

Action Plan For the New York-New Jersey Harbor Estuary Program (Draft June 17, 2008)

Harbor Estuary Program Mission Statement

Designated as an Estuary of National Significance by the Clean Water Act in 1987, the New York-New Jersey Harbor Estuary is a complex ecological system in the midst of a major urban center and port.

The New York-New Jersey Harbor Estuary Program provides a forum to develop and implement actions that improve the health of the Estuary by convening a partnership of interested stakeholders, utilizing sound science to analyze the issues, and working to carry out recommendations that are environmentally and economically responsible.

This Action Plan highlights the important environmental issues facing the New York-New Jersey Harbor Estuary that the participants in the New York-New Jersey Harbor Estuary Program (HEP) are striving to address. It is organized around five major themes or goals: *Clean Up Pollution in the Estuary; Habitat and Ecological Health; Improve Public Access; Support an Economically and Ecologically Viable Estuary and Port; and Public Education and Community Involvement.*

Each of the five themes within this Action Plan describes the challenge, accomplishments to date, and priority actions recommended by HEP. Both Science and Stewardship are important to restoring the harbor as noted in many of the priority actions.

HEP believes that a continued dialogue with all interested parties is important to the development of scientifically sound recommendations and actions. HEP will continue to undertake technical discussions and review all scientific analyses within the forum of the various work groups. Regulatory actions taken outside of HEP by individual agencies clearly benefit from the broad participation facilitated by HEP.

This document will be updated periodically to reflect new information, evolving priorities, and progress on recommended priorities. It is meant to be an organizing instrument used to assist with the implementation of the major actions in HEP's Comprehensive Conservation and Management Plan.

Goal 1 – Clean up Pollution in the Estuary: All of the Harbor waters will meet the Fishable/Swimmable goal of the Clean Water Act.

There are four sub-goals that make up Goal 1: Pathogens, Nutrients, Toxics, and Floatables. Each is presented separately below.

Goal 1A Pathogens: Increase the area for shellfish harvesting and eliminate bathing beach closures while maintaining protection of human health.

Challenge:

The Final Comprehensive Conservation and Management Plan (CCMP) prepared by the New York-New Jersey Harbor Estuary Program has identified two human use impairments due to pathogen contamination -- beach closures and shellfish bed closures. Pathogens are disease-causing microscopic bacteria, protozoans, and viruses. They are present in untreated or inadequately treated human sewage and domestic and wild animal wastes. Primary sources of pathogens include Combined Sewer Overflows (CSOs), sewage treatment plant malfunctions, illegal connections to storm sewers, inadequately maintained infrastructure, vessel sewage discharges, urban runoff and other non-point sources of pollution. Bacterial indicators are currently used to evaluate the potential for pathogen contamination.

Bacterial water quality for recreational bathing is generally acceptable on the New Jersey and New York coasts on the Atlantic Ocean (New Jersey coastline south of Sandy Hook and the south shore of Long Island). Occasionally, however, certain beaches are closed because of elevated coliform concentrations. These elevated levels usually result from wet weather events as a result of storm water discharges and CSOs, and less frequently, from malfunctions in wastewater collection and treatment systems.

Accomplishments to Date:

The effective control of pathogens needs to take the form of both large scale capital projects as well as smaller scale “best management practices” that can be undertaken by many stewards. Numerous capital projects have been carried out by municipalities in NY and NJ that have resulted in improvements in pathogens in recent decades. These projects include increased in-line storage within the sewage system or separate storage tanks such as those at Paerdegat Basin and Flushing Creek to hold excess volume until it can be treated. NYCDEP has developed a comprehensive CSO abatement program to improve water uses throughout the City. The program divides the City into eight CSO planning areas, which together cover the entire City’s waterbodies. NYCDEP and the NJ CSO communities have fully implemented the Nine Minimum Control requirements of the National CSO Control Policy to reduce the impacts of rainfall-induced discharges, particularly from CSOs. The HEP Pathogens Work Group has been working to assess water quality as it relates to pathogens and to review the data and modeling that will be used to determine the necessary load reductions. The results of this work will ultimately be considered by the states as they develop TMDLs for the harbor. Improved stormwater management will ultimately have positive impacts on CSO discharges in combined

systems. HEP partners are increasingly looking to green infrastructure, such as green roofs and rain gardens, to assist in the reduction of CSO events.

Priority Actions for Pathogens:

1. Complete Pathogens Assessment for Harbor.

- **Science:** By 2009, complete the technical analysis for the attainment of water quality standards for pathogens, including establishment of any necessary reduction targets. (*Responsible entities: Analysis is being conducted and coordinated by the HEP Pathogens Work Group (PWG).*)

2. Support for the Green Technology Initiative.

- **Stewardship:** By 2009, the PWG will identify means of supporting the use of green technology to minimize the amount of stormwater runoff throughout the NY/NJ Harbor. This support may be through grants to groups to purchase rain barrels, develop Green Roofs and/or Blue Roofs, and carry out research and pilot studies to determine the effectiveness of Green Technology and Construction methods. NYC currently has a Stormwater Best Management Practice (BMP) Task Force that is the lead for this effort within NYC. Existing New Jersey regulatory and incentive programs do and will continue to encourage green stormwater technologies. (*Responsible entities: PWG and NYCDEP.*)

3. Expand No Discharge Zone.

- **Stewardship:** By 2009, a no discharge zone for sanitary waste from recreational and commercial vessels for New Jersey side of the Hudson River will be completed and will compliment the already approved New York designation. (*Responsible entity: NJDEP.*)
- **Science:** NJDEP and NYSDEC will evaluate feasibility of establishing additional no discharge zones within the harbor core area. (*Responsible entities: NJDEP and NYSDEC.*)

4. Expand area permitted for shellfish restoration.

- **Science:** By 2010, evaluate potential water quality improvements expected by implementing pathogen load reductions and identify areas where the size of the shellfish closure could be reduced, as well as adequate enforcement of regulations that would allow for restoration of shellfish populations for ecological purposes and/or shellfishing while assuring public health protection from the consumption of tainted shellfish harvest. (*Responsible entities: NJDEP and NYSDEC.*)

5. Complete and Implement CSO Plans.

- **Stewardship:** Upon completion of pathogen load allocation effort,

complete all CSO Long Term Control Plans and set targets for implementation (*Responsible entities: NYC and NJ CSO communities responsible for preparation of Plans; States responsible for overseeing and approving Plans.*)

Goal 1B Toxics: Eliminate toxicity or bioaccumulation impacts on living resources by reducing contaminant inputs and cleaning up contaminated sites, and manage risk to humans from seafood consumption.

Challenge:

Toxics contamination is perhaps the most serious and challenging problem facing the New York/New Jersey Harbor Estuary. Organic and inorganic contaminants, including PCBs, dioxins, mercury and polycyclic aromatic hydrocarbons (PAHs), have poured into the estuary over time. While much of the discharges have been curtailed over the years, there are still active inputs of contaminants through leaks and spills, industrial discharges, erosion of historically contaminated sediments, sewage treatment plants, combined sewer overflows, atmospheric deposition and tributary runoff. Since most of the problematic contaminants are persistent and relatively insoluble in water, they have accumulated in sediments of the estuary, making them troublesome for years to come.

Current public health, economic and ecosystem problems that result from contaminants include: *Fish consumption advisories and bans:* Fish and crustaceans in the estuary accumulate hazardous amounts of contaminants prompting officials to issue health advisories for the consumption and commercial fishing bans. *Dredged material disposal:* Bottom sediments in navigation channels are typically found to be too contaminated to be placed in the ocean and/or require substantial additional costs to dispose. Costly alternative disposal practices must therefore be utilized, escalating port maintenance costs. *Ecosystem damage:* While the full range of contaminant effects to the estuarine ecosystem are currently unknown, some effects, like sediment toxicity and impaired benthic community structure, persist.

Accomplishments to Date:

The Assessment Phase of the *Contamination Assessment and Reduction Project (CARP)* was completed in September 2007. The project undertook a massive field data collection and modeling effort to identify problematic areas and contaminant source categories, and to project the effects of various clean-up and management options. As a next step, CARP plans to move into the Implementation Phase. *The Lower Passaic River Restoration Project*, combining Superfund with the Corps of Engineers' restoration planning, was initiated to develop cleanup strategies for the severe sediment contamination of the lower Passaic River. EPA and NJDEP are currently evaluating early actions available to address and remediate contaminated sediments within the lower 8 miles of the Passaic River, while a broader study of 17 mile of the lower Passaic River moves forward. *Toxics trackdown work* has been undertaken by a number of groups including NYSDEC, NJDEP, and the New Jersey Harbor Dischargers Group. There has been success in refining techniques and identifying a limited number of PCB sources. A trackdown effort within the Linden Roselle system is ongoing. The New York Academy of Sciences has undertaken an assessment of track-down techniques related to this work. A number of sediment decontamination processes have been developed by a consortium of agencies

and institutions and will provide additional options for the management of contaminated sediments.

Priority Actions for Toxics:

6. Complete Toxics Assessment for the Harbor.

- **Science:** By 2009, complete the technical analysis for the attainment of standards for toxics, including establishment of any necessary reduction targets. (*Responsible entities: Effort is being coordinated by the HEP Toxics Work Group (TWG) and must ultimately be implemented by the States*)¹

7. Investigate and Initiate Toxic Reduction Actions.

- **Science:** The newly formed toxics implementation work group will assess practical toxic load reduction methods to be considered when developing the load reduction implementation plan in 2009. (*Responsible entities: EPA and the states*)

Goal 1C Nutrients: Eliminate the adverse impacts of hypoxia and nutrient enrichment that result from human activities.

Challenge:

Excessive levels of nutrients, including carbon and nitrogen, have historically caused low dissolved oxygen conditions at locations throughout the New York-New Jersey Harbor. While water quality surveys have demonstrated that average annual conditions have improved significantly since implementation of the Clean Water Act (CWA) began in the 1970's, some areas of the harbor still do not meet the fishable/swimmable goals of the CWA. A complete assessment of dissolved oxygen in the harbor and development of appropriate actions is a complex undertaking. Conditions in many of the New Jersey waters of the Harbor are only now being more fully documented as a result of a new monitoring and reporting program. Additional factors that need to be considered are the various layers of water quality standards, proposed revisions to some of these standards, field verification of the actual benefits of facility upgrades already underway, and the impact of nonpoint source reductions (i.e. stormwater) and other activities in the watershed. The System Wide Eutrophication Model (SWEM) is the modeling tool that is being utilized by HEP to address dissolved oxygen conditions in the Harbor.

Achievements to Date:

The Nutrient Work Group (NWG) is currently working with a contractor to *evaluate water quality conditions*, assess loading reduction scenarios necessary to achieve those reductions, and develop management actions needed to achieve the fishable/ swimmable goals of the CWA. *Numerous capital projects* have been carried out by municipalities in NY and NJ that have resulted in significant improvements in dissolved oxygen levels in recent decades. Examples include upgrades at Owls Head POTW in NY and Passaic Valley Sewerage Commissioners (PVSC) in NJ. Additional projects are planned or are being constructed in East River treatment plants, and at other locations, as a result of the Long Island Sound (LIS) Total Maximum Daily Load (TMDL). The New Jersey Harbor Dischargers Group (NJHDG) has initiated a *water quality monitoring program* in New Jersey waters that is in every way, complimentary to the long time NYCDEP Harbor Survey and the results of both efforts are to be combined and reported on an annual basis.

Priority Actions for Nutrients:

8. Establish baseline loadings.

- **Science:** In anticipation of future carbon and nitrogen load reductions, the Nutrient Work Group (NWG) will establish the baseline loadings for point and non-point sources by 2008 (completed) from which any future loadings reductions will be made. (*Responsible entities: The NWG is coordinating this effort with funding from HEP for contractor assistance*)

9. Challenge grants for Best Management Practices (BMPs).

- **Stewardship:** By 2012, establish challenge grants for municipalities to implement BMPs to reduce loadings of carbon and nitrogen. Possibilities include revegetating stream buffers, programs to reduce application of fertilizers in areas that are prone to runoff, etc. NYCDEP has established a Best Management Practices task force for Jamaica Bay and the NWG will likely benefit from their findings and recommendations. (According to informal discussions with NYCDEP, funding on the order of \$20 million per year would be desirable, but no funding has been identified to date). (*Responsible entities: States*)

10. Data collection arrays.

- **Science:** By 2010, deploy additional data collection arrays to continuously monitor dissolved oxygen in critical areas of the harbor. Data from these arrays would supplement data collected for the harbor-wide survey. (*Responsible entities: NJHDG and NYCDEP*)

11. Assess Dissolved Oxygen in New York Bight.

- **Science:** Dissolved oxygen modeling work being conducted for the harbor is indicating that there may be a dissolved oxygen issue in the Bight as well, though the data to support the modeling there is not as extensive as would be desired. Therefore, EPA has embarked on a sampling effort that will take place in 2008 and 2009 that should provide sufficient new data to better calibrate the model for the Bight. This will allow a better assessment of conditions. HEP will also consider other technologies, such as gliders, for providing additional dissolved oxygen data. (*Responsible entities: EPA is collecting the data and initial analysis is funded by HEP. Funds for any future recalibration of the model have yet to be identified. NJDEP will take the lead on assessing the applicability of gliders based information to this effort*).

12. Complete Nutrients Assessment for the Harbor.

- **Science:** By 2009, complete the technical analysis for the attainment of water quality standards for nutrients, including establishment of any necessary reduction targets. (*Responsible entities: Effort is being coordinated by the HEP Nutrients Work Group (NWG) and must ultimately be implemented by the States*)²

13. Financing for Capital Projects.

- **Stewardship:** According to cost analysis reports produced by both the NJHDG and the NYCDEP, the potential cumulative costs for nitrogen and carbon reduction capital projects and operation and maintenance at

wastewater treatment facilities run into billions of dollars. However, in order to implement even a portion of these major projects described in the two reports, a federal, state and/or local financing plan will need to be developed. (*Responsible entities: to be determined.*)

Goal 1D: All of the Harbor will be essentially free from **floatable debris**.

Challenge:

In the 1980s, floatables debris (buoyant waterborne waste material such as wood, cans, bottles, plastic; buoyant sanitary and medical waste) caused significant beach closures in the NY-NJ Harbor, while also adversely impacting recreational and commercial boating and coastal marine species. These hazards, although significantly reduced over the years, remain a major concern related to the current impact of floatables on the economy and environment in the Harbor. Key sources of floatables in the NY-NJ Harbor include CSOs, storm water discharges, non-point sources (from solid waste handling systems, littering, etc.), decaying shoreline structures and vessel discharges. Resuspension of already deposited floatable materials during high tide is also a significant contributing factor.

Accomplishments to Date:

Due to the efforts of the interagency HEP Floatables Workgroup, a Floatables Action Plan was put in place in 1989, resulting in significant reduction in beach closures through identification and collection of floatable debris in the Harbor Complex. This plan was updated and enhanced in 2008. In 2004, 2005 and 2006 there were no closures at the NY-NJ Harbor beaches caused by floatables wash-ups, however, in 2007 there were two incidents of beach closures due to floatables of undetermined origin at New Jersey beaches.

A number of stewardship groups, such as the American Littoral Society and the Passaic River Restoration Initiative, conduct ongoing debris clean up programs in tributaries, wetlands and other important areas of the harbor.

New Jersey has adopted the most stringent CSO Solids/Floatables Control requirement for CSOs in the Nation. All New Jersey CSO Permittees must capture and remove Solids/Floatables which can not pass through a bar screen having bar spacing of ½ inch. In the NY/NJ Harbor Estuary Complex 83% of New Jersey's CSO have Long-Term CSO Solids/Floatable Control Measures constructed and operational. (*Insert specifically what NYCDEP has done.*) In addition, a number of agencies in both New Jersey and New York have beach and/or shoreline clean-up programs in place.

Control of floatables discharged by municipal sewer systems has been and remains a key challenge. Both New Jersey and New York City are undertaking aggressive floatable control programs as part of their respective CSO abatement programs. In addition, a number of agencies in both New Jersey and New York have beach and/or shoreline clean-up programs in place.

New Jersey also implements a strong stormwater program, particularly for its Phase II MS4s. New Jersey designated the entire State for MS4 permit coverage, issuing four

MS4 permits: (1) densely populated and coastal communities, (2) rural communities, (3) public complexes, and (4) highway agencies.

Priority Actions for Floatable Debris:

14. Reduce Street Litter.

- **Stewardship:** Reduce the amount of New York City floatables originated from street litter (predominant source of CSO floatables in the City) by implementing street sweeping and other floatables control measures, as indicated by increasing percentage of streets rated Acceptably Clean from 72% in 1994 to 92% or higher by 2009 (*Responsible entities: NYCDEP*).

15. Floatables Action Plan.

- **Stewardship:** Continue the multi-agency Floatables Action Plan, coordinated by EPA and designed to identify and collect floatables slicks in the NY-NJ Harbor before they exit the Harbor and threaten beaches in Brooklyn, Staten Island, and Nassau County on the NY south shore of Long Island and the NJ bay and ocean beaches. (*Responsible entities: USEPA, Corps, NYCDEP, and PVSC*)

16. Floatables Control at CSO Points and on Beaches.

- **Stewardship:** Continue and enhance floatables controls at CSO points and shoreline cleanup efforts, to prevent floatables from entering the Harbor (*Responsible entities: NYCDEP, NJDEP*)

Goal 2: Habitat and Ecological Health – Preserve, manage, and enhance the Estuary’s vital habitat, ecological function, and biodiversity so that the Harbor is a system of diverse natural communities.

Challenge:

As with all urban estuaries, the New York-New Jersey Harbor Estuary has lost much of its historical natural habitat. The remaining plant communities and habitats are important for their own sake, but are also critically important for sustaining the hundreds of species that depend on them. These valuable natural areas also provide much needed open space for humans. There is intense pressure to develop many of the remaining unprotected habitat areas for commercial, residential, recreation, transportation, and other purposes. Financial resources for the acquisition and protection of these sites is far less than what is needed. In many cases, the owners of the sites are also not willing sellers. Degradation of habitat has also been a problem. Toxic contamination of soil and sediments, historical and illegal filling of wetlands, interference with natural hydrological functions, and overuse are among a few of the stressors in place on habitats in the harbor.

Accomplishments to Date:

The Habitat Work Group (HWG) has continued in its quest to serve as a regional forum and catalyst for efforts focused on maintaining and restoring an ecologically healthy ecosystem. Specifically the HWG aims to conceive of and help guide programs that will restore the region’s ecosystems in such manner as to promote their biodiversity, increase and protect ecologically important open space, encourage sound watershed management, decrease erosion and pollution of the watershed, increase public access, and increase public awareness of the Harbor’s ecological and recreational values. Currently, the main focus of HEP related to habitat is to assist with the refinement and utilization of the Target Ecosystem Characteristics (TECs) and the ultimate completion of the Comprehensive Restoration Plan (CRP). The CRP is anticipated to be the blueprint for habitat restoration for the harbor. HEP is also: working with the Corps to combine and refine habitat site acquisition and restoration datasets; making site information available on the web through OASIS; supporting the completion of the Harbor Herons Conservation Plan; and supporting planning for small scale habitat restoration projects (Rahway fish passage and Idlewilde Park wetland restoration).

New Jersey recently adopted a new flood hazard area control act that establishes riparian habitats to protect ecologically significant habitat to enhance water quality.

Priority Actions for Habitat:

17. Habitat Preservation/Land Acquisition.

- **Stewardship:** Utilize the HEP site list to focus preservation of an additional 500 acres in Jamaica Bay, Hudson River, Hackensack Meadowlands, Arthur Kill, western Long Island Sound and Raritan Bay watersheds by 2012. Funding for current state and local acquisition programs should be augmented. (*Responsible entities: NJ Green Acres, NY Open Space program and others*)

18. Initiate Pilot Scale Restorations:

- **Stewardship:** Use the Target Ecosystem Characteristics (TEC) approach to identify and initiate at least 4 small scale pilot habitat restoration projects by 2009. As an outgrowth of the eelgrass TEC workshop, an eelgrass test planting proposal for Jamaica Bay has been submitted by Cornell Cooperative Extension and a permit is pending with NYSDEC. HEP has funded a second year of anadromous fish restoration planning at the Rahway River Water Supply Dam and will hopefully be ready to seek construction funds in 2008. Additional possible projects could include oyster reef restoration demonstrations, waterbird island vegetation restoration, etc. (*Responsible entities: HEP Office will work with restoration partners to identify projects and sites*).

19. Complete Harbor Herons Conservation Plan.

- **Science:** Harbor Herons Work Group shall complete Harbor Herons Conservation Plan by 2008 and set priorities for action. (*Responsible parties: Harbor Herons subcommittee will complete the plan by December 2008 utilizing HEP funding to support editing of plan*)

20. Complete the Comprehensive Restoration Plan.

- **Science:** Complete the Comprehensive Restoration Plan (CRP) for the harbor by December 2008, set priorities for restoration by 2009, and seek funding to complete 3 major projects by 2011 (*Responsible entities: Corps and others.*)

21. Support the Interior Restoration at Liberty State Park.

- **Stewardship:** Working in conjunction with the ACOE, the NJDEP will continue its work to restore the interior of Liberty State Park (LSP). In all, 251 acres of LSP will be restored and new diverse habitats will be created including freshwater and saltwater restorations, Grassland habitats, rain gardens, and early successional fields. Continue to advocate for the federal appropriation of funding through the Army Corp of Engineers. (*Responsible entities: NJDEP, Corps, and others*)

Goal 3: Improve Public Access - Ensure that all residents in the core area of the Harbor have a public waterfront access site within thirty minutes of their home for boating, fishing, swimming and/or waterfront leisure (e.g. walking, bird watching, and picnicking), without harming important habitat areas or compromising waterborne commerce.

Challenge:

The tremendous water quality improvements that have come since the Clean Water Act and other landmark environmental legislation have created the highest ambient water quality in memory. The emerging public awareness of this improvement has fueled a growing desire for more waterfront and water use. Access to the waterfront and waterways is fundamental to sustaining this momentum to improve water quality. Increasing public understanding of all the processes—particularly the natural processes such as tides and floods can dramatically influence our relationship to the waterfront and waterways. Given the dramatically varied conditions encountered along urban waterways (e.g., tides, currents, marshes, habitat areas) there is a constant need for very site specific treatments that can address the physical conditions needs of each site, including the residential and the natural community that surrounds it. As projects develop, critical elements such as ramps, floats, running water or utilities are cut out of the project as constructions estimates and costs rise. Ultimately, concerns over liability have tremendous and often negative influence over waterfront design and programming, which has the unfortunate consequence of either reinforcing the dated perception that the water is neither clean nor safe.

Accomplishments to Date:

In 2007 the NYNJ Baykeeper and Metropolitan Waterfront Alliance completed a HEP sponsored *Public Access Inventory* that will be used as a baseline for existing public access points in order to quantify progress towards improving access. There are a *variety of efforts* currently underway to help create new access points all over, as well as to tie the region together with continuous routes of access – both along the waterfront as well as on and across the water in the form of greenways and water trails. Projects such as the Liberty State Park to Delaware Water Gap trail are in development, as is the national East Coast Greenway that will connect cities along the east coast of the United States. The Hudson River Water Trail is a network of human-powered boat launches and waterfront campgrounds that line the shores of the Hudson, and the concept of water trails is gaining popularity region-wide. New Jersey has been working on developing the Hudson River Walkway, which is a continuous public pedestrian access trail along the Hudson River from the George Washington Bridge to the Bayonne Bridge.

Priority Actions for Public Access:

22. Recognize and Address Challenges to Public Access.

- **Stewardship:** Improving public access requires a balancing of land ownership, public safety, liability concerns, habitat protection and various regulatory requirements. The Public Access Work Group will create a plan on how to address these issues and present it to the Management Committee by December 2008. Issues to be addressed in the plan include: Creating equity in terms of communities and socioeconomic groups who have access to the waterfront within a 30 minute walk, bike or transit trip; improving safety in terms of waterfront design (including creating a network of landings), education, and training of waterfront personnel; dispelling myths about water quality and safety of estuary related recreation; influencing design of public park projects by outreach to parks planning, design, and operating agencies; and putting public access higher on the agenda of public agencies involved in waterfront development. Projects will be identified and implemented according to the Public Access work plan (*Responsible entity: Public Access Work Group*).

Goal 4 – Support an Economically and Ecologically Viable Estuary and Port - The Port of New York and New Jersey will be an integral and complementary part of the world-class NY-NJ Harbor Estuary that is environmentally sustainable, economically efficient, and safe for commercial and recreational navigation.

There are three sub-goals that make up Goal 4: Sediment Quality, Sediment Quantity, and Navigation. Each sub-goal is presented separately below.

Goal 4A: Sediment Quality- Reduce sediment hot spots and point and non-point sources of contaminants entering the Harbor, such that levels of toxics in newly deposited sediments do not inhibit a healthy thriving ecosystem and can be dredged and beneficially reused.

Challenge:

The Harbor Estuary suffers from widespread contamination of sediments from current and historical sources. Bioavailable contamination has resulted in reduced recreation, reduced water quality, reduced habitat quality and reduced fisheries. Contamination of navigational dredged materials has resulted in multi-fold increases in dredging costs over the past decade. Although very few of the Harbor Estuary sediments can be considered clean, there are insufficient funds to remediate the entire bottom. Multi-jurisdictional complexity make identifying sediment quality remediation projects, evaluation of needed projects, and development of cost-effective remedial alternatives more challenging. Improving sediment quality faces many difficulties including: 1) A wide range of legacy and active pollutant sources, many of which cannot be easily identified or controlled; 2) incomplete understanding of physical and biological processes that transport, alter, and concentrate pollutants in the watershed system; 3) diffuse and fragmented regulatory structure that does not specifically address sediment quality; 4) lack of regulatory consensus on sediment quality standards; and 5) poor recognition by stakeholders of the connection between upper parts of the watershed and the Harbor Estuary. New sediments entering the Harbor Estuary are, for the most part, originating outside of the Harbor proper from erosion of various parts of the watershed. While the current federal and state regulatory system has adopted numerous enforceable criteria and standards for water and biota, there are no such criteria and standards for sediments. There are, however, a few benchmarks that are being used in this region to determine potential effects of contaminated sediments on human health and the environment.

Accomplishments to Date:

The Contaminant Assessment and Reduction Project (CARP) program was completed in 2007 and has produced a state of the art model that identifies areas that present the greatest threat to different water body uses today and in the future. The model allows for the determination of the impact of management scenarios on future surficial sediment quality in the Harbor Estuary from a dredge materials management perspective. CARP

also identified and evaluated the significance or insignificances of certain sources such as tributaries, legacy sediments, sewage treatment plants, landfills, wastewater, CSO discharges and stormwater through collection of data and the creation of a modeling tool. The modeling tool will allow managers to evaluate different scenarios to assess their potential contribution to the quality of the Harbor Estuary. Development of a Total Maximum Daily Load (TMDL) for toxics in the Harbor Estuary is underway. Investigation and cleanup of major sources (Hudson River PCB site and the Lower Passaic River) are proceeding. In addition, landfill and brownfield remediation programs in New Jersey and New York have met with success at reducing localized sources. EPA's REMAP program, which includes chemical measurements and an index of biological integrity, has conducted three separate surveys spanning over ten years. Data from this program will continue to be valuable in analyzing trends throughout the harbor. New Jersey and EPA have evaluated sediment decontamination technologies. These technologies are being studied for application to large-scale sediment remediation projects.

Priority Actions for Sediment Quality:

23. Development of a sediment quality map of NY & NJ Harbor Estuary.

- **Science:** In order to manage / improve sediment quality in the Harbor a map would need to be developed that identifies priority areas for action based on the effect of sediments in these areas to the overall environment. But before a map could be developed, criteria would need to be identified that could be used to set priorities for action. In order to get this started, a study would have to be done on what existing criteria are out there that could be used for setting priorities, data needs for using those criteria and a survey of Harbor Estuary users, regulators and managers to identify what issues are important to them concerning contaminated sediments, and why - approx. \$150,000. (*Responsible entity: to be determined.*)

Goal 4B: Sediment Quantity- Achieve a quantity of sediments entering the Harbor system that supports the ecological health of the estuary, including protection of shallow water habitats, such as oyster reefs, without excessively impairing navigational activities.

Challenge:

The quantity of sediment and how it moves throughout the Harbor Estuary system affects environmental quality and navigational safety. The key to effective sediment quantity management is to ensure that sediment transport within the system is conducive to a healthy ecosystem, minimizes shoaling in navigation channels, and achieves the correct balance concerning input and output to the system. Much of the sediment dredged annually in the Harbor Estuary is thought to originate outside of the Harbor from erosion of various parts of the watershed. While the Harbor Estuary is nearly built-out, urban sprawl above the Harbor Estuary continues. Conversion of agricultural and forested land to impervious surface creates surges of stormwater runoff that erode streambeds and banks, resulting in high sediment loads that can damage aquatic systems and fill channels in the port. Sediment runoff rates from construction sites can be 1,000 to 2,000 times greater than those of forested lands. In a short period, construction activity can contribute more sediment to streams than would be discharged over several decades. The issue of sediment quantity is not a centralized focus area within most environmental or regulatory agencies. The challenges in trying to establish the connection between the upper parts of the watershed and the Harbor Estuary to meaningfully manage sediment quantity in this RSM plan include: 1) Size and diverse uses of the watershed; 2) diffuse nature of the program, involving many agencies and local planning groups and municipalities; 3) lack of regulatory controls over issues that have been historically considered local, and subject to "home rule"; 4) multitude of activities that would be applicable (individual construction projects, farming, large developments, road work, etc). The foundation for understanding and managing sediment quantity is to develop an overall sediment budget for the NY & NJ Harbor Estuary core area; this will complement the efforts that are underway with the CARP sediment transport modeling.

Accomplishments to Date:

Key habitats are being mapped throughout the watershed, including shorelines, tidal and freshwater wetlands, aquatic vegetation, and river bottom. Detailed mapping of New York tidal wetlands greater than 0.5 acres in size along the Hudson River south of the Troy Dam has been completed and is being analyzed to see changes over time. New York and New Jersey have stormwater management regulations that require BMPs to reduce sediment discharges from construction and have initiated educational and technical assistance programs to promote compliance and educate local governments, developers, contractors and designers on design practices that can reduce and improve the quality of stormwater discharges. The NJDEP and the NYSDEC (especially the Hudson River Estuary Program (HREP)) have partnered with county and local governments to adapt strategies protective of water quality, such as riparian and wetland buffers, comprehensive planning and stormwater ordinances. In the DMMP, the Corps has evaluated reducing dredging needs through engineering approaches to keep sediment out of or moving past maritime facilities. The HREP has conducted extensive outreach to

improve public understanding of the interconnection of Hudson Valley streams to the Harbor Estuary and has assisted in establishing and supporting watershed conservation groups and programs on the Hudson River.

Priority Actions for Sediment Quantity:

24. Re-establishment of former USGS river data stations in the Hudson River and Tributaries.

- **Science:** Many of the river data stations managed by the USGS were either shut down or taken over by the NY State DEC. River and tributary data will be essential in order to model sediment transport and sediment budgets. Annual funding to continue to operate these river stations is necessary - approx. \$120,000 per year. (*Responsible entities: USGS, NYS, others*).

25. NY & NJ Harbor Sediment Transport / Sediment Budget model.

- **Science:** In order to begin to manage sediment quantity and sediment quality issues, a greater understanding of the movement of sediment into and out of the Harbor system is needed, and the mechanisms that drive those movements. The first step would be to evaluate the existing results of the CARP Model and determine the need for additional data and modeling activities. (*Responsible entity and costs: to be determined.*)

Goal 4C: Navigation- Navigation related projects in the Harbor are designed and implemented in an environmentally beneficial manner.

Challenge:

Sediment that accumulates in navigation channels is a renewable resource that can replace non-renewable resources in a wide variety of applications. However, the dredging of sediments from channels can adversely affect water quality and aquatic communities by increasing the turbidity, and by spreading and increasing the bioavailability of contaminants. Dredging also can alter or destroy aquatic habitat, remove benthic invertebrates that fish and wildlife feed upon, and interrupt spawning and other activities critical to the fish life cycles. Nevertheless dredging is often necessary to maintain commercial navigation and is often a preferred means of addressing contaminated sediments because it permanently removes those sediments from the impacted ecosystem. It is also important to consider the short- and long-term impacts and benefits of a dredging project from an environmental, economic and navigational perspective.

Dredging and dredged material management is the aspect of sediment management with the greatest visibility and economic impact to the Harbor Estuary. Proper construction practices must be used so as not to compound dredging impacts or result in unintended effects such as the release of contaminants in transit to the processing site. Protective Best Management Practices (BMPs) to reduce turbidity, the dispersal of sediment-bound contaminants have proven effective over the years in addressing these issues. The States of New York and New Jersey have implemented consistent BMP conditions in permits issued for dredging projects in the NY/NJ Harbor, and both states are working toward a consistent set of standards for the management of dredged material at beneficial use sites within the Region.

The States and federal government must articulate clear policies and define priorities for beneficial use of dredged material. With improved coordination between operations and availability of sites for beneficial use, Brownfield/landfill remediation can benefit harbor maintenance by providing demand and placement sites for dredged material. In addition, a Public Processing Facility (PPF) to centralize processing of dredged material could reduce dredged material disposal costs, enhance options for beneficial use, and provide more predictability to meet the dredged material processing needs in the Harbor Estuary.

Accomplishments to Date:

The State of New Jersey has taken numerous steps to facilitate the beneficial use of dredged material. Legally, not only has dredged material been explicitly exempted from solid waste regulation but processed dredged material is specifically encouraged for use as a fill and capping material under the "Brownfield's Law" (PL 1997, Chapter 278, C.58:10B-1 et seq). The NJ Department of Environmental Protection carefully regulates dredging and dredged material management through its Office of Dredging and Sediment Technology (ODST). The ODST connects dredging proponents and those wishing to process or utilize dredged materials. The Department of Transportation Office of

Maritime Resources (OMR) provides policy and planning assistance.

Priority Actions for Navigation:

26. Development of a Regional Beneficial Use Plan for dredged material from the NY & NJ Harbor Estuary.

- **Science:** The Regional Sediment Management workgroup agrees that beneficial use of dredged material generated from navigation projects in the Harbor Estuary should be encouraged whenever possible, and a plan should be developed towards that goal. However, definition of "beneficial use" is the controversial part. In order to get this started, an evaluation would need to be done of possible beneficial uses of dredged material for the Harbor Estuary, linked up with potential sources and quality of dredged material, for review and consensus among interested parties - approx. \$100,000. (*Responsible entity: to be determined.*)

27. State Sediment Management Advocates - In both New York and New Jersey an advocate is essential for implementing the RSMP.

- **Stewardship:** In the past programs to manage dredging and the disposal of dredged material in both New Jersey and New York only succeeded when there was a high level advocate with an understanding of state programs, priorities, activities and constraints ensuring all parties were working towards common objectives. Without the focused efforts of such advocates, the shift to regional management will not be realized. (*Responsible entity: States of NY and NJ*)

Goal 5: Public Education and Community Involvement: Promote an informed and educated constituency involved in decisions affecting the ecological health of the Harbor and its living resources.

Challenge:

There are many competing social, economic, and environmental issues facing the Harbor region. Scores of community and regional groups are interested in estuary issues, but unfortunately, they are only able to reach a relatively small portion of the population. Awareness and appreciation of the estuarine ecosystem that entwines the area does not appear to be a high priority for many people. It is widely recognized that if people are aware of environmental issues and understand the importance of them, they will be more likely to find a way to participate. Therefore, it is one of the charges to the participants in HEP to do their best to enlighten the local residents through whatever means are feasible.

Accomplishments to Date:

In recent years, HEP has allocated a considerable portion of its budget to supporting community groups engaged in estuary-related activities through small grant programs. These grants have supported such activities as providing free kayak opportunities for the public, hosting waterfront events, shoreline clean-ups, teacher enrichment programs, etc. To reach a more academic and management-oriented group, HEP worked with the Hudson River Foundation to produce a State of the Estuary report in 2004 and plans to produce an updated version in 2009. This report provides a scientific assessment of the status and trends of a number of environmental indicators. HEP is also expecting to release the first annual harbor-wide water quality report shortly. All reports, proceedings, and other materials developed through HEP are made publicly available on the website www.harborestuary.org. In addition, the HEP Program Office arranges for annual congressional staff briefings to keep legislators informed about estuary issues and what the program is doing.

New Jersey implemented a Statewide Stormwater/Nonpoint Source Education program called "Clean Water NJ" which uses mass media to educate residents on the impacts of stormwater/nonpoint source pollution. Further information is available on the website, www.cleanwaternj.org.

Priority Actions for Public Education and Community Involvement:

28. Keep Elected Officials Informed.

- **Stewardship:** Keep elected officials within the core Harbor watershed informed of estuary issues and engage them as appropriate. HEP currently publishes a newsletter highlighting these issues that is mailed to over 1,800 individuals and organizations, including all elected officials.
(Responsible entity: The Policy Committee charged the Management Committee to work with the Citizens Advisory Committee to develop a

communications strategy for keeping elected officials informed. In the interim, individuals and advocacy groups can also provide information to elected officials).

29. Provide Environmental Status Reports.

- **Science:** HEP will produce and make available a State of the Estuary report every five years, with next edition due in 2009 and water quality monitoring reports every year. *(Responsible entity: The HEP Office will work with others to produce both of these reports.)*

30. Enhance Estuary Education and Stewardship.

- **Stewardship:** Provide small grants to an increasing number of non-profit groups and academic institutions to carry out projects that enhance estuary education and demonstrate stewardship of the estuary. *(Responsible entities: HEP Office and partners. HEP Office can provide some funding, but funds from other partners would be desirable).*

Regulatory Actions

The New York-New Jersey Harbor Estuary Program does not wield any specific regulatory authority. Rather, the program relies on the enthusiasm, wisdom, will, resources and authorities of all its participating partners to envision, refine and implement activities to improve the health of the estuary. That being said, regulatory programs can and do play a key role improving water quality, which is an integral part of HEP's Comprehensive Conservation and Management Plan.

Total Maximum Daily Loads, or TMDLs, are one example of such a regulatory program. TMDLs are part of the federal Clean Water Act regulatory program utilized by the states and EPA to improve water quality. TMDLs are anticipated to play a significant role in any future pollution load reductions in the harbor. While the establishing of TMDLs is a state/federal responsibility, the overall HEP community has been invited to participate in the related water quality assessment effort through the technical work groups. HEP facilitates and supports research, mathematical modeling, and assessment that will inform any regulatory actions taken by the states and EPA. The states and EPA will coordinate the development, submittal and implementation of TMDLs in accordance with the appropriate regulatory framework.