



New York/New Jersey Harbor Estuary Program

Successes and Challenges

Highlights of Program Accomplishments and
Challenges for the Future

Report by
Citizens Advisory Committee
Science and Technical Advisory Committee

February 2001



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Acknowledgement

Cover Photograph by Don Riepe. This document was prepared by Nancy Steinberg (Hudson River Foundation), Shino Tanikawa (NYC Soil & Water Conservation District) and Lingard Knutson (Port Authority of New York/New Jersey) under the guidance of the Citizens Advisory Committee and the Science and Technical Advisory Committee of the Harbor Estuary Program. The CAC and STAC would like to thank the following agencies for their input and support: US Environmental Protection Agency, US Army Corps of Engineers, Port Authority of New York/New Jersey, Interstate Environmental Commission, New York State Department of Environmental Conservation, New Jersey Department of Environmental Protection, and New York City Department of Environmental Protection.

What is the Harbor Estuary Program?

The 1987 amendments to the Federal Clean Water Act called for the designation of “Estuaries of National Significance” to be included in the newly formed National Estuary Program. There are now 28 such estuaries around the country, including Long Island Sound, Peconic Bay, Barnegat Bay, and Massachusetts Bay. In 1988 the New York/New Jersey Harbor Estuary was approved for inclusion in the National Estuary Program, and since then the New York/New Jersey Harbor Estuary Program (HEP) has been working to develop and implement a management plan for the Hudson/Raritan Estuary.

The HEP is a partnership of federal, state and local environmental agencies, business interests, scientists, environmental advocates, and citizens concerned about the future of the estuary. This diverse group of interested parties came together to develop a Comprehensive Conservation and Management Plan (CCMP) for the estuary. Early in the history of the program, the pre-existing New York Bight Restoration Program was included in the HEP, ensuring that the CCMP would include actions aimed at restoring the New York Bight offshore as well as the estuary.

The goal of the Harbor Estuary Program is “to establish and maintain a healthy and productive ecosystem with full beneficial uses.” To achieve this goal, the CCMP provides a blueprint for action in a series of chapters, or modules. Each module addresses a different type of environmental threat to the estuary and our use of it by stating a series of objectives and specific actions. Associated with each action is a “responsible entity,” which can be a government agency, multiple agencies, a work group of the HEP, or any other participating group. There is also a HEP work group for each module, tasked with ensuring that the actions in that module are carried out and coordinating module-related activities.

In 1996, after two series of regional meetings to gather feedback from the public on the issues to be addressed, the HEP’s CCMP was approved and signed by the governors of New York and New Jersey and by the EPA Administrator. Since that time, the HEP has been working to implement the plan through the actions of the individual work groups, agencies and other entities, and through the coordination among them.

What is This Document?

This document is part of a larger effort to re-energize the Harbor Estuary Program. We want to take stock of our progress, re-evaluate the program objectives, set targets for restoration of the estuary and determine the future direction for the program. The Citizens Advisory Committee (CAC) and the Science and

Technical Advisory Committee (STAC) of the HEP ensure that the voices of the public and the scientific community are considered in the management of the HEP and the implementation of the CCMP. These two groups have produced this document, which outlines the successes achieved by the HEP and the challenges that remain, in the independent opinion of the CAC and the STAC. It is an attempt at a fair assessment that equally celebrates the remarkable achievements of the HEP and points out new directions, or unfinished old ones, that the HEP should take in order to achieve its goals. Not every CCMP action is included here - this document represents highlights of what has been done and what is left to do in each module. Lack of reference in this document to any action listed in the



CCMP does not imply that that action is not being carried out or tracked. In addition, in some cases the objectives listed here have been combined with others or reworded for the sake of clarity. For a more complete description of the CCMP’s stated objectives and actions, make sure to read the CCMP itself, which is available from the HEP office. A summary of the CCMP is also available from the HEP office.

One of the anticipated outcomes of publishing this document is that the public will read it and share with the HEP their own views on the successes and challenges of the program. Over the next several months, the HEP will be reexamining the status and progress of the program and attempting to develop specific targets for restoration of the estuary. Please let the program know what you think by sending your comments to one of the contacts listed at the end of this document. We look forward to hearing your thoughts.

Habitat and Living Resources

Highlights

- ✦ Priority acquisition and restoration site maps developed; approximately \$60 million obtained to acquire/restore almost 700 acres
- ✦ US Fish and Wildlife Service's comprehensive study of Significant Habitats and Habitat Complexes of the New York Bight Watershed published
- ✦ Research conducted on habitat value of piers, pile fields and platforms
- ✦ Access to the estuary improved by the Hudson River Waterfront Walkway in NJ

The Harbor Estuary encompasses an amazing diversity of habitats that are home to an abundance of fish, birds, plants, and other organisms. However, habitat loss, fragmentation and degradation are serious concerns in the estuary. Habitat protection is one of the most important goals of the Harbor Estuary Program, and is a common thread that runs throughout the CCMP. The Habitat Module includes actions that, when taken together, should bring us closer to the HEP's vision: to establish and maintain a healthy and productive Harbor/Bight ecosystem with full beneficial uses.

The main goal of the habitat module is to develop a comprehensive regional strategy for habitat protection and restoration in the estuary. The rest of the elements of the module, as well as other actions not specifically outlined in the plan, will contribute to that strategy. While much progress has been made in working toward the Habitat module's objectives, the HEP has not yet published a regional habitat strategy (CCMP Action H-1). However, here are the successes and challenges of the elements of the plan.

OBJECTIVE: Continue and Improve Management of Coastal Development and Other Shoreline Modifications

All levels of government responsible for managing estuarine habitats already have protective programs in place. The HEP has aimed to refocus and adjust these programs to make them more effective individually, and to be more efficient at working together.

Successes

- ☺ The HEP Habitat Work Group facilitated an agreement among the US Army Corps of Engineers, NYS Dept. of State, NYC Dept. of City Planning and NYS Dept. of Environmental Conservation that will make the wetlands permitting process more efficient and consistent.
- ☺ NJ Dept. of Environmental Protection has restructured its program to carry out environmental protection on a watershed basis and has expanded some of its watersheds to include the estuary core area.
- ☺ HEP sponsored an important body of research by Dr. Ken Able of Rutgers University to assess the value of piers, platforms and interpier areas as fish habitat in the estuary.

Challenges

- ⊗ HEP as an entity should weigh in and/or comment on some of the very important local initiatives that will affect the estuary's habitat, such as the Special Area Management Plan for the Hackensack Meadowlands and the Hudson River Park.
- ⊗ The minimum acreage of freshwater wetlands that can be regulated by New York State (currently 12.4 acres or smaller parcels only if locally designated as significant) should be reduced to provide adequate protection of these small but important habitats.
- ⊗ Buffer zones between protected and unprotected areas should be comprehensively reviewed or regulated.
- ⊗ Dr. Able's research, described above, should be systematically introduced to or used by the appropriate decision-making agencies.

OBJECTIVE: Protect and Restore Regionally and Locally Significant Habitats

The HEP has undertaken new initiatives to identify the habitats most in need of protection in the estuary. Steps have also been taken to protect and restore many of those areas.

Successes

- ⊗ The Habitat Work Group has identified priority acquisition and restoration sites throughout the estuary and published maps of them; updates of these maps are ongoing. In 1998-2000 nearly \$60 million was secured to acquire or restore almost 700 acres at these sites. The maps have also served as major building blocks for the estuary-wide ecosystem restoration study now being undertaken by the Corps of Engineers.
- ⊗ The US Fish & Wildlife Service has completed, printed and distributed an extensive study of the significant habitats of the entire estuary watershed region. It is available in printed form or on CD-ROM.
- ⊗ The Corps of Engineers and NYC Dept. of Environmental Protection (DEP) are launching \$7 million plans to restore and/or improve historical habitats in Jamaica and Flushing Bays with future joint plans for the Bronx River and Gowanus Canal.
- ⊗ The Habitat Work Group has developed "issues maps" highlighting environmental challenges in watersheds of Jamaica Bay and the Arthur Kill in order to galvanize support for addressing those problems.
- ⊗ The Jamaica Bay Task Force, a multi-stakeholder group dedicated to developing

a comprehensive plan for the protection of Jamaica Bay, has been revitalized to provide local input to and coordination of the NYC DEP and the Corps of Engineers restoration and management plans for the Bay.

- ⊗ The Corps of Engineers is developing comprehensive watershed plans for the Bronx River and Jamaica Bay. The reconnaissance phase of these projects is completed and feasibility studies are being conducted.
- ⊗ The Habitat Work Group compiled a funding guide and a monitoring protocol for habitat restoration projects in the estuary.
- ⊗ A variety of public-private partnerships have been established throughout the estuary to fund and implement habitat protection projects. One example is the New York City Environmental Fund, a partnership between the Hudson River Foundation and the NYS Dept. of Environmental Conservation, which provides small grants for local groups to undertake environmental stewardship projects in their communities.

Challenges

- ⊗ It is unclear whether the CCMP goal of a net increase in aquatic habitat has been achieved; in fact, it is unlikely at this point. The "no loss of wetlands" action in the CCMP needs to be implemented.
- ⊗ The New Jersey Landscape Project described in the CCMP needs to be implemented in the Harbor/Bight.
- ⊗ The estuary is still losing ground in many areas on habitat. In view of the booming economy and escalating waterfront development, the permitting and regulatory agencies need to step up enforcement and review of permits to prevent further degradation. Increased mitigation ratios and other more creative ways to restore habitats that are currently impacted are both necessary. The HEP should use its authority to prevent losses of habitat.
- ⊗ The HEP should initiate a multi-agency review of wetland delineation to come to consensus on the value of wetlands.
- ⊗ The HEP should play an active role in shaping the Corps of Engineers' Hudson-Raritan Ecosystem study into a comprehensive blueprint for restoring the estuary.

OBJECTIVE: Reduce Contaminant and Sediment Inputs to the Estuary

Erosion, caused by the removal of stabilizing vegetation and the hardening of surfaces and edges through paving and bulkheading, can cause an excess of sediment to run off the land and into the water. This sediment load can cover fragile habitats, increase the need for dredging by filling in shipping channels, and carry a

high load of contaminants. These contaminants, such as PCBs, heavy metals and pesticides, affect the quality of estuarine habitats by accumulating through the food chain or causing toxic effects to organisms.

Successes

- ☺ The HEP has implemented the Contamination Assessment and Reduction Project (CARP), a \$30 million program to determine the main sources of contaminants of concern to the estuary (See the Toxic Contamination section of this document for more detail).
- ☺ NJ Dept. of Environmental Protection (DEP) has completed a pilot project to reduce sediment loads to the Whippany River.
- ☺ The NYC Department of Parks and Recreation (DPR), together with local partners, have implemented erosion control projects along the Bronx River and at other sites in New York.
- ☺ The Habitat Work Group developed a set of recommendations for controlling runoff from construction sites; the Natural Resources Group of the NYC DPR is producing a guide for construction site managers to aid in implementing sediment control measures.
- ☺ The Gaia Institute and the Natural Resources Group are using constructed wetlands and other ecological engineering (natural) approaches to reducing sedimentation at pilot sites in the estuary.
- ☺ NYC Dept. of Environmental Protection has conducted shore line surveys to identify illegal sewer hookups and eliminated over 96% of illegal discharges into the Harbor.
- ☺ The Environmental Protection Agency has released a new stormwater management rule that requires smaller municipalities and construction projects to obtain stormwater permits (Stormwater Phase II Rules & Regulations).

Challenges

- ☹ A comprehensive plan for sediment reduction in the estuary must be developed.
- ☹ HEP must build consensus on a detailed plan and implementation strategy to address the largest sources of contaminants identified by CARP data.

OBJECTIVE: Increase Populations of Animals and Plants and Increase Biodiversity

The CCMP outlines steps to be taken to increase populations of the estuary's residents, such as fish, birds, and invertebrates. For many people, healthy popula-

tions of animals are the most obvious indications of a healthy ecosystem.

Successes

- ☺ The Urban Park Rangers of the NYC Dept. of Parks & Recreation have been protecting populations of endangered piping plovers in the Rockaways and carrying out public programs to teach the public about these birds.
- ☺ The Hudson River Estuary Management Program, a New York State-run initiative similar in approach to the HEP, has a new program that is examining biodiversity in the estuarine region and developing recommendations for preserving and restoring it.
- ☺ The Brooklyn Botanic Garden has been conducting the Metro Flora Project, which is cataloging every plant species within a 50-mile radius of Columbus Circle, Manhattan. The results will be used to develop recommendations for managing plant populations in the Metro area.
- ☺ The Hudson River Foundation, Army Corps of Engineers and New York Sea Grant have sponsored critical research on the populations of shortnose and Atlantic sturgeon in the Hudson River. The results of this research led to an indefinite moratorium on harvesting sturgeon in order to allow their recovery.
- ☺ The New York/New Jersey Baykeeper has documented barriers to anadromous fish spawning habitat in New Jersey tributaries, and Dr. Robert Schmidt of Bard College has done the same in Hudson River tributaries in New York. Efforts are underway to fund small pilot projects that will remove impediments to the upstream migration of spawning fish.
- ☺ NYS Dept. of Environmental Conservation is investigating the feasibility of placing artificial reefs in the East River.
- ☺ The New York/New Jersey Baykeeper has an on-going experiment to restore oyster populations in the Harbor.
- ☺ Various non-profit organizations have mobilized to educate the public on the Asian Longhorn Beetle invasion through seminars and workshops.
- ☺ NYC Dept. of Environmental Protection's Endangered Species Restoration Program helped reintroduce captive-bred Peregrine Falcons to the wild in an effort to restore the population.

Challenges

- ☹ The HEP should establish a goal to coordinate policy between the states of New York and New Jersey for restoring fisheries.
- ☹ The HEP should consider new actions aimed at addressing the problem of invasive species in the estuary.

OBJECTIVE: Improve and Increase Public Access to the Estuary

The urban core of our estuary provides limited opportunity for public access to and onto the water. It is crucial that citizens be able to reach their waterfronts in order to learn about and appreciate the Harbor Estuary.

Successes

- ☺ The Issues Maps developed by the Habitat Work Group described above include guides to (and suggestions for more) public access points in the Arthur Kill and Jamaica Bay watersheds.
- ☺ Public access guides have been published by NJ Dept. of Environmental Protection (DEP) for the New Jersey waterfront and by the Regional Plan Association for the Estuary as a whole.
- ☺ New Jersey's Hudson River Waterfront Walkway, 18-miles along the Hudson River, won a landmark court decision to allow public access on private properties based on the public trust doctrine, a validation of NJ DEP's rulemaking. The trail officially opened in the summer of 2000. Signs for canoe and kayak access were funded by the HEP.
- ☺ Recent New York City waterfront policy has recognized the importance of public access to the water. Both the 1993 zoning law revisions and the 1999 Waterfront Revitalization Program include requirements for public waterfront access in many types of development.
- ☺ Water taxis and a network of commuter ferries have revived waterborne passenger transportation in the harbor.
- ☺ Segments of the Greenway Plan for New York City, a 350-mile system, have been implemented in each of the five boroughs. Much of the planned greenway is along the City's waterfront.
- ☺ NYC Dept. of Environmental Protection has been working with the Bronx River Working Group to improve river access as part of the combined sewer overflow abatement project.

Challenges

- ☹ The HEP needs to partner with public access advocacy groups to promote and initiate waterfront access projects throughout the estuary.
- ☹ The HEP must implement the CCMP Action to develop infrastructure to support public access to the estuary.
- ☹ To date, less than 10 miles of the NJ's Hudson River walkway has been constructed and approximately half of the completed walkway has been built by State and local governments. Despite legal obligations, many developers lack

either financial resources or the willingness to complete their portions of the walkway.

- ☹ Recreational opportunities, both on and in the water, need to be improved through combined sewer overflow abatement, "beach" creation, and boat launch installations.

OBJECTIVE: Educate the Public about Its Role in Habitat Protection

A critical component of the HEP's plan to protect habitat is engaging local stewards in restoration and education initiatives. Only when citizens of the estuary and watershed care about their own natural resources can we expect to improve our environment. Through the efforts of many educational and stewardship organizations concerned with estuary-related issues, there is a great deal of education focused on the local environment taking place in this region. The initiatives listed here are only a few of them.

Successes

- ☺ The HEP has produced a series of six "tip strips" listing simple things citizens can do to help the estuary in their everyday lives. The tip strips have been distributed in classrooms, NYC Parks programs, and other relevant venues.
- ☺ New York Sea Grant has hired a HEP Outreach Coordinator through funding from the Environmental Protection Agency.
- ☺ NJ Dept. of Environmental Protection (DEP) has sponsored a Harbor Education/Urban Fishing Program providing a Teacher's Guide, video, posters and brochures.
- ☺ NJ DEP has supported an education mini-grant program to support local groups conducting education programs related to the estuary.
- ☺ The New York City Soil and Water Conservation District and the HEP have partnered to coordinate a stewardship program that provides technical support and training to local groups interested in conducting monitoring and restoration in their local waterways.
- ☺ The New York City Environmental Fund has funded many grassroots habitat restoration and public education projects.

Challenges

- ☹ The HEP needs to increase production of outreach and education materials for the general public and school children.
- ☹ The HEP must establish a funding source dedicated to outreach and education for the HEP program office, as well as for local educational organizations .

A Final Note

One of the biggest challenges the HEP still faces is in turning more of the CCMP's "recommendations" into "commitments." Unfortunately many actions remain as recommendations due to lack of funding; neither the program nor the

participating agencies have been successful in increasing funding to ensure that resources are available for implementing more actions. To make HEP a funding priority, elected officials must be educated about the program. The HEP should also educate local corporations and foundations to this end.

Toxic Contamination

Highlights

✦ \$30 million Contamination Assessment and Reduction Project well underway

✦ Contaminant "Track-down" projects implemented by NYS Dept. of Environmental Conservation and others

✦ Regional Environmental Monitoring and Assessment Program of Environmental Protection Agency measuring sediment contaminants, sediment toxicity, and contaminant levels in fish and shellfish

Toxic chemicals, whether already present in the estuary or introduced through ongoing discharges, cause a variety of ecological and economic problems. Chemicals such as PCBs, dioxin, pesticides, heavy metals and PAHs (organic chemicals derived from petroleum products and byproducts) accumulate in the sediments of the estuary, and in the tissue of species such as blue crabs and striped bass. As a result of sediment contamination, it is difficult and expensive to find disposal options for sediments dredged from the harbor to maintain the Port. In addition, the bioaccumulation of these toxics has led New York and New Jersey to issue health advisories against eating fish and shellfish caught in the estuary. Striped bass became so contaminated with PCBs in the Hudson River that the commercial fishery was closed.

The HEP has developed a number of strategies for addressing these toxics-related problems in the estuary, including source identification and reduction, sediment decontamination, and improved communication of fish consumption health advisories.

OBJECTIVE: Reduce Inputs of Toxic Contaminants to the Harbor/Bight System

Reducing or eliminating ongoing sources of toxic contaminants to the estuary is the most important part of the strategy for clean-up. Since many of the most significant sources have yet to be quantified, some monitoring must take place before cleanup can occur.

Successes

☺ The HEP has initiated a multi-million dollar program called the Contamination Assessment and Reduction Project (CARP). Conducted by personnel from the two state environmental agencies, US Geological Survey in New York and New Jersey, the New Jersey Harbor Dischargers Group (NJHDG), academic researchers and other contractors, CARP's goal is to assess the sources of

contamination to the estuary, and measure the current levels of contamination in sediments, water and fish and shellfish tissue. These data will be used to construct a mathematical model of the loadings and transport of contaminants throughout the estuary in order to assess and prioritize cleanup efforts. The Army Corps of Engineers has provided funds to develop and implement a data management program to facilitate the use of the tremendous volume of data that will be generated by the CARP.

- ☺ A number of “track-down” programs are ongoing in the estuary. These programs, conducted by NYS Dept. of Environmental Conservation (DEC), the NJHDG and NJ Dept. of Environmental Protection (DEP), use state-of-the-art measuring devices to detect very low levels of contaminants in estuary tributaries and in sewage systems. By pinpointing the highest levels of certain contaminants, scientists can “track back” through a tributary or sewer system line to find discreet sources. Ongoing sources of PCBs have been identified in the Arthur Kill using this method. NJ DEP is also studying known waste sites near waterways to get a rough idea of the transport of toxic chemicals from those sites.
- ☺ New York and New Jersey, in cooperation with the EPA, are developing or have developed Total Maximum Daily Loads (TMDLs) for a variety of chemicals in the harbor and its tributaries and sub-watersheds. TMDLs are maximum daily limits of individual chemicals that can be discharged to a given water body without violating water quality standards or other limits. Permits for dischargers will be or have been revised based on the TMDLs.
- ☺ New York City Dept. of Environmental Protection (DEP) has been convening the Pollution Prevention Citizens Advisory Committee for almost ten years, with a focus on pre-treatment of industrial wastewater discharges into the NYC sewer system. This committee was vital to the development of Best Management Practices to significantly reduce the discharges of silver and Per Chloroethylene into the sewer system.
- ☺ Discharges of heavy metals from all 14 NYC wastewater treatment plants have significantly decreased.

Challenges

- ☺ A plan needs to be developed for the enforcement and regulation of contaminant discharges from the sources identified as significant by CARP.
- ☺ Implementation of clean-up projects based on track-down results has been slow and should be accelerated.
- ☺ Existing combined sewer overflow (CSO) programs are not targeted at toxics or pathogens. The HEP should promote the development of a CSO abatement strategy that addresses toxics and pathogens.

- ☺ HEP should review the Area Contingency Plan for oil spills and the Bi-State Conference Report on oil spill response plans.
- ☺ A secure, long-term funding mechanism needs to be identified for future contaminant monitoring to build on the baselines established by the CARP.

OBJECTIVE: Remediate Selected Contaminated Sediments

An important tool that can be used to address toxic contamination in the estuary is remediation or decontamination of known contaminated sediments using a variety of technologies.

Successes

- ☺ The Environmental Protection Agency (EPA), the Army Corps of Engineers and Brookhaven National Lab are conducting a large research program to develop new decontamination technologies for dredged materials. New Jersey Maritime Resources is also conducting a similar program. In the Corps of Engineers’ Dredged Material Management Plan, decontamination is recommended as part of a long-term management strategy for dredged materials.
- ☺ The Marathon Battery Superfund Site at Foundry Cove on the Hudson River has been remediated. Approximately 189,000 tons of cadmium-laden sediments and soils were removed from the site.

Challenges

- ☺ The Diamond Alkali Superfund site on the Passaic River and the General Electric Hudson River Superfund Site have not yet been remediated. EPA is responsible for making decisions on what will be required for remediation at both of these sites; EPA’s proposal for the Hudson River site was issued in December 2000 and is now undergoing public review. The process has moved very slowly at both sites.

OBJECTIVE: Minimize Health Risks Due to Consumption of Contaminated Local Fish and Shellfish

Because of the presence of unhealthy levels of toxic contaminants in the flesh of fish and shellfish in the estuary, health advisories restricting their consumption have been issued in both states. In addition to reducing contaminants estuary-wide, there are other steps that must be taken to address this problem.

Successes

- ☺ The Hudson River Foundation has sponsored research at the Mount Sinai School of Medicine to determine contaminant levels in Hudson River anglers who eat their catch. A pilot study has been completed.
- ☺ NJ Dept. of Environmental Protection (DEP) and the NYS Department of Health have conducted surveys of anglers to determine how much local fish and shellfish they eat and how well they understand the fish consumption advisories. NJ DEP has used this information to produce and provide informational materials on fish contamination for high-risk groups particularly women of child-bearing age.
- ☺ NJ DEP, with Environmental Protection Agency (EPA) funding, has printed health advisory signs for the Raritan River Estuary to be posted by local governments.
- ☺ In conjunction with EPA's Regional Environmental Monitoring and Assessment Program (R-EMAP) study, NYS Dept. of Environmental Conservation conducted extensive sampling of contaminants in the tissue of fish and shellfish throughout the estuary.

Challenges

- ☹ Signage and other materials containing information about the health advisories need to be more widely posted and available and must be translated into multiple languages. This issue is being addressed by community groups, such as the Watchperson Project in Brooklyn and the Bronx Clean Air Coalition. Other outreach tools need to be developed as well.
- ☹ New York and New Jersey need to better coordinate their risk assessment methodologies and health advisories, particularly for shared waterbodies.
- ☹ The states and EPA should review available fish tissue criteria and consider revising health advisories based on this new information. New Jersey has already begun this review.
- ☹ A more consistent sampling program to measure contaminant levels in fish and shellfish of the estuary should be implemented.

OBJECTIVE: Develop a Better Understanding of Toxic Contamination in the Estuary

There are many gaps in our knowledge of the sources, cycling, transport, and effects of contaminants in the estuary. These gaps must be addressed with further research if effective management decisions are to be made.

Successes

- ☺ Environmental Protection Agency (EPA) conducted an extensive study of patterns of contamination in estuarine sediments (R-EMAP). Data on contaminant levels in sediments, sediment toxicity, and benthic communities were collected in 1993-1994 and again in 1998.
- ☺ Dr. Steven Eisenreich of Rutgers University, with funding from the Hudson River Foundation, New Jersey Sea Grant, NJ Dept. of Environmental Protection and EPA, has studied the extent to which atmospheric deposition contributes to the levels of contaminants in the estuary.
- ☺ Dr. Kevin Farley of Manhattan College, with funding from the Hudson River Foundation, EPA and Port Authority of New York/New Jersey, has developed a mathematical model of chemical fate and transport in the estuary. A more detailed model will be developed by a contractor chosen for the CARP.
- ☺ Between 1990 and 2000, government and private funding sources have supported over \$68 million in research and monitoring of toxic substances in the estuary.

Challenges

- ☹ A consistent, repeatable toxics monitoring program for the estuary must be developed and funded.
- ☹ More research on the effects of toxic chemicals on the ecosystem and on human health must be funded and conducted.
- ☹ Further Toxicity Identification Evaluation (TIE) studies, which identify the chemicals responsible for observed toxicity, should be conducted.

Management of Dredged Materials

Highlights

- ✦ Army Corps of Engineers' draft Dredged Material Management Plan completed
- ✦ Bi-State Dredging Agreement between the States of New York and New Jersey released
- ✦ Cession of disposal at Mud Dump Site; Historic Area Remediation Site designated
- ✦ "Beneficial reuse" projects implemented such as remediating mines and capping landfills
- ✦ Decontamination technologies being developed

The Port of New York and New Jersey plays a vital role as the primary gateway for imported consumer goods to reach the citizens of the region. Because the Harbor is not naturally deep, with its rivers continuously transporting and depositing sediment, it is necessary to dredge channels and berths. To maintain the Port for safe movements of deep draft ships and barges, approximately 2 - 3 million cubic yards must be dredged annually. Management and disposal of the dredged material have been and continue to be a significant regional problem.

The 1996 Comprehensive Conservation and Management Plan was released with a Draft Dredged Material Management Chapter. The Dredged Material Management Integration Workgroup has continued to meet since that time. At this time, it is generally agreed that stakeholders, including the port interests, the resource and regulatory agencies, and the environmental groups are not communicating with each other as effectively as possible. A sense of mistrust among stakeholders has developed. In addition, the lack of scientific information about the biological effects of dredged material placement has aggravated the situation and has impeded the region from formulating a regionally accepted plan for dredged material management.

Certainly there have been some breakthroughs, including the closing of the Mud Dump Site, designation of the Historic Area Remediation Site, creation of a subaqueous confined disposal facility, and the use of amended dredged material on brownfields and as cap or fill for former landfills and strip mines in Pennsylvania. The following list of successes and challenges is based on elements of the Draft Dredged Material Management Chapter as they appear in the Comprehensive Conservation and Management Plan.

OBJECTIVE: Develop a Future Dredged Material Management Structure

The original intent of this objective was to gather the several HEP/Dredged Material Management Forum and other related workgroups into an organized structure. The workgroups would then develop policy, provide information and assist the U.S. Army Corps of Engineers in the development and implementation of a regional Dredged Material Management Plan.

Successes

- ⊕ The Dredged Material Management Integration Workgroup has met on a monthly basis to provide a regular forum for the exchange of ideas and information among the stakeholders.
- ⊕ The Army Corps of Engineers produced a Draft Dredged Material Management Plan in September 1999, along with an Environmental Impact Statement, that stresses beneficial reuse. The plan is being updated to reflect the recent changes in the Environmental Protection Agency's disposal criteria.
- ⊕ The NY District of the Army Corps of Engineers has created the NY/NJ Harbor Programs Section to concentrate on several harbor issues, including dredged material management.
- ⊕ A bi-state dredging agreement has been adopted by the Governors of New York and New Jersey.

Challenges

- ⊖ In order to develop a harmonized regulatory system for dredged material management, regional governments and citizen advocates must continue to seek consensus.
- ⊖ The Dredged Material Management Plan must be finalized and implemented.
- ⊖ New or existing HEP workgroups should be used by all parties as a means to resolve disagreements and review regulatory or policy changes.
- ⊖ Regulatory or policy changes must involve early discussion with all stakeholders and should reflect consensus from independent scientific review of the technical data.

OBJECTIVE: Develop Plans for Closure of the Mud Dump Site and Historical Disposal Areas

In 1996, an agreement was brokered outside of the HEP process in which the Mud Dump Site was closed, and re-designated as part of the Historic Area Remediation Site (HARS). The agreement was memorialized in the "three party letter" signed by the Environmental Protection Agency (EPA) Administrator, the Secretary of the Army and the Secretary of the Department of Transportation. Both the "three party letter" and a subsequent Environmental Impact Statement stated that the HARS "will be remediated with uncontaminated dredged material (i.e. dredged material that meets current Category 1 standards and will not cause significant undesirable effects including those through bioaccumulation)." The purpose of this clause was to ensure the capping of the HARS with cleaner material, thereby sequestering the contaminated site from fish and shellfish. However, the ambiguity of the statement has led to disagreements among the

stakeholders regarding the definition of "remediation material." The "three party letter" also stated that the EPA would invest at least nine months to review the ocean disposal testing requirements in use and to ensure that any further revision reflects both sound policy and sound science. This process has taken much longer than anticipated and has not been part of the HEP process.

Successes

- ⊕ The designation of the HARS acknowledged that historic dredged material disposal practices had compromised the environs of the Mud Dump Site and that remediation of the site should occur.
- ⊕ The Environmental Protection Agency recently proposed changes to the Bioaccumulation Testing Evaluation Framework for placement of dredged material at the Historical Area Remediation Site.

Challenges

- ⊖ The testing evaluation framework for determining the suitability of material to be placed at the HARS should be finalized in an expeditious manner using the best science available.
- ⊖ The HEP should provide a forum for developing consensus on remediation efforts at the HARS.
- ⊖ The HEP should also conduct appropriate research, monitoring and modeling in order to understand conditions at the HARS, evaluate material placement strategies, and track progress in remediating the site.
- ⊖ The HEP must provide a forum for consensus on dredged material placement at the HARS. The process must include: 1) goal on future use of site, if any; 2) opportunity for independent scientific consensus; and 3) promulgation of priority for clean material (including sand, clay & rock).

OBJECTIVE: Reduce Continuing Inputs of Toxic Chemicals and Upland Soils

Please see the Contaminants Assessment and Reduction Program (CARP) in the Toxic Contamination section of this document.

OBJECTIVE: Identify, Evaluate, and Select Disposal and Treatment/Decontamination Alternatives

In 1996, alternatives to the ocean placement of dredged material in the region were scarce and very expensive. The CCMP laid out several actions that would foster the examination and use of several upland and nearshore placement options. Although each option has had some resistance by environmental and community

groups, some have proven to be environmentally acceptable, albeit still expensive.

Successes

- ☺ Water Resources Development Act appropriations have provided funding for the development of treatment technologies.
- ☺ The State of New Jersey published a manual on the Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters in October 1997. The manual clarified the permitting process for several dredged material management options.
- ☺ Several private firms have successfully used amended dredged material as a cap for brownfield sites in the state of New Jersey.
- ☺ At an abandoned mine in Pennsylvania, a demonstration project is now underway to assess the suitability of treated dredged material as fill for the remediation for acid mine drainage.
- ☺ The Port Authority constructed the Newark Bay Confined Disposal Facility (a nearshore subaqueous pit) to accept and sequester material unsuitable for the HARS.
- ☺ The State of New Jersey has financed several decontamination technology demonstration projects, making products available for brownfields remediation, landscaping (such as for golf courses), and habitat restoration in New Jersey. Eighteen million dollars of the Water Resources Development Act and \$20 million from the State of NJ have financed a consortium of agencies and private corporations to develop and implement bench scale projects. These pilot projects utilized a variety of treatments of contaminated dredged material to produce cement, topsoil, bricks, tiles and building aggregate. Negotiations for full scale operations are proceeding.
- ☺ NYC Dept. of Environmental Protection is conducting a pilot study at the Pennsylvania Avenue landfill to evaluate the use of dredged material as fill material to be placed under a cap and as planting medium. The remediated landfill, under the Gateway National Recreation Area jurisdiction, will provide passive recreational uses for the communities.

Challenges

- ☺ The State of New York must finalize and implement a regulatory framework for the placement of dredged material on land.
- ☺ The risks associated with different dredged material disposal options must be evaluated and compared.
- ☺ The HEP must develop an active strategy to work out the logistics to implement the decontamination treatment option.

A Final Note

As the port expansion planning moves ahead, it is increasingly more important that we build on successes and focus on remaining challenges in a timely manner. It is in the interest of all — agencies, the industry, and communities — to approach this task in an open process and with a goal of a strategy based on consensus.



Pathogenic Contamination

Highlights

- ✦ A study on alternate indicator of pathogenic contamination completed by NJ Dept. of Environmental Protection and University of North Carolina
- ✦ NYC Dept. of Environmental Protection's pilot studies of new disinfection techniques underway
- ✦ NYC Harbor Survey's continuous monitoring of pathogenic contamination since 1935

Pathogens are microscopic disease-causing organisms such as bacteria and viruses that are found in untreated human sewage and domestic and wild animal waste. These organisms can cause human illness through direct contact while swimming or through the ingestion of contaminated shellfish. Sources of pathogenic contamination include combined sewer overflows, stormwater discharges, illegal sewage hookups and vessel discharges. The CCMP chapter on pathogenic contamination includes actions to reduce loadings and improve monitoring of pathogens.

OBJECTIVE: Reduce Loadings of Pathogens to the Estuary to Levels Protective of Human Health

Preventing pathogens from entering the estuary, using a variety of source reduction techniques, is an important step in ensuring that shellfish are safe to eat and beaches are safe for recreation.

Successes

- ☺ New York City plans to commit \$1.5 billion to combined sewer overflow (CSO) abatement projects over the next 10 years, including sewer system improvements and the construction of storage facilities to hold wet-weather overflows for treatment during dry weather. Other measures, such as increased wet-weather capture at the treatment plants themselves, have already been taken to reduce CSO impacts.
- ☺ NYC Dept. of Environmental Protection (DEP) has conducted a major study of stormwater runoff and is implementing measures to reduce the impacts of stormwater through control of construction and contaminated site runoff.
- ☺ NYC DEP is conducting pilot studies at the 26th Ward and Tallman Island wastewater treatment plants to optimize the effluent chlorination process for more complete and efficient disinfection of wastewater.
- ☺ NYC DEP is in the process of installing boat pump-out facilities in Little Neck, Flushing and Jamaica Bays under a grant from the US Fish and Wildlife Service. Additional locations are being evaluated.
- ☺ Through cooperation among various government agencies, a Regional Bypass Model has been developed that evaluates the impact of raw sewage spills on beaches and shellfish areas.

- ☺ The HEP Pathogens Work Group has begun the process of developing a Total Maximum Daily Load (TMDL) for pathogens in the estuary.
- ☺ New Jersey and New York have both submitted proposals to designate the Hudson River as a vessel “No Discharge” zone, within which boats would be required to use pump-out stations and prohibited from discharging their waste directly to the waters of the estuary. New York’s application is undergoing a federal review process, and New Jersey is modifying its proposal based on comments from the Environmental Protection Agency. “No Discharge” zones already have been designated in New Jersey in the Manasquan River, the Shark River Estuary, the Navesink River and the Shrewsbury River.

Challenges

- ☺ Most of the CSO abatement measures being considered in New York City’s CSO Abatement Program have not addressed the problem of pathogen loadings, but have focused instead on decreasing loadings of floatables. Future CSO abatement measures will also have to address pathogenic contamination in the estuary.
- ☺ NJ Dept. of Environmental Protection has encountered a variety of problems in implementing CSO abatement programs.
- ☺ Although NYC has begun investigating alternatives for disinfection of wastewater effluent to reduce pathogen loads (particularly viruses) to the system, this program needs more attention. Additional pilot projects should be conducted to test the efficacy of these alternate methods, and some of them should be implemented if they are found to be effective.

OBJECTIVE: Develop Additional Indicators of Pathogenic Contamination

The indicator of pathogenic contamination most commonly monitored in the estuary - concentrations of fecal coliform bacteria - has been used for decades but has certain limitations. For example, although human fecal contamination poses a much greater health risk than animal waste, the fecal coliform indicator does not distinguish between the two contamination sources. The presence of fecal coliform also does not correlate well with the levels of human fecal viruses, which may be of more concern with respect to disease than bacteria. For these reasons, HEP has outlined a series of actions aimed at developing new pathogenic indicators.

Successes

- ☺ NJ Dept. of Environmental Protection and the University of North Carolina completed a study using F+ RNA coliphages (a type of virus) as indicators of pathogenic contamination in the estuary.

Challenges

- ☺ The F+ RNA coliphage study must be reviewed by all appropriate agencies. The Pathogens Work Group should facilitate the implementation of any further studies needed to determine whether this indicator should replace or supplement the fecal coliform indicator, either as a diagnostic tool or as new standards.

OBJECTIVE: Continue Interstate Dialogue on Beach Closure Policies to Ensure a Reasonably Consistent Approach

Although beaches in New York and New Jersey are monitored for levels of fecal coliform, the monitoring methods, standards, and closure mechanisms are different in the two states. The HEP has recommended a series of actions to be taken to better coordinate the beach monitoring and closure processes between the two states.

Successes

- ☺ In October 2000 Congress passed the Beaches Environmental Assessment and Coastal Health Act (the BEACH Bill) requiring all coastal states to implement rigorous beach monitoring and closure and public notification protocols that meet certain requirements as outlined by the Environmental Protection Agency (EPA). The EPA will be required to maintain a national database of beach water quality information.

Challenges

- ☺ New York and New Jersey need to expand on the limited dialogues they have had thus far on coordinating beach monitoring and closure protocols. In particular, New York’s policies should be reviewed and steps should be taken to ensure that their protocols are as rigorous as New Jersey’s.

OBJECTIVE: Continue and Implement Necessary Monitoring, Modeling and Research Related to Pathogenic Contamination in the Estuary

Successes

- ☺ New York City Department of Environmental Protection’s Harbor Survey has been measuring fecal coliform in the Harbor’s waters since 1974 and total coliform since 1935. Summer samples show that city-wide fecal coliform concentrations have decreased one hundred-fold since 1974.

☺ The Interstate Sanitation Commission (now called the Interstate Environmental Commission) also measures coliform levels in the estuary's waters.

☺ Better monitoring, reporting and medical diagnosis of human illness induced by consumption of pathogen-contaminated local shellfish must be implemented.

Challenges

☺ New Jersey should implement a monitoring program similar to New York City's annual Harbor Survey to ensure that the entire estuary is monitored for pathogens (and other parameters) in a consistent manner.

A Final Note

The quality of the Harbor Estuary's waters has improved dramatically with respect to pathogens in the last two decades. However, rainfall-induced discharges continue to be a significant source of pathogens, causing our waters to remain classified as non-swimmable.

Floatable Debris

Highlights

+ Highly successful Floatables Action Plan resulting in removal of tons of debris every year by multiple skimmer vessels

+ NJ Clean Shores Program removes debris before it gets into the estuary

+ Annual International Beach Cleanup Day sponsored locally by the American Littoral Society and others

Floatable debris is water-borne waste material that floats. It includes wood (from deteriorating piers, vessels, felled trees, etc.), aquatic vegetation, detritus, litter (from streets, beaches, boats, etc.), sewage-related wastes, and fishing gear. Some floatables, such as medical wastes, lead to beach closures, which can hurt local economies. Some large floatables pose a navigation hazard to both commercial and recreational boating. Floatables also adversely affect coastal ecosystems. For instance, abandoned boats can become lodged in marshes destroying vegetation and creating mosquito breeding habitat. Floatables also compromise the aesthetics of our waterfront.

Street litter ends up in our water as floatables via storm sewers and combined sewer overflows. Other floatables originate from landfills, marine transfer stations, and direct littering from boats and beaches. In fact, illegal disposal is estimated to be a significant source of floating tires. Decaying shoreline structures and sunken vessels also contribute to floatable debris and constitute a major source of bulk floatables by weight.

The main goal of the CCMP's chapter on floatable debris is to reduce floatables in the Harbor to prevent beach closures, adverse ecological impacts, and navigational hazards.

OBJECTIVE: Continue and Enhance Implementation of Successful Short-Term Floatables Action Plan

After a series of beach closures in 1987 and 1988, a short-term floatables control plan was developed by an interagency work group. The plan is "short-term" insofar as it does not eliminate the cause of the floatables pollution; it is a temporary plan that may become unnecessary when long-term plans, such as the combined sewer overflows (CSOs) abatement program, are implemented. Since the implementation of the short-term plan, incidents of beach closures due to

floatables wash-ups have declined dramatically. The short-term plan will continue, pending funding, until long-term plans render it unnecessary.

Successes

- ☺ Environmental Protection Agency, US Coast Guard, and NJ Dept. of Environmental Protection (DEP) continue to conduct helicopter surveillance of beaches for floatables slicks during the summer.
- ☺ Army Corps of Engineers continues its Harbor Drift Removal program, deploying three skimmer vessels. NYC Dept. of Sanitation provides barges for debris removal and accepts debris from the Army Corps of Engineers for disposal. Privately owned commercial fishing vessels are also deployed as needed.
- ☺ NYC Dept. of Environmental Protection (DEP) has installed containment booms and netting systems at 23 CSO outfalls that drain approximately 58,600 acres to prevent floatables from entering the Harbor and its tributaries. Four skimmer vessels collect the floatables contained by these systems. In addition, the NYC DEP operates an open water skimmer vessel in the Upper and Lower Bays.
- ☺ NJ DEP runs the Clean Shores Program, which utilizes inmates to collect floatables from non-recreational shorelines year-round.
- ☺ Through the Alternative Sentencing Program, several community groups in Jamaica Bay have hosted debris removal operations in Shellbank Creek. The Alternative Sentencing Program provides individuals, who have been convicted of low-level, non-violent crimes, as laborers for community projects.
- ☺ Passaic Valley Sewerage Commission is operating a small skimmer vessel and has plans to purchase another for use in Newark Bay and the Passaic and Hackensack Rivers.

Challenges

- ☺ NYC conducted a pilot Clean Shores program in Staten Island in 1992. Prison unions opposed the project and it was discontinued. This effort should be revived and the Clean Shores program should be adopted statewide in NY.

OBJECTIVE: Expand the Harbor Drift Removal Program without Compromising Important Habitat

The Army Corps of Engineers' Harbor Drift Removal Program is responsible for removing debris from the waters and shorelines of the Harbor core area. Beyond removing floatables from the open waters of the Harbor, the program is aimed at identifying shoreline sites that could potentially contribute significant

quantities of floatables debris to the Harbor (such as derelict piers) and removing these structures without compromising habitat or navigational safety.

Successes

- ☺ Army Corps of Engineers, with support from the NYC Dept. of Environmental Protection, has continued to operate the skimmer vessel for removal of floatables from navigation channels.
- ☺ Jamaica Bay Operation Clean Sweep, a multi-agency and community task force to remove derelict boats in Jamaica Bay, was established in the spring of 2000. This "ad hoc" task force removed more than 40 boats during the summer and fall of 2000. In addition to removal, the task force has inventoried derelict boats around Jamaica Bay, identifying boats to be removed in the future.
- ☺ Army Corps of Engineers has expanded its Hudson-Raritan Estuary restoration study to identify areas of debris that may be contributing to the degradation of natural communities.
- ☺ The Harbor Drift Removal Program, jointly sponsored by the federal government and the State and the City of New York, continues to remove potential drift material at the source. Recently 18,000 timber piles, 1,000 tons of metal, 20,000 cubic yards of concrete and 300 cubic yards of debris were removed from the Brooklyn waterfront.

Challenges

- ☺ The HEP should work to secure funding for the Army Corps of Engineers' Harbor Drift Removal program, which has been erratic, resulting in periods of no skimmer vessel operation.
- ☺ The HEP should urge appropriate agencies to monitor marine transfer stations to guard against solid waste entering the waterways.
- ☺ The HEP should consider establishing a Floatables Workgroup to address issues and coordinate various efforts.

OBJECTIVE: Implement Beach Cleanups.

Many floatables do enter the Harbor from beaches, and beaches accumulate debris from all of the other sources of floatables mentioned, making beach cleanups essential to maintaining the aesthetic values of our beaches, particularly during the swimming season.

Successes

- ☺ NYC Dept. of Parks & Recreation (DPR) rakes NYC beaches every day during

the swimming season (Memorial Day through Labor Day) and on select days during the rest of the year.

- ☺ American Littoral Society's International Beach Cleanup Day has been growing in number of volunteers and groups involved. This event not only has a tremendous public education value, but also quantifies and categorizes the debris collected for inclusion in a national database.
- ☺ Community groups frequently conduct shoreline clean up where agency programs are lacking, such as along tributaries and in back bay areas.
- ☺ NJ Dept. of Environmental Protection runs the Adopt-a-Beach program, in partnership with volunteers. The agency sponsors two statewide beach clean ups annually as required by state law. Clean ups are conducted by volunteers, who "adopt" a stretch of the beach. Data collected from this program are sent to the Center for Marine Conservation for their national and international database on marine debris.
- ☺ Passaic Valley Sewerage Commission has run shoreline cleanups for several years.

Challenges

- ☺ NYC DPR removes waste receptacles from beaches the day after Labor Day despite continued public use of the beaches.
- ☺ More preventive measures are necessary, rather than retroactive measures.
- ☺ Law enforcement agencies should enforce existing anti-litter laws more aggressively.

OBJECTIVE: Assess and Control Landfills and Solid Waste Practices

Floating objects often enter the Harbor from eroding landfills or improper processing of solid wastes. Because of the proximity of landfills to the water, waste that is disposed of carelessly can easily reach the water. Commercial solid waste is often trucked to marine transfer stations, where it is compacted and loaded onto barges to be taken to a remote landfill. During this process, some of the waste can come loose and enter the water as floatables.

Successes

- ☺ Plans are moving ahead for landfill remediation at Pelham, Fountain, and Pennsylvania Avenue in NYC, and litter control measures are implemented at Fresh Kills landfill.
- ☺ In 1998, the Habitat Workgroup hosted a widely successful landfill restoration symposium that brought experts from both sides of the Atlantic to New York to

discuss the habitat potential of closed landfills.

- ☺ Improved unloading practices have reduced floatables entering from active landfills in the past few decades.

Challenges

- ☺ There are abandoned landfills eroding and releasing debris in the Hackensack Meadowlands that require proper closure.
- ☺ The HEP should ensure that landfill closures around the Harbor, including those in the Hackensack Meadowlands, are properly monitored.

OBJECTIVE: Communicate Impacts of Marine Debris and Appropriate Disposal Practices

Public education is critical if we are to reduce the amount of litter that enters the Harbor/Bight. Often the public is unaware of the impact of littering on the ecosystem. Posting simple signs at marinas, boat launches, and waterfront access areas should become standard practice.

Successes

- ☺ The HEP tip strips have been updated and distributed at various environmental events. NYC Soil & Water Conservation District has mailed tip strips to community and environmental organizations, including a few marina operators.
- ☺ NYC Dept. of Environmental Protection has conducted a survey of the public's attitude towards littering as part of the combined sewer overflow abatement program. The majority of those surveyed said they were willing to change their behavior. The study estimated that if we can change the behavior of 25% of the entire population in the city, it would lead to a 20% reduction in litter on city streets.

Challenges

- ☺ A comprehensive outreach and education program on floatables prevention through the school system will greatly benefit the floatables control program.

OBJECTIVE: Reduce Loadings of Floatables from Combined Sewer Overflows, Stormwater Discharges, and Non-Point Source Discharges

Some important sources of pollution, including floatables, to the Harbor/Bight — combined sewer overflows (CSOs), storm water discharges, and surface runoff — are associated with runoff induced by rainfall. Effective abatement of these

sources is therefore important in reducing impacts associated with floatables. More successes and challenges in this area can be found under the Rainfall Events section of this document.

Successes

- ☺ NYC Dept. of Environmental Protection's (DEP) Floatables Control Program is projected to reduce the amount of floatables entering the Harbor by over 85 %. This program entails hooding and cleaning catch basins (approximately 137,000 citywide, implemented in three phases), boom and skimmer operations at some CSO outfalls, construction of CSO retention and treatment facilities, and public education.
- ☺ A pilot study to determine the efficiency of catch basin hoods in removing floatables is currently underway at Tallmans Island.
- ☺ NYC DEP's CSO abatement program has evaluated conventional and innovative technologies to reduce floatables. Some conventional techniques have been implemented (for instance, a retention tank at Avery Avenue) or are being evaluated ("Vortex" technology at Corona Avenue). In addition, NYC DEP is evaluating some innovative technologies (for instance, screens of various types and "baffles" — plates that prevent floatables from entering the Harbor.)
- ☺ NYC DEP enlisted community volunteers to conduct floatables surveys at city beaches during the summers of 1999 and 2000. Data are compared to the base data collected in 1990.
- ☺ NYC Dept. of Sanitation has implemented its Segmented Street Cleaning Program, under which mechanical sweeping of large commercial strips has increased from 4 to 6 days per week in 38 community boards. This program will be implemented throughout the city within the next three years.
- ☺ NJ Dept. of Environmental Protection requires all discharge permittees to install bar screens that capture a certain minimum size of solids and floatables at all CSOs.
- ☺ NJ State legislation (Sewerage Infrastructure Improvement Act) provides grants for planning and design of solids and floatables controls.

Challenges

- ☹ The HEP and its partners should develop an extensive public education campaign on simple actions citizens can take to prevent floatables.
- ☹ More waste baskets and frequent trash pickups are needed in many neighborhoods and parks.

A Final Note

Although the short-term floatables control plan has been successful in reducing the incidents of beach closures, whatever measures we ultimately take need to be based on long-term solutions — to reduce the sources of floatables.



Nutrients and Organic Enrichment

Highlights

- ✦ System-Wide Eutrophication Model (SWEM) developed to examine transport and potential for reduction of nutrients
- ✦ Nitrogen reduction technologies being implemented at wastewater treatment plants

Low levels of dissolved oxygen in the bottom water during the summer have been a problem in western Long Island Sound, Jamaica Bay, parts of Raritan Bay and the Bight. This condition, hypoxia, is detrimental to many marine organisms, particularly those that can not move out of hypoxic water in search of oxygen. Dissolved oxygen can be depleted as a result of a process called eutrophication, where the water is overloaded with nutrients leading to excessive plant growth. When dead plant matter settles to the bottom and is decomposed by bacteria, dissolved oxygen from this layer of the water column becomes depleted. Excess inputs of organic matter can also have the same effects on dissolved oxygen levels through microbial decomposition. When the bottom layer of the water does not become re-oxygenated through mixing of the water, it becomes hypoxic. Hypoxia is usually not a concern during the winter months when the water is well mixed.

The main goal of the nutrients and organic enrichment chapter of the CCMP is to improve our understanding of causes of low dissolved oxygen condition, and eliminate adverse impacts of hypoxia resulting from human activities.

OBJECTIVE: Upgrade Municipal Wastewater Treatment Plants to Achieve Full Secondary Treatment

The Clean Water Act requires all municipal water treatment plants to achieve full secondary treatment. All but two of the municipal plants discharging into the Harbor meet this requirement. The secondary treatment of sewage removes at least 85% of total suspended solids and biochemical oxygen demand (a measure of the amount of organic matter that would consume oxygen through biochemical processes) from the influent. All but the Newtown Creek wastewater treatment plant are complying with the secondary treatment requirements in the Harbor, and this plant is currently being upgraded.

Successes

- ☺ NYC Dept. of Environmental Protection (DEP) is implementing a program to reduce nitrogen loadings from plants discharging into the East River and Jamaica Bay.
- ☺ NYC DEP has upgraded the Owls Head wastewater treatment plant to full secondary treatment at a cost of approximately \$450 million.
- ☺ NYS Dept. of Environmental Conservation (DEC) and NYC DEP are finalizing

an agreement to complete the upgrade of the Newtown Creek wastewater treatment plant to secondary treatment levels, to upgrade the four Upper East River plants to remove more nitrogen and to complete a comprehensive water quality improvement plan for Jamaica Bay.

- ☺ NYC DEP has developed a plan to divert centrate (water left over from the sewage sludge “dewatering” process) from the East River plants.
- ☺ NYC DEP is in the process of completing new or replacement sanitary sewer projects, totaling \$14 million, to eliminate direct discharges of sewage to Jamaica Bay or its tributaries.

Challenges

- ☺ New technologies need to be researched to overcome technical difficulties of nitrogen removal, such as the limited foot prints of existing plants.
- ☺ Centrate disposal plan needs to be finalized.

OBJECTIVE: Establish Environmental Objectives for the Harbor/Bight

In order to determine necessary actions and to measure the successes of these actions, we need to establish specific environmental objectives which should be relevant to the ecosystem of concern. For instance, the dissolved oxygen standard currently in use by regulatory agencies is based on fresh water ecosystems. However, the Harbor/Bight water is saline — distinctly different from freshwater ecosystems. There is a clear need to establish objectives to minimize nutrient loadings that are specific to the ecosystem of the Harbor/Bight.

Successes

- ☺ In November 2000, the Environmental Protection Agency released a document, Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras. The criteria incorporate a new biological framework that evaluates the duration of low oxygen conditions rather than averages of oxygen measurements taken over time.
- ☺ NYC Dept. of Environmental Protection’s Use and Standards Attainment Project will evaluate the relationship between aquatic uses and regulatory standards in NYC waters, starting with Paerdegat Basin and the Bronx River. This project includes a comprehensive field-sampling program in 23 waterbodies in and around the city, computer modeling, engineering, and input from local communities.
- ☺ Long Island Sound Study completed a Total Maximum Daily Load for total nitrogen to achieve water quality standards for dissolved oxygen in Long Island Sound.

Challenges

- ☺ The HEP needs to take the lead in developing objectives, with respect to nitrogen and organic matter loading, that are appropriate for the Harbor/Bight ecosystem.
- ☺ Relevant agencies should educate the public on its role in nutrient and organic matter loading.

OBJECTIVE: Develop and Implement Low-Cost Nitrogen Reduction Actions

Creative uses of old technology and keeping abreast of new advances are critical in developing low-cost nitrogen reduction measures. Often, municipal treatment facilities can be retro-fitted with new technology to improve pollutant discharge levels.

Successes

- ☺ NYC Dept. of Environmental Protection has implemented or is implementing Biological Nitrogen Removal (BNR) retrofitting at the four Upper East River wastewater treatment plants: Wards Island, Hunts Point, Tallmans Island, and Bowery Bay. Retrofitting is also planned for the 26th Ward, Red Hook, and Oakwood Beach wastewater treatment plants.
- ☺ The four Jamaica Bay wastewater treatment plants have been meeting the nitrogen discharge limits.

Challenges

- ☺ Retrofitting treatment plants with the BNR technology will not meet the nitrogen reduction goals set by the Long Island Sound Study’s Total Maximum Daily Load (TMDL). Meeting the TMDL goals will require \$1.4 billion in capital and a \$42 million increase in operation and maintenance expenditures.

OBJECTIVE: Develop and Implement Additional Actions Necessary to Eliminate Adverse Effects of Eutrophication

There is a limit to the quantities of pollutants that can be removed from treatment plant discharges. Beyond a certain point, the additional reduction of pollutant levels becomes insignificant compared to the cost of upgrading a plant to achieve that reduction. It is therefore critical that we evaluate all alternatives, including innovative, unconventional, and non-engineering solutions to reducing nitrogen levels in the Harbor/Bight.

Successes

- ☺ System-Wide Eutrophication Model (SWEM) was developed by NYC to correlate the effect of nitrogen inputs to eutrophication in the Long Island Sound. This tool is used to estimate the effectiveness of nitrogen reduction at NYC and other wastewater treatment plants on reducing eutrophication and improving dissolved oxygen.
- ☺ NYC Dept. of Environmental Protection (DEP) conducted a pilot study at Oakwood Beach wastewater treatment plant in Staten Island for converting ammonia in wastewater into fertilizer.
- ☺ The Staten Island Bluebelt, a NYC DEP project, treats stormwater using ecological engineering by routing stormwater through a series of constructed wetlands.

Challenges

- ☹ Nitrogen reduction measures implemented at many wastewater treatment plants are approaching the limit of technology.
- ☹ The HEP and the responsible agencies need to develop a strategy to address non-point sources of nitrogen.
- ☹ Results of research on the significance of atmospheric deposition as a nitrogen source need to be communicated to and reviewed by the relevant government agencies.

OBJECTIVE: Conduct Additional Studies to Understand the Causes of Hypoxia, Algal Blooms and Other Eutrophication Effects

Eutrophication and resulting hypoxia are complex phenomena, not always induced by human activity. It is often extremely difficult to elucidate the cause of an algal bloom. For instance, scientists have been working for nearly two decades

to determine the cause of brown tides. Part of the difficulty lies in the complex relationship between hydrologic conditions and the climate, which affects where and when hypoxic conditions occur. Therefore it is important to understand the relationships among nutrients, climatic conditions, algal blooms and hypoxia, if sound nutrient management decisions are to be made.

Successes

- ☺ Hudson River Foundation has sponsored important research on carbon and nutrients cycling in the estuary.
- ☺ The atmospheric contribution of nutrients has begun to catch the attention of researchers. Dr. Steve Eisenreich and Dr. Yuan Gao, both of Rutgers University, have studied the atmospheric deposition of certain contaminants and nutrients in the estuary.

Challenges

- ☹ The scientific community should focus on determining whether and where eutrophication would occur without the influence of human activities in order to determine what the “natural” condition of the estuary is.

A Final Note

Wastewater treatment has improved drastically over the last few decades as municipalities upgrade their wastewater treatment plants to meet the requirements of the Clean Water Act for secondary treatment. The next step is nitrogen (nutrients) removal. However, engineering solutions are approaching the point where the incremental benefits of installing new technologies may not outweigh the huge costs of these upgrades. As the treatment plants approach the technological limits, we must begin to evaluate other sources of nitrogen in the Harbor such as non-point sources including air deposition. We must also begin to seek more innovative solutions to nitrogen removal, such as ecological engineering solutions.



Rainfall Events

Highlights

- ✦ Through NYC Dept. of Environmental Protection's Shoreline Surveys, >96% of illegal dry-weather discharges eliminated
- ✦ Solids/floatables removal facilities and demonstration projects implemented at several combined sewer overflows in New York City
- ✦ Staten Island Bluebelt using non-structural solutions for treating stormwater
- ✦ NYC Soil & Water Conservation District implementing stewardship program to assist groups involved in non-point source education

Three major sources of pollution to the Harbor/Bight are associated with runoff induced by rainfall. Two of these sources, combined sewer overflows and stormwater discharges, are regulated as point sources under the Clean Water Act's National Pollution Discharge Elimination System permit program. The third source, surface runoff, is not currently regulated by federal or state permit requirements. Please refer to the Floatables section for more information.

OBJECTIVE: Implement the Nine Minimum Measures of the National Combined Sewer Overflow Control Policy

The National Combined Sewer Overflow Control Policy issued by the US Environmental Protection Agency prescribes nine measures that constitute a minimum recommended level of combined sewer overflow (CSO) control.

Successes

- ☺ NYC Dept. of Environmental Protection (DEP) conducted shoreline surveys and eliminated over 96% of illegal discharges into the Harbor. This effort has matured into the Sentinel Monitoring Program, under which the harbor and its tributaries are evaluated on a quarterly basis to identify and abate any new dry-weather discharges.
- ☺ Pollution Prevention Citizens Advisory Committee, convened by the NYC DEP, meets regularly to monitor the NYC DEP programs on industrial pre-treatment and pollution prevention programs.
- ☺ NYC DEP has been implementing the Integrated Floatables Control Program, which includes catch basin hood upgrades, boom installation, skimmer operation, and public education.
- ☺ NYC DEP is in the process of completing \$14 million in new or replacement sanitary sewer projects to eliminate direct discharges of sewage to Jamaica Bay or its tributaries.
- ☺ NYC DEP has completed construction of the Corona Avenue Vortex Facility, a demonstration project for removal of floatables and settleable solids discharges into Flushing Bay.
- ☺ Middlesex County Utilities Authority is conducting several studies to address extraneous flows under a consent order. These studies investigate water quality impacts on the Raritan River, effluent reuse, and land-based sludge management.

- ☺ NJ Dept. of Environmental Protection has taken enforcement action against municipalities that are non-compliant with the provisions of the CSO discharge permits. These actions resulted in consent orders with seven municipalities.
- ☺ The planning stage of NJ's Sewerage Infrastructure Improvement Act has been completed for all CSOs, and solids/floatables control facilities are operational at 10% of the CSOs.
- ☺ The Municipal Utilities Authorities of Edgewater and North Bergen, the Towns of Harrison and Guttenberg, and the Village of Ridgefield Park have initiated or completed the CSO control plans through the separation of stormwater and sanitary sewers or installation of solids/floatables control facilities.

Challenges

- ☺ The public, commuters in particular, municipalities, and ferry operators must be better educated on the water quality impacts of litter.
- ☺ The Town of Kearny, the Borough of East Newark, the City of Bayonne, and the Cities of Gloucester, Perth Amboy and Rahway must now meet the requirements of the consent orders.

OBJECTIVE: Implement Additional Combined Sewer Overflow Controls to Meet Water Quality Standards and Restore Beneficial Uses

Implementing the nine minimum measures recommended by the National Combined Sewer Overflow Control Policy will not necessarily achieve water quality goals, restore beneficial uses, or eliminate adverse ecological impacts. Additional steps, including a long-term plan, are necessary.

Successes

- ☺ NYC is implementing a comprehensive CSO abatement program as per consent order with NYS Dept. of Environmental Conservation. The program divides the city into 8 CSO planning areas, which together cover all of the city's waterbodies.
- ☺ NYC Dept. of Environmental Protection (DEP) is in the construction phase for CSO retention facilities to reduce sediment and contaminant loads to the Bronx River, Alley Creek, Westchester Creek, Flushing Creek and Bay, Hutchinson River and Paerdegat Basin.
- ☺ NYC DEP has begun a study to evaluate the fate and transport of solids discharged from CSO outfalls. This study will enable us to determine the CSO contribution of sediments, organic matter and contaminants to the harbor.
- ☺ NYC DEP's Use and Standards Attainment Project is currently identifying the

- desired uses of waterbodies and will develop plans for achieving those uses.
- ☺ NJ is coordinating the Combined Sewer Overflow Long Term Control Planning with the Watershed Management Planning with various sewer system owners and/or operators. CSO permittees have begun land-side monitoring and development of a Storm Water Management Model as the first phase of the Long Term Control Planning.

Challenges

- ☺ The HEP should promote further research into new technologies for abatement of CSO and stormwater discharges that can be implemented within the space and hydraulic constraints of the existing sewer system.
- ☺ More waste baskets and frequent trash pickups are necessary in many neighborhoods and parks.
- ☺ CSO control programs should include reductions of toxic materials as well as other pollutants.

OBJECTIVE: Implement Measures to Control Municipal and Industrial Stormwater Discharges

Stormwater discharges occur when it rains in areas with separate storm and sanitary sewer systems. Although much of the Harbor core area is served by combined sewer systems, significant areas do have stormwater systems. For example, approximately 30% of New York City is served by separate sewers. The entire Bight and back bays are either served by separate sewer systems or unsewered.

Successes

- ☺ Environmental Protection Agency (EPA) has released a new rule on stormwater management that will require smaller municipalities and construction projects to obtain stormwater permits (Stormwater Phase II Rules and Regulations).
- ☺ NYC Dept. of Environmental Protection (DEP) is developing an urban construction site erosion control plan.
- ☺ Natural Resources Group of the NYC Dept. of Parks and Recreation is developing a guidebook for the Parks Enforcement Patrol officers outlining procedures for working with developers of projects adjacent to parkland to prevent sediment runoff. The Natural Resources Group also offers training workshops on erosion and sedimentation to Parks Enforcement Patrol officers.
- ☺ NYC DEP has issued modifications to the City's stormwater management program that will address identification of pollutant sources, discharge charac-

terization, and assessment of pollution controls.

- ☺ Two stormwater control projects have been developed in NYC: Van Cortlandt Lakes Restoration/Recreation Access project and the Harlem River restoration project in Spuyten Duyvil.
- ☺ NYC DEP has an innovative stormwater management program, the Staten Island Bluebelt program, in which stormwater is routed through a series of constructed wetlands before discharging into the Raritan Bay.

Challenges

- ☺ The HEP and its partners should renew the CCMP commitment to the development and timely implementation of the CSO Long Term Control Plans by sewer owners and operators in New York and New Jersey.
- ☺ The EPA and NJ Dept. of Environmental Protection need to obtain enforceable commitments from sewage treatment plant owners and operators to their CSO abatement responsibilities.

OBJECTIVE: Focus Federal Resources and Programs on Harbor/Bight Waterways

There are numerous federal funding opportunities and programs that can benefit the Harbor/Bight. The US Environmental Protection Agency awards grants to states under Section 319 of the Clean Water Act to assist with implementation of the state non-point source management programs. New York City is one of 13 Urban Resources Partnership cities. URP is a program of the US Dept. of Agriculture, administered through a partnership of federal and state agencies, aimed at empowering local communities in under-served areas to become stewards of their natural resources and improve the quality of life.

Successes

- ☺ NYC Dept. of Parks and Recreation received Section 319 grants in 1994 for a salt marsh restoration in Inwood Hill Park in Manhattan. The restored marsh was to act as a buffer to prevent polluted runoff from entering the Harlem River. The NYC Water Quality Coordinating Committee also received funding to create a wetland in the Bronx to treat stormwater runoff from a paved schoolyard.
- ☺ The URP provided seed money to the Partnerships for Parks, which brought together communities along the Bronx River to found the Bronx River Working Group, an alliance of over 60 community and environmental groups, government agencies, businesses, schools, and interested individuals. The funds provided by the URP have been passed through to community groups for

grassroots projects. Since the formation of the Bronx River Working Group, the Bronx River has been named the River of the Year in 1999 by Commissioner Henry Stern of the NYC Parks Dept.; has received more than \$10 million through Congressman Jose Serrano; and has recently been awarded \$11 million each by the Governor and the Mayor towards the Bronx River Greenway implementation.

- ☺ The URP has provided funding and technical assistance to the Friends of Gateway, a non-profit organization, to implement a project enabling communities to discover and enjoy Jamaica Bay. As part of this project, small grants were awarded to local community groups.
- ☺ The URP has also funded the construction of wetlands for stormwater treatment in East New York. The project not only abates stormwater runoff, but also creates much needed parkland in a borough with the fewest acres of open space.
- ☺ The URP has also provided technical assistance to numerous community projects in New York City.

Challenges

- ☺ A large portion of the Section 319 funds has been spent on abatement of agricultural non-point source pollution. The HEP and its partners should direct a larger portion of these funds for urban non-point source pollution abatement.
- ☺ The URP funding, which came from the Natural Resources Conservation Service and Forest Service budgets, was recently eliminated. The program now needs to focus entirely on provision of technical assistance by partner agencies. The HEP should support reinstating URP funding through the two federal agencies.

OBJECTIVE: Continue and Enhance Education Programs for Control of Non-Point Source Pollution

Because of the nature of non-point source pollution, public education is critical in reducing this source. The target audiences for non-point source education campaigns should include the general public, as well as professional stakeholders, such as engineers, landscape architects, and municipal planners.

Successes

- ☺ NYC Soil & Water Conservation District and the HEP jointly hosted a stewardship training workshop on non-point source pollution and citizen action. The workshop focused on what private citizens can do to reduce the non-point

sources of pollution.

- ☺ Environmental Protection Agency (EPA) has completed its website on non-point source pollution. The EPA headquarters published a series of fact sheets on the web, while the EPA Region II has its own non-point source pollution web page describing the problems particular to the NY/NJ Metropolitan region.
- ☺ The NYC Envirothon 2001, a high school environmental science competition sponsored by the NYC Soil & Water Conservation District, will feature non-point source pollution as the current events topic, giving NYC high school students an opportunity to learn about this pollution.

Challenges

- ☺ Effective programs for capturing runoff from roads and highways should be investigated by relevant agencies.
- ☺ The HEP and its partners should take the lead in promoting the use of innovative non-point source technologies, such as created wetlands, to engineers, landscape architects, and municipal decision makers.
- ☺ The HEP should educate land use decision makers on the importance of vegetated open space in the prevention of stormwater runoff, in addition to its habitat value and air quality improvement benefits.

Conclusion

In this document the Citizens Advisory Committee and the Science/Technical Advisory Committee highlighted what they perceived to be the most important achievements of the program along with remaining challenges. We recognize that there are many other achievements not included in this report, but we have chosen to focus on those that would not have been possible without the HEP.

One significant success of the program that cuts across all chapters is that many funding agencies - public and private - have focused their programs on the problems of the Harbor Estuary. For example, since 1990 the Hudson River Foundation has spent over \$18 million on research on the Hudson River focused on the estuary, much of which was committed with HEP goals in mind. The New York and New Jersey Sea Grant offices have similarly supported almost \$2 million to estuary-related research in the past 10 years.

However, one of the most important challenges that remains for the HEP to address is securing more funding, and more kinds of funding, for technical work, particularly monitoring. The HEP produced an Environmental Monitoring Plan

that was included as an Appendix to the CCMP. This plan outlines recommendations for tracking a series of environmental indicators over time in order to determine whether the health of the estuary is improving in response to management actions taken by the HEP. Without funding, many of these measures have not and will not be monitored, and the HEP will find it difficult to determine whether it is achieving its environmental objectives. By their nature, monitoring programs require many years of consistent funding in order to provide appropriate and accurate information. While this type of resource is difficult to secure, HEP must attempt to identify such funds if it intends to monitor its own success as well as the health of the environment.

The HEP has enabled collaboration and cooperation among governmental and non-governmental entities and individuals. Through this program re-evaluation effort, the HEP is now looking to expand its constituency and reach out to elected officials at local, state, and federal levels. Your input is a critical element of this ambitious effort. After all, the estuary belongs to everyone.



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