

Delaware River Basin Commission

2023-2024 Monitoring Updates
Autumn MACC Meeting
December 13, 2023

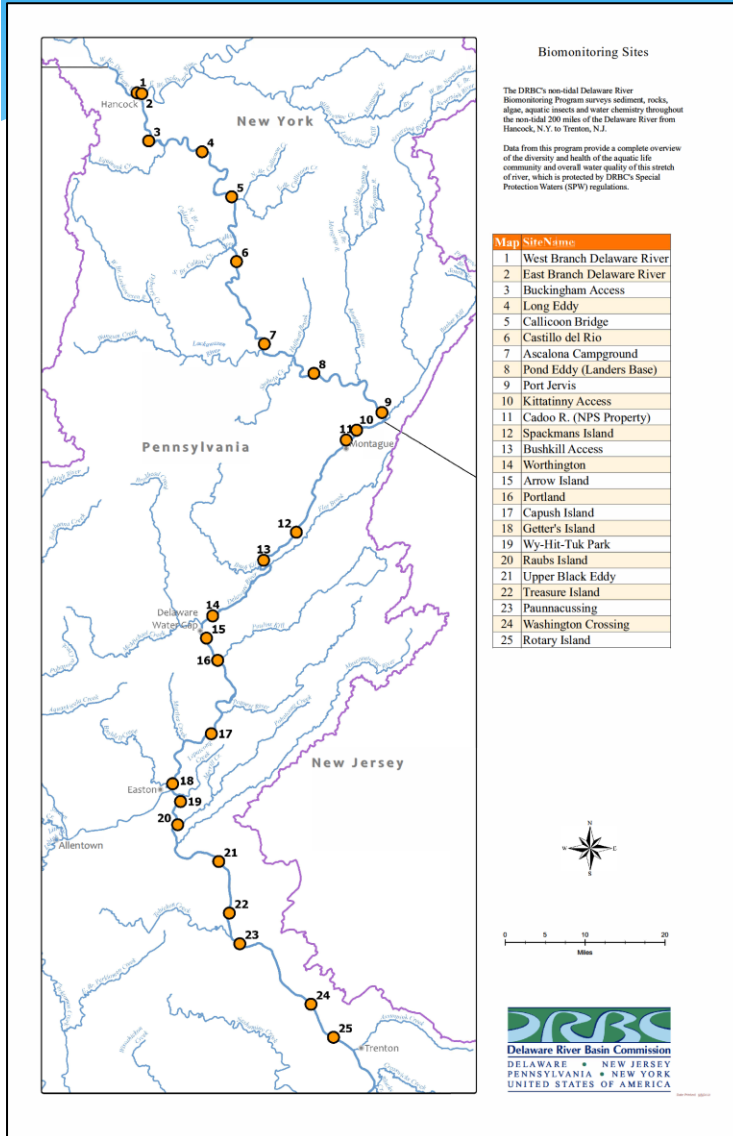
Updates from DRBC's Science & Water Quality
Management Staff

- Elaine Panuccio, Water Resource Scientist
- Jake Bransky, Sr. Aquatic Biologist
- John Yagecic, Manager, Science & Water Quality Assessment

Presented to an advisory committee of the DRBC on December 13, 2023. Contents should not be published or re-posted in whole or in part without permission of DRBC.



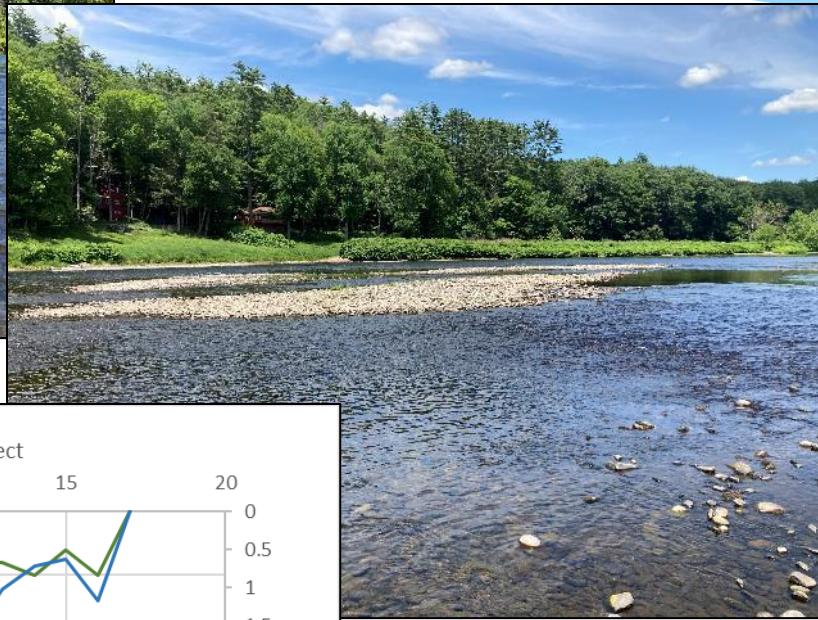
Non-tidal Biological Monitoring



- 25 Stations from Trenton to Hancock
- August and September Index Period
- Collected macroinvertebrates, algae, water quality, and physical habitat data
- Samples from be 2022 and 2024 will be analyzed in 2024



Upper Delaware Low-Flow Habitat Study

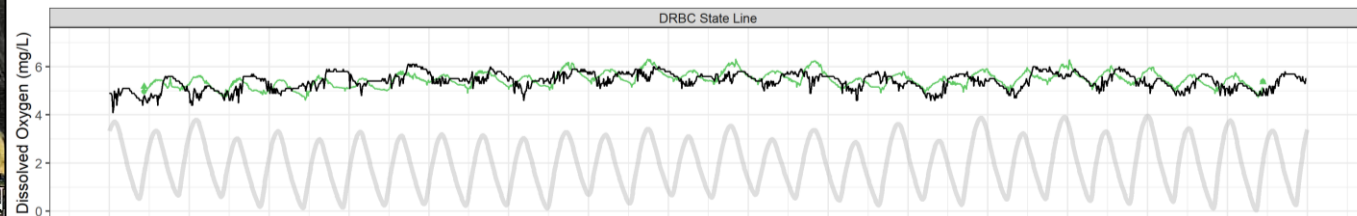


- Ground truth available habitat in Upper Delaware river during low flows
- Support modelling efforts currently ongoing to better understand river flows
- Measured flow and depth across several transects at potential restriction points
- Potentially will perform additional measurements in 2024

DO Monitoring Sturgeon Habitat



- Current USGS logger at Chester is several miles upstream of important sturgeon nursery grounds
- Collect enhanced spatial resolution DO data in portion of the estuary important to young-of-year Atlantic sturgeon
- Deploy several top/bottom DO loggers at multiple locations
- Target low DO time of year (July-September)





This National Fish and Wildlife Foundation grant will begin in spring 2024. It will examine 6-PPDq, a chemical that is acutely toxic to coho salmon and linked to die off events in the Pacific Northwest. It is also sub-lethally toxic to other salmonid species, including a few trout species. This first of its kind study in the Delaware River Basin will quantify the presence of 6-PPDq in trout streams during normal flow and after significant rain events

Picture is of tire wear particles on a membrane filter.

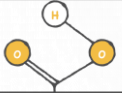

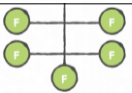
PDE BIL TRIBUTARY MONITORING


- POLLUTANT LOADS IN TRIBS
 - PFAS
 - PCBS
 - DIOXINS
 - FURANS
 - PAHS
 - NEONICOTINOIDS
 - ORGANOCHLORINES



Funding from the PDE, through the Bipartisan Infrastructure Law will support a one-time sampling of water from 12 tidal tributaries in NJ and PA in summer 2023. The goal was to get a snapshot of the pollutants from several important classes that will inform future efforts to track down sources of these compounds that harm water quality in the Delaware River Basin. Sampling is complete, and we are waiting on the lab to return the data with an expectation that we will write the report next fall and winter with a Spring 2025 release.

PFAS MONITORING

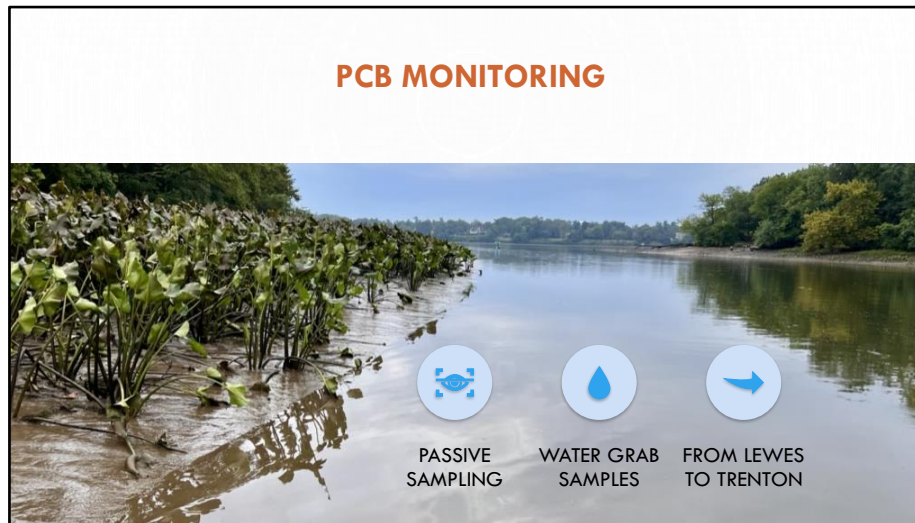
	NFWF: YEARS 1, 2 & 3
	PA CZM: YEARS 1 & 2
	PFAS SYNTHESIS



DRBC PFAS website w/all DRBC reports and presentations as well as general PFAS background information.

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- 1) NFWF Year 1 PFAS report is posted on the DRBC website linked to the QR Code. Year 2 report is written and should be published early in the new year. We completed all the sampling for Year 3 last summer, which included 15 main stem sites from Lackawaxen to Pea Patch Island and 1 tributary (Schuylkill) for water and sediment and 9 sites for fish and 1 for blue crabs. That report will be available in winter 2024/2025.
- 2) PA CZM Year one report is published and available at the link in the QR Code. Sampling for water and sediment is complete 17 sites, 11 mainstem and 6 tributaries, but fish sampling will resume in the spring.
- 3) Plan to start synthesizing all PFAS data that DRBC has collected going back to 2004 as well as other publicly available data from the Basin to assess trends and inform future efforts to confront PFAS in our catchment. This is a long-term plan as we are waiting for our current years data to come back from the lab, and after we've written those reports, we will begin working on this effort.



This EPA 106-Grant sponsored study will add to the long-term PCB dataset developed by DRBC. This study will replicate the 2020 work done by Dr. Ron MacGillivray (retired DRBC) by using passive samplers at 5 sites from Lewes, DE to Trenton, NJ to assess the dissolved concentrations of PCBs in the Delaware River mainstem. There will also be water samples collected at 12 sites. This work will be done in Winter and Spring 2024.

SPW Monitoring (2023-2025)



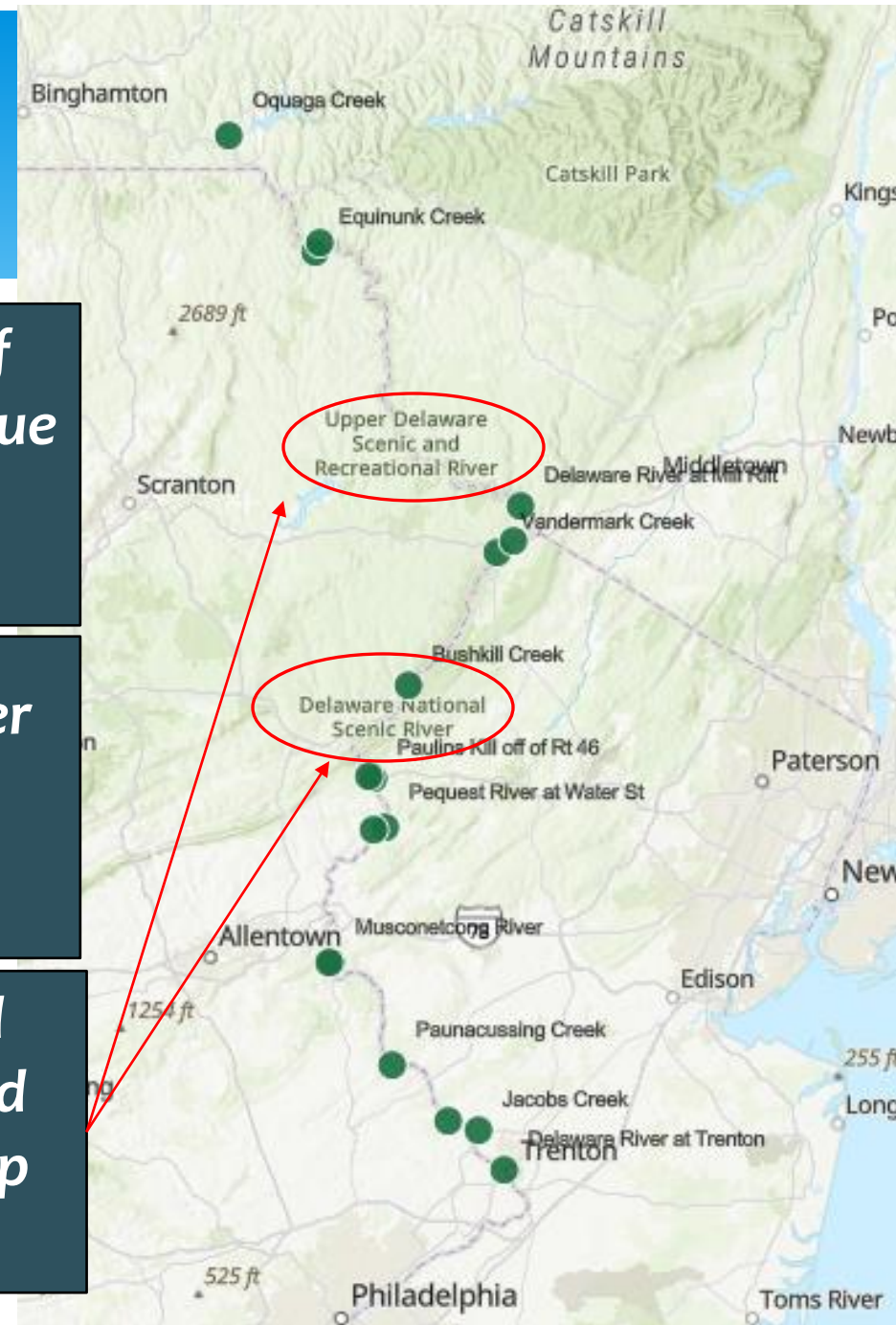
Completed 1 year of sampling (will continue with some adjustments)

17 locations twice per month May – September

NPS staff collected Upper Delaware and Delaware Water Gap sites

Parameter list (NJDOH analytical lab):

Alkalinity, Chloride, Hardness, Sulfate, TSS, TDS, Nitrate+Nitrite, Total Nitrogen, Ammonia, TKN, TP, Silica, Ca, Mg, Na, K, DO, turbidity, pH, water temperature



Delaware River Cyanotoxins Screening Study



2022: 11 tidal locations
2023: 13 non-tidal locations



DNREC lab used ELISA immunoassay method for analyses for cyanotoxins

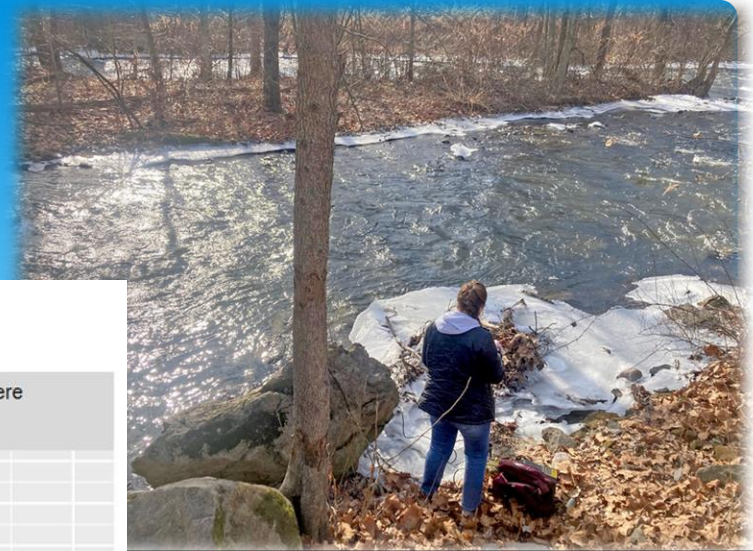


Presence of microcystin across tidal and non-tidal (some anatoxin-a in tidal)



2024:
targeted approach (SPATT & microcystin congener analysis)

Non-tidal Chloride Monitoring (May 2021 – April 2023)



Chloride at SPW Delaware River Sites (1960 to Current)
Ordered by descending River Mile



Study concluded in April of 2023, and received results from NJDOH lab

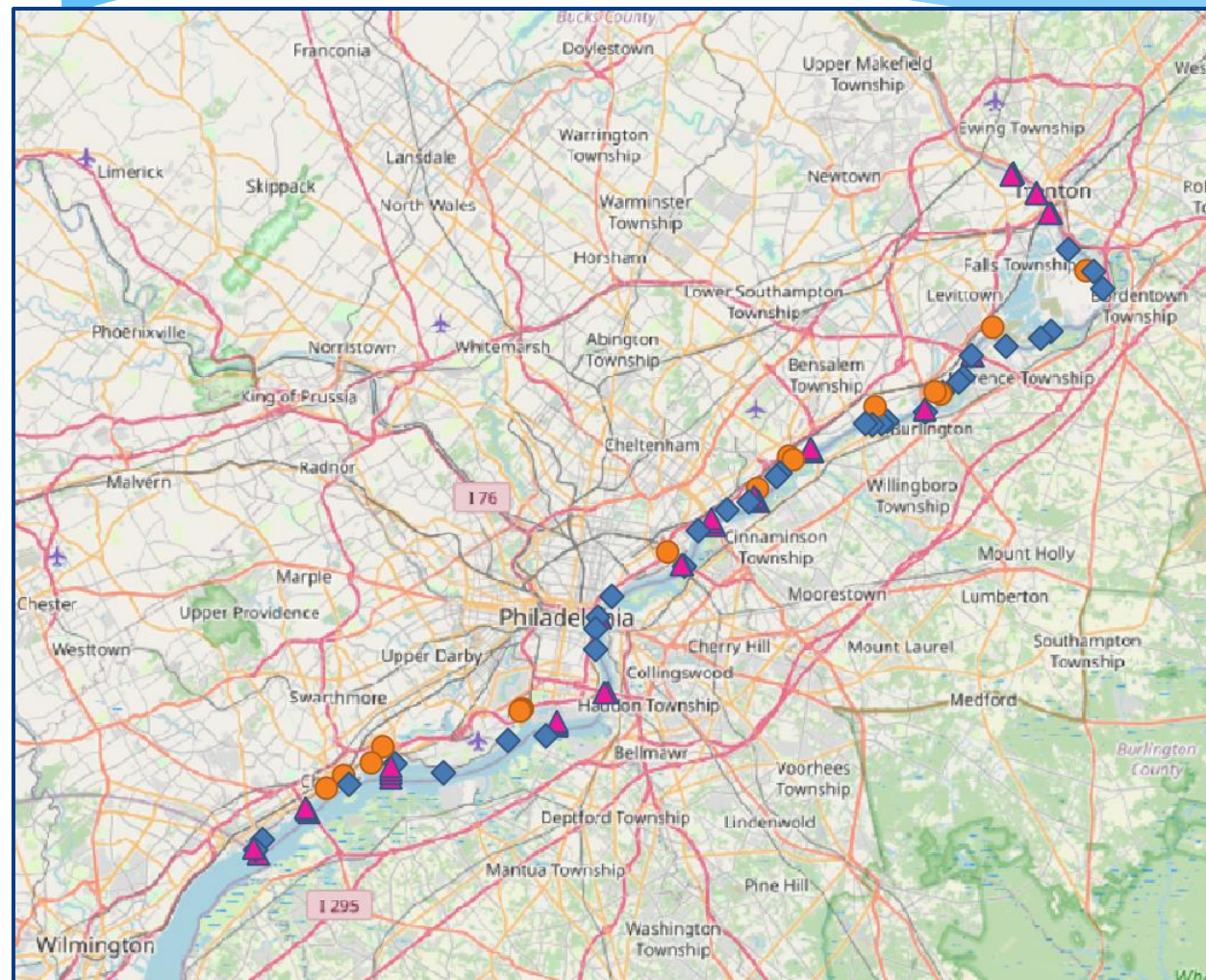
Currently in report writing phase to summarize the results

Delaware Estuary Water Quality Monitoring (Boat Run)



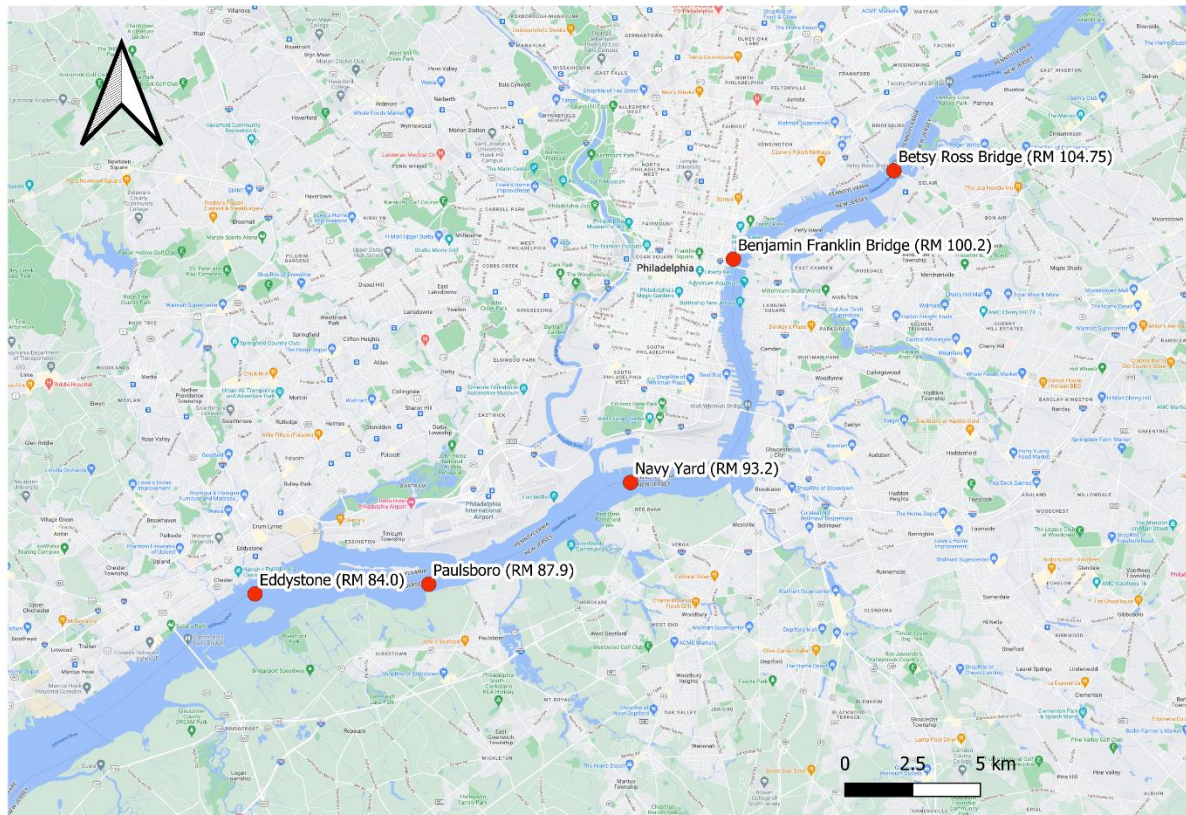
- Since mid-1960's
- 22 Sites
- Once per month, April-October (typical)
- Parameter Groups
 - Dissolved Oxygen, pH, temperature, specific conductance, turbidity, secchi depth, PAR
 - Nutrients (ammonia, nitrate + nitrite, phosphorus)
 - Sodium, chloride, Chlorophyll a
 - Bacteria
 - Metals

Bacteria 1 of 3: PADEP Support Delaware Estuary Bacterial Monitoring



- Up to 89 sites (transects, single stations, tidal tributaries)
- Up to 6 sampling events targeting a 30-day period
- Bacteria (E. Coli, Enterococci, Fecal Coliform)
- Smaller subset for qPCR
- Summer 2024 & potentially Summer 2025
- Still in the planning stages

Bacteria 2 of 3: Over-the-Hydrograph Bacterial Monitoring



- 5 sites (boat run sites within secondary contact area)
- 3 Rain events (> 0.75-inch within 24-hours)
- Before, during, after rain event
- Originally planned for 2023 but deferred to 2024

Bacteria 3 of 3: Additional Near-Shore + Tryptophan Logger

- Combination of 20 sites (9 near shore, and 11 boat based)
- Over 5 sampling events
- Acquire 2 **tryptophan loggers**
- Concurrent bacterial and tryptophan measurement - comparison to determine whether a relationship between bacterial and tryptophan measurement can be defined
- *Grant application stage*
- If successful, intending to leverage the other 2 bacterial sampling projects (PADEP support and over-the-hydrograph) for concurrent tryptophan & bacterial monitoring over a range of conditions & locations

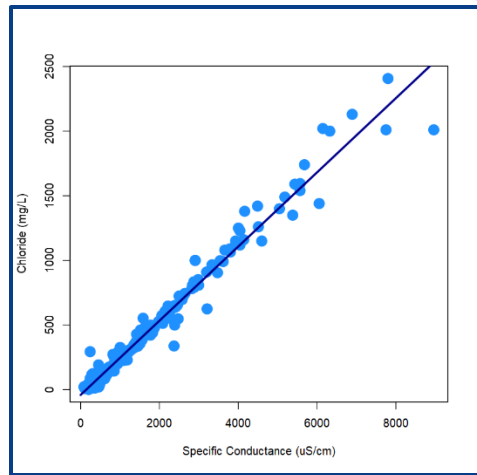
NJDEP Tributary Nutrient Monitoring Support



- Part of a larger project
- Blacks Creek, Crosswicks Creek, Pennsauken Creek
- Deploy data sondes for DO, temp, pH, SC, turbidity, phycocyanin
- Nutrient grab samples every other week
- Starting 2023 or 2024
- Continuing possibly through 2028

Winter Chloride Monitoring: Daily Assessment via DRBC Water Quality Dashboard

Continuous
 real-time
 Specific
 Conductance
 (USGS)

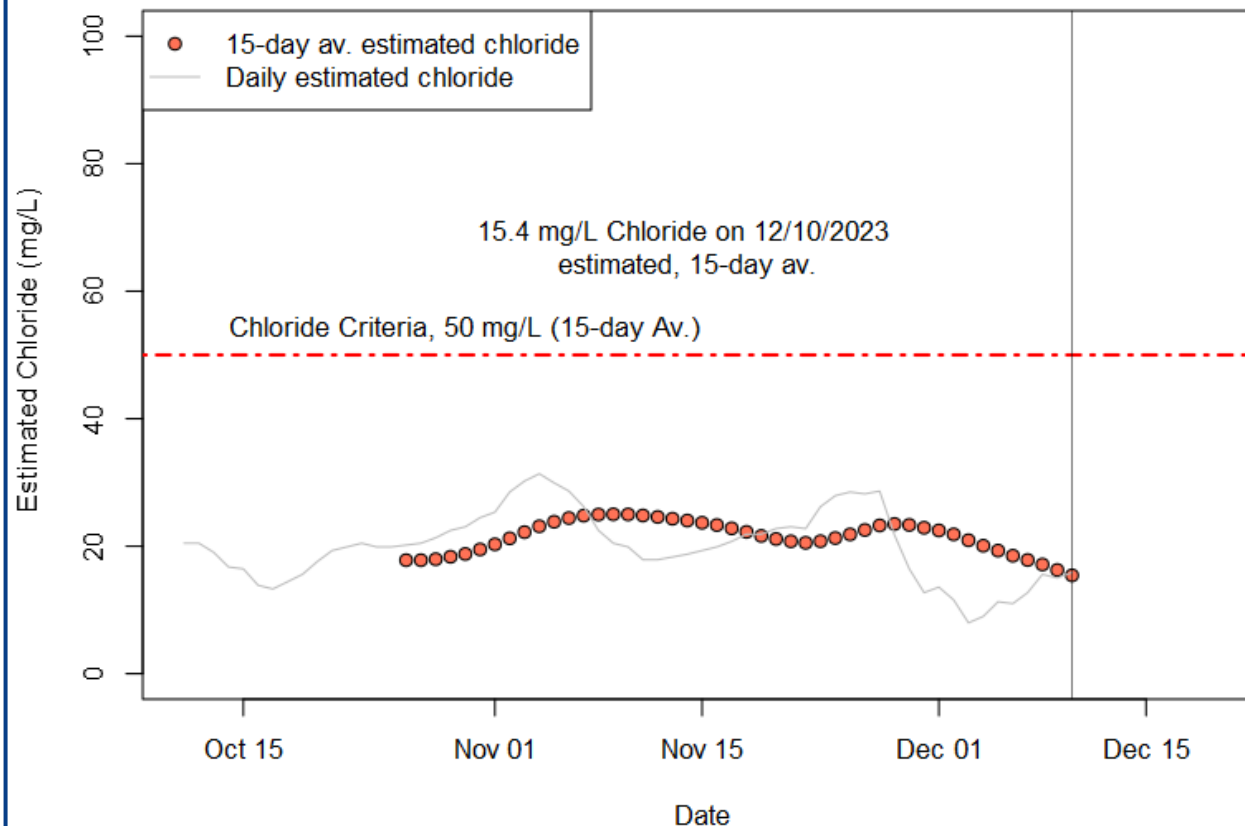


Plot estimated Rolling
 Mean Chloride
 Compared to Criteria

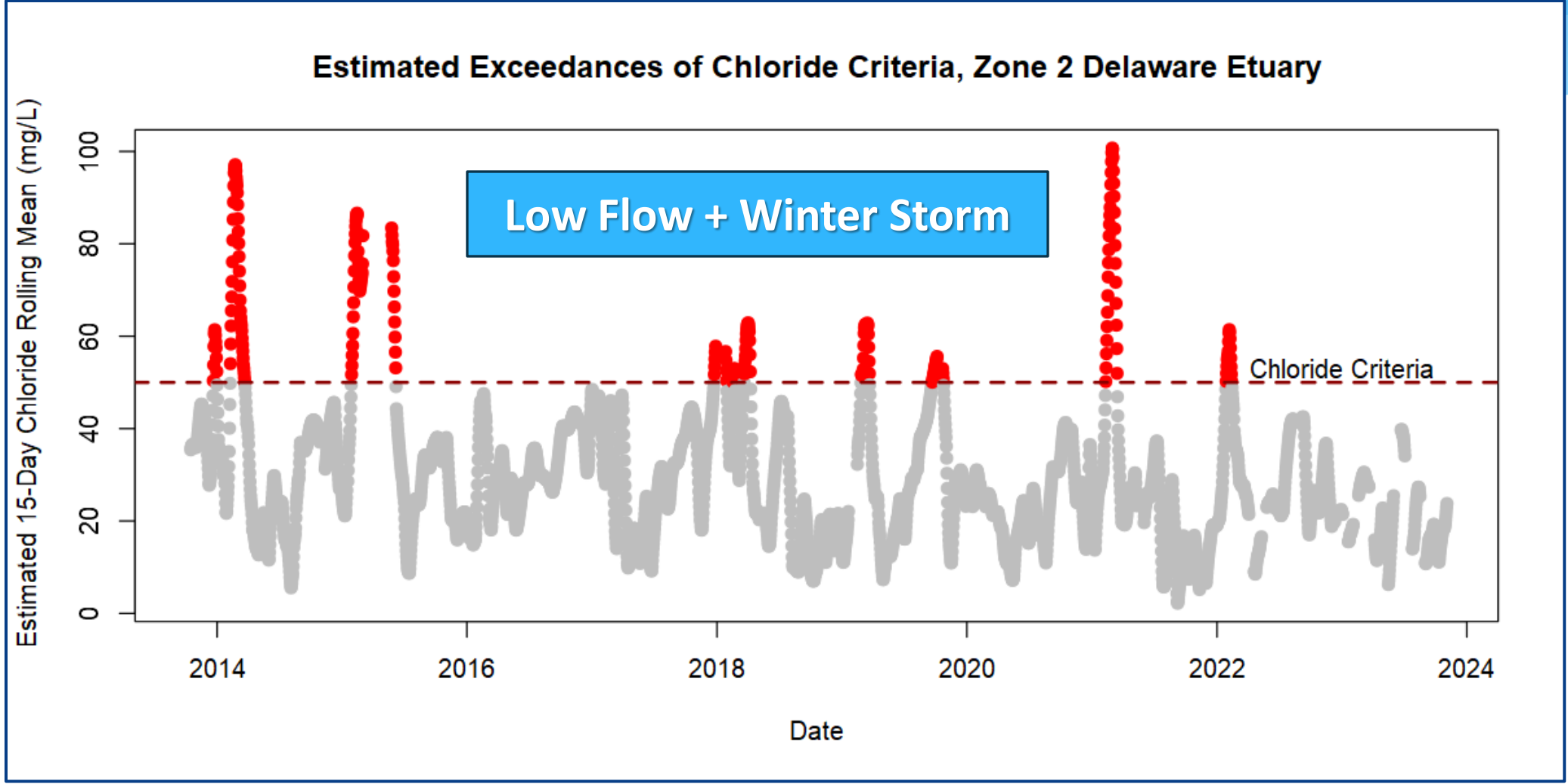


Compute
 estimated
 Rolling Mean
 Chloride

Comparison of Estimated Chloride to Criteria,
 Delaware River Zone 2, as of 12/10/2023



Apparent Criteria Exceedances have occurred in Zone 2



Winter Chloride Monitoring, Zone 2

- 1 sample per day
- 1 location (Bristol Wharf, Zone 2)
- Analyzed for Chloride
- Initiated when conditions suggest that exceedance of criteria is likely
- Terminated when exceedance is confirmed or determined to be no longer likely
- To commence in 2023 (suitable conditions)
- Provide more leverage to pursue remedial action



Drone Based Monitoring



- Acquired a drone with thermal imaging camera
- Planned work:
 - Heat dissipation areas
 - Pre- and during flood inundation at selected locations
- Open to other technical applications