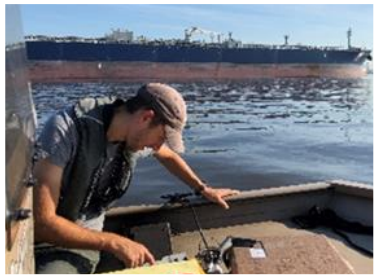

Delaware Estuary Recreational Uses:

Updates and Status

John Yagecic, Manager Water Quality Assessment

April 23, 2024

Water Quality Advisory Committee

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Regulations & Background

CSO & Ambient Data

Status of Co-Regulator Strategy

Upcoming Monitoring

Regulations & Background

Current Recreational Uses / Criteria in Delaware Estuary (DRBC WQ Regs)

Zone	Use	Fecal Coliform	Enterococcus
		Geometric mean colonies per 100 mL	
2	Recreation	**200**	**33**
3	Recreation – Secondary Contact	**770**	**88**
Upper 4			
Lower 4	Recreation	**200**	**33**
5			**35**
6			

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DRBC Water Quality Regulations
Section 1.20.6

F. "Recreation" includes all water-contact sports.

G. "Recreation - secondary contact" restricts activities to where the probability of significant contact or water ingestion is minimal, encompassing but not limited to:

1. boating,

2. fishing,

3. those other activities involving limited contact with surface waters incident to shoreline recreation.

http://www.nj.gov/drbc/library/documents/WQregs.pdf

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EPA Office of Water 820-F-12-058

Table 1. Recommended 2012 RWQC.

Criteria Elements	Estimated Illness Rate (NGI): 36 per 1,000 primary contact recreators			Estimated Illness Rate (NGI): 32 per 1,000 primary contact recreators	
	Magnitude			Magnitude	
Indicator	GM (cfu/100 mL)[a]	STV (cfu/100 mL)[a]	OR	GM (cfu/100 mL)[a]	STV (cfu/100 mL)[a]
Enterococci – marine and fresh	35	130		30	110
OR					
E. coli – fresh	126	410		100	320
Duration and Frequency: The waterbody GM should not be greater than the selected GM magnitude in any 30-day interval. There should not be greater than a ten percent excursion frequency of the selected STV magnitude in the same 30-day interval.					

[a] EPA recommends using EPA Method 1600 (U.S. EPA, 2002a) to measure culturable enterococci, or another equivalent method that measures culturable enterococci and using EPA Method 1603 (U.S. EPA, 2002b) to measure culturable *E. coli*, or any other equivalent method that measures culturable *E. coli*.

https://www.epa.gov/sites/production/files/2015-10/documents/rwqc2012.pdf

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CSO & Ambient Data Review

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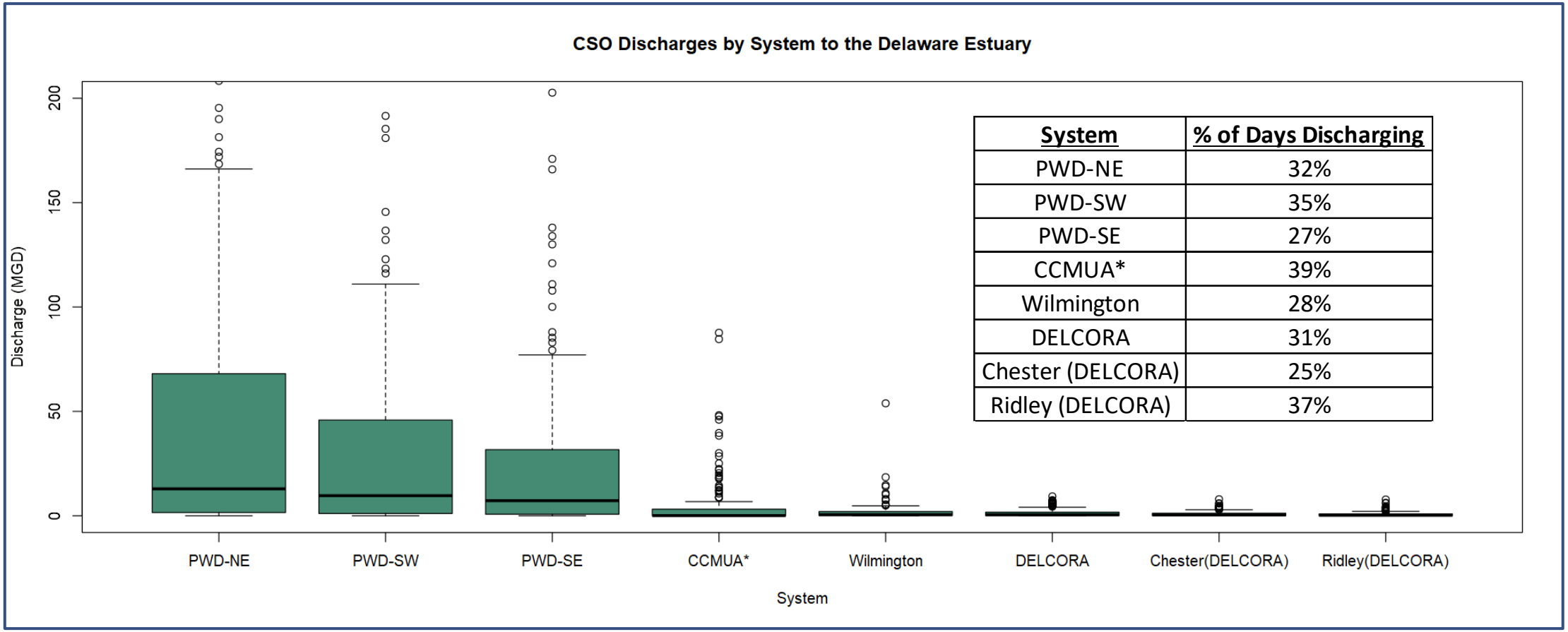
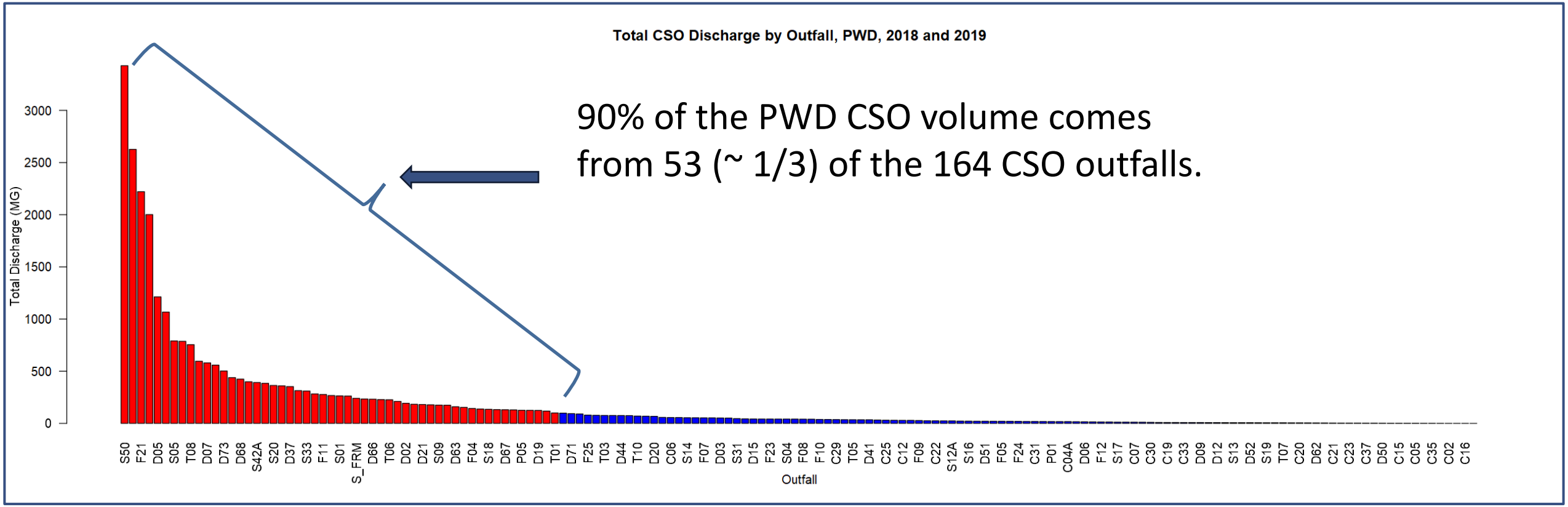
CSO Discharges by Subsystem



System	% of Days Discharging
PWD-NE	32%
PWD-SW	35%
PWD-SE	27%
CCMUA*	39%
Wilmington	28%
DELCORA	31%
Chester (DELCORA)	25%
Ridley (DELCORA)	37%

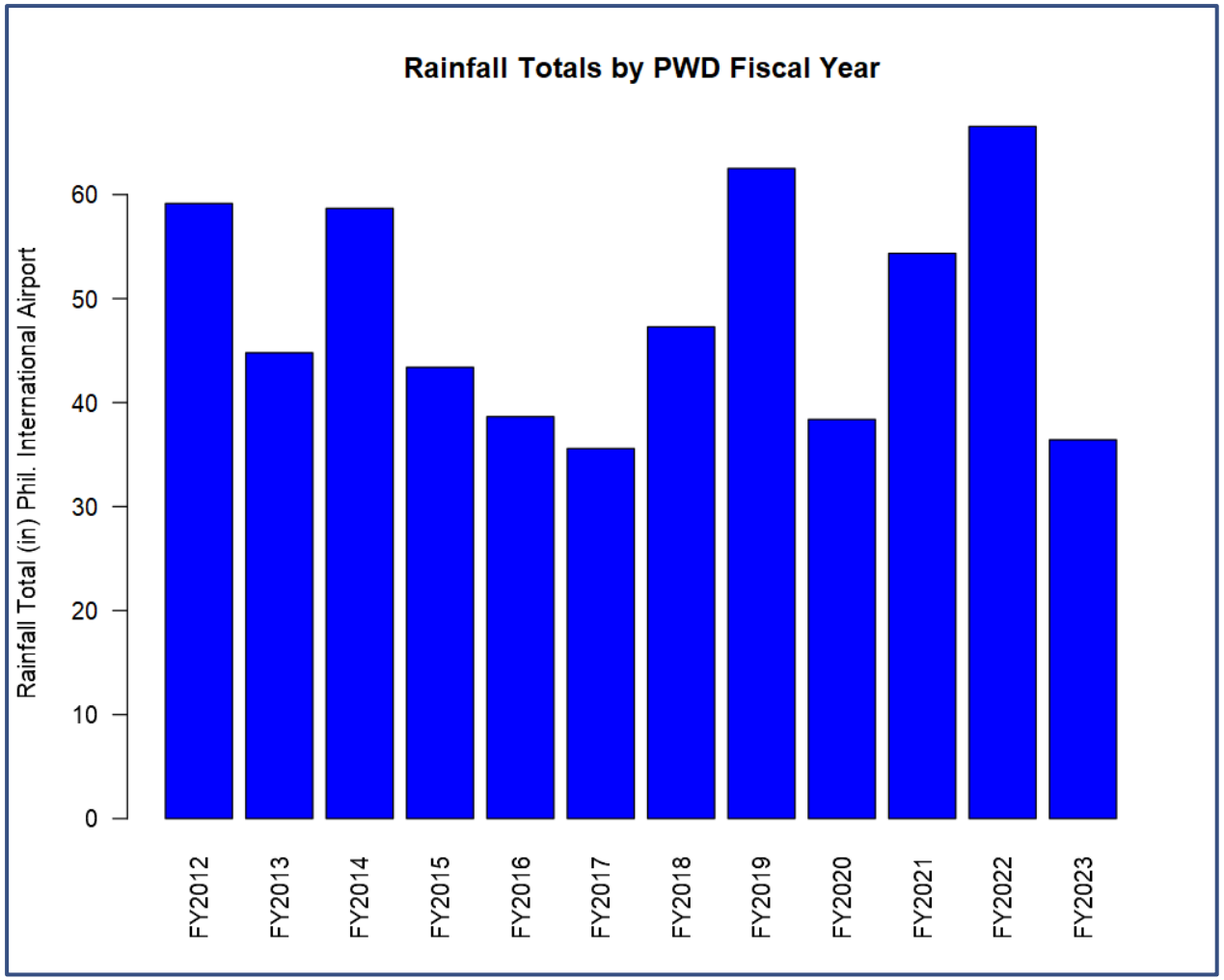
Data provided by the utilities for the period 2018 through 2019, except CCMUA which was 2014.

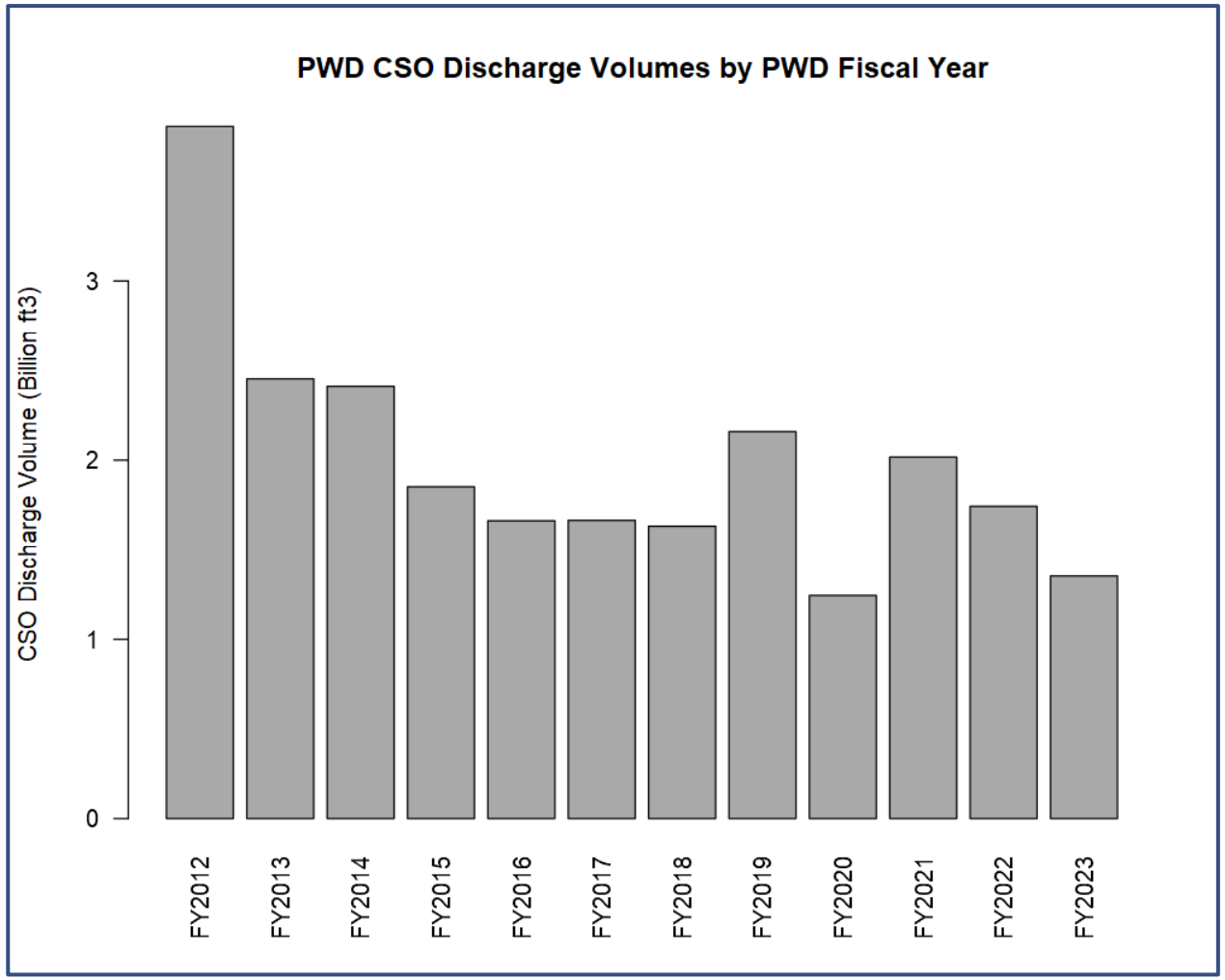
CSO Discharges by Subsystem



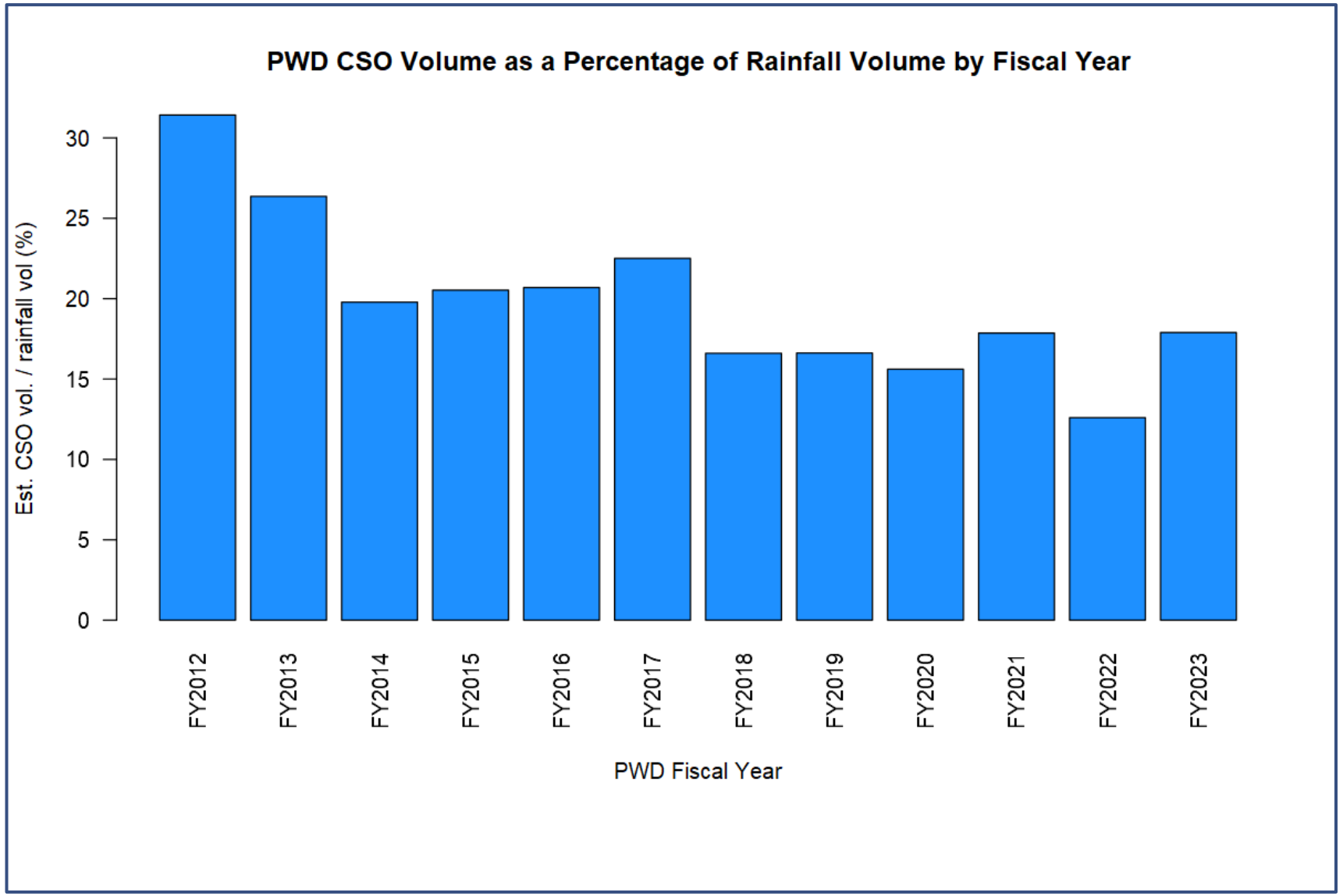
90% of the PWD CSO volume comes from 53 (~ 1/3) of the 164 CSO outfalls.

Rainfall and PWD CSO Discharge Totals





PWD CSO Volume as a Percentage of Rainfall Volume by PWD FY



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Enterococcus and E. Coli by Year
Entire Estuary

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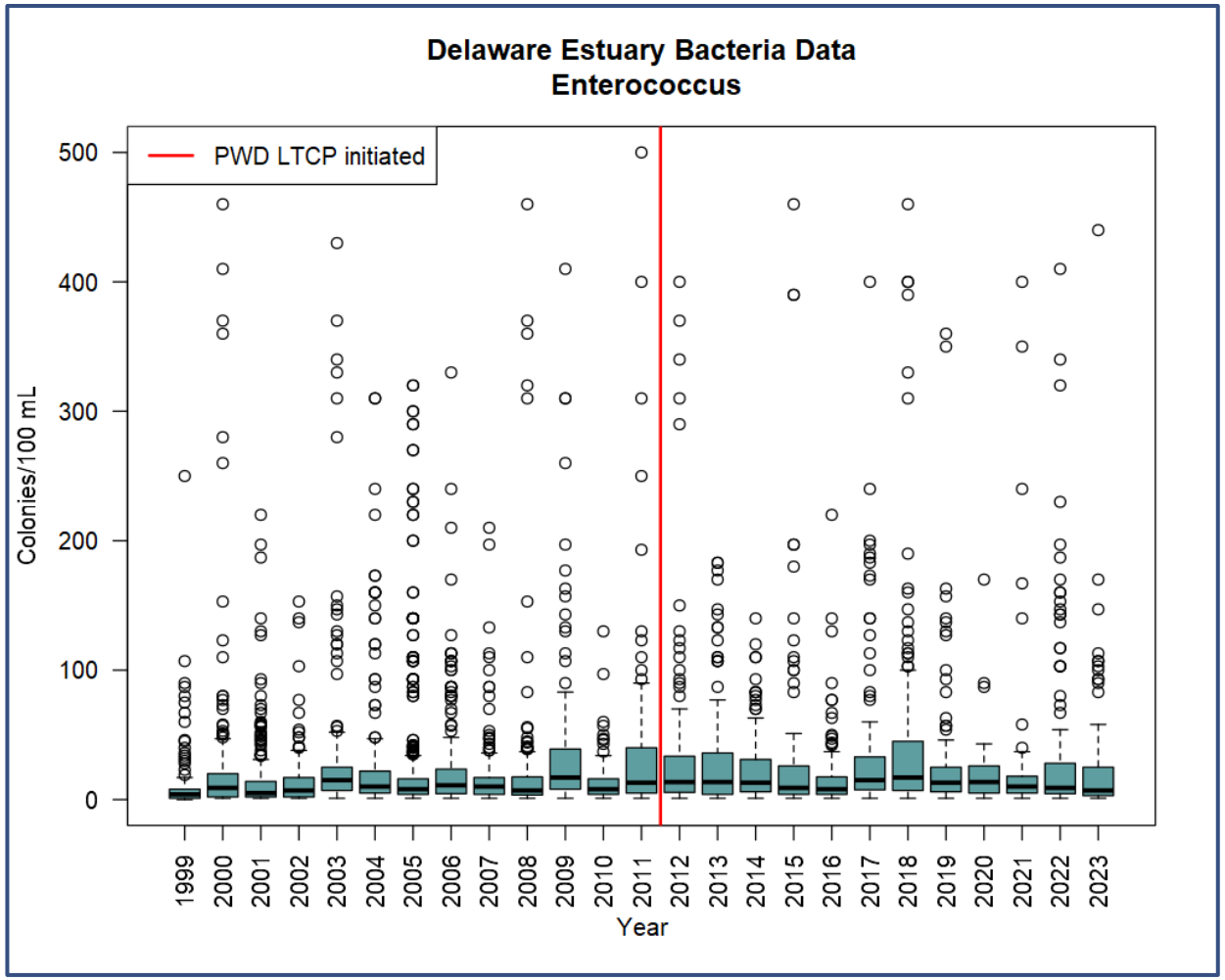

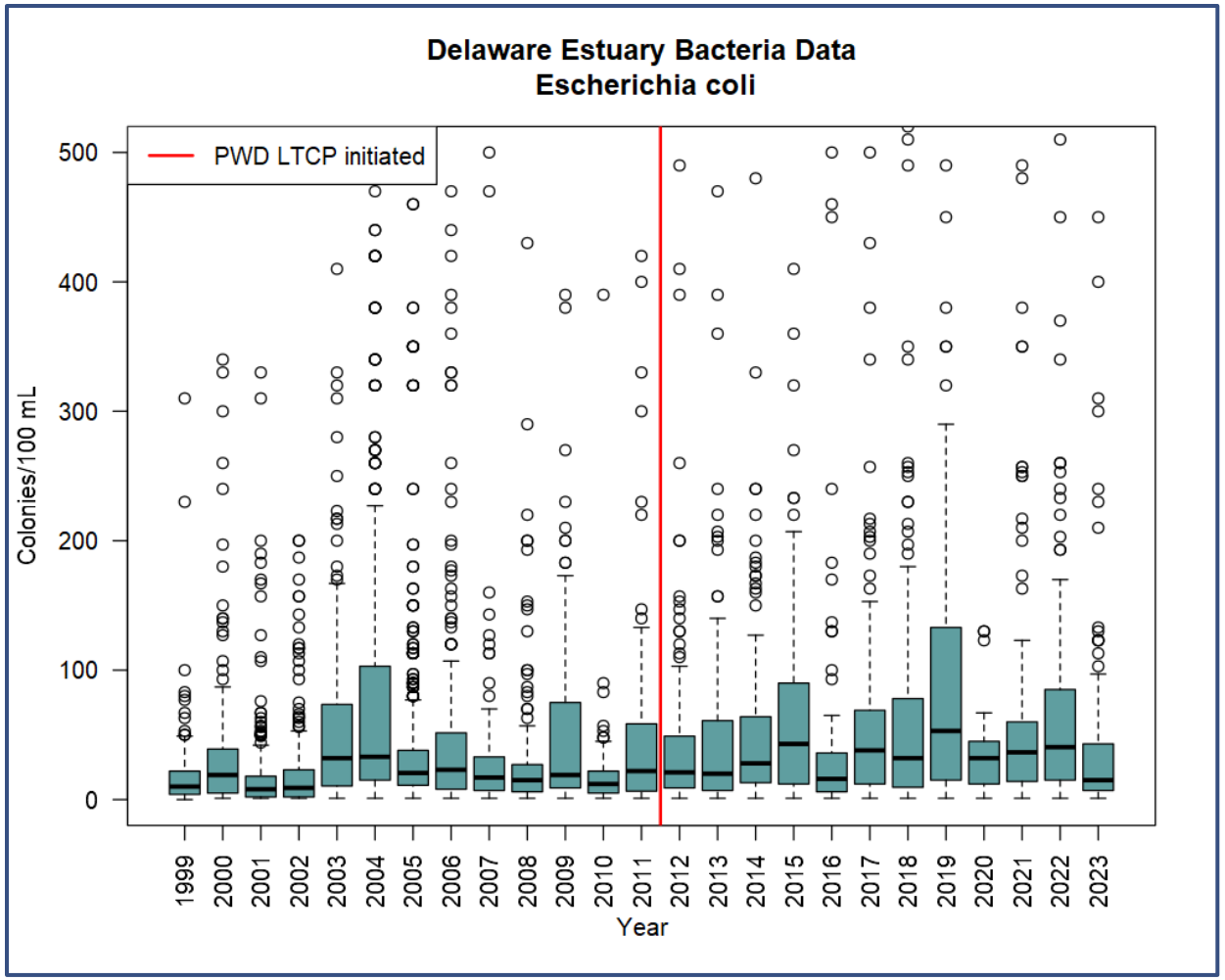

Enterococcus and E. Coli by Year
Secondary Contact Area Only

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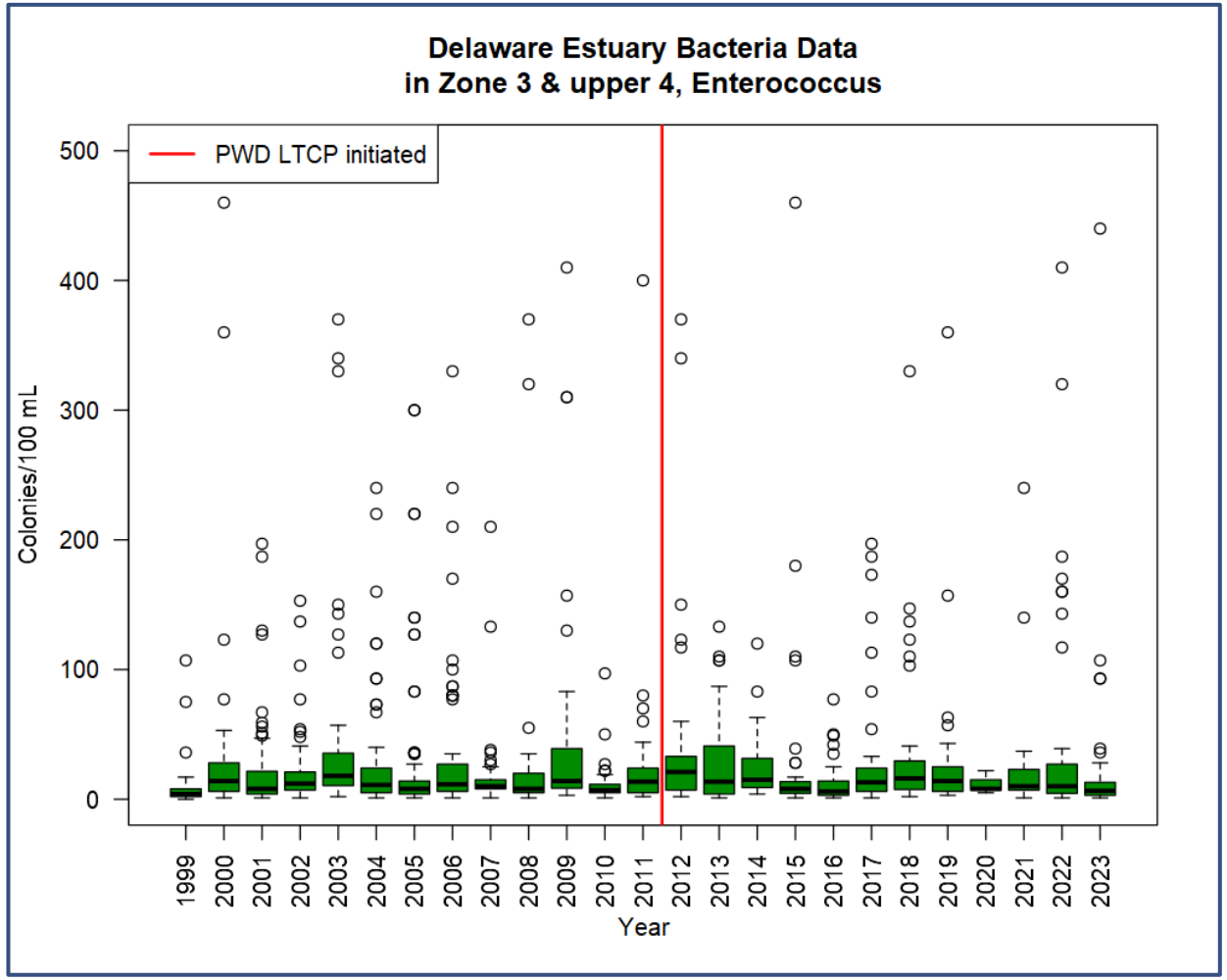

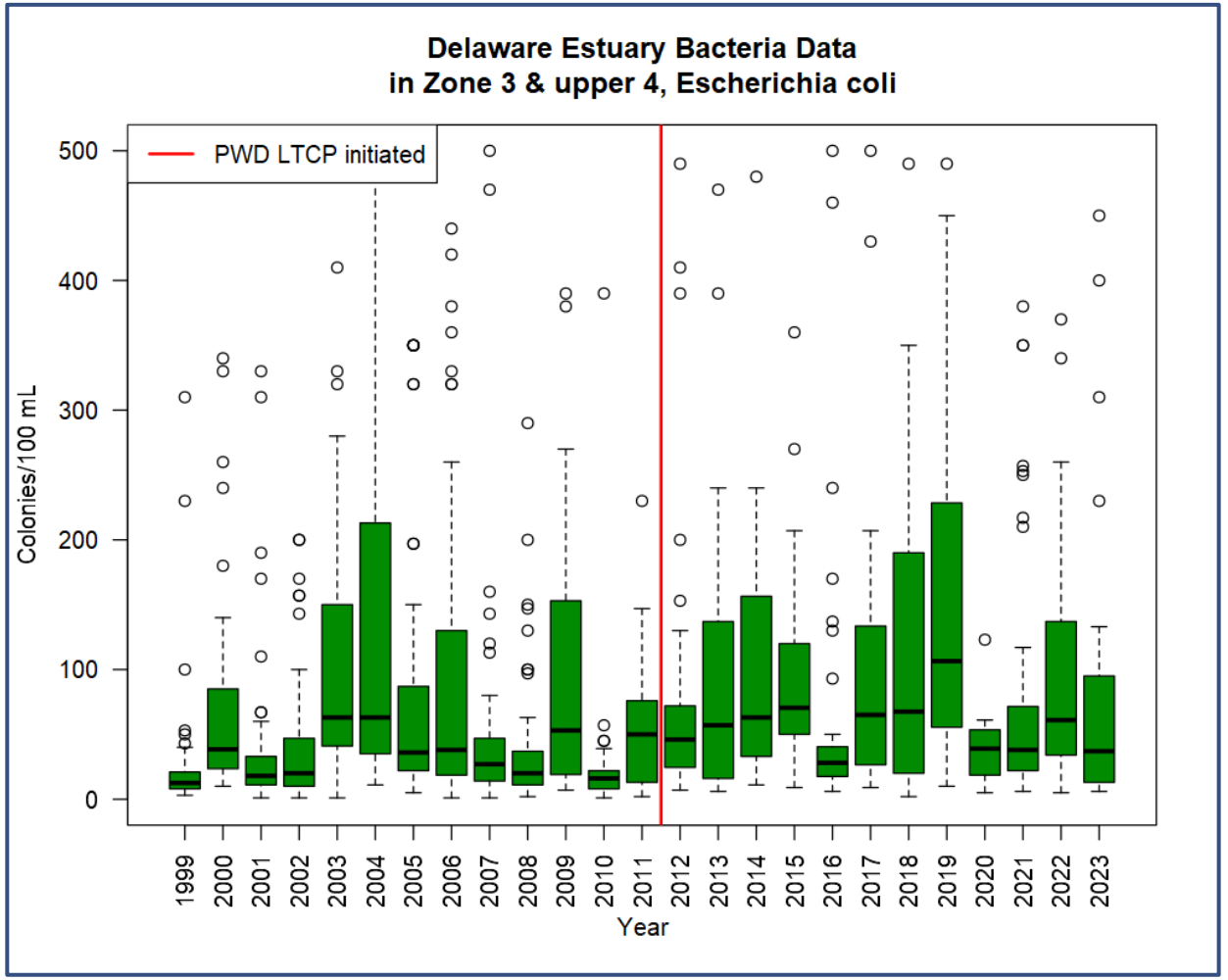

Enterococcus and E. Coli by River Mile

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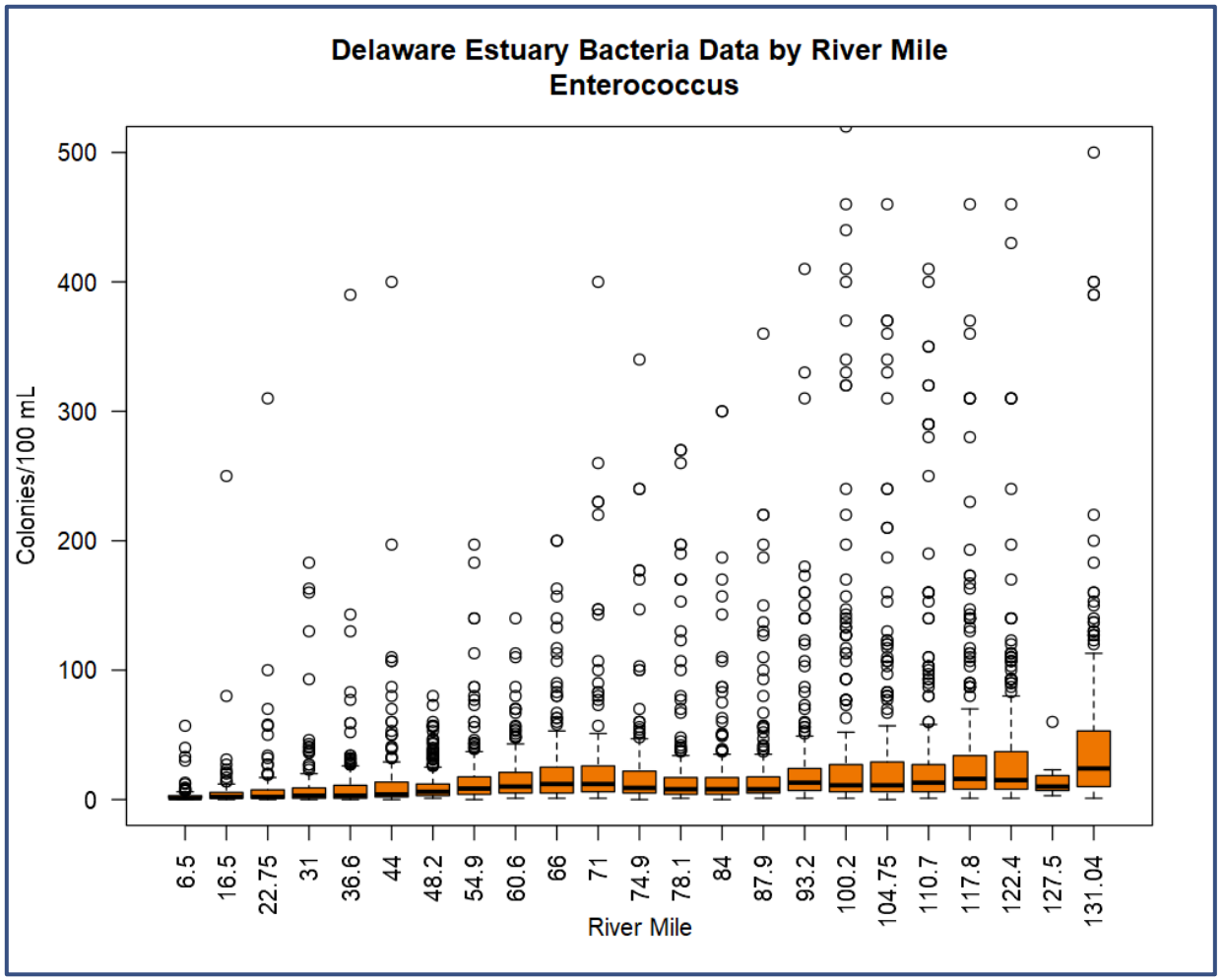
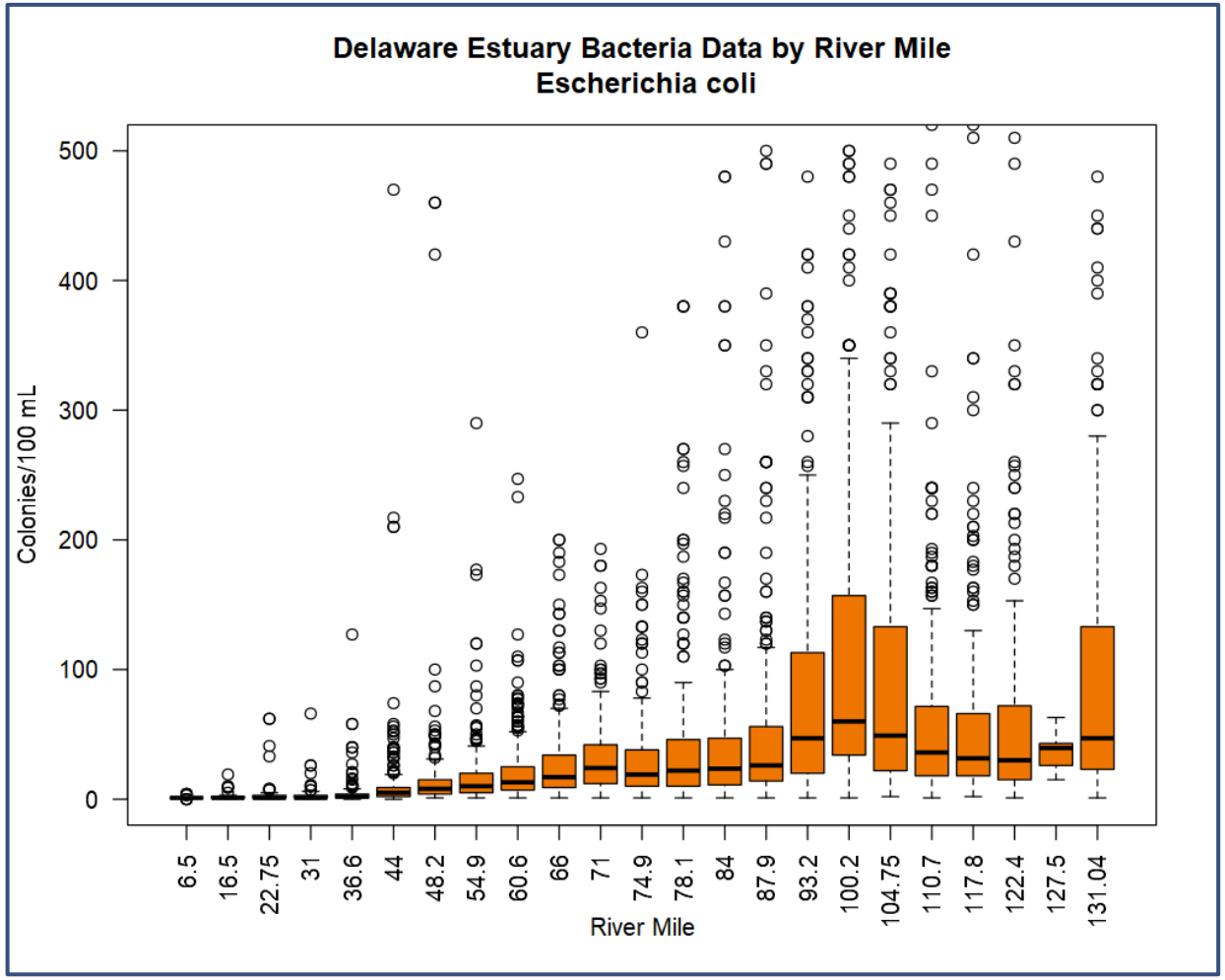
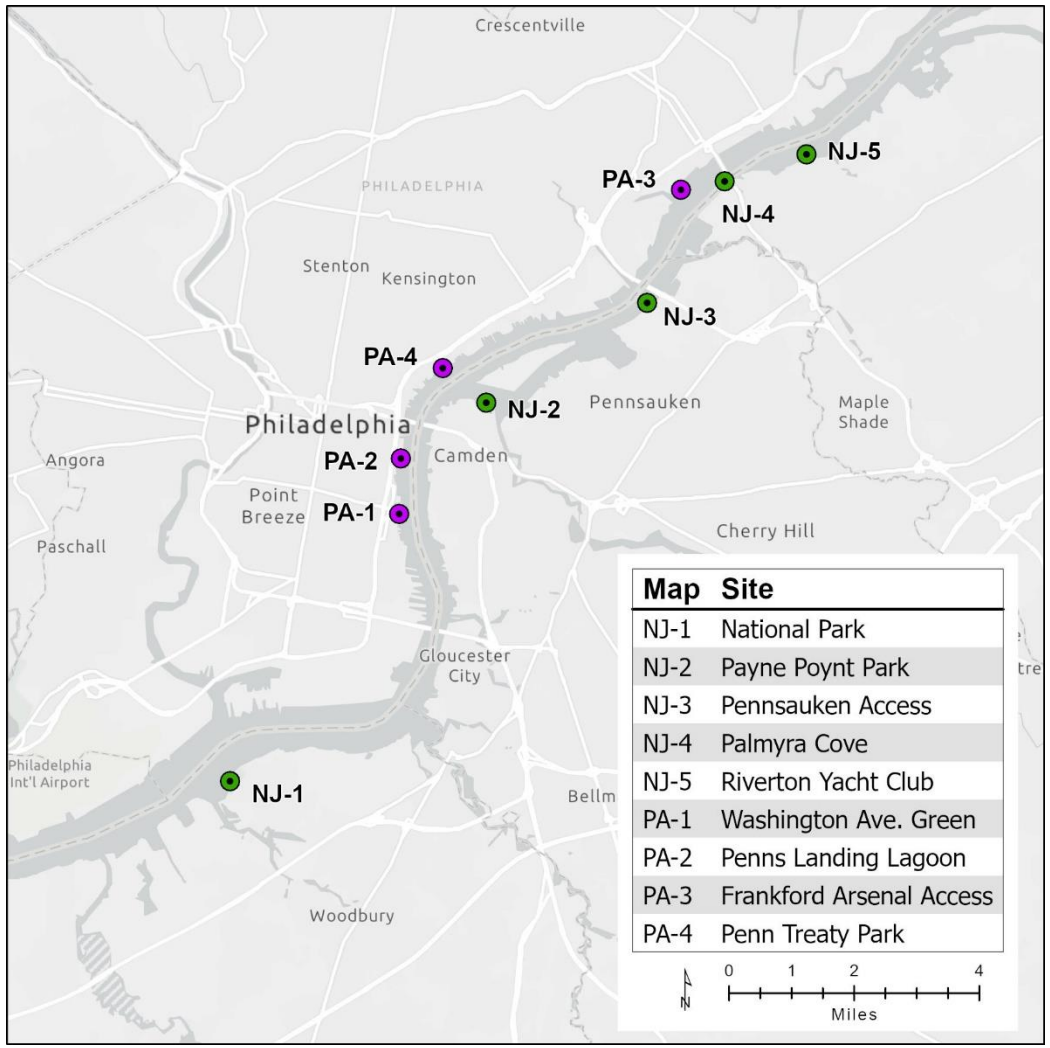




Near Shore Bacterial Monitoring 2019-2022



Date	NPK	WAG	PLL	PPP	PSA	FAA	PCN	RYC
6/10/2019	53.3	78.4	23	69	70.6	544.7	251.2	94.9
6/19/2019	33	61.3	11.6	64.3	21.9	349	189.1	41.4
6/25/2019	59	156.6	12.8	87.6	22.6	392.5	175	57.4
7/1/2019	81.4	227.4	15.4	91.8	14.2	129.6	100.8	38
7/9/2019	137.5	181.8	20.4	93.5	14.5	232.7	129.7	43.7
7/22/2019	119.5	50.5	13.9	88.1	16.5	245.2	103.1	105.3
7/30/2019	46.1	27.3	11.8	119.8	11.8	140	91.3	66.1
8/6/2019	27.9	30.9	20.7	167.4	11.5	96.3	36.1	27.5
8/12/2019	31.8	40.1	18.7	132.5	22.4	70.3	18	20
8/19/2019	53.4	83.5	53.8	215	26.1	168.1	26.9	20.7
8/28/2019	44.8	142.9	52.7	205.1	19.6	93.7	21.9	14.1
9/4/2019	83.7	129.8	45.2	99.3	20.8	107.3	22.3	18.7
9/9/2019	307.9	109.1	27.7	87	31.2	154.2	58.2	52.1
9/16/2019	135.6	87.2	26.1	100.5	26.5	127.7	61.6	71.1
9/24/2019	55.5	32.4	11.9	48.8	31.1	56.4	47.1	74.8

https://www.nj.gov/drbc/library/documents/WQAC/120320/Yagecic_Review2020BacteriaData.pdf

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Comparison of Boat Run & Near Shore Sampling Results (same reach & period)

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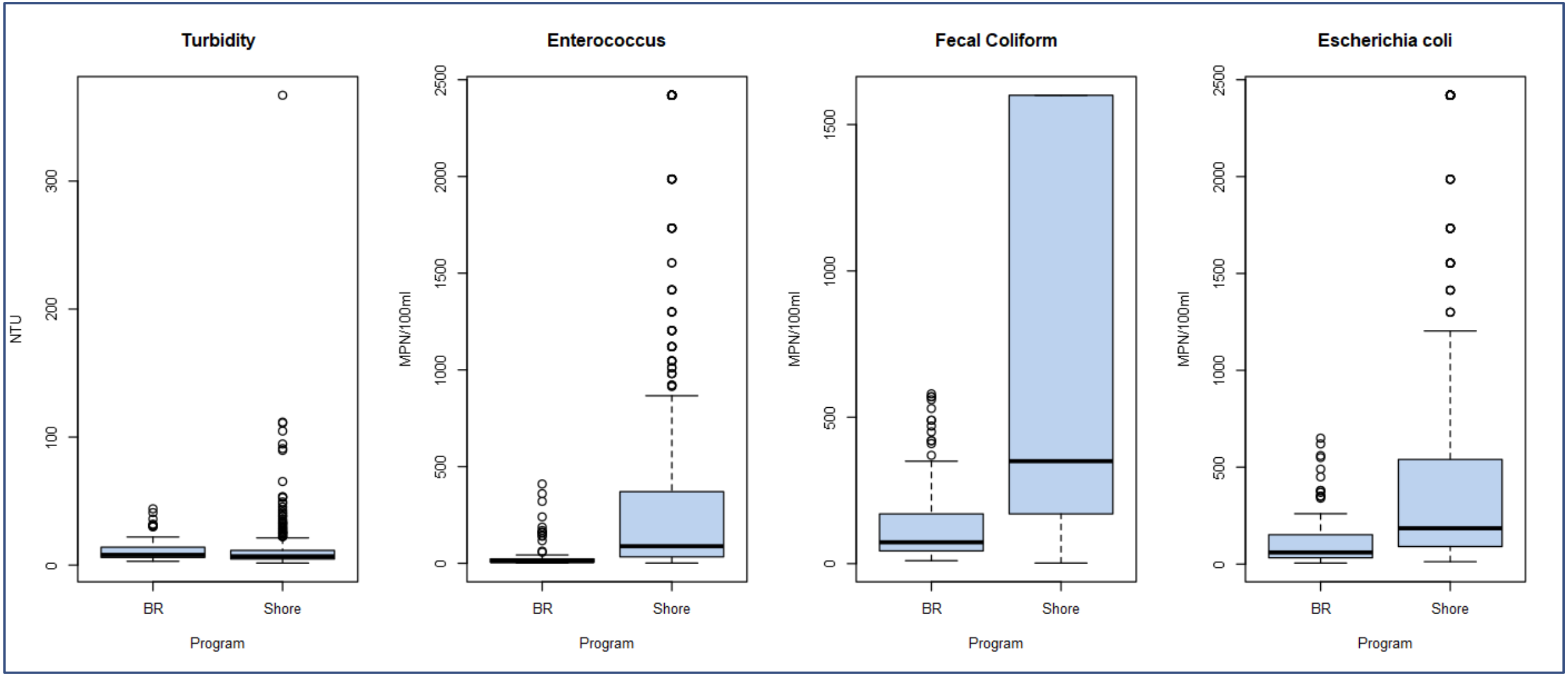

Status of Co-Regulator Strategy

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Co-Regulator Strategy Reminder

- The co-regulators (EPA2 & 3, PA, NJ, DE, DRBC) share a combined long-term goal of designating primary contact recreation as the applicable recreation use for Zones 3 and upper Zone 4 of the Delaware Estuary.
- The coregulators met throughout 2021 to develop the following near and long-term activities for implementation that support the goal of designating primary contact recreation as the applicable recreation use for Zones 3 and upper Zone 4 of the Delaware Estuary.
- Continued meetings through the present for coordination and to assess status

Co-Regulator Strategy Presented at WQAC, May 2022

https://www.nj.gov/drbc/library/documents/WQAC/051822/yagecic_recreational-use_update.pdf

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Recreational Use Co-Regulator Participants (current)

- Josh Lookenbill (PADEP)
- Pravin Patel (PADEP)
- Kristen Schlauderaff (PADEP)
- Frank Klapinski (NJDEP)
- Biswarup Guha (NJDEP)
- Stephen Seeberger (NJDEP)
- Marzooq Alebus (NJDEP)
- Susan Rosenwinkel (NJDEP)
- Steven Domber (NJDEP)
- Bhanu Paudel (DNREC)
- Michael Bott (DNREC)
- Andrew Bell (DNREC)
- KL Lai (EPA3)
- Nicole Lick (EPA3)
- Denise Hakowski (EPA3)
- Dana Hales (EPA3)
- Jessica Martinsen (EPA3)
- Wayne Jackson (EPA2)
- Virginia Wong (EPA2)
- Namsoo Suk (DRBC)
- John Yagecic (DRBC)
- Elaine Panuccio (DRBC)

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Co-Regulator Strategy
Near Term Activities (5 years) Continued

- **Assess** whether existing **criteria** are protective of **primary contact** recreation in Zone 2 and lower Zone 4- Zone 6. If necessary, establish new criteria that are protective of the primary contact designated use. IN PROGRESS
- **Assess guidance on primary and secondary contact recreation** according to activity and location as it would apply to Zones 3 and upper 4 of the Delaware Estuary. COMPLETED
- **Continue data collection** to define which areas are more or less likely to support primary contact recreation. IN PROGRESS
- Continue **data collection to differentiate proportions of human-derived versus animal-derived** bacteria especially during dry weather. INVESTIGATING NEW APPROACH
- Evaluate the **duration of bacteria exceedances** and relationship to wet weather. IN PROGRESS
- Develop **bacteria models** that simulate current and projected bacteria loads. IN PROGRESS

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Co-Regulator Strategy
Near Term Activities (5 years)

- Evaluate **hazard report** developed by PWD and other stakeholders. COMPLETED
- Explore and evaluate **hazard mitigation and risk reduction** recommendations for recreational use in this area. TO BE INITIATED
- Review and consider results of the University of Pennsylvania **Water Center Study**. COMMENTS PROVIDED – COMPLETED
- Evaluate performance of the **Fluidion®** (near real-time) bacterial monitors deployed by USGS at sites in the Delaware Estuary. COMPLETED
- Assess whether existing **criteria are protective of secondary contact** recreation in Zones 3 and upper Zone 4. If necessary, establish new criteria that are protective of the secondary contact designated use. EPA LEAD – IN PROGRESS
- Continue and/or enhance **CSO permit oversight**, enforcement and compliance assistance IN PROGRESS
  a. Use existing regulatory and enforcement tools to ensure implementation of LTCPs .
  b. Forecast post-LTCP water quality conditions.
  c. Identify funding opportunities for CSO infrastructure upgrades.

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Co-Regulator Strategy
Near Term Activities (5 years)

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Long Term Activities (+ 5 years)

TO BE INITIATED

- Upon completion of the above Near-Term Activities and where the data and evaluation support it, the DRBC would recommend site-specific locations and conditions for rulemaking to revise the designated use to primary recreation.
- As appropriate, evaluate the positive impacts of green and gray infrastructure on bacterial water quality given the ongoing execution of CSO Long Term Control Plans (LTCPs) and wet weather flow treatment enhancements.
- As major CSO controls are implemented and at conclusion of CSO LTCP implementation, assess CSO permittee sampling plans and results of CSO Post Construction Compliance Monitoring to verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls.

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Upcoming Monitoring

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Status of Bacterial Monitoring Activities

past

- Boat Run Bacterial Monitoring (50+ years, ongoing)
- Near Shore (2019-2022 completed, *may do more in the future*)
- Estuary Cross-sections (2021 completed)
- Microbial Source Tracking (2022, Completed *but inconclusive*)
- Evaluation of Fluidion at Camden with USGS (2021-2022, Completed, some reservations)

future

- CCMUA trackdown study (preliminary meetings, cooperation with CCMUA, EPA, NJDEP, WPF, Drexel U.)
- Over-the-hydrograph sampling (planned for 2023, weather didn't cooperate, deferred to 2024)
- Coordination with PADEP for enhanced monitoring (2024+, coordination underway)
- NJDEP Augmented sites (2024)
- Concurrent Tryptophan Monitoring (2024+, coordination underway)

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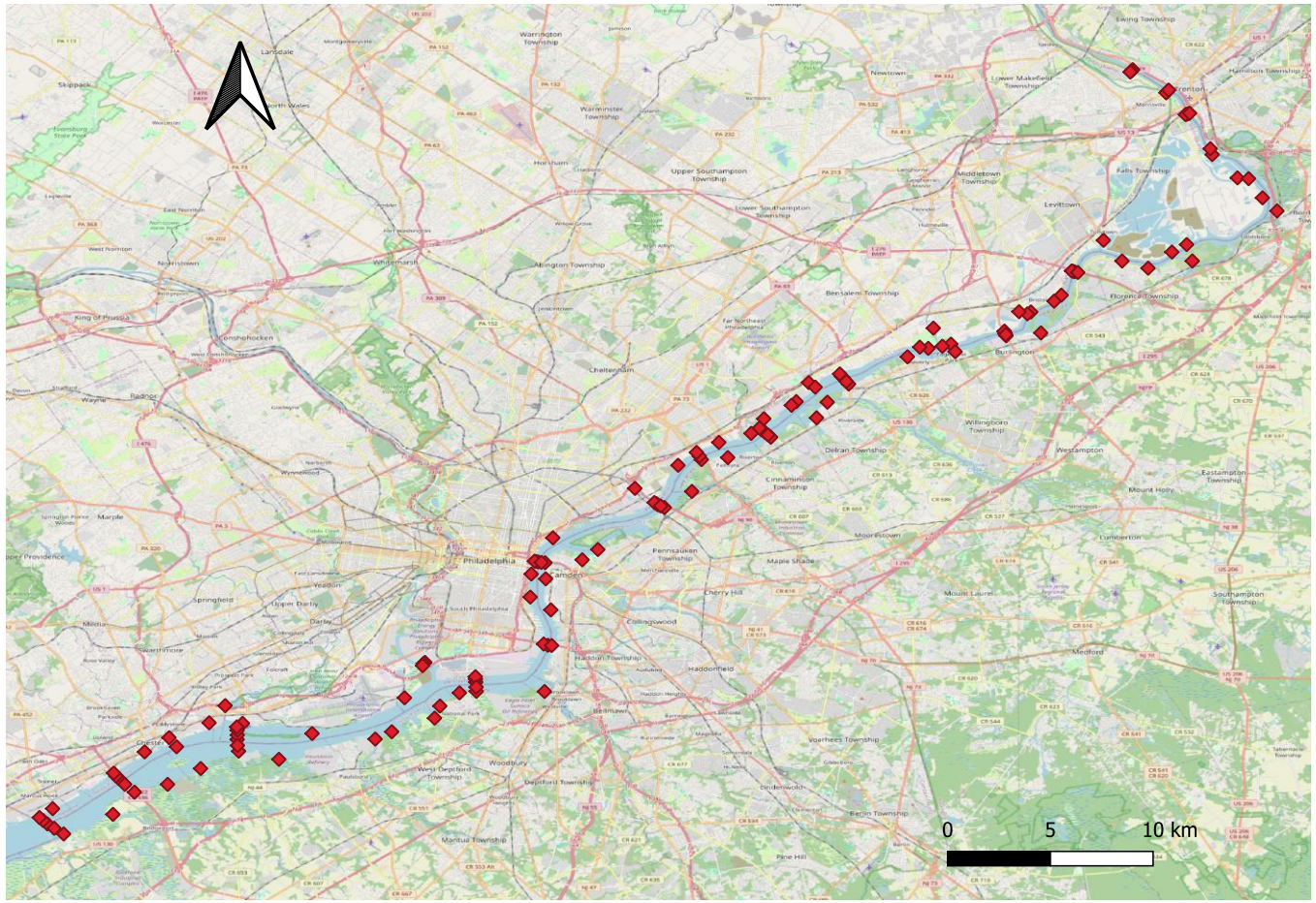
- PA Sites 88
- NJ Sites 46
- 6 events
- 30-day window
- Fecal Indicator Bacteria
  - Fecal Coliform
  - Enterococci
  - E. Coli
- qPCR (PA sites)
- Summer 2024



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- Tryptophan Logger

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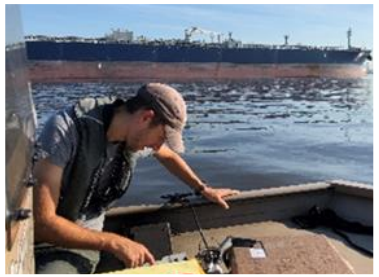

Delaware Estuary Recreational Uses:

Updates and Status

John Yagecic, Manager Water Quality Assessment

April 23, 2024

Water Quality Advisory Committee

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