229th Technical Committee Meeting

Scott Mandirola, Chair
Presiding
June 14-15, 2022

The meeting will begin at 1:00 P.M. (Eastern). 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."***
- ***If you need assistance during the meeting, please call our office at 513-231-7719 ext. 100.***

Chair’s Welcome & Roll Call

Scott Mandirola

Chair, Technical Committee

TEC Members Roll Call

- IL – Scott Twait *
- IN – Brad Gavin *
- KY – Katie McKone *
- NY – Melanie Stein *
- OH – Audrey Rush *
- PA – Kevin Halloran *
- VA – Melanie Davenport*
- WV – Scott Mandirola
- USACE – Erich Emery*
- USCG – Josh Miller *
- USEPA – David Pfeifer *
- USGS – Jeff Frey *
- CIAC – Vacant
- PIAC – Cheri Budzynski
- PIACO – Betsy Bialosky
- POTW – Alex Novak
- WOAC – Angie Rosser
- WUAC – Chris Bobay
- Chair – Scott Mandirola *
- Executive Director – Richard Harrison *

* Voting member

Agenda for the 229th Meeting of the Technical Committee

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

ACTION ITEMS AND REPORTS

1. Action on Minutes of 228th Technical Committee Meeting * – Chair Mandirola
2. Chief Engineer's Report – Director Harrison
3. Highlights of FY23 Technical Program Plan - Staff
4. 2022 Biennial Assessment of Ohio River Water Quality Conditions (305b) * – Ryan Argo
5. Biological Programs Update – Ryan Argo
   a. Trends Analysis of PCBs in Fish Tissue – Daniel Cleves
   b. National Rivers and Streams Assessment
   c. 2021 Biological Pool Assessments
   d. 2022 Biological Field Season Schedule
6. TEC Member Roundtable Reports

ADJOURN/RECONVENE WEDNESDAY AT 8:30 A.M.

7. Monitoring Programs to Update Bacteria, PCBs, and Dioxin Data for Use in 305b Assessments; Broad Scan Survey of Unmonitored Parameters Contained in the Pollution Control Standards - Heath
8. Source Water Protection Programs Update – Sam Dinkins
   a. ODS Status Report
   b. Summary of Unknown Benzene Detections
9. HABs Prediction Model – Greg Youngstrom
10. Preliminary Results of Ohio River Ambient PFAS Survey – Sam Dinkins, Jason Heath

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OTHER BUSINESS

- Comments by Guests
- Announcement of Upcoming Meetings

ADJOURNMENT (NOON)

Agenda Item 1:

Request for action on minutes of the 228th Technical Committee Meeting

Chair Mandirola

The minutes were emailed with the agenda package on May 26, 2022

Agenda Item 2:
Chief Engineer's Report

Executive Director Harrison

Agenda Item 3:

Highlights of FY23 Technical Program

Argo, Dinkins, Heath

Information Item

Technical Programs

Technical Program Highlights

Biological Programs

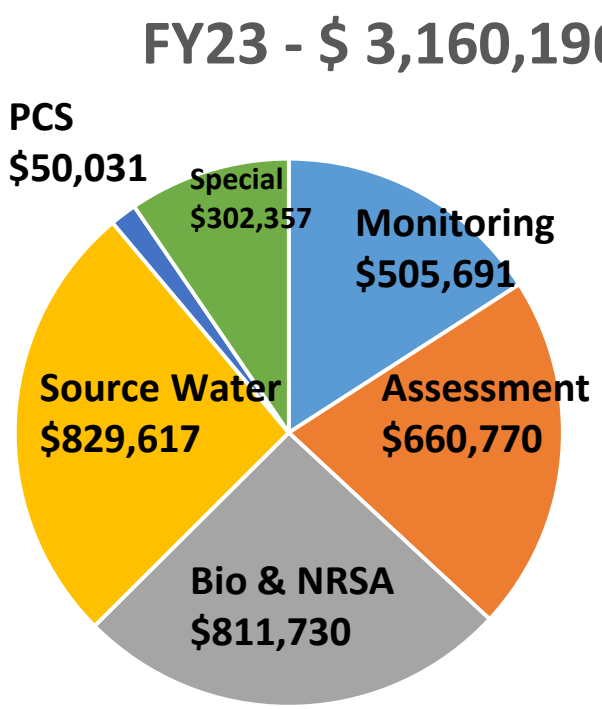
Water Quality Monitoring Programs

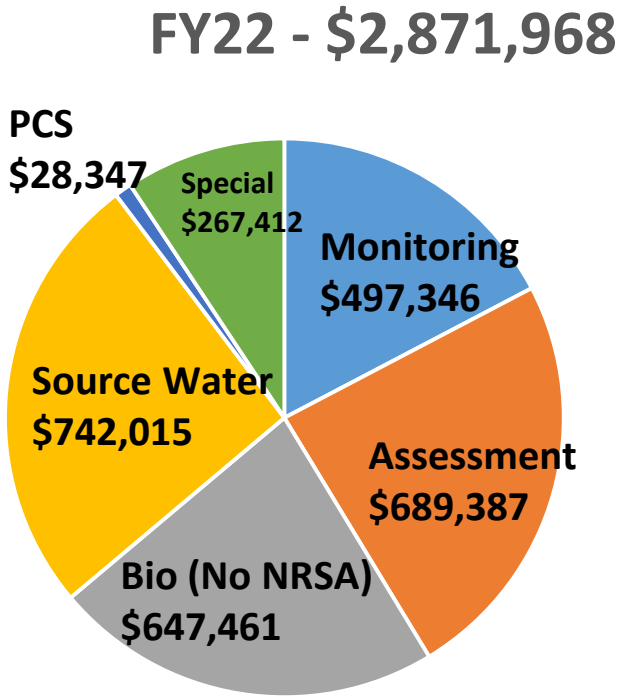
Water Quality Assessment Programs

Source Water Protection Programs

Budget Comparison FY23 vs. FY22						
	FY23 Proposed		FY22 Budget		Difference FY23-FY22	
	Payroll	Total Budget	Payroll	Total	Payroll	Total Budget
Water Quality Monitoring						
Clean Metals	$19,830	$139,518	$15,143	$144,891	$4,687	-$5,373
Bimonthly Sampling	$24,380	$145,688	$27,301	$135,877	-$2,921	$9,811
Bacteria Monitoring	$29,627	$100,172	$25,037	$89,462	$4,590	$10,710
Supplemental Monitoring	$9,694	$23,872	$18,521	$58,338	-$8,827	-$34,466
Algae/Nuts	$32,242	$96,441	$20,372	$68,777	$11,870	$27,664
Total	$115,773	$505,691	$106,374	$497,346	$9,399	$8,345
Water Quality Assessment						
Monitoring Strategy Dev	$48,627	$123,409	$65,112	$169,690	-$16,485	-$46,281
Watershed Protection	$115,813	$291,139	$106,837	$278,381	$8,976	$12,758
TMDL	$1,737	$5,801	$1,650	$5,723	$86	$78
Urban Wet Weather	$1,197	$2,947	$1,082	$2,758	$115	$189
Work Groups	$43,967	$110,086	$37,221	$96,788	$6,746	$13,298
Special Studies	$1,737	$4,277	$1,650	$4,209	$86	$68
WQ Assessment	$39,245	$101,382	$36,898	$98,838	$2,347	$2,544
QA / QC	$8,734	$21,729	$12,854	$33,001	-$4,120	-$11,272
Total	$261,056	$660,770	$263,305	$689,387	-$2,248	-$28,617
Biological Programs						
Macro Studies	$24,715	$131,140	$23,270	$142,484	$1,445	-$11,344
Fish Tissue	$16,931	$76,193	$14,656	$56,277	$2,275	$19,916
Fish Population	$60,709	$260,730	$56,849	$245,141	$3,860	$15,589
Bio Assessment	$75,645	$205,270	$70,641	$203,559	$5,004	$1,711
Total	$178,000	$673,333	$165,417	$647,461	$12,583	$25,872
Standards						
PCS Administration	$9,709	$23,910	$11,115	$28,347	-$1,406	-$4,437
PCS Development	$10,607	$26,121	$0	$0	$10,607	$26,121
Total	$20,316	$50,031	$11,115	$28,347	$9,201	$21,684
Source Water						
ODS	$112,597	$480,342	$104,338	$498,856	$8,259	-$18,514
Spills	$26,687	$72,801	$17,688	$55,663	$8,999	$17,138
Emergency Response	$21,300	$60,306	$13,370	$42,097	$7,930	$18,209
Source Water Assessment	$81,721	$216,168	$55,100	$145,399	$26,621	$70,769
Total	$242,305	$829,617	$190,497	$742,015	$51,808	$87,602
Subtotal	$817,451	$2,719,442	$736,707	$2,604,556	$80,743	$114,886
NRSA	$27,664	$138,397		$0		
Grand Totals		$2,857,839		$2,604,556		$253,283

Technical Programs FY23 vs. FY22





Biological Programs

- Biological data has been entered into STORET National Aquatic database
- Completing 3 pool surveys and open water segment (half a pool in terms of effort) this summer.
- Begin NRSA in 2023:
  - Hire field crew leader (contract)
  - Complete approx. half of 92 sampling events
  - Reduce to 2 pool surveys
- Fish Tissue
  - Will complete a typical year with ~40 composite samples helped compensate for less sampling during NRSA.
  - Adding PFAS to analyses.
  - Completing additional PFAS tissue sampling for IDEM.
- Trends
  - PCBs in fish tissue nearing completion
  - Begin mercury in fish tissue trends analysis

Water Quality Monitoring & Assessment Programs

- Completed an evaluation of the Bimonthly/clean metals monitoring programs
  - Resulted in the addition of 3 water quality parameters and 4 additional monitoring stations.
  - These costs have been fully incorporated into our regular budget.
- PFAS study essentially completed
  - Waiting on EPA to complete a final QA review. Currently assembling public release data tables and report.
- Contact Recreation Monitoring
  - Added Fecal coliform back into WV monitoring stations at their request (unbudgeted)
  - 2 sites each at Wheeling and Huntington - $5,000
- Completed 2022 305b
- Begin review of contact recreation, dioxin, and PCBs monitoring programs to update 305b assessments.
- Complete a Broad Scan of unmonitored parameters contained in our PCS.
  - This was completed approximately ten years ago; all nondetects.
- Currently completing a flows data base of HEC-RAS modeled flow data.

Pollution Control Standards

- Continue to review permits.
- Added 5 weeks of staff time to PCS Development to review the status of criteria compared to USEPA updates of National Recommended Criteria.

Source Water Protection

- **Included $10,000 for 1 year subscription to WaterSuite to maintain the data under the contaminant source inventory project.**
- **Looking at moving the Maysville, KY ODS to the Thomas More Bio station.**
- **Investigate relocation of St. Albans ODS on the Kanawha River.**
- **Conducting a scoping effort for ODS data management and alert system.**
- **$56,500 reserved for ODS equipment replacement.**

Grants and Special Projects

- **$140,000 from unencumbered funds – scoping for updating ORSANCO's data base management system.**
- **IDEM 604b – Maintain HABs Continuous Monitoring System.**
- **IDEM Fish Tissue Collection Program**
- **Maintain HABs Model**
- **WVDEP 604b – Fecal coliform monitoring at WV Contact Recreation sites.**
- **OEPA 604b – Cover ODS program costs.**

FY23 Grants and Special Projects

	IN 604 (b) Continuous Monitoring	IDEM Fish Tissue Collections	MPG Project	WV 604 (b) Fecal coliform	OEPA 604(b) ODS Data Mgmnt & Alert System
EXPENDITURES					
Payroll	$40,920	$3,053	$3,669	$17,251	$0
Employee Benefits	$18,966	$1,415	$1,700	$7,996	$0
Staff Travel	$4,935	$3,113	$0	$875	$0
Commission Travel					
Adv. Comm. Travel					
Supplies	$31,685	$250	$0	$500	$0
Telephone					
Equipment Purchases					
Mort., Utilities, & Maintenance					
Equipment Repairs and Maintenance					
Printing and Reproduction					
Lab Fees and Delivery	$13,114	$5,880	$24,000		$51,650
Contractual Services				$6,552	
SUB-TOTAL - DIRECT EXPENSES	$109,620	$13,711	$29,369	$33,173	$51,650
Indirect Expenses Allocation	$40,882	$3,051	$3,665	$17,235	$0
Total program Cost	$150,502	$16,762	$33,035	$50,408	$51,650

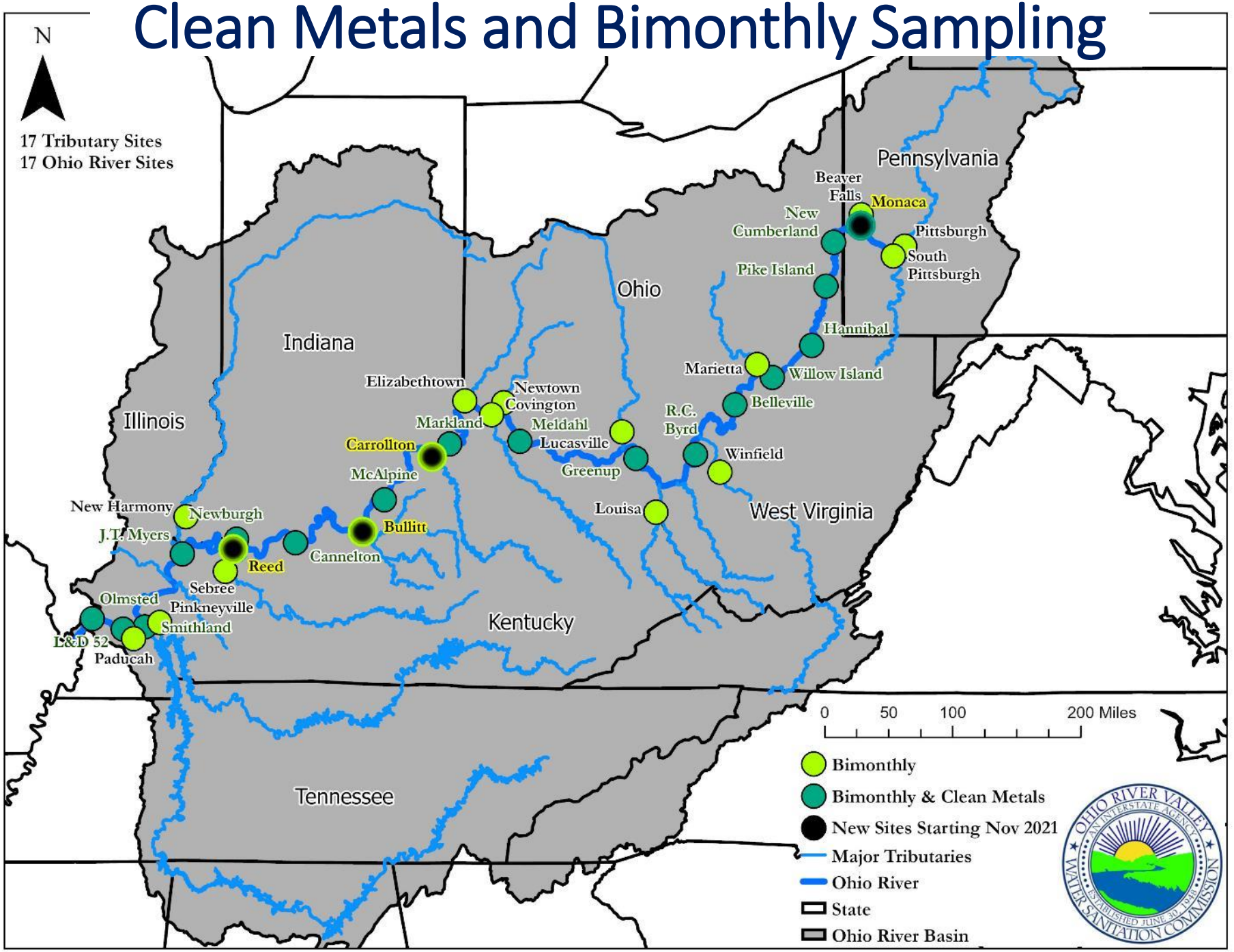
Routine Monitoring

Biological & Bimonthly

Bio/Bimonthly Programmatic Considerations

- Bimonthly/Clean Metals
  - Clean metals analytical costs decreased with new lab contract
  - Additional Sites and Parameters resulting from programmatic review are now FULLY incorporated into annual budgets
    - Supplemental Monitoring funds had temporarily supported these additions in FY22
- Biological Core Programs
  - Pools Surveys – Conducting Pool Surveys in 3 pools and targeted sampling in Open Water
  - Macro RFP – evaluating proposals currently, shouldn't drastically affect the budget
  - Fish Tissue – Per BWQSC recc and TEC approval, PFAS analytes have been added to all regular collections
- Outside Biological Funding
  - IDEM Fish Tissue Special Procurement – Staff will collect samples, grant covers analytical, some travel and personnel
    - IDEM will be using the additional data to re-evaluate current listings and investigate PFAS in FT
- Aquarium
  - Are not currently scheduling events for 2022 – pending evaluation of resources across biological and educational staff

Clean Metals and Bimonthly Sampling



Metals and Bimonthly Program Parameters

Clean Metals Parameters	Water Pollutant
Aluminum	Conventional
Antimony	Toxic
Arsenic	Toxic
Barium	Conventional
Beryllium	Toxic
Cadmium	Toxic
Calcium	Conventional
Chromium	Toxic
Chromium(VI)	Toxic
Copper	Toxic
Fixed Suspended Solids	Conventional
Hardness, Ca, Mg	Conventional
Iron	Conventional
Lead	Toxic
Magnesium	Conventional
Manganese	Conventional
Mercury	Toxic
Methylmercury(1+)	Toxic
Nickel	Conventional
Organic carbon	Conventional
Potassium	Conventional
Selenium	Toxic
Silver	Conventional
Sodium	Conventional
Strontium	Conventional
Thallium	Toxic
Total suspended solids	Conventional
Volatile Suspended solids	Conventional
Zinc	Toxic

Bimonthly Parameters	Water Pollutant
Ammonia Nitrogen	Conventional
Bromide	Conventional
Chloride	Conventional
Cyanide	Conventional
Hardness	Conventional
Nitrate-Nitrite Nitrogen	Conventional
Phenolics, Total Recoverable	Toxic
Sulfate	Conventional
Total Dissolved Solids	Conventional
Total Kjeldahl Nitrogen	Conventional
Total Nitrogen	Conventional
Total Organic Carbon	Conventional
Total Phosphorus	Conventional
Total Suspended Solids	Conventional
Field Parameters	
Dissolved Oxygen	Conventional
pH	Conventional
Specific Conductance	Conventional
Temperature	Conventional
Turbidity	Conventional
Parameters Starting Nov 2021	
Dissolved Organic Carbon	Conventional
Orthophosphate	Conventional
Biochemical Oxygen Demand	Conventional

BWQSC & TEC Approved Pool Survey Schedule

Factors Considered

- IDEM FT Project
- NRSA Participation

Pool	Times Assessed	Yrs Since Last Survey	Cycle 3								Cycle 4					
			2015	2016	2017	2018	2019	2020	IDEM 2021	IDEM 2022	IDEM NRSA 2023	IDEM NRSA 2024	2025	2026	2027	2028
Emsworth	3	4				X		Asseesments Postponed - COVID						X		
Dashields	3	1							X						X	
Montgomery	3	7	X								X					
New Cumberland	3	5			X								X			
Pike Island	3	4				X								X		
Hannibal	3	1							X						X	
Willow Island	3	6		X									X			
Belleville	2	8								X						X
Racine	3	7	X									X				
RC Byrd	3	3					X							X		
Greenup	3	2		X									X			
Meldahl	3	5			X								X			
Markland	3	1							X						X	
McAlpine	3	1							X							X
Cannelton	3	6		X							X					
Newburgh	3	5			X							X				
JT Myers	3	7	X							X*						
Smithland	3	3					X							X		
Olmsted	2	8								X						X
Open Water		8								X						X

Indiana Fish Tissue pools highlighted

Everything past the double yellow line is hypothetical

*first pool in 4th Assessment

Source Water Protection & Emergency Response Programs

ograms Overview

Source Water Protection/Emergency Response	FY22	FY23
Source Water Assessment & Protection	$145,399	$216,168
Organics Detection System (ODS)	$498,856	$480,342
Spill Notification & Tracking	$ 55,663	$ 72,801
Emergency Response Preparedness	$ 42,097	$ 60,448
TOTAL Source Water Programs	$742,015	$ 829,759

ograms Overview

Special Projects	FY22	FY23
IN 205j Grant (HABs)	$146,913	$150,502
OH 604b Grant (FY22-PFAS; FY23-ODS)	$ 51,810	$ 51,650
PFAS – State Funded	$ 33,470	$ 0
WV 604b Grant (FY23 – Fecal & Trends)	$ 0	$ 50,408
HAB App	$ 0	$ 33,035
106 – Supplemental	$ 62,322	$ 23,872
TOTAL Special Projects	$294,515	$309,467

ograms Overview

Water Quality Monitoring & Assessment	FY22	FY23
Work Groups	$ 96,788	$110,086
QA/QC	$ 33,001	$ 21,729
Algae/Nutrients/HABs	$ 68,777	$ 96,441
Bacteria Monitoring	$ 89,462	$100,172
WQ Data Assessment	$ 98,838	$101,382
Monitoring Strategy	$169,690	$123,409
TMDLs	$ 5,723	$ 5,801
PCS Development	$ 0	$ 26,121
PCS Administration	$ 28,347	$ 23,910
Watershed Protection	$278,381	$291,139
Urban/Wet Weather WQ Assessment	$ 2,758	$ 2,947
Emerging WQ Issues	$ 4,209	$ 4,277
TOTAL Source Water Programs	$875,974	$907,414

Program Notes

1. ODS
   - Maintenance contract with Terra Tech ($80,000)
   - Completed Chromeleon 7 software upgrades
   - Station Relocations
     - St. Albans, WV and Maysville, KY
   - ODS Data Management & Alert System
     - OH 604b grant plus ODS IT funds
2. Indiana HAB Project(205j Grant)
   - Program initiated in FY20 ($150K)
     - Deployed 2 additional continuous monitoring stations (Markland, Newburgh)
   - FY21 $150K – Extend project period plus add Aquarius software
   - FY22 $146K – Extend project period
   - FY23 $150K – Extend project period
   - FY24 $159K – Extend project period

Program Notes (continued)

3. Bacteria Monitoring
   - Resume fecal coliform analysis at WV stations
   - Complete bacteria trends assessment

4. Source Water Protection
   - Add WaterSuite subscription service
     - Contaminant Source Inventory software
     - US EPA support ends June 30, 2022
     - Evaluating future ORSANCO role as central hub to support river-wide source water protection efforts

Agenda Item 4:

2022 Biennial Assessment of Ohio River Water Quality Conditions

Report of the 305(b) Workgroup

Ryan Argo

rargo@orsanco.org

***Actionable Item**

2022 Biennial Report – Workgroup Activity

- **April 2021** –Discussed previous assessment methodologies and treatment of HABs

- **August 2021** – Approved updates to assessment methodologies and inclusion of HAB discussion in final report
  - Adopted changes largely focused on assessment thresholds
    - e.g. designating different thresholds for toxic & conventional pollutants

- **December 2021** – Reviewed and approved draft use attainments

- **April 2022** – Draft 2022 Biennial Report distributed to the workgroup for comment

- **May 2022** – Workgroup suggested edits and comments addressed final draft provided to TEC members

Methodology Update Example: Aquatic Life Use

Fully Supporting

- Conventional - <10% criteria exceedance for any one
- **Toxic - No exceedances or 1 exceedance**

  and/or
- Biota - *m*ORFIn and ORMIn scores are greater than or equal to 20.0
  - (i.e. a condition rating of 'Fair', 'Good', 'Very Good', or 'Excellent')

Partially Supporting - Impaired

- Conventional - >10% and <25% criteria exceedance for any one
- **Toxic - >1 exceedance, AND ≤10% of samples**

  and/or
- Biota - one of the indices scores 'Fair' or better (>20.0)

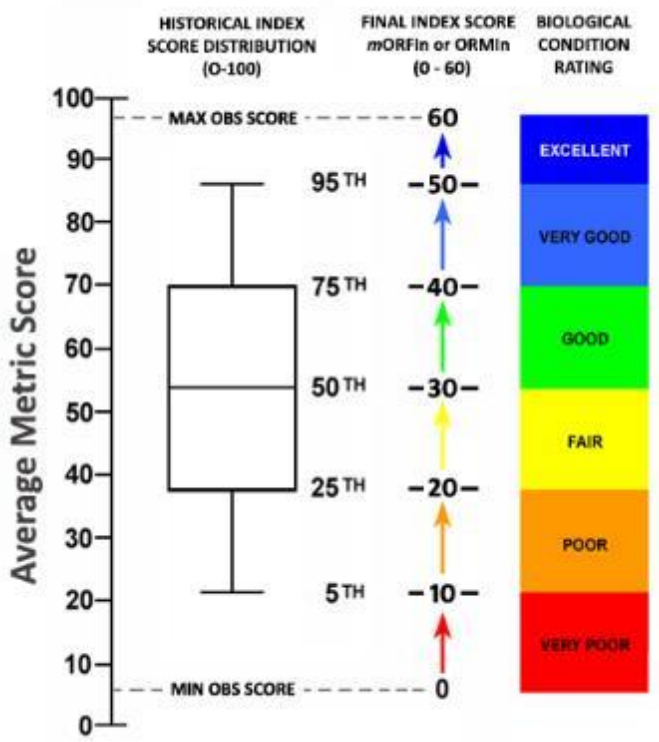
  and, the other index scores 'Poor' (10.0 - 19.9)

Not Supporting - Impaired

- Conventional - >25% criteria exceedance for any one
- **Toxic - >1 exceedance AND >10% of samples**

  and/or
- Biota - pool in which both indices score 'Poor' (<20.0)

  or, in which either index scores 'Very Poor' (<10.0)



Summary of 2016-2020 Use Attainment

- **Aquatic Life Use – Entirety of Ohio River is fully supporting**
  - Total Iron exceeded criteria in greater than 10% of samples in several river segments.
  - Fish and/or macroinvertebrate assessments indicate every segment is in full support.
  - ***WOE approach*** employed favoring the direct measures of aquatic life (biological indices)

- **Contact Recreation Use – 629.9 miles (i.e. approx. 2/3) of Ohio River is classified as impaired**
  - Historical (2003-2008) longitudinal survey data was used as it provides the greatest coverage in regards to river miles sampled and precipitation events included.
  - Recent data from six largest combined sewage overflow (CSO) communities during the recreational season was also used.

- **Public Water Supply Use – Entirety of Ohio River is fully supporting**
  - Water utility surveys did not indicate source water issues
  - Finished water maximum contaminant level (MCL) violations as reported to USEPA by water utilities were treatment byproducts or due to incomplete treatment.
  - ***WOE approach*** employed concluding that neither the surveys nor MCL violations indicated issues with the Ohio River source water.

- **Fish Consumption Use – All of Ohio R. is partially supporting (PCB/Dioxins) – All of Ohio R. is fully supporting (Mercury)**
  - Historic water quality data for PCBs and Dioxins exceeded criteria by two or more orders of magnitude.
  - Recent water quality samples exceeded the 0.012 µg/L mercury criterion in excess of ten percent of the samples at six stations, river-wide.
  - No exceedances of the 0.3 mg/kg methylmercury criteria occurred in fish tissue data for each pool of the Ohio R.
  - ***WOE approach*** employed favoring the direct measure of methylmercury in fish tissue as opposed to the water column mercury criteria which was derived to indirectly protect methylmercury levels in fish tissue.

Summary of 2016-2020 Use Attainment

	States	Number Miles Use is Impaired				
		Aquatic Life	Contact Recreation	Public Water Supply	Fish Consumption for PCBs & Dioxin	Fish Consumption for Mercury
PA	0.0-40.2	0	40.2	0	40.2	0
OH-WV	40.2-317.1	0	245.0	0	276.9	0
OH-KY	317.1-491.3	0	60.8	0	174.2	0
IN-KY	491.3-848.0	0	243.3	0	356.7	0
IL-KY	848.0-981.0	0	40.6	0	133.0	0
TOTAL	981.0	0	629.9	0	981.0	0

** 305(b) workgroup supports updating these data as soon as practicable*

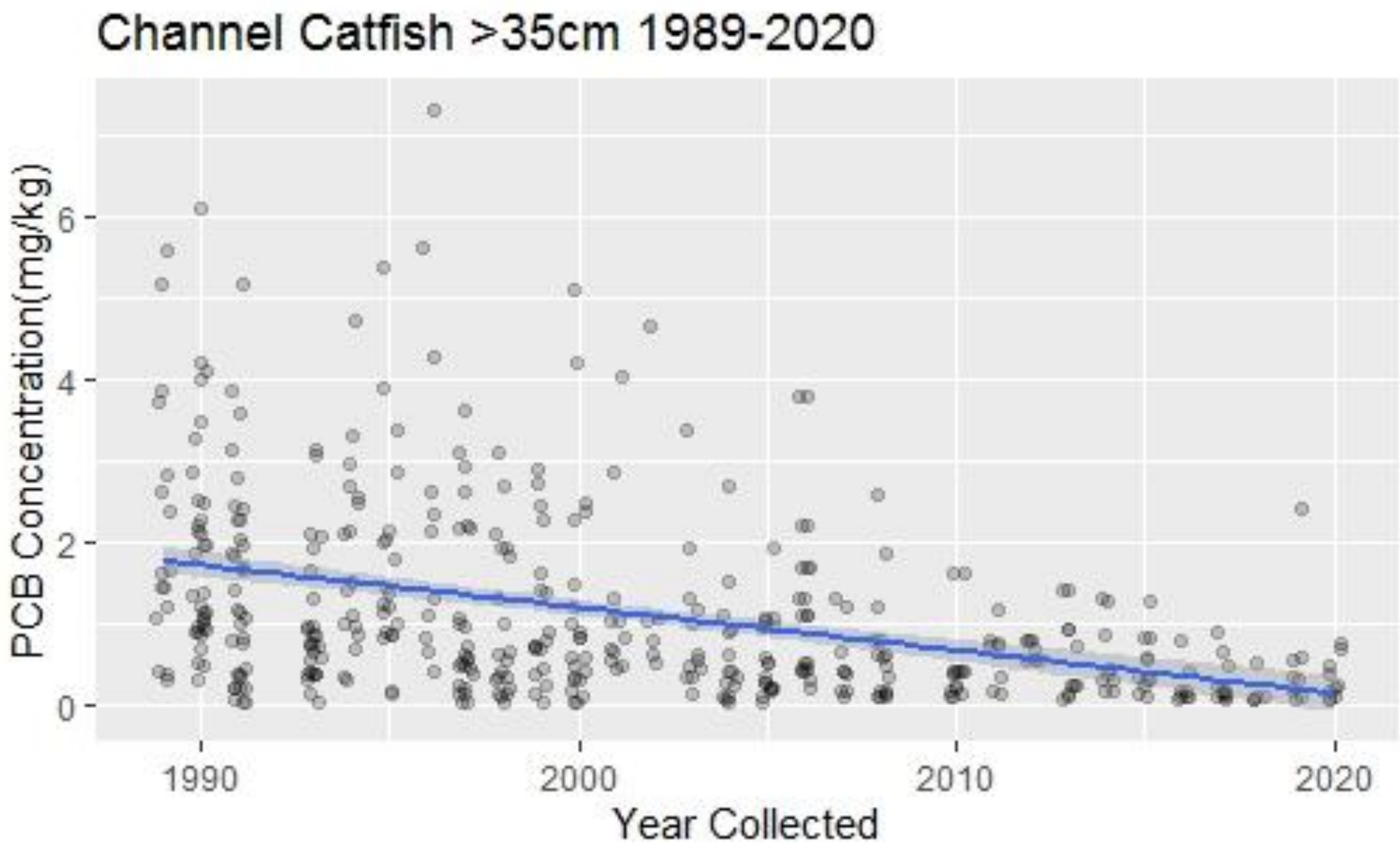
305b Workgroup Recommendations (*Action Needed)

1. Update Longitudinal Bacteria (*E. coli*) Dataset to extent practicable
   - Establishing a workgroup to assist in the development of a monitoring design and propose to TEC
2. Update the aqueous PCB and Dioxin datasets (1997-2004)
   - Less priority than Bacteria Monitoring
3. Postpone development of a HAB assessment methodology, include summary of HABs in Biennial Report
   - Completed - see Chapter 6
4. *Accept 2022 use assessments, recommend TEC support the Draft 2022 Biennial Report and its recommendation for Commission approval

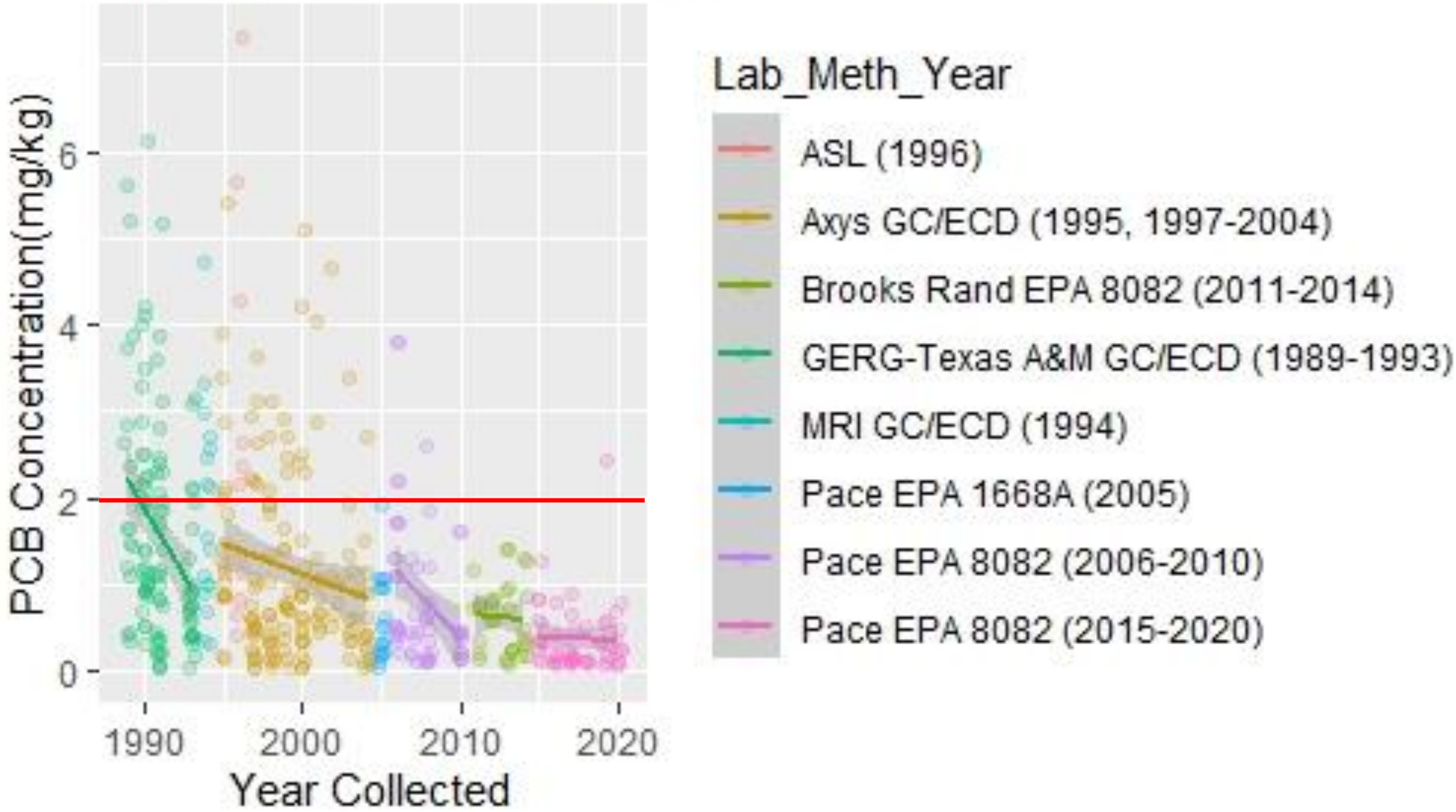
Agenda Item 5:

Biological Programs Update

PCBs Trends in Fish Tissue – Daniel Cleves
2021 Biological Pool Assessments – Ryan Argo
2022 Biological Field Season Schedule
National Rivers and Streams Assessment


Channel Catfish >35cm 1989-2020
PCB Concentration(mg/kg)
0
2
4
6
1990
2000
2010
2020
Year Collected

Channel Catfish TL4 1989-2020 >35 cm



Why did we choose this approach?

- **Confounding factors**
  - Differences in “total PCB” enumeration schemes, laboratory standards and analytical methods
  - Inherent biases within an historic dataset (length bias, spatial bias (river mile), etc.)
  - Species’ differences (different diets/lifecycle changes lead to differing rates of bioaccumulation)
  - Seasonal variability (lipid content and PCBs are positively correlated; lipid content fluctuates seasonally)

- **Can we group consistent analytical methods conducted by different labs?**

- **How can we concurrently apply length standardization, lipid normalization, and account for spatial bias?**

  - Length Standardization: PCB Concentration/Length
  - Lipid normalization: PCB Concentration/Lipid Content
  - Collection location: negative correlation, as river mile increases PCBs tend to decrease

What is multiple linear regression?

- **One outcome variable, modeled from multiple predictor variables**
  - Outcome variable = intercept + predictor variable*β_1 + predictor variable*β_2 + predictor variable*β_3…

- **Best Subset Regression – generates multiple models using all combinations of predictor variables**
  - Example output:

Selection Algorithm: Exhaustive

	avg.length_cm	Pool.Number	Per_Lipids	avg.length_cm:Per_Lipids
1 (1)	" "	"*"	" "	" "
2 (1)	" "	"*"	" "	"*"
3 (1)	"*"	"*"	"*"	" "
4 (1)	"*"	"*"	"*"	"*"

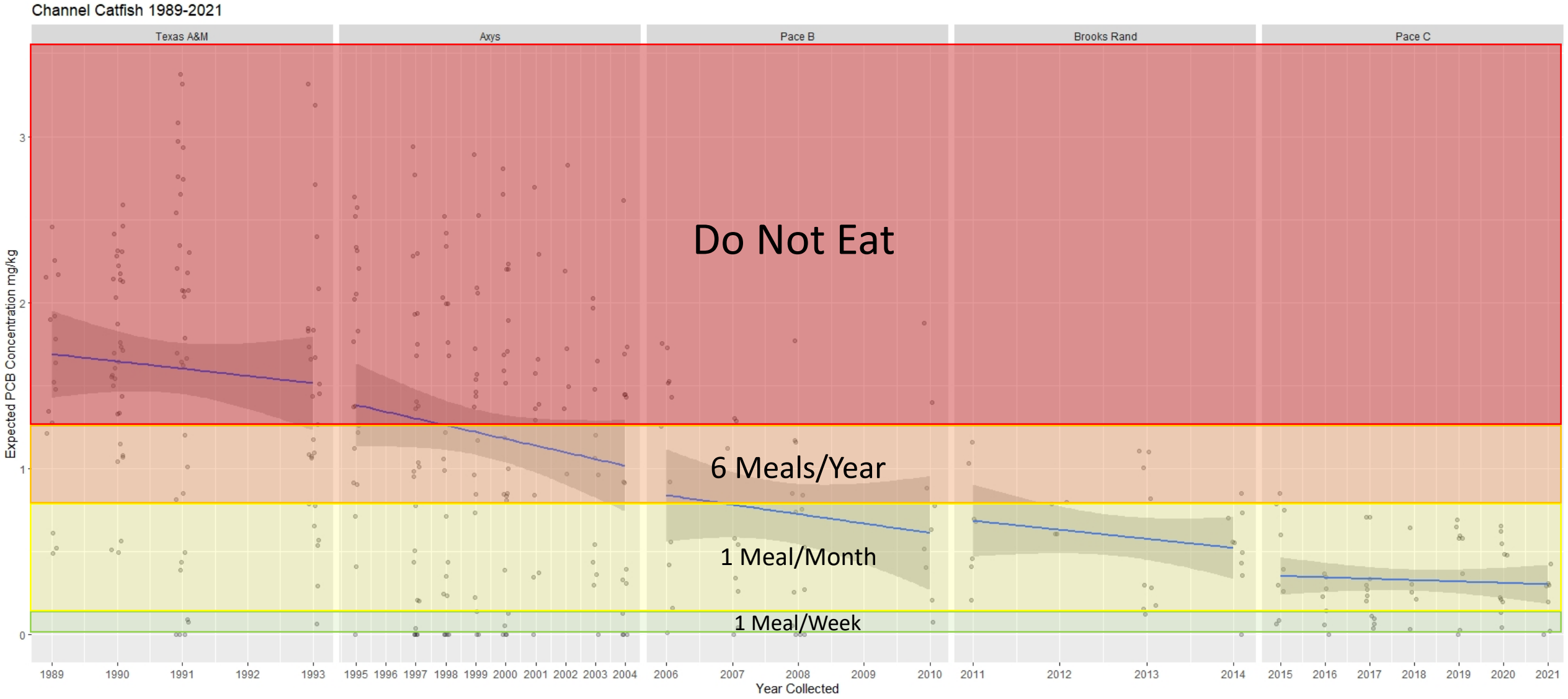
Best Subset Regression: Channel Catfish

tPCBs = Intercept + Average Length of Composite*β_1 – Pool Number*β_2 + Lipid Percentage*β_3 + Length:Lipid*β_4

Laboratory (years in service)	Average Length of the Composite Sample (cm)	Pool Number (location of sample collection *1-20*)	Composite Sample Lipid Percentage (%)	Length:Lipid Interaction Term (Length*Lipid*β)
Texas A&M (1989-1993)	+	-		+
Axys (1995, 1997-2004)	+	-		+
Pace (2006-2010)		-		+
Brooks Rand (2011-2014)	+	-		
Pace (2015-2021)		-	+	
Pace + Brooks Rand EPA 8082A (2006-2021)	+	-	+	

Channel Catfish: Expected PCB concentrations (mg/kg) separated by Laboratory

- **Production banned 1979**
- **PCBs still widely in use for multiple electrical and industrial applications phased out throughout the 1980's**



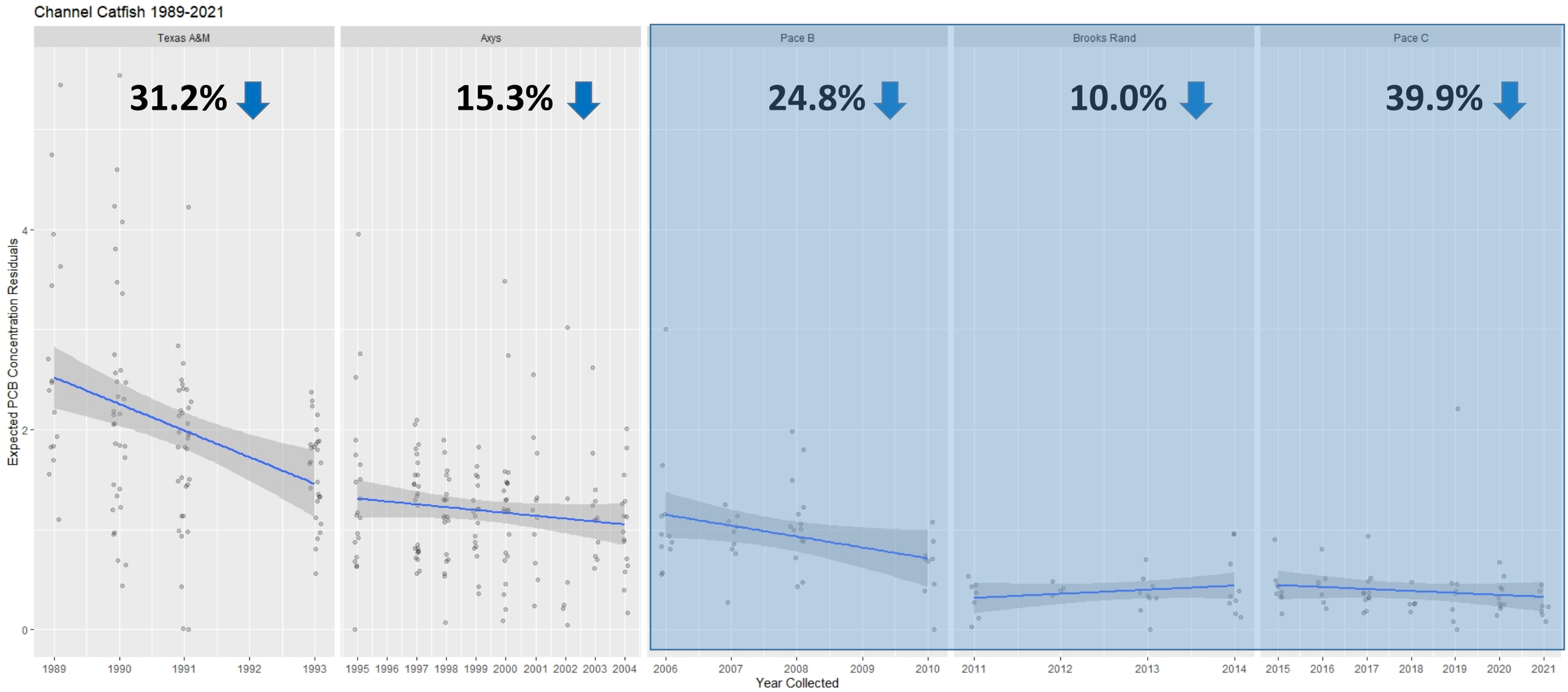
Why Use Residuals?

Multiple regression was used to explain variation in the **outcome variable** (total PCBs) accounted for by the **predictor variables** (length, lipid, and location) included in the models

Residuals = Observed – Expected

Residuals are being applied to remove known biases allowing better comparison over time that the model is accounting for so we are left with less biased trend that can then be compared over time

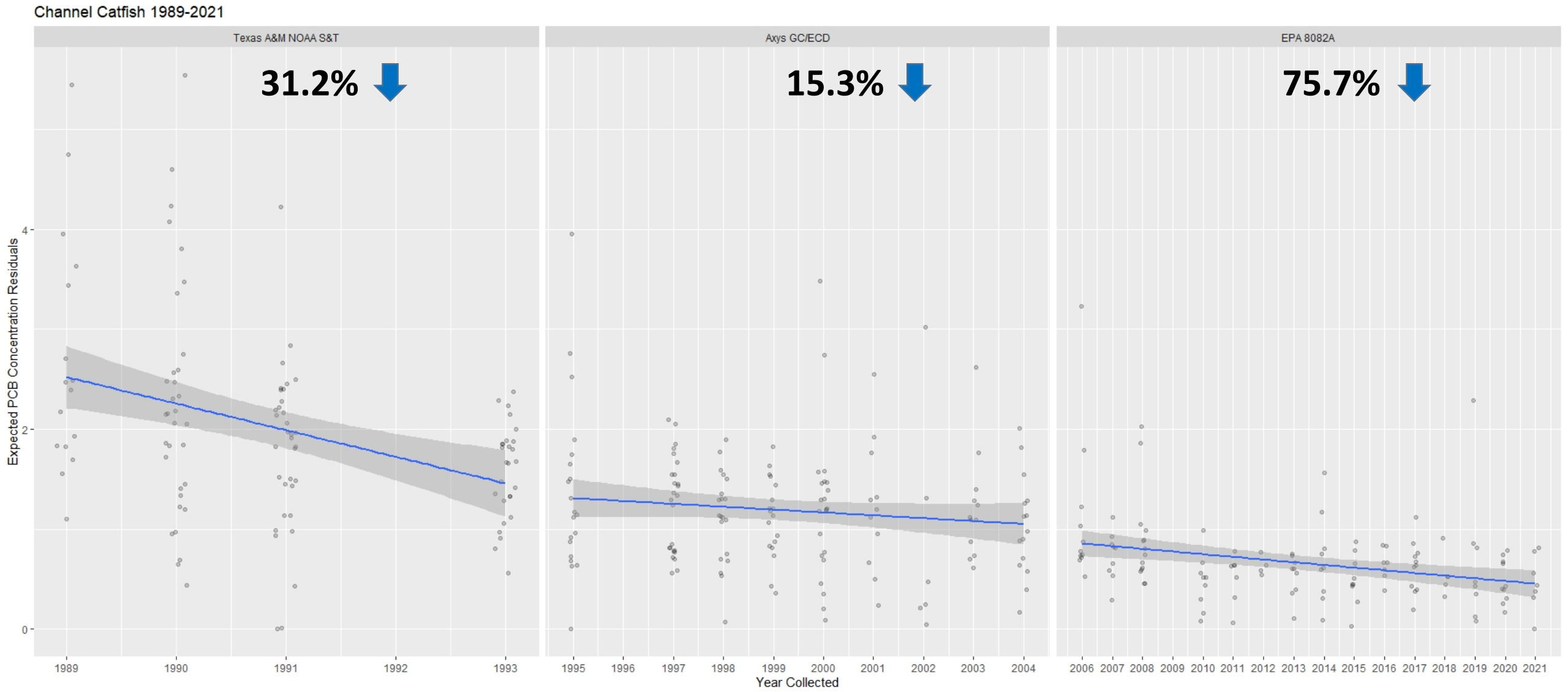
Models by Laboratory



= percentage decrease in median observed values (central tendency)

= fitted regression line w/ 95% CI

Models by Analytical Method



= median (central tendency) percentage decrease

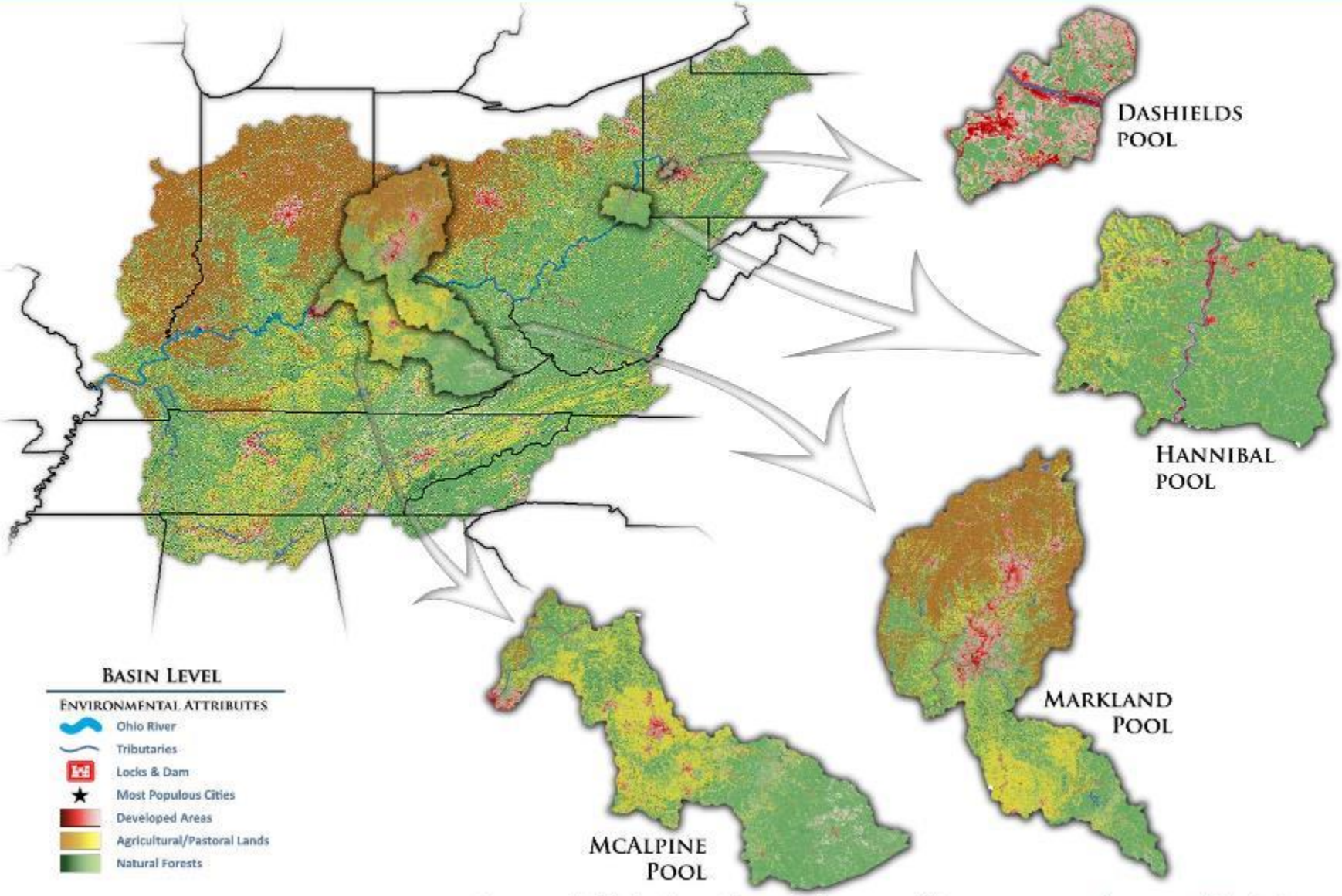
= fitted regression line w/ 95% CI

ORSANCO Biological Sampling Overview

- Sample 3-4 pools per annually
  - Fish assemblages (night-time electrofishing)
  - Macroinvertebrate assemblages (Hester-Dendy, kick net)
  - Habitat assessment (benthic substrate, aquatic macrophytes)
- 15 random sites per pool (scores averaged)
  - Collectively represent the condition of pool
  - Scored using a fish (*m*ORFIn) and macro (ORMIn) indices
- 18 river-wide fixed stations (fish, macros, habitat); 2004-present
- River-wide fish tissue collection
  - Additional collections on behalf of IDEM
- Basin-wide mobile aquarium displays

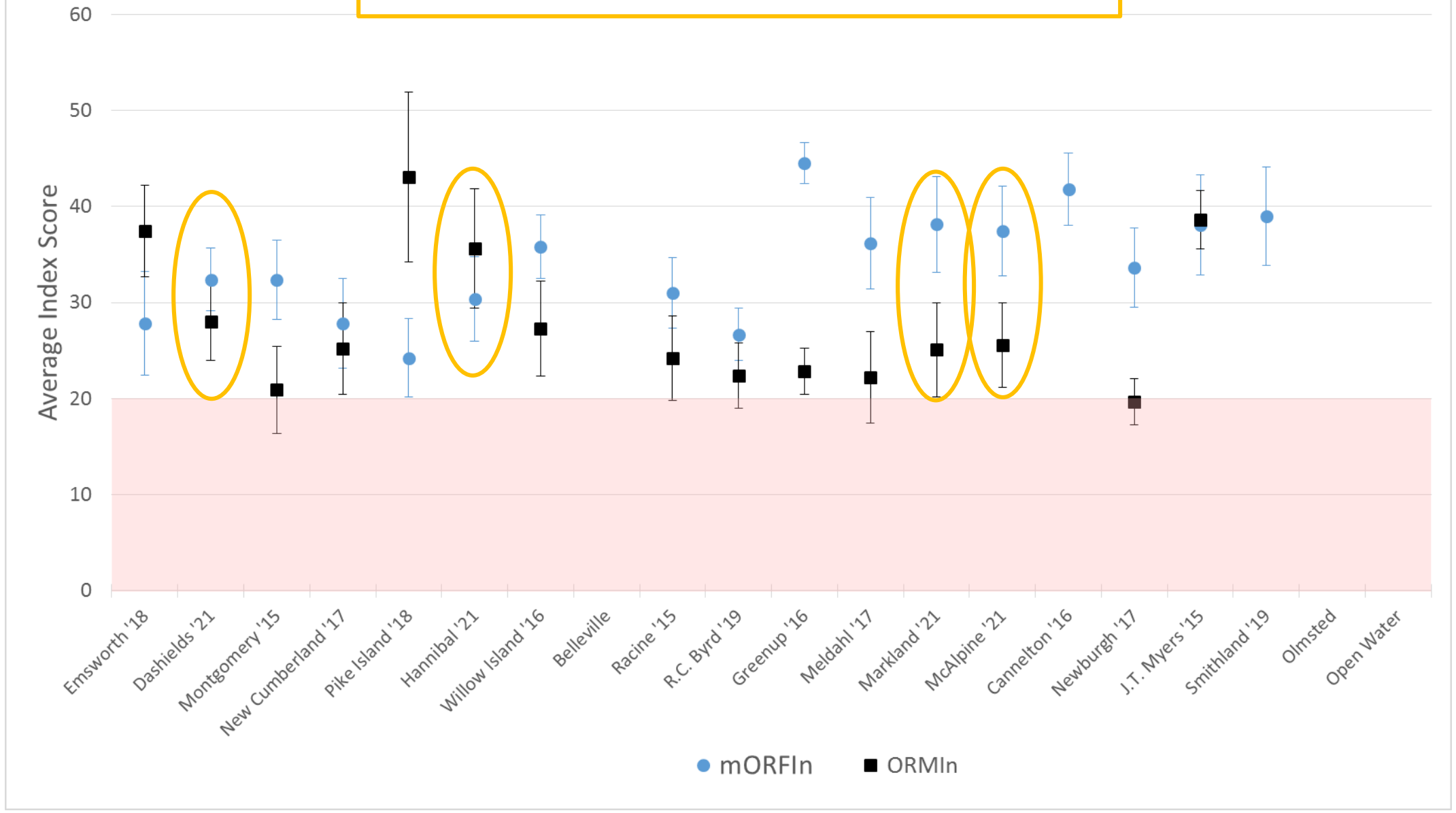
2021 Pool Survey Results

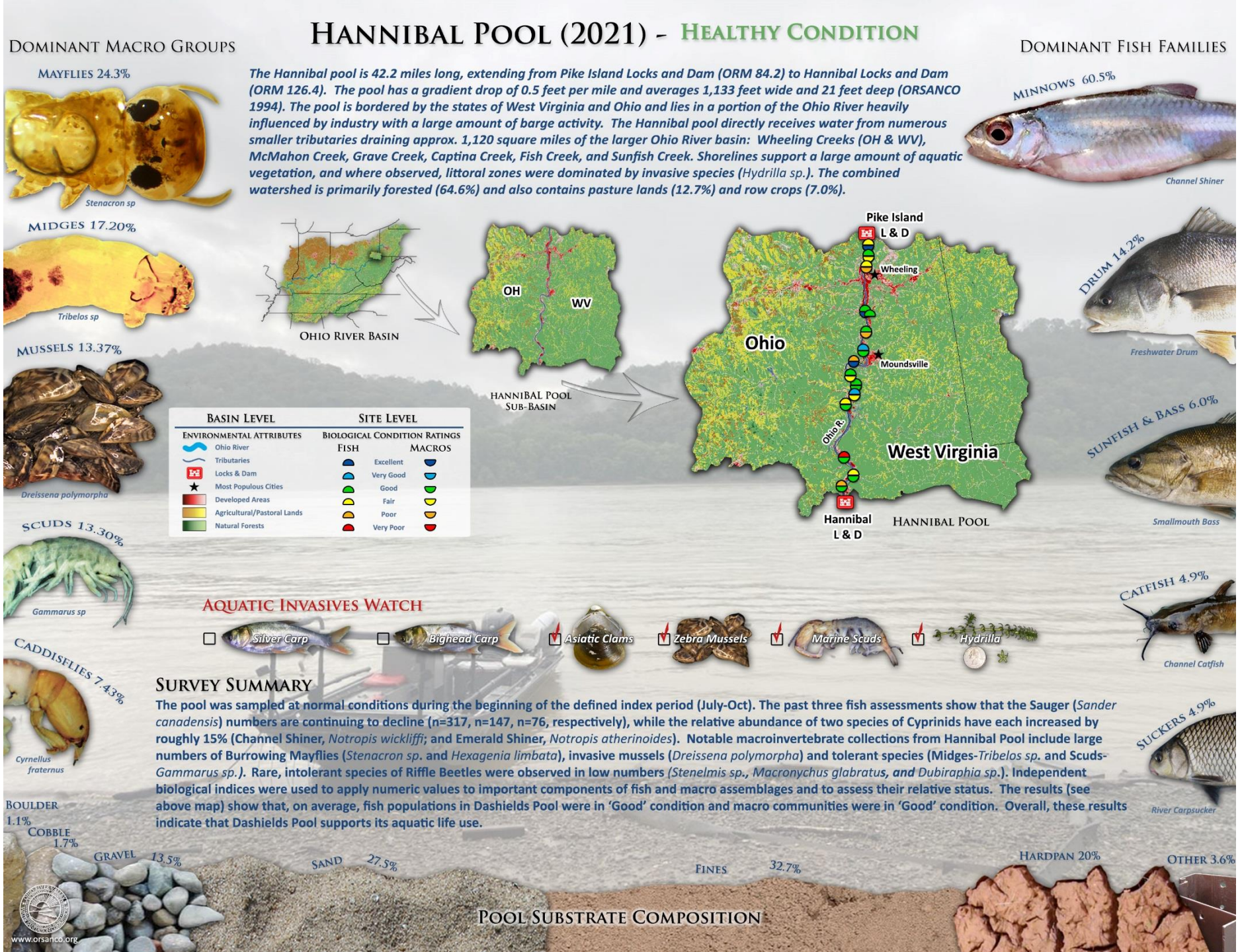
The results of the 2021 biological surveys are detailed in the following pages (relative pool locations shown below). Included are brief descriptions of the land use & hydrology, site level mORFIn & ORMIn ratings, summaries of notible catches & instream habitat, and the overall biological condition of each pool.



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

2021 Final Pool Assessments





2021 Pool Report available online https://www.orsanco.org/publications/pool-assessments/

1-Page Pool Summaries Available upon request

2022 Biological Activities

IDEM FT Collections
John T. Myers

PFAS Added to All
Routine Fish Tissue

Belleville

Tributary Survey
Olmsted

KDOW Metals Samples

Open Water

- 15 random 500m sites per pool
  - Fish Community
  - Macroinvertebrate Community
  - Fish Tissue Collections
  - Instream Habitat & SAV
  - Paired Water Quality Samples
  - Special Projects

Locks and Dams
Fixed Stations
Major Tributaries
Belleville Pool
JT Myers Pool
Olmsted Pool
Open Water
Ohio River
Ohio River Basin

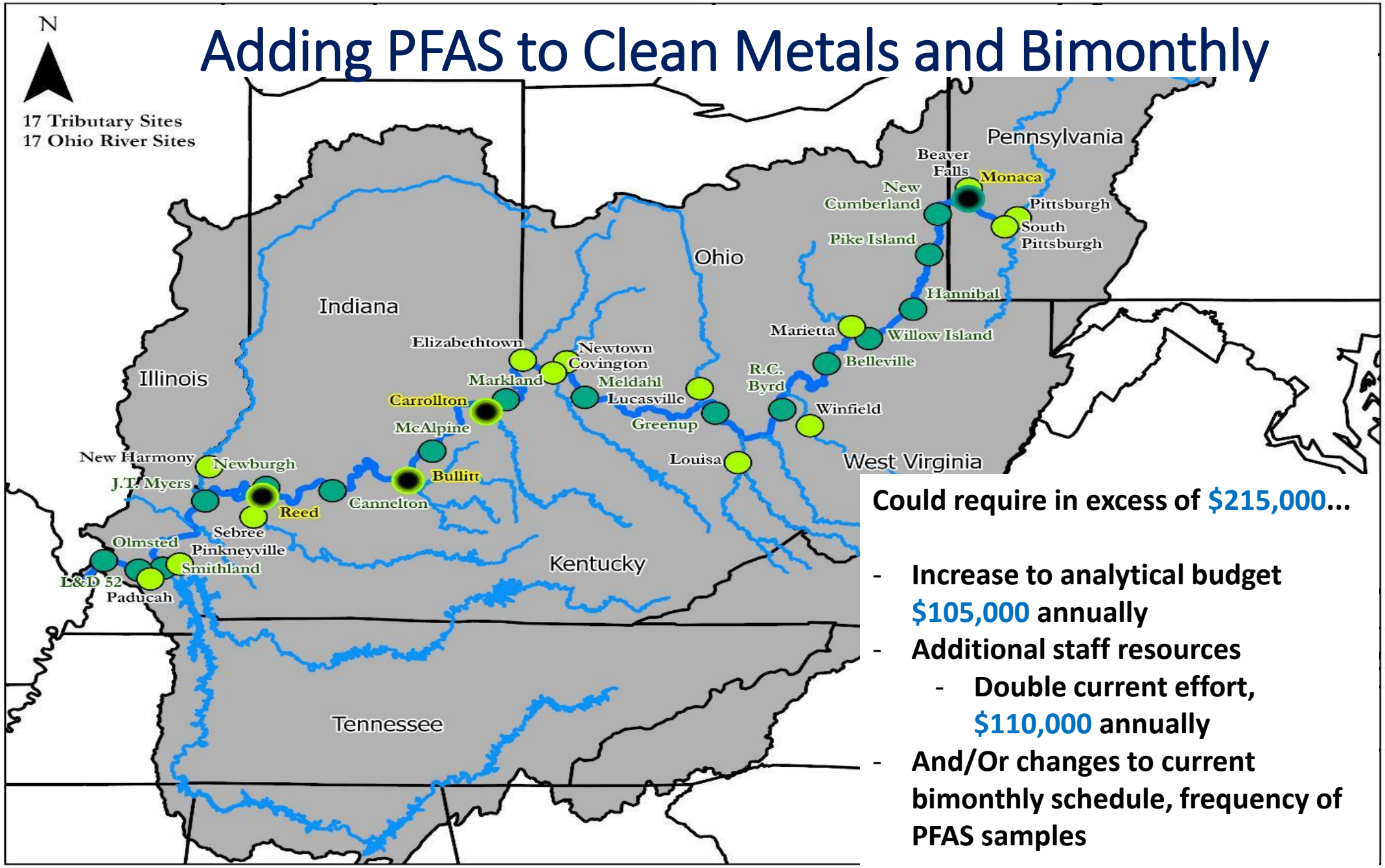
Preliminary Ohio R. Fish Tissue PFAS Data

Composite ID	Species	PFOA mg/kg	PFOS PPB ug/kg	PFOS PPM mg/kg	Program
2021-459-2.5	Smallmouth Buffalo	ND	4.7	0.0047	IDEM
2021-460-4C	Channel Catfish	ND	1	0.001	IDEM
2021-464-4C	Channel Catfish	ND	1.1	0.0011	IDEM
2021-487-2.5	Smallmouth Buffalo	ND	2.3	0.0023	IDEM
2021-525-12	Spotted Bass	ND	14	0.014	IDEM
2021-528-9.7	Redear Sunfish	ND	4.9	0.0049	IDEM
2021-558-9	Bluegill	ND	13	0.013	IDEM
2021-585-10	Smallmouth Bass	ND	7.3	0.0073	IDEM
2021-590-12	Spotted Bass	ND	10	0.01	IDEM
2021-597-9	Bluegill	ND	9.7	0.0097	IDEM
2021-600-12	Spotted Bass	ND	8	0.008	IDEM
Great Lakes Consortium for FCAs (fish muscle)		-	>10	>0.01	
Draft USEPA Criteria (fish muscle)		0.125	2910	2.91	

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

Existing Ohio River FCA more restrictive for Hg and PCBs

Adding PFAS to Clean Metals and Bimonthly

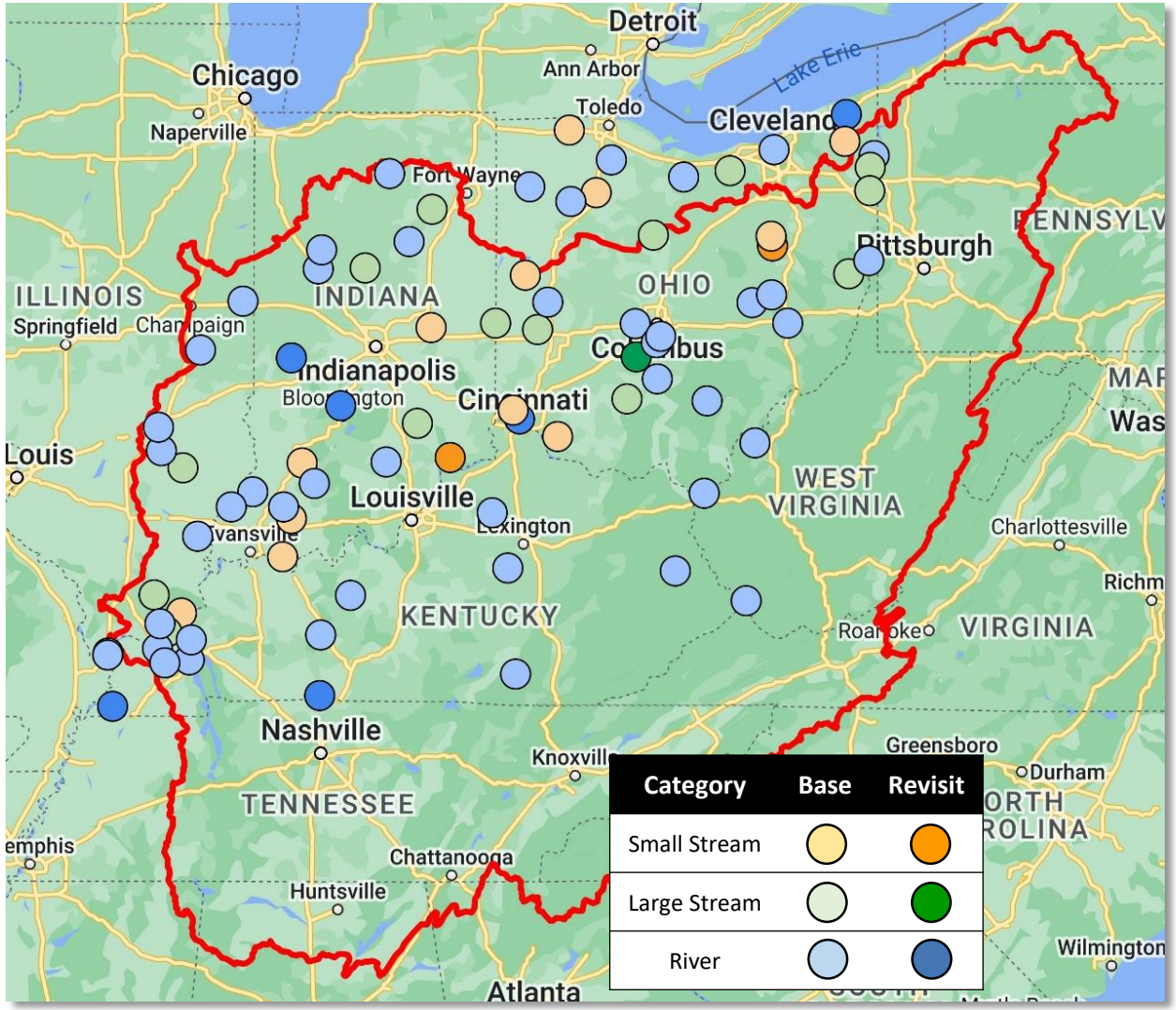


Could require in excess of $215,000...

- **Increase to analytical budget $105,000 annually**
- **Additional staff resources**
  - **Double current effort, $110,000 annually**
- **And/Or changes to current bimonthly schedule, frequency of PFAS samples**

2023/24 ORSANCO NRSA Events

- 92 Events in 4 Ohio River Basin States
  - OH – 40
  - KY – 16
  - IN – 23
  - IL - 13
- Funding begins Oct. 2022 (FY23-FY25)
  - $579,600 total income
  - ½ covers works, ½ cover personnel time
  - New equipment, better assist states
  - ↑ Staff experience, Basin knowledge
  - Funds Contractual Aq. Biologist
    - Early 2023 – Oct. 2024
- Annual Monitoring Impacts
  - 2x normal field season travel weeks
  - Decrease to 2 pool surveys in ‘23 & ‘24
  - Possibly impact fixed station surveys & Aquarium displays



2021 BWQSC Recommendations – Completed

1. Approve the use of fish survey results from Dashields, Hannibal, Markland, and McAlpine in final 2021 pool assessments.

2. Review Dashields, Hannibal, Markland, and McAlpine macroinvertebrate data with the BWQSC for potential use in final 2021 pool assessments, once data are available.

3. Conduct 2022 biological surveys in Belleville, John T. Myers, and Olmsted pools, as well as six probabilistic sites in the open water section below Olmsted Locks and Dam.

4. Add analyses for PFAS compounds to all ORSANCO Ohio River fish tissue collections.

5. Evaluate the necessity to recalibrate biotic indices following the 2022 field season. **- TBD**

6. Support the analytical methods used in evaluating potential PCB trends in ORSANCO's fish tissue dataset.

7. Support ORSANCO staff's continued participation in upcoming 23/24 USEPA National Rivers and Streams Assessment (NRSA), recognizing that this may affect concurrent Ohio River activities.

Agenda Item 6:

TEC Members Reports

- IL – Scott Twait
- IN – Brad Gavin
- KY – Katie McKone
- NY – Melanie Stein
- OH – Audrey Rush
- PA – Kevin Halloran
- VA – Melanie Davenport
- WV – Scott Mandirola
- USACE – Erich Emery
- USCG – Josh Miller
- USEPA – David Pfeifer
- USGS – Jeff Frey
- CIAC – Vacant
- PIAC – Cheri Budzynski
- PIACO – Betsy Mallison
- POTW – Alex Novak
- WOAC – Angie Rosser
- WUAC – Chris Bobay

229th Technical Committee Meeting

Scott Mandirola, Chair
Presiding
June 14-15, 2022

The meeting will begin at 8:30 A.M. (Eastern). 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."***
- ***If you need assistance during the meeting, please call our office at 513-231-7719 ext. 100.***

Agenda Item 7:

Monitoring Programs to Update Bacteria, PCBs, and Dioxin Data for use in Future 305(b) Assessments.

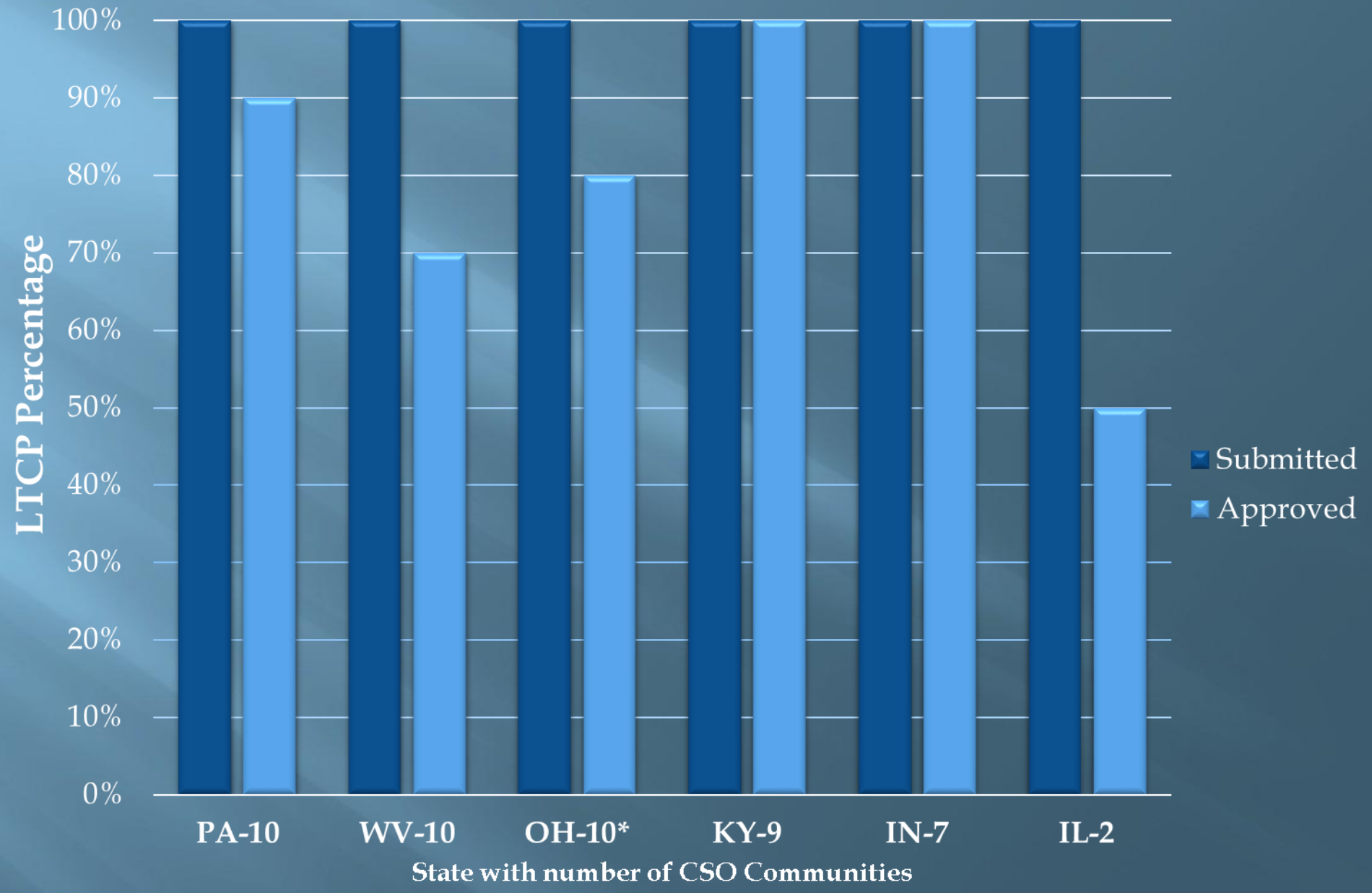
Broad Scan Survey of Unmonitored Parameters Included in the Commission's PCS.

Contact Recreation Use Assessments/Bacteria

- Vast majority of 305b Report Contact Recreation Use Assessment based on longitudinal bacteria surveys collected up until 2008.
- Longitudinal surveys comprised of 5 rounds of sampling were collected every 5 miles.
- Current bacteria monitoring occurs in 6 large CSO communities representing a very small portion of the Ohio River.
- Thus, contact recreation use assessments based on old data.
- A lot of progress has been made by Ohio River communities in wet weather controls in the last decade.
- Therefore, updated bacteria data for the entire river may be desirable.


Pittsburgh
Wheeling
Cincinnati
Huntington
Louisville
Evansville
Chicago
Detroit
Cleveland
Columbus
Indianapolis
Nashville
Lake Erie
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
TENNESSEE
Ohio
Pennsylvania – 10 Communities
West Virginia – 10 Communities
Ohio – 10 Communities
Kentucky – 9 Communities
Indiana – 7 Communities
Illinois – 2 Communities

Status of Ohio River Communities LTCP



*New Boston is not required to submit a LTCP.

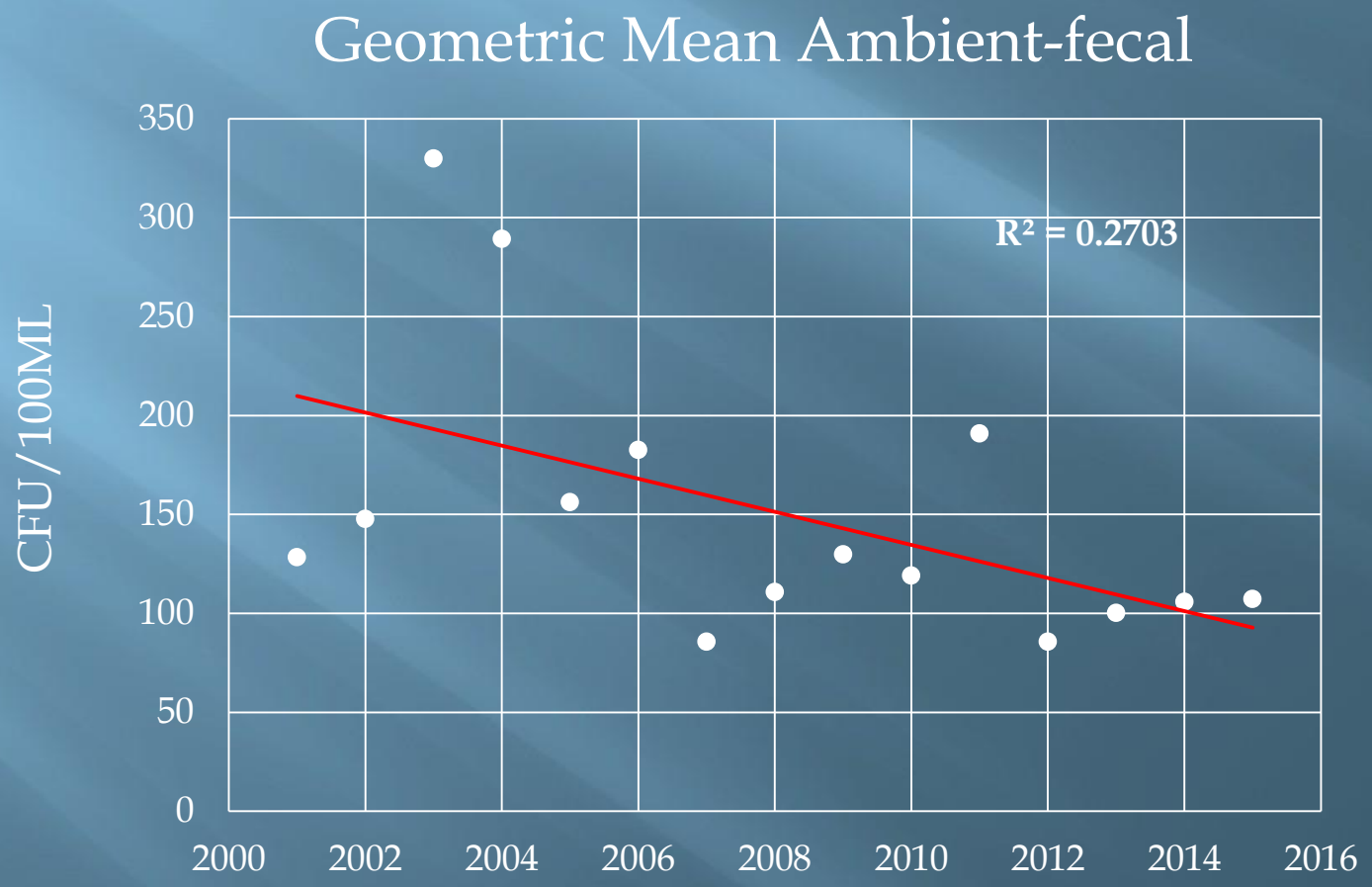
Status Highlights

- ALCOSAN
  - Modified Consent Decree approved
  - Reduce 7 billion gallons by 2036
  - Expand Northside plant from 250 MGD to 600 MGD by end of 2027

- Cincinnati MSD
  - All Phase 1 projects (100) were completed
  - Continued effort on the completion of Bridge projects (25) and early Phase 2A projects
  - Lick Run Greenway project to be completed by Spring 2021.

- Louisville MSD
  - Louisville MSD Waterway Protection Tunnel is projected for completion Spring 2021
  - Shawnee Park CSO Basin Project was named one of the twelve “Infrastructure Game Changers” by the ASCE

Ambient Fecal Bacteria Trend



Geo mean of all sites, river-wide, by year. p=0.047

-When all factors are considered, it appears to be a significant decrease in bacteria concentrations in the Ohio River between 2001-1015.

-Likely a combination of several management practices, including CSO/SSO reduction, better agriculture maintenance, septic upgrades, stormwater BMPs, etc

Recommendation

- Updating bacteria data river-wide is needed as recommended by the 305b Work Group.
- Challenges
  - Bacteria levels are highly variable based on wet weather sources.
  - Bacteria criteria to protect contact recreation are based on 5 samples collected over 30 days.
  - ORSANCO does not have the staffing alone to complete a comprehensive bacteria sampling effort to support a reassessment of the contact recreational use.
- Convene work group to develop recommendations for a contemporary monitoring program to reevaluate contact recreation use assessments.

PCBs & Dioxin Fish Consumption Updates

- PCBs and Dioxins were collected in the water column until 2004 using “High Volume” sampling.
- Fish consumption use was evaluated based on sampling every 50 miles.
- All samples much higher than criteria.
- Challenges:
  - High vol sampling necessary to evaluate parts per quadrillion criteria.
  - Time and staff intensive.
  - Analytical costs are very expensive.

Dioxin Data

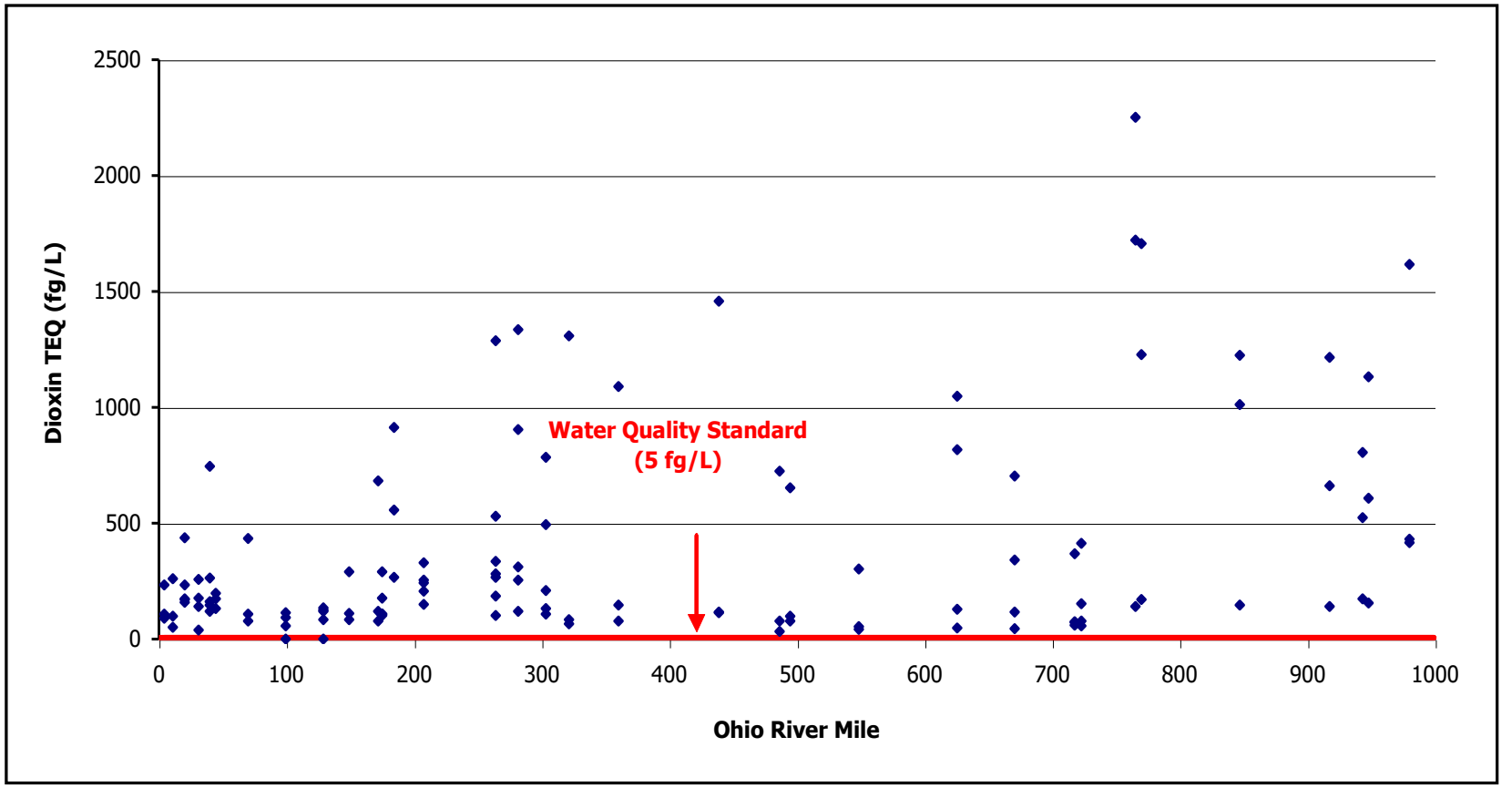


Figure 10. Dioxin TEQ concentrations in the Ohio River (1997-2004).

PCBs Data

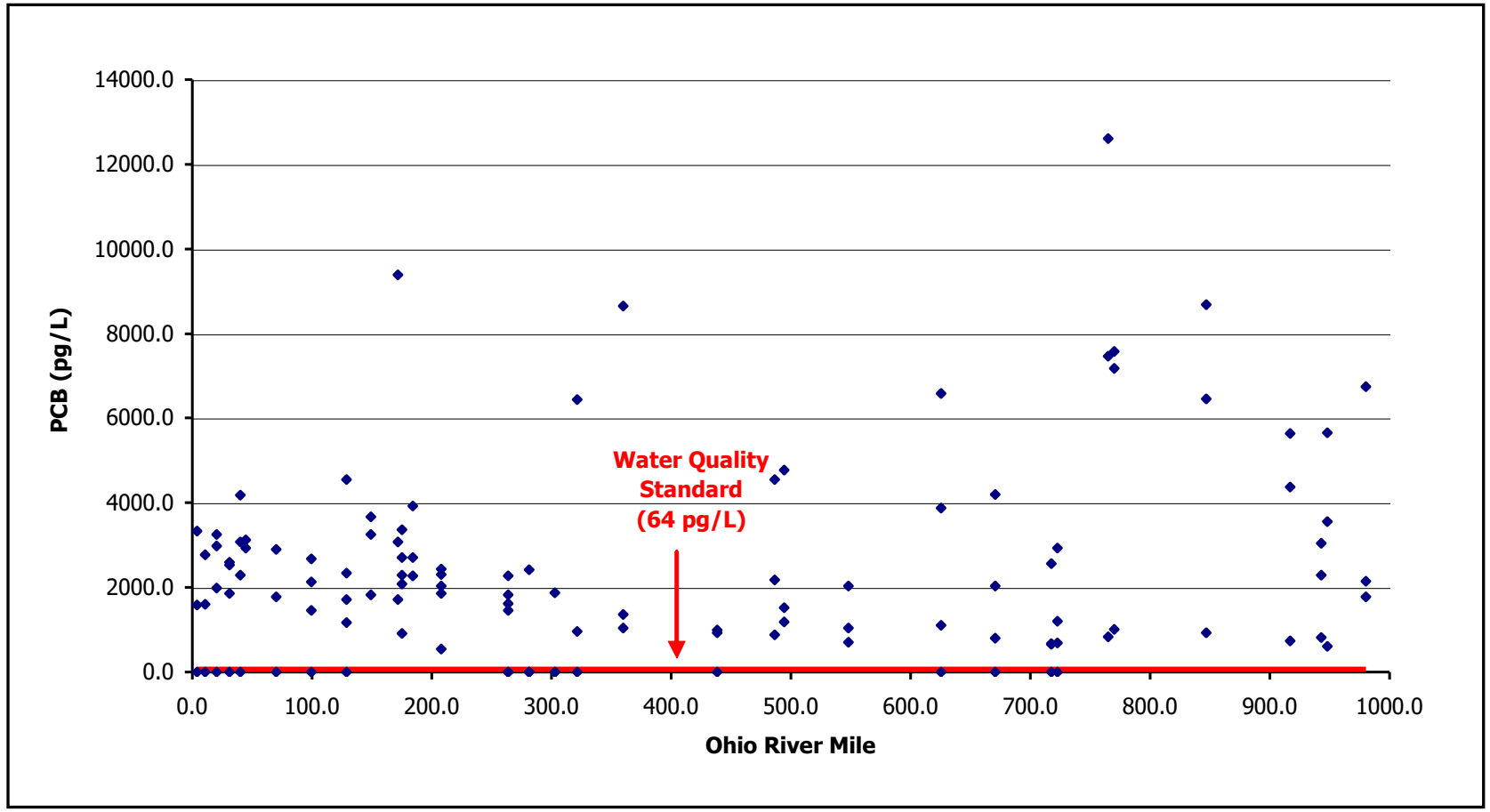


Figure 11. PCB data from the Ohio River collected from 1997-2004.

Recommendation on PCBs & Dioxin

- 305b Work Group recommends updating PCBs and Dioxin data.
- Lower priority than bacteria data update.
- Establish Work Group to evaluate options for sampling plan to update PCBs and Dioxin data.

Broad Scan Survey

- Only a small subset of water quality parameters contained in ORSANCO's Pollution Control Standards are included in our routine monitoring programs.
- A survey of 104 parameters included in the PCS but not routine monitoring programs was completed in 2013.
- EDI sampling was completed for two rounds of sampling at 3 locations (upper, middle and lower river).
- There were no detections of any parameters.
- Objectives of this work to determine if additional parameters should be included in routine monitoring.
- Recommendation is to repeat the suvey but need a team to review specifics of the monitoring effort.

Agenda Item 8:

Source Water Protection & Emergency Response Updates

Sam Dinkins

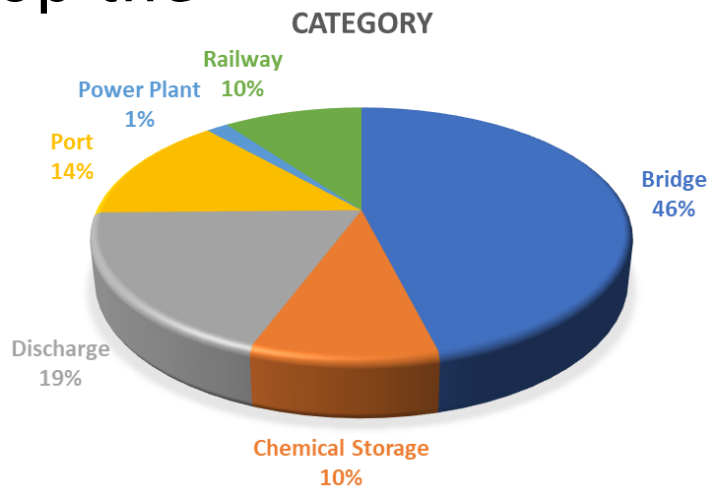
Outline

1. Contaminant Source Inventory
   - WaterSuite Project Status
2. Organics Detection System Status Update
3. Emergency Response Update
   - Recent Spill Updates

Contaminant Source Inventory

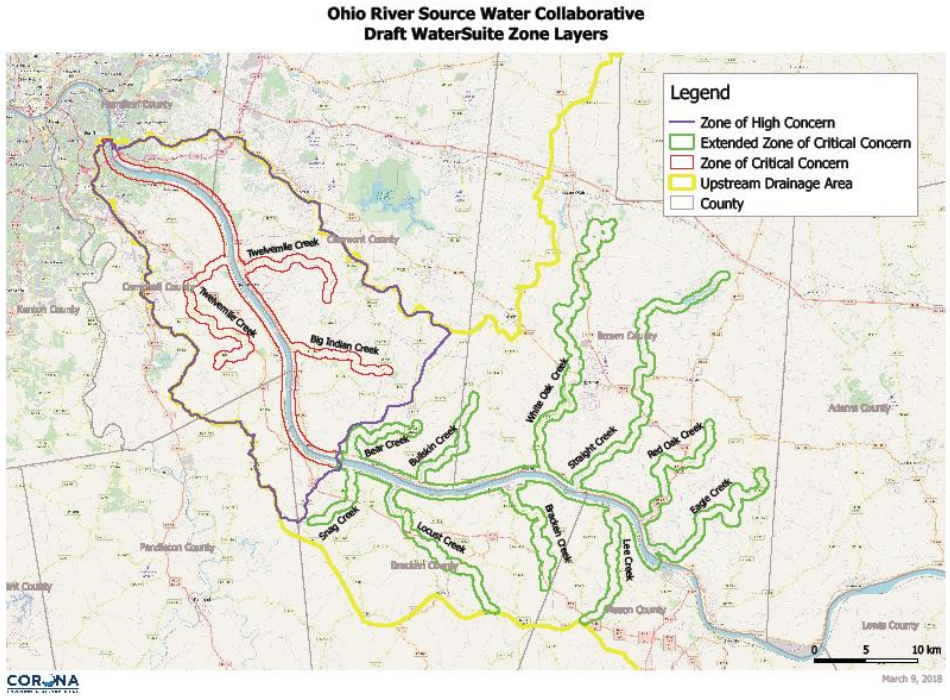
Contaminant Source Inventory Projects

- Objective: **Develop GIS database tool to assist water utilities in assessing potential water quality risks.**
- Utilizes WaterSuite software to map contaminant threats and associated information
- US EPA provided funding to develop the platform

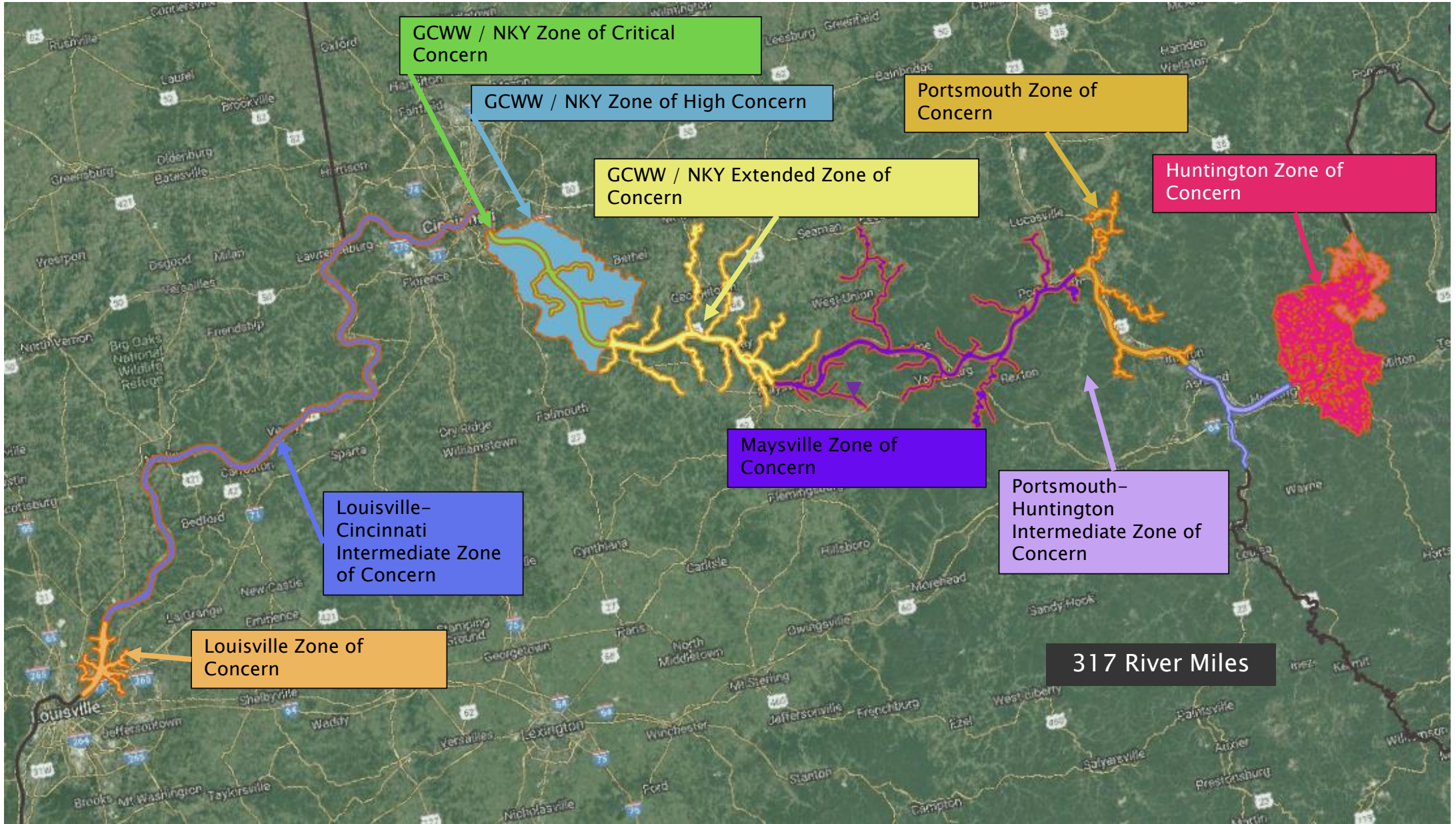


Ohio River Contaminant Source Inventory Project

- Phase 1 – Maysville to Cincinnati
  - Initial mapping completed Fall 2018
- Phase 2 –
  1. Extend study area to upstream of Portsmouth, OH
  2. Evaluate source water protection and emergency response priorities
  3. Update Tier II data
- Phase 3 –
  - Further extended area (Louisville, KY to Huntington, WV)



Ohio River Project Area



Allegheny River Project

- Similar effort as the Ohio River Project
- Numerous Allegheny River utilities participating
- Municipal Authority of Westmoreland County also engaged
  - Youghiogeny and Monongahela Rivers
- Experienced challenges receiving Tier II Hazardous Chemical Storage Data

Next Steps

- US EPA funding ends June 30, 2022

- Allegheny Project meeting
  - June 18 in Pittsburgh, PA
- Ohio River Project meeting – June 23
  - June 23 (Virtual)

- How will the WaterSuite Projects be managed in the future?
- Need to setup meetings with utility partners
- Possible role for ORSANCO

Organics Detection System Update

ODS Operation & Maintenance

- 16 active ODS sites, 13 currently operational
  - Chemours (Parkersburg, WV) – Possible issue with Mass spec.
  - Huntington, WV – issues with lab contamination (i.e. paint)
  - Hays Mine (Pittsburgh, Monongahela) – on-site ODS operators have left; in transition for new staff
- Staff performed 13 service visits since January
  - Autosamplers, SAM (on purge & trap), contamination, FID issues
- Monitoring Station Relocations:
  - Evaluating Thomas More University Field Station as possible relocation for Maysville ODS site
  - In discussion with WV DEP for potential alternative location for former St. Albans site on Kanawha River

Additional ODS Program Updates

- Chromeleon Software installed at ORSANCO HQ
  - All sites complete
- Beginning stages of data management and alert system development
  - RedHawk Technologies
  - Feasibility Study should be completed in 4-6 weeks
- STAG Grant- Applied for 2 STAG grants through Sen. Brown (OH) and Sen. Capito (WV) to provide partial funding for ODS instrumentation replacement
- Planning stage to create training/media content in near future
  - Quick Reference Guides, videos, step by step tutorials

Emergency Response Update

Notable Spill Events

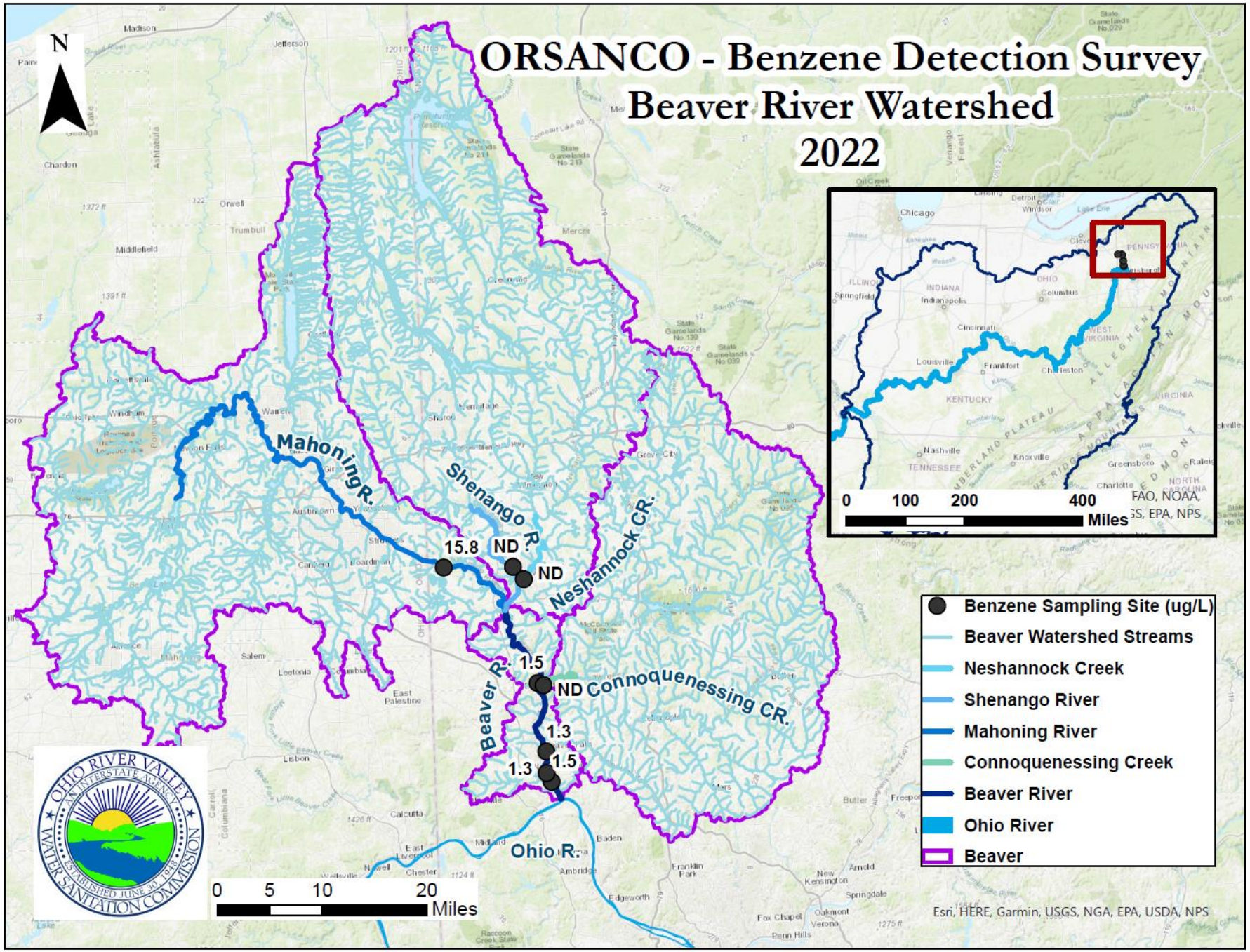
- Feb1, 2022 – Benzene detects at multiple ODS station
- Mar 5, 2022 – Diesel released to Dutch Creek, Wilmington, OH
  - Originally reported 80,000 gallons
  - Incident Command requested ORSANCO conduct water quality sampling
  - Some detections observed in Little Miami River
  - No issues on the Ohio River
- May 26, 2022 – Train derailment near Oakmont, PA
  - Multiple tanker cars derailed into Allegheny River
  - 4 cars carrying petroleum distallates (30,000 gallons each)
  - Low-level detections at ODS monitoring stations at Pittsburgh Water and West View Water

Timeline of Response to Benzene Detections

- Feb 1, 2022 – First detected Midland, PA
  - No spills reported
- Feb 4 – West View Water detects styrene in samples dating back to Jan 29
- Feb 6 – USEPA/PADEP collect samples upstream of West View
  - All non-detect
- Feb 9-10 – ORSANCO staff determine West View GC malfunctioned resulting in false-positive for styrene at West View

Timeline (cont.)

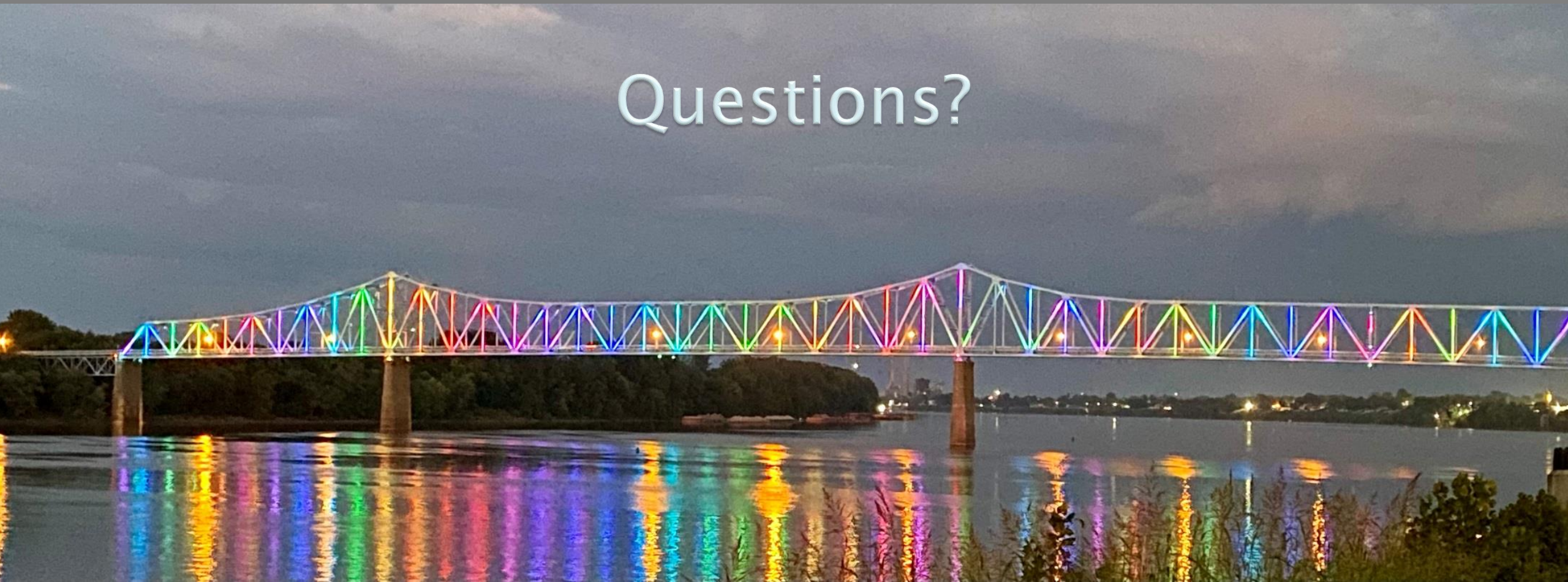
- Feb 11 – Beaver Falls receives results of benzene detection from Feb 2
- Feb 11 – ORSANCO detects benzene in Beaver River
- Feb 12 – ORSANCO samples throughout Beaver Watershed
  - Results indicate source is on the Mahoning River
- Feb 16 – OEPA/PADEP conducted sampling
  - Source is isolated to 4-mile stretch of Mahoning R. near Lowellville, OH


ORSANCO - Benzene Detection Survey
Beaver River Watershed
2022
N
Mahoning R.
Shenango R.
Neshannock CR.
Beaver R.
Connoquenessing CR.
Ohio R.
15.8
ND
ND
1.5
ND
1.3
1.5
1.3
Benzene Sampling Site (ug/L)
Beaver Watershed Streams
Neshannock Creek
Shenango River
Mahoning River
Connoquenessing Creek
Beaver River
Ohio River
Beaver
0 5 10 20
Miles
0 100 200 400
Miles
FAO, NOAA,
GS, EPA, NPS
Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS
OHIO RIVER VALLEY
AN INTERSTATE AGENCY
WATER SANITATION COMMISSION
ESTABLISHED JUNE 30, 1948

Continued Efforts

- OEPA has since conducted multiple rounds of sampling
  - Source remains unknown
- Benzene continued to be detected at multiple locations for roughly 2 months
  - Beaver Falls last benzene detection May 22
- Two additional peaks occurred starting Feb 19 and March 9

- High water levels have limited sampling efforts
- OEPA plans to sample the week of June 20 provided river levels have dropped sufficiently


Questions?

Agenda Item 9:

HABs Prediction Model

Greg Youngstrom

HAB Prediction Model

Agenda Item 9

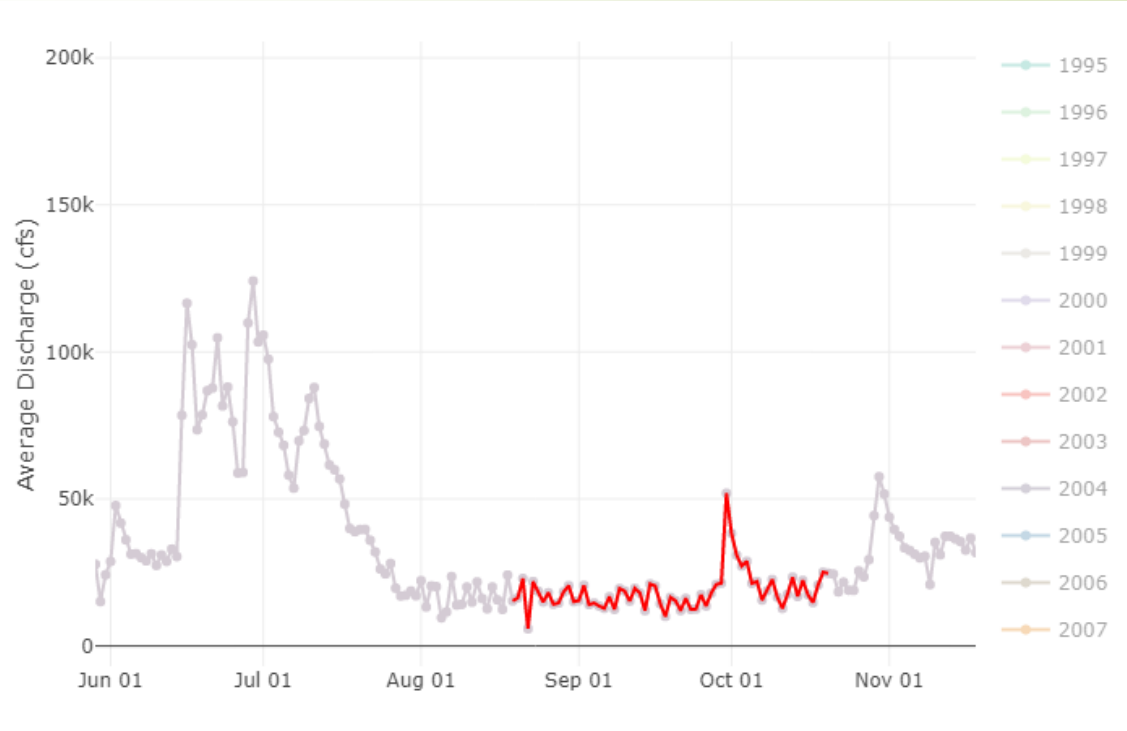
Greg Youngstrom

Background

- Initial funding by USEPA RARE grant
- Purpose was to understand the causes of the 2015 HAB
- Received $24,000/yr for 3 years
- Project team includes USEPA, NWS, ORSANCO, Neptune, Inc.
- Current funding is through Multi-Purpose Grant (ends September 30, 2022)

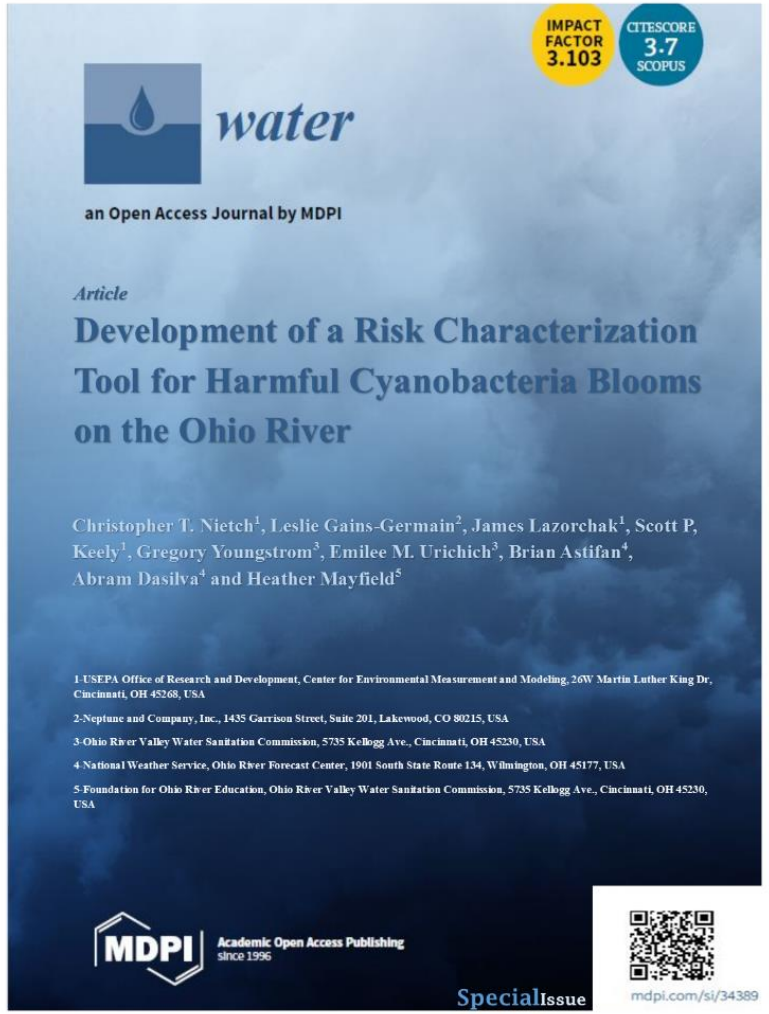
Cause of 2015 HAB

- Significant effort to acquire data from water utilities and states
- Flow pattern different in 2015
- Temperature used as a boundary condition
- Plenty of nutrients all the time

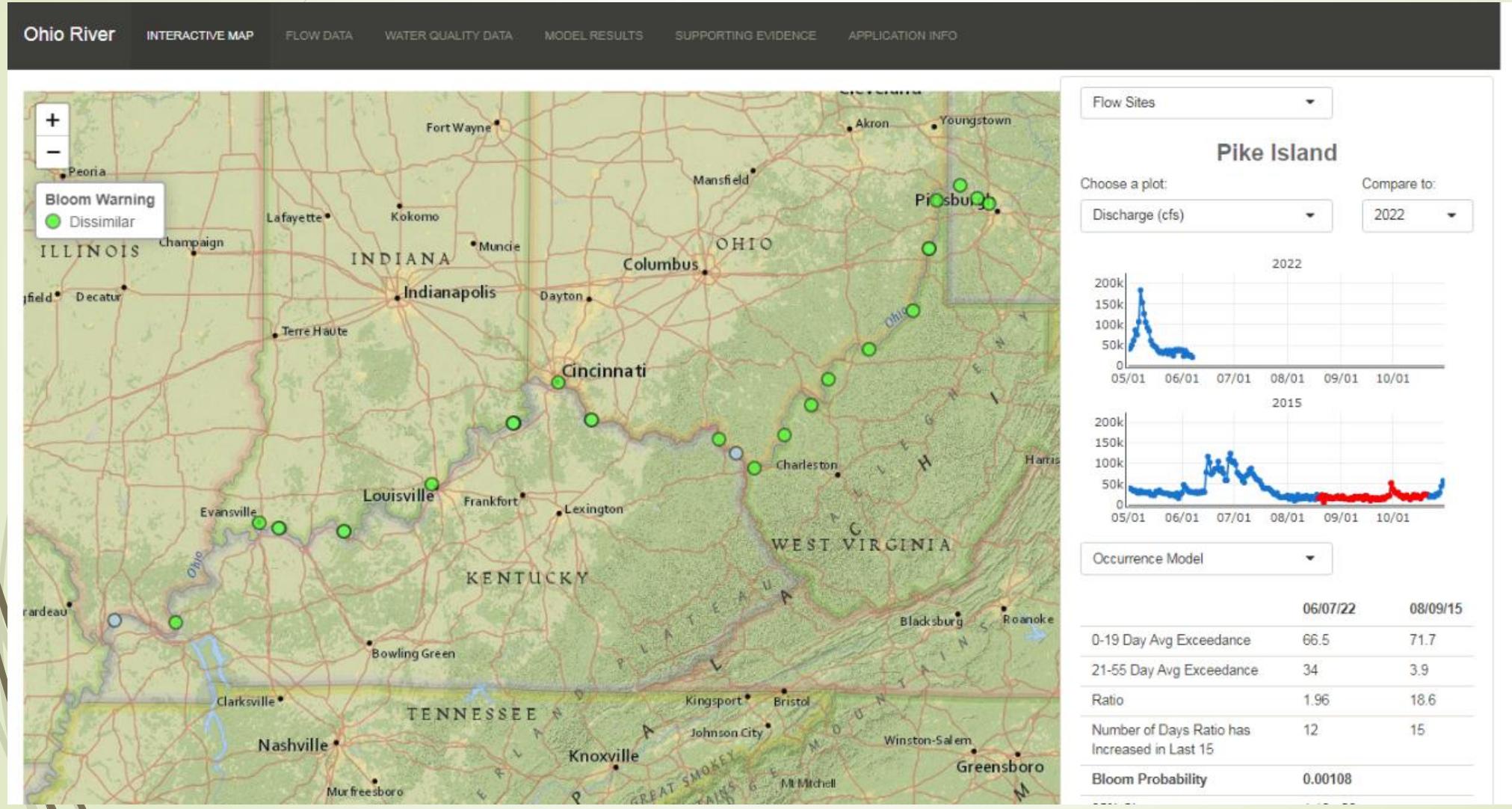


Model development

- "Occurrence" model gives a prediction of whether a HAB will occur this year
- After 2019 HAB added the "Persistence" model to better characterize long term low flow
- Flow data from 20 locations
- Predictions are for each location - not river-wide

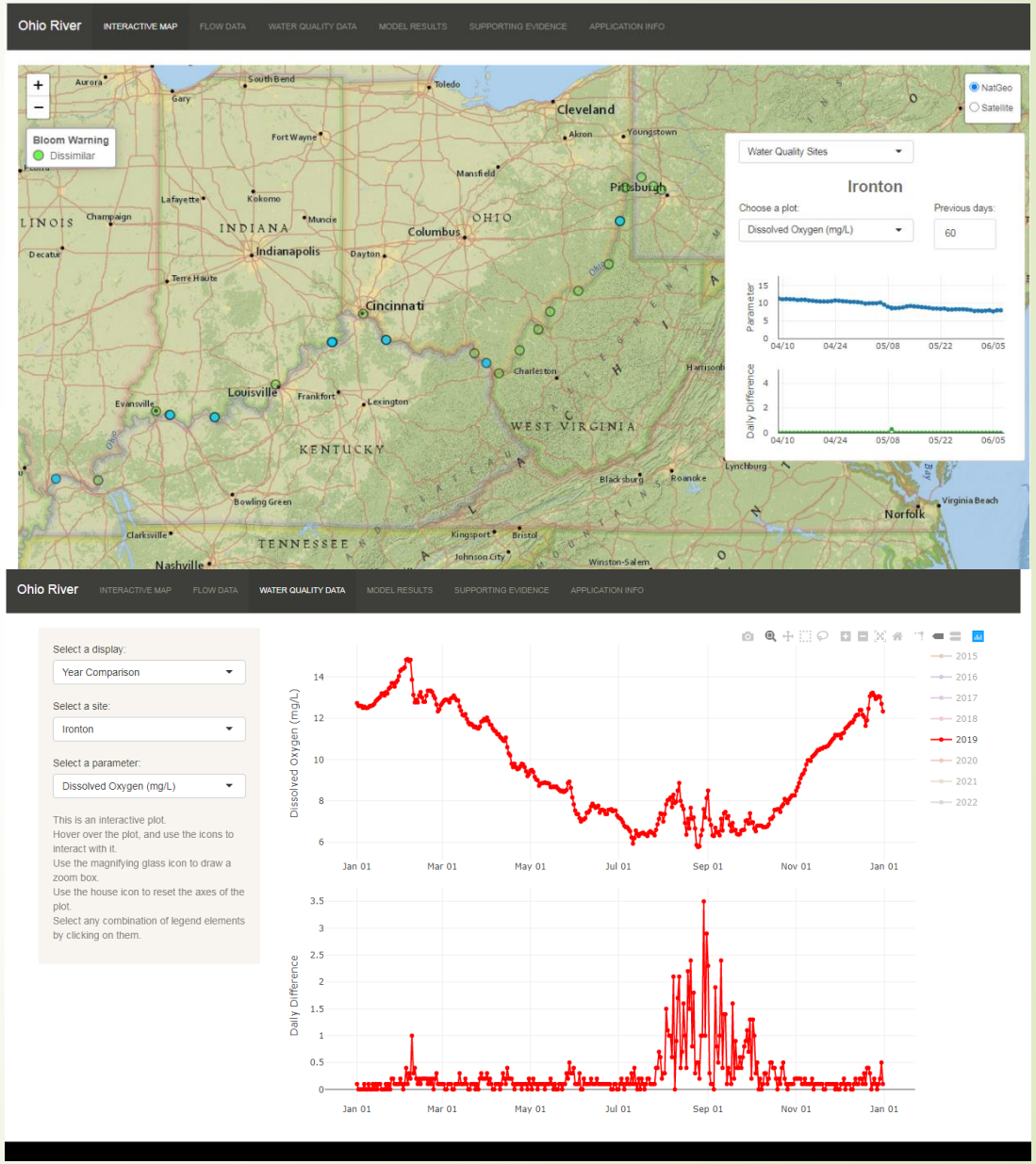


Developed HAB app to visualize data



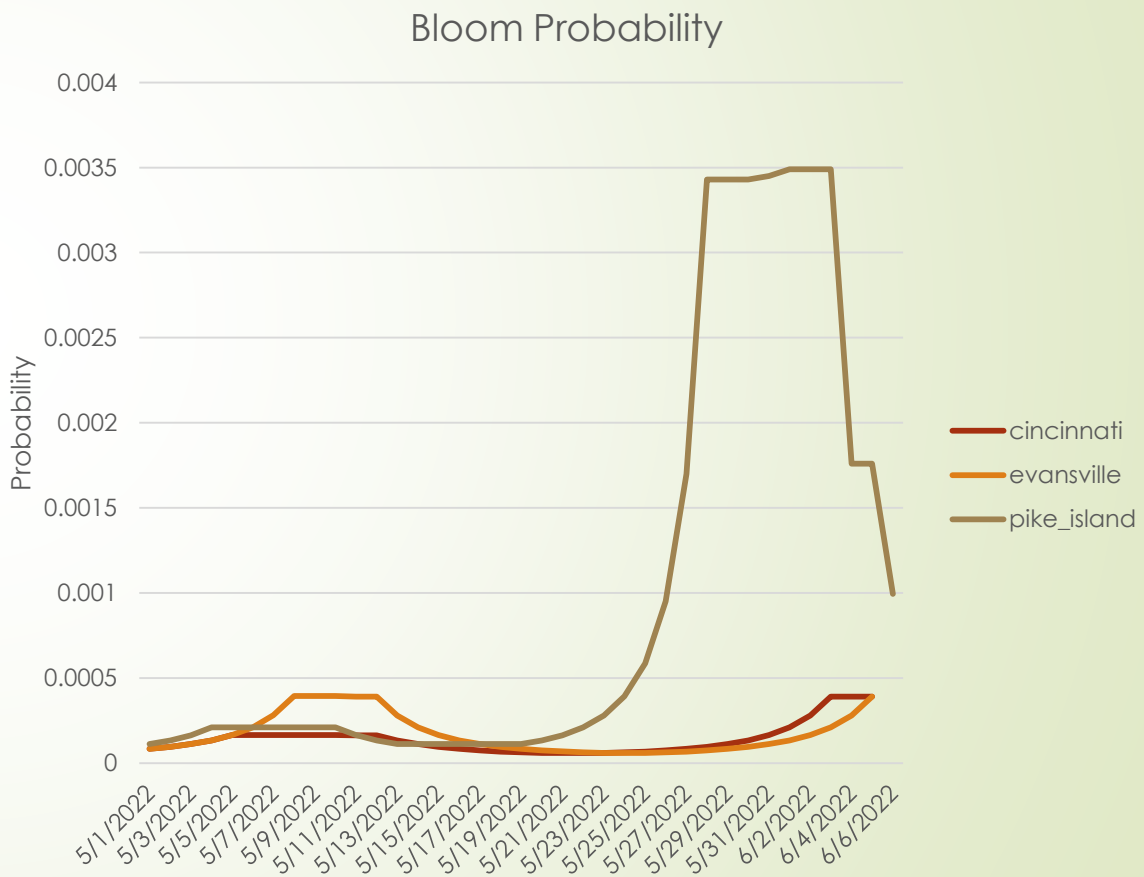
Supporting Data

- Includes data from ORSANCO HAB stations and USGS supergauges
- Data is available as “at a glance” or for more in-depth analysis
- Flow at each station
- Model results
- ORSANCO Bimonthly data



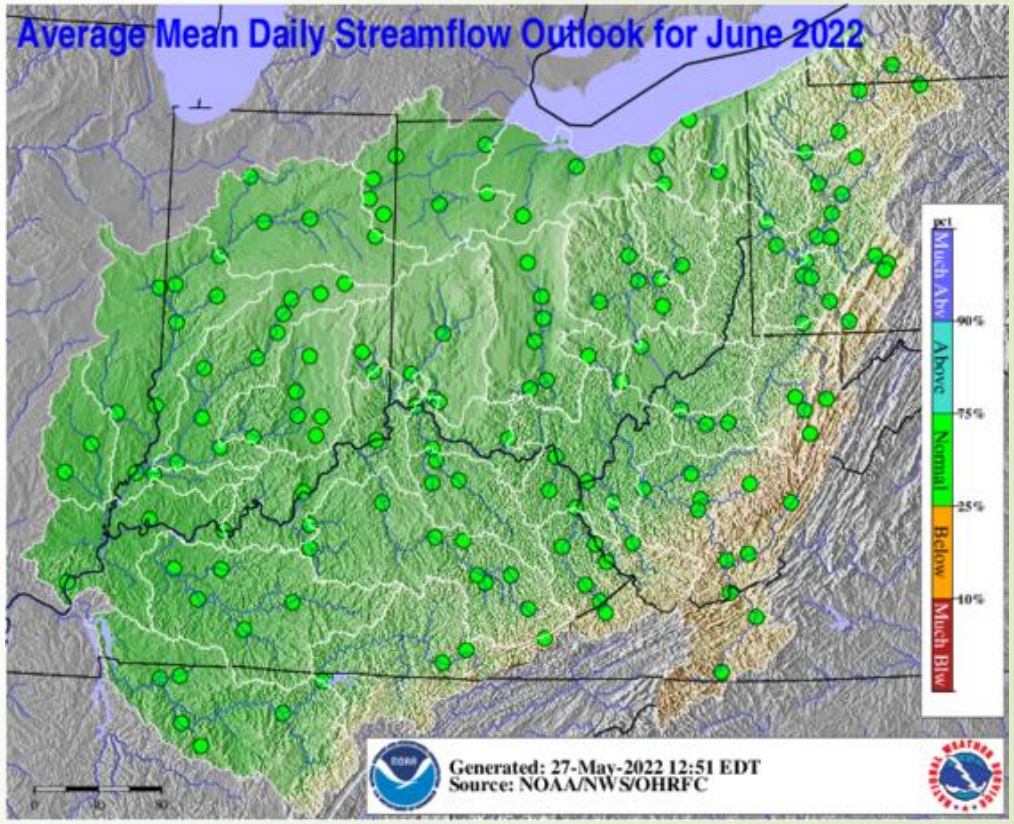
Recent Improvements

- Fixed broken links due to changes in flow gauge availability
- Added download and graphing function for bloom probability
- Add Pike Island and Meldahl HAB stations (July 2022)
- Evaluate moving to HTML/Java Script platform



Next Steps

- Funding
- Add third model for longer range forecast
- Regular fixes of links
- Move to stand alone website



Agenda Item 10:

Preliminary Results of Ohio River Ambient PFAS Survey

Jason Heath, San Dinkins - ORSANCO Staff

Project Status

- Final data has been received from the lab.
- ORSANCO requested several samples be rerun for 6:2FTS because:
  - Unusual looking results.
  - Apparent difficulty in analyzing for this PFAS.
  - First round rerun of this parameter that came back as nondetect.
- Rerun data may be available in July. Flagged in spreadsheet and discussed in the draft report that there may be an update to spreadsheet and report after rerun data is available.
- Data spreadsheets and draft report have been developed and reviewed by PFAS Communications work group, PFAS work group, and TEC.

Study Objective

- Characterize ambient conditions relative to PFASs in the Ohio River at 20 locations
  - Two rounds of sampling (different seasons)
  - Probabilistic-systematic approach used for site selection.
  - Outside of any regulatory mixing zones.

- The survey is not intended to focus on drinking water, but rather develop ambient baseline conditions for the Ohio River.

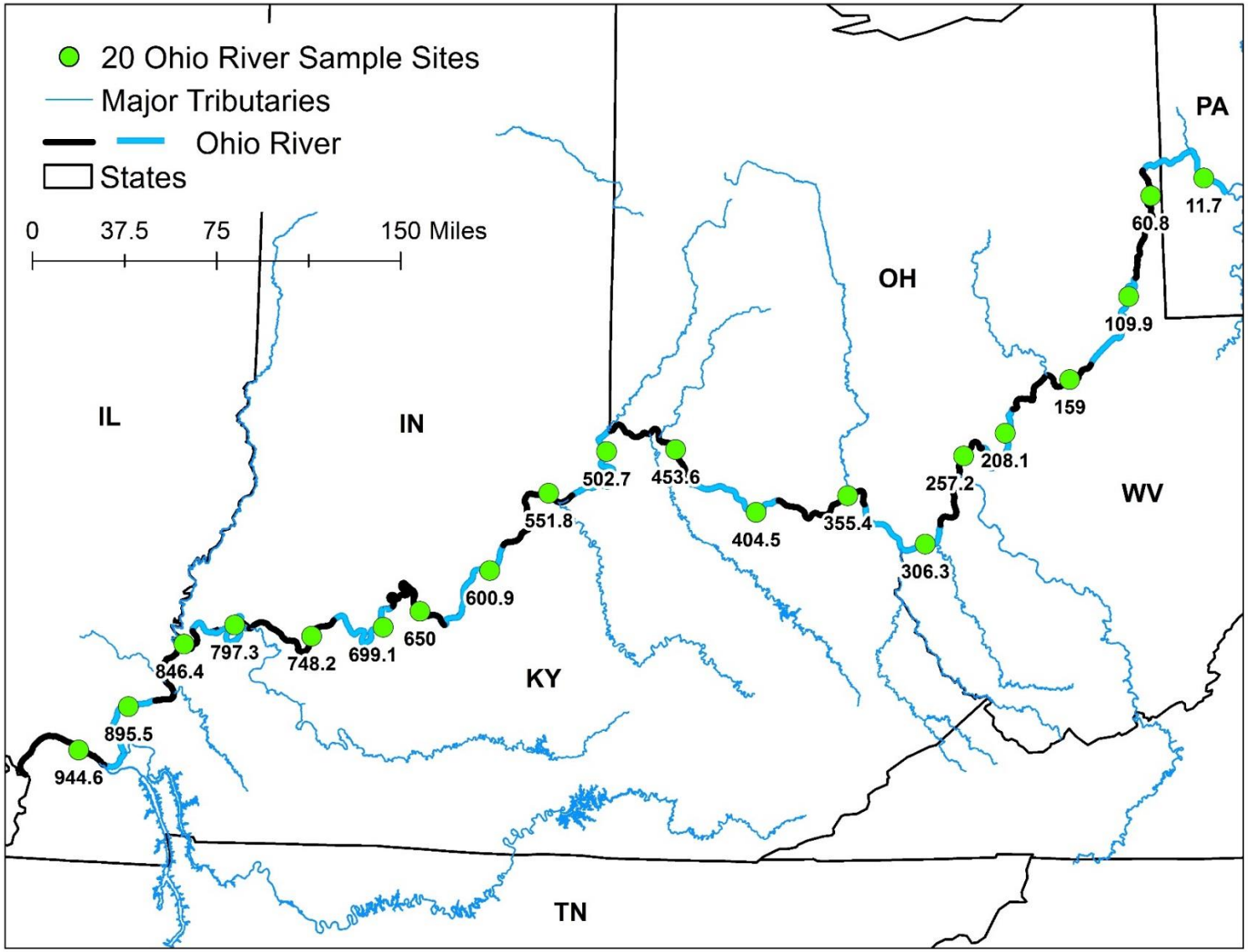
- Results may inform states, EPA, utilities & other interested parties on Ohio River ambient water quality conditions. The Commission is developing a communication plan.

Survey Design

- PFAS Sample Collection
  - 20 Ohio River ambient sites
  - 2 tributaries (Allegheny & Monongahela)
  - 9-point discrete sample collection at 3 sites
  - Conduct test run with field blanks (Spring 2021)

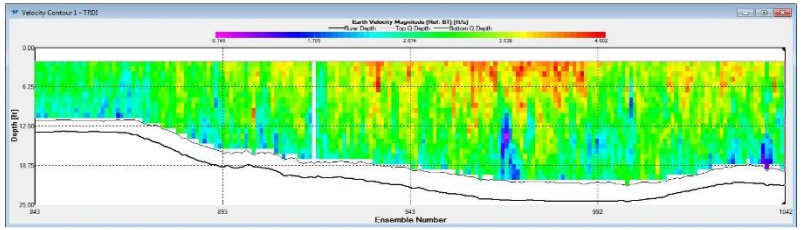
- Survey Timing
  - Round #1: Summer 2021
  - Round #2: Fall 2021
  - Each round requires 6 weeks to complete

Systematic-Probabilistic Approach to Sampling Site Selection



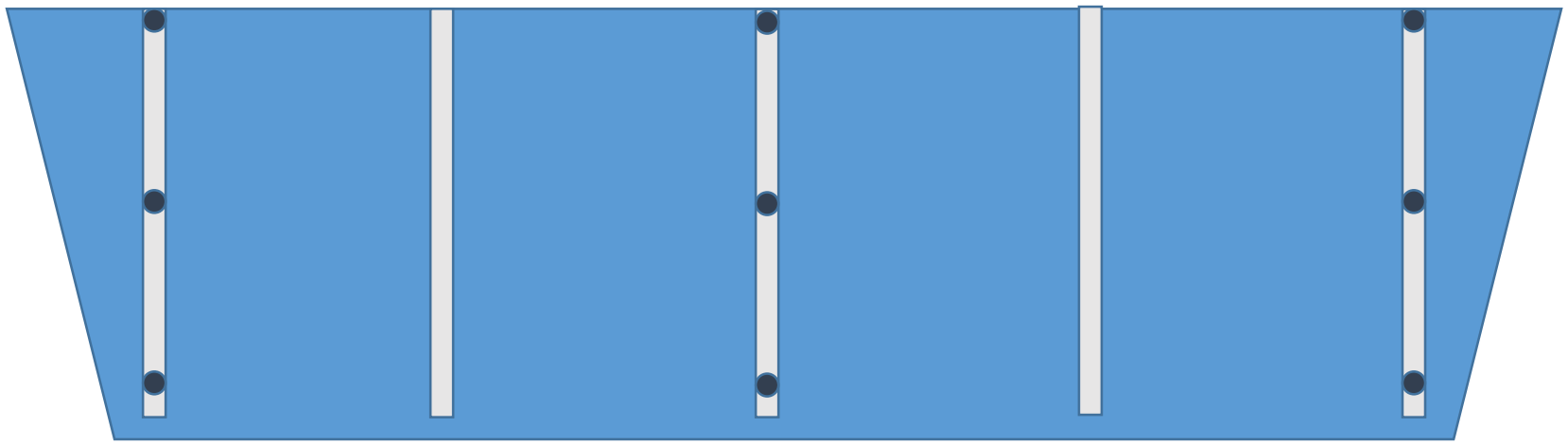
Sample Collection Methodology

- Use EDI (Equal Discharge Increment) method for all Ohio River and tributary sampling locations
  - Flow-weighted, depth integrated cross-sectional sampling provides for a more representative sample collection method
- Discrete samples to be collected at 3 existing EDI sampling sites during the first round, and 5 sites during the second round.
  - Analyze discrete samples separately to gain understanding of vertical and lateral distribution of PFAS in the water column



Discrete Sampling at 3 Transects

- Below diagram represents one transect from the 20 selected sites.
- 9 discrete samples will be collected using a peristaltic pump and silicone tubing.
- The purpose is to investigate how PFASs are distributed in the water column.
- Discrete samples will be collected during the EDI composite sampling.



Sample Analysis

- Analysis performed by US EPA contractor Battelle Laboratories
- Newer DoD lab method (LC-MS/MS)
- 28 PFAS analytes (includes Gen-X)
- QA/QC Samples
  - Equipment blanks – 1 per site
  - Replicates and Matrix Spikes – 3 per round
  - Field blanks & Trip blanks – 1 per week

Since Last Update

Round #1 Completed

- June 15 – July 21, 2021
- 20 Ohio River + 2 tributary sites
- Discrete sampling at 3 sites

Round #2 Completed

- September 29 – October 26, 2021
- Increased number of discrete sampling sites from 3 to 5
  - Added discrete sites at ORM 306 and ORM 355 in round #2, based on round #1 preliminary data indicating a likelihood of greater detections at these locations.

USEPA has completed a passive sampler study at multiple ORSANCO sites to evaluate 3 different sampler technologies.

Observations from Round 1 Preliminary Data

- Every site had detections of multiple PFAS.
- Twelve of twenty eight PFAS were detected; nine were detected frequently.
- Five of twenty eight PFAS were detected above the laboratory LOQ.
- PFOA and HFPO-DA were detected above the LOQ most frequently.
- HFPO-DA had the highest concentration at 32.2 ng/L.
- PFOA was detected at nineteen sites with a range from 4.88 ng/L to 12.90 ng/L.
- HFPO-DA (GenX) was detected at nine sites with a range from 5.63 ng/L to 32.20 ng/L.
- PFOS was detected below the LOQ at every site.
- PFBA was detected at one site at 5.31 ng/L.
- PFBS was detected at three sites with a range from 5.01 ng/L to 6.05 ng/L.
- PFPeA was detected at five sites with a range from 5.76 ng/L to 26.60 ng/l.

Observations from Round 2 Preliminary Data

- Every site had detections of one or more PFAS.
- Nine of twenty eight PFAS were detected; eight were detected frequently.
- Six of twenty eight PFAS were detected above the LOQ.
- PFOA and PFBA were detected above the limit of quantification most frequently, followed by HFPO-DA.
- 6:2FTS had the highest concentration at 28.2 ng/L, followed by HFPO-DA at 12.0 ng/L.
- PFOS was detected at one site at 7.73 ng/L.
- PFOA was detected at seven sites with a range from 5.00 ng/L to 6.82 ng/L.
- HFPO-DA (GenX) was detected at four sites with a range from 5.43 ng/L to 12.0 ng/L.PFBA was detected at eight sites with a range from 5.53 ng/L to 10.30 ng/L.

Preliminary Data: QA Results

- Equipment blanks were collected with every sample
  - All blanks passed acceptance criteria < LOQ with the exception of 6:2FTS in one equipment blank, one field blank, and one trip blank. We've asked for these to be rerun.
- 6 sets of replicates collected
  - All replicates above the LOQ passed acceptance criteria being RPD < 30%
- 1 Batch of Round 2 samples being rerun for concerns with 6:2FTS (one also for PFOS due to lab flag).
- Rerunds possibly available in July.
- All data except reruns have passed final EPA QA review.

Status & Options

- Draft report and data have been presented to PFAS Messaging Work Group, PFAS Technical Work Group, and TEC.

- Data and report could be released with data to be rerun screened out.

- Or wait for rerun data before releasing.

Other Business:

- Comments by Guests
- Announcement of Upcoming Meetings
- Adjourn

Chair, Scott Mandirola