Port and Maritime

GOALS, OBJECTIVES, *and* PRIORITY ACTIONS

PORT AND MARITIME WORK GROUP

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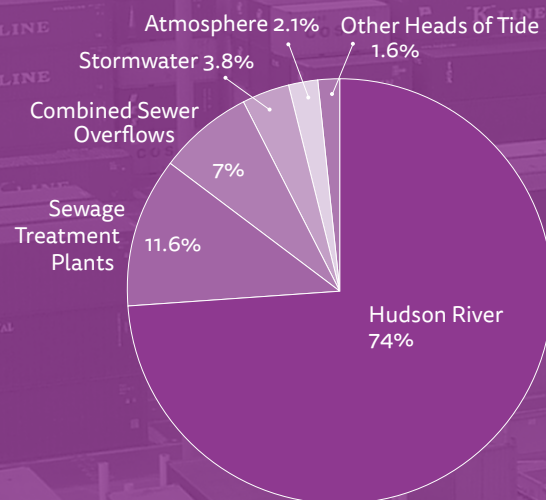### Loading of PCBs to the NY/NJ Harbor Estuary

Atmosphere 2.1%
Other Heads of Tide 1.6%
Stormwater 3.8%
Combined Sewer Overflows 7%
Sewage Treatment Plants 11.6%
Hudson River 74%

Data source: Hudson River Foundation, *Contaminant Assessment and Reduction Project Summary Report*

Photo: Port Elizabeth, NJ. Captain Albert E. Theberge, NOAA (ret.)

Support port and associated maritime operations so that they are both economically and ecologically viable.

The Port of New York and New Jersey and associated maritime activities are an integral and complementary part of the New York – New Jersey Harbor Estuary. The economic importance of moving cargo and people must be balanced with addressing historic and on-going impacts of port facilities and operations on estuarine ecology and host waterfront communities. HEP's role is to provide important information on the sources and fate of contaminated sediment.

The presence of toxic contaminants in sediments is a major factor in the economic and ecological health of the Port. The second phase of the Contaminant Assessment and Reduction Project (CARP 2) will provide important information on the movement of sediment, and in particular the sources and fate of contaminated sediment. Over the next five years as the project's scope is delineated and data is collected and analyzed by a team led by the Hudson River Foundation, HEP will provide a vehicle for informing and engaging public and private stakeholders in this work. HEP will also convene a workshop on the appropriate development and use of seasonal no-dredging windows.

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The Port of New York and New Jersey is the largest port on the Atlantic seaboard, with about 3.7 million containers, 500,000 automobiles, and other goods coming in and out each year. This cargo is valued at $200 billion and supports about 190,000 direct jobs at the port and associated shipping and maritime trades.

Successfully managing this critical industrial activity requires careful attention to the Estuary and surrounding waterfront communities. In particular, the management of the quantity and quality of sediment that flows into navigation channels and berthing areas, both for large container ships as well as smaller tugboats and barges, can substantially reduce the costs of dredging while reducing the exposure of people and wildlife to toxic materials.

The Estuary is a machine for transporting sediment down the Hudson and other rivers into the harbor. Between 400,000 to 1.4 million metric tons each year move through the system. Conversion of agricultural and forested land to impervious surface creates surges of stormwater runoff that erodes streambeds and banks. These high sediment loads 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. Understanding the movement of material in the system can help guide efforts to foster best management practices throughout the Estuary to reduce this load while protecting habitat. It can help refine and target actions to address the sediment management and erosion goals articulated by the Hudson River Estuary Program and the Hudson River Comprehensive Restoration Plan.
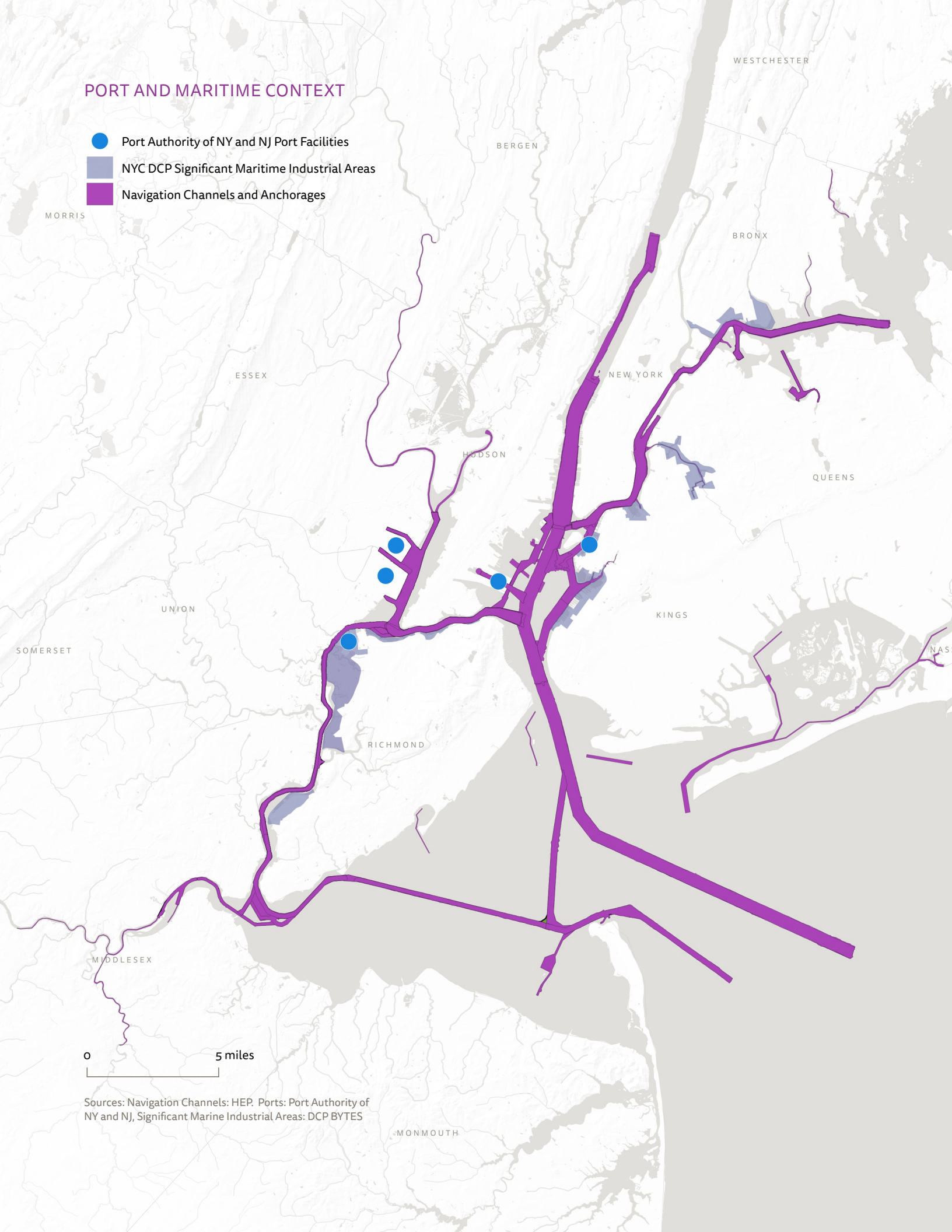
Unfortunately, a history of industrial activities along our waterways has left behind pollutants in the sediment that are toxic to people and wildlife, such as heavy metals, dioxin, and PCBs. Bioavailable contamination has resulted in reduced recreation opportunities, water quality, habitat quality, and fisheries. Contamination of navigational dredged materials has resulted in multi-fold increases in dredging costs over the past decade. Cleaning up this material, concentrated at Superfund sites in the Passaic, Newtown Creek, Gowanus Canal and especially in the upper Hudson River, will help eliminate sources of these contaminants from the system. The original Contaminant Assessment and Reduction Project (CARP), completed in 2007, identified the relative contribution of these and other sources of toxic contamination across the Estuary. A more detailed and updated mapping will further illuminate our understanding of the sources and fate of toxic material, and can be used to help guide decisions on dredging as well as restoration and public access projects.

The recent completion of the Harbor Deepening Project makes this improved understanding ever more important. By lowering the depth of eight navigation channels, this 12 year, $2.1 billion initiative reduced the need for annual appropriations for maintenance dredging. With its completion, the importance of understanding when and how dredged material might become clean enough for beneficial uses or disposal at Historic Area Remediation Site (HARS) is more critical than ever.

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 to mitigate direct dredging impacts. Dredging can alter or destroy aquatic habitat, remove benthic invertebrates that fish and wildlife feed upon, and interrupt spawning and other activities critical to fish life-cycles. Seasonal no-dredging windows have been developed to protect fish and wildlife resources but rely on incomplete scientific information. This uncertainty is compounded by the possible impact of climate change on these resources. Moreover, there are inconsistencies between the relevant federal agencies and the States of New York and New Jersey in their implementation of these windows. Dredging can also result in unintended secondary effects such as the release of contaminants during 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.

● Port Authority of NY and NJ Port Facilities

NYC DCP Significant Maritime Industrial Areas

Navigation Channels and Anchorages

WESTCHESTER

BERGEN

MORRIS

ESSEX

BRONX

NEW YORK

HUDSON

QUEENS

UNION

KINGS

SOMERSET

NAS

RICHMOND

MIDDLESEX

0   5 miles

Sources: Navigation Channels: HEP. Ports: Port Authority of NY and NJ, Significant Marine Industrial Areas: DCP BYTES

MONMOUTH

Port and Maritime

*Support port and associated maritime operations so that
they are both economically and ecologically viable.*

OBJECTIVE A *Improve understanding and management
implications of changing sediment contamination in the
Estuary, including the timeline for achieving HARS suitable
sediments in the navigation channels*

M-A-1 **SEDIMENT QUALITY**
*Map current sediment quality conditions in the Estuary and
identify changes over the last 15 years.*

M-A-2 **FUTURE CONTAMINATION**
*Evaluate, update and refine the CARP I Sub-models to predict
levels of contamination in the future.*

OBJECTIVE B *Help design and implement port and maritime
improvement projects that are more environmentally friendly*

M-B-1 **DREDGING WINDOWS**
*Convene Technical Workshop on the development of seasonal
windows for dredging projects.*

CHALLENGES	INDICATORS
● **CONTAMINATION MAKES DREDGING EXPENSIVE** *OBJECTIVES A & B*	**CONTAMINATION MAKES DREDGING EXPENSIVE** • *Contaminants in Sediments (PCBs, dioxin, PAHs)* • *Metals in Sediments (Hg, Cr, Cd, Pb)* • *PCBs (in fish)*
● **INCOMPLETE UNDERSTANDING OF DREDGING IMPACTS** *OBJECTIVES A & B*	**INCOMPLETE UNDERSTANDING OF DREDGING IMPACTS** • *Estuarine and Diadromous Fish Abundance*

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OBJECTIVE A
Improve understanding and management implications of changing sediment contamination in the Estuary, including the timeline for achieving HARS suitable sediments in the navigation channels

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MA-A-1

SEDIMENT QUALITY
Map current sediment quality conditions in the Estuary and identify changes over the last 15 years.

NEED
The changes in Harbor sediment quality over the last 15 years are not well documented.

DESCRIPTION
As part of the second iteration of the Contaminant Assessment and Reduction Project (CARP II), a team led by the Hudson River Foundation will create a current conditions map of levels of PCBs and dioxins in navigation channels and off-channel areas in the Estuary. The mapping and data analysis will be used to assess the adequacy and accuracy of previous CARP model projections of future contaminant levels in Harbor sediments and determine where improvements to the model are needed.

The initial map will be based on existing information from regional assessments and dredged material testing data. Subsequent maps will be updated with new data collected under CARP II.

HEP will convene one or more meetings to provide a means of communicating this information to key stakeholders and managers, including the HEP Management Committee and Policy Committees, and will follow up with key stakeholders to help identify possible additional applications of the data. HEP will help communicate findings to HREMAC.

KEY PARTNERS: NJDOT, HRF, Monmouth University, USACE, EPA, NJDEP, NYDEC, PANY/NJ, NYCEDC, Rutgers University, HREMAC
RESOURCES: Staff and Leveraging. HRF is managing the CARP II technical team with $ 4.1 million of funding provided by NJ DOT.
TIMELINE: 2017-2020
OUTCOMES
Short term:
- Data on level of PCBs and Dioxins and associated maps of current Harbor contamination and changes in contamination over the last 15 years.
- Identification of additional management applications and research needs.

Long-term:
- Improved forecast of dredged material placement costs.

MA-A-2

FUTURE CONTAMINATION
Evaluate, Update and Refine the CARP I Sub-models to predict levels of contamination in the future.

NEED
The CARP I model forecasted that over the 30 year period from 2010-2040, many of the current contaminants of concern in dredged material were expected to decrease to levels that would allow ocean placement. Since the 2002 CARP I model projections of time to HARS (ocean placement) suitability, the bathymetry of the Harbor has changed significantly and the Harbor has experienced a number of extreme events that were not simulated in the CARP I model projections. Therefore, it is necessary to refine the CARP models and to assess the impacts of extreme flow events on contaminant responses in Harbor sediments.

DESCRIPTION
The refined CARP II model will be applied to reevaluate the CARP I forecasts to predict future (15 and 25 years from now) levels of contamination in the sediments within navigation channels of the New York and New Jersey Harbor.

HEP will convene one or more meetings to provide a means of communicating key information to Harbor and Hudson River stakeholders and managers, including the HEP Management Committee and Policy Committees and the Restoration Work Group, and will follow up with key stakeholders to help identify possible additional applications of the data.

KEY PARTNERS: NJDOT, HRF, Monmouth University, USACE, EPA, NJDEP, NYDEC, PANY/NJ, Rutgers University
RESOURCES: Staff and Leveraging. HRF is managing the CARP II team with $4.1 million of funding provided by NJ DOT.
TIMELINE: 2017-2020
OUTCOMES
Short term:
- Report on the evaluations of the CARP II Models (hydrodynamic, sediment transport and organic carbon cycling, and contaminant fate and transport sub-models).
- Forecast of the time for dredged material to meet HARS suitability.

Long-term:
- Improved forecast of future sediment quality including contaminant responses to extreme events to support improved dredged material planning.

OBJECTIVE B
Help design and implement port and maritime improvement projects that are more environmentally friendly.

MA-B-1

DREDGING WINDOWS
Convene Technical Workshop on the development of seasonal windows for dredging projects.

NEED
Building shared understanding and a scientifically valid and consistent approach to the use of seasonal no-dredge windows will aid decision-makers.

DESCRIPTION
HEP will convene a workshop to review the science behind time-of-year restrictions on dredging (i.e. seasonal windows). Building on the information compiled by NY Sea Grant and data collected by the USACE through the Harbor Deepening Program, this effort will incorporate recent biological and operational data, assess potential impacts of dredging operations to natural resources, and discuss the policy approach to implement consistent, environmentally sound, economically feasible seasonal windows. The anticipated deliverables coming out of this effort will be: 1. A map identifying the locations and times-of-year dredging is restricted to protect natural resources; and 2. An updated decision matrix that incorporates biological data, operational considerations, and project information that will assist resource agencies with refining the application of seasonal windows to waterfront infrastructure projects.

KEY PARTNERS: USACE, EPA, PANY/NJ, NOAA, NYDEC, NJDEP, NJDOT, NYCEDC
RESOURCES: Staff and Leveraging. Grant Projects <$200,000.
TIMELINE: 2019-2020
OUTCOMES
Short term:
- A framework and shared understanding of the issues and available information affecting application of seasonal dredging windows.

Long-term:
- More efficient and effective regulation of waterfront infrastructure projects.

Data source: NYSDEC, Contaminant Monitoring Program

Striped Bass Annual Average [PCB]

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