233rd Technical Committee Meeting

Scott Mandirola, Chair
Presiding
October 10-11, 2023

The meeting will begin at 1:00 P.M. (Eastern) on October 10. Below are a few tips to effectively navigate the meeting:

- ***Confirm that your first and last name is entered correctly in the GoToMeeting software.***
- ***Mute your microphone at all times unless speaking.***
- ***Disable your camera unless you are a Technical Committee member.***
- ***The presenter will prompt participants for verbal questions, or use the Chat feature.***
- ***Detailed GoToMeeting instructions and important information can be found in the previously emailed document, "ORSANCO Virtual Technical Committee and Commission Meeting Instructions."***

Chair’s Welcome & Roll Call

Scott Mandirola

Chair, Technical Committee

TEC Members Roll Call

- IL – Scott Twait *
- IN – Brad Gavin *
- KY – Katie McKone *
- NY – Damianos Skaros *
- OH – Melinda Harris *
- PA – Kevin Halloran *
- VA – Jeffrey Hurst *
- WV – Scott Mandirola*
- USACE – Erich Emery *
- USCG – Michael Franke-Rose*
- USEPA – David Pfeifer *
- USGS – Jeff Frey *
- CIAC – Kathy Beckett
- PIAC – Cheri Budzynski
- PIACO – Betsy Bialosky
- POTW – Reese Johnson
- WOAC – Chris Tavenor
- WUAC – Chris Bobay
- Chair – Scott Mandirola *
- Executive Director – Richard Harrison *

* Voting member

Agenda for the 233rd Meeting of the Technical Committee

CHAIRMAN'S WELCOME AND ROLL CALL (October 10, 1:00 P.M.)

ACTION ITEMS AND REPORTS

1. Action on Minutes of 232nd Technical Committee Meeting – Chair Mandirola *
2. Chief Engineer's Report – Director Harrison
3. New H2Ohio Initiatives to Address Concerns Regarding Forever Chemicals & Rising Salinity Levels in Ohio's Rivers and Shallow Aquifers – Bob Miltner, Ohio Environmental Protection Agency
4. Pennsylvania Surface Water PFAS Sampling: "Per- and polyfluorinated alkyl substances (PFAS) in Pennsylvania Surface Waters: A statewide assessment, associated sources, and land-use relations" – Amy Williams, Pennsylvania Department of Environmental Protection
5. Results of Ohio River Fish Tissue Contaminants Monitoring for PFAS – Rob Tewes, ORSANCO
6. The Cincinnati Smart Sewers Story – Reese Johnson, Metropolitan Sewer District of Greater Cincinnati
7. ORSANCO's Contact Recreation/Bacteria Monitoring and Analyses Initiatives – Stacey Cochran, ORSANCO

ADJOURN/RECONVENE WEDNESDAY MORNING (October 11, 9:00 A.M.)

8. ORSANCO Biological Programs Update – Ryan Argo, ORSANCO
9. Algae/Nutrients Update – Greg Youngstrom, ORSANCO
10. Source Water Protection and Emergency Response Programs Update – Sam Dinkins, ORSANCO
11. TEC Member Roundtable Reports

OTHER BUSINESS

- Comments by Guests
- Announcement of Upcoming Meetings

ADJOURNMENT (NOON)

Agenda Item 1:

Request for action on minutes of the 232nd Technical Committee Meeting

Chair Mandirola

The minutes were emailed with the agenda package on June 8 , 2023

Agenda Item 2:
Chief Engineer's Report

Executive Director Richard Harrison

Agenda Item 3:

New H2Ohio Initiatives to Address Concerns Regarding Forever Chemicals & Rising Salinity Levels in Ohio's Rivers and Shallow Aquifers

Bob Miltner, OEPA

H_2Ohio Initiatives

- ORSANCO Technical Committee
- October 10, 2023
- Robert Miltner
- Robert.Miltner@epa.ohio.gov

Ohio Environmental Protection Agency

Characterize PFAS & PFOA in Large Rivers

Draft Recommended Freshwater Aquatic Life Water Quality Criteria

Criteria Component	Acute Water Column (CMC)[1]	Chronic Water Column (CCC)[2]	Invertebrate Whole-Body	Fish Whole-Body	Fish Muscle
PFOA Magnitude	49 mg/L	0.094 mg/L	1.11 mg/kg ww	6.10 mg/kg ww	0.125 mg/kg ww
PFOS Magnitude	3.0 mg/L	0.0084 mg/L	0.937 mg/kg ww	6.75 mg/kg ww	2.91 mg/kg ww
Duration	1-hour average		4-day average		Instantaneous3
Frequency	Not to be exceeded more than once in three years, on average		Not to be exceeded more than once in three years, on average		Not to be exceeded more than once in te years, on average

Ohio Environmental Protection Agency

PFAS & PFOA

- Contract with EnviroScience
  - 150 sites in large rivers across the state
- Water column
- Macroinvertebrates
  - Tissue & Qualitative Assessment
- Fish Tissue
  - Spotfin Shiner – whole body
  - Bluegill – whole body
  - Channel Cat – fillet

Ohio Environmental Protection Agency

PFAS & PFOA – What We Might Expect

Vanishingly low concentrations in water column samples

- 5 – 15 ng/L
- Michigan
- ORSANCO
- Ohio EPA DDAGW
- US EPA Chronic ~ 840 or 8400 ng/L

Several or more "exceedances" in fish tissue

- Michigan
- Source identification, tracking

Macroinvertebrate data may help refine estimates for environmentally relevant concentrations

Salt Pollution in Ohio
&
Steps Toward Managing the Problem

Sensible Salting Workshops

Robert Miltner

Ohio EPA

Ohio Environmental Protection Agency

Background Information

- Winter road salting pioneered in New Hampshire in 1938
  - Adopted as practice in 1945
  - Widespread since 1975 (10 million tons annually)
  - Now at ~ 20 million tons annually
  - Ohio is 3rd in tons applied

- Long-term Environmental Impacts Coming to Light
  - Trend of increasing chloride concentrations in rivers and lakes across the northern tier of states and Canada
  - Induced permanent stratification in some lakes

- Salt applied in excess of travel safety

- New technologies and BMPs exist to reduce salt application but maintain safety levels

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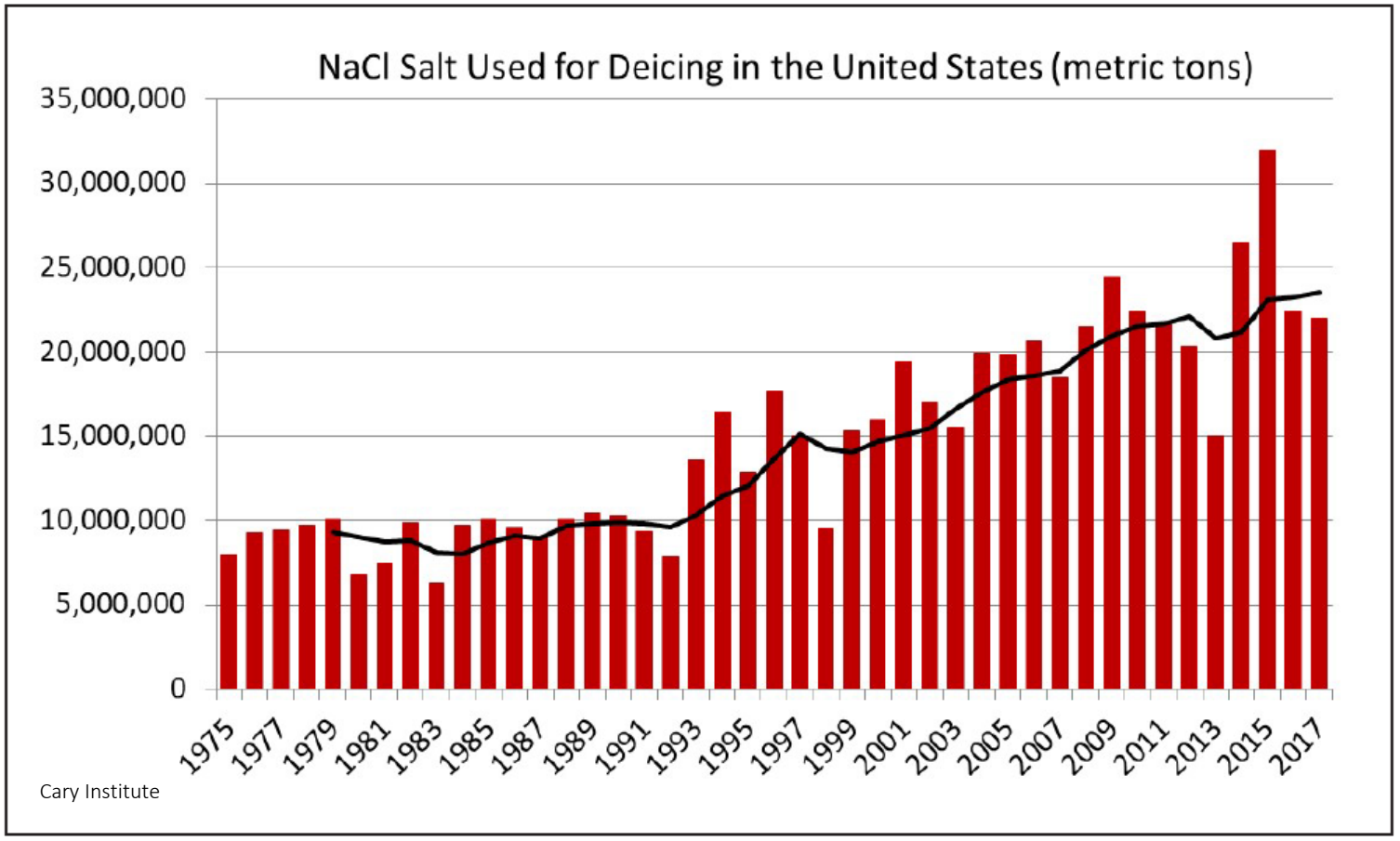
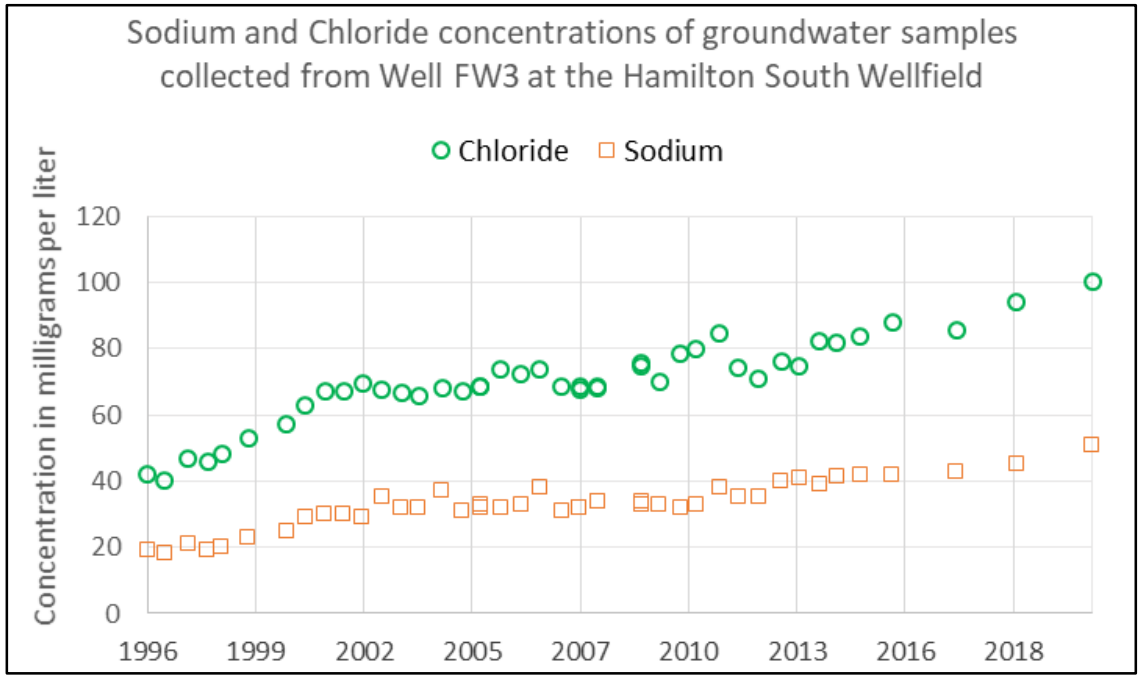
Road Salt Use by Year



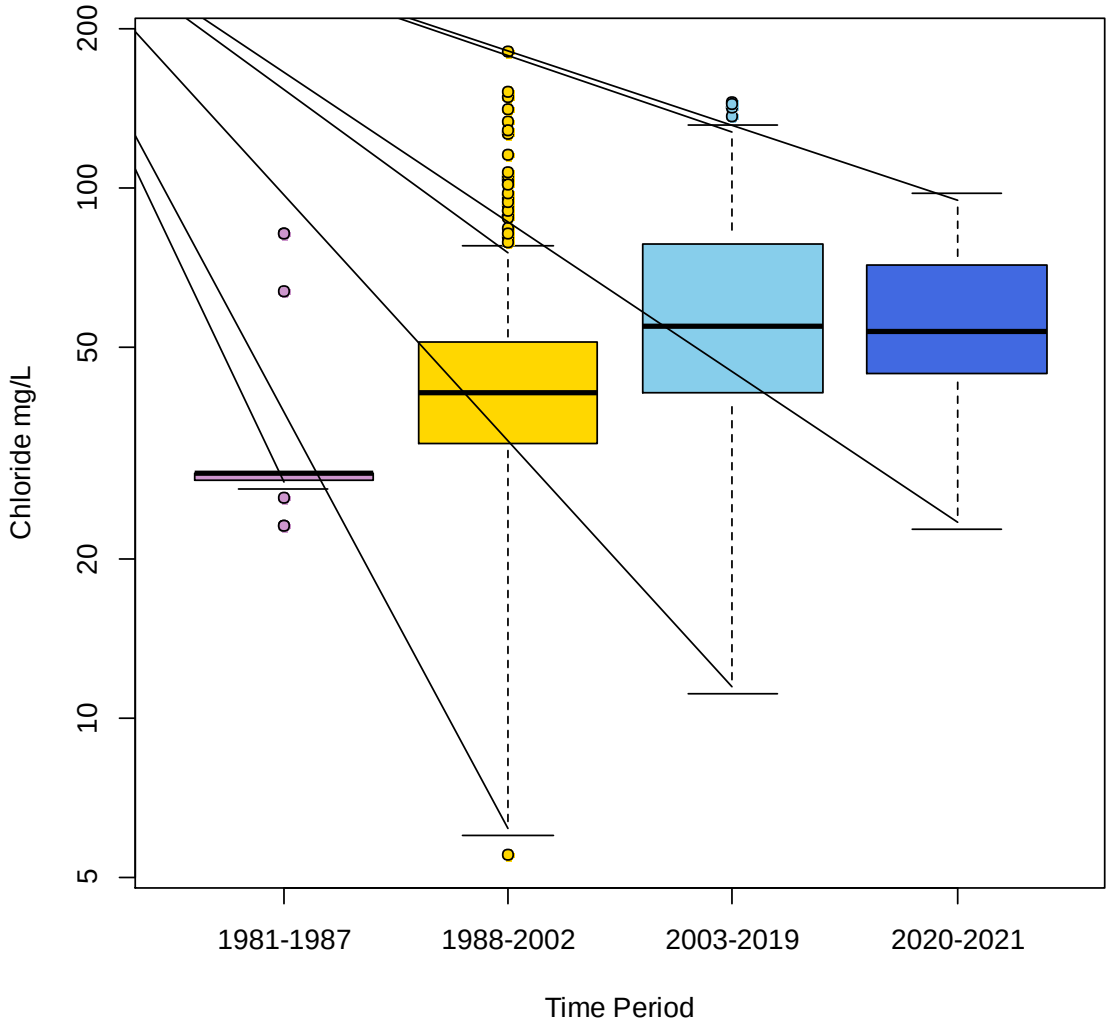
Salt Concentrations are Trending Up

Miami Conservancy District – Ground Water



Miami Conservancy District blog, October 13, 2021

Large River Segments, Great Miami Watershed



Once salt is in water (drinking or waste) it cannot feasibly be removed!

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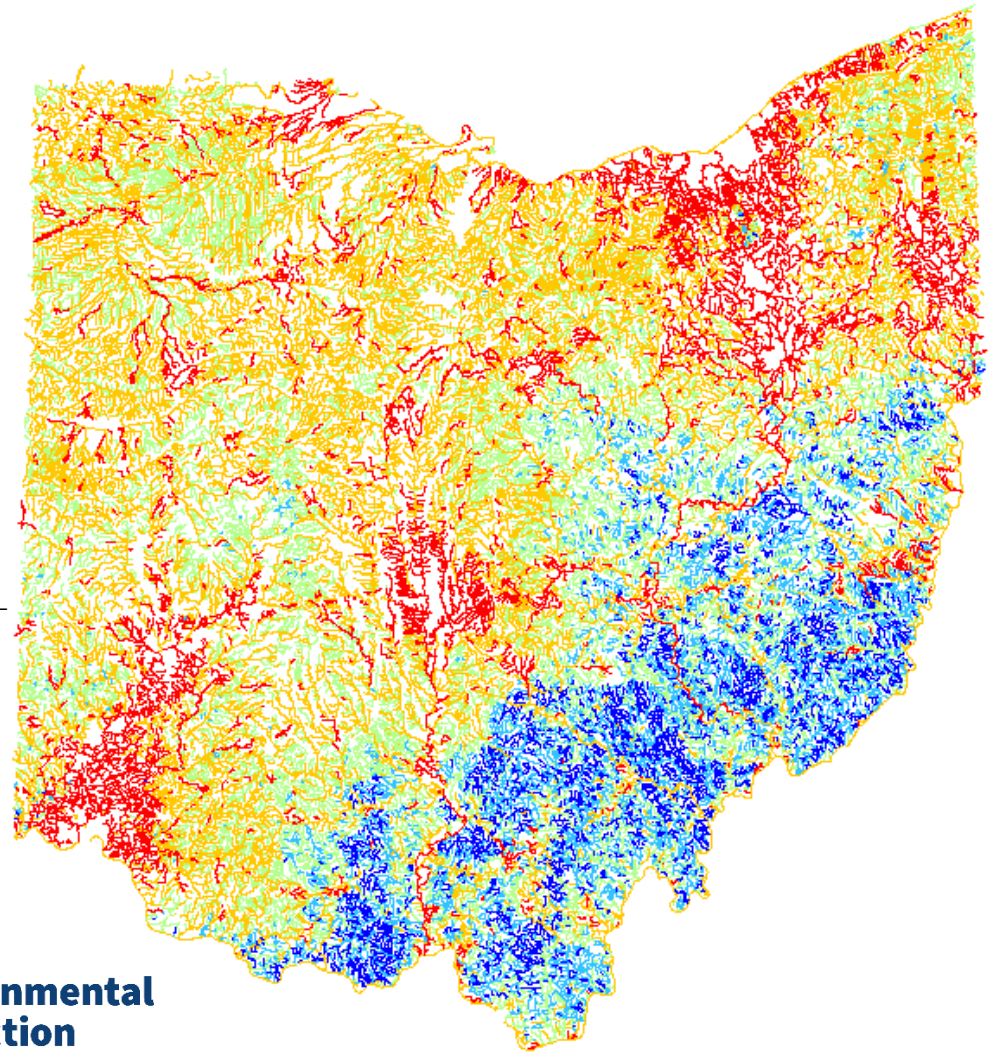
Spatial Extent

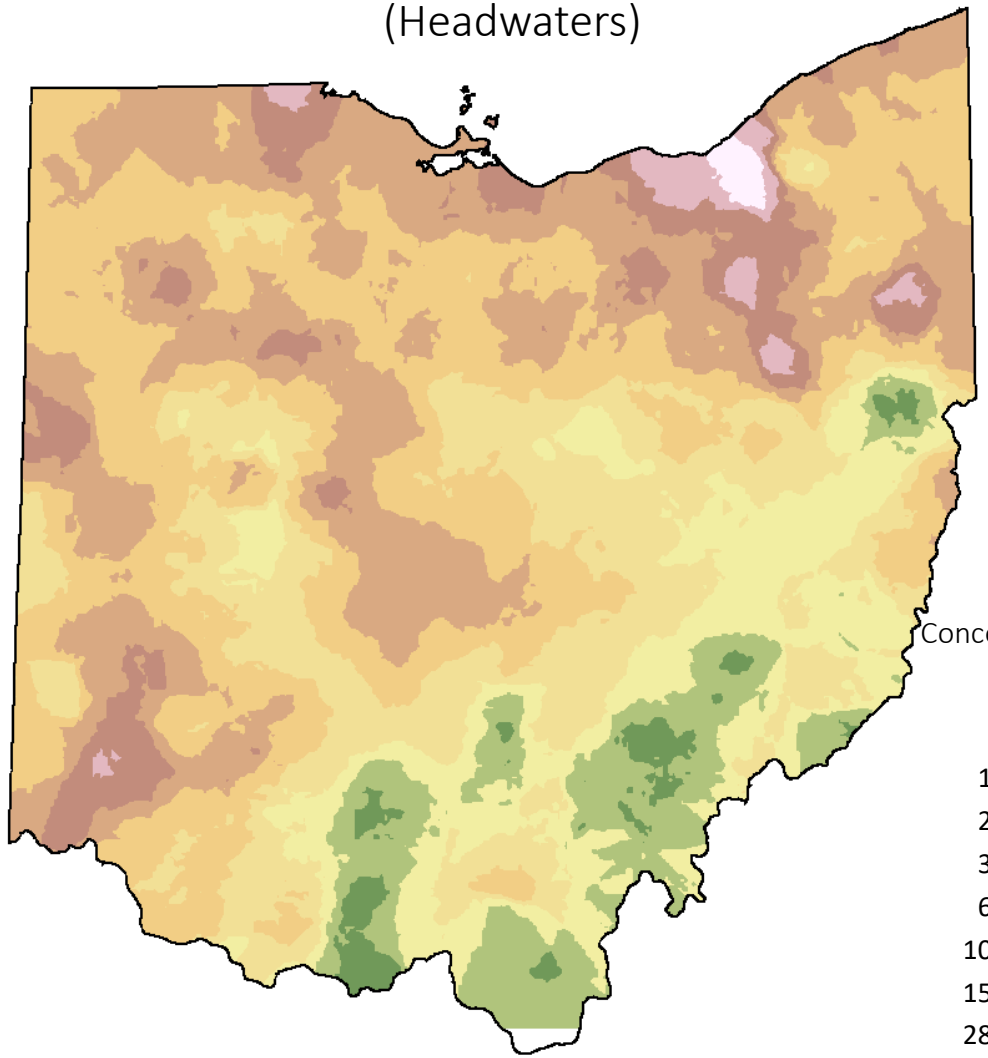
Prediction to NHD 100 K



Concentration mg/L

- 3
- 7
- 14
- 28
- 135

Interpolation from Observed Values (Headwaters)



Concentration mg/L

- 5
- 8
- 12
- 20
- 32
- 63
- 100
- 158
- 282

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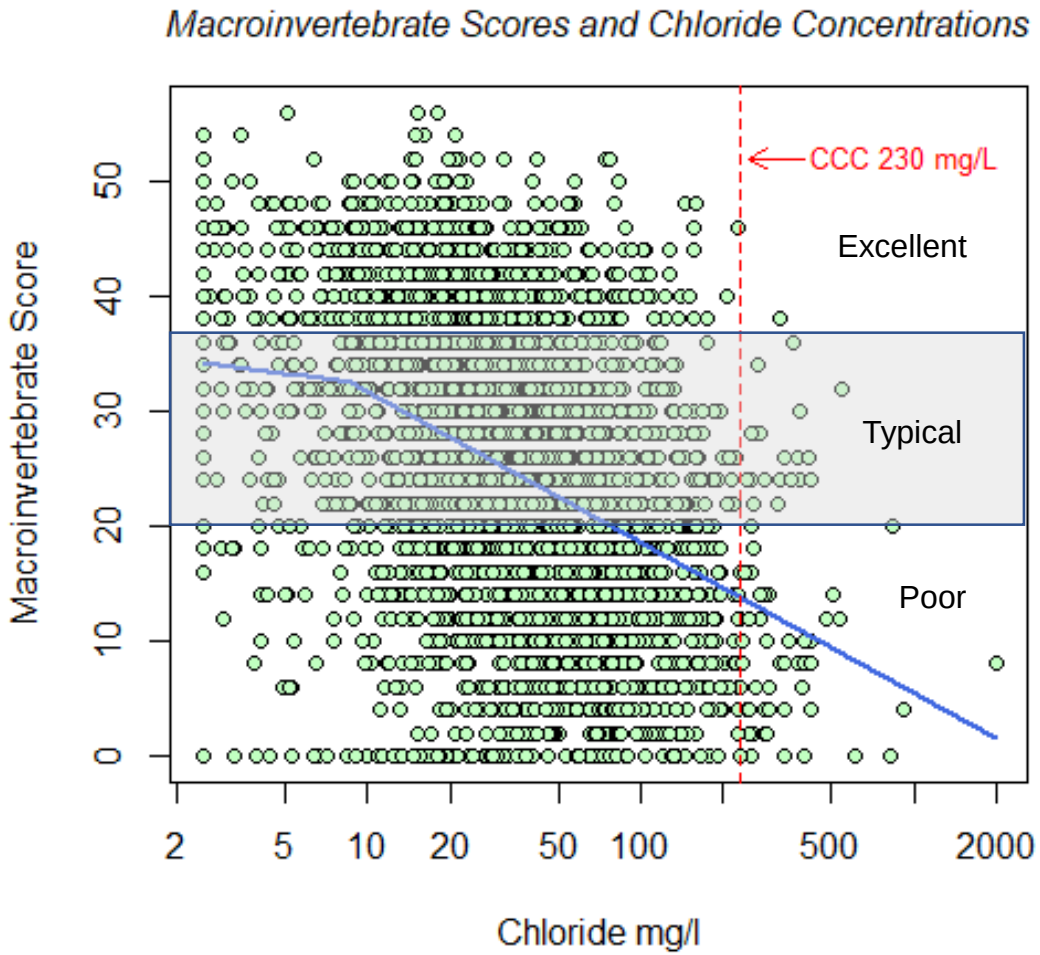
Implications of Increasing Salination

- Injurious to aquatic life
  - Continuous effect across the domain of concentrations
  - US EPA chronic criterion of 230 mg/l under-protects
- Public and private water supplies are being impacted
  - Drinking water standard is being threatened or exceeded
- Corrosive to infrastructure
  - Pavement, concrete and steel
  - Collection and distribution systems
  - Lead leaching from plumbing



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Managing Pollution from Diffuse Sources

Structural Measures

Live-edge plow blades
Brine tanks
Pavement sensors
Calibration equipment

Non-Structural Measures

Local ordinances
Regulation
Incentives (e.g., 319 funding)
Liability waivers
Service levels
Statewide management plan (MN)
Education and outreach

Extent of Present Management

Covered storage of salt piles

Secondary containment of brine (spills)

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Chloride Management Plan

- Proactive approach
- Resources to help organize, coordinate, and promote education and outreach
  - Tap existing expertise
  - Contract training
  - Initial period; need to encourage long-term funding
  - Areawide agencies, conservancy districts, local SWCDs
- Incentivize BMP & technology adoption
  - Fund training events
  - Cost share for equipment
    - H2Ohio - initial round; proactive
    - WRRSP may also be an avenue
  - Ohio EPA business model
    - Longer-term

Ohio Environmental Protection Agency

Discussion and Questions

Municipal Application

Private Application (up to 50% of the load)

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Agenda Item 4:

Pennsylvania Surface Water PFAS Sampling: "Per- and polyfluorinated alkyl substances (PFAS) in Pennsylvania Surface Waters: A statewide assessment, associated sources, and land-use relations"

Amy Williams, PADEP

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BUREAU OF CLEAN WATER

Pennsylvania Surface Water PFAS Sampling:

"Per-and polyfluorinated alkyl substances (PFAS) in Pennsylvania surface waters: A statewide assessment, associated sources, and land-use relations"

S.E. Breitmeyer, A.M. Williams, J.W. Duris, L.W. Eicholtz, D.R. Shull, T.A. Wertz, E.E. Woodward

Amy Williams, Water Program Specialist, Water Quality Division

PFAS Information

What are sources of PFAS?

- Firefighting Foams
- Detergents
- Paint
- Food Packaging
- Non-Stick Coatings
- Stain, water, and grease resistance
- Metal plating
- Pesticides
- Photography

Why sample for PFAS in surface water?

- They are persistent in the environment – they do not break down readily
- PFAS have been detected in PA public water systems
- Areas of concentration include Aqueous Film Forming Foam (AFFF) sites (military bases, airports), industrial areas, landfills, wastewater treatment

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Surface Water PFAS Monitoring 2019

Objectives:

- Identify PFAS in PA surface waters
- Identify associations with possible sources of PFAS contamination (PSOC) & other parameters
- Compare raw concentrations collected to human & ecological benchmarks

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Surface Water PFAS Monitoring 2019

- Land use & physical attributes in upstream catchments calculated
- Counts of PSOC in local catchments tallied
- Hydrological yield of sum of 33 PFAS (∑PFAS) computed for each stream
- Conditional inference tree analyses used to identify drivers of ∑PFAS hydrologic yields

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Surface Water PFAS Monitoring 2019

- 161 water quality network (WQN) stations sampled in Sept 2019
- 33 PFAS chemicals and 19 total oxidizable precursors (TOP) & other water chemistry parameters sampled
  - pH, alkalinity, total dissolved solids (TDS), total nitrogen (TN), ammonia, chloride, sulfate
- SGS AXYS PFAS Methods MLA-110 and MLA-111
- Extensive quality assurance conducted

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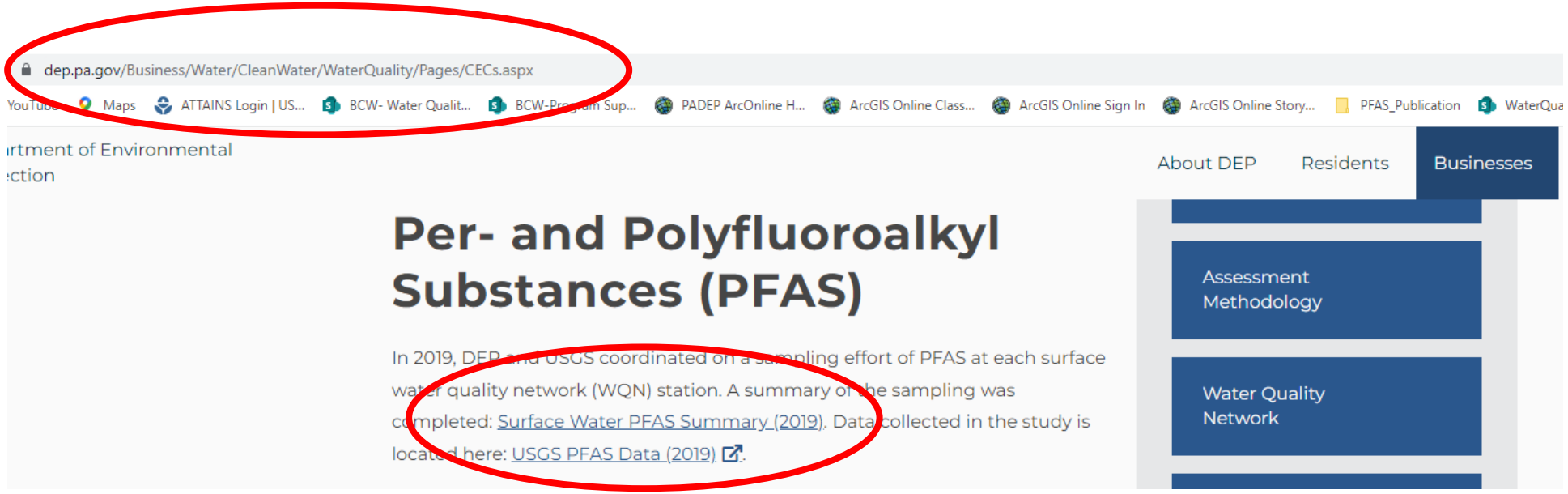
Surface Water PFAS Monitoring 2019

Compound	Abbreviation	TOP Analysis
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	
4:2 fluorotelomersulfonate	4:2 FTS	
6:2 fluorotelomersulfonate	6:2 FTS	
8:2 fluorotelomersulfonate	8:2 FTS	
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	
4-dioxa-3H-perfluorononanoate	ADONA	
Perfluoro-2-propoxypropanoate	HFPO-DA	
N-Ethylperfluorooctanesulfonamide	N-EtFOSA	
N-Ethylperfluorooctanesulfonamidoacetic acid	N-EtFOSAA	
N-Ethylperfluorooctanesulfonamidoethanol	N-EtFOSE	
N-Methylperfluorooctanesulfonamide	N-MeFOSA	
N-Methylperfluorooctanesulfonamidoacetic acid	N-MeFOSAA	
N-Methylperfluorooctanesulfonamidoethanol	N-MeFOSE	
Perfluorobutanoate	PFBA	X
Perfluorobutanesulfonate	PFBS	X
Perfluorodecanoate	PFDA	X
Perfluorododecanoate	PFDoA	X
Perfluorododecanesulfonate	PFDoS	X
Perfluorodecanesulfonate	PFDS	X
Perfluoroheptanoate	PFHpA	X
Perfluoroheptanesulfonate	PFHpS	X
Perfluorohexanoate	PFHxA	X
Perfluorohexanesulfonate	PFHxS	X
Perfluorononanoate	PFNA	X
Perfluorononanesulfonate	PFNS	X
Perfluorooctanoate	PFOA	X
Perfluorooctanesulfonate	PFOS	X
Perfluorooctanesulfonamide	PFOSA	
Perfluoropentanoate	PFPeA	X
Perfluoropentanesulfonate	PFPeS	X
Perfluorotetradecanoate	PFTeDA	X
Perfluorotridecanoate	PFTrDA	X
Perfluoroundecanoate	PFUnDA	X

Surface Water PFAS Monitoring 2019

- Data are linked at the following website:



- Highest PFOS + PFOA discrete water concentrations were found in SE PA at WQN stations 121 (Neshaminy Creek), 154 (Valley Creek near Valley Forge), and 193 (Wissahickon Creek)

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Study Area

- WQN is fixed, statewide network of surface water sampling sites
  - Analyses of metals, nutrients, major ions
  - Some have been sampled for many decades
  - Large amount of data & spatial coverage
  - PFAS sampled once at each site in 2019

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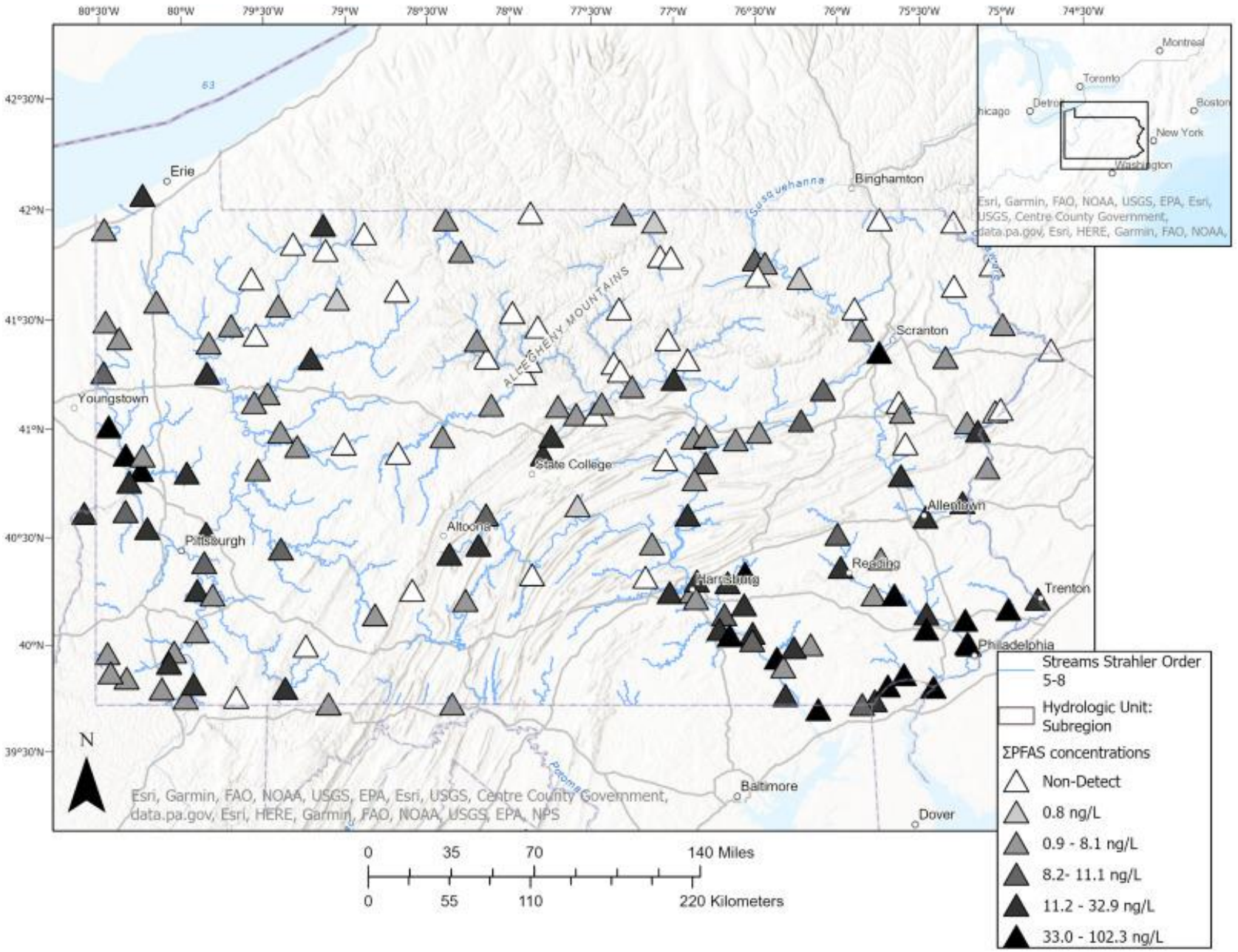
2019 Locations



Geospatial Analyses

- Land use, upstream catchments:
  - Wetland, Cropland, Developed Land (sum of Open Space, and Low, Medium, & High-Intensity Development)
- PSOC counts:
  - 16-km buffer within each site's upstream catchment
  - Spatial Layers: Water Pollution Control Facilities (WPCF), Military Installations, Airports, Fire Training Schools, Combined Sewer Overflow Outfalls (CSO), Oil & Gas Wells, Land Recycling Cleanup Locations, EnviroFACTS Industries, Superfund Sites, Sinkholes
- EnviroFACTS Industries further categorized into 14 major groups

Geospatial Analyses

- EnviroFACTS Industries further categorized into 14 major groups:
  - Electronic & other electrical equipment & components except computer equipment (EECEF)
  - Transportation equipment
  - Chemicals & allied products
  - Fabricated metal products except machinery & computer equipment
  - Furniture & fixtures
  - Industrial & commercial machinery & computer equipment
  - Measuring, analyzing, & controlling instruments
  - Paper & allied products
  - Petroleum refining & related industries
  - Primary metal industries
  - Rubber & misc. plastics products
  - Textile mill products
  - Transportation by air
  - Electric gas & sanitary services

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Data Prep

- Non-detect values assigned ½ the method reporting level for analyses
- ∑PFAS mass load for each stream:
  - ∑PFAS X instantaneous streamflow (measured in the field)
- ∑PFAS hydrologic yield:
  - ∑PFAS load / drainage area = ∑PFAS yield (ng/s/km2)
  - Individual PFAS hydrologic yields at each site also calculated

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Data Analyses

- Concentration and occurrence statistics
- ∑PFAS & land use analyses: Spearman's Rho Correlations
- Significant explanatory variables of ∑PFAS yield: non-parametric conditional inference trees ("ctree")
  - Included upstream catchment physical & land use parameters, local catchment PSOC, & site water chemistry parameters as independent variables

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PFAS Results

- PFAS compounds detected (12/33):
  - PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFBS, PFPeS, PFHxS, PFOS, 6:2 FTS
- Lowest number of detections: PFPeS (2 streams)
- Highest number of detections: PFOA (113 streams)
- Median concentrations:
  - PFOA: 1.2 ng/L (non-detect – 16 ng/L)
  - PFOS: non-detect (non-detect – 23 ng/L)
- Median yield:
  - PFOA: 3.6 ng/s/km2 (non-detect – 175 ng/s/km2)
  - PFHxA: 3.4 ng/s/km2 (non-detect – 84 ng/s/km2)

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PFAS Results

- Maximum PFOA concentration = 16 ng/L
- Maximum PFOS concentration = 23 ng/L
- ∑PFAS ranged from non-detect to 102 ng/L (median = 3.8 ng/L)
- Concentrations and compounds detected were consistent with other studies in the region
- Median ∑PFAS yield among all streams = 11.9 ng/s/km2
- Maximum yields of individual detected substances ranged 8.2 – 278 ng/s/km2

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Spearman's Rho Results

- ∑PFAS yields associated with cropland & development in upstream catchment

Credit: PA Dept of Agriculture

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ctree Results

- Most statistically significant explanatory variables:
  - First round (all abiotic variables):
    - Most significant: % development in upstream catchment
    - Count of karst sinkholes
    - Ammonia (only in streams with ≤ 7.58% development)
  - Second round (removed % development):
    - Count of electronics manufacturing facilities (EECEF)
  - Third round (removed % development & highest yielding stream – Valley Creek):
    - EECEF no longer an explanatory variable
    - Explanatory variables included: total nitrogen conc., local catchment WPCF count, ammonia conc., local catchment CSO count, chloride conc.

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Threshold Comparisons

- No PFOA or PFOS detections exceeded EPA ecological or state thresholds
- EPA Drinking Water Health Advisory Levels (HAL):
  - Reporting levels of PFOA & PFOS higher than EPA HAL
  - 70% of streams had exceedance of PFOA HAL (0.004 ng/L)
  - 47% of streams had exceedance of PFOS HAL (0.02 ng/L)
- EPA Drinking Water Maximum Contaminant Levels (MCL):
  - 16 streams had exceedance of PFOA MCL (4 ng/L)
  - 11 streams had exceedance of PFOS MCL (4 ng/L)

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Threshold Comparisons

- There were also exceedances of PADEP's new drinking water maximum contaminant level goals (MCLGs) and MCLs (published after this document's submission):

	MCLG (ng/L or ppt)	MCL (ng/L or ppt)
PFOA	8	14
PFOS	14	18

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Conclusions

- Development upstream is primary driver of ∑PFAS
- WPCF and EECEF primary sources associated with ∑PFAS contamination
- Sewage infrastructure surrounded by oil & gas development is a potential source
- Important to Note: streams sampled during drought conditions (may affect chemistry parameters such as chloride, etc.)

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Questions?

Amy Williams
717-772-4045
amywilli@pa.gov

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Agenda Item 5:

Results of Ohio River Fish Tissue Contaminants Monitoring for PFAS

Rob Tewes, ORSANCO

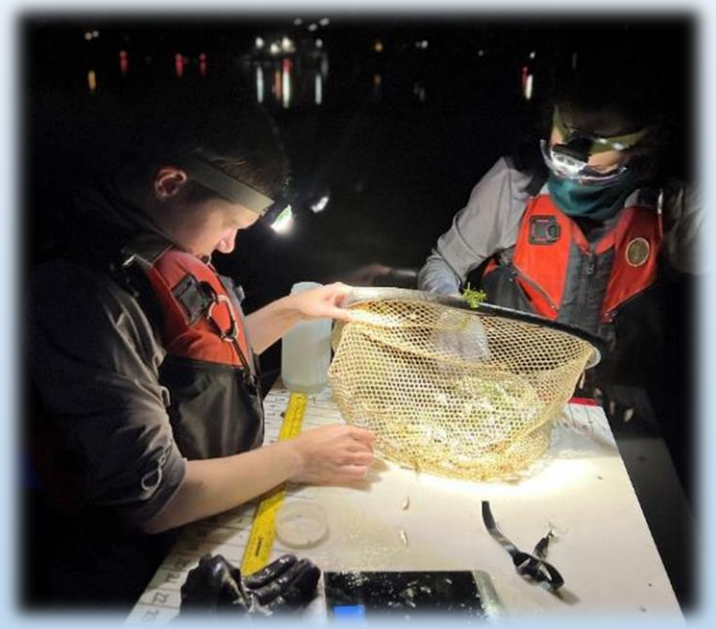
Ohio River Fish Tissue Contaminants Monitoring - PFAS

233rd ORSANCO Technical Committee

Agenda Item 5

ORSANCO Fish Tissue Contaminants Monitoring Program Overview

- ORSANCO has been collecting fish tissue contaminants data from the Ohio River since the 1980s.
- These data are provided to each of the 6 mainstem states to inform consumption advisories.
- These data are also used to track and monitor Ohio River fish tissue contaminants.



ORSANCO Fish Tissue Contaminants Monitoring Program Overview

- ORSANCO sends between 15 and 25 frozen, whole-fish composites to our contract laboratory annually

- Composites are thawed, measured and weighed, filleted

(left side fillet only per fish), homogenized and analyzed

- Analytes include:
  - PCBs (Aroclors)
  - Metals (Cd, Pb, Se, Hg)
  - MeHg
  - Pesticides (catfishes)
  - PFAS (35 compounds)

ORSANCO Fish Tissue Contaminants Monitoring PFAS

- In 2021 ORSANCO added 35 per- and polyfluoroalkyl substances (PFAS) to its suite of fish tissue contaminants analytes.

Perfluorobutanoic acid (PFBA)	Perfluorononanesulfonic acid (PFNS)
Perfluoropentanoic acid (PFPeA)	Perfluorodecanesulfonic acid (PFDS)
Perfluorohexanoic acid (PFHxA)	Perfluorododecanesulfonic acid (PFDoS)
Perfluoroheptanoic acid (PFHpA)	Perfluorooctanesulfonamide (PFOSA)
Perfluorooctanoic acid - br/lin (PFOA)	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)
Perfluorononanoic acid (PFNA)	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)
Perfluorodecanoic acid (PFDA)	N-methylperfluorooctane sulfonamide (NMeFOSA)
Perfluoroundecanoic acid (PFUnA)	N-ethylperfluorooctane sulfonamide (NEtFOSA)
Perfluorododecanoic acid (PFDoA)	N-methyl perfluorooctanesulfonamidoacetic acid - br/lin (NMeFOSAA)
Perfluorotridecanoic acid (PFTrDA)	N-ethyl perfluorooctanesulfonamidoacetic acid - br/lin (NEtFOSAA)
Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)
Perfluorohexadecanoic acid (PFHxDA)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)
Perfluorooctandecanoic acid (PFODA)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)
Perfluorobutanesulfonic acid (PFBS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
Perfluoropentanesulfonic acid (PFPeS)	4,8-dioxa-3H-perfluorononanoic acid (ADONA)
Perfluorohexanesulfonic acid - br/lin (PFHxS)	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)
Perfluoroheptanesulfonic acid (PFHpS)	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
Perfluorooctanesulfonic acid - br/lin (PFOS)	

ORSANCO Fish Tissue Contaminants Monitoring PFAS

- ORSANCO currently develops and distributes proposed consumption advisories for Ohio River fish based on PCBs and total Hg.
  - ORSANCO has collected PFAS data from a total of 35 composite samples, and has submitted 15 more for 2023, bringing the total number to 50 by 2024.
  - Advisory guidance is based primarily on PFOA and is currently being investigated.

Table 1. Levels of PFOS in Fish and Corresponding Meal Advice Categories for all Populations

PFOS in Fish (µg/kg)	**Meal Frequency**
≤ 10	Unrestricted
> 10-20	2 meals/week
> 20-50	1 meal/week
> 50-200	1 meal/month
> 200	DO NOT EAT

Great Lakes Consortium for Fish Consumption Advisories; Best Practice for Perfluorooctane Sulfonate (PFOS) Guidelines, Nov. 2019.

Table 1. Levels of PFOS in fish and corresponding 8-ounce meal advice categories.

PFOS in fish (ng/g)	Meal Advice
3.5	1 meal per week
7.5	2 meals per week
15	1 meal per month
30	6 meals per year
60	3 meals per year
> 60	Do Not Eat

Maine CDC Scientific Brief: PFOS Fish Consumption Advisory May 5, 2022.

ORSANCO Fish Tissue Contaminants Monitoring PFAS

TABLE 1—DRAFT RECOMMENDED FRESHWATER AQUATIC LIFE WATER QUALITY CRITERIA FOR PFOA AND PFOS					
Criteria component	Acute water column (CMC) 1	Chronic water column (CCC) 2	Invertebrate whole-body (mg/kg ww3)	Fish whole-body (mg/kg ww)	**Fish muscle (mg/kg ww)**
PFOA Magnitude	49 mg/L	0.094 mg/L	1.11	6.10	**0.125**
PFOS Magnitude	3.0 mg/L	0.0084 mg/L	0.937	6.75	**2.91**
Duration	1-hour average	4-day average	Instantaneous.4		
Frequency	Not to be exceeded more than once in three years, on average.	Not to be exceeded more than once in three years, on average.	Not to be exceeded more than once in ten years, on average.		
1 Criterion Maximum Concentration. 2 Criterion Continuous Concentration. 3 Wet Weight.					
4 Tissue data provide instantaneous point measurements that reflect integrative accumulation of PFOA or PFOS over time and space in aquatic life population(s) at a given site.					

ENVIRONMENTAL PROTECTION AGENCY [EPA–HQ–OW–2022–0365 and EPA–HQ– OW–2022–0366; FRL 8310–01–OW]
Draft Recommended Aquatic Life Ambient Water Quality Criteria for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS)
Federal Register May 3, 2022.

ORSANCO Fish Tissue Contaminants Monitoring PFAS

U.S. state	Date of most recent update	Basis	Do not eat level (ng/kg)	1 meal/month (ng/kg)	1 meal/week (ng/kg)	Reference Dose
Alaska	2019	Not listed in the advisory		no values set		Not identified
New Hampshire	2021	Not listed in the advisory		no values set		Not identified
Alabama	2002	State references EPA value of "of 0.077 µg/kg-day for calculating the allowable limit of PFOS in fish tissue. "	800,000	201,000-800,000	41,000-200,000	7.7x10-5 mg/kg-day
Illinois	2021	Based on the EPA 2016 lifetime health advisory	200,000	50,000-200,000	20,000-50,000	2x10-5 mg/kg-day
Indiana	2019		"	"	"	"
Minnesota	2020		"	"	"	"
New York	2022		"	"	"	"
Ohio	2022		"	"	"	"
Pennsylvania	2021		"	"	"	"
Wisconsin	2022		"	"	"	"
Connecticut	2022		159,000	40,000-159,000	20,000-40,000	"
Maryland	2022			no values set		"
Michigan	2016	State calculated	300,000	75,000-150,000	19,000-38,000	1.4x10-5 mg/kg-day
Oregon	2021	Oregon Health Authority Provisional Reference Dose, September 2021		no values set		4.1x10-6 mg/kg-day
Maine	2022	U.S. Agency for Toxic Substances and Disease Registry (ATSDR) 2021	60,000	7,500-15,000		2x10-6 mg/kg-day
Massachusetts	2021	U.S. Agency for Toxic Substances and Disease Registry (ATSDR) 2018 draft (subsequently published in 2021)	183,000	7,620-15,200	1,760-3,520	2x10-6 mg/kg-day
New Jersey	2019	State calculated	204,000	3,900-17,000	560-3,900	1.8x10-6 mg/kg-day
Calculated	2022	EPA interim lifetime health advisory 2022	79	20-79	8-20	7.9X10-9 mg/kg/day

Barbo et. al., Locally Caught Freshwater fish across the United States are likely a significant source of exposure to PFOS and other perfluorinated compounds. Env. Research Vol. 220; 1 March 2023.

ORSANCO Fish Tissue Contaminants Monitoring PFAS

ID	RMI	Species	PFOA	PFOS PPT ng/kg	PFOS PPB ug/kg	PFOS PPM mg/kg	PCBs_mg/kg	Program	Year Collected
2021-12-1	12	Common Carp	ND	4700	4.7	0.0047	1.48	ORSANCO	2021
2021-12-10	12	Spotted Bass	ND	42000	42	0.042	0.436	ORSANCO	2021
2021-11-2.7	11	Black Buffalo	ND	3500	3.5	0.0035	0.526	ORSANCO	2021
2021-13-17	13	Sauger	ND	7900	7.9	0.0079	0.459	ORSANCO	2021
2021-26-17	26	Sauger	ND	7000	7	0.007	0.736	ORSANCO	2021
2021-459-2.5	459	Smallmouth Buffalo	ND	4700	4.7	0.0047	0.133	IDEM	2021
2021-460-4C	460	Channel Catfish	ND	1000	1	0.001	0.123	IDEM	2021
2021-464-4C	464	Channel Catfish	ND	1100	1.1	0.0011	0.105	IDEM	2021
2021-487-2.5	487	Smallmouth Buffalo	ND	2300	2.3	0.0023	0.06	IDEM	2021
2021-525-12	525	Spotted Bass	ND	14000	14	0.014	0.124	IDEM	2021
2021-528-9.7	528	Redear Sunfish	ND	4900	4.9	0.0049	0.0041	IDEM	2021
2021-558-9	558	Bluegill	ND	13000	13	0.013	0.0292	IDEM	2021
2021-585-10	585	Smallmouth Bass	ND	7300	7.3	0.0073	0.0472	IDEM	2021
2021-590-12	590	Spotted Bass	ND	10000	10	0.01	0.117	IDEM	2021
2021-597-9	597	Bluegill	ND	9700	9.7	0.0097	0.0311	IDEM	2021
2021-600-12	600	Spotted Bass	ND	8000	8	0.008	0.0913	IDEM	2021
2022-199-11	199	Largemouth Bass	ND	16000	16	0.016	0.106	ORSANCO	2022
2022-294-4B	294	Channel Catfish	ND	2300	2.3	0.0023	0.115	ORSANCO	2022
2022-357-4B	357	Channel Catfish	ND	1100	1.1	0.0011	0.0577	ORSANCO	2022
2022-440-17	440	Sauger	ND	7900	7.9	0.0079	0.24	ORSANCO	2022
2022-752-17	752	Sauger	ND	12000	12	0.012	0.17	ORSANCO	2022
2022-776-17	776	Sauger	ND	5000	5	0.005	0.0917	IDEM	2022
2022-777-17	777	Sauger	ND	5400	5.4	0.0054	0.11	IDEM	2022
2022-824-1	824	Common Carp	ND	2200	2.2	0.0022	0.16	IDEM	2022
2022-840-9	840	Bluegill	ND	13000	13	0.013	0.0444	IDEM	2022
2022-842-9	842	Bluegill	ND	13000	13	0.013	0.0311	IDEM	2022
2022-844-9	844	Bluegill	ND	25000	25	0.025	0.0421	IDEM	2022
2022-888-4B	888	Channel Catfish	ND	860	0.86	0.00086	0.059	ORSANCO	2022
2022-959-4B	959	Channel Catfish	ND	4800	4.8	0.0048	0.17	ORSANCO	2022
2022-965-1	965	Common Carp	ND	9600	9.6	0.0096	0.134	ORSANCO	2022
2022-966-1.6	966	River Carpsucker	ND	7500	7.5	0.0075	0.128	ORSANCO	2022
2022-966-18A	966	Freshwater Drum	ND	18000	18	0.018	0.0209	ORSANCO	2022
2022-972-4B	972	Channel Catfish	ND	1900	1.9	0.0019	0.0974	ORSANCO	2022
2022-974-17	974	Sauger	ND	19000	19	0.019	0.122	ORSANCO	2022
2022-978-0.6	978	Silver Carp	ND	6600	6.6	0.0066	0.0091	ORSANCO	2022

Advisory Groupings

Level 1	Unlimited Consumption
Level 2	1 meal/week
Level 3	1 meal/month
Level 4	6 meals/year
Level 5	No Consumption

Contaminant	limited Consumpt	1 ml/wk	1 ml/mo	6 ml/yr	No Consumption
	Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
Hg (ppm)	<=0.05	0.05<x<=0.22	0.22<x<=0.94	NA	>0.94
PCB (ppm) skin on	<=0.05	0.05<x<=0.22	0.22<x<=0.94	0.94<x<=1.88	>1.88
PCB (ppm) skin off	<=0.036	0.036<x<=0.155	0.155<x<=0.67	0.67<x<=1.34	>1.34

A uniform fish consumption advisory protocol for the Ohio River. Environ Monit Assess, 2011.

Table 1. Levels of PFOS in Fish and Corresponding Meal Advice Categories for all Populations

PFOS in Fish (µg/kg)	Meal Frequency
≤ 10	Unrestricted
> 10-20	2 meals/week
> 20-50	1 meal/week
> 50-200	1 meal/month
> 200	DO NOT EAT

Great Lakes Consortium for Fish Consumption Advisories; Best Practice for Perfluorooctane Sulfonate (PFOS) Guidelines, Nov. 2019.

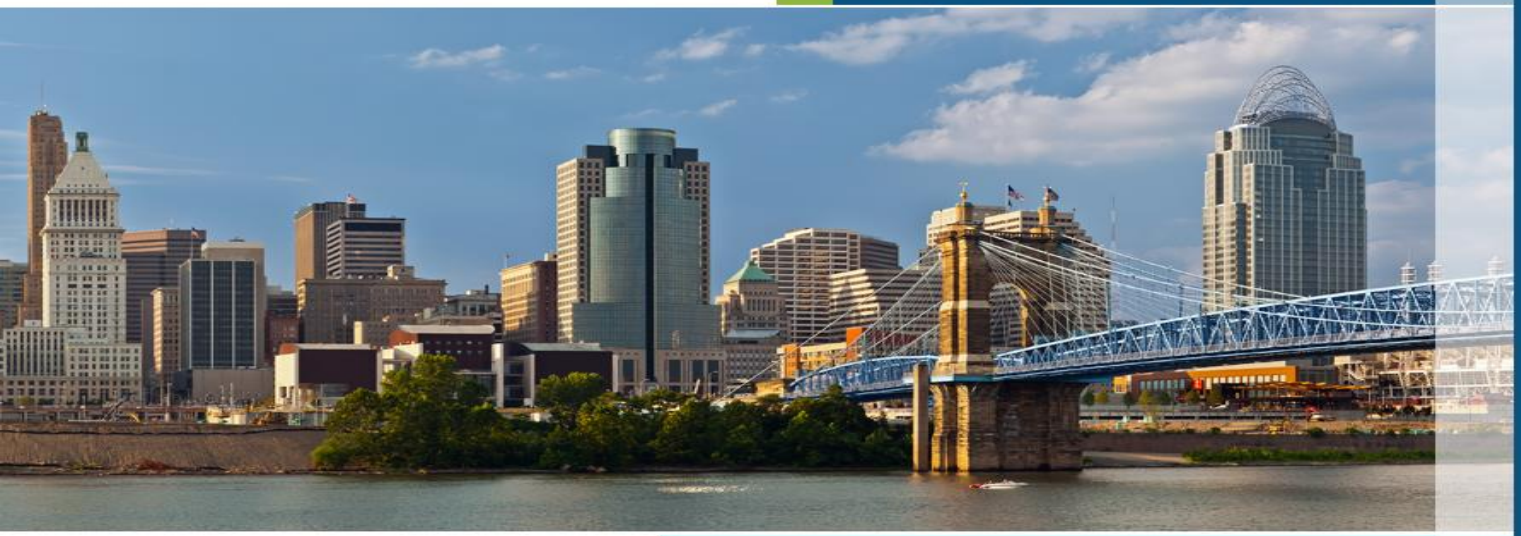
ORSANCO Fish Tissue Contaminants Monitoring PFAS Summary

- No ORSANCO fish tissue samples analyzed for PFAS fall into a consumption advisory category more restrictive than 1 meal / week for total PFOS (all samples to date are ND for PFOA).
    - Most samples analyzed for PFAS fall within the “unlimited consumption” advisory category based on PFOS concentrations.
    - However, PCB concentrations in most of those samples trigger a 1 meal / week or greater advisory.
- Incorporating PFAS into future proposed consumption advisories will be discussed by the FCAW this offseason.
    - Under current protocol, proposed advisory development factors in 10 years of fish tissue contaminants data collection.

Agenda Item 6:

The Cincinnati Smart Sewers Story

Reese Johnson, Metropolitan Sewer District of Greater Cincinnati



A New Road to Compliance

The Cincinnati *Smart Sewers* Story

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

JACOBS

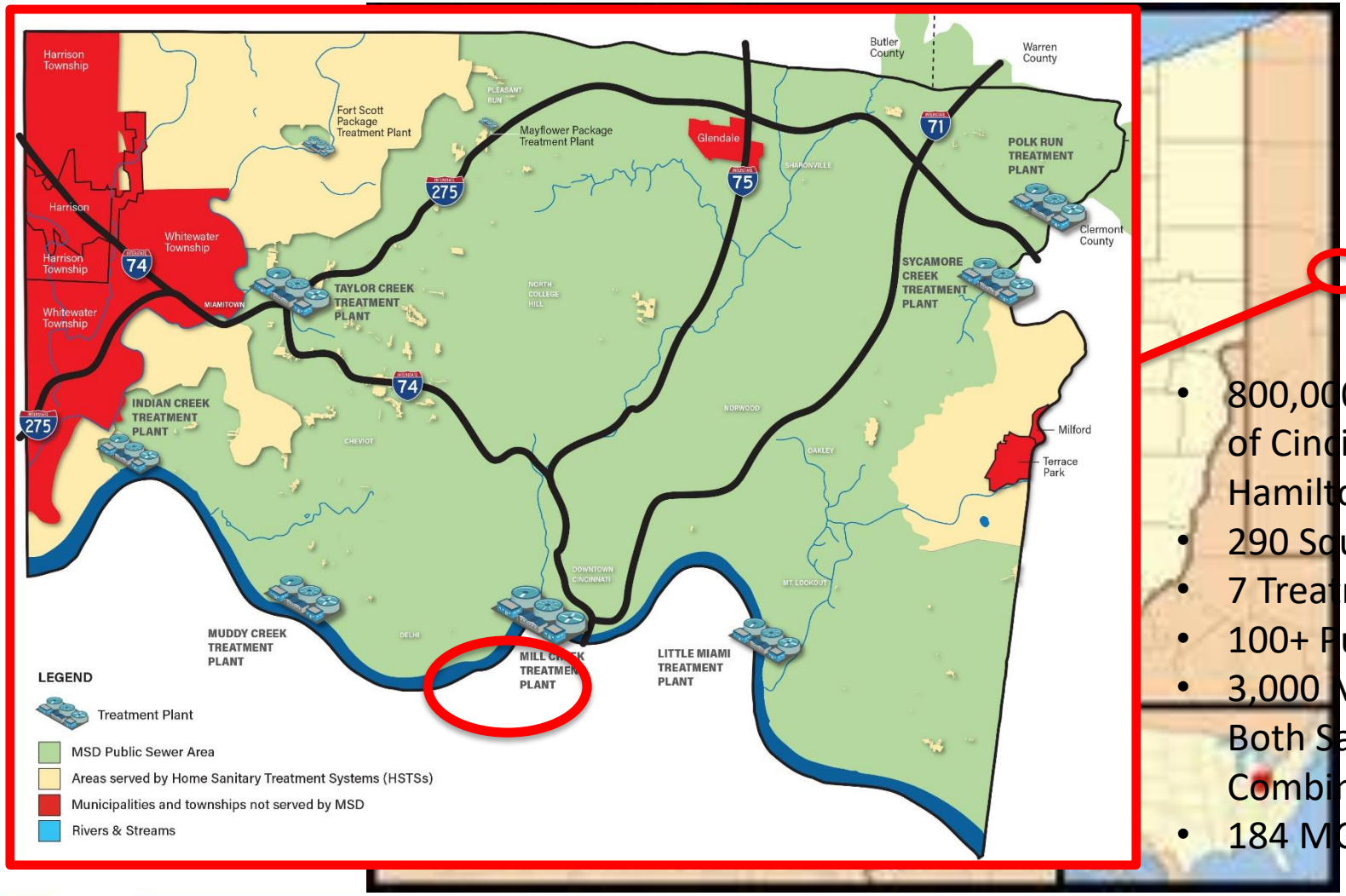
CDM Smith listen. think. deliver.

GRAYMATTER

PCS Technologies

xylem Let's Solve Water

Setting: A Quiet Corner of Ohio



- 800,000+ Residents of Cincinnati and Hamilton County
- 290 Square Miles
- 7 Treatment Plants
- 100+ Pump Stations
- 3,000 Miles of Sewers, Both Sanitary and Combined
- 184 MGD on Dry Days

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

…With An Overflow Problem

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 1: Gearing Up for a Long Journey

2002, 2003: Filing of the Interim Partial Consent Decree for SSOs and the Global Consent Decree for CSOs and Treatment Plants

2004-2006: Four teams of consultants developed a 24-volume Wet Weather Improvements Plan detailing over 450 projects estimated to cost over $3.5 Billion

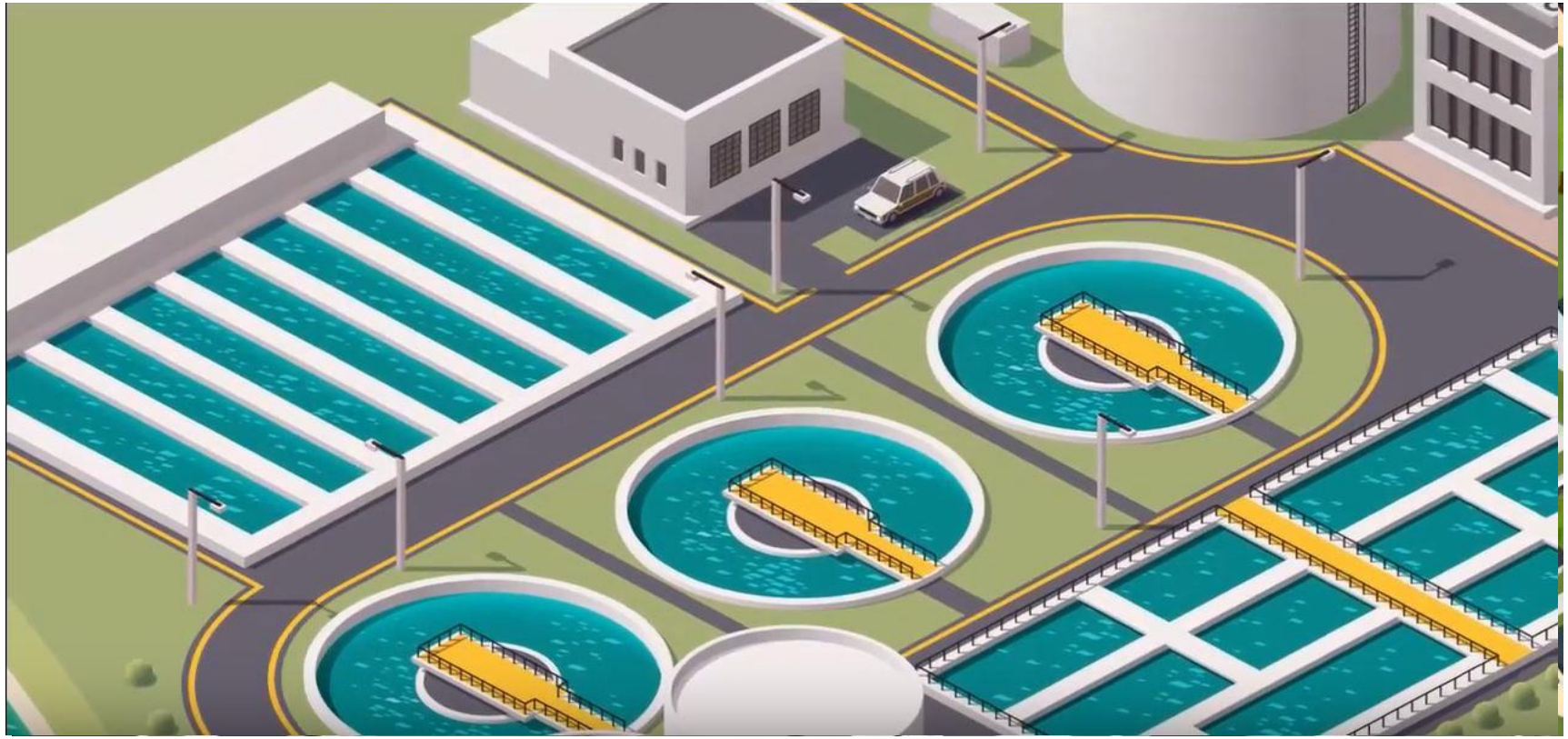
2010: Regulators approve a two-phase implementation schedule

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 1: Gearing Up for a Long Journey

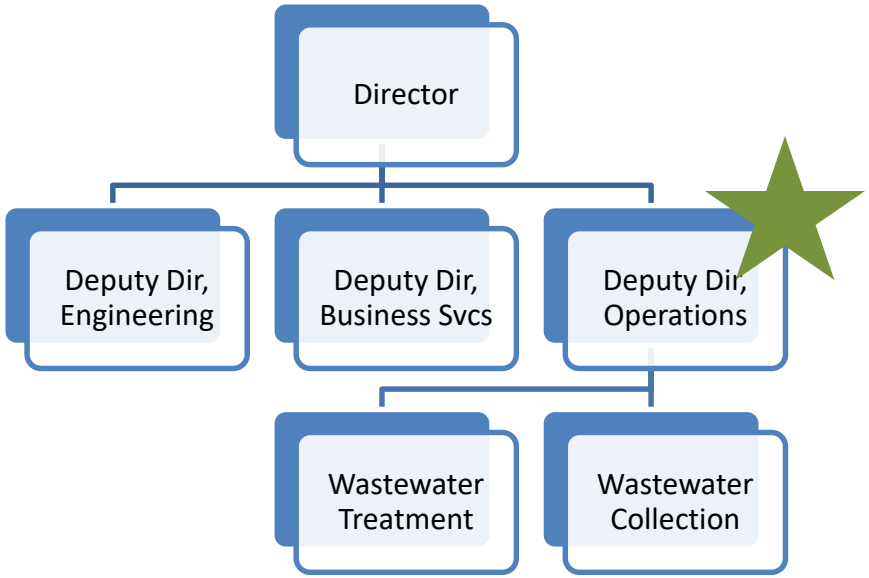
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

The Plot Twist: A New Path Emerges…



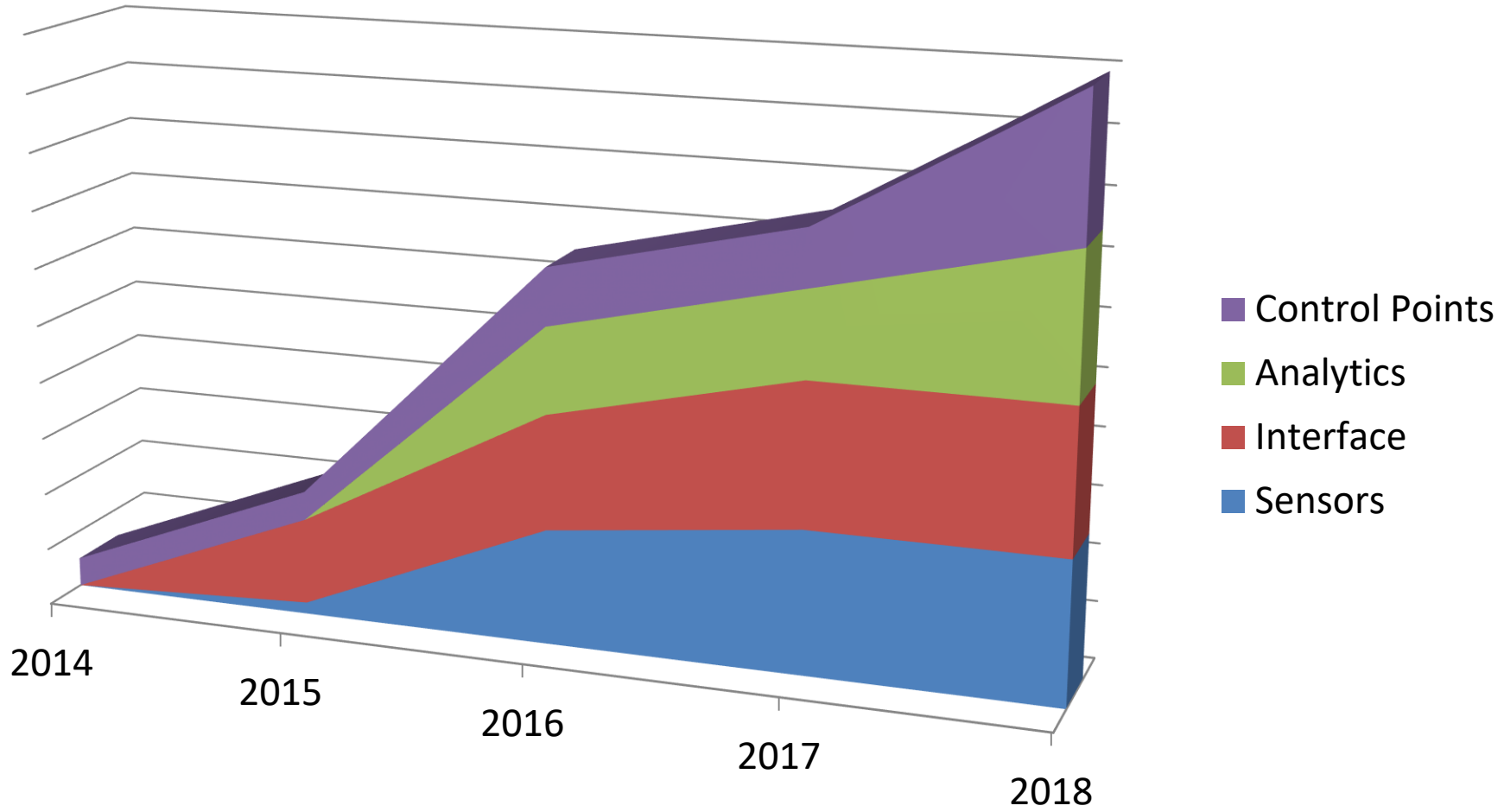
System-wide Operational Optimization

Chapter 2: A New Direction



Organizational Change to Empower Success

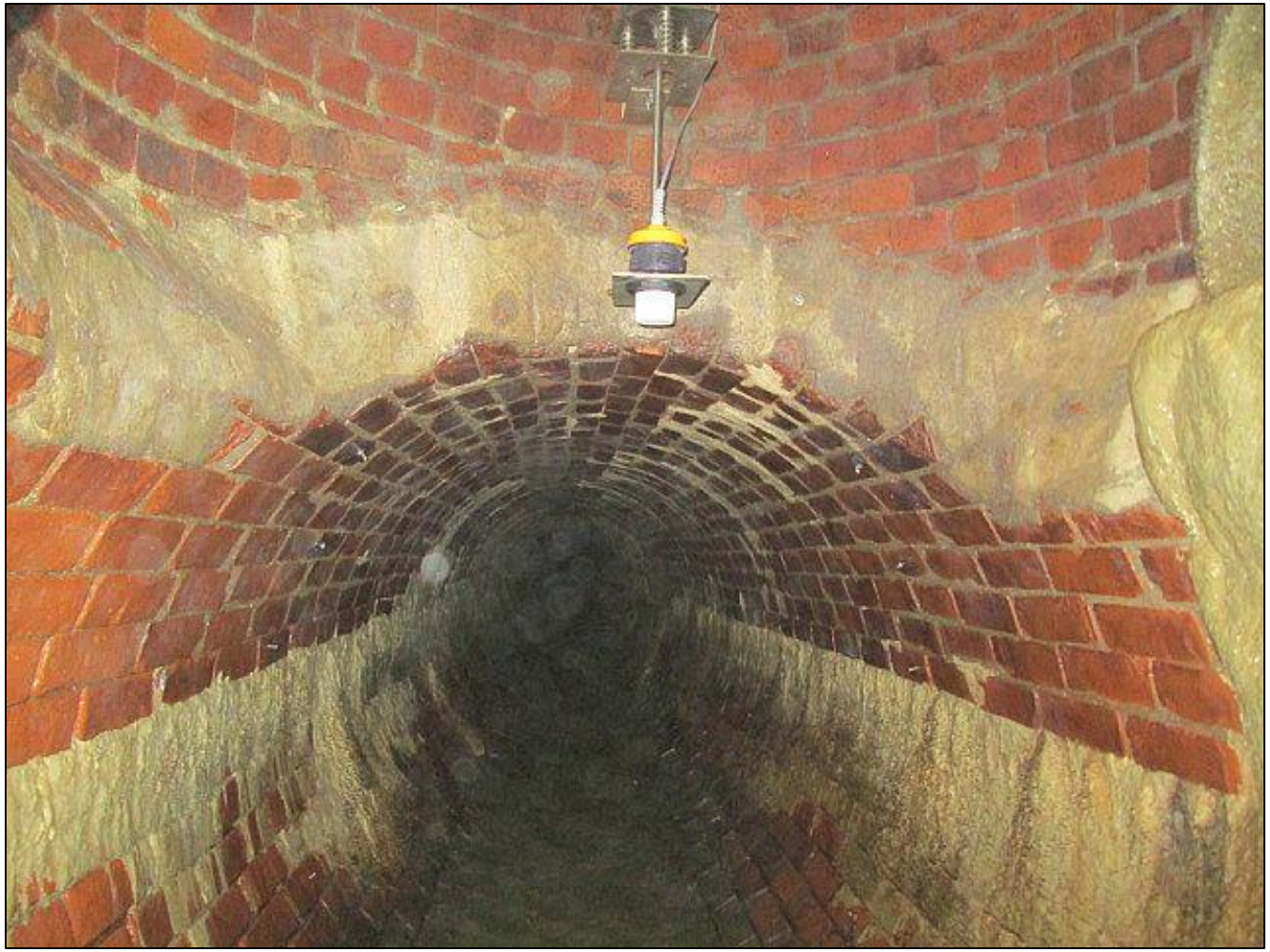
Chapter 2: A New Direction



METROPOLITAN SEWER DISTRICT of greater CINCINNATI

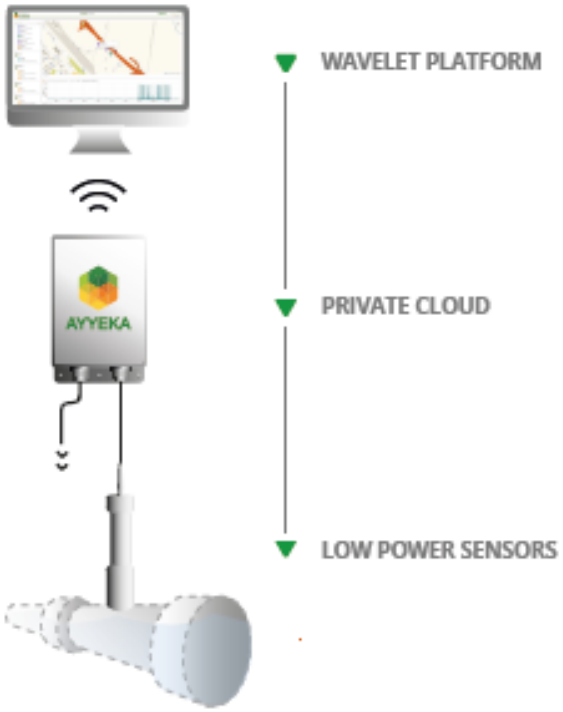
Four Components to Achieve Success

Chapter 3: Turn on the Lights!

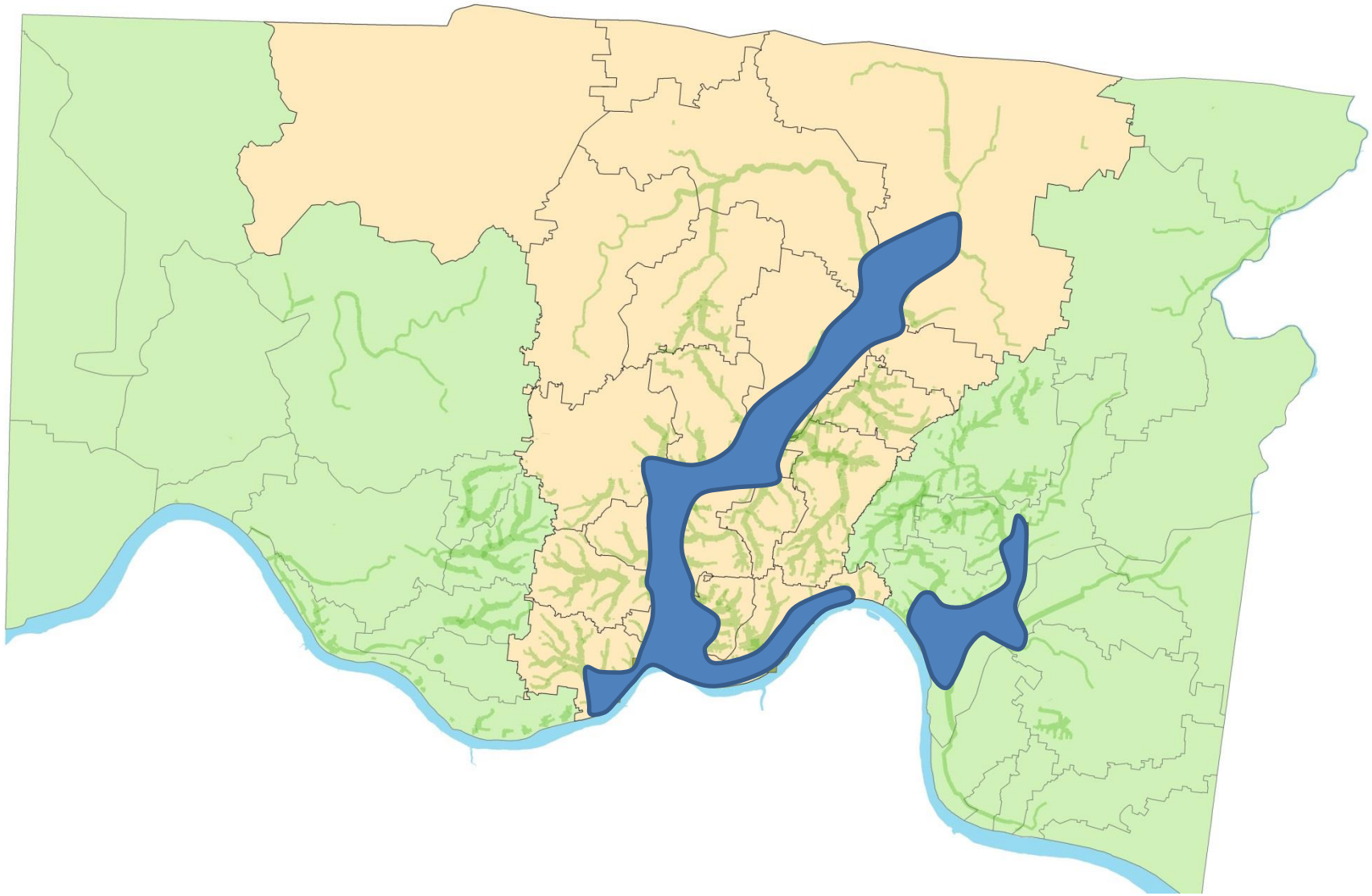


Chapter 3: Turn on the Lights!

- Partnered with EPA on a Sensor Challenge
- Conducted Pilots with Multiple Technology Providers
- Selected Best Proposal via Competitive RFP
- Standard RTU Capable of Multiple Types of Sensors, Secure Data Transfer with Buffering
- Integrates with SCADA, where its monitored, dispatching field crews as needed for maintenance

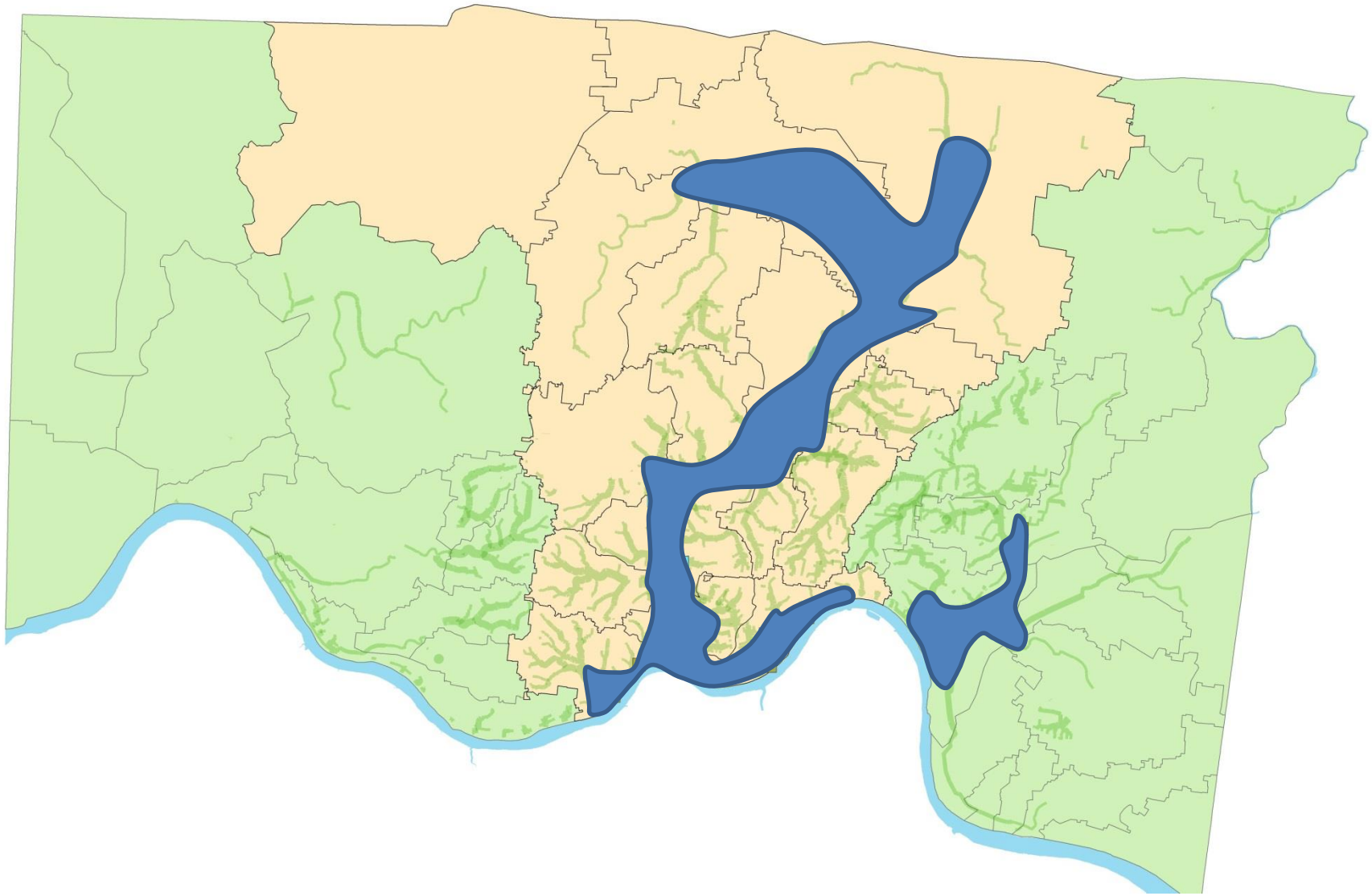


Chapter 3: Turn on the Lights!



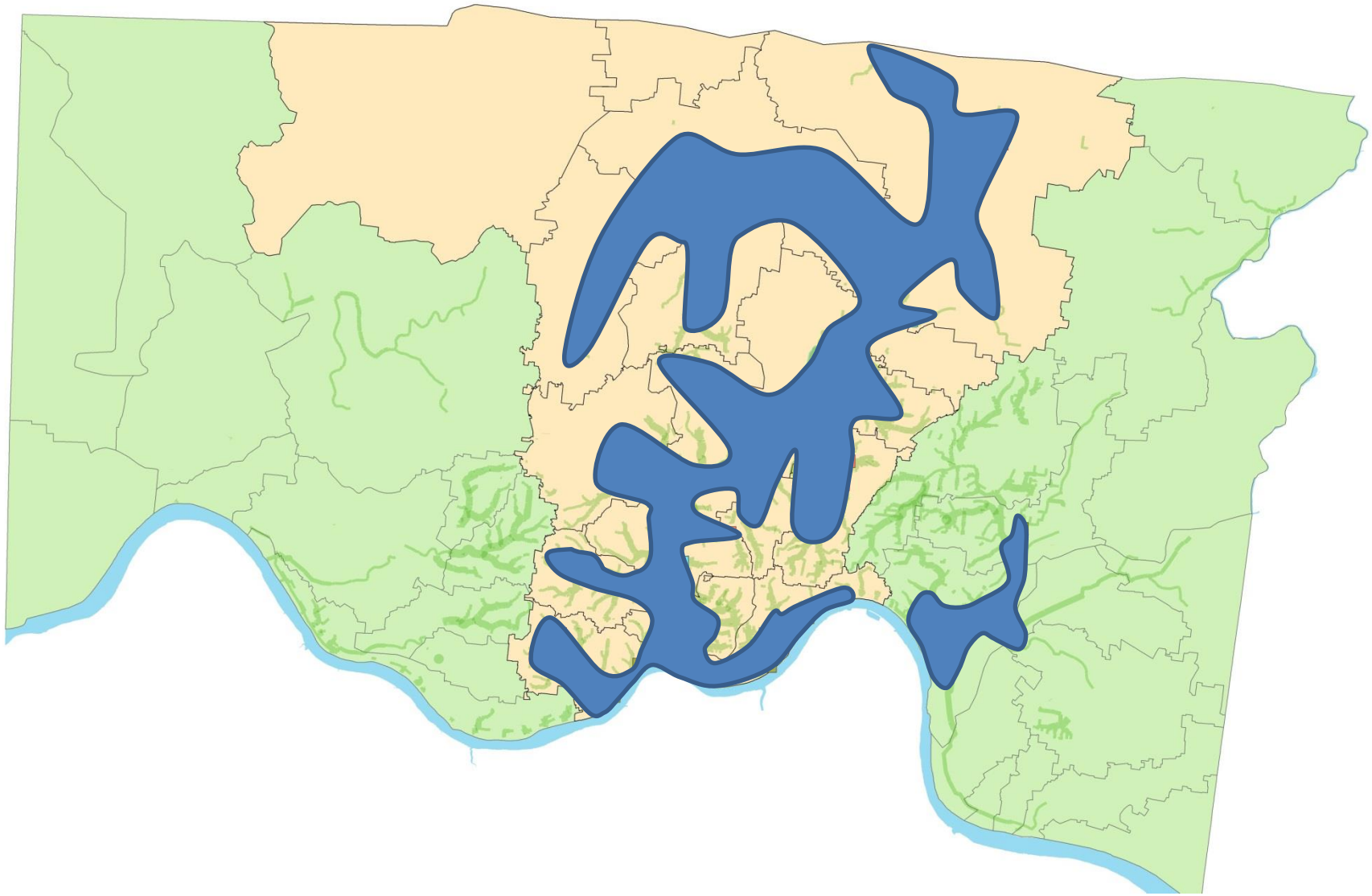
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 3: Turn on the Lights!



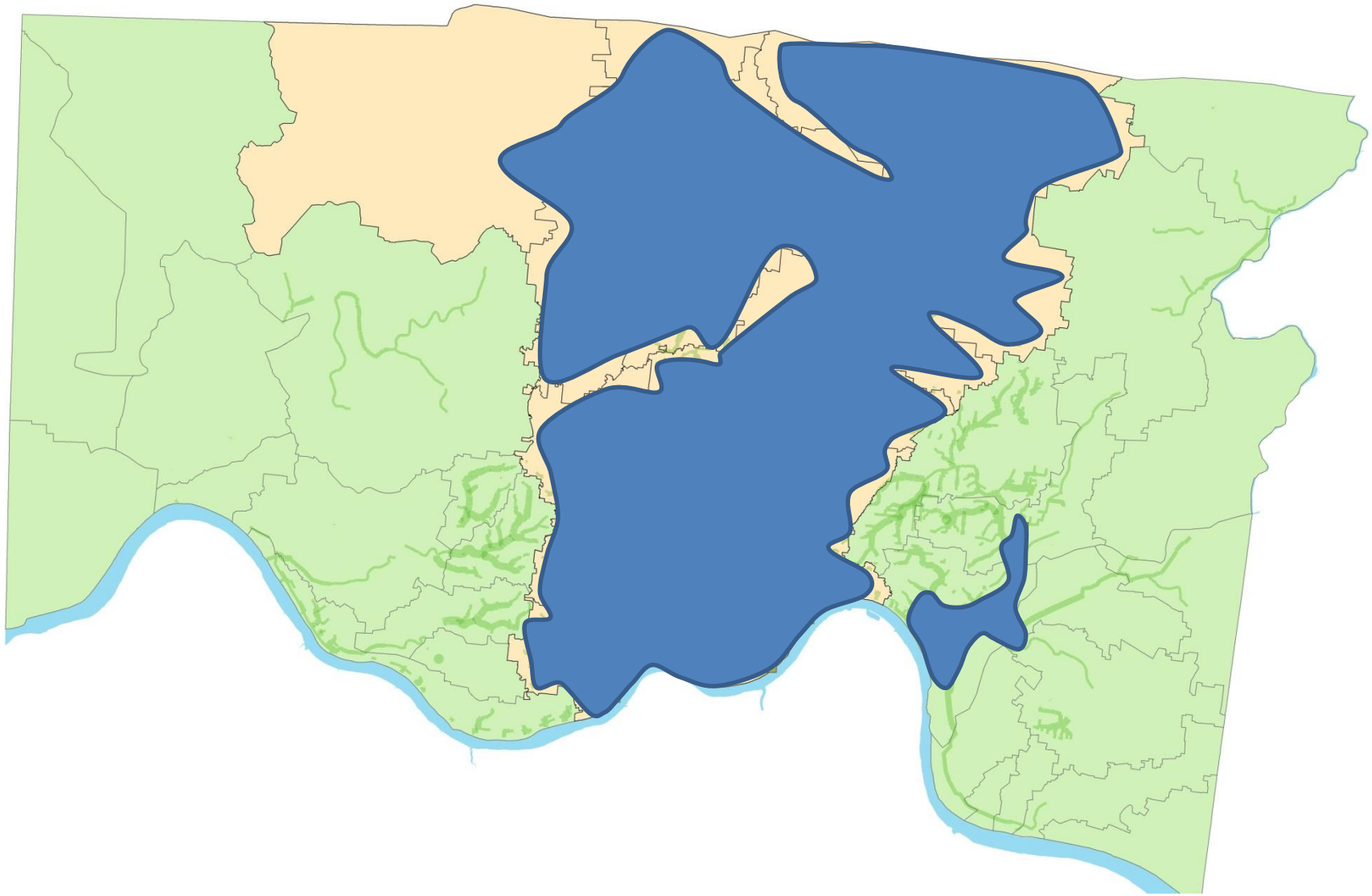
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 3: Turn on the Lights!



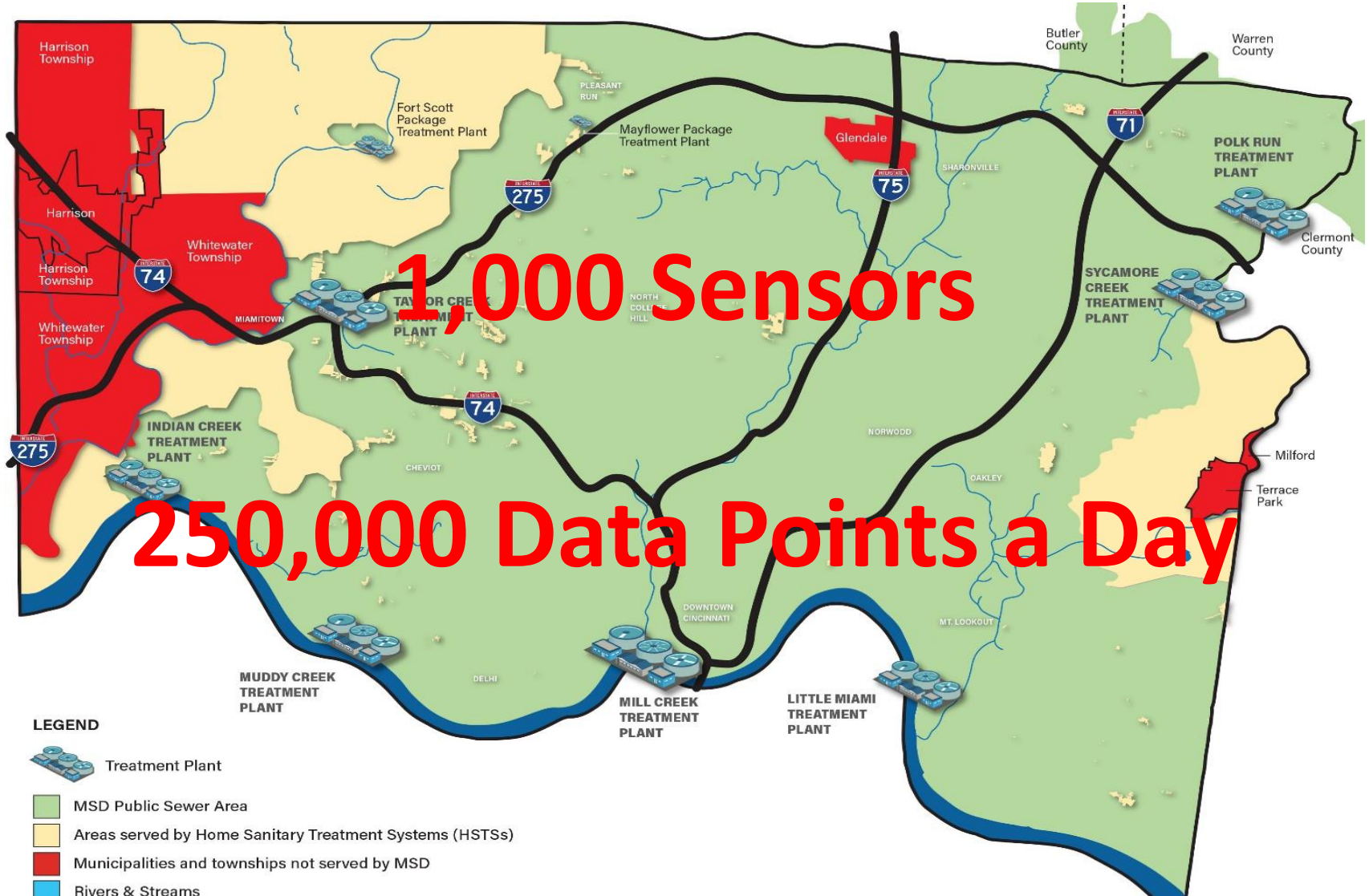
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 3: Turn on the Lights!



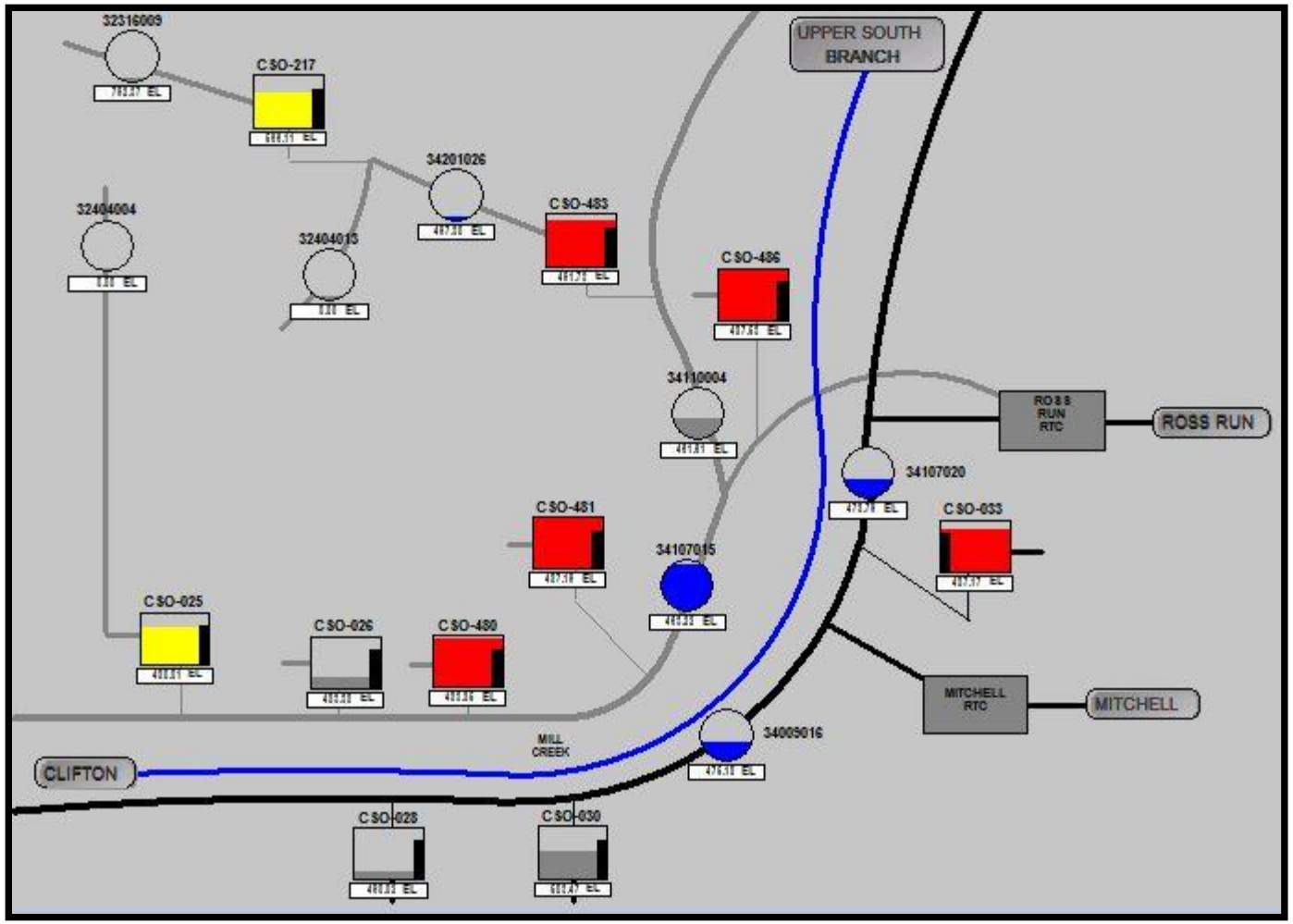
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 3: Turn on the Lights!

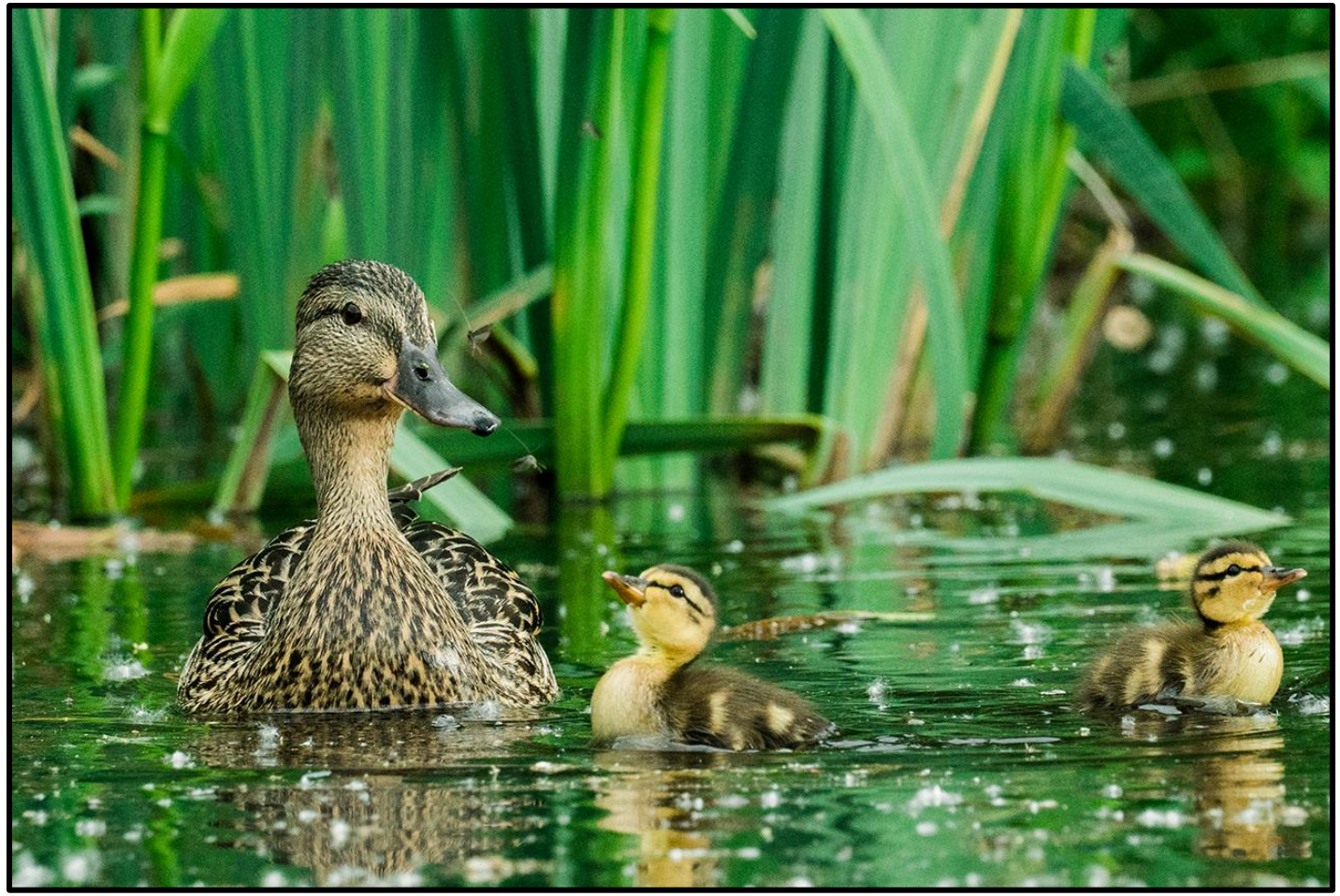


METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 4: Seeing is Believing



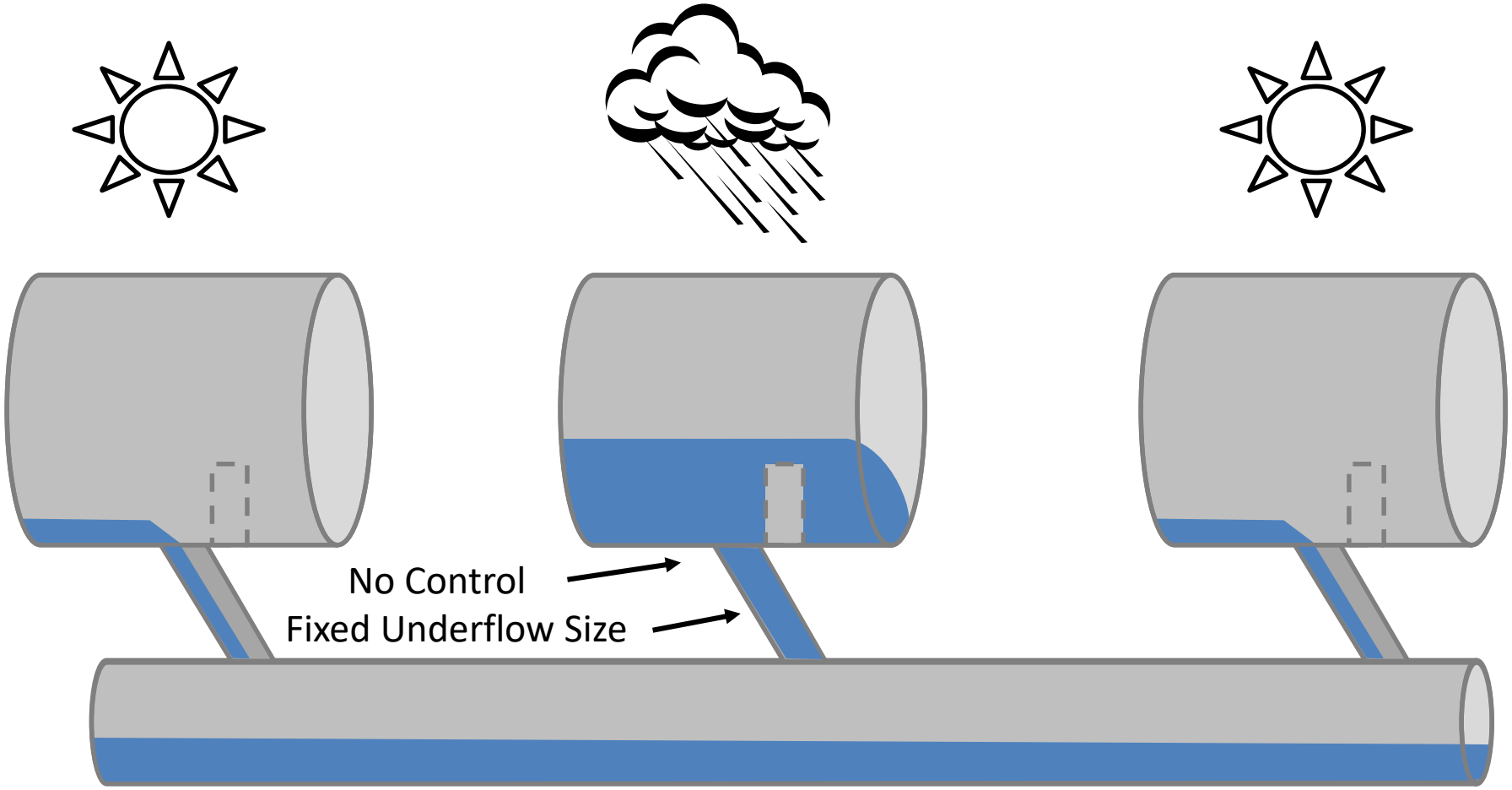
Chapter 4: Seeing is Believing



METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 4: Seeing is Believing

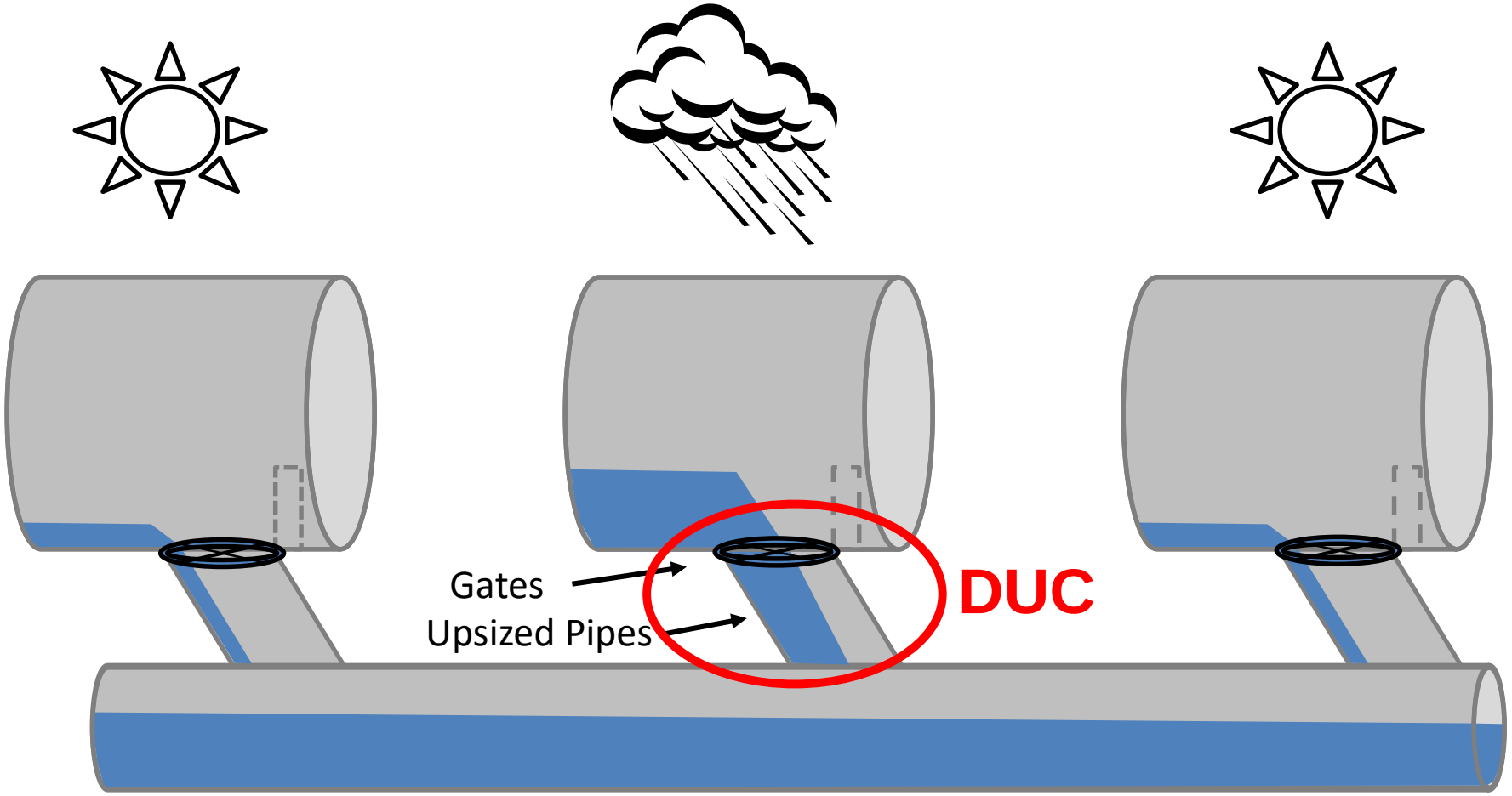
Traditional, Passive Regulator Structures



METROPOLITAN SEWER DISTRICT of greater CINCINNATI

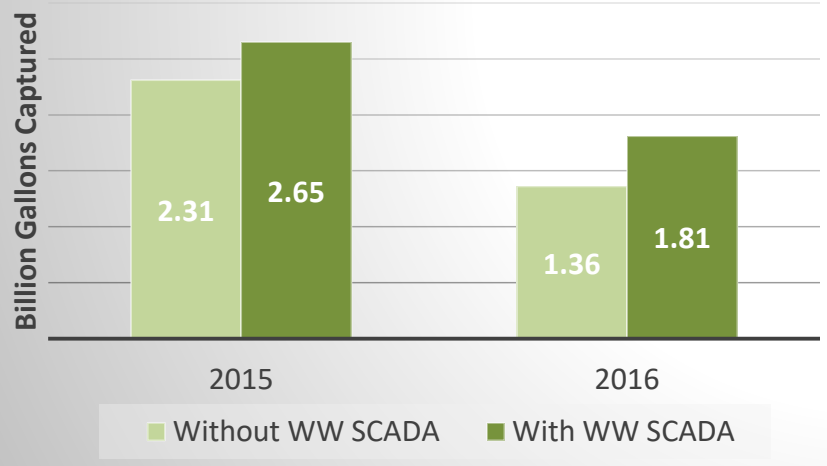
Chapter 4: Seeing is Believing

Dynamic Underflow Control (DUC) Structures



METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 5: Reaping the Benefits



Leveraged Data at 4 Wet Weather Facilities:

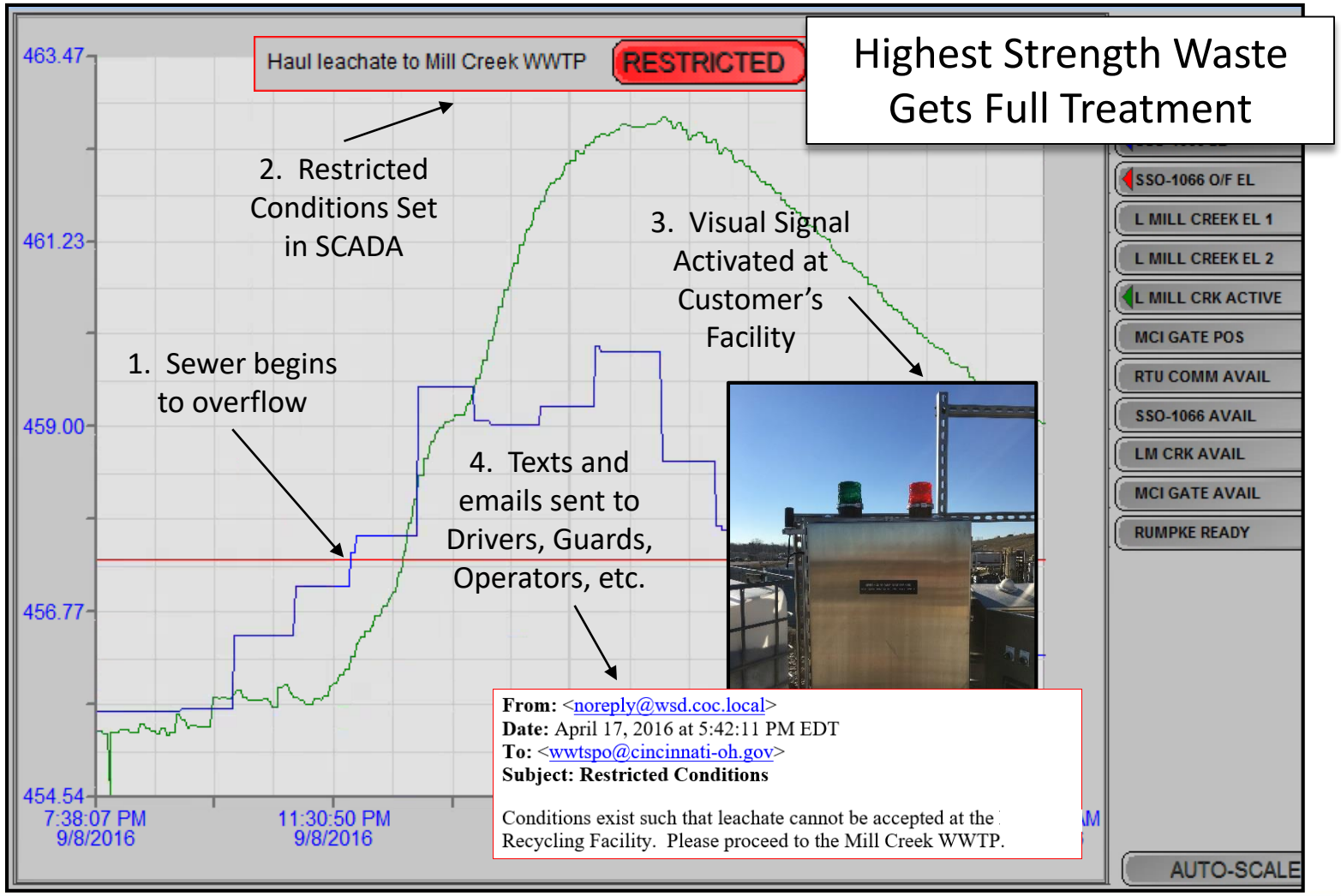
1st Year, added real-time monitoring capabilities:

15% improvement

2nd Year, added real-time control capabilities:

33% improvement

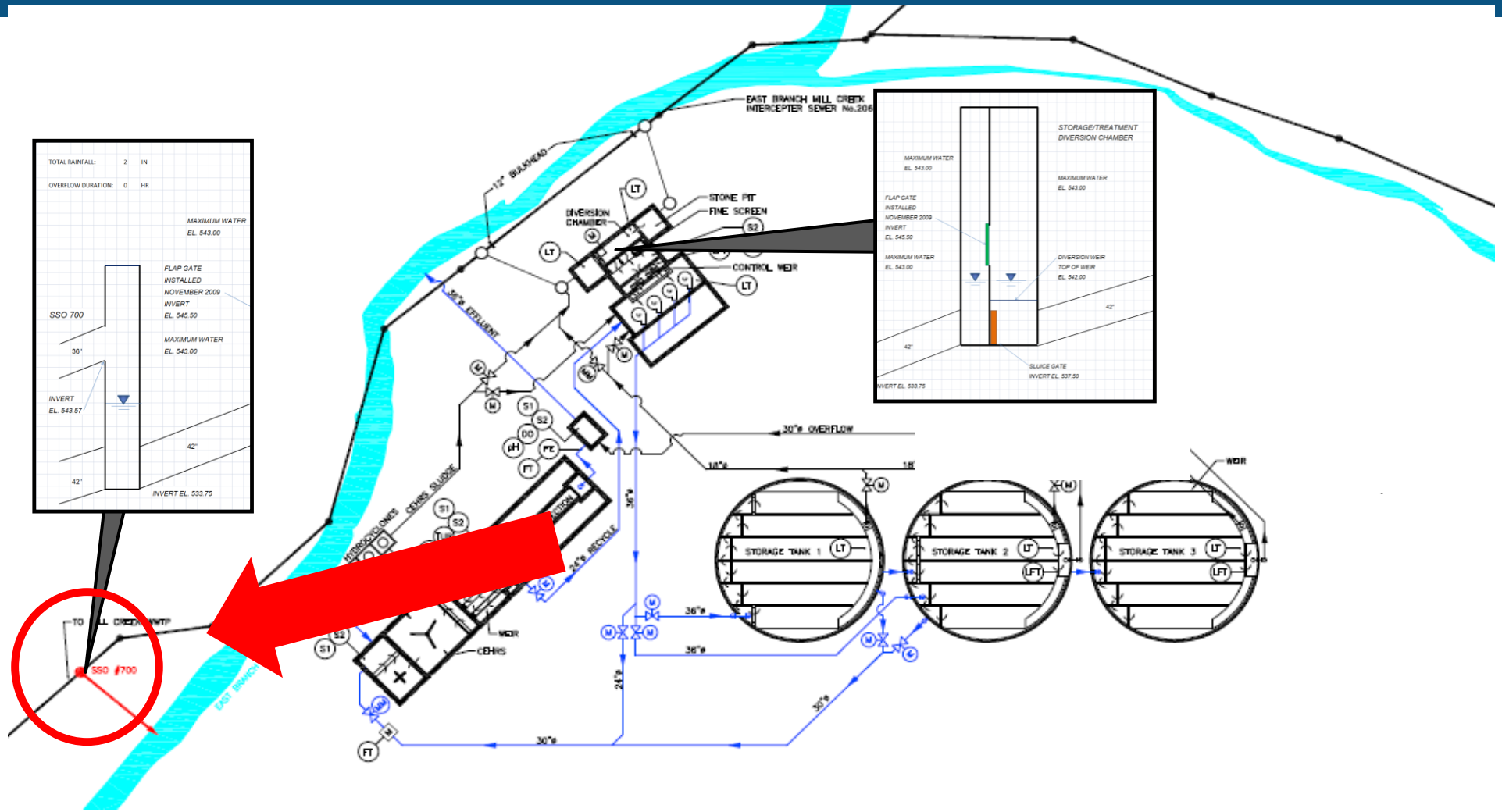
Chapter 5: Reaping the Benefits



Highest Strength Waste Gets Full Treatment

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

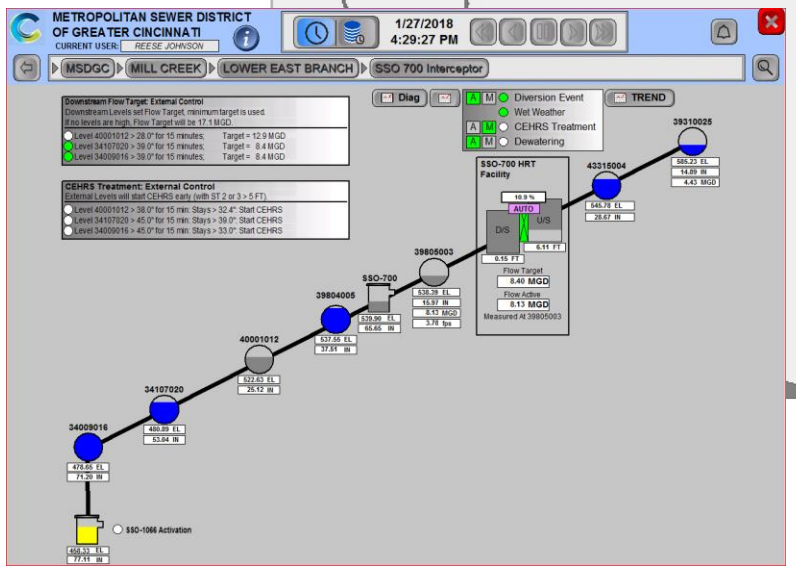
Chapter 5: Reaping the Benefits



METROPOLITAN SEWER DISTRICT of greater CINCINNATI

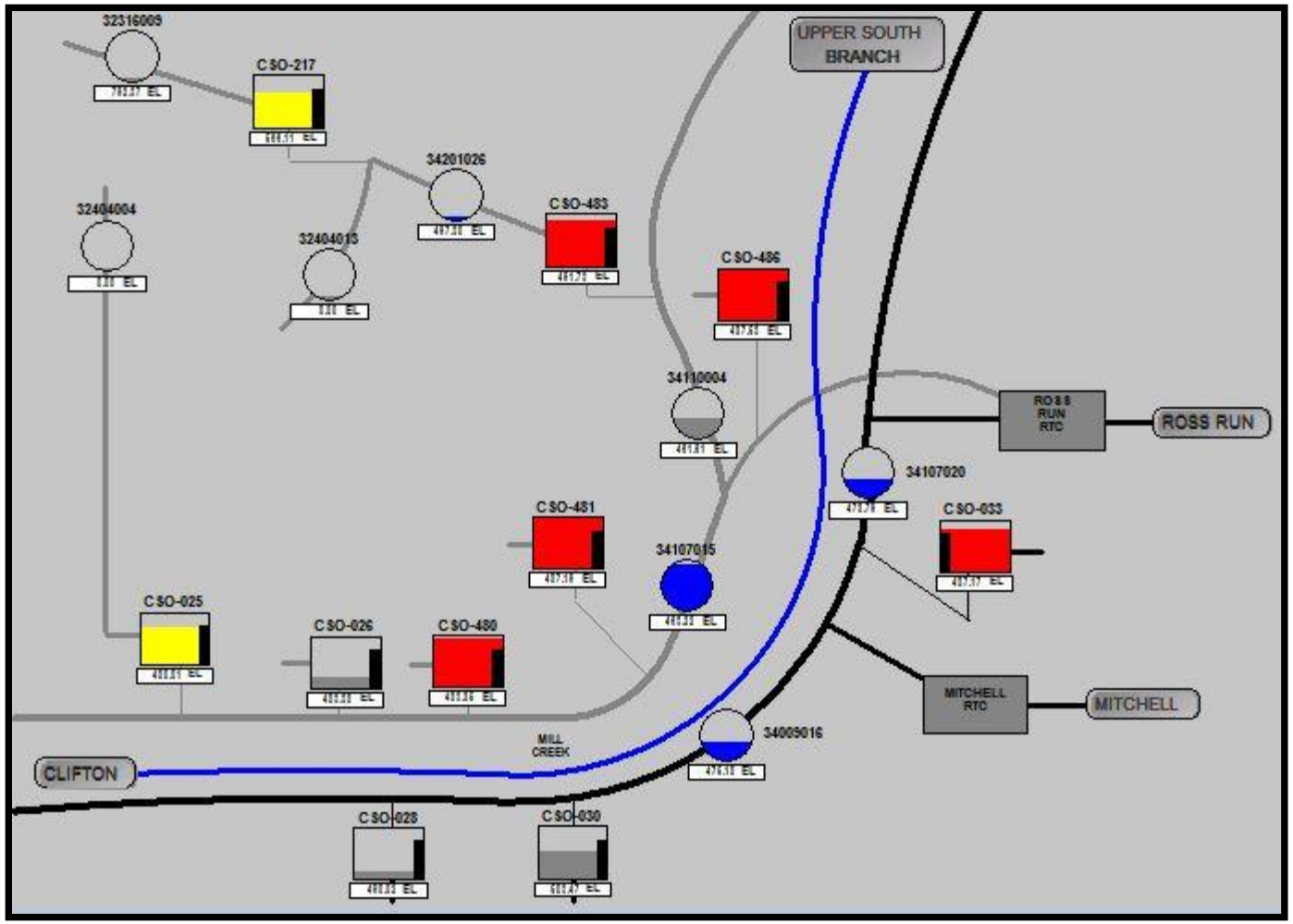
Chapter 5: Reaping the Benefits

Overflow Reduced
by 247 MG
In a Typical Year

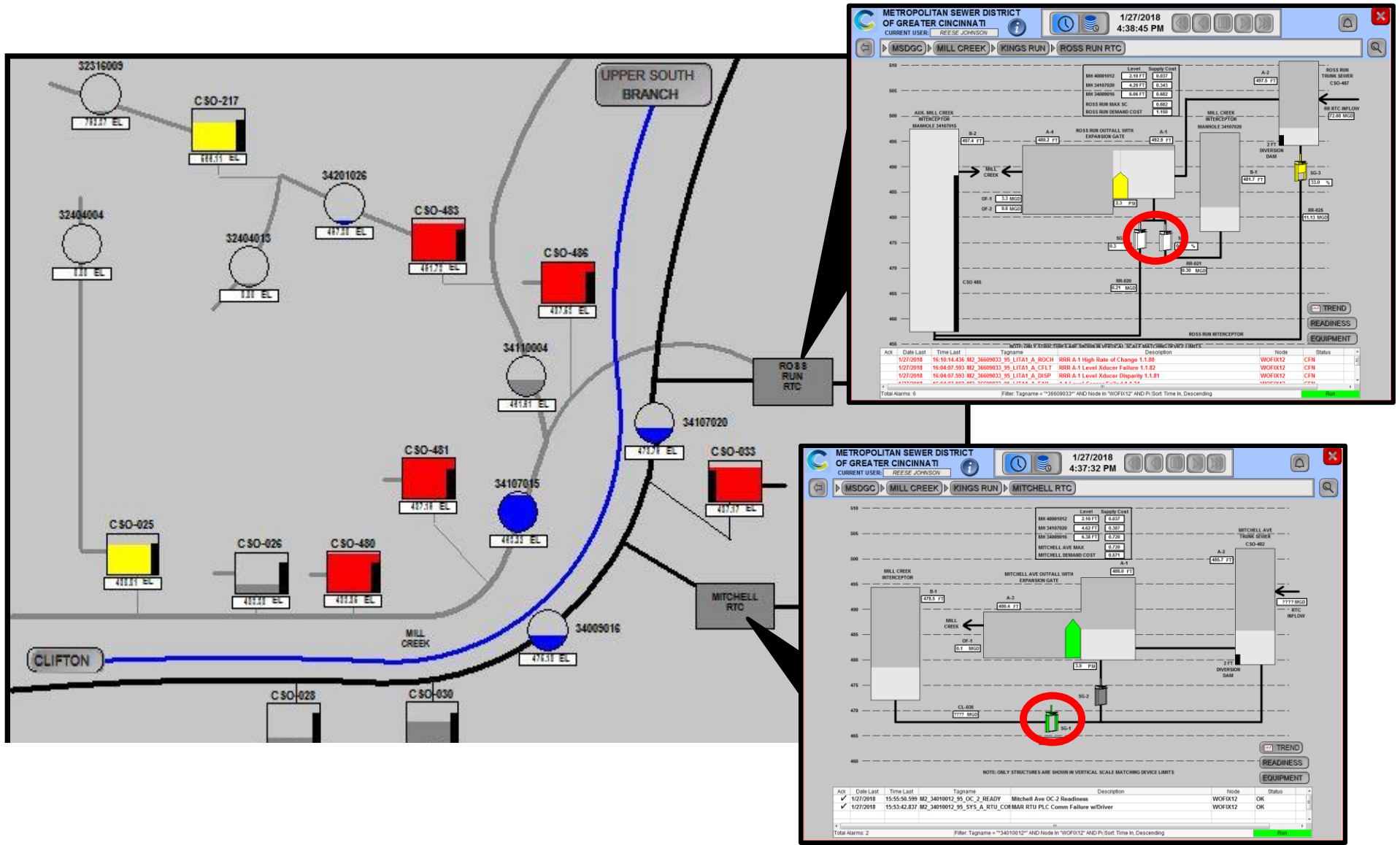


Mill Creek
WWTP

Chapter 5: Reaping the Benefits



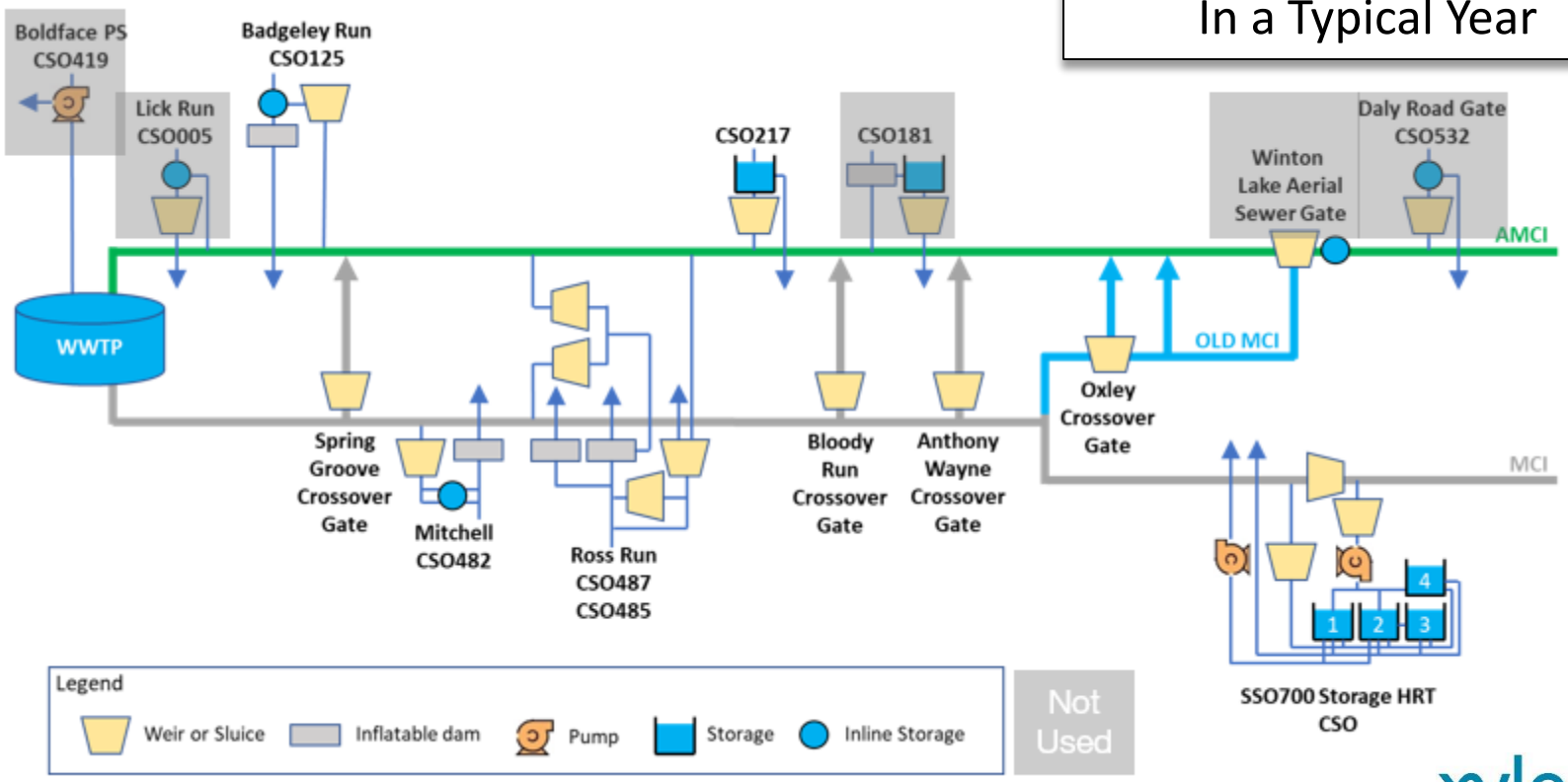
Chapter 5: Reaping the Benefits



METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 5: Reaping the Benefits

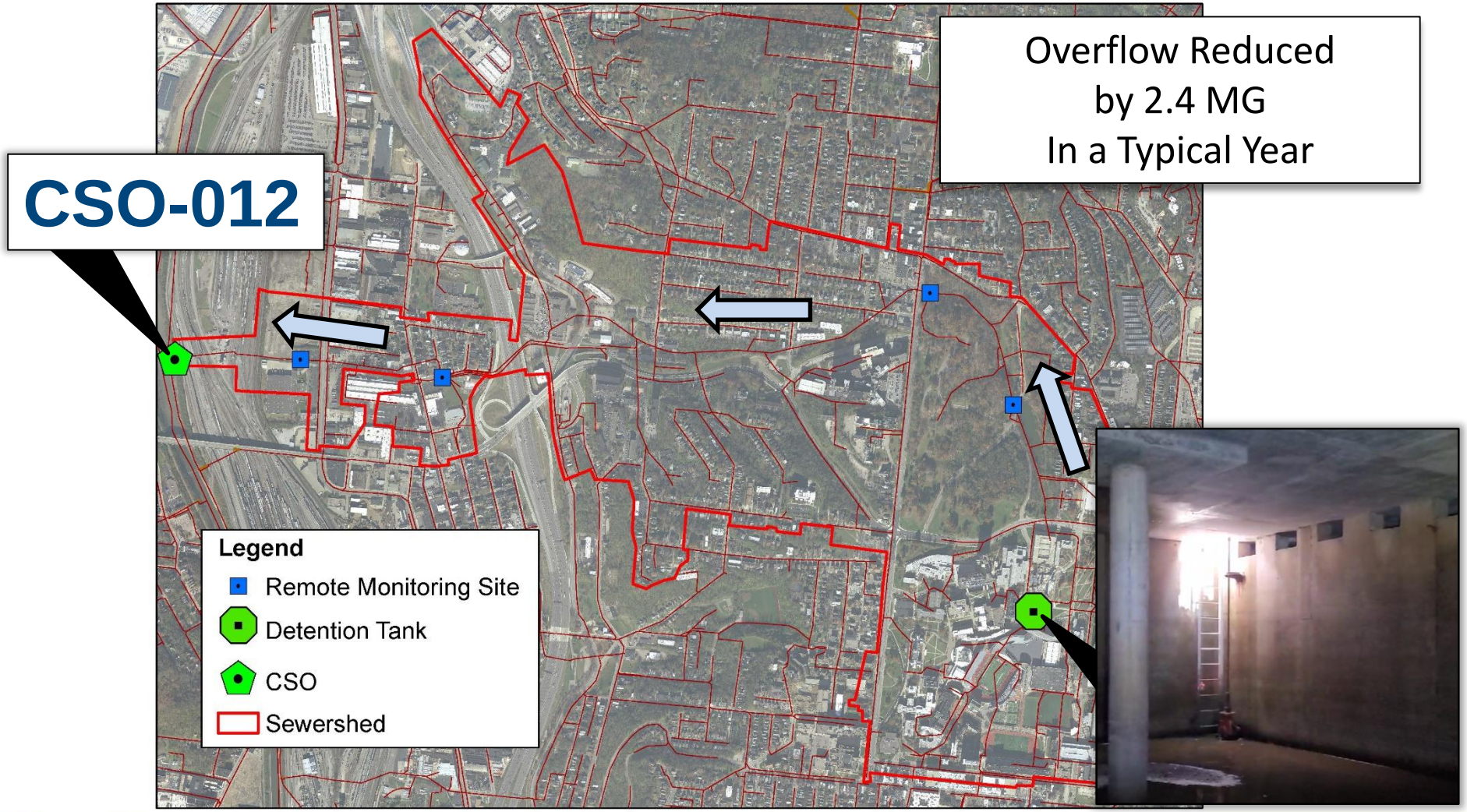
Overflow Reduced by an Additional 60 MG In a Typical Year



xylem
Let's Solve Water

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 5: Reaping the Benefits

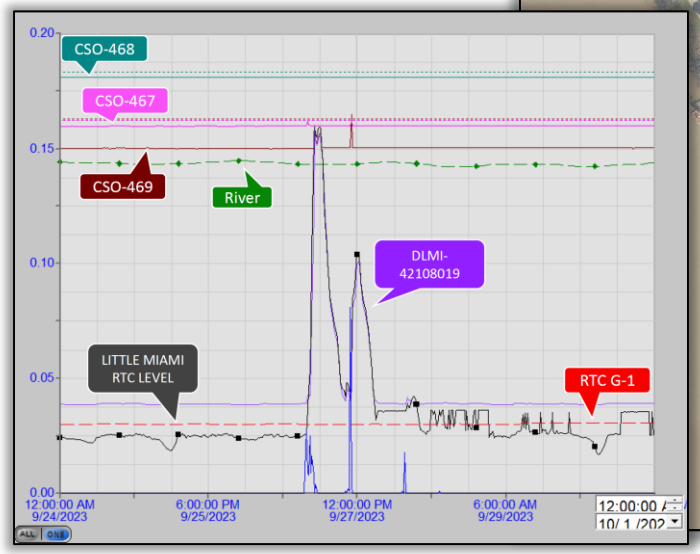


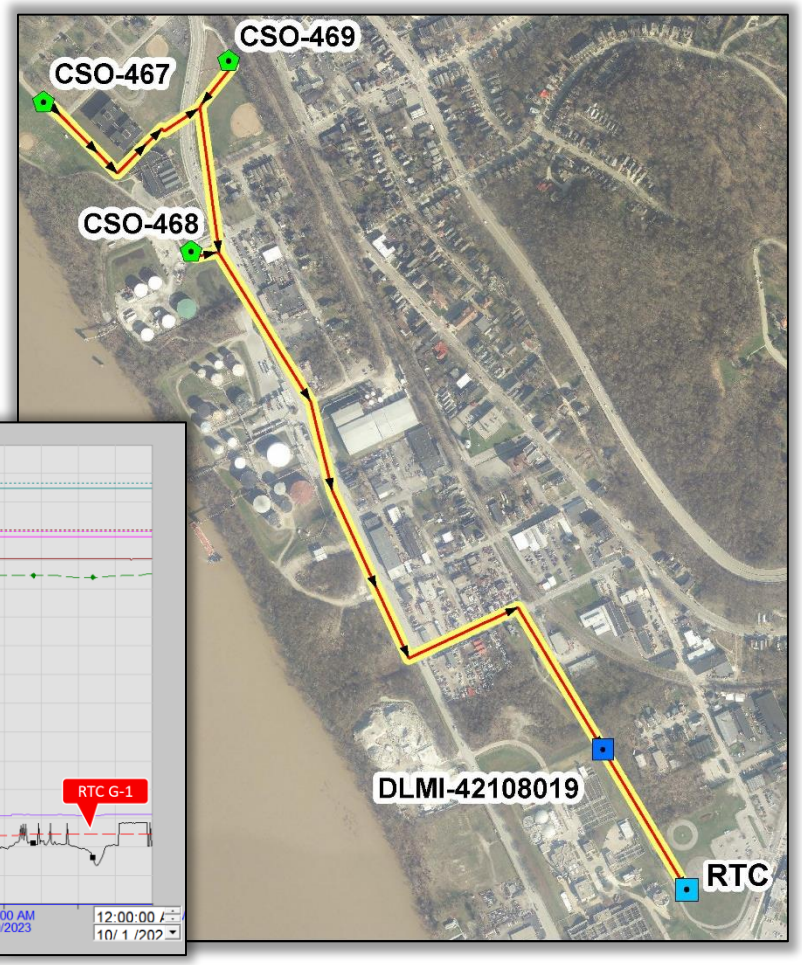
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 5: Reaping the Benefits

Chapter 5: Reaping the Benefits

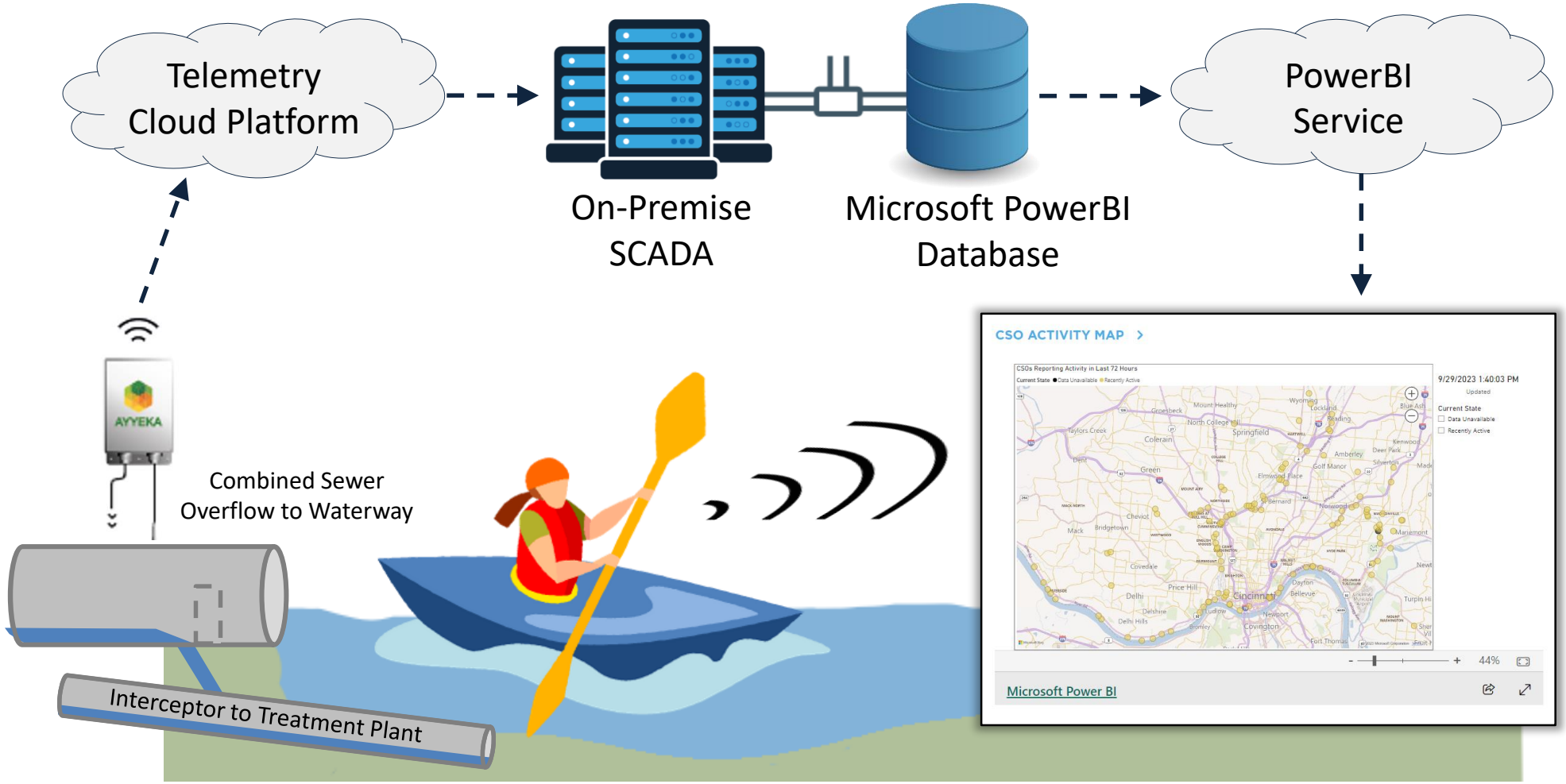
- Effectively leverage data
- Provide information and insight
- Foster a Basin Wide Operational Mindset





METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Chapter 5: Reaping the Benefits



Chapter 5: Reaping the Benefits (2022)

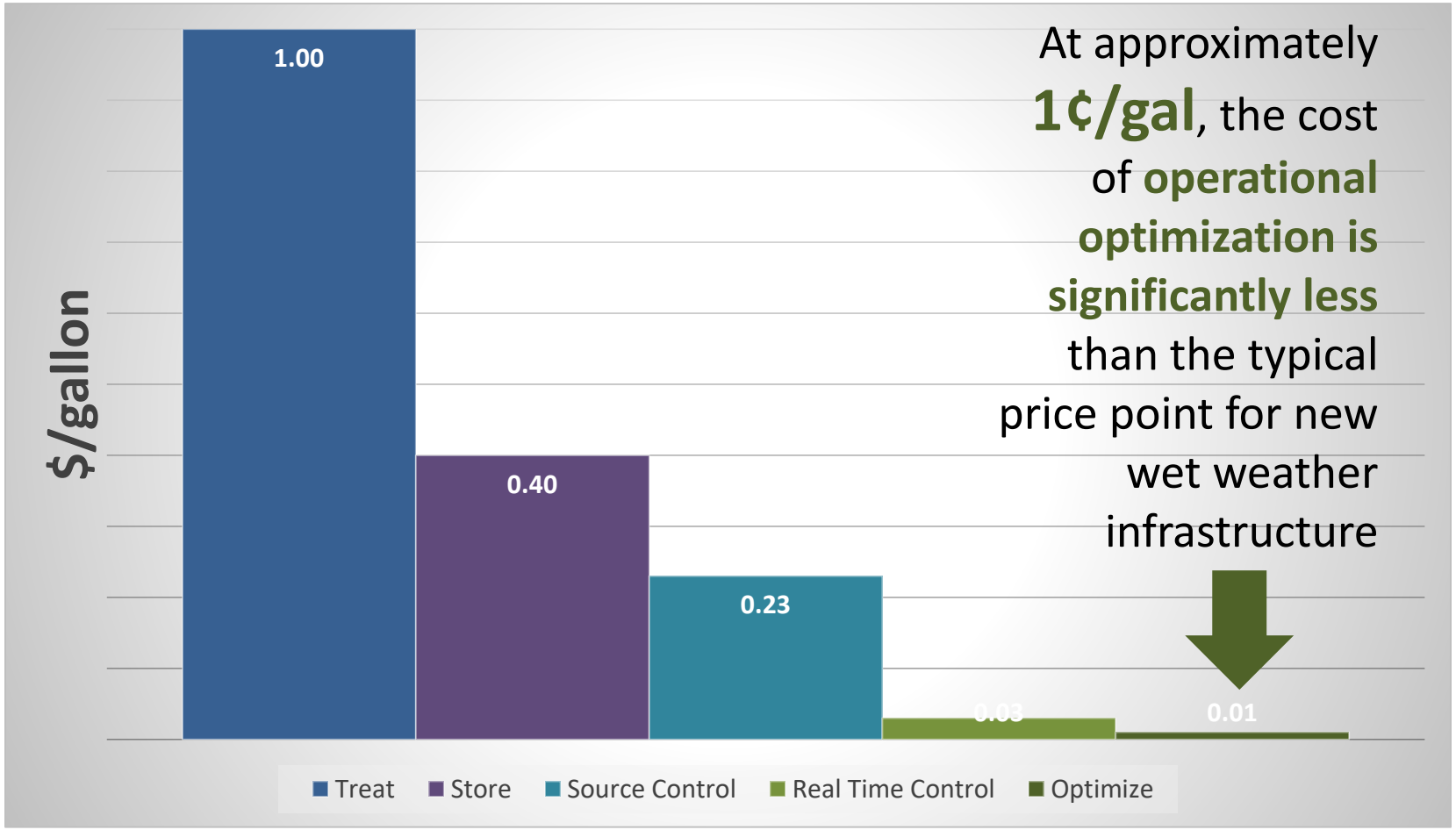
- CSO Reductions
  - Lick Run: 995 MG
  - Bloody Run: 474 MG
  - Ross Run: 206 MG
  - Mitchell Run: 103 MG
  - Wooden Shoe: 67 MG
  - Badgeley Run: 31 MG

1.9 BG

- SSO Reductions
  - SS0-700: 375 MG

0.4 BG

Dollars and Sense



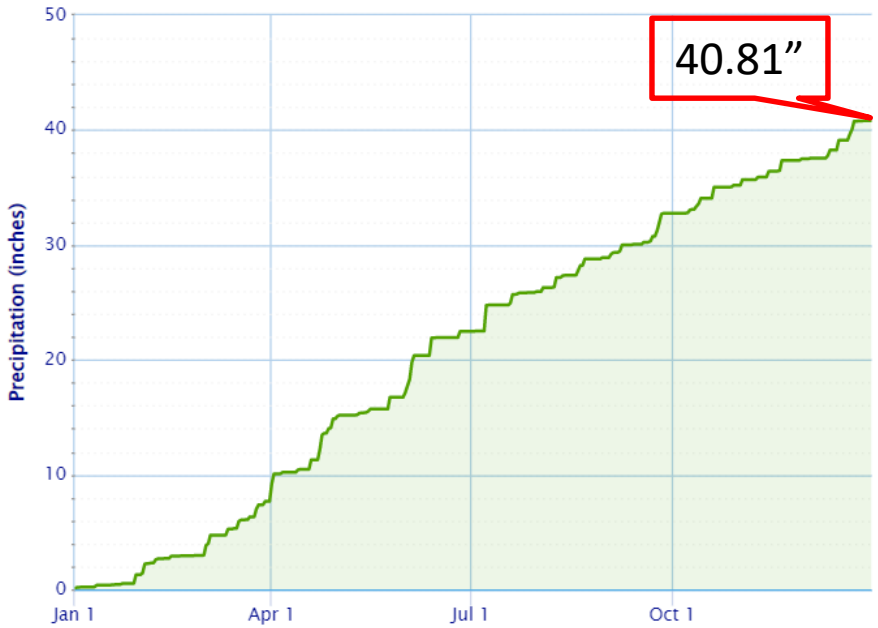
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

What's the Next Chapter?

- Find Additional Opportunities to Reduce Overflow
- Modify Existing Wet Weather Facilities to Use New Operational Capabilities
- Adapt Future Wet Weather Projects to Take Advantage of New Strategy

Chapter 6: Prepare for the Future

"Typical Year" (1970)



Recent Average (1991-2020)

Month	Total Precipitation Normal (inches)
January	3.30
February	3.17
March	4.16
April	4.53
May	4.67
June	4.75
July	3.83
August	3.43
September	3.11
October	3.35
November	3.23
December	3.73
Annual	45.26

Data provided by:

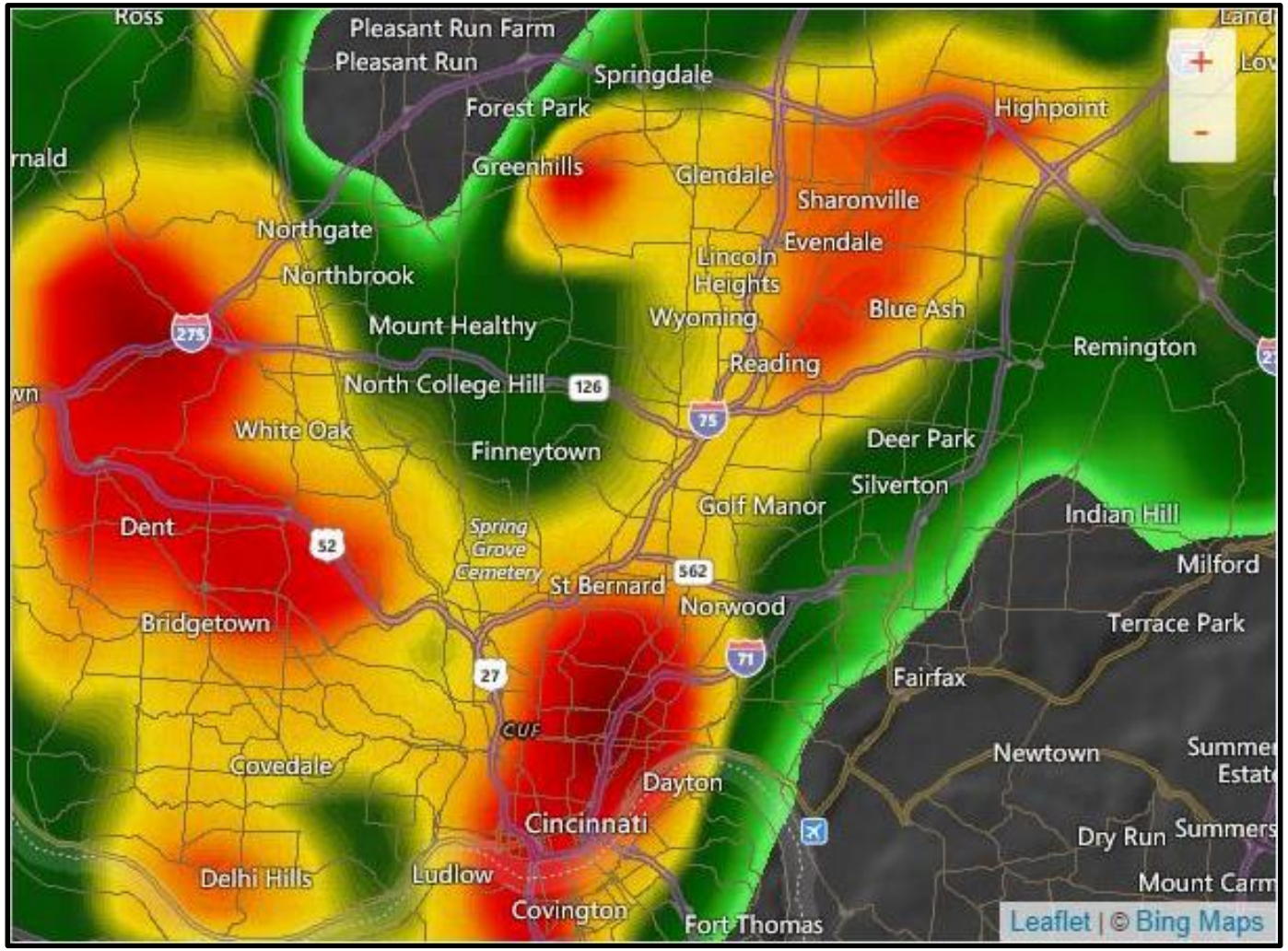
NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Climate (weather.gov)

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

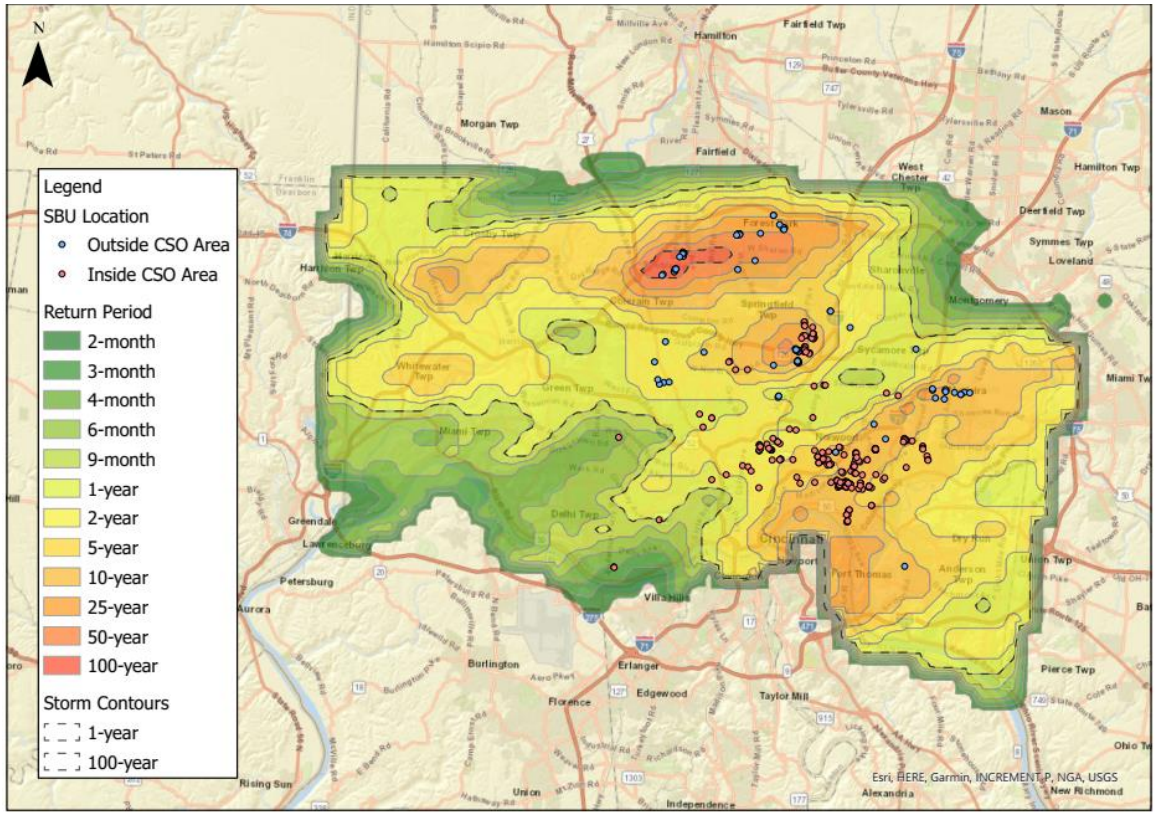
Increased Amount of Rain

Chapter 6: Prepare for the Future



Increased Intensity of Rain

Preview of the Trilogy



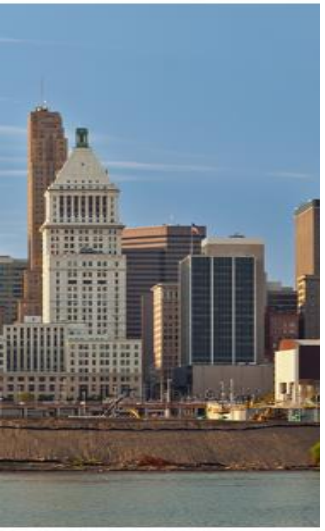
- 2019
  - 2019 03-14 - 1yr
  - 2019 03-29 - 1yr
  - 2019 04-18 - 1yr
  - 2019 04-24 - 1yr
  - 2019 05-02 - 1yr
  - 2019 06-05 - 5yr
  - 2019 06-16 - 50yr
  - 2019 06-17 - 2yr
  - 2019 06-18 - 5yr
  - 2019 06-19 - 5yr
  - 2019 07-15 - 25yr
  - 2019 07-17 - 5yr
  - 2019 07-18 - 2yr
  - 2019 07-30 - 100yr
  - 2019 08-06 - 1yr
  - 2019 08-12 - 1yr
  - 2019 08-20 - 100yr
  - 2019 08-30 - 1yr
  - 2019 09-01 - 1yr

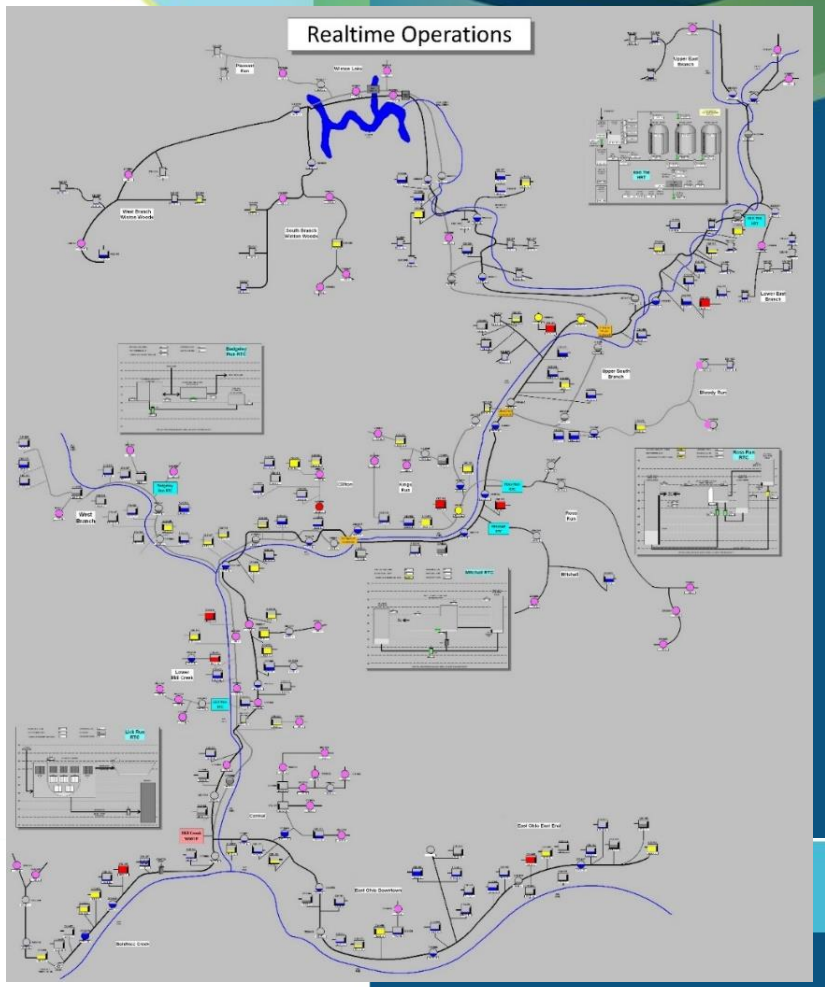
METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Increased Frequency of Heavy Rain

Moral of the Story

- Leverage Existing Assets
- Optimize Competing Priorities
- Handle Dynamic Weather Patterns
- Provide Water Users Valuable Info
- WQ Improvement at Lowest $/gal





The Cincinnati *Smart Sewers* Story

Reese Johnson, PE, PMP

reese.johnson@cincinnati-oh.gov

METROPOLITAN SEWER DISTRICT of greater CINCINNATI

Agenda Item 7:

ORSANCO's Contact Recreation/Bacteria Monitoring and Analyses Initiatives

Stacey Cochran, ORSANCO

RECREATION/BACTERIA MONITORING AND ANALYSES INITIATIVES

October 9-10, 2023

Agenda Item 7

Informational Item

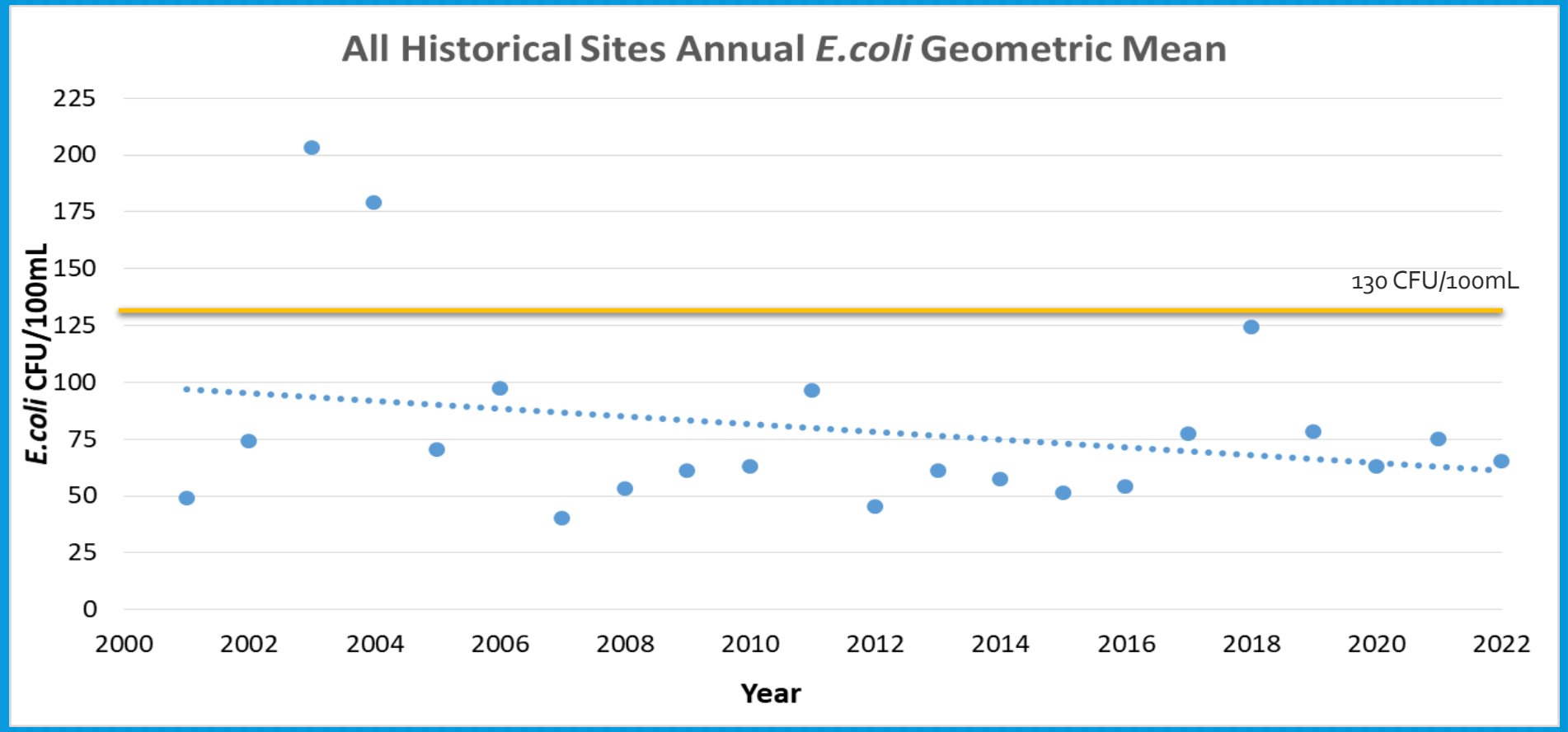
AVAILABLE DATA SET

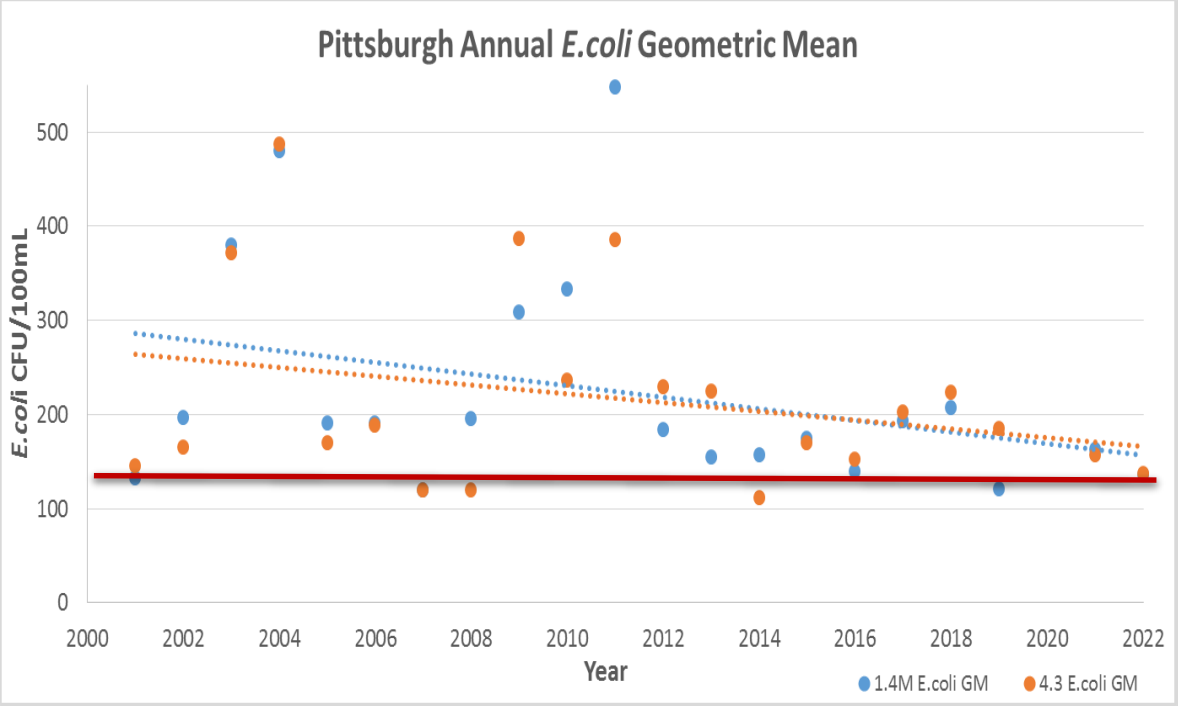
- Sampling conducted in 6 large CSO Communities
  - Pittsburgh, Wheeling, Huntington, Cincinnati, Louisville, and Evansville
- Weekly sampling April-October
  - April was added in 2013
- Stations Upstream & Downstream of CSO Systems
  - 2000-2009 includes Downtown Station
- Surface Grab Samples
- Fecal Coliform and E. coli Analysis
  - 2000-2016 both by Membrane Filtration
  - 2017-Present E.coli by Colilert Method at all 6 Communities
    - Fecal Coliform by Colilert Method at Wheeling and Huntington Site only

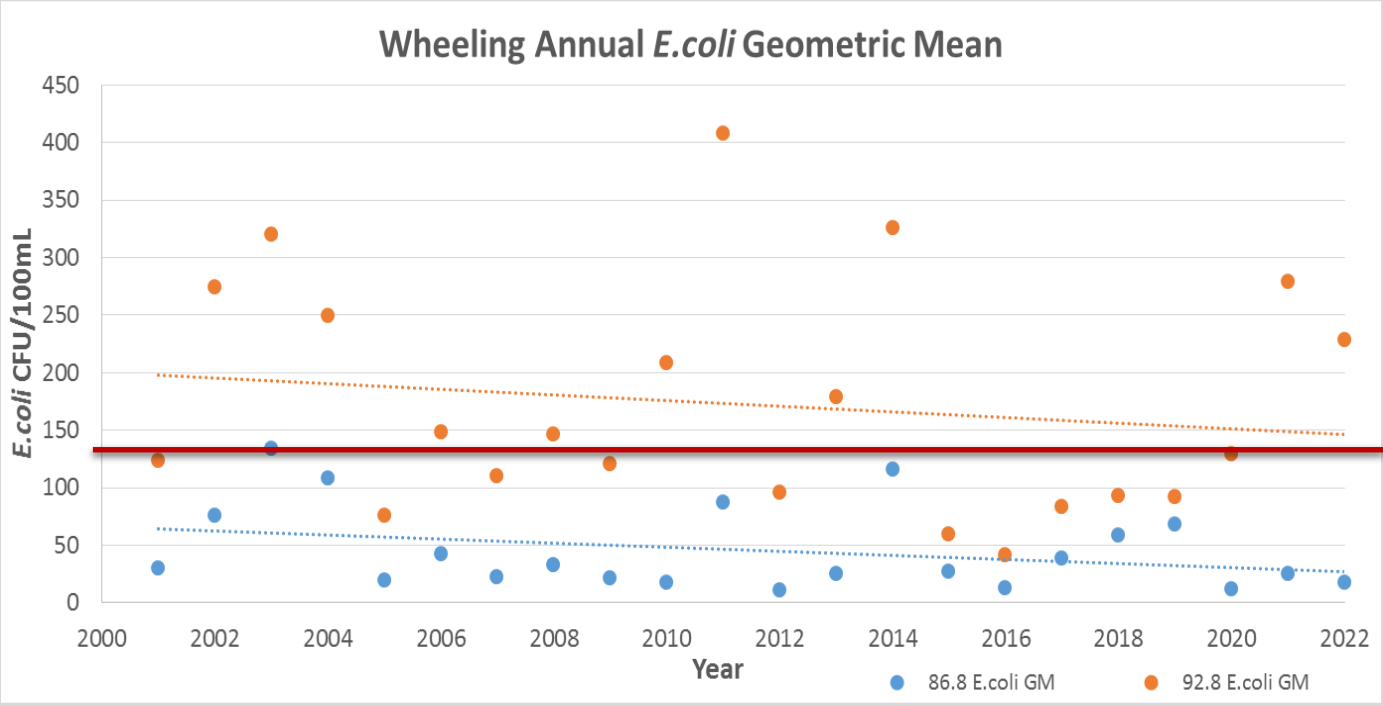
WHAT THIS DATA SET IS USED FOR

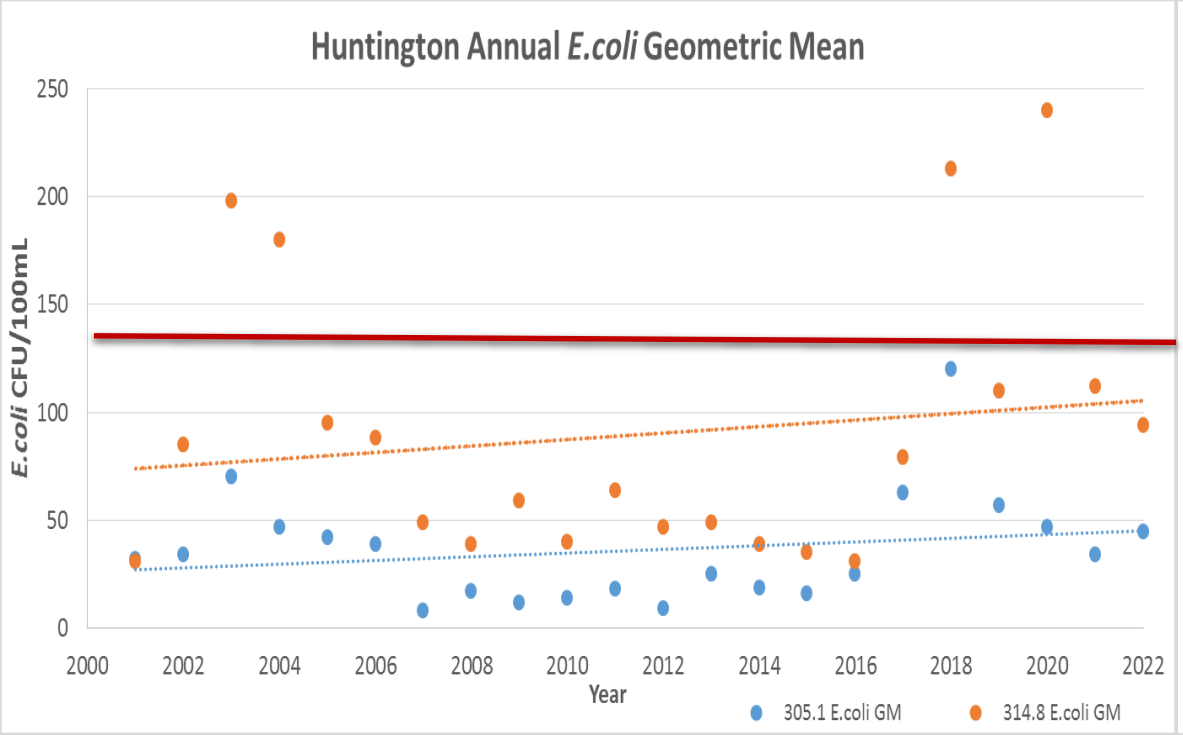
- To Inform the Public
  - Results updated weekly on ORSANCO's website
- 305b Assessment
  - Updated bi-annually
- Bacteria Trends Report
  - 2001-2015
    - Fecal Coliform and *E.coli* Mean
  - 2001-2022 (in progress)
    - *E.coli* Geometric Mean

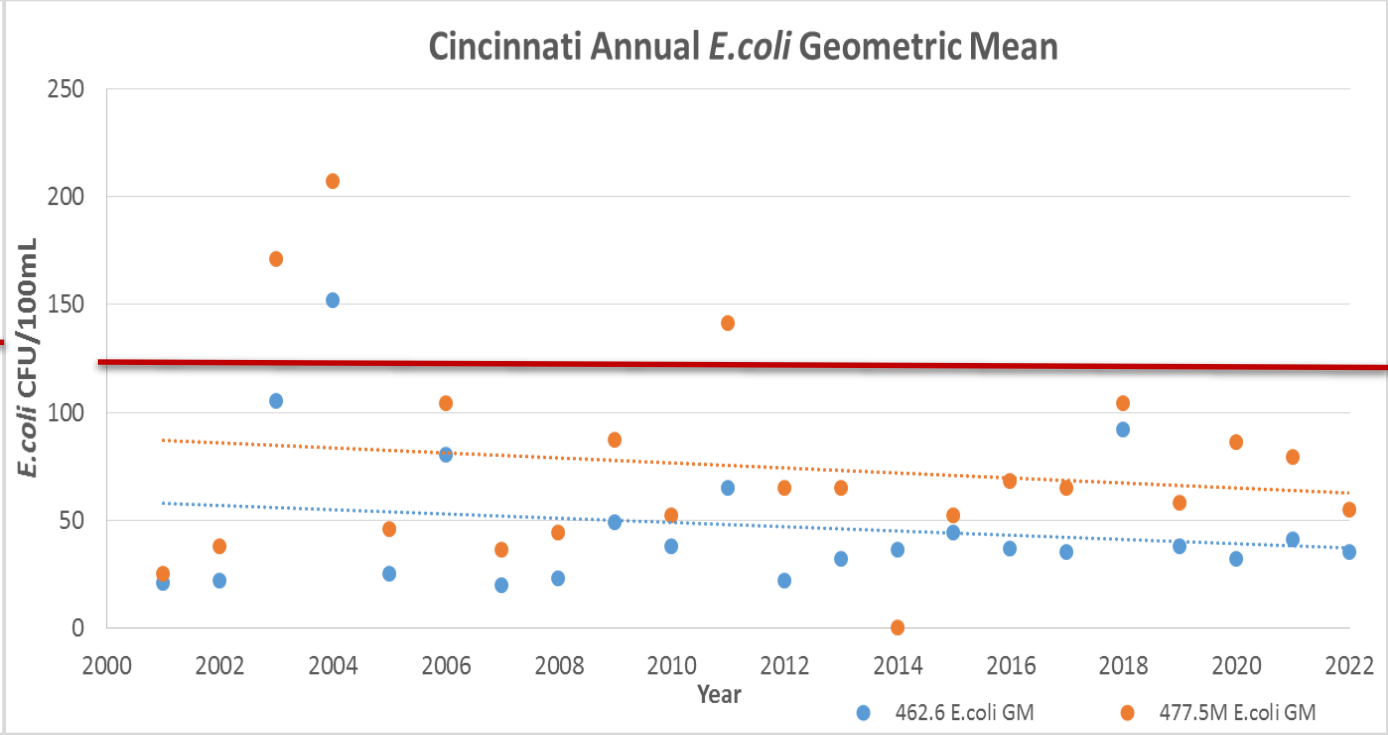
BACTERIA TRENDS REPORT ANNUAL DATA

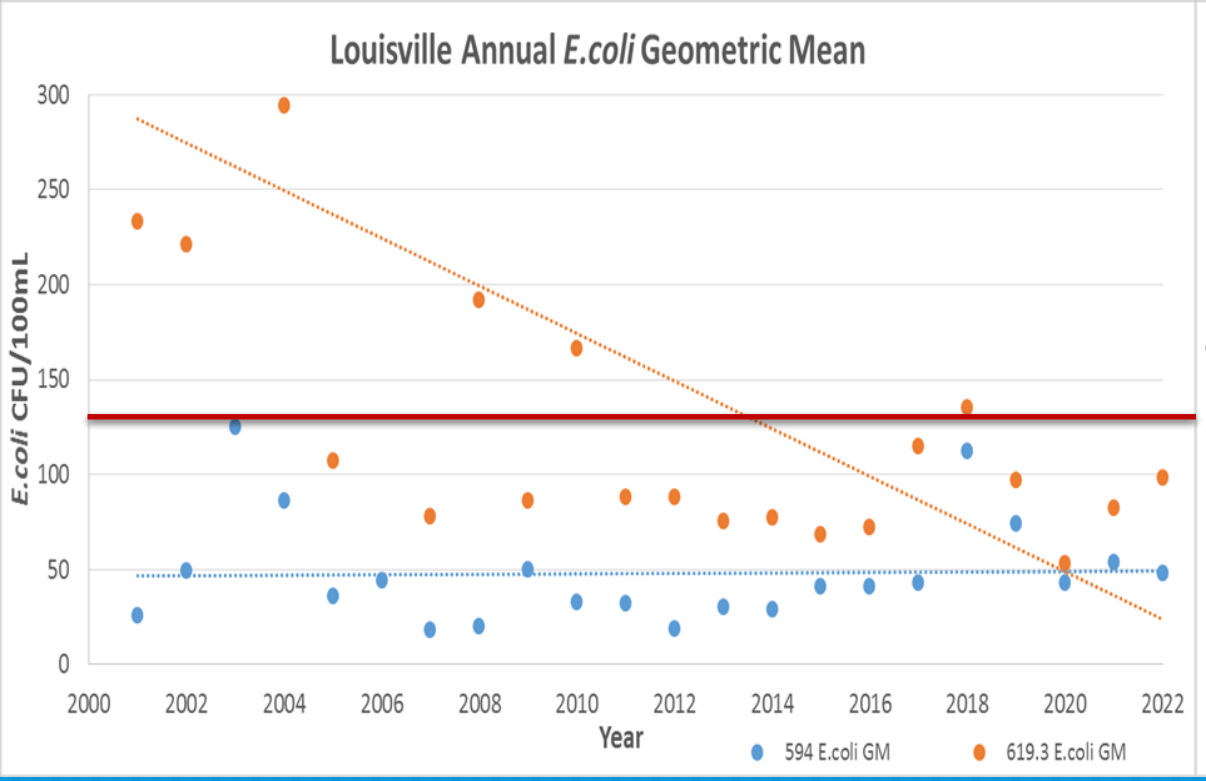


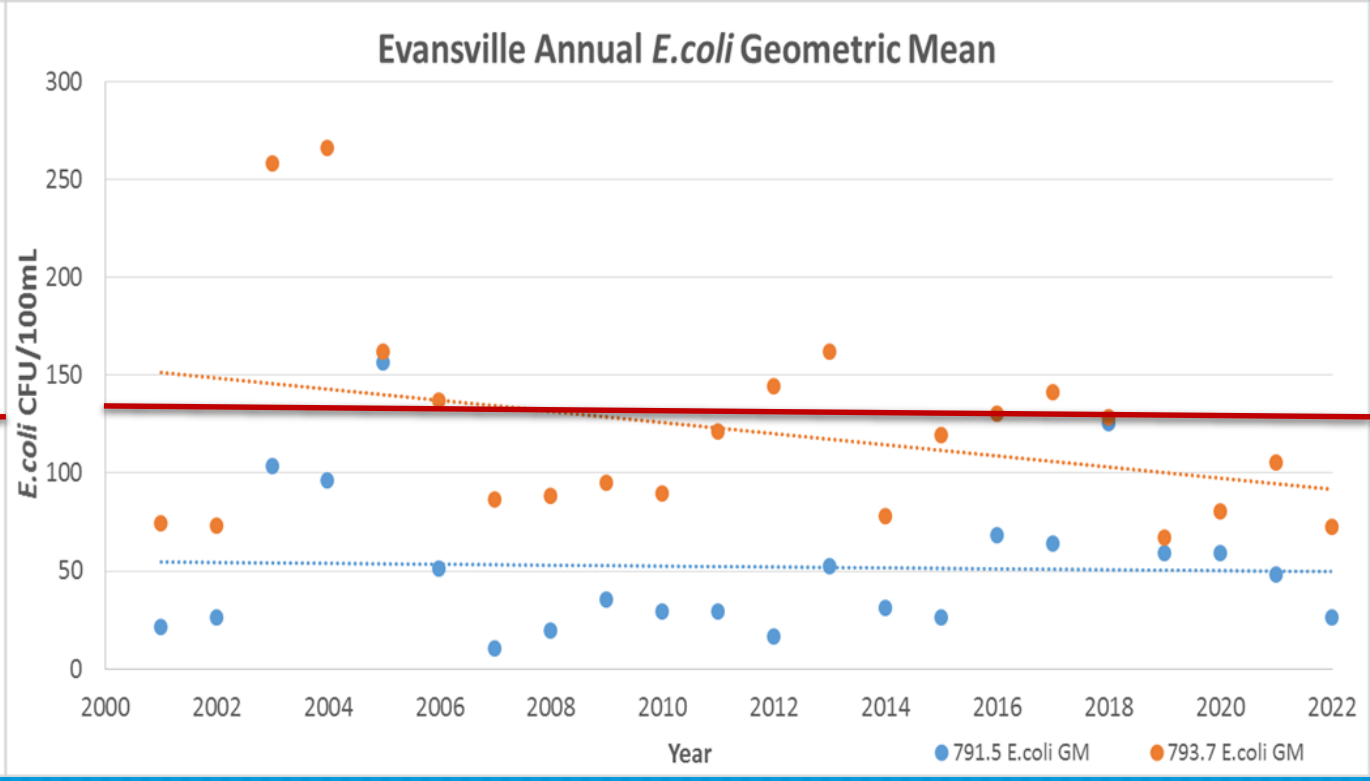

Pittsburgh Annual E.coli Geometric Mean
E.coli CFU/100mL
0
100
200
300
400
500
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Year
1.4M E.coli GM
4.3 E.coli GM


Wheeling Annual E.coli Geometric Mean
E.coli CFU/100mL
0
50
100
150
200
250
300
350
400
450
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Year
86.8 E.coli GM
92.8 E.coli GM


Huntington Annual E.coli Geometric Mean
E.coli CFU/100mL
0
50
100
150
200
250
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Year
305.1 E.coli GM
314.8 E.coli GM


Cincinnati Annual E.coli Geometric Mean
E.coli CFU/100mL
0
50
100
150
200
250
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Year
462.6 E.coli GM
477.5M E.coli GM





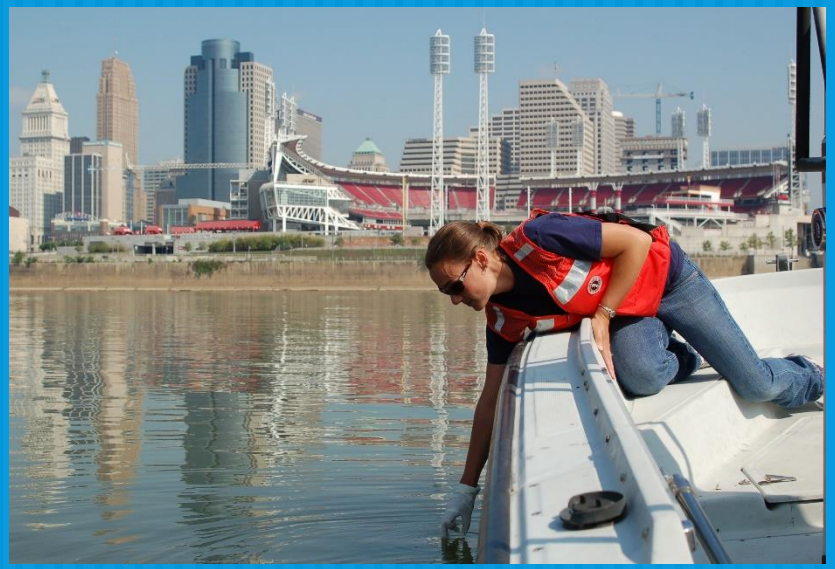
- All sites show a decreasing linear regression for *E.coli* except in Huntington on an annual basis
- Higher *E.coli* geometric means were displayed at downstream sites with the exception of Pittsburgh
  - The confluence of the Monongahela and Allegheny Rivers are relatively close to the sample site and may have an impact on those results

BACTERIA MONITORING INITIATIVE

- WV 604b Grant
  - Comparison study of Fecal Coliform, E.coli and Total Coliforms by Colilert Method and Real-Time Proteus instrument
- Colilert Method
  - Use of substrate media
  - Results calculated after Incubation of 18 or 24 hours
- Proteus Instrument
  - Use of Tryptophan-like fluorescence to detect active coliforms
  - Real-Time Results calculated based off an Algorithm

Questions?

Stacey Cochran
stacey@orsanco.org
513-231-7719



233rd Technical Committee Meeting

Scott Mandirola, Chair
Presiding
October 10-11, 2023

The meeting will reconvene at 9:0 A.M. (Eastern) on October 11 at 9am and conclude by Noon. Below are a few tips to effectively navigate the meeting:

- ***Confirm that your first and last name is entered correctly in the GoToMeeting software.***
- ***Mute your microphone at all times unless speaking.***
- ***Disable your camera unless you are a Technical Committee member.***
- ***The presenter will prompt participants for verbal questions, or use the Chat feature.***
- ***Detailed GoToMeeting instructions and important information can be found in the previously emailed document, "ORSANCO Virtual Technical Committee and Commission Meeting Instructions."***

Agenda Item 8:
Biological Programs Update

Informative Item – No Action Required

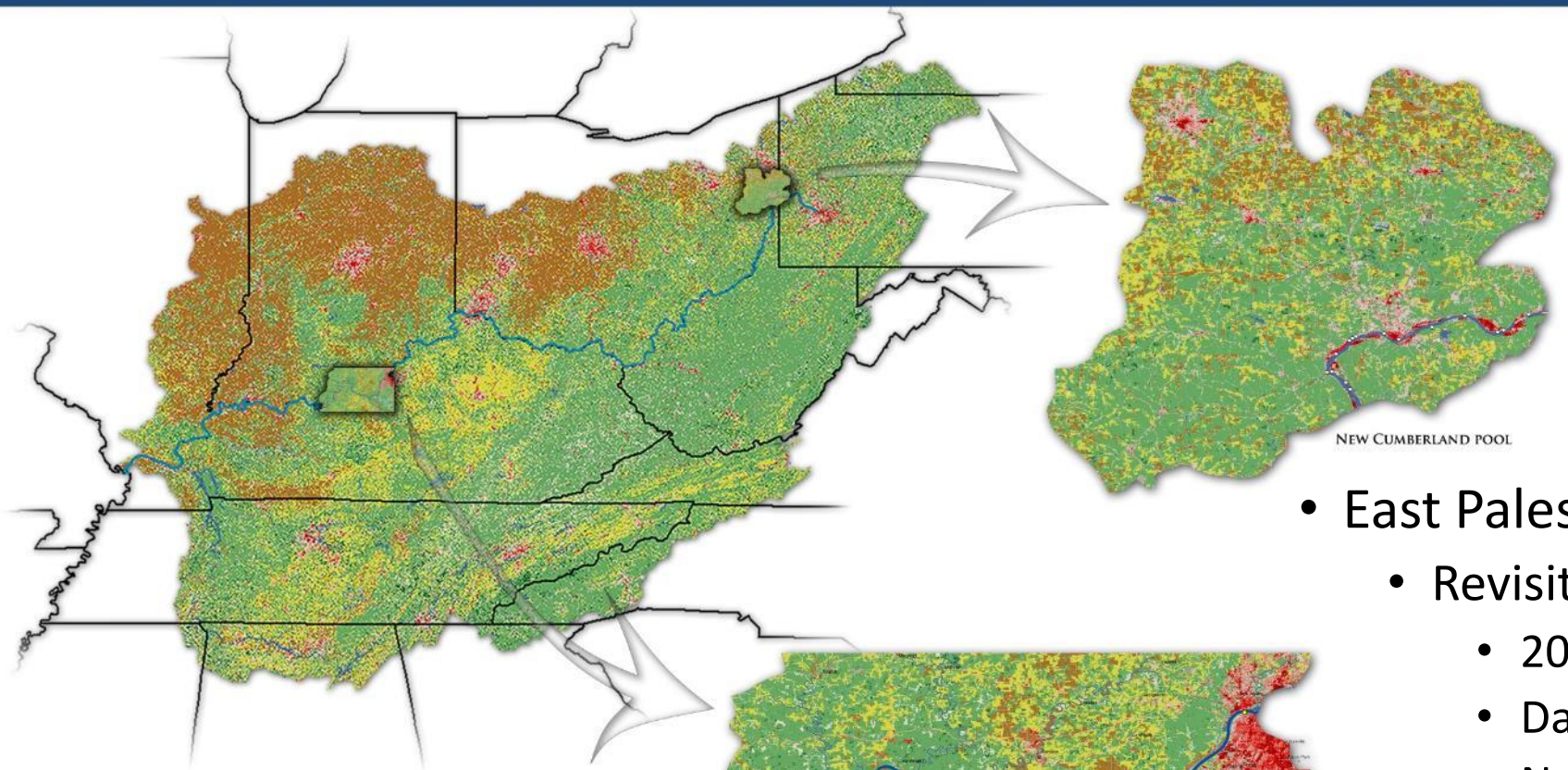
Ryan Argo
rargo@orsanco.org

2023 Biological Survey Schedule

- **National Rivers and Streams Assessments (NRSA)**
  - Index period is **June – September 30th**
- **Reduction to two Ohio River Pool Surveys**
  - Electrofishing Surveys completed in **July**
  - ~~Fixed Stations Surveys conducted in **August**~~
  - Macroinvertebrate HD's are set and SAV collections completed in **September**
    - Retrieval of HD's and multi-habitat kicks in **October**
- **BWQSC afforded staff the ability to prioritize normal activities**
  - Staff will continue to communicate with the BWQSC should further adjustments be required.

2023 Pool Surveys

The results of the 2023 biological surveys are detailed in the following pages (relative pool locations shown below). Included are brief descriptions of the land use & hydrology, site level mORFIn & ORMIn ratings, summaries of notible catches & instream habitat, and the overall biological condition of each pool.



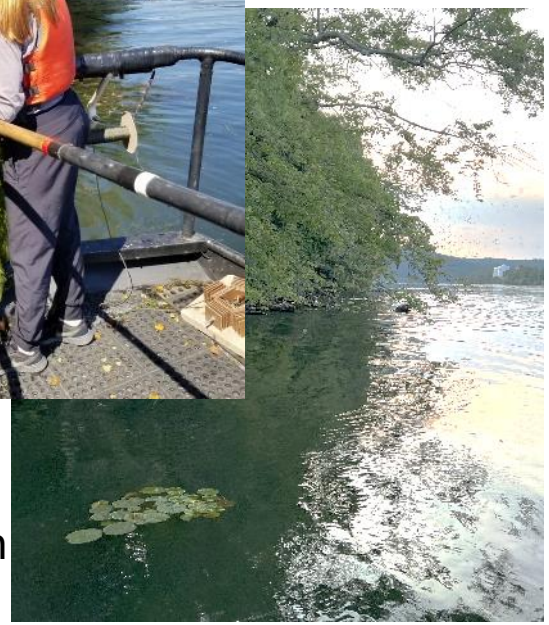
IDEM Fish Tissue
KDOW Metals Samples

- East Palestine Follow-up
  - Revisit Lower Little Beaver Creek
    - 2017: Two 500m sites
    - Day-time electrofishing only
    - No fish tissue

For more detailed catch, metric, and index scores visit www.orsanco.org/programs/biological-programs

New Cumberland Surveys

- Electrofishing completed July 10th – 14th
- HDs set and SAV completed Sept 4th – 8th
- Retrieving HDs next week



SAV abundant within the pool first observation of lily pads

Conducted EF at two revisit sites on Little Beaver Creek

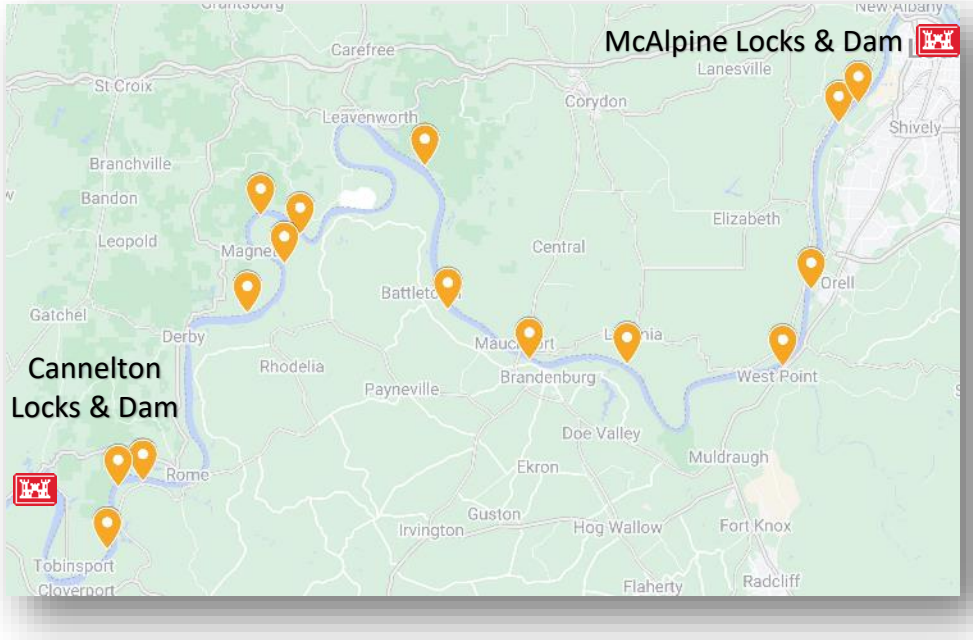
Encountered multiple Longhead Darters, Until recently, considered extirpated from Ohio waters for 80 years

Cannelton Surveys

- Electrofishing completed July 17th – 21st, Aug 1st
- HDs set and SAV completed Aug 28th – Sept 1st
- Retrieving HDs & KDOW metals this week

Longest Ohio R. pool presents challenges, but a lot of forested shoreline, no SAV

Silver Carp becoming ever greater safety concern in lower river



Encountered healthy redhorse populations, Collected 10 fish tissue composites for IDEM

ORSANCO 2023-24 NRSA Sites

92 Events

- OH (40)
- KY (16)
- IN (23)
- IL (13)

Site Lengths

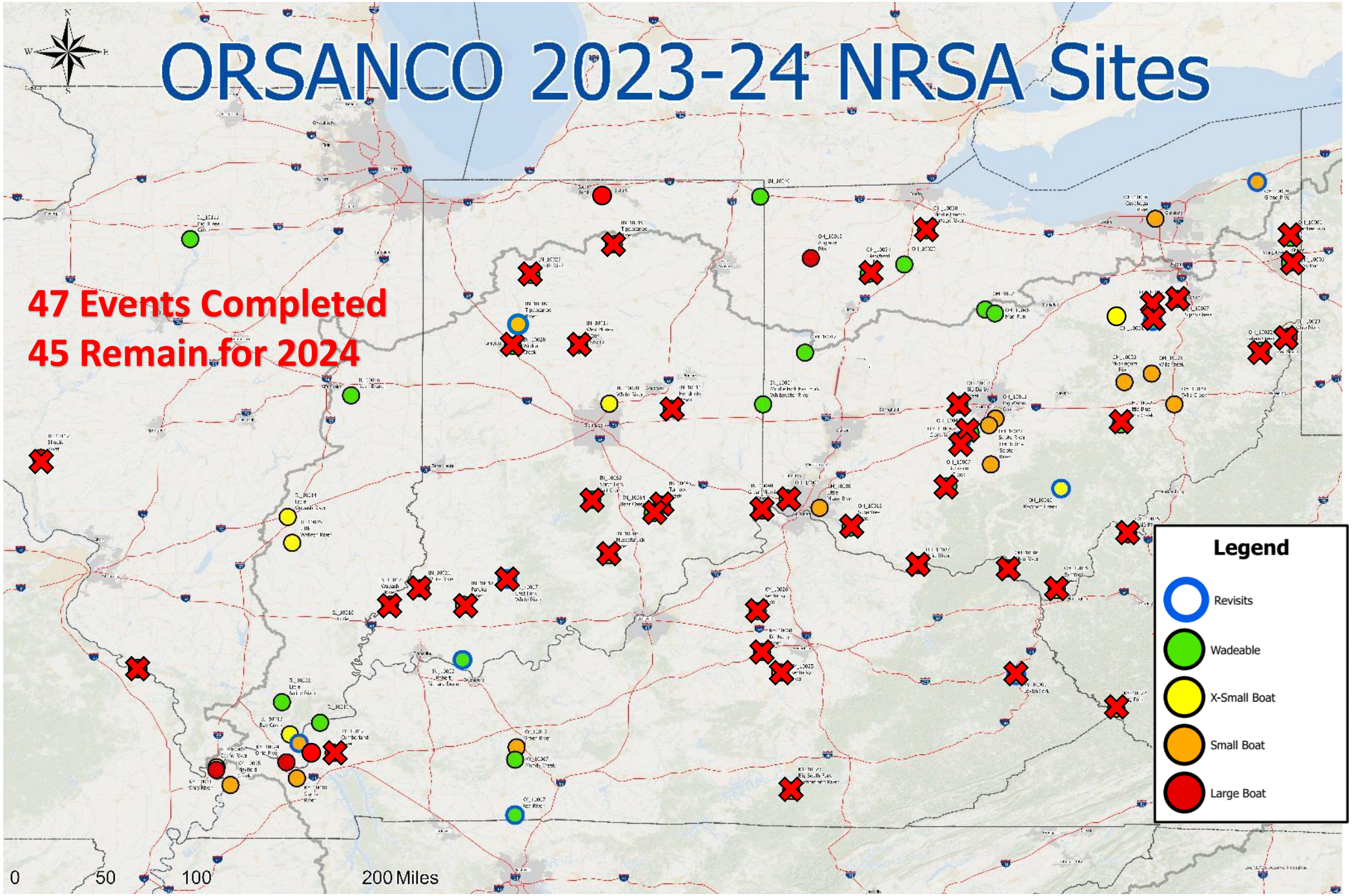
- 150m – 4km

Dedicated Staff

- Six ORSANCO
- Six Seasonal

4 Site Types

- 20’ Jon Boats
- 14’ Jon Boat/Canoe
- 10’ Buggy/Canoe
- Wadeables

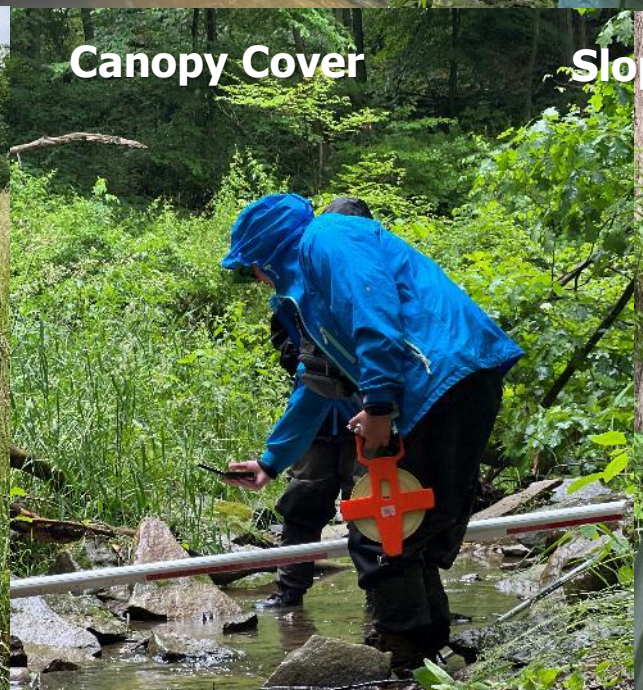


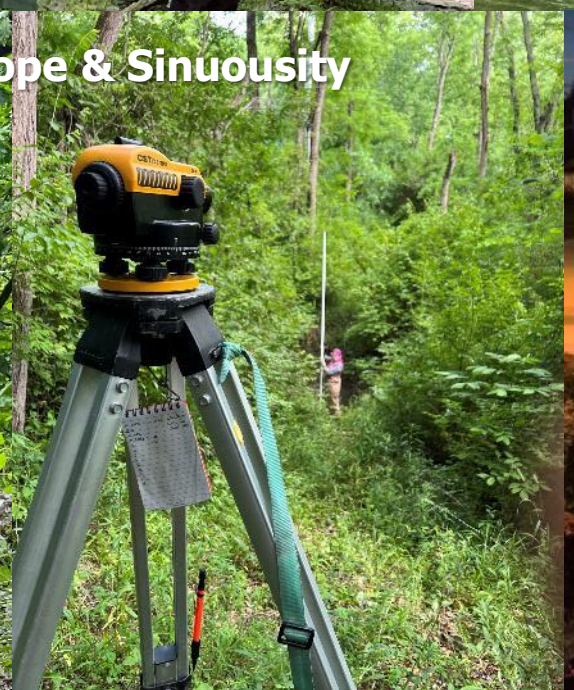

Water Chemistry


Riparian Assessment


Macroinvertebrates
& Periphyton


Stream Anatomy


Canopy Cover


Slope & Sinuousity


Sample Filtration
Processing & Shipment


Electrofishing and Fish Taxonomy


Southern
Redbelly Dace


Longear Sunfish


Northern Studfish


Stonecat


Mottled Sculpin


Blue Catfish


Largemouth Bass


Flathead Catfish


Shovelnose Sturgeon


Blue Sucker


North Fork Salt Creek (IN)


Sippo Creek (OH)


Hendricks Brook (IN)


Big Darby Creek (OH)

SCIENCE REQUIRES A LOT OF WALKING

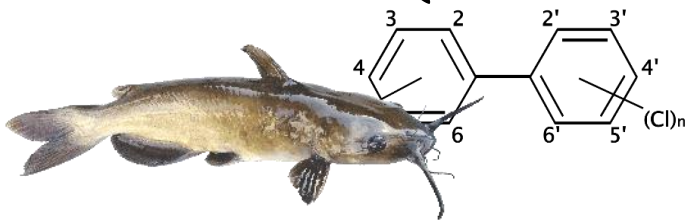
A LOT OF GEAR TYPES

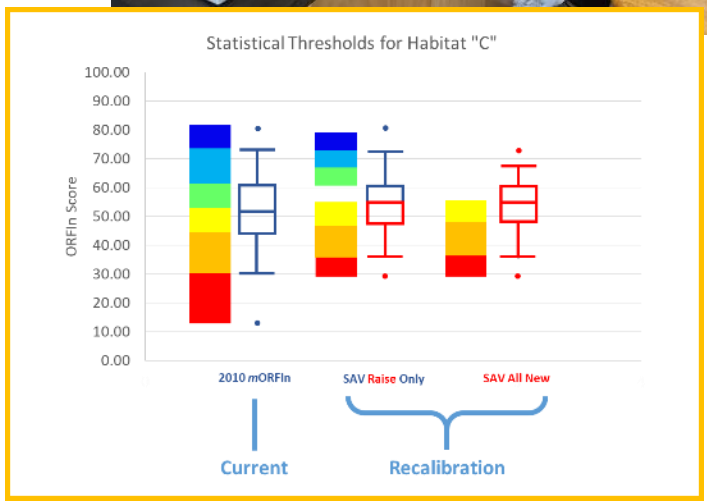

TEAMWORK AND PERSERVERANCE

Remaining Fall & Winter Tasks

- October (end of Field Season)
  - Shipment of ORSANCO and IDEM fish tissue composites to analytical lab
  - Macro retrieval in New Cumberland and Cannelton (3rd metals collection)
  - Finish minnow ID of the 47 completed NRSA sites
    - All data submitted via NRSA App and equipment returned by Oct 31st
    - All prior NARS data - www.epa.gov/national-aquatic-resource-surveys/data-national-aquatic-resource-surveys
    - Fish data collected by staff stored in ORSANCO database

- November and beyond
  - Shipment of macro samples for speciation and enumeration
  - Data review and index calculation
  - Finalize edits to report on PCBs trends in Channel Catfish
    - submit to TEC for review
  - Continue index recalibration process and review with BWQSC
  - BWQSC set tentatively for early 2024





Agenda Item 9:

Algae Nutrients Update

Greg Youngstrom

Agenda Item 9: Algae/Nutrients Update

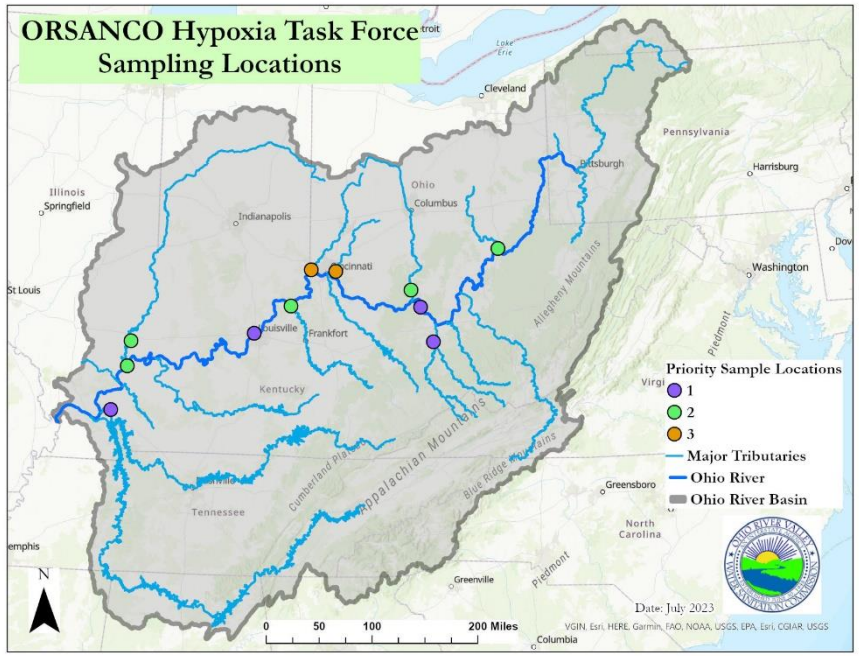
Hypoxia Task Force Funding

Hypoxia Task Force Funding

- Funding through the Bipartisan Infrastructure Law.
- $60 million for Task Force States, Tribes, Sub Basin Groups, Land Grant Universities
- ORSANCO eligible for $400,000 as the convener of the Ohio River Sub Basin Committee (OH, KY, IN, IL)
- We proposed a 2 part project based on comments from the Sub Basin Committee
  - Additional sampling at select locations to improve load estimates
  - Sub Basin Committee meeting 1/yr
- Currently responding to comments from USEPA (should be completed in 2 weeks)
- Project start date of 1/1/24

Additional Sampling Locations

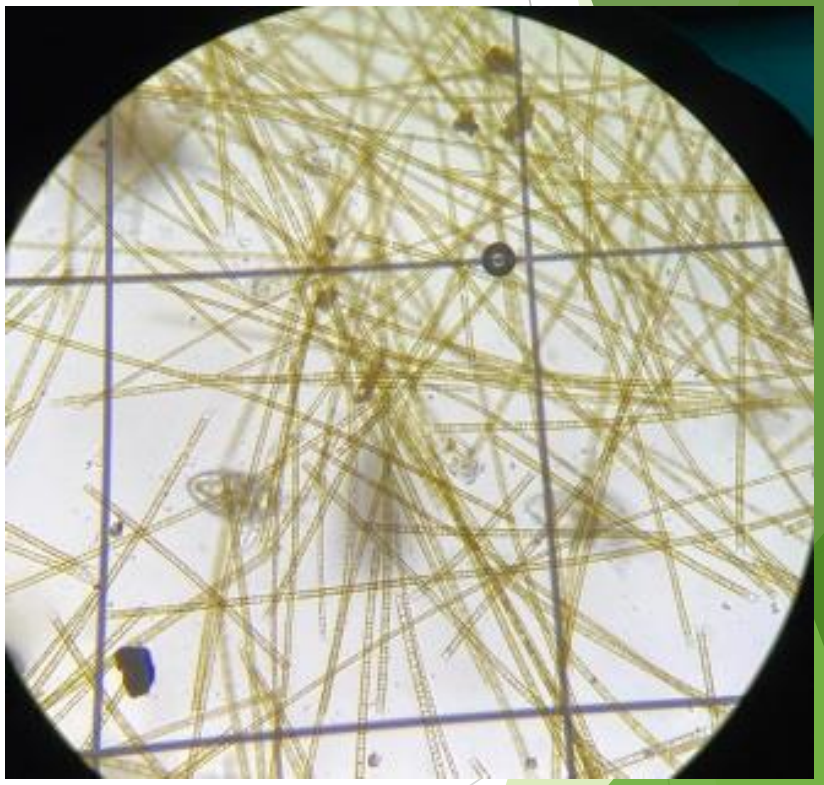
- HTF Monitoring Subcommittee identified 4 locations in the Ohio River Basin that would improve modeling. These are at locations already sampled by our Bimonthly Program.
- 7 Additional locations identified by States as useful to improve load estimates



2023 *Aulacoseria* bloom

Aulacoseira Bloom

- August 1 – Sample from Cincinnati area showed increase in *Aulacoseira*
- Reported on the Aug 4 and 11 weekly water quality reports
- August 14 Cincinnati water contacted us regarding shortened filter run times
- High pH and filter turbidities reported from Wheeling (ORM 86.8) to Henderson (ORM 803.5)
- First encountered 7/31 in Evansville.
- Lasted approximately 10 days



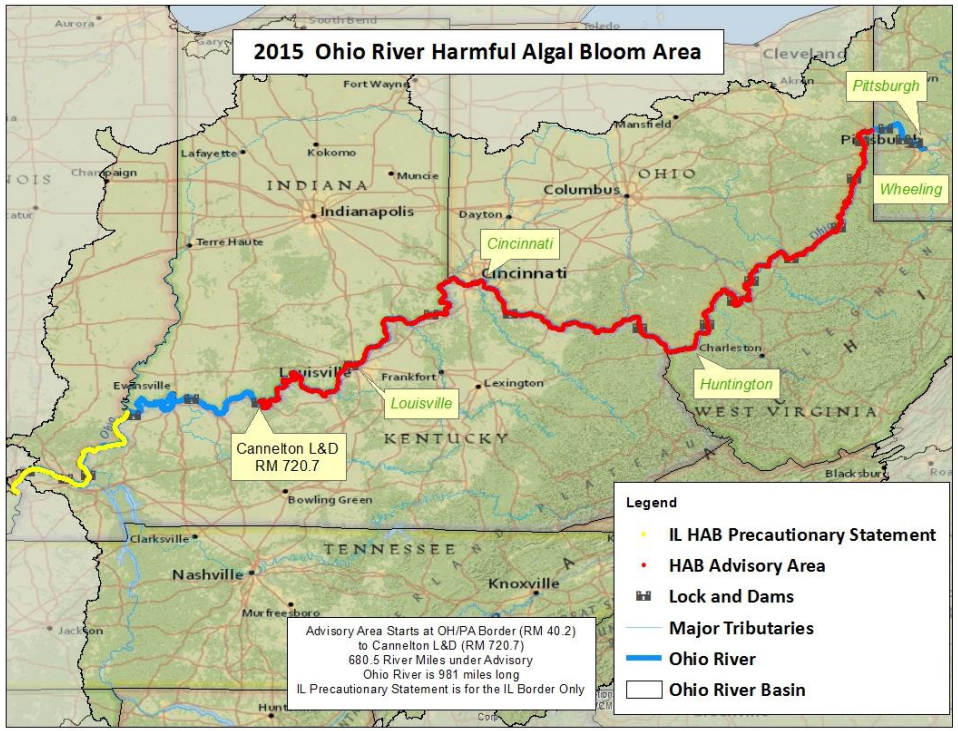
River Mile	River	Location	Algae Issues
6.2	Allegheny	Pittsburgh	None
5	Ohio	West View	None
5.25	Beaver	Beaver Falls	High pH and filter turbidity last weekend
40.2	Ohio	East Liverpool	No issues
65.2	Ohio	Weirton	No issues
86.8	Ohio	Wheeling	pH slightly elevated (7.8-8.08) from 8/5-8/10
306	Ohio	Huntington	pH 8.5-8.6 last week. Toxin testing negative
319.7	Ohio	Ashland	pH over 8.0 for over a week
327.6	Ohio	Russell	pH 8.6 last week, now 8.0. High filter turbidities
407.8	Ohio	Maysville	pH reached 8.99 last Friday. Filter backwashing began end of July
462.8	Ohio	Cincinnati	pH 7.6 on Sunday, 8.6 on Monday. Increased backwashing
462.9	Ohio	No. Kentucky	Similar issues as Cincinnati
Pool 9 and 3	Kentucky	KY AM Water	None
600	Ohio	Louisville	pH 7.77-7.88. Increased Aulacoseira since 7/31
791.5	Ohio	Evansville	pH as high as 8.5 between 7/31 and 8/10.
803.5	Ohio	Henderson	High pH and filter turbidity for 8 days but now fine

Ironton pH

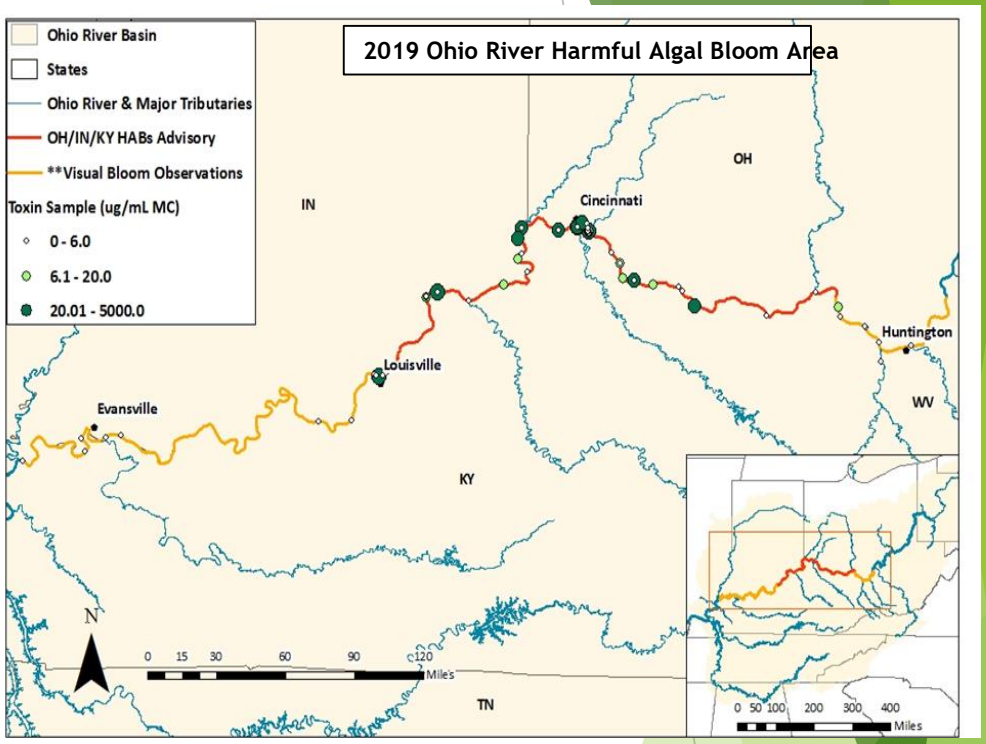

2015
2016
2017
2018
2019
2020
2021
2022
2023
pH
8.5
8
7.5
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Oct 01
Daily Difference
0.8
0.6
0.4
0.2
0
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Oct 01

HAB app

Ohio River HAB Events



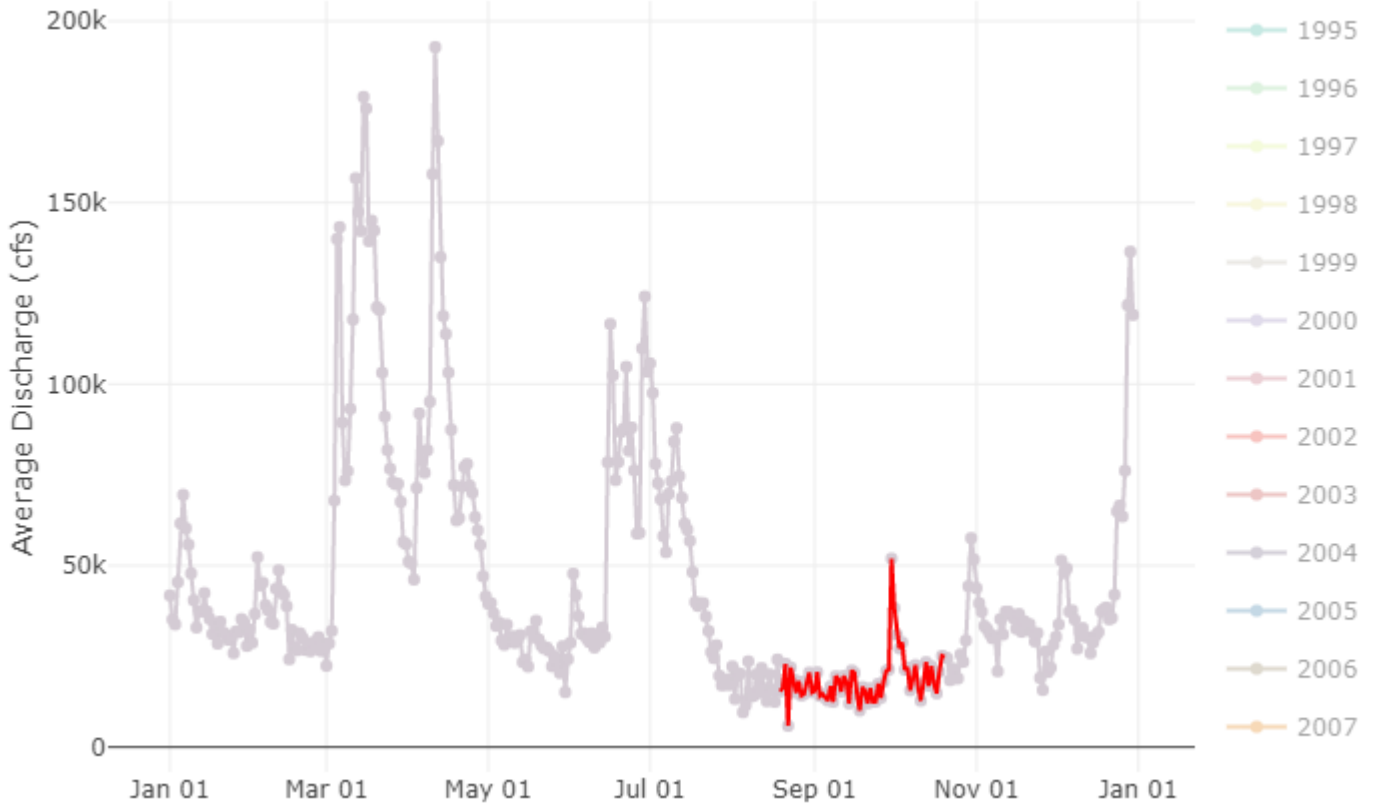
- Began August 19th near Wheeling, WV
- Extended over 650 miles
- Final advisory not lifted until November 4th
- Primarily *Microcystis aeruginosa* – Highest microcystin measured was 1,800 µg/L



- Began September 11th
- Covered over 300 miles
- Continued for over 1 month
- *Microcystis aeruginosa* - Highest microcystin measured >10,000 µg/L

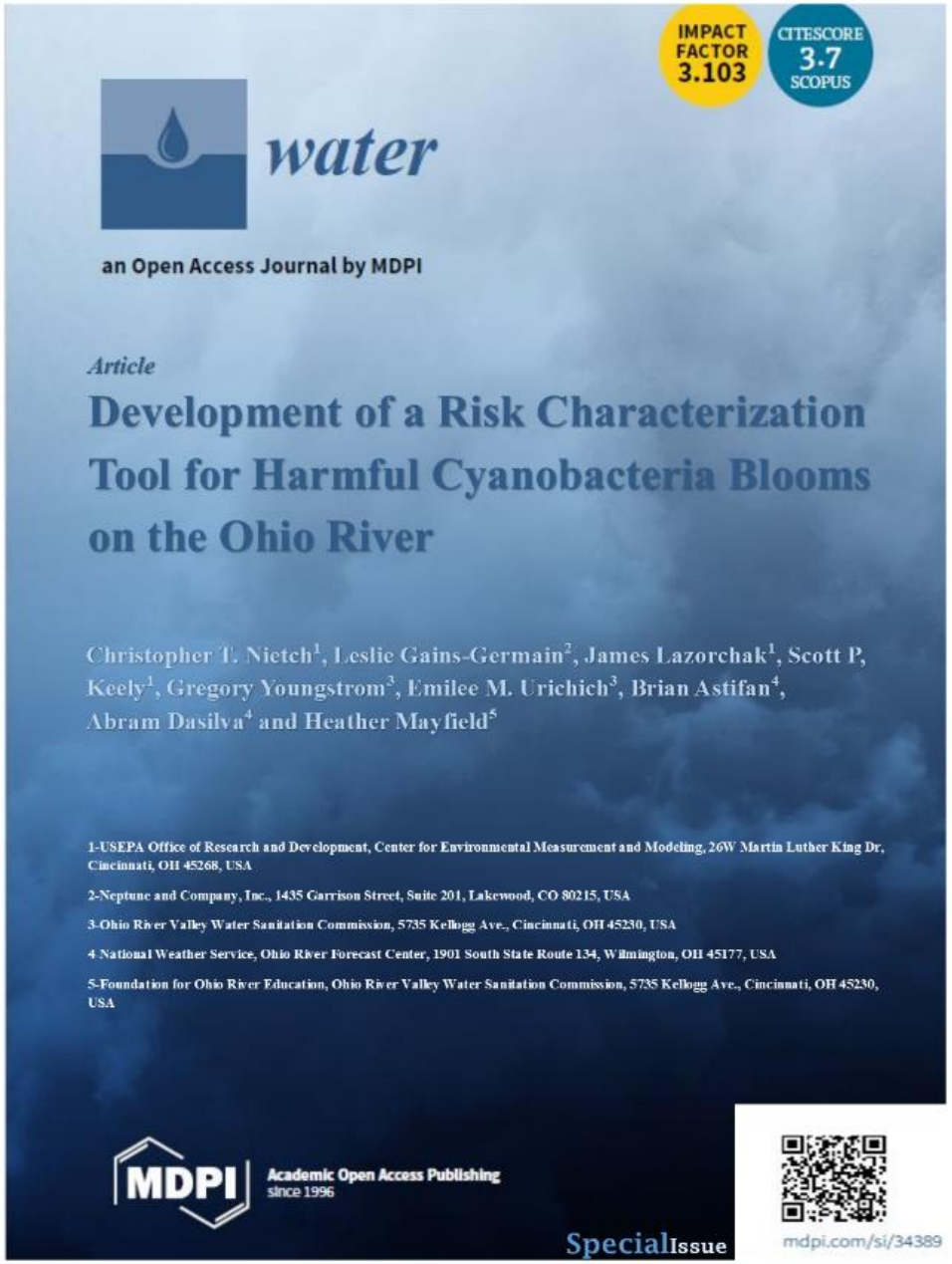
Analysis of Cause

- **Only flow data had sufficient data density (both spatial and temporal)**

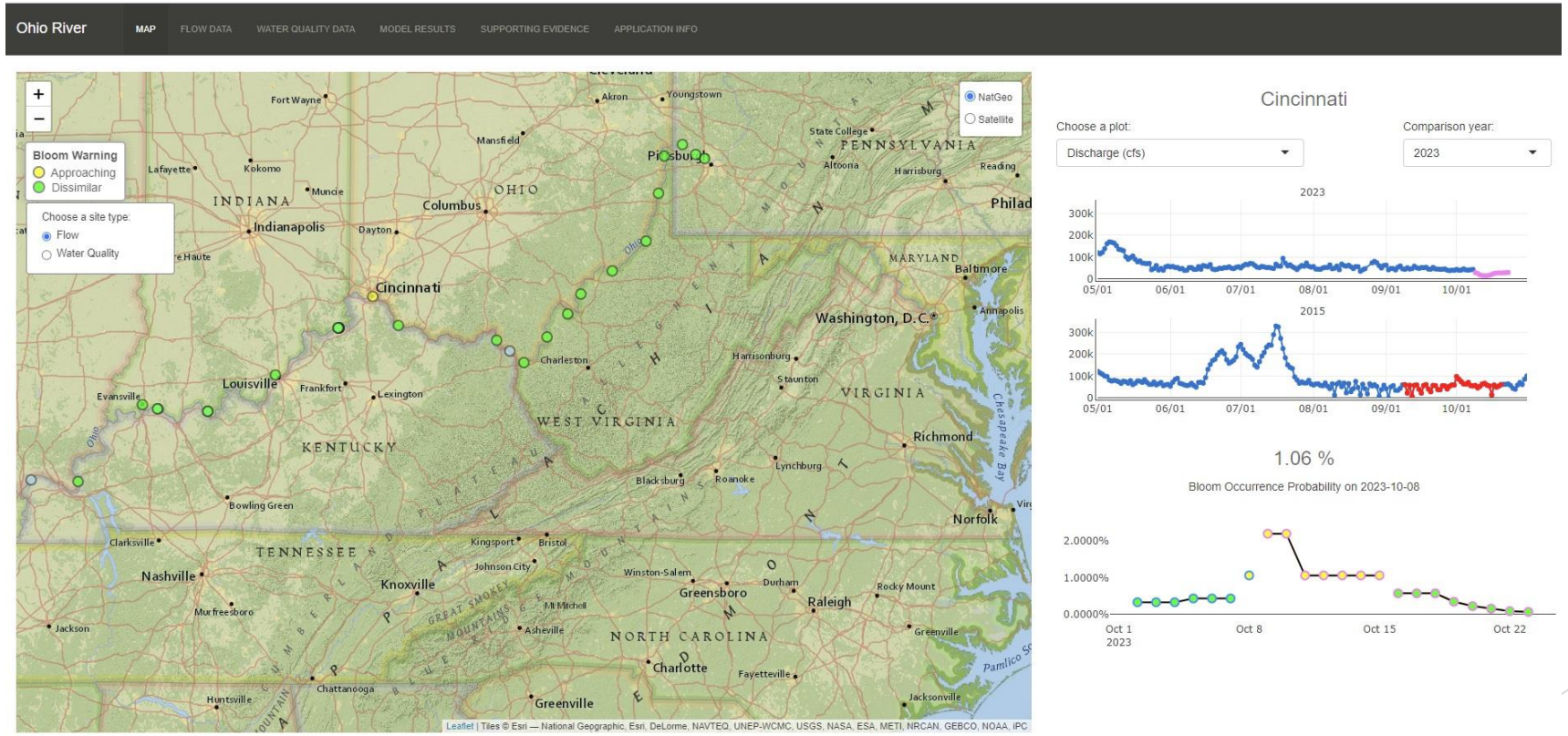


Development of HABapp

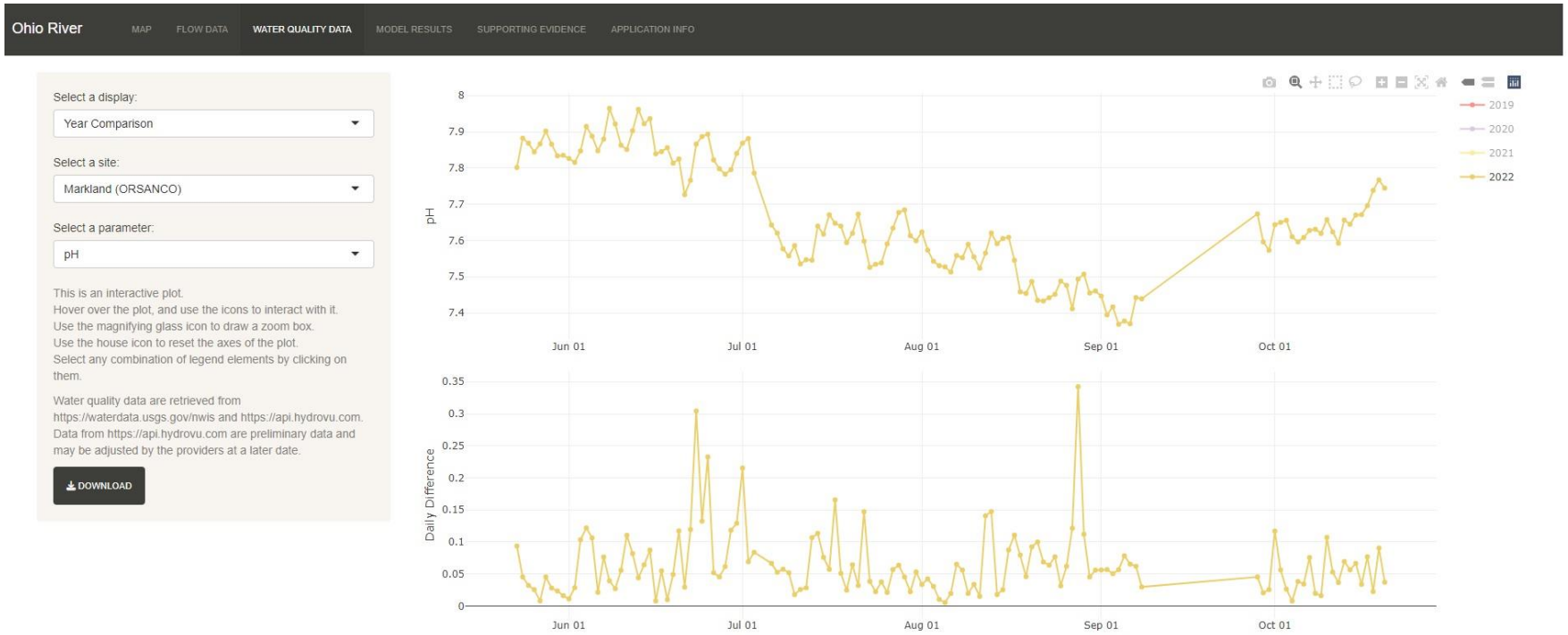
- Development team included USEPA, NWS, Neptune, Inc., ORSANCO
- 2 Bayesian models
  - "Occurrence" model compares current flow to 2015 flow pattern
  - "Persistence" model brings in long term low flow (developed after the 2019 bloom)
- Temperature is a boundary condition but is not in either model
- Full model development published in *Water*



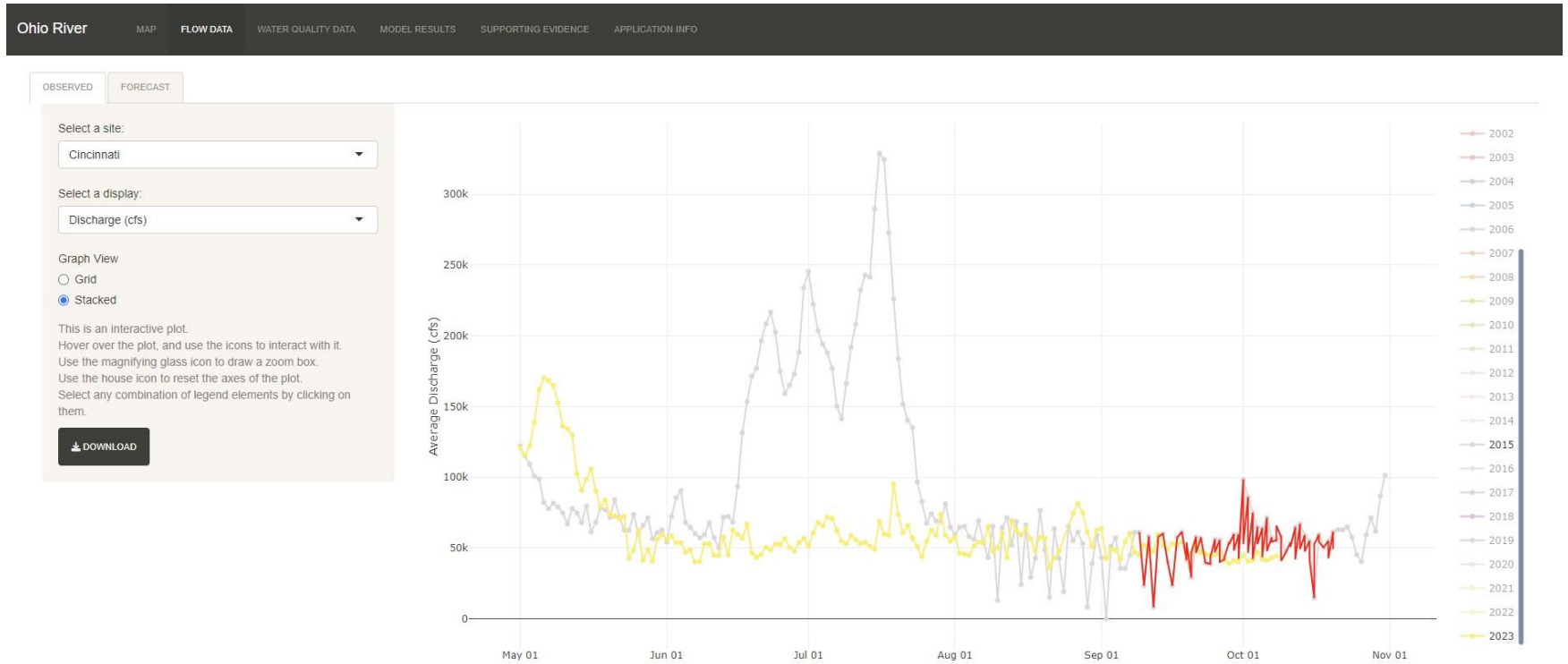
HAB App
Opening Page



HAB app
Water Quality Data



HAB app
Flow Data



Questions?

Agenda Item 10:

Source Water Protection & Emergency Response Programs Update

Sam Dinkins

SOURCE WATER PROTECTION & EMERGENCY RESPONSE

Technical Committee Meeting

October 10-11, 2023

OUTLINE

- Source Water Protection
  - Western PA Source Water Protection Conference
  - Organics Detection System Update
- Emergency Response
  - Kentuckiana Sub-Area Plan Float Trip
  - US EPA ICS Institute Training Exercise

WESTERN PA SWP CONFERENCE

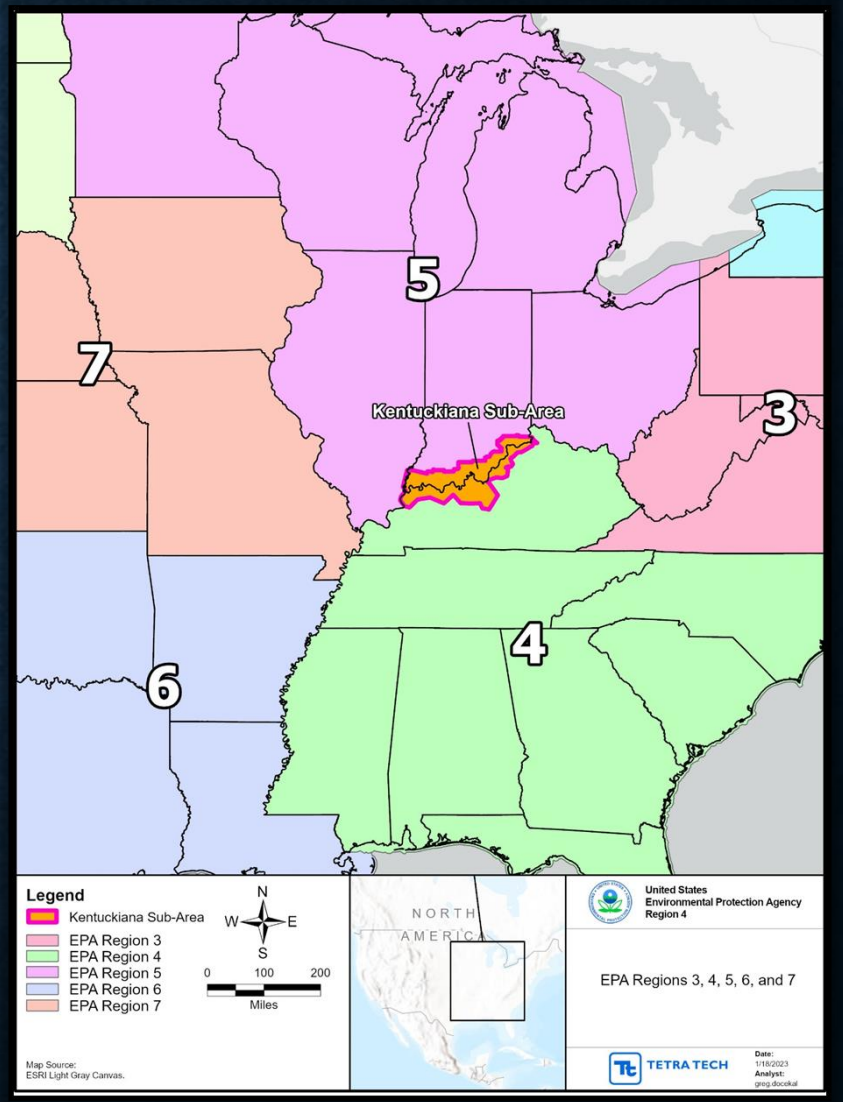
- Two-day conference hosted by PA DEP
  - Brought together utilities, state, regional, and federal agencies, academia, and consultants
- Participated in SWP Panel Discussion
- Richard also presented on ORSANCO's SWP efforts & potential to extend to headwaters region

ORGANICS DETECTION SYSTEM

- Lots of activity!
- Two stations not operational – Parkersburg & Maysville
- Received Chemours Vibrant Community Grant
  - $144K to replace inoperable ODS unit in Parkersburg, WV
- Relocating Maysville unit to Thomas More Univ. Field Station
- Pittsburgh Water & Sewer Authority (PWSA) donating 2017 GC/MS unit to ORSANCO
  - Will replace West View Water unit with instrument donated by PWSA
- Data Management & Alert System Project (RedHawk Technologies)
  - Front-end of system complete for beta testing

KENTUCKIANA SUB-AREA CONTINGENCY PLAN (KSACP)

- Establishes overarching strategy for coordinated responses by local, state, and federal agencies within the designated Sub-Area
- KSACP encompasses portions of US EPA Regions 4 & 5
- Runs from Markland Locks & Dam to the Wabash River
  - Ohio River Miles 531.5 to 848.1
- Plan is nearly complete and "River Truthing" is underway



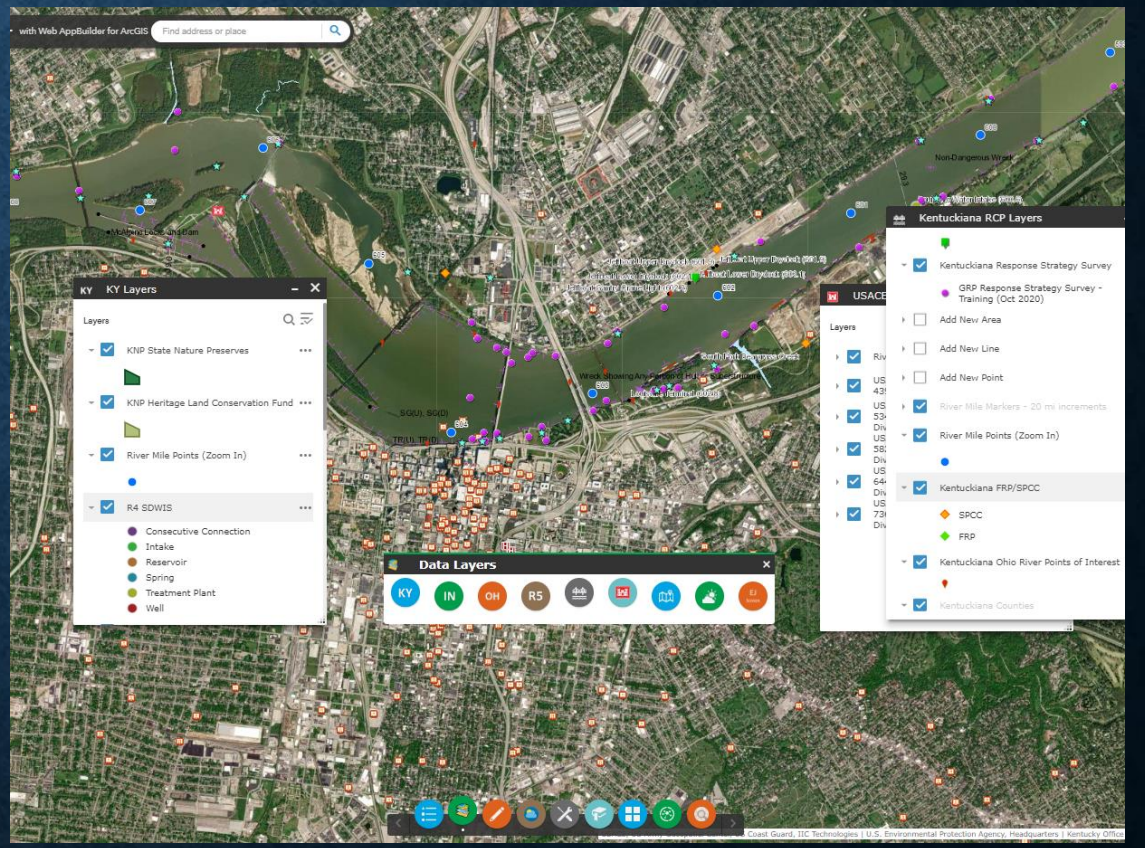
KSACP River Float

August 21-25 2023

- Floated the McAlpine Division
  - Identified mitigation strategies
  - One of TBD KSACP floats completed
  - 2nd proposed float, Cannelton Division - JT Myers Division (Owensboro - Henderson)
- 5 teams covered the RDB and LDB
- 4 days, 41 river miles: 586-627
- 3 vessels, 4 land vehicles, 22 field team members
- Over 118 waypoints collected
- ORSANCO, USCG, KDEP, and EPA

KENTUCKIANA STAKEHOLDER DATA VIEWER

- Identified key locations for response efforts
- Each waypoint classified by location type
  - Access point, boat ramp, staging area, etc.
- Recorded coordinates, photos, access and other relevant details to aid response
- Data loaded into data viewer in real-time
- Possible ORSANCO data layer???



INCIDENT COMMAND SYSTEM EXERCISE

US EPA ICS Institute Training Exercise (Pittsburgh)

- Large-scale national training event (All EPA regions)
- Four days of ICS training with Day 5 Exercise
- Approximately 300 participants
- ORSANCO invited to participate on planning committee to design training exercise

US EPA ICS EXERCISE

Exercise Scenario

- Train derailment in East Liverpool, OH
- Initial release of diesel fuel and sulphuric acid
- Simulation began on Day 10
- Inject: Railcar damaged during recovery resulted in benzene release
  - Modeled after 2022 Allegheny River train derailment
- Good test of utility notifications and awareness of drinking water issues
- Great opportunity to share ORSANCO spill response capabilities


QUESTIONS OR COMMENTS?
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Agenda Item 11:
TEC Members Reports

- IL – Scott Twait
- IN – Brad Gavin
- KY – Katie McKone
- NY – Damianos Skaros
- OH – Melinda Harris
- PA – Kevin Halloran
- VA – Jeffrey Hurst
- WV – Scott Mandirola
- USACE – Erich Emery
- USCG – Michael Franke-Rose
- USEPA – David Pfeifer
- USGS – Jeff Frey
- CIAC – Vacant
- PIAC – Cheri Budzynski
- PIACO – Betsy Bialosky
- POTW – Reese Johnson
- WOAC – Chris Tavenor
- WUAC – Chris Bobay

Other Business:

- Comments by Guests
- Announcement of Upcoming Meetings
  Feb 6-8, 2024: Covington, KY
- Adjourn

Chair, Scott Mandirola