HEP's Commitments to Advancing Green Infrastructure

JERSEY WATER WORKS: GREEN INFRASTRUCTURE COMMITTEE

April 2023

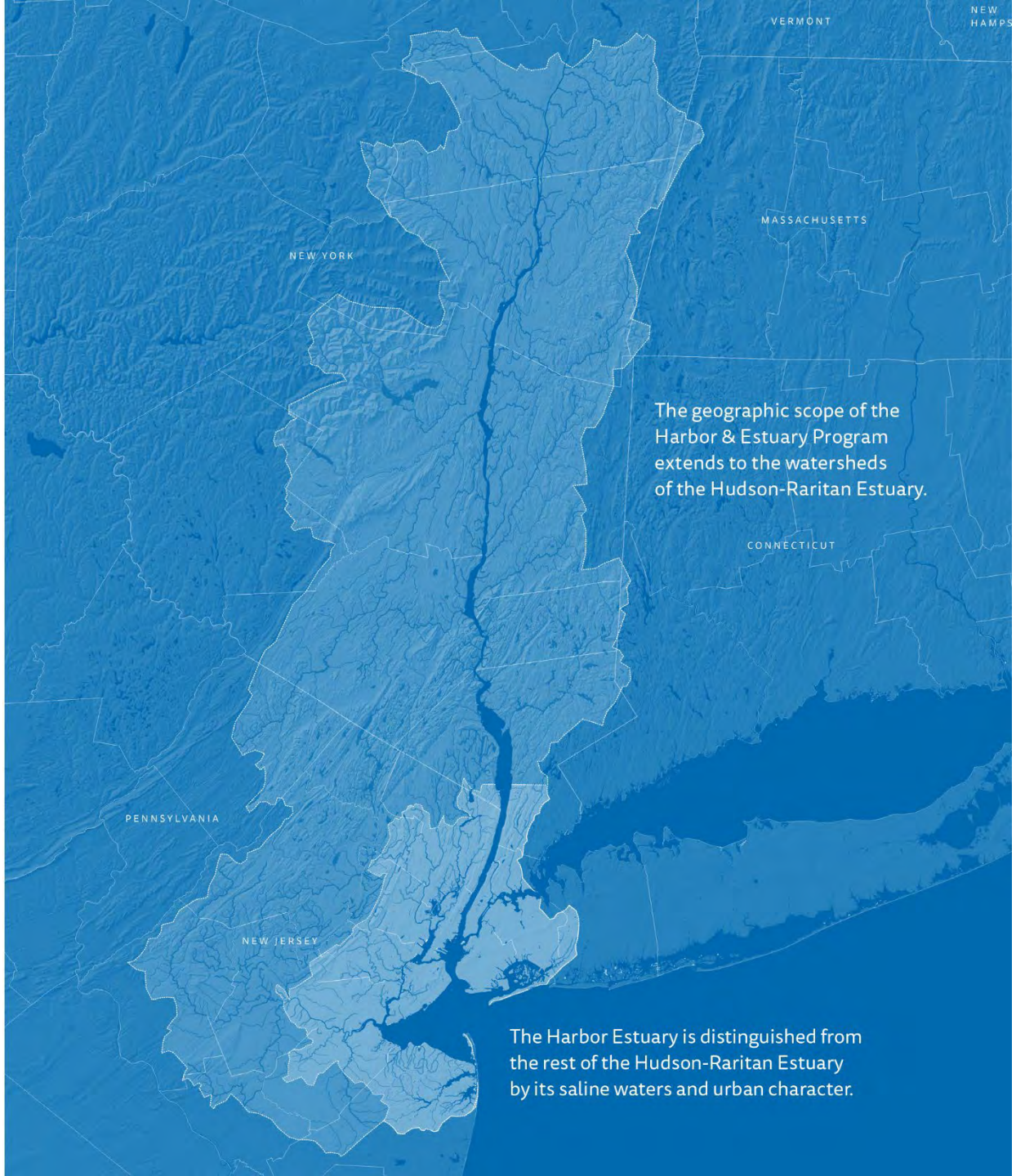
HUDSON RIVER FOUNDATION

NY/NJ HARBOR & ESTUARY PROGRAM

THE HARBOR ESTUARY AND ITS WATERSHEDS

HEP takes a watershed approach to address its management goals and the geographic scope of the Program extends to the watersheds of the rivers that drain to the harbor, notably the Hudson, Raritan, Passaic and Hackensack.

Because of common challenges and opportunities, HEP is focused on the tidal waters of the Estuary south of the Mario Cuomo (Tappan Zee) Bridge.

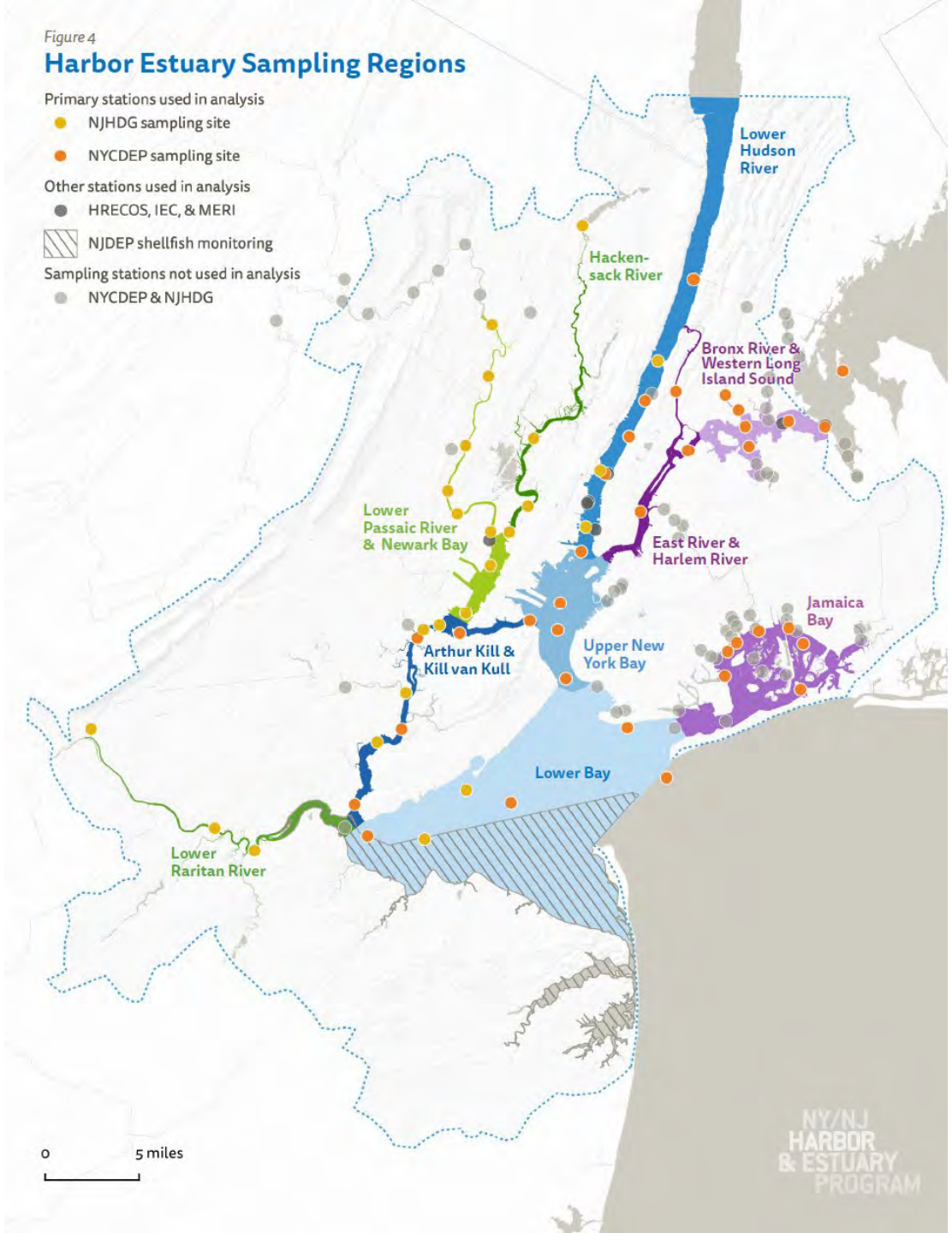


2021 Harbor-Wide Water Quality Monitoring Report

https://www.hudsonriver.org/article/harborwidewq

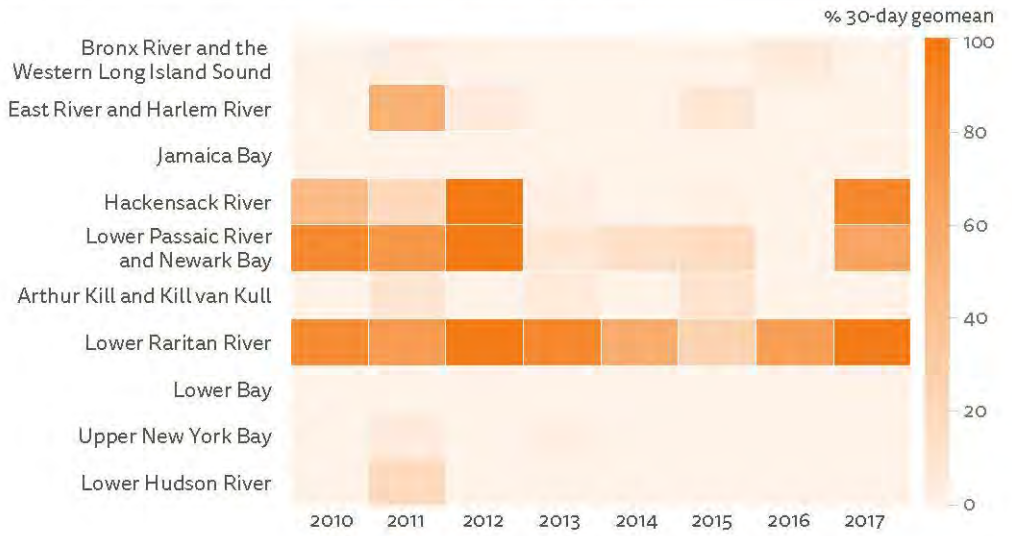
Figure 4

Harbor Estuary Sampling Regions



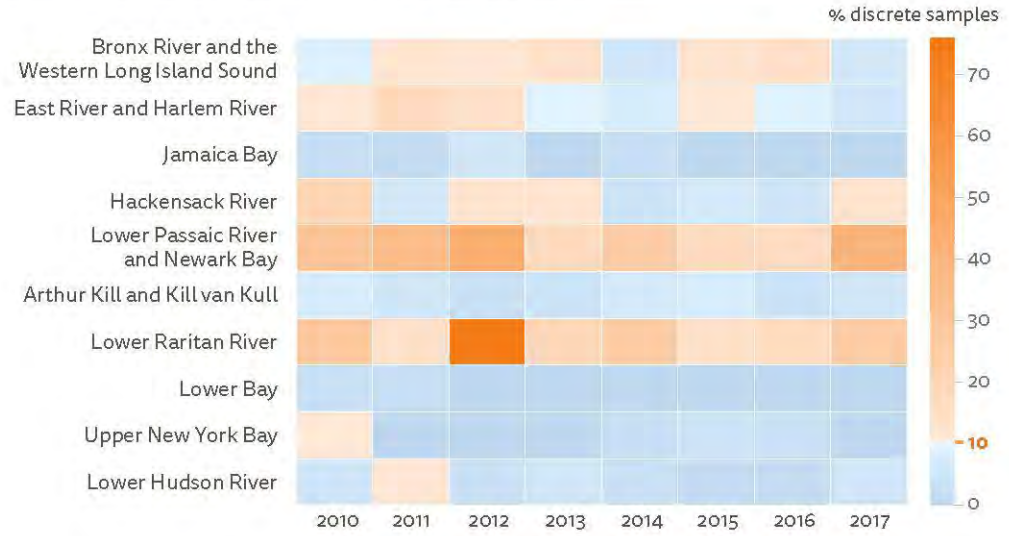
Enterococcus

Percent Summer Days, 30 - Day Geomean Above 35 cfu/100 ml



Enterococcus

Percent Discrete Samples Exceeding 130 cfu/100 ml



Regional Waterbody Summary
Lower Passaic River and Newark Bay

The Silicon Valley of the 1800s, the Lower Passaic River flows through the historic industrial heartland of New Jersey. From the Dundee Island Dam, the tidal Passaic River flows south to Newark Bay, where its waters mix with those of three other major waterbodies: the Arthur Kill, Kill van Kull, and the Hackensack River. The entire watershed includes portions of Essex, Passaic, Hudson, Bergen, and Union Counties. While the shorelines still harbor major industrial uses, including the port and related facilities in Newark and Elizabeth, there are some important public access points such as Newark's Riverfront Park, and Stephen Gregg Park in Bayonne.

Major factors impacting water quality in this region include chemical leaks and spills, CSOs, contaminated sediments, industrial post source discharge, landfills, municipal discharge and sewage, unpermitted discharges, and urban runoff. The Lower Passaic River, designated as a Superfund site, has borne a heavy burden of pollution from a century of industrialization and manufacturing that has left layers of dioxin (including 2,3,7,8-TCDD), PCBs, arsenic, benzo[a]pyrene (PAHs), dieldrin, heptachlor epoxide, chlordane, and DDT in the waterbody and in fish tissue. In addition to these impairments, the Lower Passaic River and Newark Bay are also affected by floatables, low levels of dissolved oxygen, high phosphorus levels, total suspended solids, and pH levels. The EPA currently reports that aquatic life, fish consumption, public bathing, recreation, and shellfishing are impaired throughout the region. TMDLs are needed for all aforementioned causes of impairment.

Waterbody	Water Class NJAC 7: 9B-1.14(d)(1)	Water Quality Criteria: Pathogenic Bacteria (cfus/100mL)	Water Quality Criteria: Dissolved Oxygen (mg/L)
Upper Passaic River	FW2-NT: Fishing, Fish Propagation, and Bathing	*E. Coli*: Monthly GM ≤ 126 and a single sample max > 235	Never < 4.0 at any time
			24-hour average ≥ 5.0
Passaic River	Class SE2: Fishing and Fish Propagation	Fecal Coliform: Monthly GM ≤ 770	Never < 4.0
Lower Passaic River and Newark Bay	Class SE3: Fishing and Fish Migration	Fecal Coliform: Monthly GM ≤ 1,500	Never < 3.0

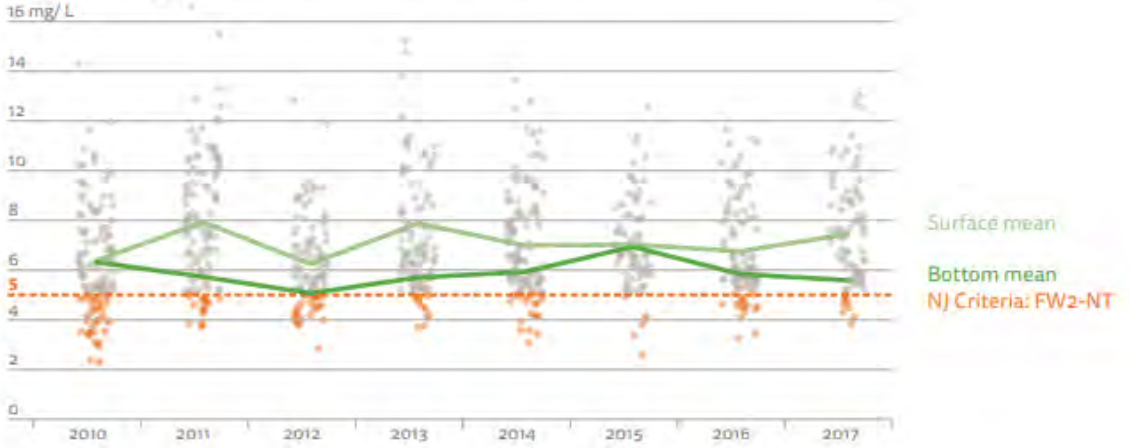
Dissolved Oxygen

Dissolved oxygen (DO) is a critical measure of habitat quality for fish and other wildlife. It is measured at the surface, where sunlight can penetrate to generate photosynthesis, as well as at the bottom, where sunlight is less available. In general, bottom DO concentrations are consistently lower than surface DO concentrations. Compliance with DO criteria has varied throughout the eight-year period. The Lower Passaic River and Newark Bay have been in compliance with the criteria throughout the eight-year period, though daily values have fluctuated below 4 mg/L. The percent of time DO samples were less than 4 mg/L was between 2-14% for surface DO and 0-15% for bottom DO. The percent of time DO samples were less than 5 mg/L has been between 7.7-22% for surface DO and 3-48% for bottom DO.

The data presented are from the Long-term Ambient Water Quality Monitoring of the New Jersey Portion of the New York/New Jersey Harbor Waters discrete sampling program, conducted by the NJHDG. The Hudson River Environmental Conditions Observing System (HRECOS) has a continuous monitoring station located in the Newark Bay that is operated and maintained by the Passaic Valley Sewerage Commission (PVSC). The HRECOS station was installed in 2014 in Newark Bay near the confluence with the Passaic River and collects data every 15 minutes year round. Results from the two data sources do show inconsistencies, with the HRECOS data being more severe. For example, in 2016, the percent of bottom DO samples that were less than 4.0 mg/L at the NJHDG stations was 3%, while the HRECOS stations for the same period was 8%.

2016	NJHDG	HRECOS
Average (mg/L)	5.84	4.99
% < 4.0 mg/L	3	7.9
% < 5.0 mg/L	16.4	52.2
Discrete Minimum Sample (mg/L)	3.56	2.74

Dissolved Oxygen, Summer Mean, Surface and Bottom

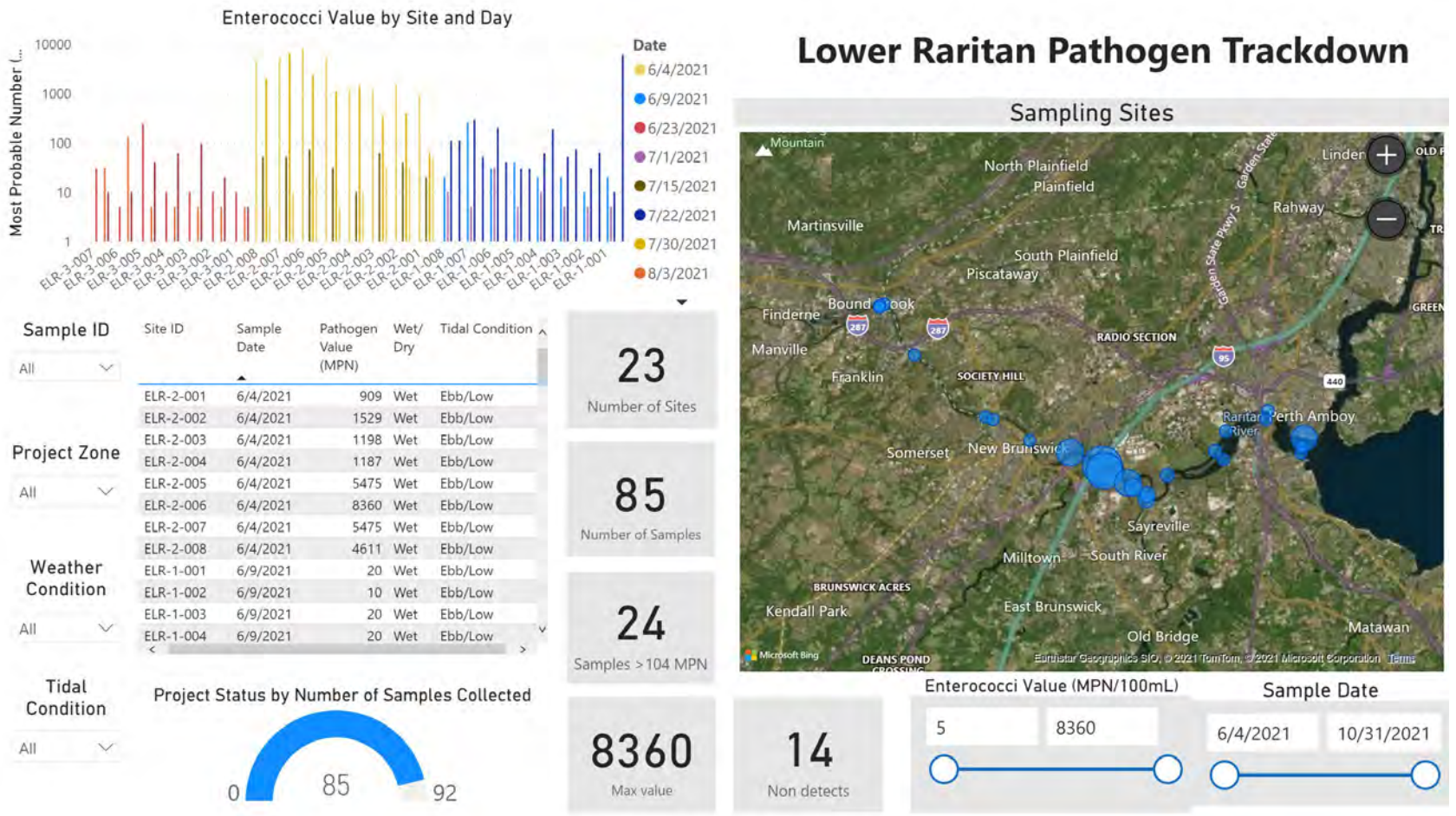


Water Quality

WQ-C-1: PATHOGEN MONITORING
Design an intensive pathogen monitoring and notification plan in select near-shore areas.

LOWER RARITAN RIVER PATHOGEN TRACKDOWN MONITORING

HEP has been working with EPA R2 to find pathogen sources of human origin that are impacting the water quality of the Lower Raritan and Perth Amboy. During calendar year 2021 the project focused on obtaining pathogen information at 23 sampling sites and through a collaborative effort, we are working towards sharing the data collected as well as an adaptive management approach that followed to help identify locations of human pathogens on the Lower Raritan and its' tributaries.



AQUATIC CONNECTIVITY THROUGH CLIMATE-READY INFRASTRUCTURE

Aquatic connectivity is a key restoration goal for HEP and its partners. While aquatic connectivity has been studied in the watersheds of New Jersey with respect to dams, the effectiveness of fish passage at many structures, such as culverts and bridges, has not been assessed. Based in part on similar efforts by the Hudson River Estuary Program in New York, HEP is assessing road-stream crossings for how well they can pass fish and other aquatic life and any hydraulic capacity issues that may lead to roadway flooding and erosion. We use these assessments to prioritize restoration of the crossing.

https://www.hudsonriver.org/article/actcri

Water Quality

WQ-C-2 DISSOLVED OXYGEN MONITORING
Address monitoring gaps and lack of information, including the need for real-time monitoring, relevant to DO requirements for different life stages of benthic and pelagic fauna.

ARTHUR KILL PILOT MONITORING

Working in partnership USGS, NYSDEC, and NJDEP, our objective it to pilot a one day synoptic on the Arthur Kill with the goal to characterize the spatiotemporal variability of dissolved oxygen (DO) concentrations in the Arthur Kill. Spatial variability will be characterized through a single day of boat-based spatial survey using a combination of high-resolution mapping and vertical profiles in late summer 2023. Findings from this pilot study will be made available in early 2024.

Water Quality

WQ-B-2: GREEN INFRASTRUCTURE
Support implementation of green infrastructure opportunities in CSO and MS4 communities.

CITY OF PERTH AMBOY, NJ

HEP will be funding the Rutgers Cooperative Extension Water Resources Program to provide technical assistance to the City of Perth Amboy by preparing six (6) final construction-ready green infrastructure design plans. Upon completion, Rutgers will assist the City in applying for grants for the green infrastructure projects identified in the 2022 green infrastructure feasibility report for CSO-shed #16 which will include:

- #20 - 2nd Street and Gordon Street
- #21 - 2nd Street and Lewis Street
- #22 - 2nd Street and Patterson Street
- #23 - Broad Street and State Street
- #24 – Fayette Street and Prospect Street
- #25 - Fayette Street and Watson Avenue

PERTH AMBOY CSO 16: GREEN INFRASTRUCTURE SITES

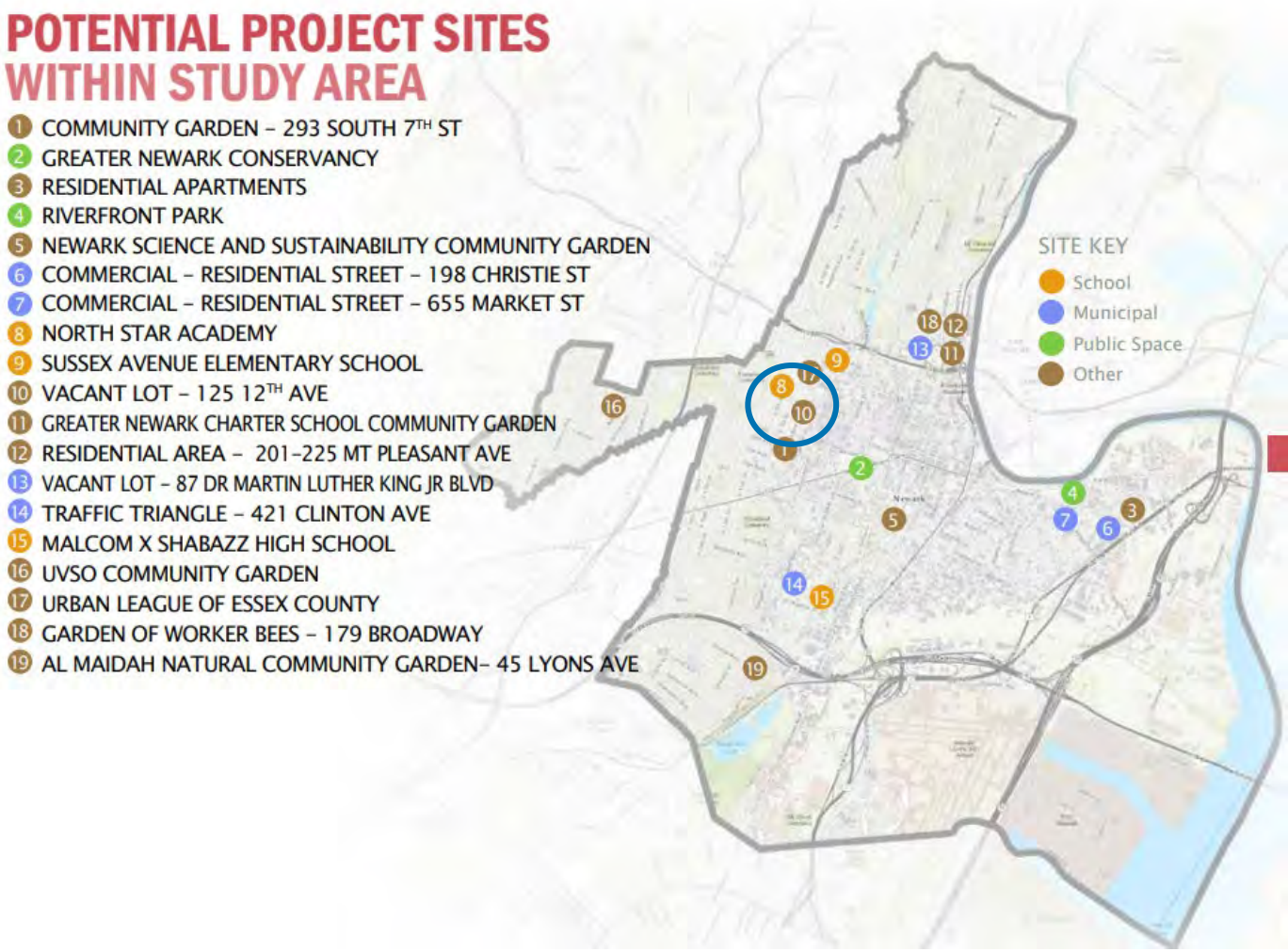
Water Quality

WQ-B-2: GREEN INFRASTRUCTURE
Support implementation of green infrastructure opportunities in CSO and MS4 communities.

NEWARK DIG – CITY OF NEWARK, NJ

The City of Newark has committed to managing 214 acres of public property with green infrastructure. To support this effort, HEP is providing funding to Newark DIG to leverage work they will be advancing in partnership with Rutgers/City of Newark on the Fairmount Avenue Green Streets CSO mitigation project. Funding will be used to support the following:

- GI Reformers' Community Engagement
- Workforce Development for GI (10-15 certified trainees to be hired for installation)
- Green Infrastructure Design Plans (2-4)



WQ-E-3: CLIMATE ADAPTATION
Advance understanding and consideration of water quality in the analysis of hazard mitigation and coastal resilience projects.

BUILDING COMMUNITY CAPACITY FOR CLIMATE RESILIENCY RFP

Objectives for Funding:

1. Enable disadvantaged communities to fully participate in planning and decisions about coastal adaptation and other infrastructure projects across the HEP area that are being advanced by federal, state, and local agencies.
2. Advance community-initiated projects that will enhance climate resiliency, including shoreline improvements, stormwater management measures, and natural and nature-based resiliency features.
3. Address gaps in data and knowledge that will improve community and agency understanding of baseline conditions, the current and future impacts of climate change, community values, and/or the effectiveness of alternative adaptation measures and management strategies.
4. Demonstrate the power of collaboration between community, government, independent scientists, and/or utilities.

Visit https://www.hudsonriver.org/article/climate-resilience-grants to learn more and access the RFP.

Questions?

Rosana Pedra Nobre
Water Quality Program Manager
(212) 483-7667
Rosana@hudsonriver.org

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