Two States – One Bay

A bi-state conversation about the future of Raritan Bay

Bill Schultz/Raritan Riverkeeper

Introduction

The Two States: One Bay conference, convened on June 12, 2015 by the Sustainable Raritan River Initiative (SRRI) at Rutgers University and the New York-New Jersey Harbor & Estuary Program (HEP), brought together more than 200 representatives from federal, state and local governments, educational institutions, non-profit organizations, and businesses to focus on Raritan Bay. During plenary and working sessions where regional and bi-state issues and cooperation were the primary focus, conference participants examined the key topic areas of water quality, climate resiliency, habitat conservation and restoration, fish and shellfish management, and public access. This report identifies the insights and opportunities raised at the conference, including possible strategies to address ongoing bi-state challenges to ensure the stewardship and vitality of Raritan Bay. The Sustainable Raritan River Initiative and the New York-New Jersey Harbor & Estuary Program invite stakeholders from both New York and New Jersey to join us in taking next steps towards greater bi-state cooperation in addressing the challenges facing Raritan Bay.

Overview

Raritan Bay, roughly defined as the open waters and shorelines from the Verrazano-Narrows Bridge to the tidal reach of the Raritan River at New Brunswick, New Jersey, and out to Sandy Hook, provides important habitat, fishery resources, and recreational benefits to the New York and New Jersey region. These resources are enjoyed by more than one million nearby residents of the two states, as well as many annual visitors from outside the region. The Bay, however, is negatively affected by pollution, development pressures, climate change and coastal flooding. Management of these concerns is complicated by policy and regulatory challenges that differ across state boundaries. The Bay also has not received the kind of coordinated attention afforded other bays and river systems along the mid-Atlantic coastline and areas within the New York-New Jersey Harbor Estuary.

Shelly Xia

Participant discussions identified 20 key opportunities.

Progress to restore and improve Raritan Bay requires strong collaboration among stakeholders, and in addressing the most complex issues, bi-state cooperation to ensure stewardship. Conference participants, representing a wide range of public and private stakeholders, explored opportunities for bi-state and regional cooperation. Through expert presentations, instant polling, and guided working sessions the more than 200 participants reviewed and discussed challenges and opportunities centered on water quality, climate resiliency, habitat conservation and restoration, fish and shellfish management, and public access.

This report, developed by the conference conveners based on those conversations, offers the most important insights and details opportunities for specific bi-state initiatives. We heard many important ideas at the conference for how to ensure the vitality of Raritan Bay. Those scores of specific ideas seem to concentrate in these key areas for fostering regional collaboration:

- Explore opportunities to address consistency across the Bay in terms of water quality standards, monitoring, and management.
- Collaborate with regional partners to identify new opportunities for habitat restoration and connectivity for inclusion in the Hudson-Raritan-Estuary Comprehensive Restoration Plan and seek the funding necessary to support these initiatives.
- Take steps to improve management of hard clams, horseshoe crabs, blue crabs, and recreational fisheries on a bi-state basis that could lead towards a more ecosystem-based modeling and management system for the Bay.
- Increase awareness of and expand opportunities for public access in Raritan Bay including stewardship, engagement, and regional planning.
- Conduct further analysis and modeling on the effects of storms combined with sea level rise, and the potential mitigating effects of green infrastructure and nature-based features to aid in bi-state planning on a regional spatial scale for climate resiliency.

Bi-state collaboration in these and other areas presents opportunities for setting a regional agenda for scientific research, collaborating on data development and articulating findings to better inform decision makers Bay-wide.

The remainder of this report, organized by the five key topic areas examined at the conference, presents a summary of discussions by participants during the plenary and working sessions, identifies specific opportunities where bi-state and regional cooperation are most important, and outlines areas where HEP and SRRI, with the support and collaboration of regional and bi-state stakeholders, intend to focus their efforts for a more sustainable Raritan Bay. HEP and SRRI will be working with these public and private partners to help identify leadership and spur progress on these many important initiatives.

Paul Eidman

Recreational fishing is a business and pastime on Raritan Bay.

Water Quality

Since the Clean Water Act, enormous progress in improving water quality has been made in the region. However, many challenges remain, in part due to historic contamination, the urbanized, densely populated nature of the Raritan Bay, and bi-state management constraints. Sediment contamination, high levels of pathogens and nutrients as well as low levels of dissolved oxygen and occurrences of harmful algal blooms are all issues of concern, stemming in large part from polluted storm water and combined sewer overflows (CSOs). While many areas of the Bay are considered safe for contact recreation, water quality monitoring is not sufficient to support a full understanding of risk. Based on data that are collected, shellfish harvesting and oyster restoration and research are limited due to pathogens. A combination of gray and green infrastructure can be used to manage the quantity and quality of water flowing into the Bay, but finding adequate funding sources to implement projects is often challenging. Many municipalities in Raritan Bay are currently pursuing or planning to pursue green infrastructure projects. There are, however, thousands of acres of impervious surfaces in the watershed and green infrastructure efforts must be scaled to maximize the benefits.

John Witsch

Providing tmely alerts of pathogen pollution could better protect and raise awareness among those recreating and fishing in Raritan Bay.

Insights and opportunities

A central topic discussed at the conference is the need for more consistent water quality governance across state boundaries. Consistency in standards, advisory thresholds, and monitoring methodology (e.g. indicator organisms for pathogen criteria) avoids confusion and enables progress towards the common goal of fishable, swimmable waters. A federal/bi-state task force could begin to address this issue. One current example is that both New Jersey and New York are in the process of reviewing a petition to consider Raritan Bay for designation as a “No Discharge Zone” for pollutants from vessels operating in the Bay.

Additionally, there is a need to retain and reduce storm water runoff volumes and to reduce the frequency of CSO discharges by implementing green and gray approaches. A key path forward is to continue the inventory of impervious surfaces (as begun by Rutgers Water Resources Program) through mapping and surveys and to determine appropriate methods and locations for implementing green infrastructure. The inventory could consider funding opportunities (including the possibility of a storm water management fee); permit requirements and long-term commitments for maintenance and repair.

Pathogens

Insights

Combined sewer overflows and storm water are major contributors at a regional scale, although the extent to which they influence pathogen levels at specific locations is not well understood. Pathogen levels are extremely variable, changing rapidly with exposure to sunlight, water temperature, currents, and other factors. Researching the ways in which these abiotic and biotic factors interact to affect pathogen survival

and distribution will aid in developing management measures. There is also a lack of data relating to other local non-point sources from private lands.

Participants voiced a need for more information about pathogens issues relating to shellfish consumption, contact recreation, and personal behaviors.

Opportunities

Pursue monitoring and tracking of near-shore pathogens to identify hot spots, as well as identification of specific local pollutant sources, which may include failing septic systems and contributions from private land sources. Monitoring is also needed to better understand causes and effects of natural pathogen level fluctuations on the system and to determine system-wide responses.

Develop ecosystem-based models informed by monitoring to increase the understanding of pathogen levels and fluctuations in the Bay. A more thorough grasp of the causes and effects of natural pathogen variation in the system will help determine specific pathogen load reductions.

Provide timely public updates on pathogen issues relating to recreation and shellfishing. The public is often unaware of current conditions in the Bay or what causes pollution, including how individual actions can affect water quality and what steps can be taken to minimize impacts. This could include improving signage and developing an alert system to inform all potential recreational users of impairments, including shared reporting of CSO discharges.

Nutrients, Dissolved Oxygen, and Harmful Algal Blooms

Insights

Additional information is needed to determine what standards are appropriate for this unique system and what synergistic interactions exist between physical, chemical and biotic conditions. Harmful algal blooms (HABs) can have negative impacts on humans and wildlife via the production of natural toxins or their accumulated biomass. Large-scale events may also impact local economies.

Programs that focus on educating about non-point source pollution are common and widespread. However, there often remains a disconnection between individual actions and downstream impacts.

Opportunities

Undertake research to understand relationships between nutrients, dissolved oxygen and algal blooms and how this affects the biota in the Raritan Bay system under specific scenarios. Develop ecosystem-based models that will help inform appropriate criteria and water quality endpoints. Other nutrient sources such as atmospheric nitrogen may also have important effects on loads and could be considered.

Engage the public as citizen scientists for algal bloom monitoring. The frequency and extent of HABs in the region is not well understood and citizen scientists could assist with filling in data gaps.

Educate the public on the connection between upstream inputs and the health of the Bay. The public is often not aware of how their habits, including the use of fertilizers and not picking up pet waste, affect water quality downstream and how measures such as green infrastructure are important for ensuring clean water (see also Bathing Beaches Opportunities).

Habitat Protection and Restoration

When compared to other parts of the NY-NJ Harbor Estuary, Raritan Bay has a far more natural shoreline, ranging from the wetlands of Cheesequake State Park and the rich habitat of Conaskonk Point on the south side of the Bay in New Jersey to the forested edges and sandy beaches of Conference House Park and Butler Manor Woods on Staten Island. The Bay also houses numerous brownfield and Superfund sites. Multiple efforts to improve the Raritan River and Bay have occurred in recent years, including three dam removals that have opened 17 upstream Raritan river miles of spawning grounds to river herring, shad, and other fish species in the region for the first time in nearly 100 years. Groups around the Bay are currently working to restore several wetland habitats, oyster reefs, tributaries, and natural shorelines and shallows areas, as well as to acquire land for conservation purposes, supporting progress towards the 2009 Hudson-Raritan Estuary Comprehensive Restoration Plan (CRP) goals. Various tools and resources exist to support restoration, including compensatory habitat mitigation, mitigation banking, buyout programs, nature-based features, and accounting for ecosystem services provided by restored habitats, but funding for project implementation remains a challenge.

NY/NJ Baykeeper

NY/NJ Baykeeper, Rutgers University, and Naval Weapons Station Earle are collaborating on habitat restoration in Middletown, NJ.

Insights and opportunities

The Hudson-Raritan Estuary Comprehensive Restoration Plan sets broad regional goals and target ecosystem characteristics. The creation of a general permit by NJDEP for habitat creation and enhancement and living shoreline activities, along with regional discussions, demonstrates new interest in natural shoreline stabilization methods and restoration. These efforts present new opportunities in New Jersey and potentially for collaboration with New York on conservation and restoration.

Living Shorelines, Wetlands and Eelgrass Bed Restoration

Insights

There is a need to identify additional restoration opportunities in the region, though funding is a crosscutting issue. There are few successful eelgrass (important fish habitat) restoration case studies in the region and more research is needed to explore locations that may have potential.

Opportunities

Expand the existing inventory of restoration opportunities and implemented projects in Raritan Bay. Through the Comprehensive Restoration Plan and its Restoration Work Group, the NY-NJ Harbor & Estuary Program and its partners could assist in using bi-state analysis to identify additional potential habitat restoration sites of significance in the Raritan Bay and map what has been restored or conserved to inform surrounding actions. Recent advancements include freshwater wetlands restoration in Staten Island and living shorelines efforts in Ware Creek. Opportunities include a 46-acre tidal wetlands project proposed as part of the South Shore of Staten Island Coastal Risk Management Study being led by the US Army Corps of Engineers and New York State.

Support the development of regionally appropriate metrics and monitoring protocols to better measure both baseline conditions and the effectiveness of living shorelines and nature-based resiliency measures in addressing target conditions.

Oyster Reefs

Insights

Water quality, regulatory concerns, and funding continue to challenge expansion of oyster restoration efforts. Additionally, there is a need to understand whether oysters can survive sustainably in Raritan Bay, at which specific locations, and how to stabilize installations in high-energy areas. There is also a need to increase the understanding of contaminant hotspots locations, and to gain a better understanding of the stresses that influence mortality. There is currently a state ban on using commercial shellfish for research, restoration, and education purposes in New Jersey waters except for the limited projects noted below.

NY/NJ Baykeeper

Oyster reef balls were deployed at Naval Weapons Station Earle with the aim of stabilizing the shoreline and providing habitat.

Opportunities

Continue discussions across the two states addressing scientific and management challenges to oyster restoration. In Raritan Bay, oyster restoration has recently proceeded at Naval Weapons Station Earle and Ware Creek, a project led by NY/NJ Baykeeper. Additionally, researchers from Rutgers and NY/NJ Baykeeper have developed a rapid shoreline assessment protocol that includes identifying potential oyster habitat. Off the south shore of Staten Island, a resiliency project involving oysters (*Living Breakwaters)* is planned.

Acquisition and Conservation

Insights

Increasing habitat connectivity is critically important. Recent acquisitions include one property along Matawan Creek and a small addition to Mt. Loretto Unique area on Staten Island. Connecting contiguous conservation land in the region is a challenge due to many small private tracts and high property values.

Opportunities

Support larger-scale connectivity analysis and conservation projects, such as flood plain restoration and protection of wetland and riparian buffers, which can assist in boosting habitat connectivity and resiliency. One such opportunity lies in identifying a strategy for lands acquired through NJDEP Blue Acres or New York State Governor's Office of Storm Recovery buyouts where future acquisitions could be analyzed at a regional level for their potential to increase habitat and resiliency.

Tributary Connections

Insights

Tributary connectivity projects can yield great rewards for fisheries and ecosystems but are also challenging, requiring technical analyses, willing owners, and stewardship. Recent projects on the Raritan River, meeting obligations to restore Natural Resource Damages, were the first of their kind approved by NJDEP and offer good models for continued progress.

Opportunities

Boost fishery populations and ecosystem health through connectivity improvements. In addition to recent expansion of habitat corridors on the Raritan River (through removal of dams), work to advance other opportunities, such as fish ladder installation and further dam removals on Raritan tributaries.

FISH AND SHELLFISH MANAGEMENT

Fisheries have always been and remain integral to the ecology, economy, and the identity of Raritan Bay. Ensuring their viability could be an important driver of federal and bi-state cooperation towards other Raritan Bay management goals. Important commercial fishing techniques in Raritan Bay include pound netting; purse seining for menhaden; dredging and setting pots for blue crabs; and harvesting of hard clams using hand tools and depuration facilities. Other important fishery issues include horseshoe crab harvesting in New York; oyster restoration; and recreational fishing for summer flounder (fluke), striped bass, bluefish, and winter flounder. There are currently no fisheries management plans specific to Raritan Bay. State Fisheries Management Plans are guided by actions taken by two interstate management entities: Atlantic States Marine Fisheries Commission for waters up to three miles from shore and the Mid-Atlantic Fisheries Management Council for waters from three to 200 miles off shore. These forums provide important venues for cooperative action.

Paul Eidman

Four and one half million pounds of menhaden are landed in Raritan Bay annually.

Insights and Opportunities

Stock assessments of resident species and assessments of multiple species interactions in the Bay would yield a better understanding of fishery health and habitat status and be the basis for improved management. Such assessments may be important vehicles for understanding the potential impact of climate change and disease. These assessments could be a first step toward developing an ecosystem-based management strategy. Some work, like a stock assessment of hard clams, could build off existing data collections. Multi-species assessments are highly complex and require close collaboration as well as an in-depth knowledge of all components of a system acquired through extensive data collection and modeling. Improving understanding and creating consistent bi-state standards for fisheries could provide pathways towards this more comprehensive long-term effort.

Hard Clams

Insights

The hard clam fishery in the Bay comprises about 50% of New Jersey's hard clam landings and was historically a significant portion of the New York harvest. Because of poor water quality, all clams from these restricted waters currently must be cleansed. In New Jersey this is accomplished through depuration in two plants in Monmouth County. New Jersey has undertaken regular surveys; the latest will be published in 2015. All New York State areas can currently be harvested. However, the New York relay program is currently suspended due to lack of participants and low margins/high costs of operation.

Opportunities

Conduct a bi-state study of the status of hard clam resources and the viability of a future commercial

fishery in Raritan Bay to provide the basis for evaluating the status of the clam population and developing a bay-wide strategy for managing the future fishery. The study could include an assessment of the current population of hard clams utilizing recent surveys conducted in New Jersey in 2015 and possibly fishery landings data; evaluate restoration/enhancement possibilities; and document the benefits and costs of addressing constraints on harvesting including water quality improvements, depuration, and policy changes.

NOAA

Hard clams (*Mercenaria mercenaria)* are harvested in Raritan Bay

Horseshoe Crabs

Insights

Horseshoe crabs and the eggs they deposit in the spring are critical for migratory shore birds, fueling their journey to breeding grounds along the Atlantic seashore. Horseshoe crabs are also sought after for bait and increasingly for the biomedical industry. While New Jersey has had a moratorium in place since 2008, New York State allows harvesting subject to a statewide quota. This inconsistency hampers enforcement.

Opportunities

Develop a consistent Bay-wide strategy for horseshoe crabs. Such an effort could be informed by the spawner surveys being conducted in other areas by the New York State Department of Environmental Conservation and Cornell Cooperative Extension's Marine Program. This information could be used to develop a bi-state strategy for surveying and managing this valuable resource, leveraging - and perhaps expanding - efforts being conducted by volunteers.

Blue Crabs

Insights

Little is known about the extent to which contaminated sediments compromise the stock of crabs and the health of human (and non-human) consumers. Health advisories from the two states offer differing guidance on consuming crabs from the Bay. This issue particularly impacts subsistence and recreational fishing. While Raritan Bay accounts for about 15% of New Jersey's commercial dredge harvest each year, or roughly 90,000 pounds, it is less than 3% of the overall commercial crab harvest from pots and dredging.

Opportunities

Review or conduct additional peer-reviewed research on blue crabs to aid in developing consistent health advisories between the two states and improve the communication of that information to the public and managers.

Recreational Fishing

Insights

Recreational fishing is an important amenity and economic driver for Raritan Bay communities. Additionally, subsistence fishing occurs throughout the Bay. Management of this resource is hampered by a lack of data on overall biomass, mortality status, landings, and infrastructure. Such information (particularly landings) is not shared by fishermen, and existing data are not easily shared between the states. It is unclear whether the existing regulations are appropriate or being adequately implemented or if Raritan Bay has the biomass to support a larger fishery.

Opportunities

Work in partnership with recreational fishing interests to create a shared recreational fishing data repository as a first step towards identifying research needs that will inform better management of Raritan Bay recreational fishing.

Conch/Whelk

Insights

The conch or whelk fishery is growing in popularity on the Bay. New Jersey has imposed a size limit and New York is in the process of adopting regulations and reporting requirements.

Opportunities

Consider adopting common size limits for whelk, potentially a model for other fisheries.

Public Access

The Public Trust Doctrine in both states protects the rights of the public to physically pass to, from, and along tidal waterways and shores. Raritan Bay boasts a diverse variety of over 4,500 acres of publicly accessible waterfront space, ranging from esplanades and marinas to the beaches of the Raritan Bayshore, Sandy Hook, and Conference House Park. Access, however, is not equally distributed, and residents still face challenges as to facility access, safety, and where and how to get onto the water. There are numerous public land managers and non-profit stewards of the Bay. The National Park Service, state, county, and local public agencies, non-profit organizations like Raritan Riverkeeper, Sustainable Raritan River Initiative, the Natural Resources Protective Association, the Lower Raritan Watershed Partnership, NY/NJ Baykeeper, the American Littoral Society, and multiple others are active in the area.

Bill Schultz/Raritan Riverkeeper

Raritan Bay's accessible waterfront spaces offer an opportunity for public education and engagement about the estuary.

Insights and opportunities

While there is a great deal of public access in the region, there remain other physical and non-physical barriers to access. Increasing public access and awareness of access can be used as a tool for public education and engagement with estuary issues – promoting what the Bay has to offer and making the connection between watershed impacts and the health/provision of these services. At a regional scale, the Hudson-Raritan Estuary Comprehensive Restoration Plan sets the goal of creating or upgrading one public access point every year, benefiting fishers, boaters, swimmers, and local residents throughout the Hudson-Raritan Estuary. However, translating between the intention of these goals and progress on the ground in both states is needed. More specific opportunities for all areas include assessing the quality and quantity of public access in the region; promoting access; and using planning as a tool to collaborate on identifying strategic areas for establishing new and improving existing access.

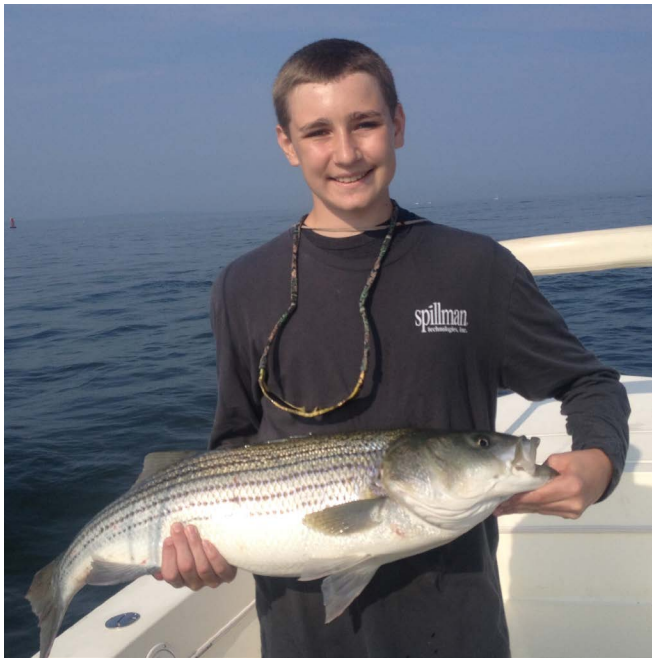
Bathing Beaches

Insights

Swimming occurs along the many beaches throughout the Bay. Beaches classified as either bathing or non-bathing are monitored in Monmouth County on a weekly basis during the recreational season. Monitored beaches include Ideal and Thompson Avenue beaches in Middletown, Miller and Recreation Center beaches in Highlands, and Sandy Hook/ Gateway National Park. Wolfe's Pond Beach on Staten Island is also monitored. Monitoring in other areas is limited and there are areas where swimming occurs where no water quality testing is conducted. Funding for lifeguards and bacteria monitoring are challenges for smaller communities.

Opportunities

Support ways to improve use and public awareness of access opportunities and water quality of Raritan Bay, fostering the connection between residents and Raritan Bay. Opportunities include multi-lingual education programs that increase the understanding of water quality in the region, supporting water quality monitoring and improvement projects, as well as improving bi-state communication and rapid alert networks that support bathing and fishing.



Paul Eidman

Fishing is an important community connection to Raritan Bay, but access points are limited in some areas.

Connections to Greenways/Trails

Insights

Physical connections to Raritan Bay and awareness of those connections between publicly accessible lands could be improved. The Henry Hudson Trail is a prominent greenway in Monmouth County, spanning 24 miles along the Bayshore. Parkland and greenways on the southern shore of Staten Island provide relatively consistent access to Raritan Bay.

Opportunities

Expand on opportunities to physically connect existing parks and increase awareness of those connections through efforts related to National Water Trails designation, wayfinding signage, development of new greenways and paths, access point signage, marketing and other means. The NY-NJ Harbor & Estuary Program is currently assessing gaps in waterfront access, which could also form the basis for a regional trails and public access plan.

Recreational Fishing and Boating

Insights

According to research by New Jersey Sea Grant, the southern Raritan River and Bay possess 36 marinas that are accessible to the public, four of which have public launch ramps (there are five additional municipal launches). On the south shore of Staten Island, there are three key launch points – Great Kills Park, the Princess Bay Boatmen's Association marina (Lemon Creek), and Conference House Park (beach-launch only). Areas with more private and commercial development, such as at the mouth of the Raritan River and Arthur Kill, and the Navesink and Shrewsbury rivers, provide less access. One challenge in some areas is access points are narrow, which can be problematic for anglers. A primary challenge to boat access is funding for maintenance and improvements of docking and launching facilities.

Opportunities

Use locally driven planning efforts in both states to consider ways of increasing and improving access for fishing and boating in the Bay.

NY/NJ Baykeeper

Raritan River near its mouth and Raritan Bay are home to at least 36 publicly accessible marinas.

Climate Resiliency

Climate change is a global phenomenon that will have far-reaching effects on natural resources, built infrastructure and populations. With the exception of sea level rise (occurring in the Bay at a higher rate due to subsidence of the Atlantic Coastal Plan), the effects of climate change in Raritan Bay will generally follow global projections of higher temperatures and more extreme weather and storm events. By 2050, 70% of summers in the region are projected to be warmer than the warmest summer on record. That percentage will increase to 90% by the turn of the century. More extreme events – both wetter and drier – are likely to lead to more significant flooding and drought. And, while there is little evidence that the number of storms will increase, there is evidence that the intensity and frequency of the most intense storms (and associated surge) will increase. If higher sea level rise projections are realized, the return period for storms like Sandy may be close to 20 years by 2100. By 2050, sea level could be two feet higher in Raritan Bay, and more than four feet higher by 2100. These stressors are likely to affect ecosystems and infrastructure, exacerbating existing impacts from development, pollution, and other factors.[1] Recently, Superstorm Sandy was an alarm, influencing the status of regional goals for preparedness.

Mike Fedosh

Extreme storm events, sea level rise, and storm surge are likely to impact the region, among other effects from climate change.

Insights and opportunities

Conference participants discussed efforts underway to better integrate the latest research and planning efforts focused on climate change impacts and adaptation into decision-making. Efforts on both sides of the Bay include development of regulatory standards; assimilation of the latest climate science to assist decision-makers and planners; engagement of stakeholders in considering long term impacts of climate change on communities; encouragement of more community input into resiliency planning; development of financing strategies for climate preparedness; implementation of resilient gray and green infrastructure demonstration projects; and development of tools for resilience planning. Participants recognized the value added in building from these existing foundations to advance information sharing, joint research, and bi-state strategies to enhance the resilience of Raritan Bay.

Insights

Of particular interest were the combined effects of storms with sea level rise on Raritan Bay and surrounding communities, and the potential mitigating effects of green infrastructure and nature-based features. Participants expressed interest in more information on projected climate change impacts specific to Raritan Bay and its tributaries.

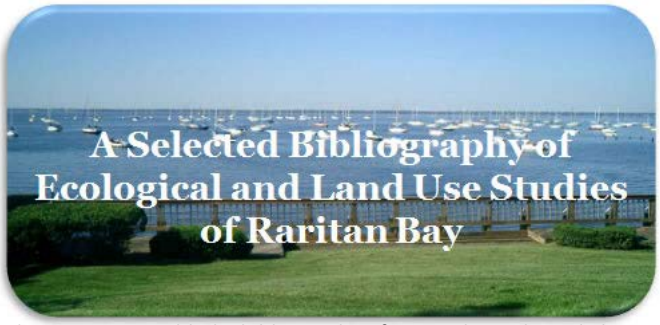
Opportunities

Conduct further regional analysis and modeling on the effects of coastal storms and surges combined with precipitation and inland flooding hazards, and on the regional effects of proposed solutions. Collaborate on green infrastructure and nature-based feature demonstration projects to inform state, federal, and local priorities and promote the resiliency benefits of natural systems. Bi-state collaboration in these areas presents opportunities for setting a Bay-wide agenda for climate resiliency.

[1]NJCAA. 2013. *Resilience. Preparing New Jersey for Climate Change: A Gap Analysis from the New Jersey Climate Adaptation Alliance.*

ADDITIONAL RESOURCES AND ACKNOWLEDGEMENTS

The New Jersey Department of Environmental Protection assembled a bibliography of research conducted about Raritan Bay, available at http://nj.gov/dep/dsr/raritanbay. Additionally, a video about Raritan Bay was developed for the conference, and can be watched on the NY-NJ Harbor & Estuary Program's YouTube channel. For the complete conference agenda, please visit www.harborestuary.org or www.raritan.rutgers.edu/. For more information about the event or Raritan Bay, contact info@harborestuary.org or raritan@ejb.rutgers.edu.



The NJDEP assembled a bibliography of research conducted about the Bay in advance of the conference.

Conference Steering Committee members

Doug Adamo, NPS
Carl Alderson, NOAA
Kate Anderson, EPA
Pinar Balci, NYCDEP
Richard Balla, EPA
Lisa Baron, USACE
Thomas Belton, NJDEP
Kate Boicourt, NY-NJ HEP
Peter Brandt, EPA
Linda Brennen, Monmouth Co.
Gary Buchanan, NJDEP
Ed Burke, SI Borough President's Office
Meredith Comi, NY/NJ Baykeeper
Robert Englert, SI Borough President's Office
Jessica Fain, NYC Planning
Dominick Fresco, NJDEP
Bruce Friedman, NJDEP
Dorina Frizzera, NJDEP
Ariane Giudicelli, NY-NJ HEP
Abigail Golden, NY-NJ HEP
Karen Greene, NOAA
Biswarup Guha, NJDEP
Sarah Harpaz, Rutgers University
Jeanne Herb, Rutgers University
Venetia Lannon, NYSDEC
Tony MacDonald, Monmouth University
Keith Mahoney, NYCDEP
Sara Malone, Rutgers University
Debbie Mans, NY/NJ Baykeeper
Susan Maresca, NYSDEC
Michael Marrella, NYC Planning
Christopher McNamara, NY Governor's Office
Jeff Myers, NYSDEC
Negron Nesmarie, EPA
Rob Pirani, NY-NJ HEP
Evelyn Powers, Interstate Env. Commission
Beth Ravit, Rutgers University
Joseph Reynolds, Monmouth Co. Park System
Judy Shaw, Rutgers University
Clay Sherman, NJDEP
Dennis Suszkowski, Hudson River Foundation
Nick Tufaro, Middlesex County Planning
Alex Zablocki, NY Governor's Office of Storm Recovery

New York - New Jersey Harbor & Estuary Program
www.harborestuary.org

HUDSON RIVER FOUNDATION
for Science & Environmental Research

Sustainable Raritan River Collaborative

RUTGERS
THE STATE UNIVERSITY OF NEW JERSEY

Bill Schultz/Raritan Riverkeeper

This report and the conference was produced by HEP (Robert Pirani, Ariane Giudicelli, Kate Boicourt) in Partnership with SRRI (Sara Malone, Judy Shaw, Jeanne Herb) with the assistance of the Conference Steering Committee members. Although the information in this document has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreements with the Hudson River Foundation, it has not undergone the Agency's publications review process and therefore, may not necessarily reflect the views of the Agency and no official endorsement should be inferred. The viewpoints expressed here do not necessarily represent those of USEPA, members of the Management Committee of HEP, the Conference Steering Committee, or the SRRI Steering Committee, nor does mention of trade names, commercial products or causes constitute endorsement or recommendation for use.