Craft Impacts on Environmentally Sensitive Areas in Barnegat Bay.

Produce More Comprehensive Research



Stinging Sea Nettles

Hard Clams



Key Research Findings from SFY12 (year one):

- Four indices of habitat quality were evaluated using worms, crabs, and clams living in the bottom sediments of Barnegat Bay. The analysis shows that a substantial majority of the 100 sites sampled are identified as either not degraded, good or of high quality.
- Predictive algal-diatom models were constructed for salinity, total dissolved phosphorus, and Chlorophyll A that can be used for historical reconstruction of sea-level rise and the history of nutrient eutrophication in Barnegat Bay.
- Hard clam research underway which will assess the seasonal growth and condition of hard clams in relation to the food supply (i.e. algae and particulate organic matter).
- Stinging sea nettles are at higher densities in the northern regions of Barnegat Bay with a peak in early July. Smaller individuals are present throughout the Bay, meaning, it may just be a matter of time until polyp populations become better established in southern Barnegat Bay.
- The distribution and abundance of zooplankton, which include the larval stages of fish, crabs and clams, was determined for the Bay. Highest abundance of larval crabs and clams were in the spring and fall. A large bloom of copepods was observed one month after Superstorm Sandy occurred.
- A dynamic ecosystem model of Barnegat Bay was developed to understand how natural and human induced changes could affect the structure and function of the Bay's natural resources (i.e. fish, crabs and clams) and their utilization in a sustainable manner.
- Salt marshes remove over 80% of the human nitrogen load to Barnegat Bay. Once sequestered in sediments, further microbial action alters the nitrogen and returns it to the atmosphere as gaseous nitrogen through biochemical denitrification.
- Assessment of the value of NJ's marine conservation at Sedge Island using blue claw crabs indicates the importance of establishing and maintaining these special areas for the sustainability of ecosystems and populations of economically important species.

BARNEGAT BAY ACTION ITEM #10

Reduce Water Craft Impacts



COMPLETED ACTIONS

- 16 ecologically sensitive areas identified and targeted for Green Boater practices.
- 3 compliance sweeps conducted during Summer 2012 to educate boaters on Green Boater practices resulted in 241 stops, producing 188 warnings and 53 summonses.
- Before and after observation survey of boater use conducted in 16 ecologically sensitive areas to document the impact of compliance sweeps.
- 6,000 hits to the interactive boater map developed to assist boaters in identifying ecologically sensitive areas and other key natural features in Barnegat Bay. www.nj.gov/dep/barnegatbay/plan-watercraft.htm
- Green Boater tips included in the Boater Safety Manual.
- Boater safety highlighted in wake of Superstorm Sandy.



CONTINUING ACTIONS

- Additional distribution of Green Boater education materials to marinas and public access areas along Barnegat Bay before summer boating season.
- Development of mobile App for boaters to identify ecologically sensitive areas and other natural features when on the water.
- Green Boater compliance sweeps.



Boats and personal water craft can harm the Bay by damaging submerged aquatic vegetation and disrupting aquatic habitats. After reviewing numerous studies conducted by New Jersey academic institutions and DEP's own research, ecologically sensitive areas were identified and will be evaluated to determine the appropriate environmental management strategies to protect them.

Reduce Water Craft Impacts

COMPREHENSIVE MANAGEMENT



Developed and distributed Green Boater education posters and flyers to boaters.



Research by Rutgers University was initiated in 2013: An Evaluation of Water Craft Impacts on Environmentally Sensitive Areas in Barnegat Bay.

