226th Technical Committee Meeting

Commissioner Bruno Pigott, Chairman
Presiding
June 8-9, 2021

The meeting will begin at 1:00 P.M. 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.***

Chairman's Welcome & Roll Call

Commissioner Bruno Pigott

Chairman, Technical Committee

TEC Members Roll Call

- IL – Scott Twait *
- IN – Eileen Hack *
- KY – Katie McKone *
- NY – Jeff Konsella (vacant) *
- OH – Audrey Rush *
- PA – Kevin Halloran *
- VA – Melanie Davenport*
- WV – Scott Mandirola *
- USACE – Erich Emery*
- USCG – Josh Miller *
- USEPA – David Pfeifer *
- USGS – Mike Griffin (Jeff Frey) *
- CIAC – Vacant
- PIAC – Cheri Budzynski
- PIACO – Betsy Mallison
- POTW – Alex Novak
- WOAC – Angie Rosser
- WUAC – Chris Bobay
- Chairman – Commissioner Pigott *
- Executive Director – Richard Harrison *

* Voting member

Agenda for the 226th Meeting of the Technical Committee

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

ACTION ITEMS AND REPORTS

1. Action on Minutes of 225th Technical Committee Meeting*
2. Chief Engineer's Report
3. PFAS Project Update
4. Microplastics in Freshwater Aquatic Environments – Dr. Sherri Mason
5. Ohio River Basin Alliance Abundant Clean Water Objective Update
6. Biological Programs Update
7. Source Water Protection Programs Update
8. Status of Abatement for Ohio River CSO Systems

ADJOURN (5:00 P.M.)/RECONVENE WEDNESDAY (9:00 A.M. - NOON)

9. Technical Committee Member Reports
10. Review of ORSANCO's Bimonthly/Clean Metals Monitoring Programs *
11. FY22 Proposed Technical Programs

OTHER BUSINESS

- Comments by Guests
- Announcement of Upcoming Meetings
- Adjourn

Agenda Item 1:

Request for action on minutes of the 225th Technical Committee Meeting

Chairman Pigott

The minutes were emailed with the agenda package on May 20, 2021

Agenda Item 2:
Chief Engineer's Report

Executive Director Harrison

Agenda Item 3:

PFAS Project Update

Harrison, Heath

Ohio River PFAS Survey Development

1) Study Objectives
2) Site Selection
3) Sample Collection Methodology
4) Selection of Sites for Discrete Sampling
5) Analytical Services
6) Sampling Schedule/QA samples
7) Pre-Survey QA Study
8) USEPA Passive Sampler Study
9) Review of QAPPs, sampling plan, and SOP.

Project Oversight through the PFAS Work Group, Technical Committee, and Commission

- States
- Federal – USEPA, USGS, USACE
- Water Utilities
- ORSANCO Advisory Committees
- ORSANCO Commissioners

- All aspects of the project reviewed by work group, reported in detail to ORSANCO's Technical Committee, and regular updates to Commission.

Study Objective

- Characterize ambient conditions relative to PFASs in the Ohio River at 20 locations, for 2 rounds of sampling under two separate seasons.
  - Secondary objective to generate information about the distribution of PFAS throughout the Ohio River water column.
- The survey is not intended to focus on drinking water.
- Survey will set the baseline to develop ambient conditions that may be repeated in the future to track changes in Ohio River conditions.
- Results may inform states, EPA, utilities & other interested parties on Ohio River ambient water quality conditions. The Commission is developing a communication plan.

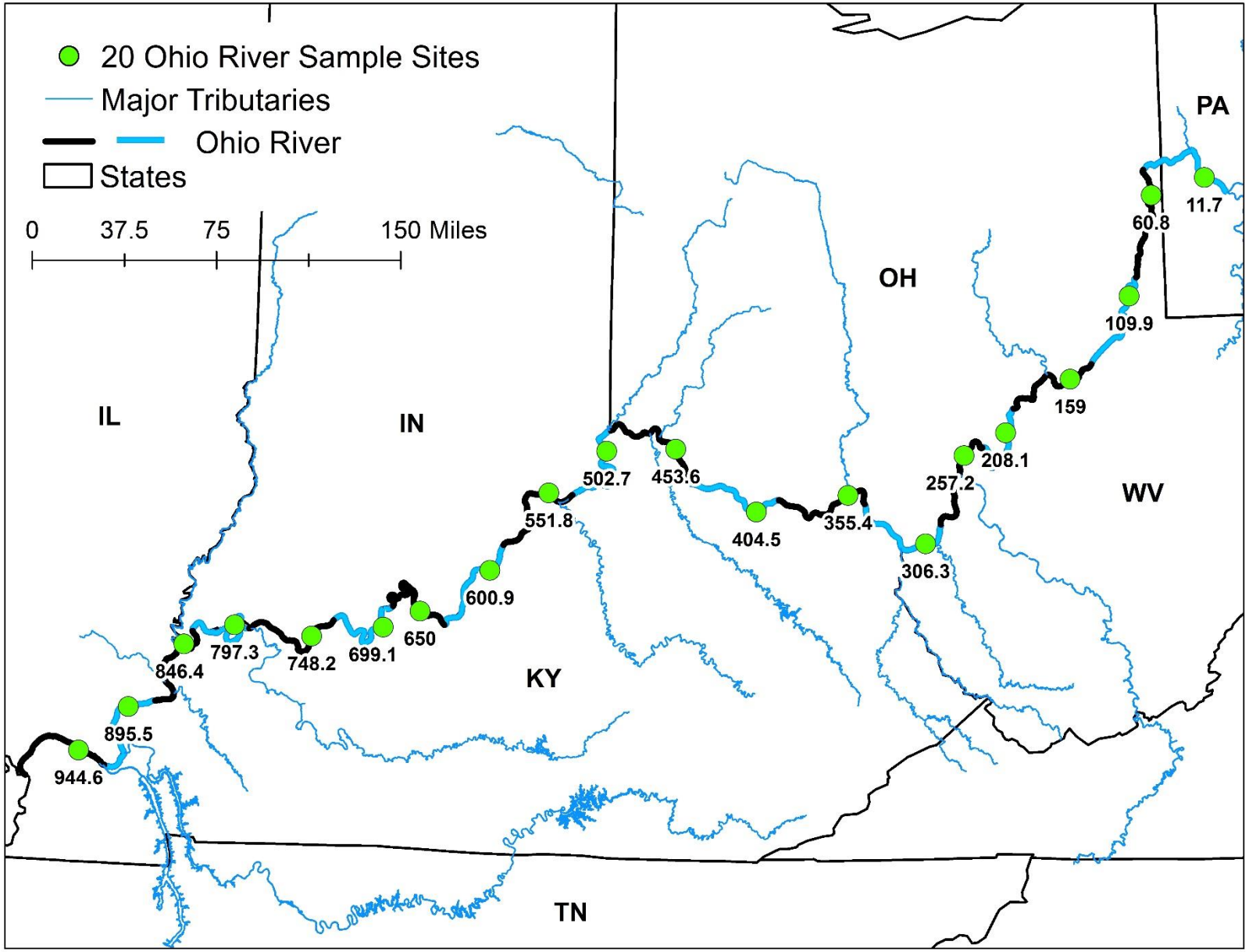
Site Selection

- 20 Ohio River sites.
  - Probabilistic-Spatially balanced selection approach.
  - Sites not within regulatory mixing zones.
  - Site selection has been finalized.

- Probabilistic Spatially Balanced Approach
  - Divided the river into 20 equal length segments (49.05 miles each)
  - Randomly selected the most upstream station

- WV Water Resources Institute requested us to collect 1 Allegheny River and 1 Monongahela River sample during first round with possible second round.

Systematic-Probabilistic Approach



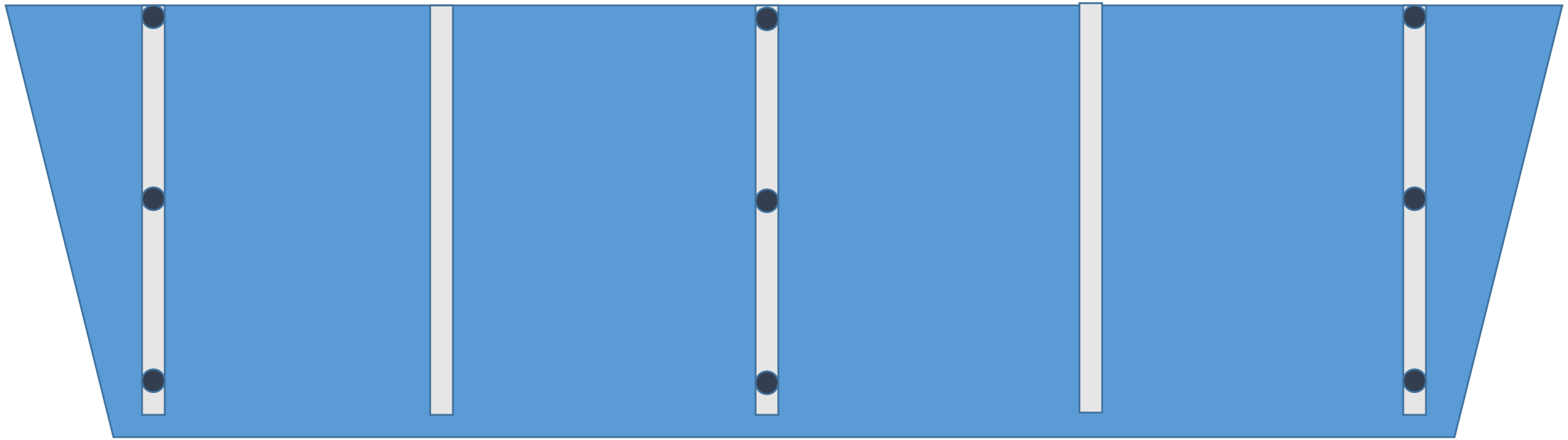
Sample Collection Methodology

- Proceeding with EDI-Equal Discharge Increment Method.
  - Allows for a larger portion of the water column to be sampled and composited to better represent an “average” flow-weighted cross-sectional concentration transect composite.
  - Reduces the uncertainty associated with single point grabs within a very large cross-sectional area where the variability in concentration across the river is unknown.

- Discrete grab samples at 3 existing sampling sites comparing transect composite to discrete grab samples within the transect.
  - 9 single point grab samples at 3 depths and 3 widths (surface, middle & bottom grabs at left-bank, mid-stream & right-bank.

Cross-Sectional View of the Ohio River & Sampling Locations within the Water Column

- Below diagram represents one transect from the 20 selected sites.
- 9 discrete samples will be collected with peristaltic pump and silicone tubing.
- The purpose is to investigate how PFASs are distributed in the water column.
- This will be done on the same day as the EDI composite sample.



Selection of 3 Sites to Conduct the Discrete Sampling Study

- Select 3 sites/transects from the 20 existing Ohio River monitoring stations to conduct the discrete sampling study.

- This will allow for a look at the distribution of PFASs in the water column. Is it well mixed or does it tend to concentrate in a particular part of the water column (such as at the surface)?

- Workgroup recommended selecting stations that might be expected to have detections based on historic data, or sites downstream of significant tributaries that may exhibit incomplete mixing.

Discrete Sampling Sites Selected

- The work group recommended the following three sites for discrete sampling:
  - ORM 257.60 Cheshire, OH (downstream of Parkersburg based on OSU/EPA data).
  - ORM 551.25 5 miles downstream of Kentucky River (8th largest tributary).
  - ORM 600.48 Louisville area.

Analytical Services

- USEPA has secured analytical services with Battelle labs.
- Using DoD compliant Isotope Dilution method based on EPA 537.1.
- Batelle Lab has been certified by DoD.
- 28 PFAS compounds including GenX.
- Flow measurements at every site with ADCP (Acoustic Doppler Current Profiler) instrumentation considers full X-sectional flows.
- Suspended solids, TOC & physical parameters.

PFAS Detection Limits for Surface Water Samples Aqueous Samples per Battelle SOPs based on EPA Method 537.1 and Compliant with DoD QSM Ver. 5.3

Analyte	CAS No.	MDL (ng/L)	LOD (ng/L)	LOQ (ng/L)
PFBA	375-22-4	0.45	1.0	5.0
PFPeA	2706-90-3	0.26	1.0	5.0
PFHxA	307-24-4	0.53	1.5	5.0
PFHpA	375-85-9	0.26	1.0	5.0
PFOA	335-67-1	0.51	1.5	5.0
PFNA	375-95-1	0.31	1.0	5.0
PFDA	335-76-2	0.14	0.5	5.0
PFUnA	2058-94-8	0.22	0.5	5.0
PFDoA	307-55-1	0.19	0.5	5.0
PFTrDA	72629-94-8	0.15	0.5	5.0
PFTeDA	376-06-7	0.73	2.0	5.0
NMeFOSAA	2355-31-9	0.35	1.0	5.0
NEtFOSAA	2991-50-6	0.50	1.0	5.0
PFOSA	754-91-6	0.46	1.0	5.0
PFBS	375-73-5	0.14	0.5	5.0
PFPeS	2706-91-4	0.26	1.0	5.0
PFHxS	355-46-4	0.11	0.4	5.0
PFHpS	375-92-8	0.85	2.0	5.0
PFOS	1763-23-1	0.44	1.0	5.0

Analyte	CAS No.	MDL (ng/L)	LOD (ng/L)	LOQ (ng/L)
PFNS	68259-12-1	0.36	1.0	5.0
PFDS	335-77-3	0.27	1.0	5.0
4:2FTS	747124-72-4	0.50	1.0	5.0
6:2FTS	27619-97-2	0.53	1.5	5.0
8:2FTS	39108-34-4	0.60	2.0	5.0
HFPO-DA	13252-13-6	0.25	0.5	5.0
Adona	919005-14-4	0.27	1.0	5.0
11Cl-PF3OUdS	763051-92-9	0.23	0.5	5.0
9Cl-PF3ONS	756426-58-1	0.27	1.0	5.0

Sampling Schedule with QA Samples

- Starting week of June 14, 2021 for the first round of sampling.
  - Theoretically will be a higher flow event.
- Second round in fall, 2021.
  - Typically fall would reflect a lower flow event.
- Sampling schedule also presents a schedule for QA samples
  - One equipment blank collected with every EDI sample.
  - One discrete sampling equipment blank collected on days with discrete sampling.
  - One trip blank every week; 3 replicate samples over the 6 week schedule.
  - Equipment, field and trip blank procedures described in QAPP.
- Sampling schedule proposes to begin downstream and systematically move upstream.

Pre-Survey QA Study

- Used to determine if our sampling equipment or methods contribute to sample contamination.
- Collected 2 equipment blanks, one for EDI method and one for discrete sampling method.
- Collect one river sample with EDI and one with discrete sampling method.
- Collect one field and one trip blank.
- This has been completed. However, results are not yet available.

USEPA Passive Sampler Project

- USEPA Passive Sampler Study of PFASs in the Ohio River to be conducted in conjunction with the ORSANCO surveys.
- Work group recommended that passive sampling sites be selected as a subset of the set of 20 already selected sites.
- Work group also recommended that passive sampling sites coincide with sites selected for discrete sampling.
- Work group recommended that passive samplers be placed during the same timeframe to coincide with ORSANCO’s sampling schedule.

Documents Review

- PFAS work group met on Dec. 15, 2020 to review and comment on QAPP, Sampling Plan & EDI method SOP specific to PFASs..
- Staff received extensive comments by Jan. 15, 2021 and addressed almost all comments.
- Revised documents were sent back out the work group after revisions as well as USEPA's analytical QAPP.
- PFAS work group met again on April 23 and additional comments od documents were received.
- Data quality indicators for Bias, Representativeness, and Comparability may not be addressed.

SCHEDULE

- Planning to begin survey Round 1 week of June 14.
- This should represent the higher flow round of sampling.
- One sample per day will be collected.
- 3-4 samples per week.
- Requires 6 weeks to complete one round at 20 sites.
- Round 2 will repeat round 1 and begin in the fall which should coincide with lower flows.

Agenda Item 4:

Freshwater Plastic Pollution: An Overview

Dr. Sherri “Sam” Mason

Dr. Sherri "Sam" Mason
Professor of Chemistry
Sustainability Coordinator
Penn State Erie, The Behrend College

Freshwater Plastic Pollution:

An Overview

Source: *Plastics: A Toxic Love Story* by Susan Freinkel

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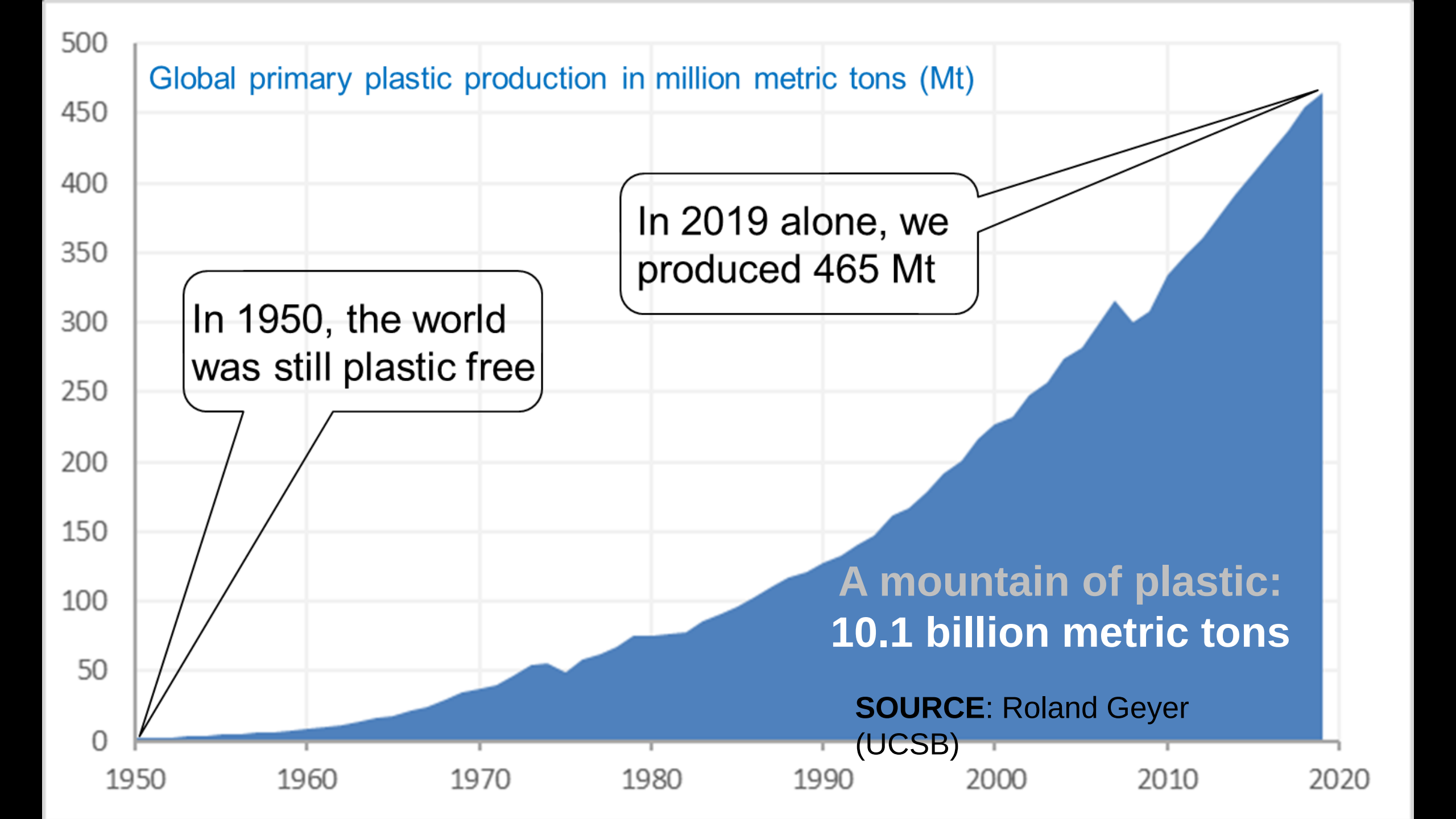
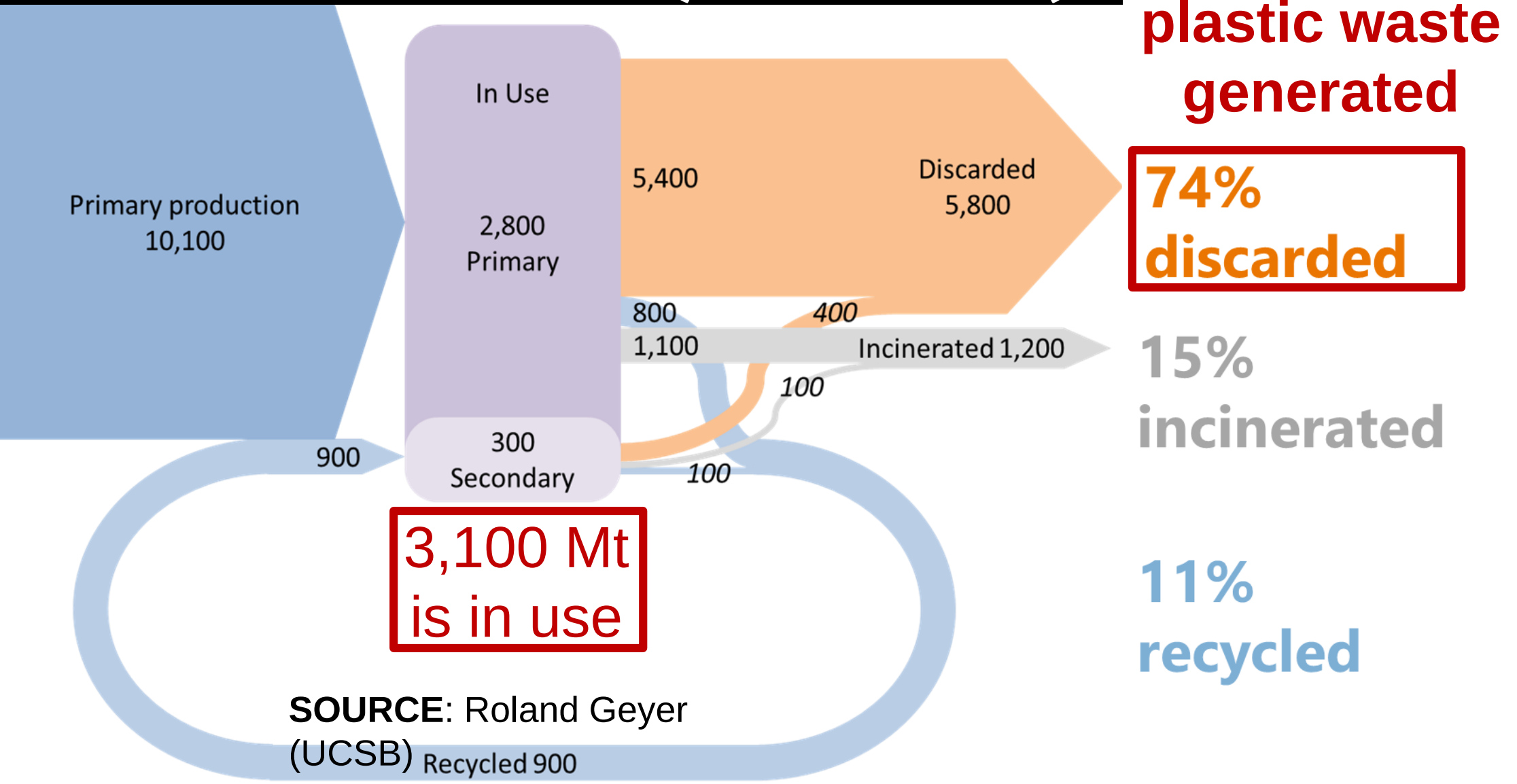
- Birth
  - Parkesine/Celluloid – 1862 (1870)
    - first semi-synthetic plastic
  - Bakelite – December 7, 1909
    - first U.S. patent for a synthetic plastic


Global primary plastic production in million metric tons (Mt)
500
450
400
350
300
250
200
150
100
50
0
1950
1960
1970
1980
1990
2000
2010
2020
In 1950, the world was still plastic free
In 2019 alone, we produced 465 Mt
A mountain of plastic:
10.1 billion metric tons
SOURCE: Roland Geyer (UCSB)

Production, Use & Fate of All Plastic Ever Made (1950-2019)



3,100 Mt is in use

SOURCE: Roland Geyer (UCSB)

7,900 Mt of plastic waste generated

74% discarded

15% incinerated

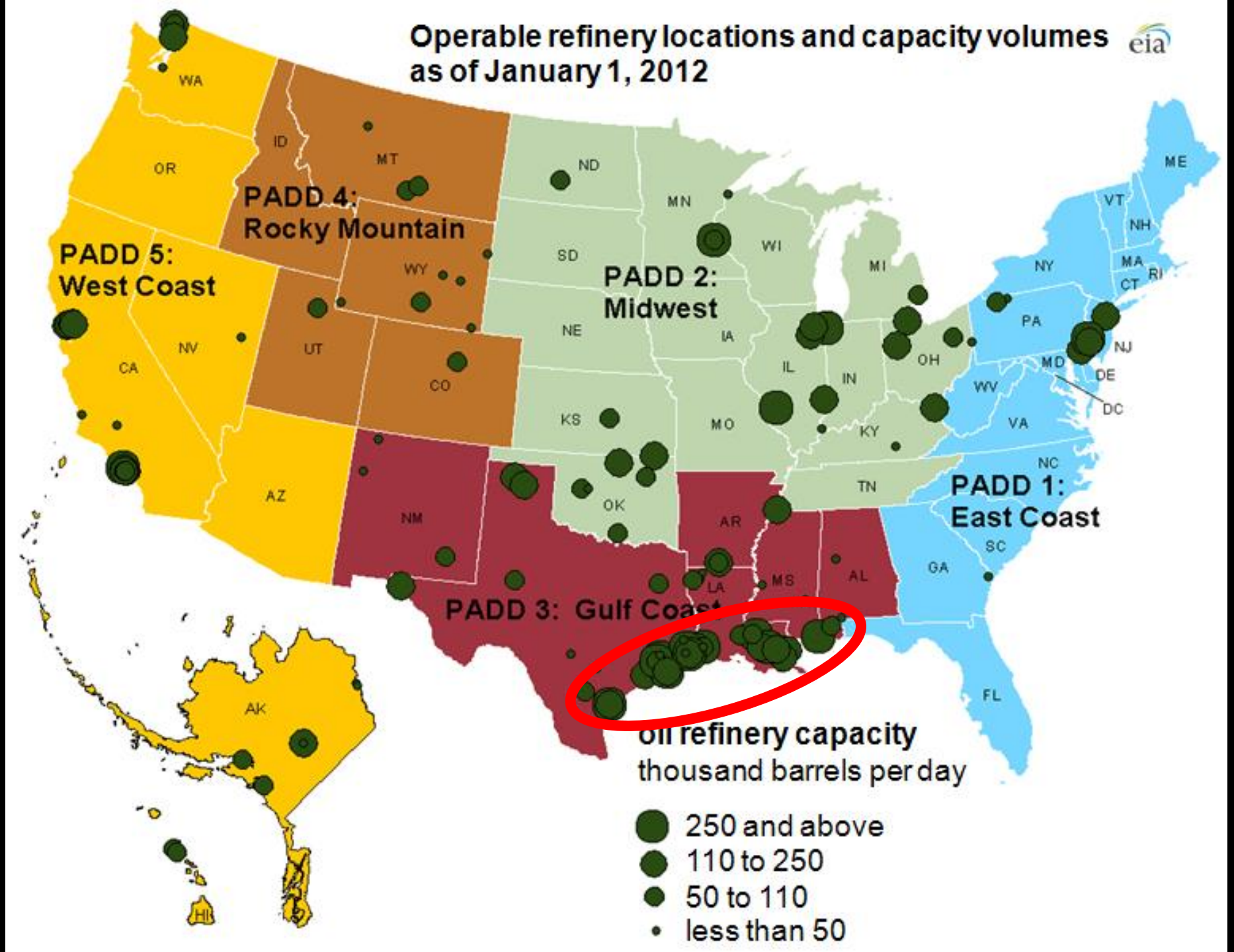
11% recycled

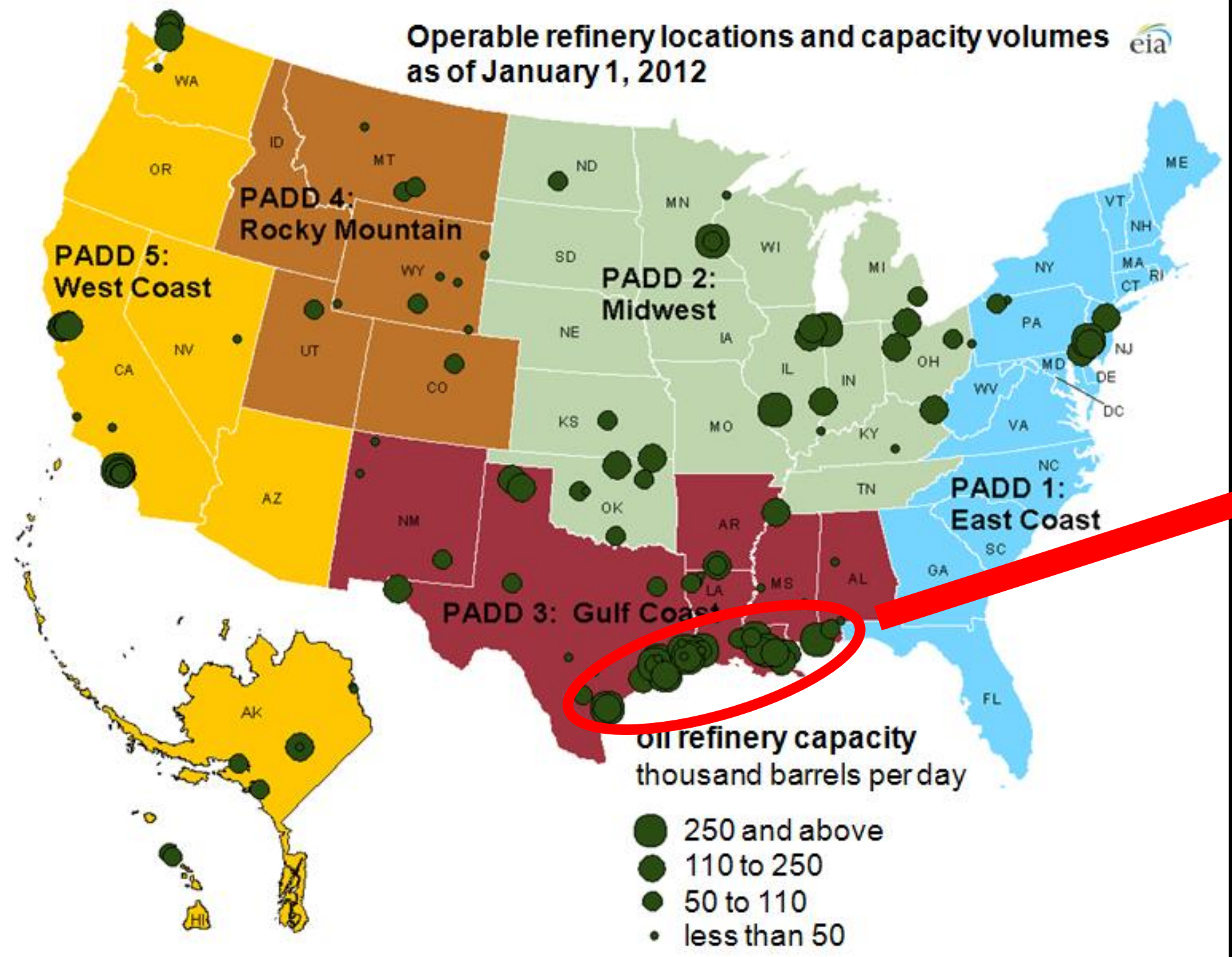
SOURCES

Mismanaged Waste (Litter)

Industrial


FOSSIL FUELS


Operable refinery locations and capacity volumes as of January 1, 2012
eia
PADD 5: West Coast
PADD 4: Rocky Mountain
PADD 2: Midwest
PADD 1: East Coast
PADD 3: Gulf Coast
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
VA
NC
SC
GA
FL
PA
NY
MD
DE
DC
NJ
CT
RI
MA
VT
NH
ME
AK
HI
oil refinery capacity
thousand barrels per day
250 and above
110 to 250
50 to 110
less than 50



"Cancer Alley"

Search US edition
The Guardian

The polluters
Environment

Emily Holden *in Monaca, Pennsylvania*

Fri 11 Oct 2019 09.13 EDT

Will a push for plastics turn Appalachia into next 'Cancer Alley'?

FRACKING

HYDRAULIC FRACTURING

Fracturing fluid (a mix of water, sand, and chemicals) is pumped into the well

The pressure causes the rock surrounding the pipe to crack

The proppants hold open these cracks to allow the trapped natural gas to escape

Gas flows up the well to be collected

POTENTIAL RISKS
groundwater contamination
air quality degradation

WATER
SAND
CHEMICALS

70 to **140 billion**
GALLONS of water used to fracture 35,000 wells in the U.S. each year

equals approximately the **ANNUAL WATER CONSUMPTION** of 40 to 80 cities with population 50,000

(sand or ceramic beads) **300,000** to **4 million** pounds of proppants used per well

various chemicals make up **0.5%** to **2.0%** total volume of fracturing fluid = up to **330 TONS**

NATURAL GAS

Information courtesy of Earthworksaction.org, design by Hannah Otto, March 2013

FRACKING

trucks of water for each well **200**

HYDRAULIC FRACTURING

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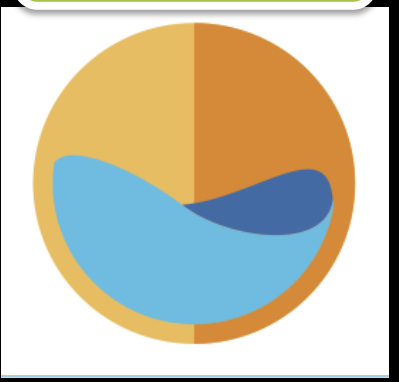
NATURAL GAS

Information courtesy of Earthworksaction.org, design by Hannah Otto, March 2013

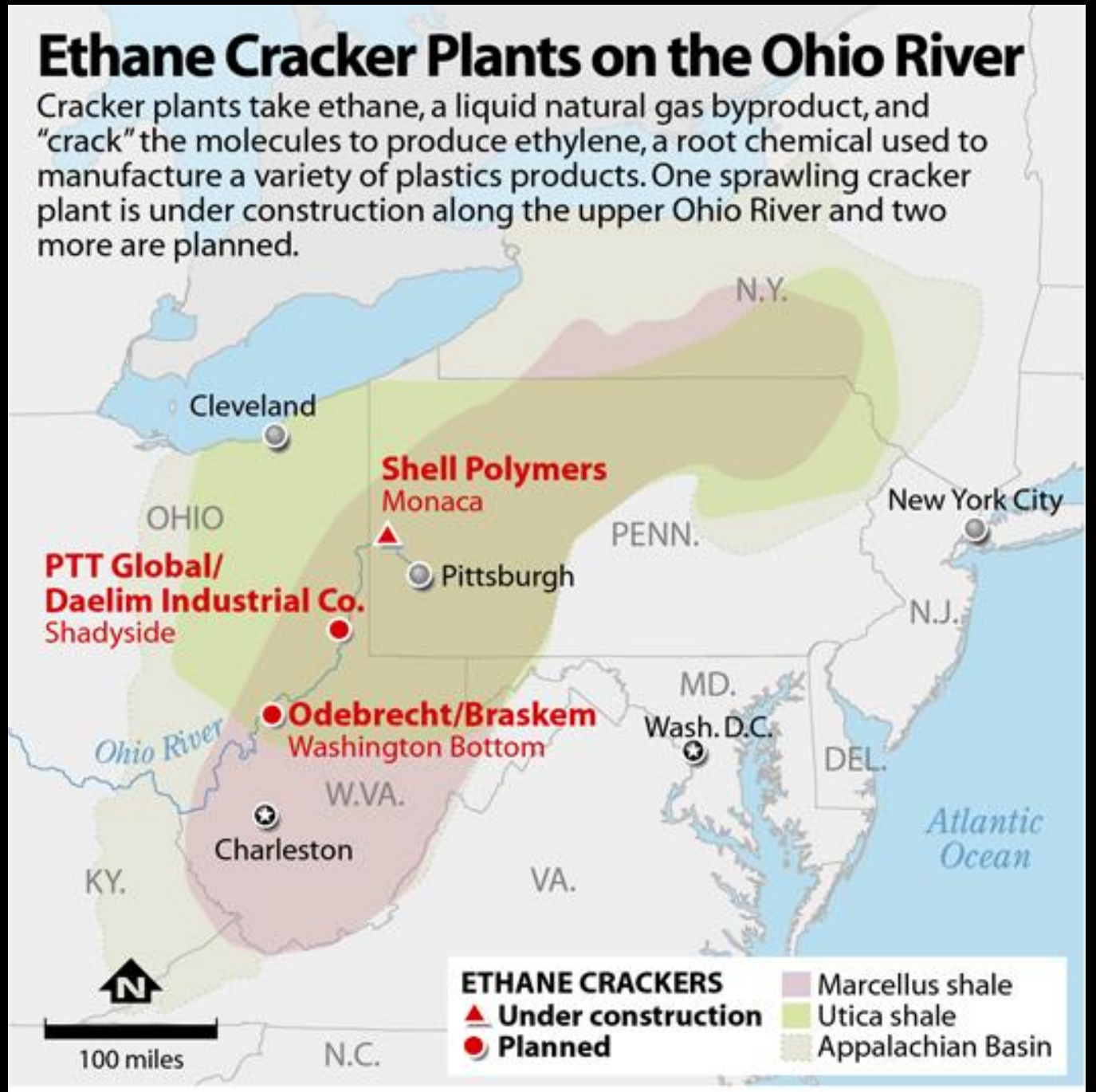
Dry Gas

Wet Gas



Ethane Cracker Plants on the Ohio River

Cracker plants take ethane, a liquid natural gas byproduct, and "crack" the molecules to produce ethylene, a root chemical used to manufacture a variety of plastics products. One sprawling cracker plant is under construction along the upper Ohio River and two more are planned.



SOURCE: U.S. Energy Information Agency

PAUL HORN / InsideClimate News


Ethane C
Cracker plants
"crack" the mo
manufacture a
plant is under
more are plann
Clev
OHIO
PTT Global/
Daelim Indus
Shadyside
Ohio River
KY.
N
100 miles
SOURCE: U.S. Energy

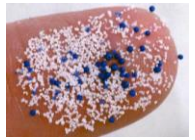
SOURCES

Mismanaged Waste (Litter)

Industrial

Textile

In-Use Product



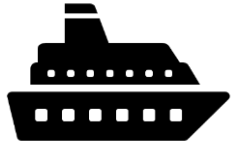
PATHWAYS

Rivers

Wind

Atmospheric Deposition

Direct Input



Runoff (e.g., Urban, Ag, Industrial)

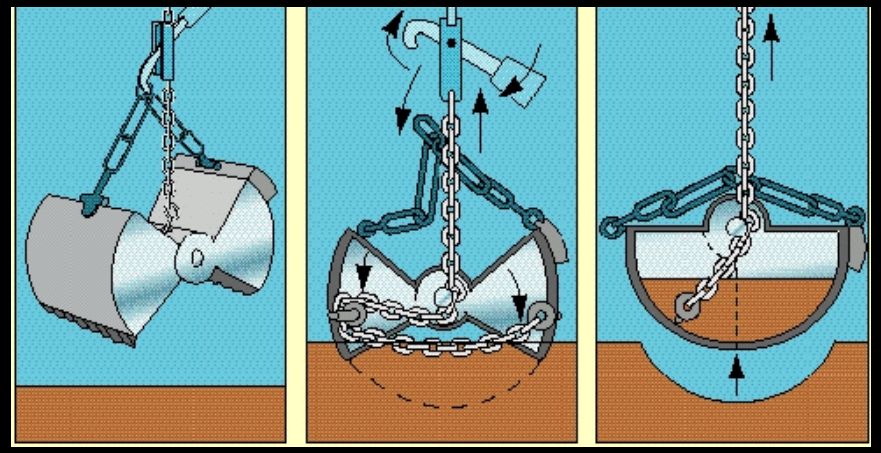
Treated or Untreated Wastewater

SOURCE: Chelsea Rochman, Oceanography, December 2020

METHODS

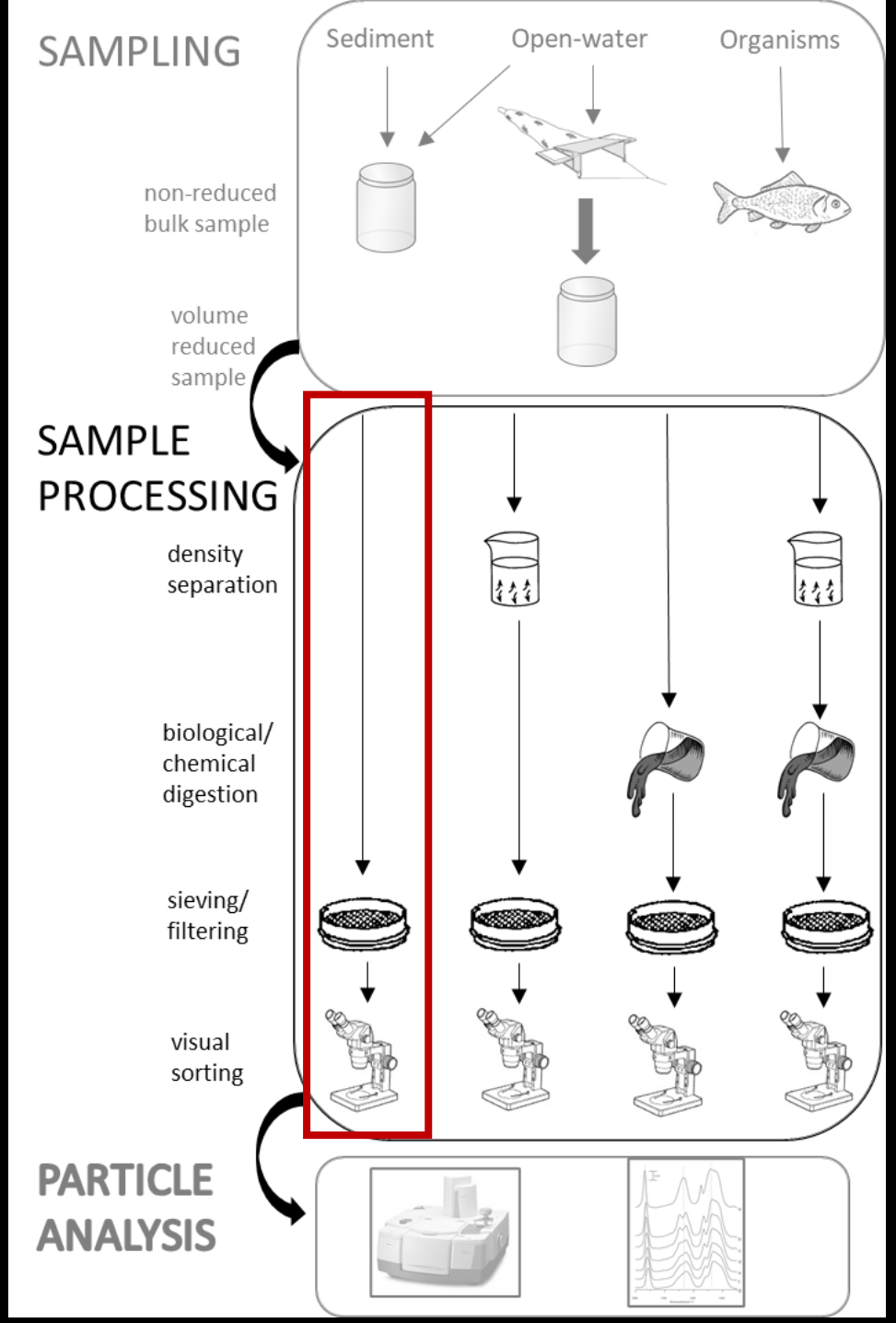
SAMPLING METHODS

WATER



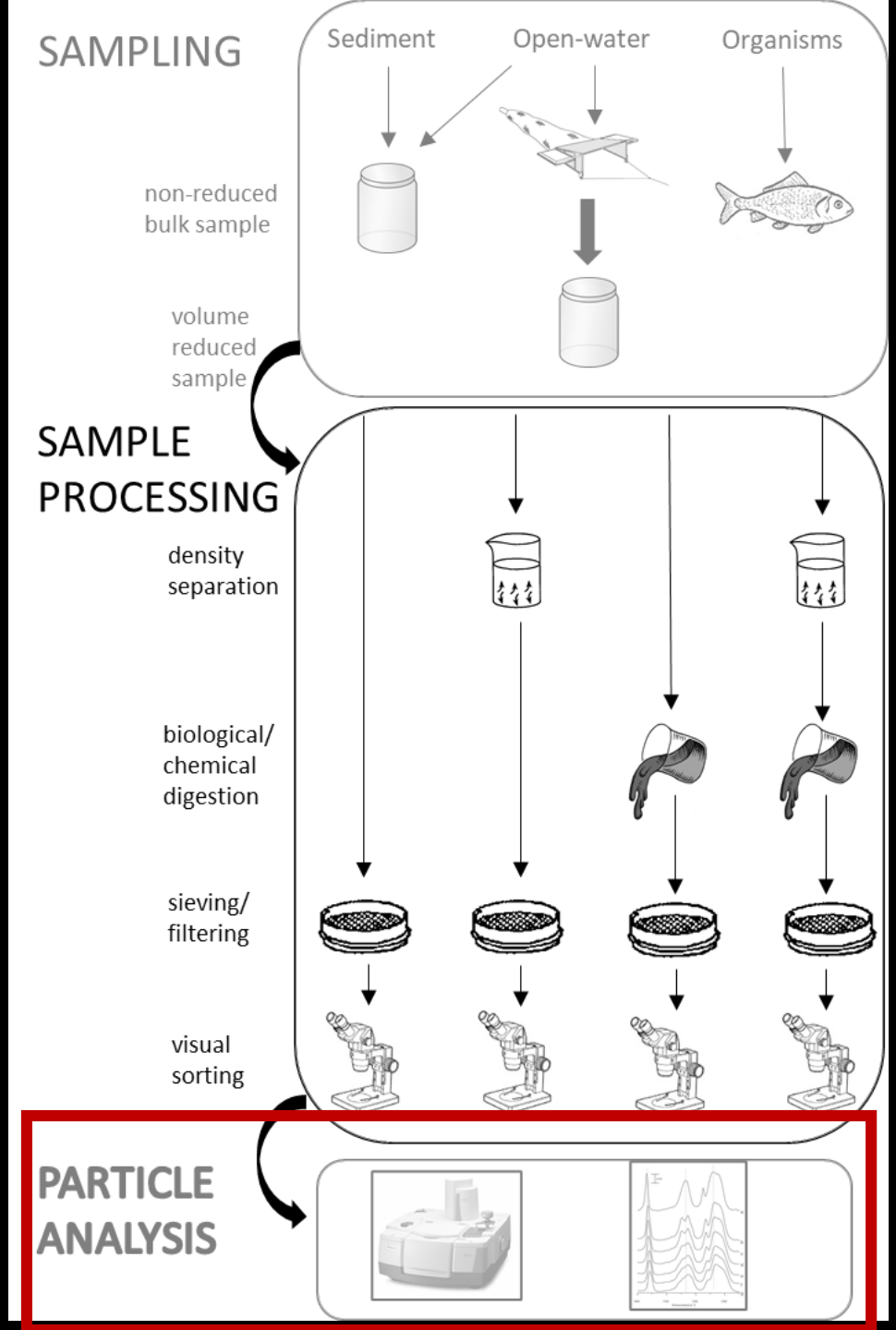
SAMPLING METHODS

SEDIMENT


SAMPLING
Sediment
Open-water
Organisms
non-reduced bulk sample
volume reduced sample
SAMPLE PROCESSING
density separation
biological/ chemical digestion
sieving/ filtering
visual sorting
PARTICLE ANALYSIS

Photos courtesy of Brendan Bannon

Photos courtesy of Tim Hoellein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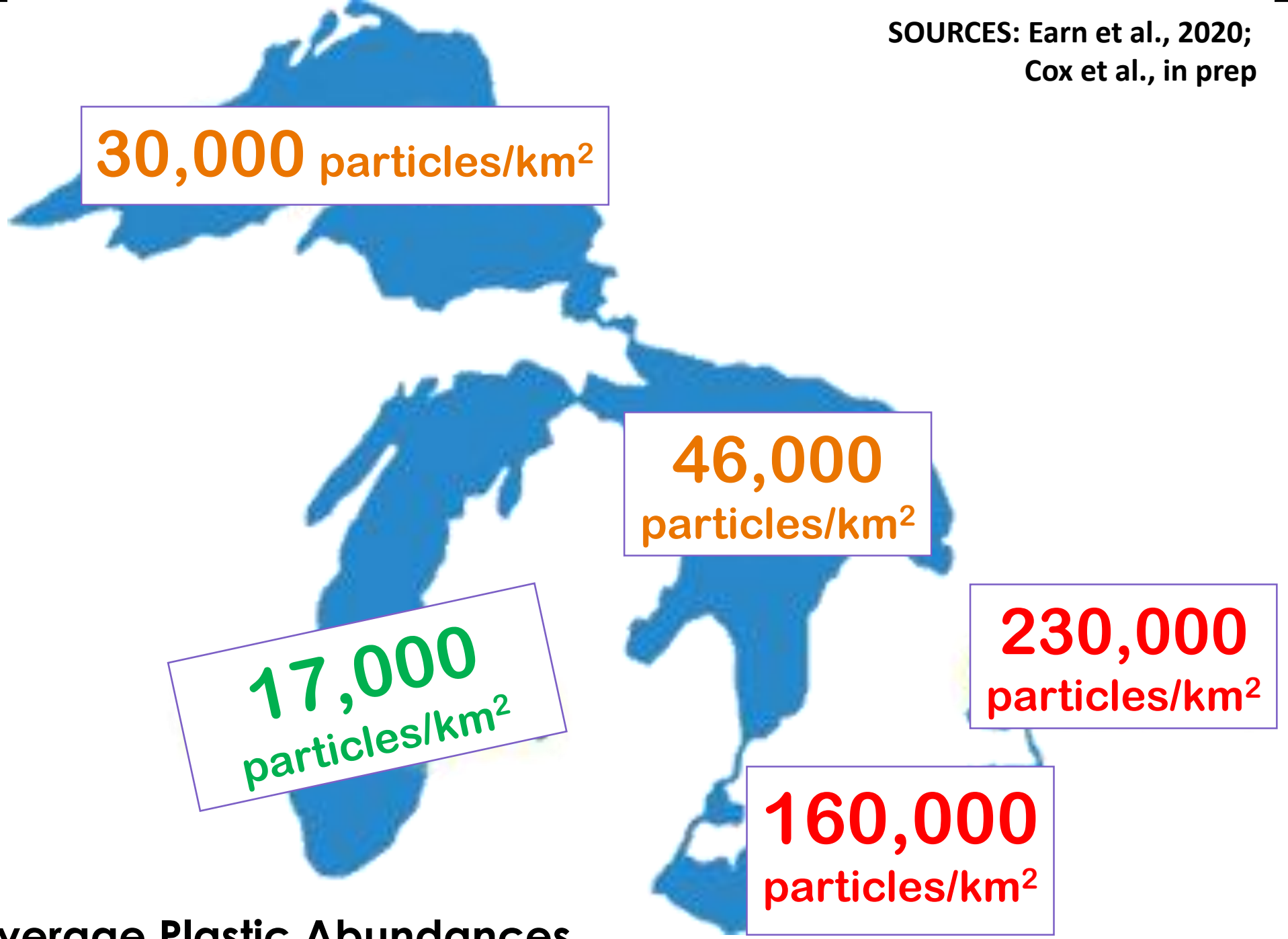
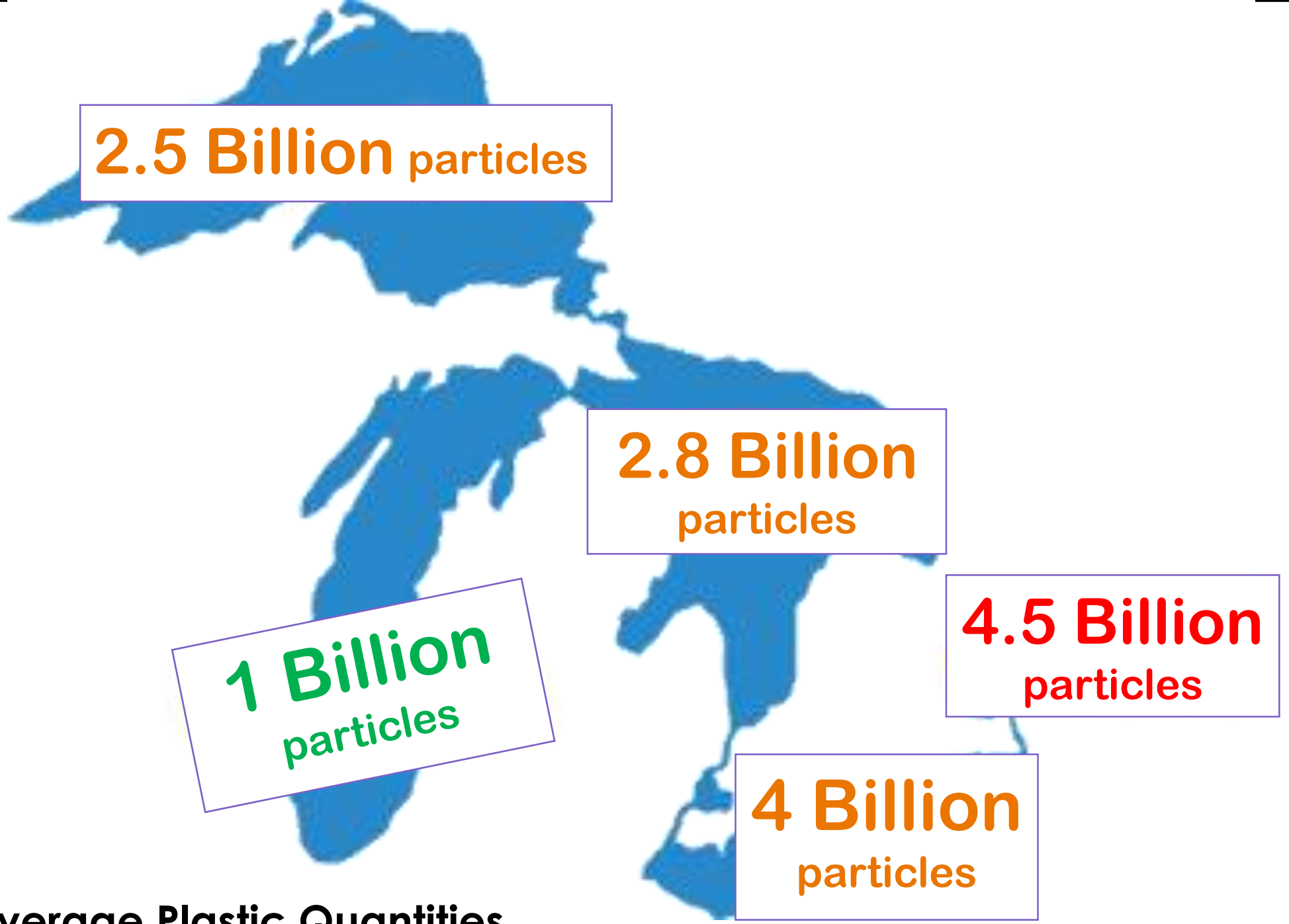
visual sorting
PARTICLE ANALYSIS


Open Water
Surveys

SOURCES: Earn et al., 2020;
Cox et al., in prep



Average Plastic Abundances



Average Plastic Quantities

MICROPLASTIC

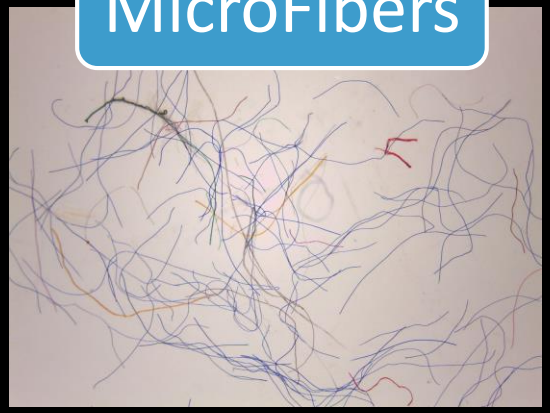
Less than 5 mm

Primary Microplastics

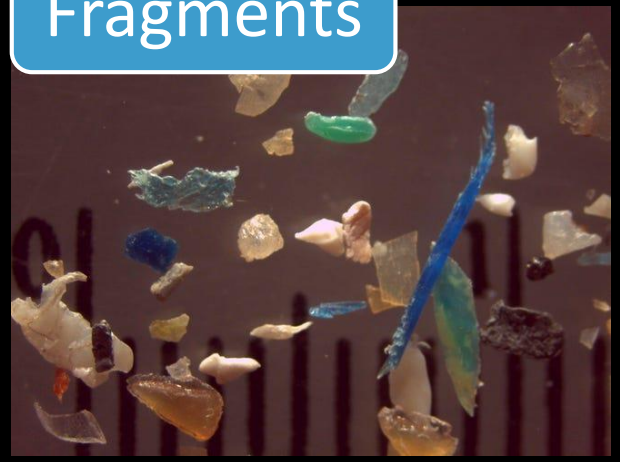
Pre-Production Pellets

Microbeads

MicroFibers



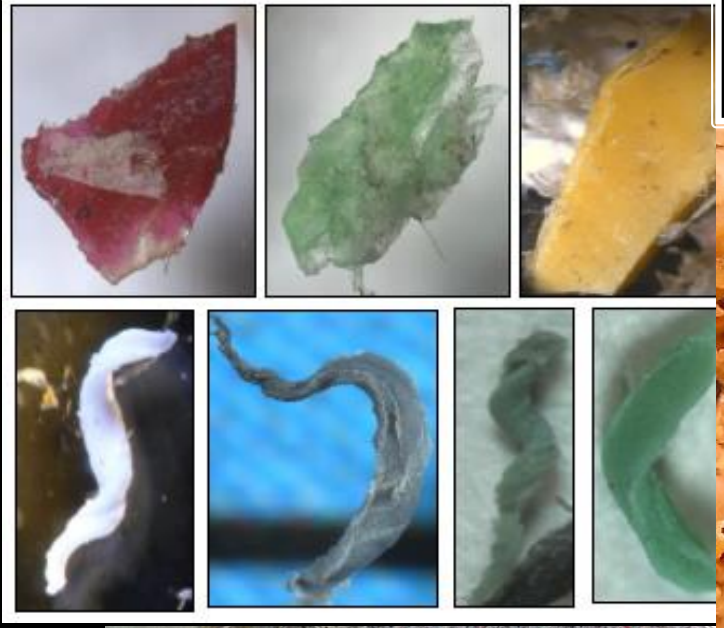
Fragments



Secondary Microplastics

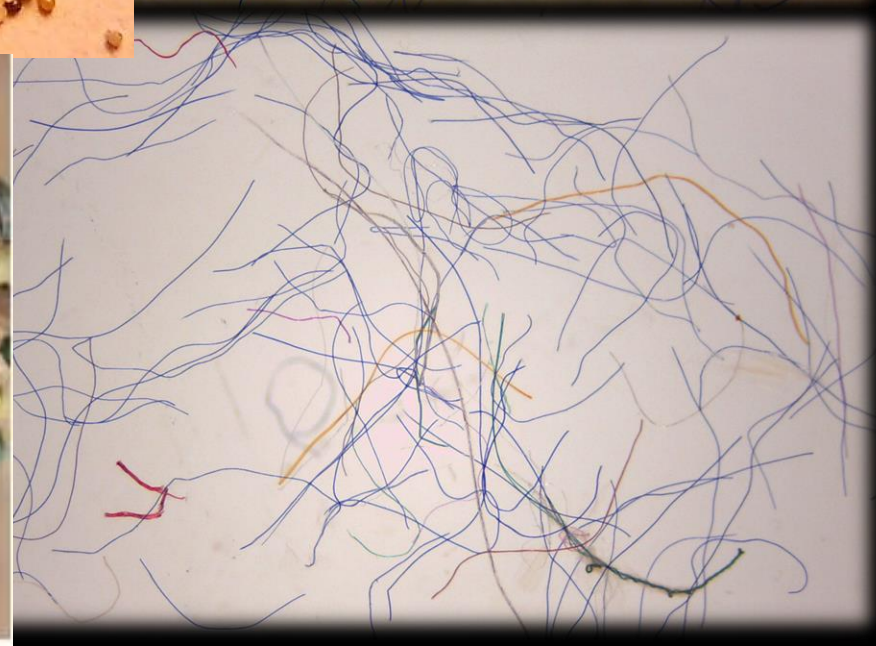
Photo-Degradation

FRAGMENTS

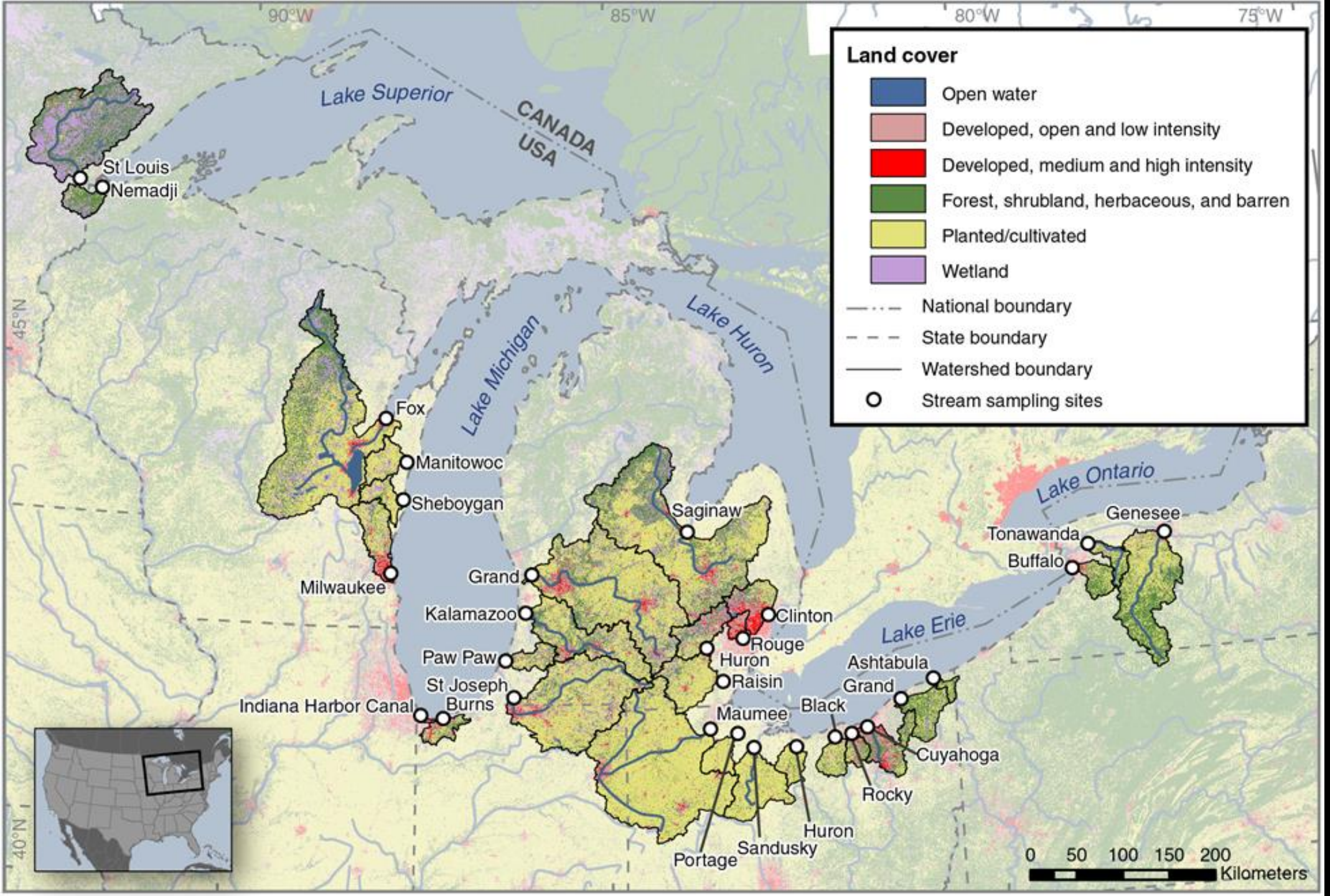


PELLETS

FIBERS/LINES

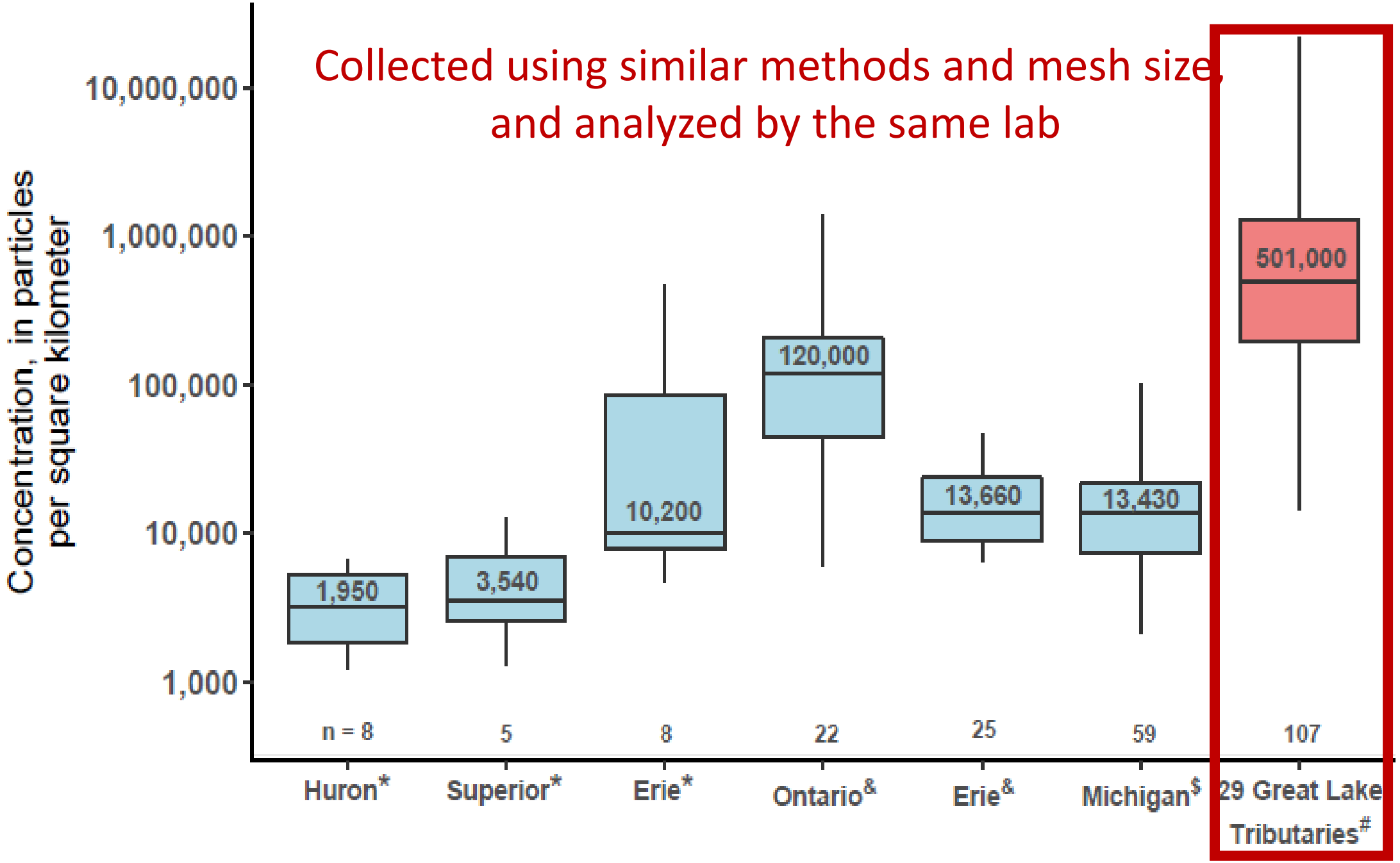


Rivers

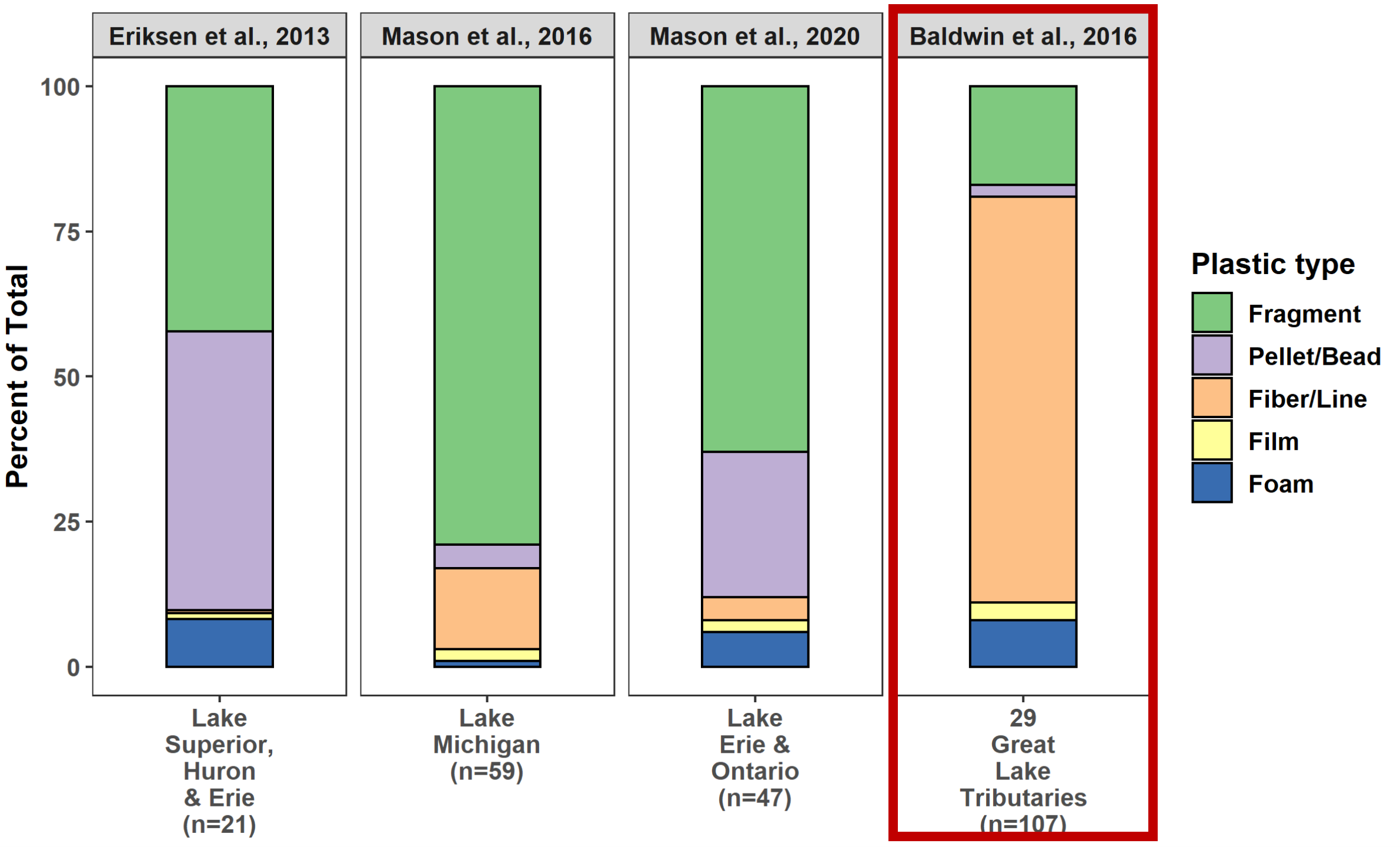


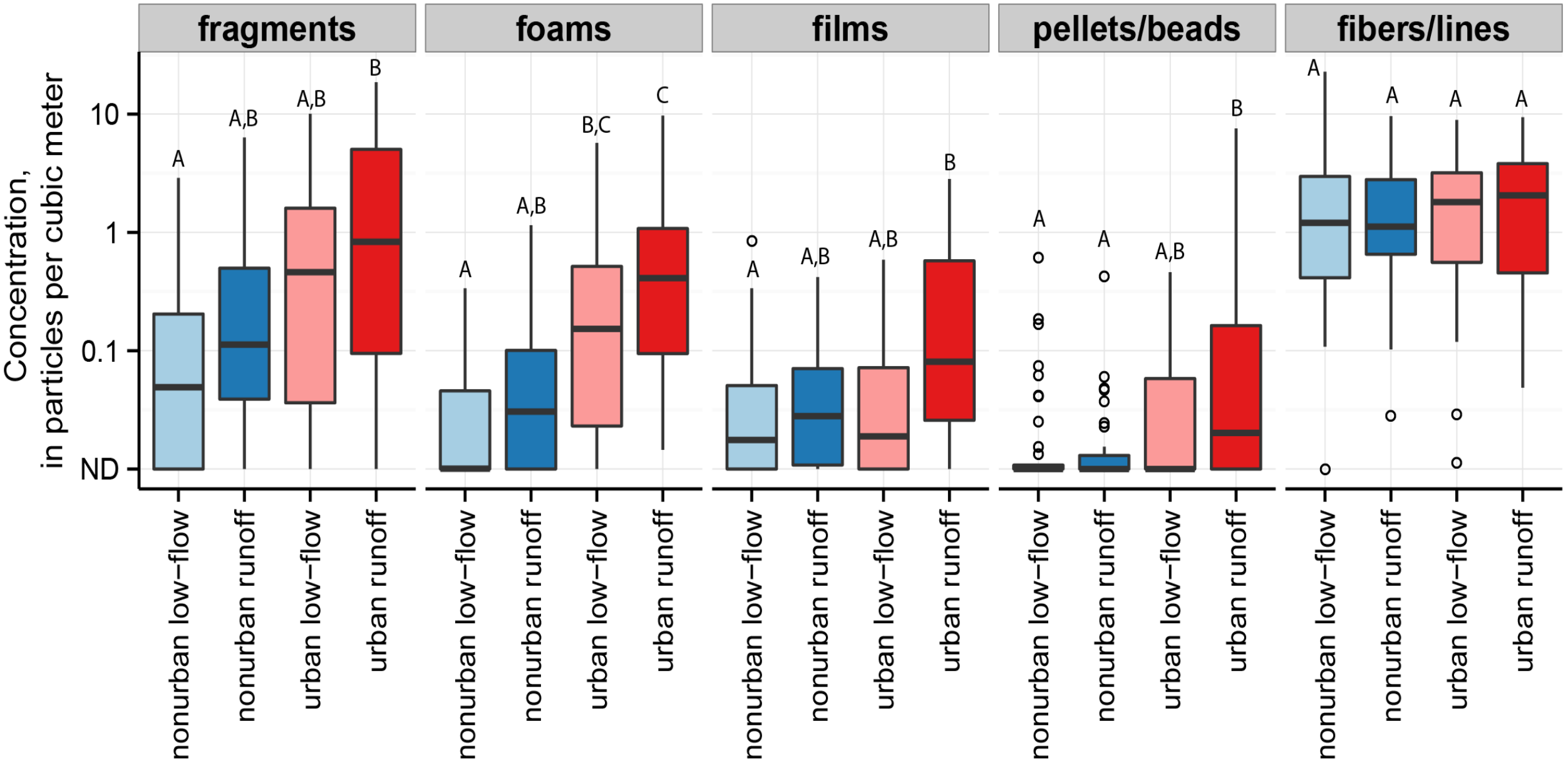
SOURCE: Baldwin et al. (2016)

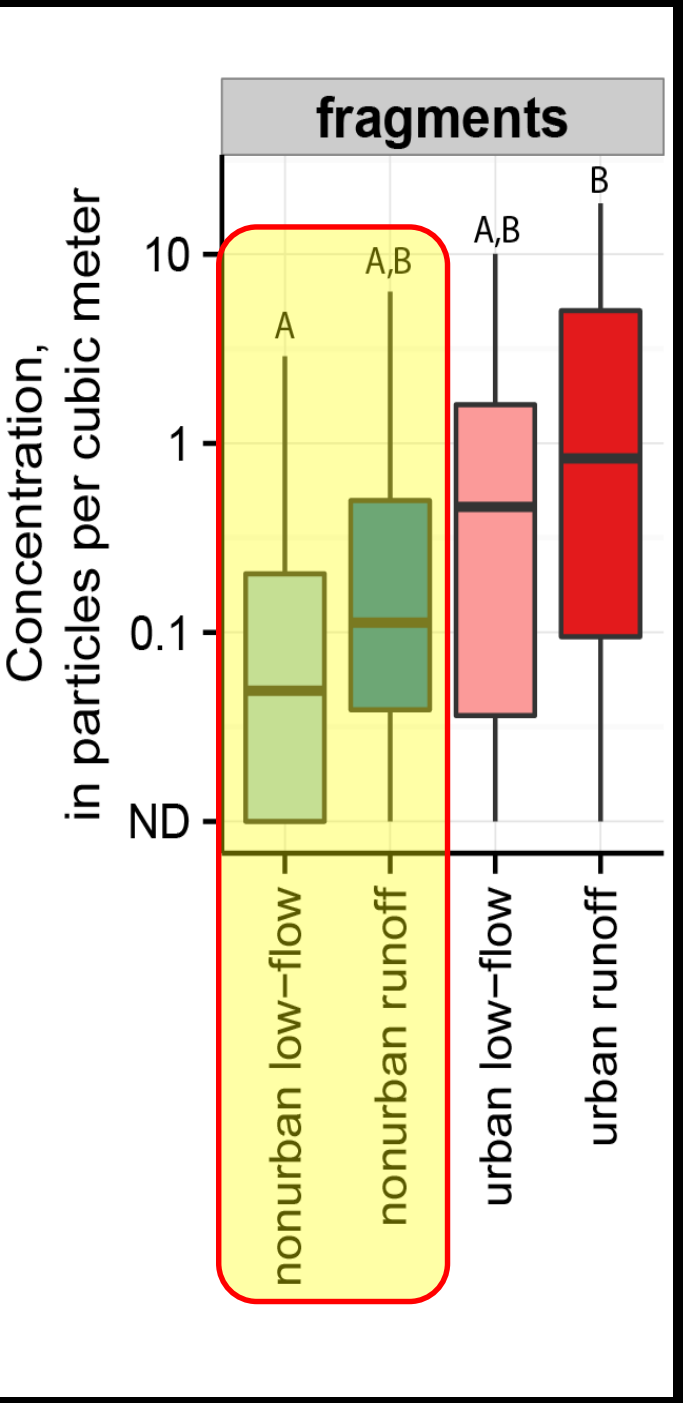
Collected using similar methods and mesh size, and analyzed by the same lab

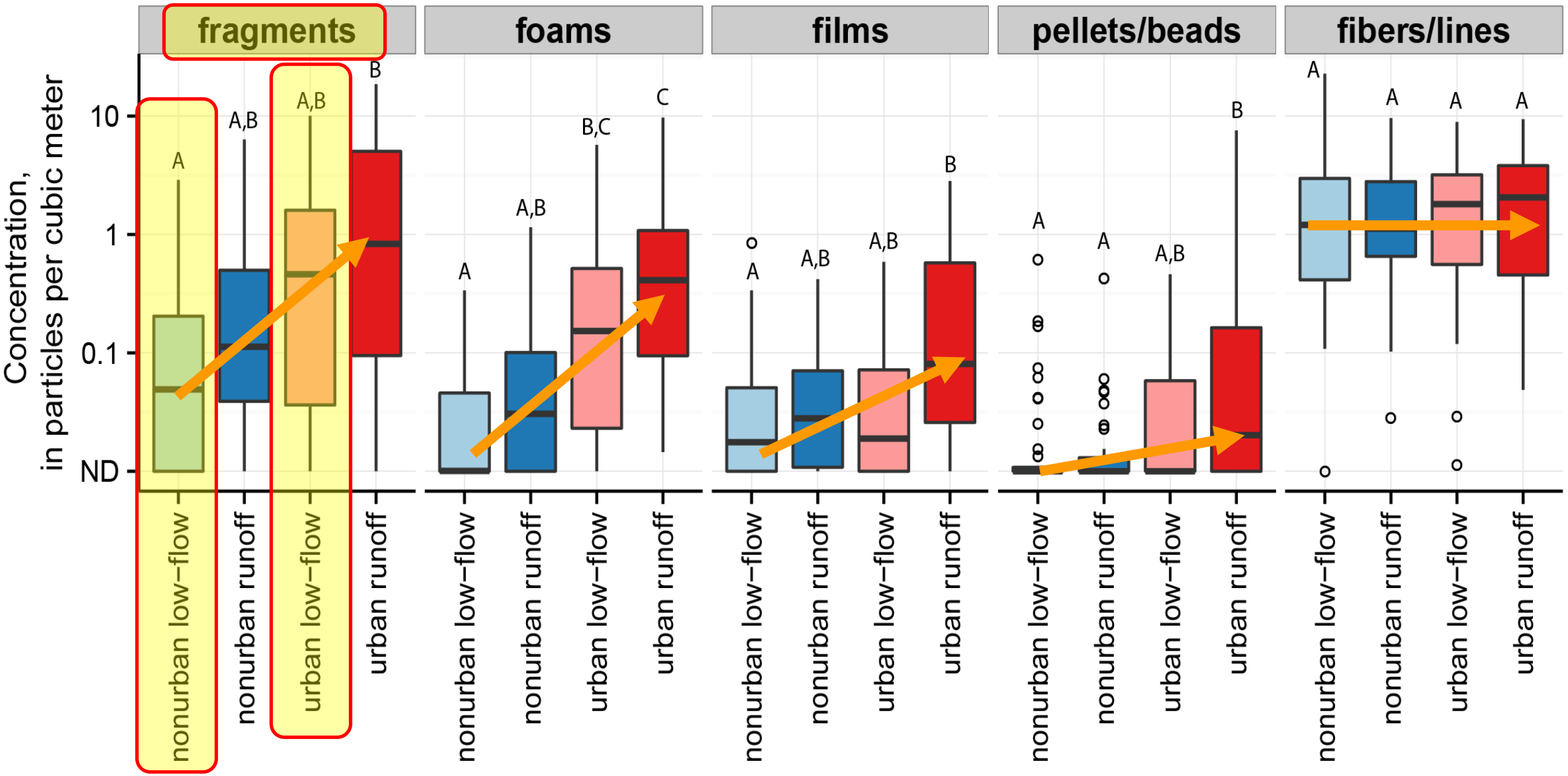


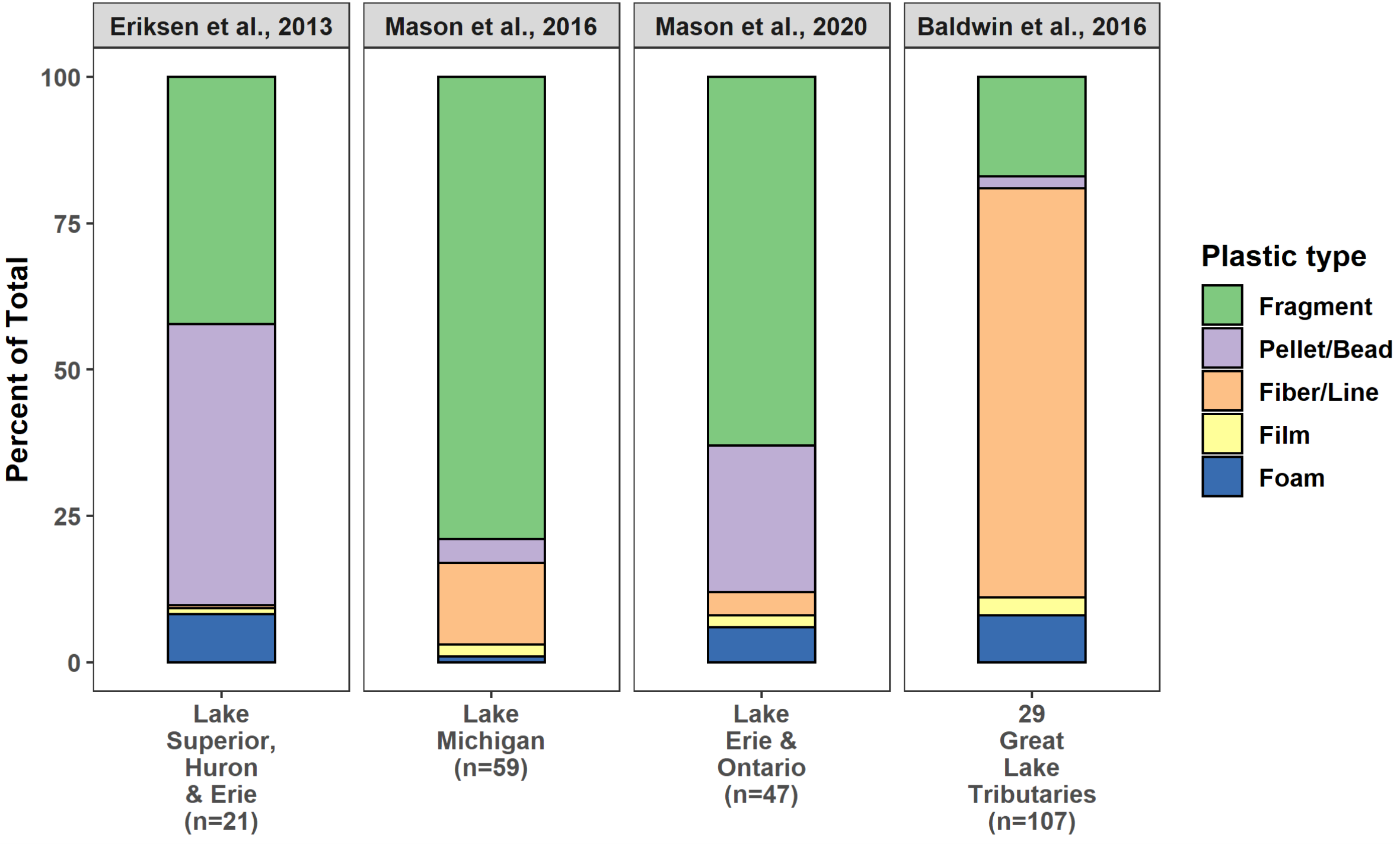
*Eriksen et al., 2013; &Mason et al., 2020; $Mason et al., 2016; # Baldwin et al., 2016


Eriksen et al., 2013
Mason et al., 2016
Mason et al., 2020
Baldwin et al., 2016
Percent of Total
100
75
50
25
0
Lake Superior, Huron & Erie (n=21)
Lake Michigan (n=59)
Lake Erie & Ontario (n=47)
29 Great Lake Tributaries (n=107)
Plastic type
Fragment
Pellet/Bead
Fiber/Line
Film
Foam


fragments
foams
films
pellets/beads
fibers/lines
Concentration, in particles per cubic meter
10
1
0.1
ND
A
A,B
A,B
B
A
A,B
B,C
C
A
A
A,B
A,B
B
A
A
A,B
B
A
A
A
A
nonurban low−flow
nonurban runoff
urban low−flow
urban runoff

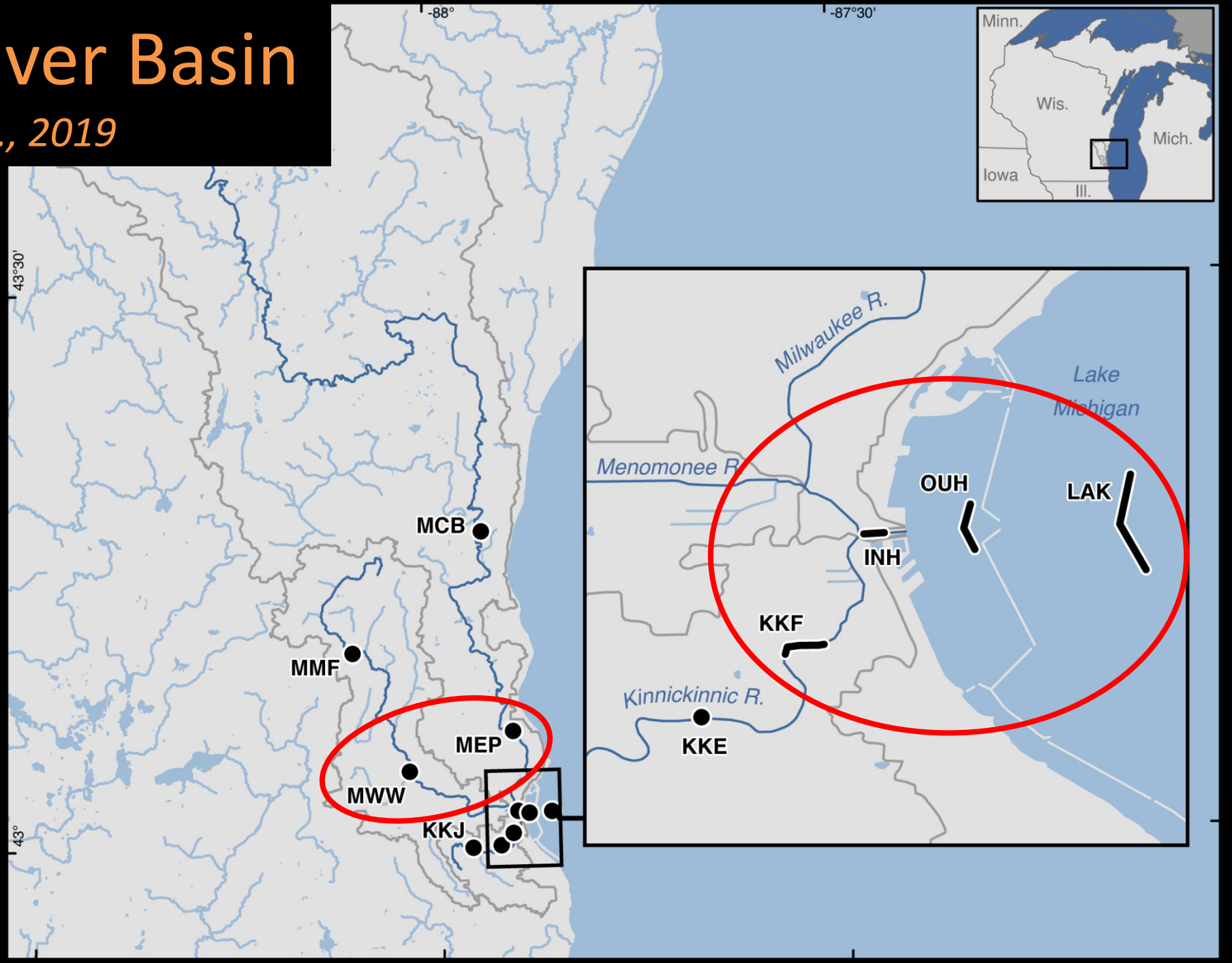

fragments
Concentration, in particles per cubic meter
10
1
0.1
ND
A
A,B
A,B
B
nonurban low−flow
nonurban runoff
urban low−flow
urban runoff


fragments
foams
films
pellets/beads
fibers/lines
Concentration, in particles per cubic meter
10
1
0.1
ND
A
A,B
A,B
B
A
A,B
B,C
C
A
A
A,B
A,B
B
A
A
A,B
B
A
A
A
A
nonurban low−flow
nonurban runoff
urban low−flow
urban runoff


Eriksen et al., 2013
Mason et al., 2016
Mason et al., 2020
Baldwin et al., 2016
Percent of Total
100
75
50
25
0
Lake Superior, Huron & Erie (n=21)
Lake Michigan (n=59)
Lake Erie & Ontario (n=47)
29 Great Lake Tributaries (n=107)
Plastic type
Fragment
Pellet/Bead
Fiber/Line
Film
Foam

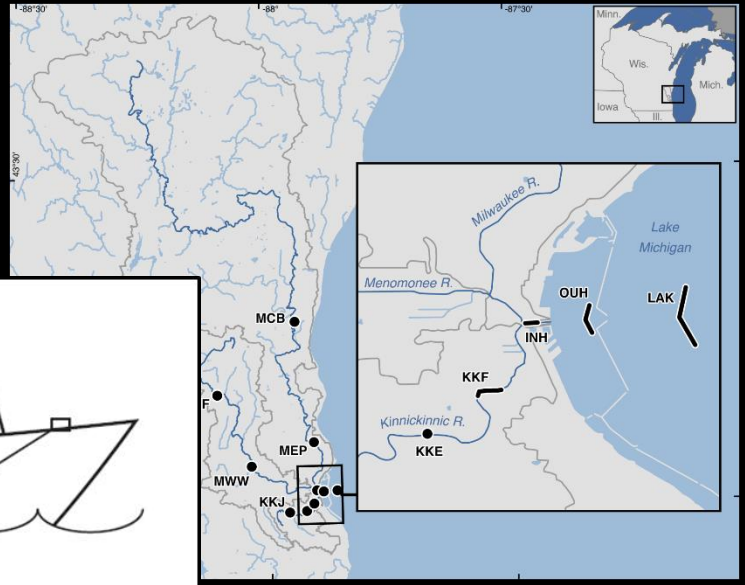
Milwaukee River Basin

Lenaker et al., 2019

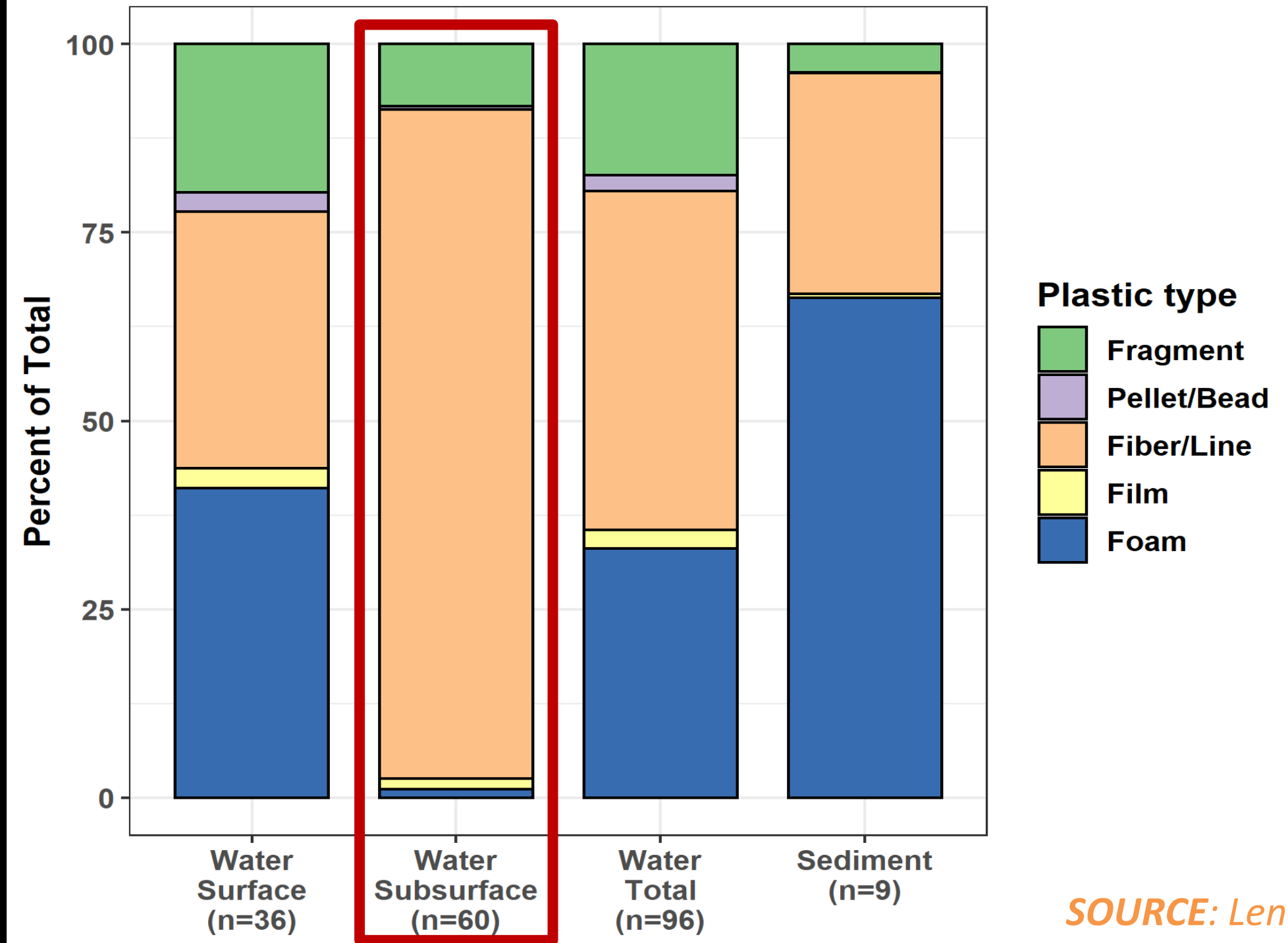


Milwaukee River Basin

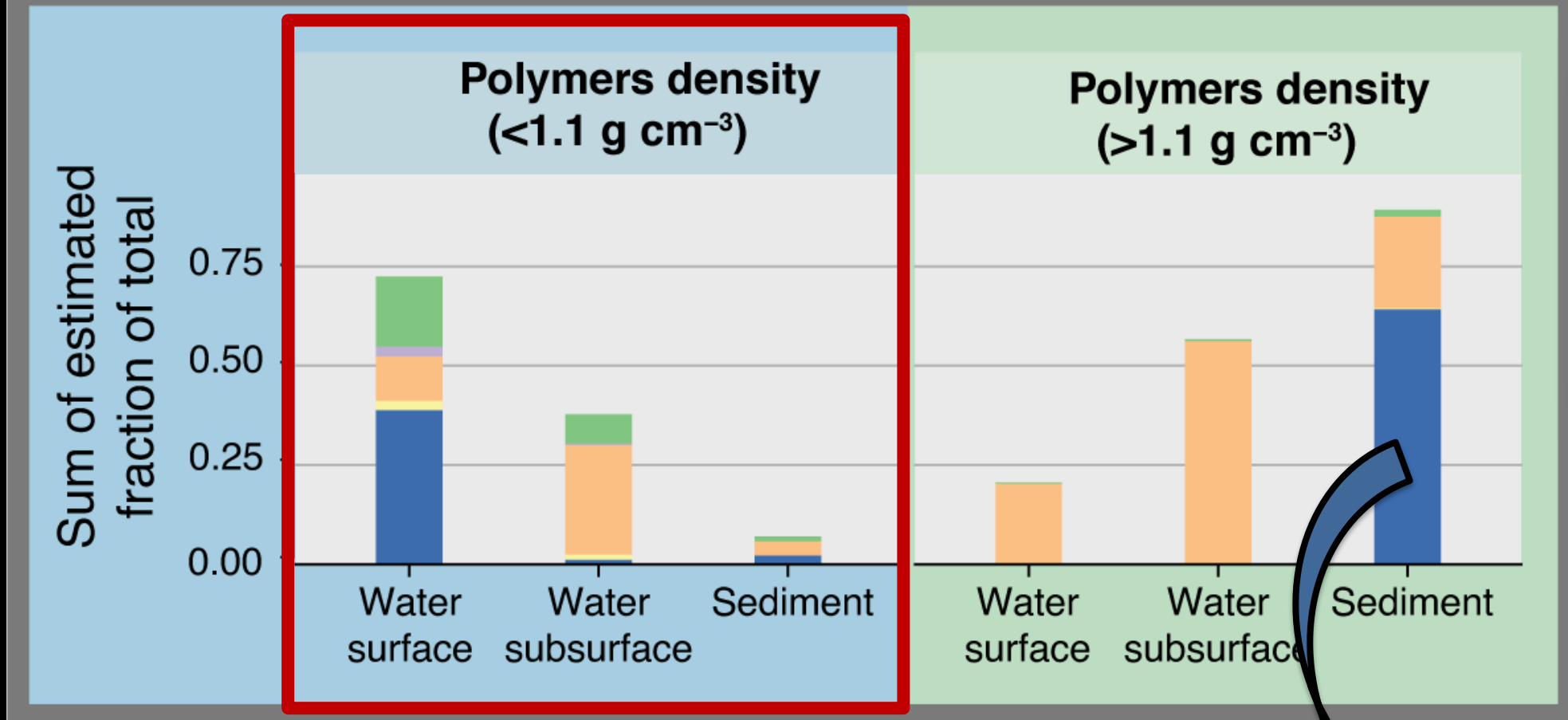
Lenaker et al., 2019



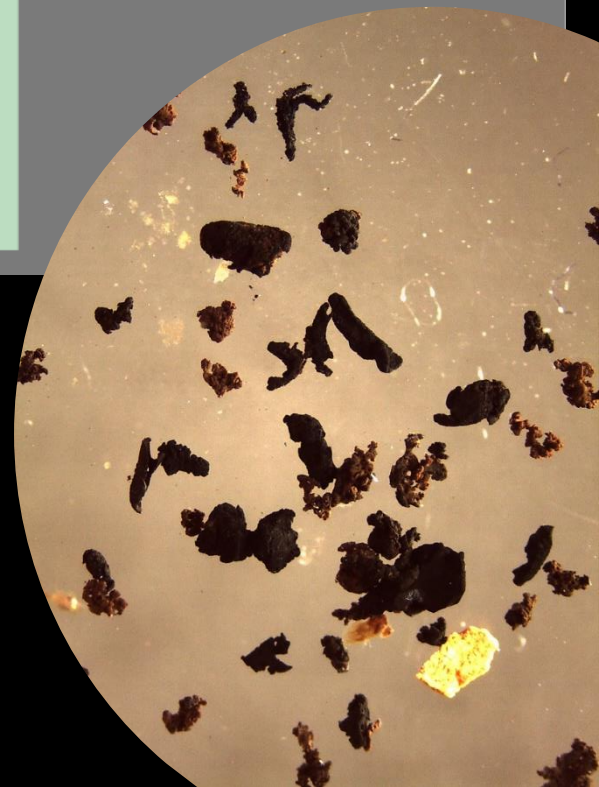
WQSP: Water Quality Sensor Package



***SOURCE**: Lenaker et al. (2019)*



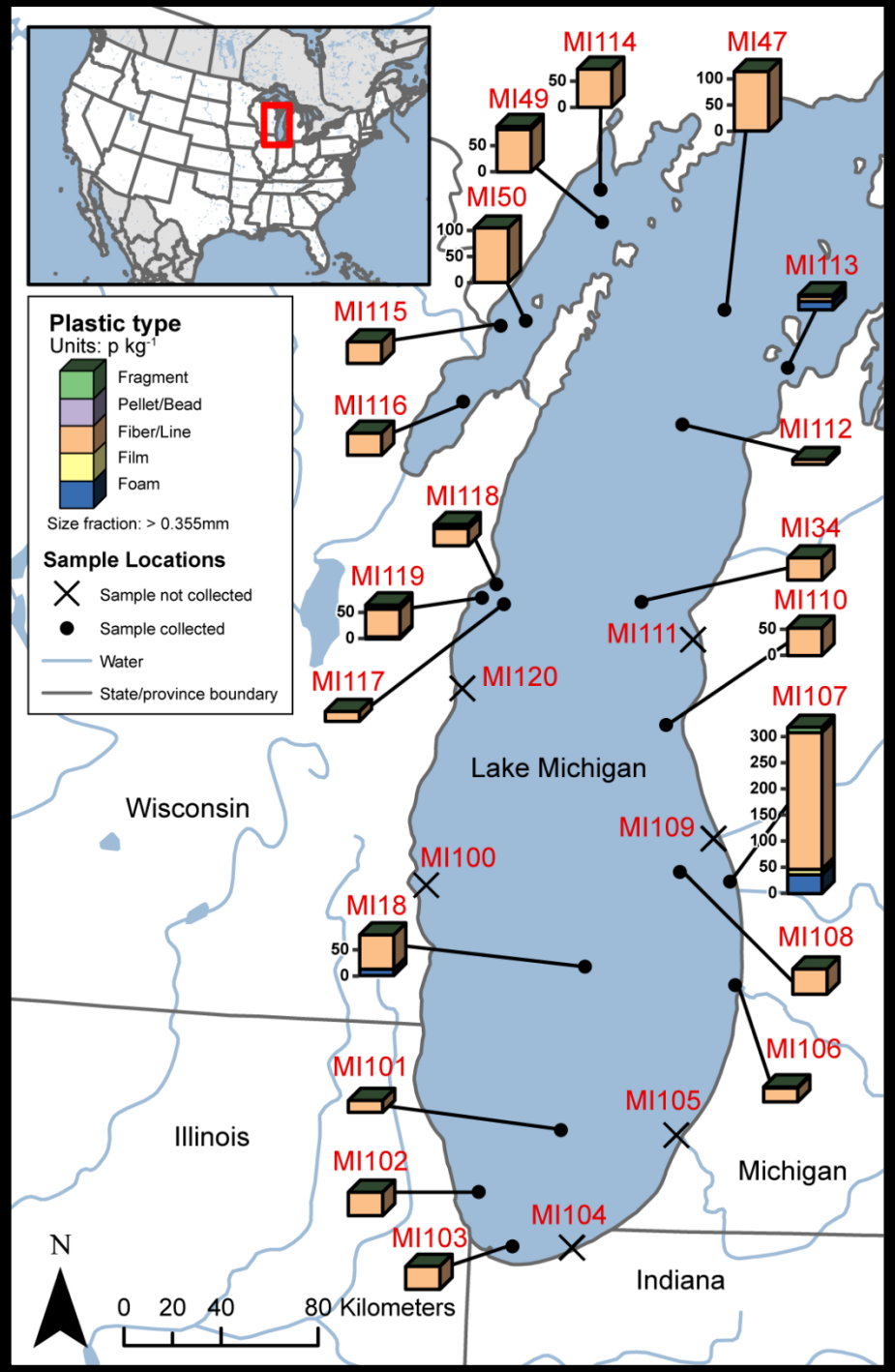
***SOURCE**: Lenaker et al. (2019)*

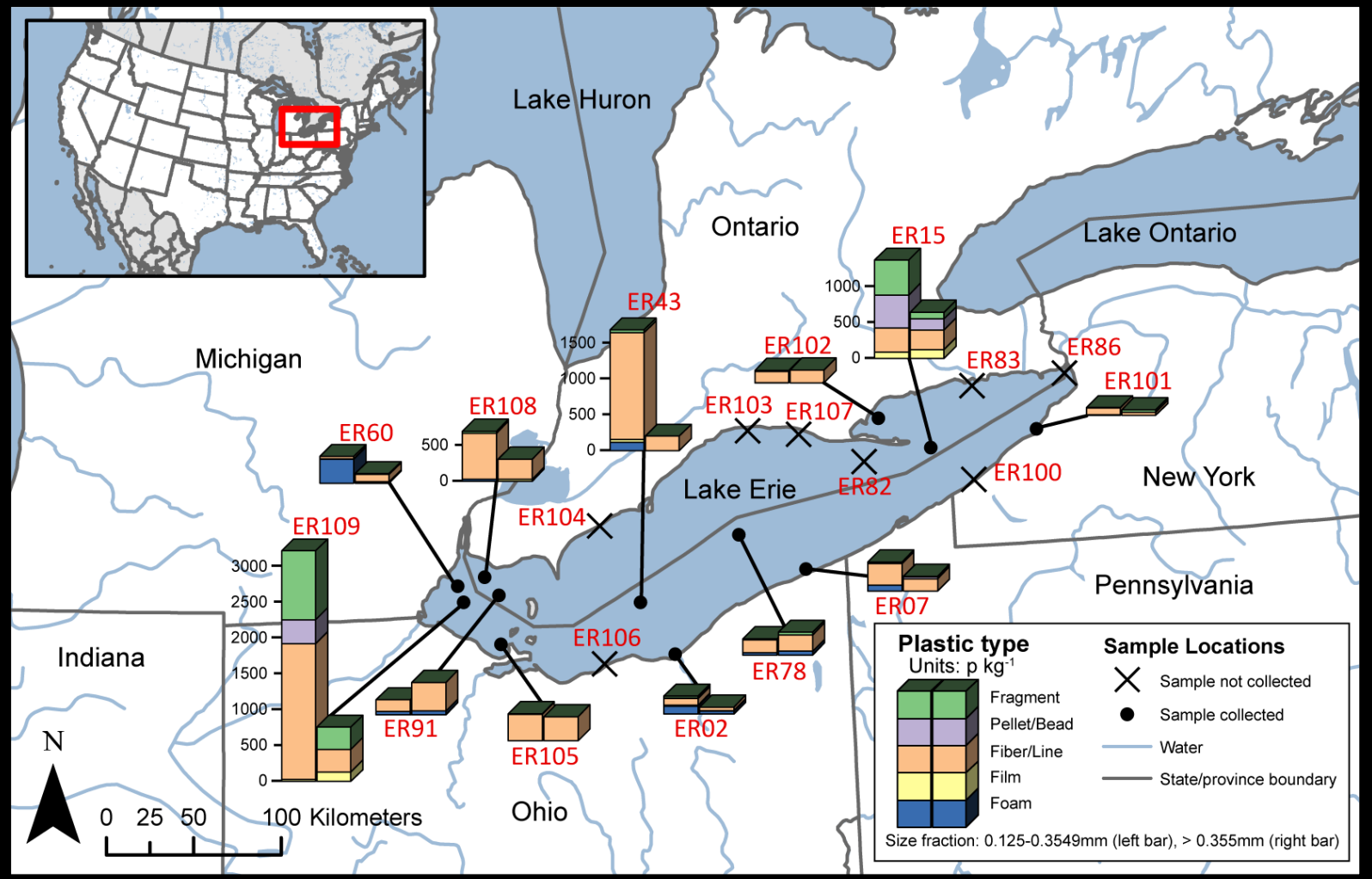


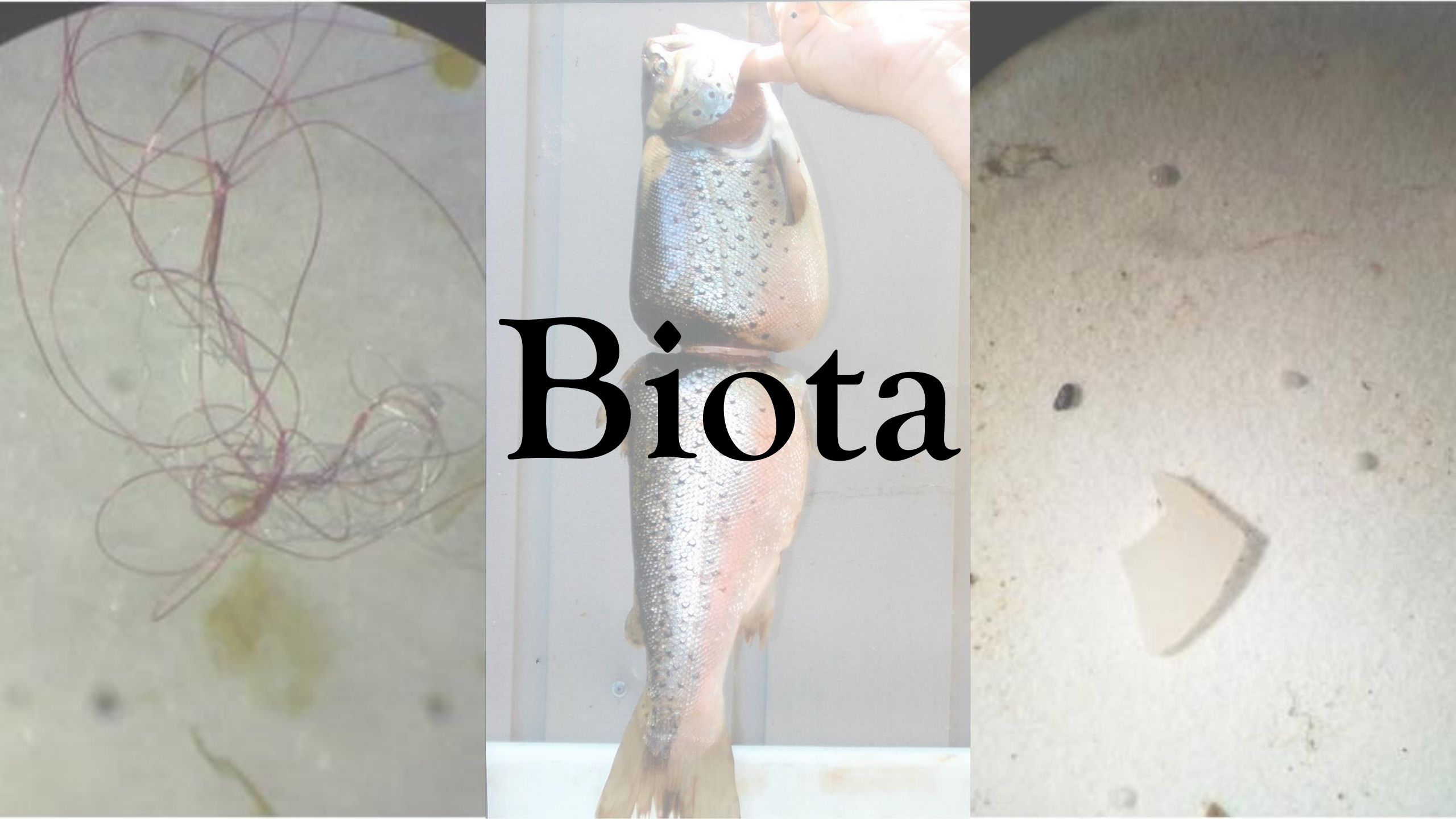
Lake Sediment

Lake Sediment Concentrations

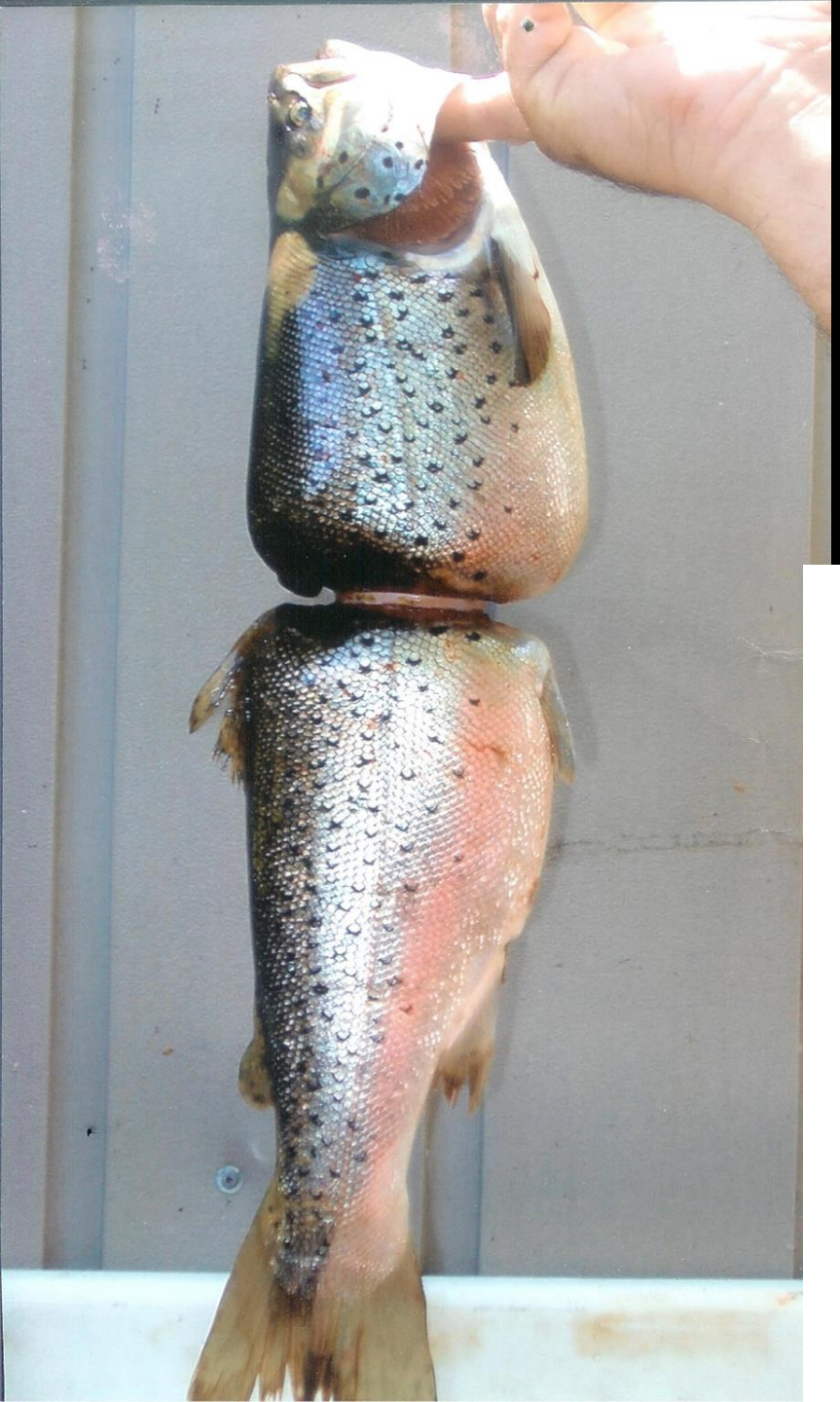
Lenaker et al., 2021





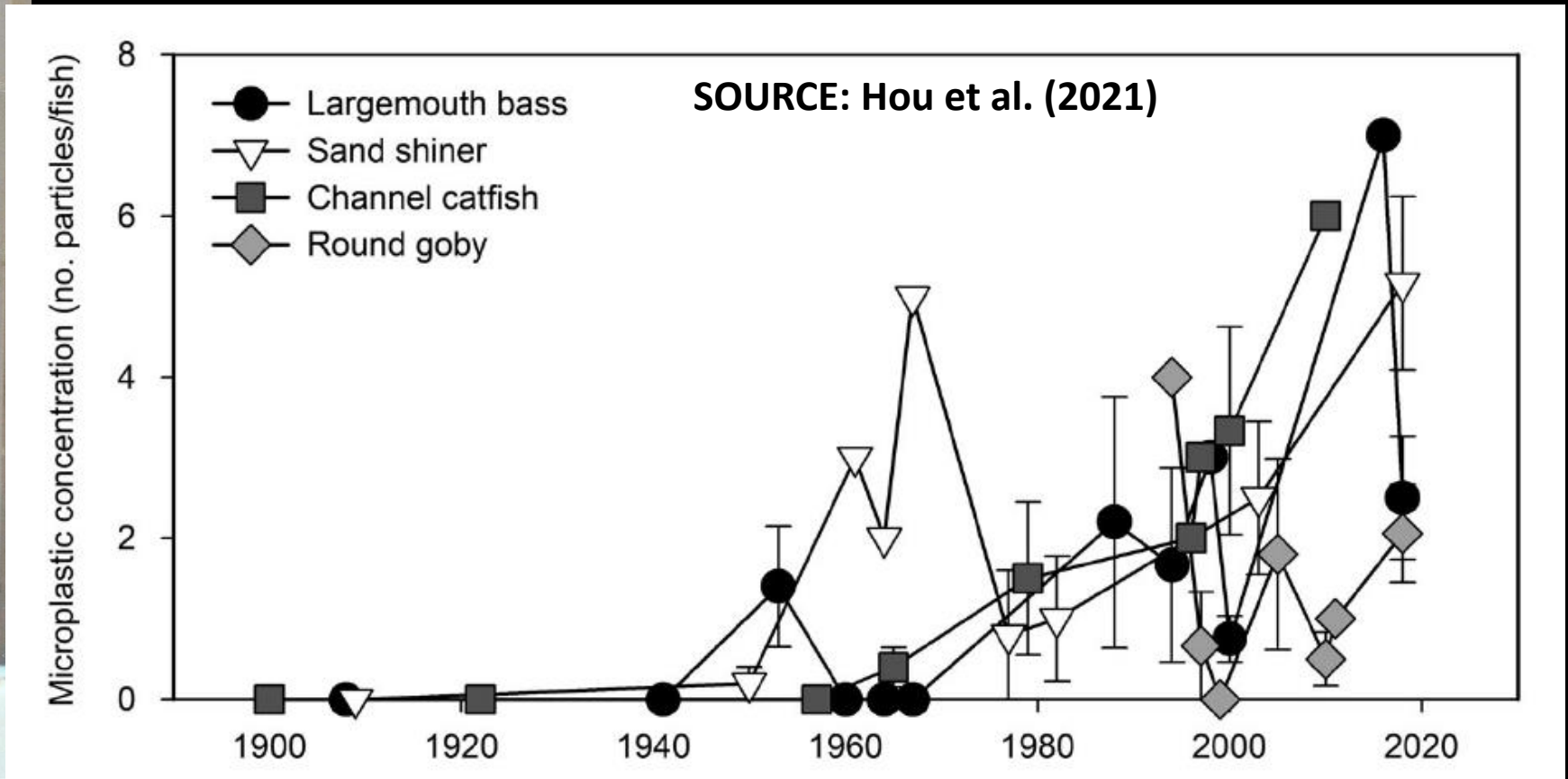


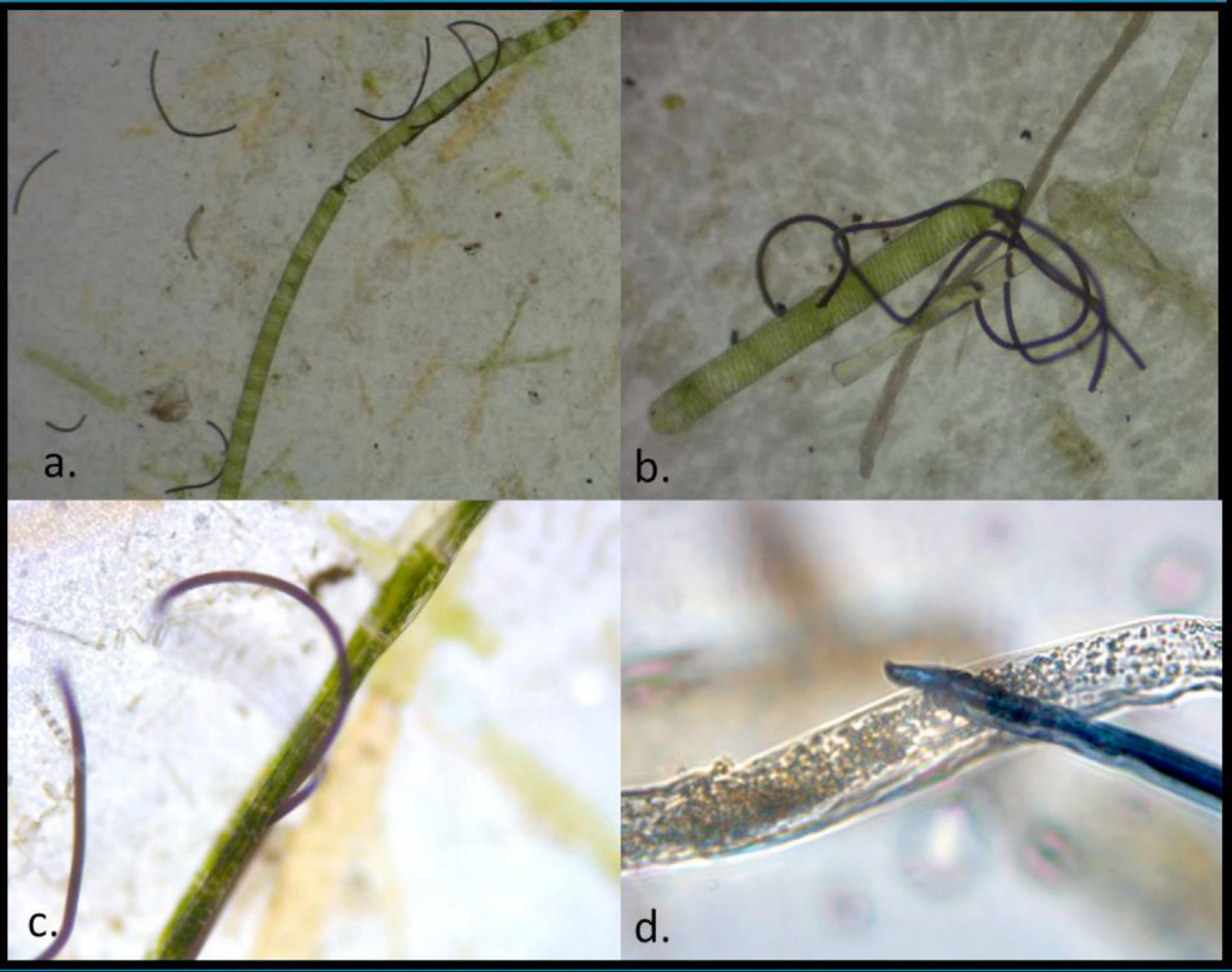
Biota



FIBERS DOMINATE

- McNeish et al. (2018)
  - 97-100% of particles
  - 10 fish taxa
  - L. Michigan watersheds
- Athey et al. (2020)
  - 91% of particles
  - Rainbow smelt
  - L. Huron and L. Ontario





SOURCE: Peller et al. (2021)

MICROPLASTICS IN HUMAN CONSUMABLES

OVERVIEW

Consumer Product	Region	Size	Average	Est. Yearly Consumption
Sea Salt	USA	>100 um	212 particles/kg	180 particles
Beer	Great Lakes	>100 um	4.05 particles/L	520 particles
Tap Water	Global	>100 um	5.45 particles/L	5,100 particle
Bottled Water	Global	>100 um	10.4 particles/L	9,870 particle
		> 6.5 um	325 particles/L	308,425 part.

Environmental Science & Technology

Article

Cite This: Environ. Sci. Technol. XXXX, XXX, XXX−XXX

pubs.acs.org/est

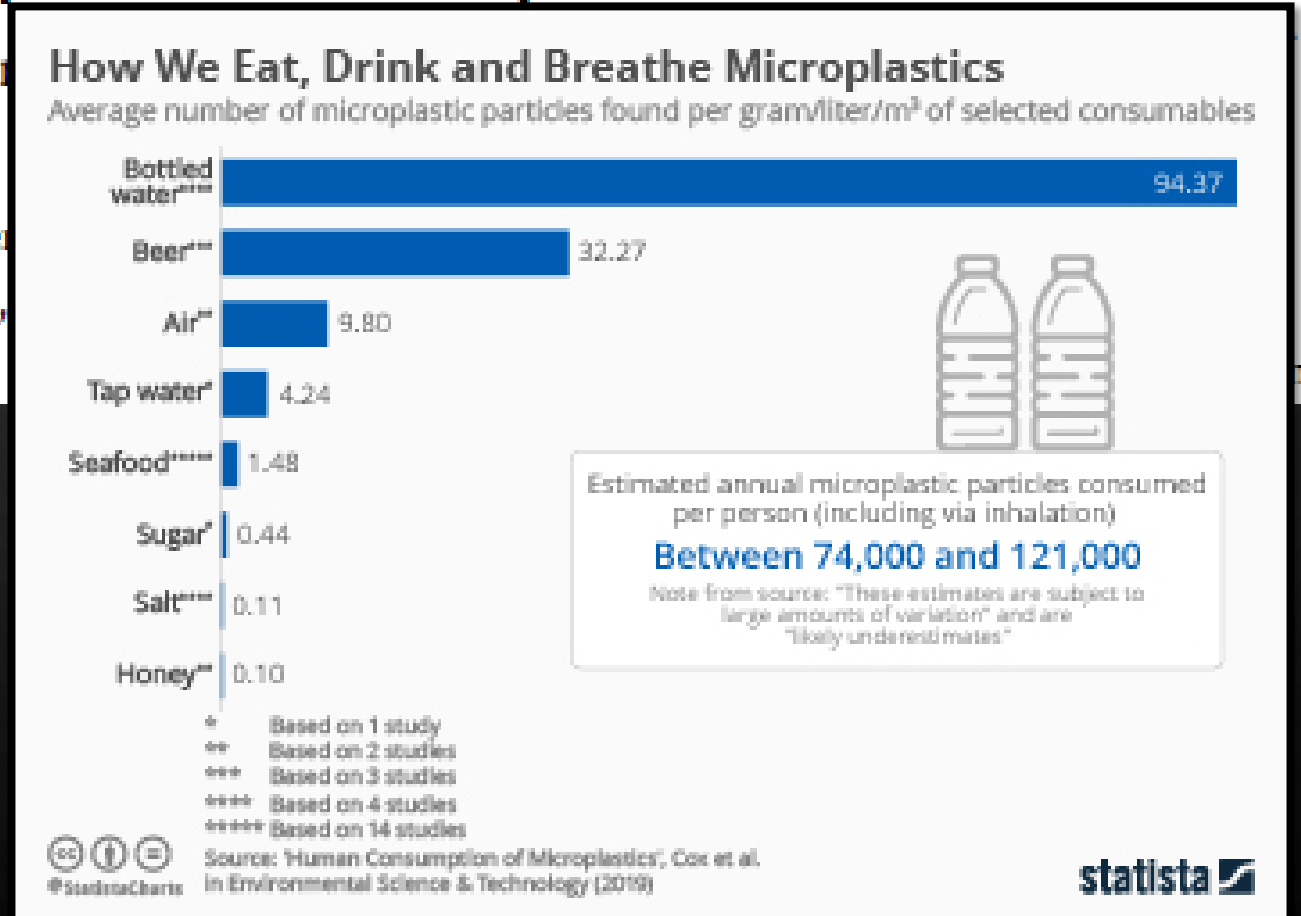
Human Consumption of Microplastics

Kieran D. Cox,*[†,‡] Gar… Francis Juanes,[†] and Sarah E. Dudas[†,‡,§]

[†]Department of Biology, Univer…

[‡]Hakai Institute, Calvert Island,

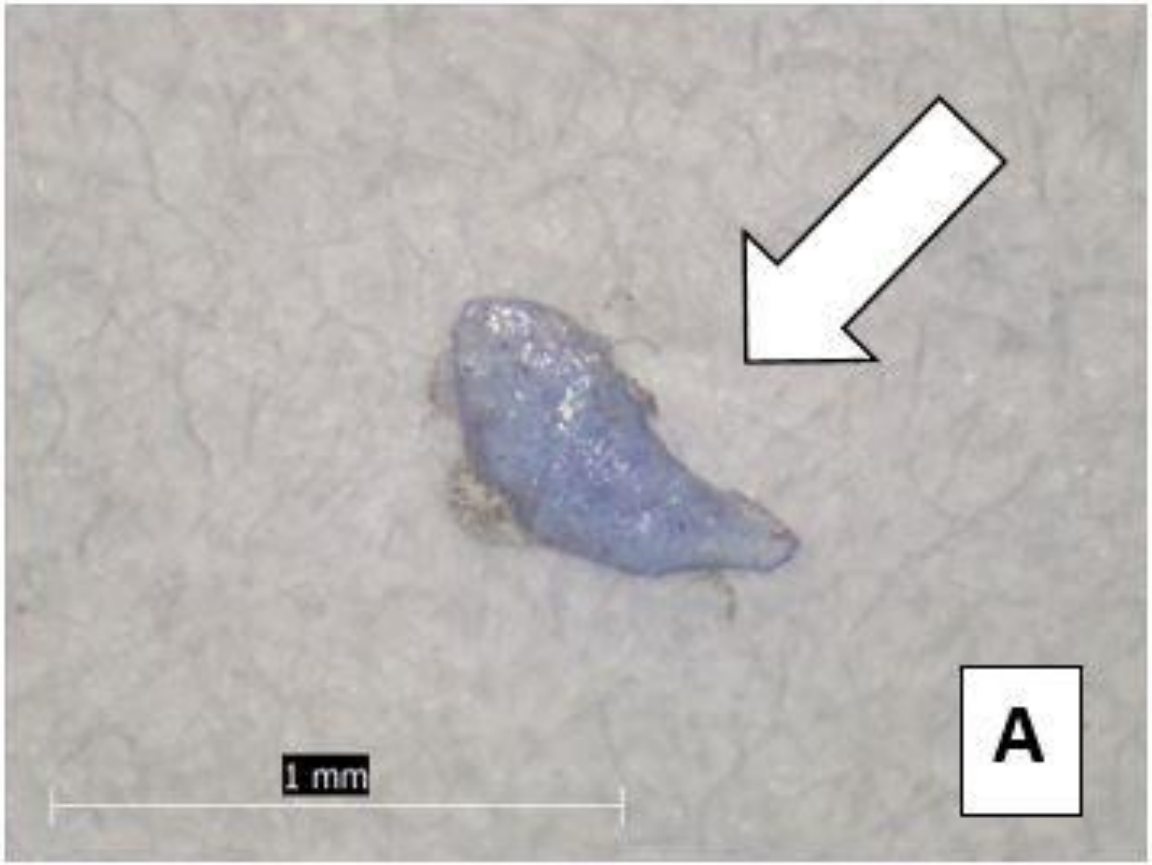
[§]Fisheries and Oceans Canada, …nada

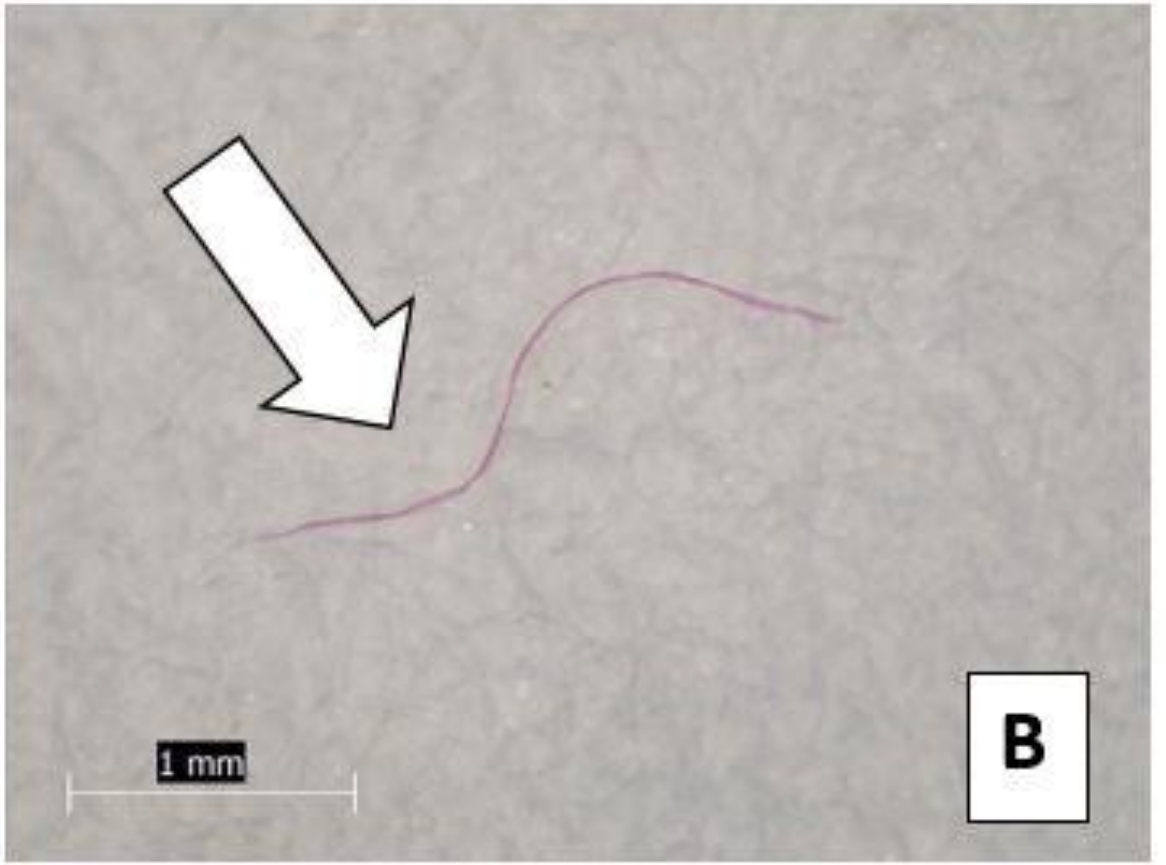


Kosuth et al. (2018)

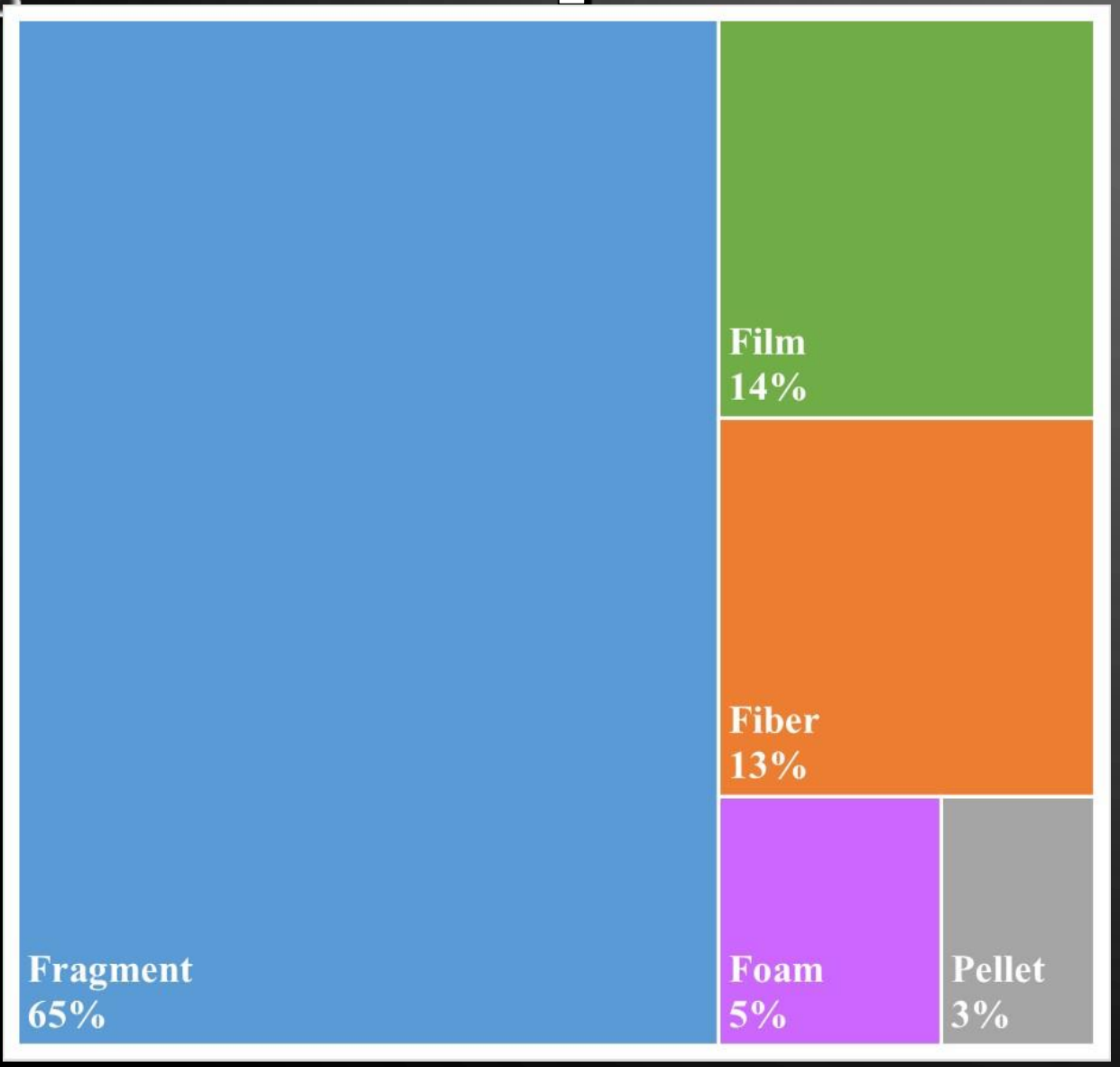
Beer, Sea Salt & Tap Water

98% Fibers

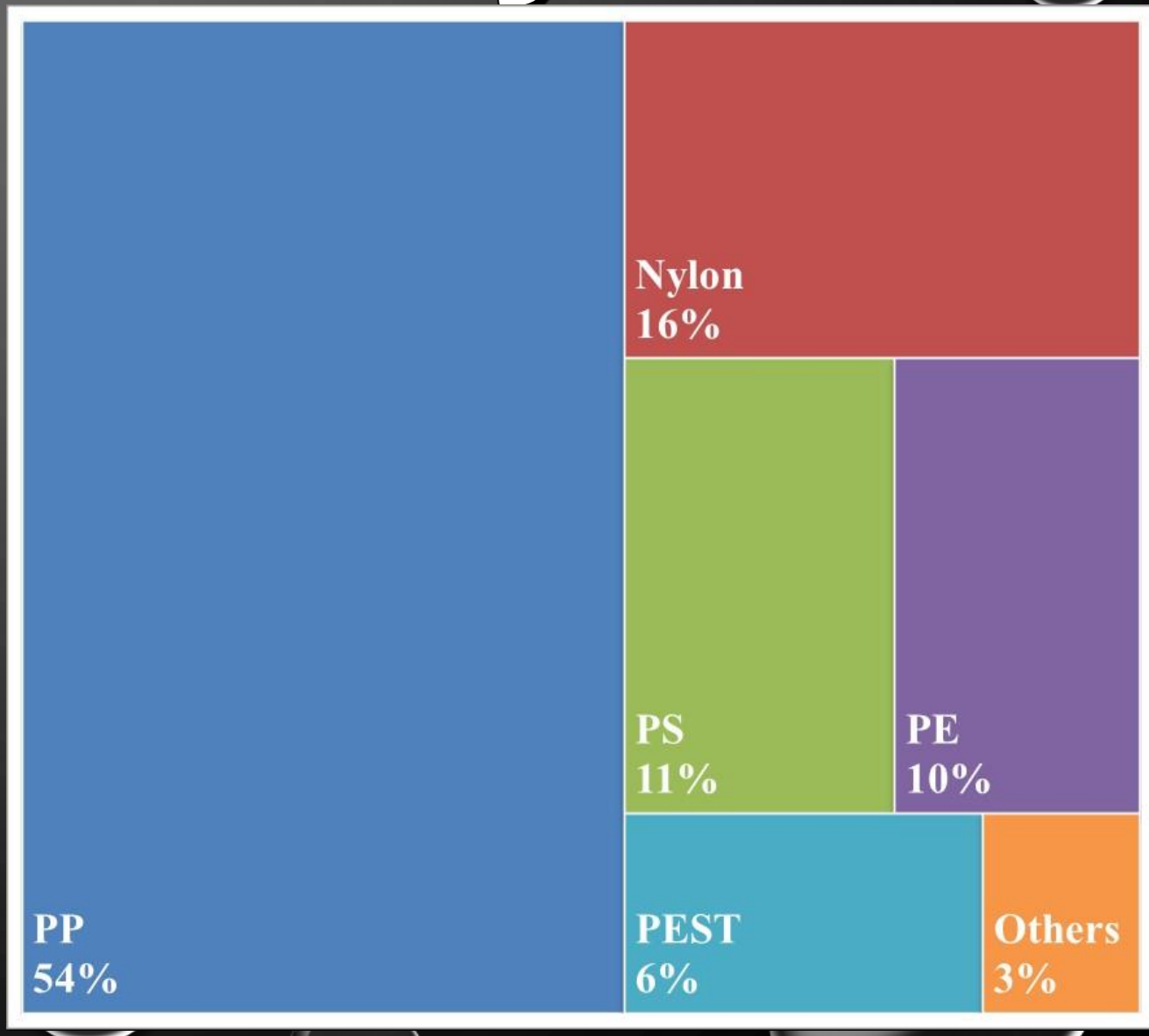




Shape



Polymer



Knowledge Gaps

- Understand Major Pathways
  - atmospheric deposition
  - stormwater vs. wastewater
  - mass-balance models
- Address Environmental Compartments with Little Data
  - air
  - biota
- Degradation Kinetics
  - macro (land) → micro (water) ?
  - biodegradable alternatives (e.g. PLA)
- Ecological Impact
  - bioaccumulation
  - human health

GESAMP

Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

GUIDELINES FOR THE MONITORING AND ASSESSMENT OF PLASTIC LITTER IN THE OCEAN

GESAMP (2019). Guidelines or the monitoring and assessment of plastic litter and microplastics in the ocean (Kershaw P.J., Turra A. and Galgani F. editors), (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 99, 130p.

Thank You!

THE HEINZ AWARDS

PennState Behrend

USGS
science for a changing world

5GYRES

THE BURNING RIVER FOUNDATION

U.S. BRIG NIAGARA
ERIE MARITIME MUSEUM

SINCE 1971
Sea Grant
New York
Bringing Science to the Shore

PANGAEA EXPLORATION
exploration - education - conservation

ILLINOIS – INDIANA SEA GRANT

THE GREAT LAKES SCHOOLSHIP
INLAND SEAS
EDUCATION ASSOCIATION
INLAND SEAS EDUCATION CENTER

SAVE THE RIVER
Upper St. Lawrence RIVERKEEPER

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

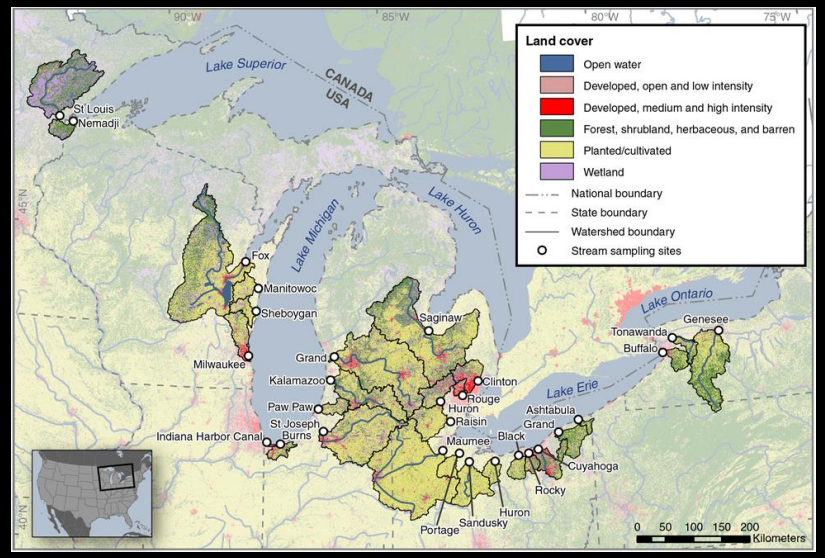

QUESTIONS?
WESTCOTT
RULER

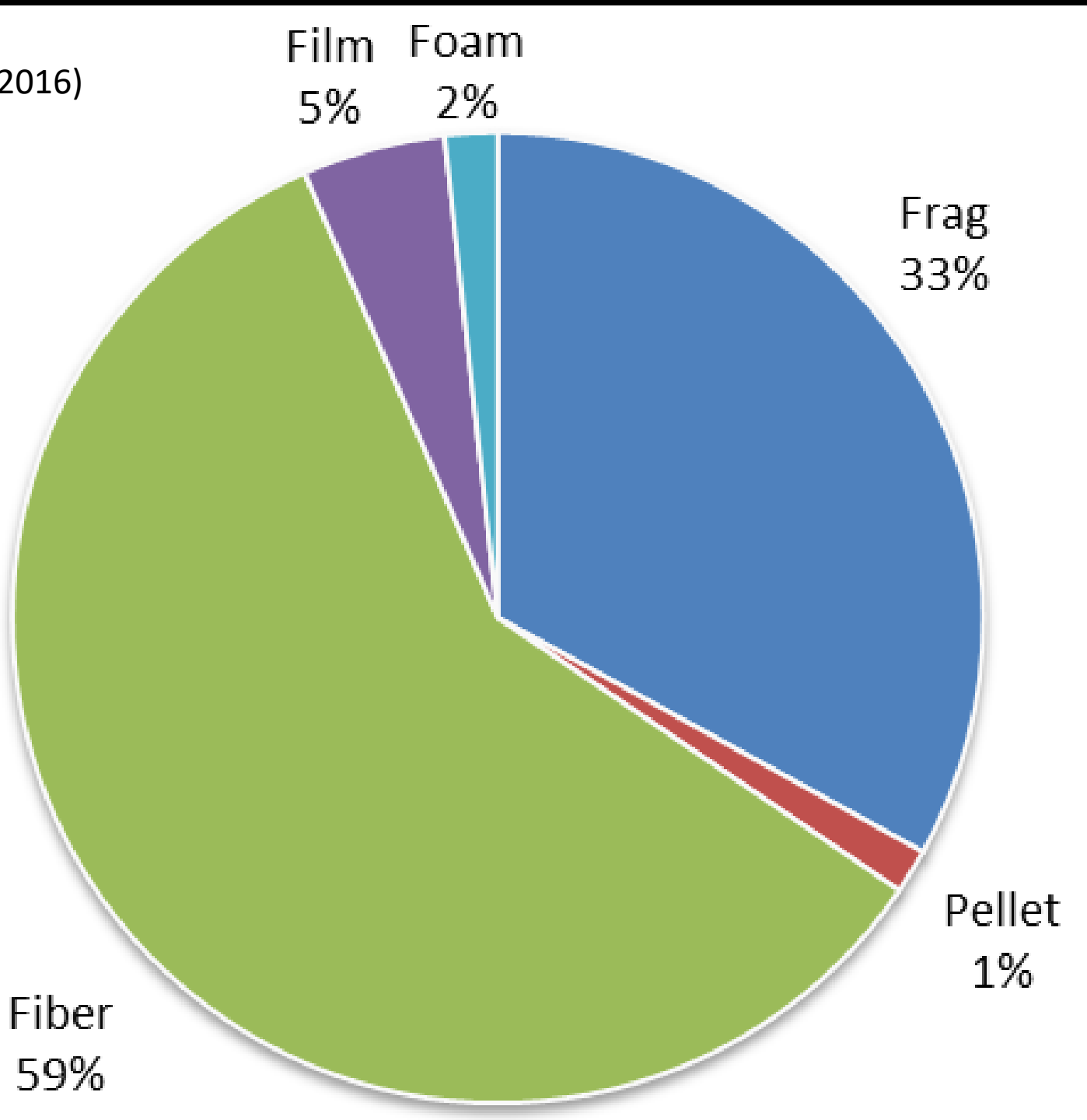
Wastewater Treatment Plants

WWTP

SOURCE:
Mason et al. (2016)

> 4 million particles/day



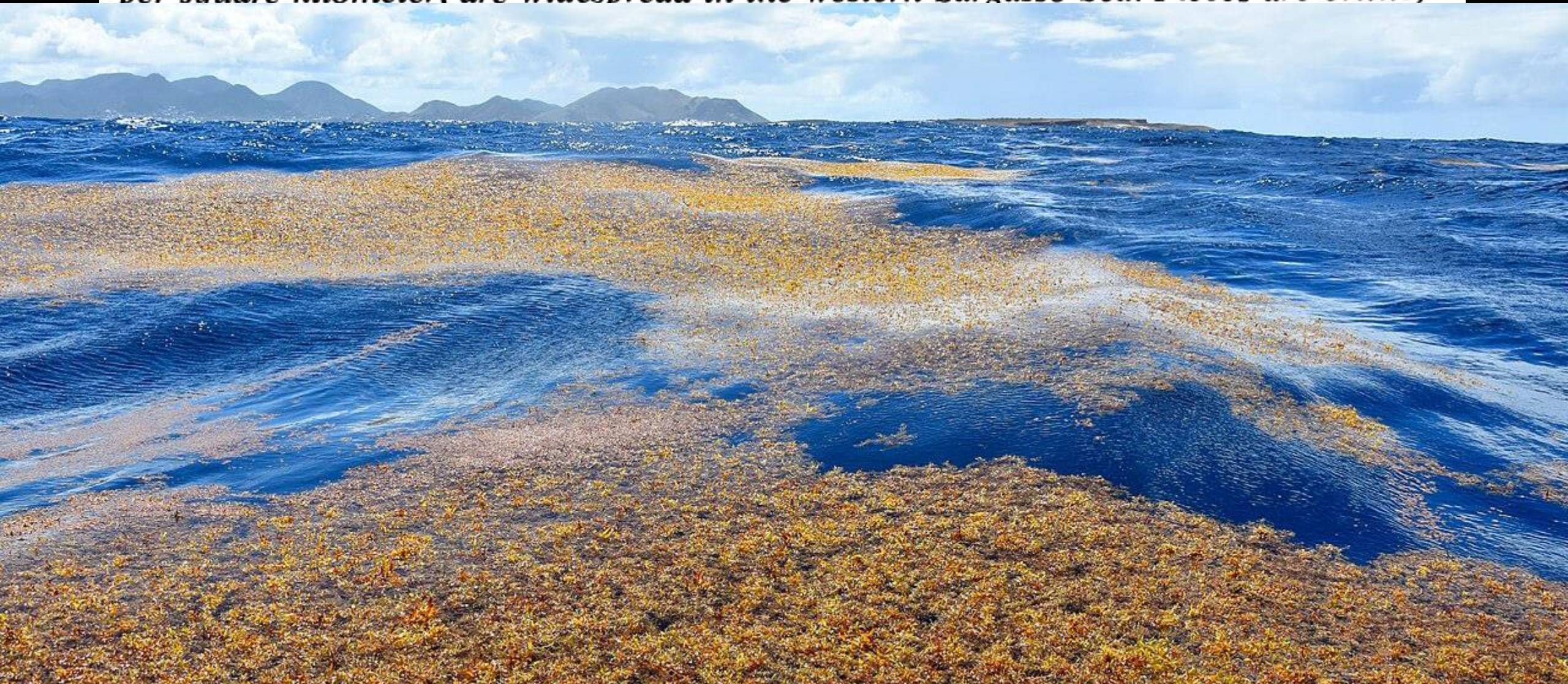


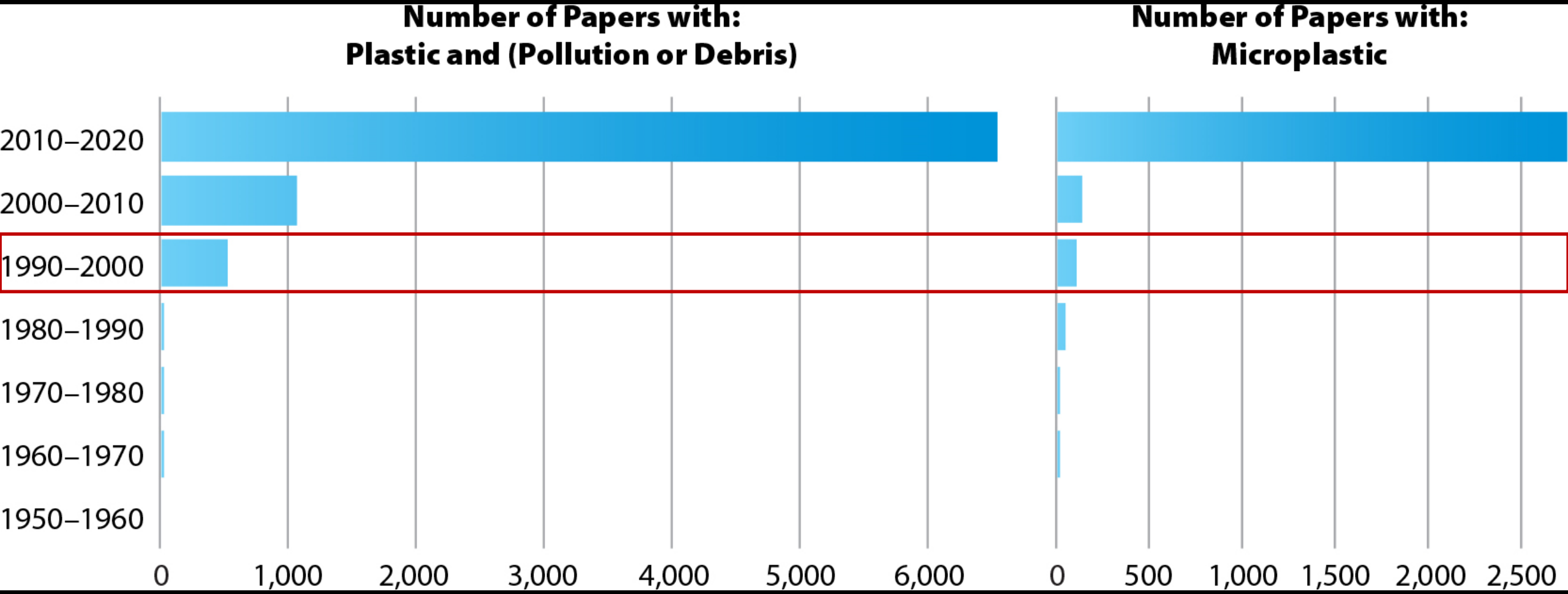
Plastics on the Sargasso Sea Surface

Carpenter & Smith

SCIENCE, VOL. 175

Abstract. *Plastic particles, in concentrations averaging 3500 pieces and 290 grams per square kilometer, are widespread in the western Sargasso Sea. Pieces are brittle,*




Number of Papers with:
Plastic and (Pollution or Debris)
Number of Papers with:
Microplastic
2010–2020
2000–2010
1990–2000
1980–1990
1970–1980
1960–1970
1950–1960
0
1,000
2,000
3,000
4,000
5,000
6,000
0
500
1,000
1,500
2,000
2,500


NATIONAL
GEOGRAPHIC

Agenda Item 5:

Ohio River Basin Alliance Abundant Clean Water Objective Update

Director Harrison

Agenda Item 6:

Biological Programs Update

2021 Field Season Schedule

Ryan Argo

rargo@orsanco.org

226th TEC Meeting

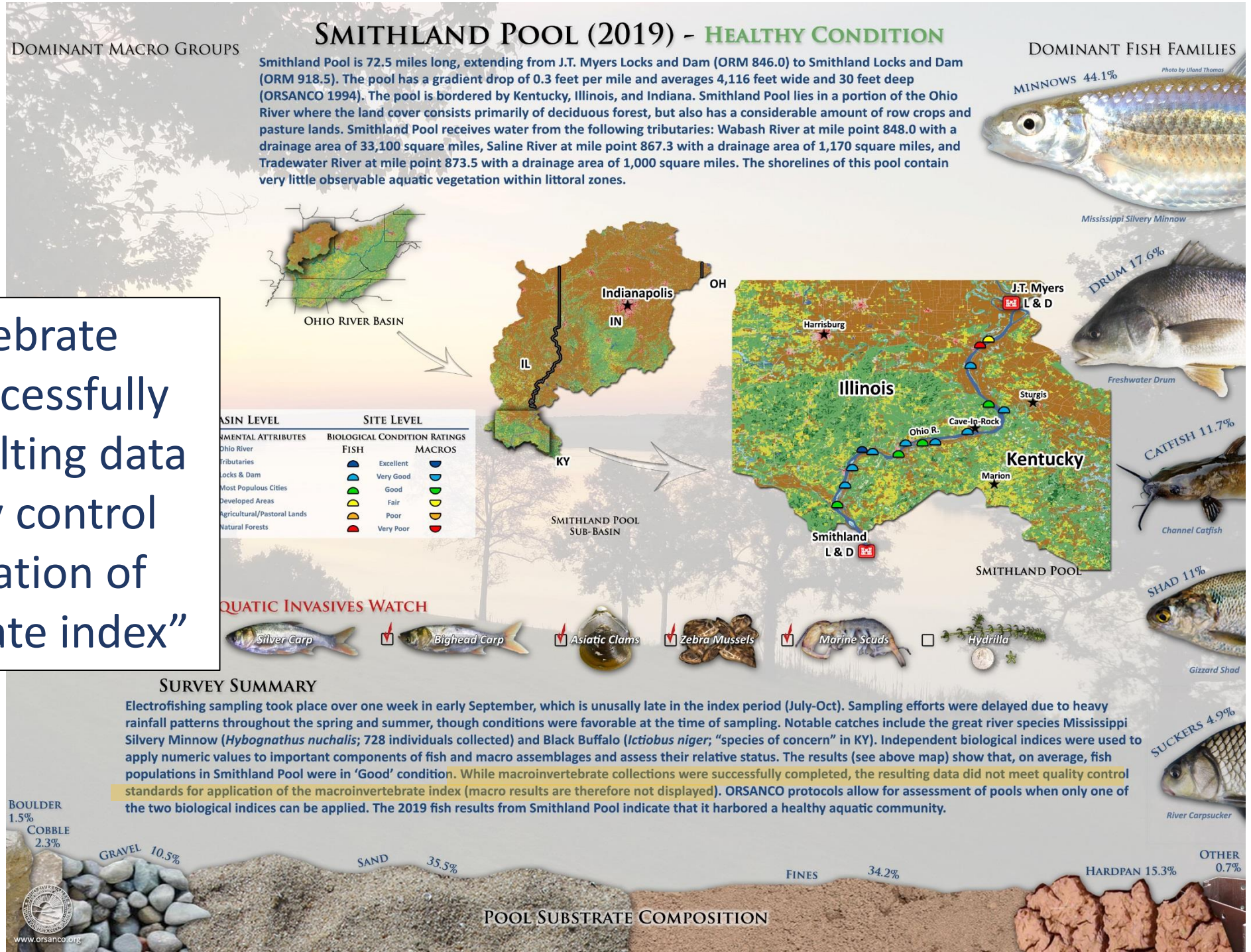
June 8th & 9th, 2021

2019 Smithland Macro Data

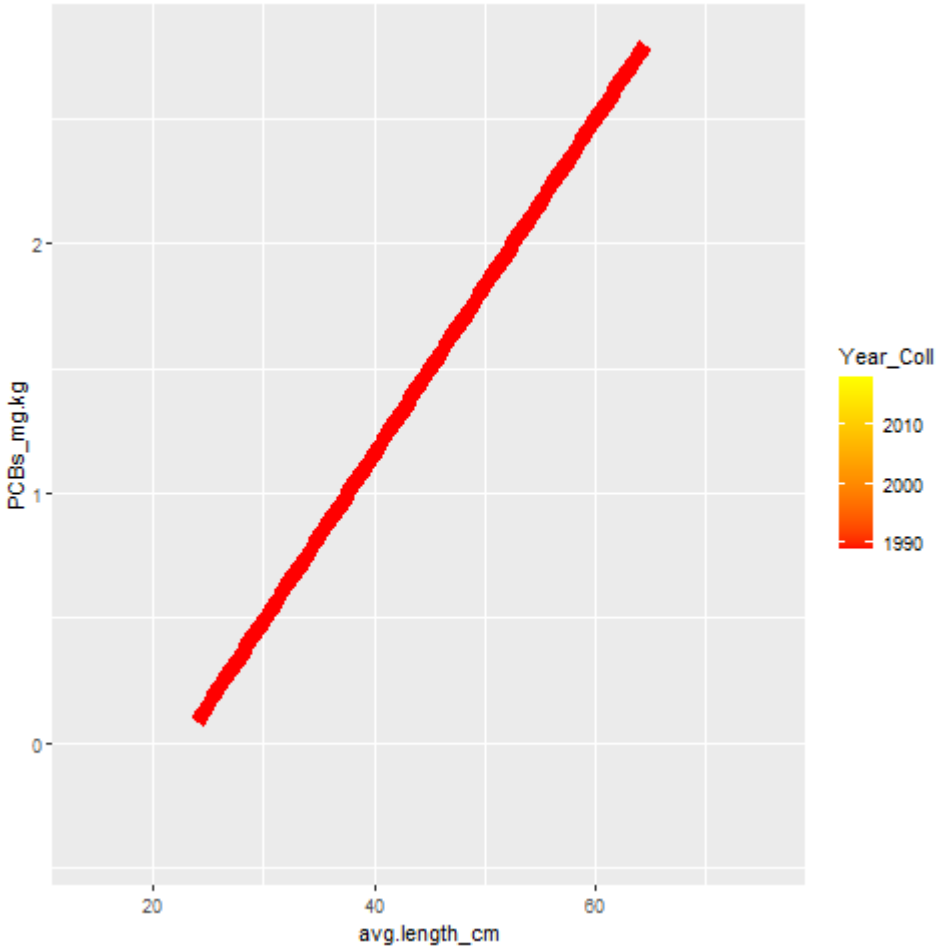
- Initial data return was delayed due to pandemic-related issues at contract lab
- Data returned in late 2020 lacked necessary taxonomic resolution
- Samples were sent to a second laboratory for identification/enumeration confirmation
- Data returned late January, were reviewed with BWQSC after Feb TEC meeting

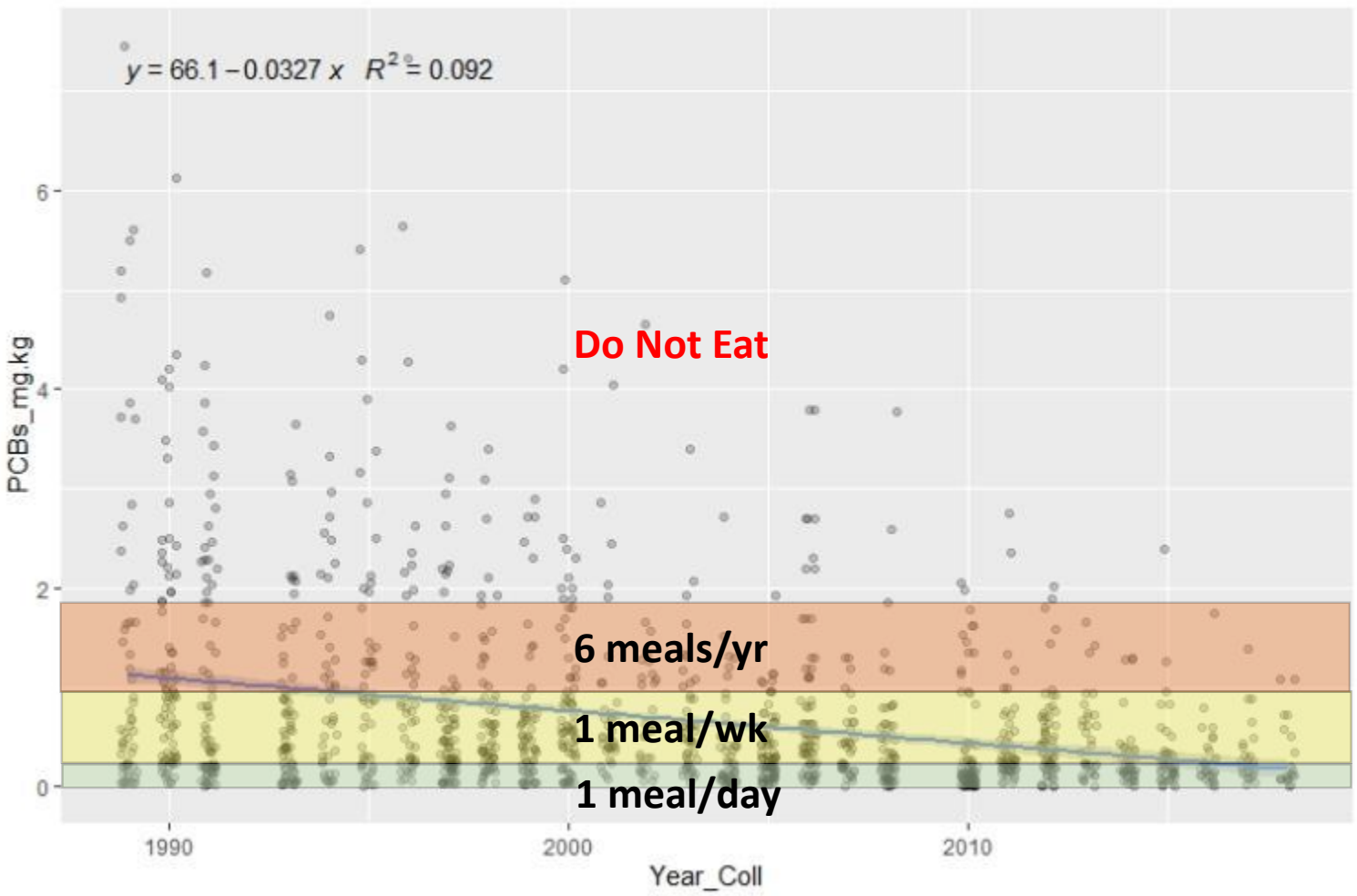
Staff Lead: Bridget Borrowdale

"While macroinvertebrate collections were successfully completed, the resulting data did not meet quality control standards for application of the macroinvertebrate index"



Ongoing Fish Tissue PCBs Trends Analyses





Staff Lead: Daniel Cleves – dcleves@orsanco.org

Ongoing Fish Tissue PCBs Trends Analyses

- Preliminary analyses highlighted need to
  - Adjust for observed correlations (e.g. length, rivermile)
  - Exercise caution when applying length standardization methods
  - Test validity of aggregating data at higher taxonomic levels

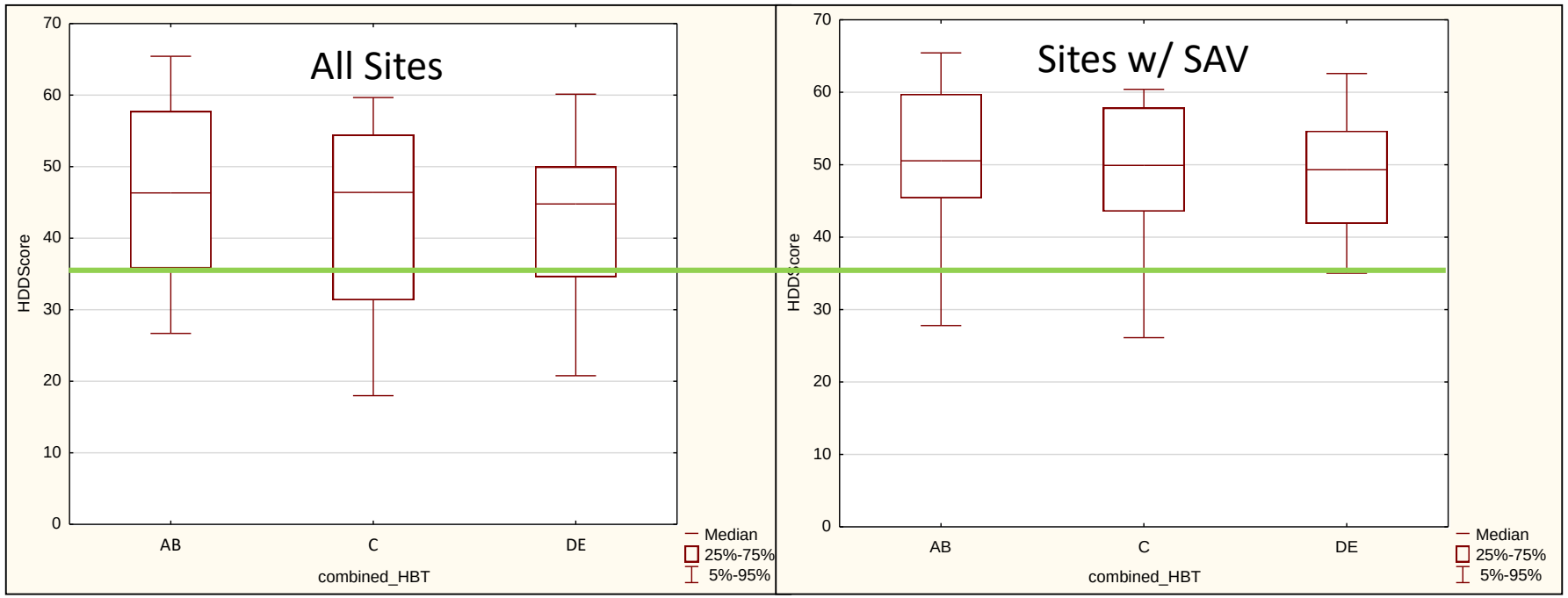
- Use findings to inform future trends analyses
  - Incorporate 2019 & 2020 data
  - Produce repeatable approach
  - Report goal by end of FY22

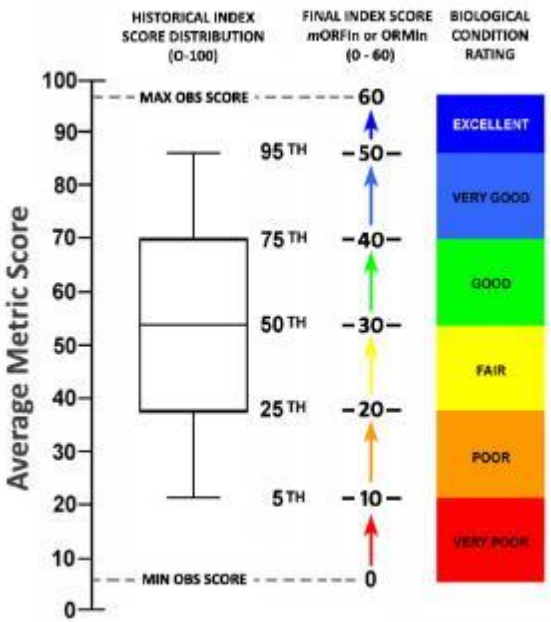
- Known issue to resolve
  - Varying lab methods for PCB quantification
    - EPA methods exist to adjust for the differences prior to determining valid temporal trends
    - Investigate past contracts and physical documentation

Staff Lead: Daniel Cleves

Ongoing Macro Investigations

- More paired submerged aquatic vegetation (SAV) and macro data are required to further refine both indices
  - 5 of 18 pools remain to be surveyed for SAV

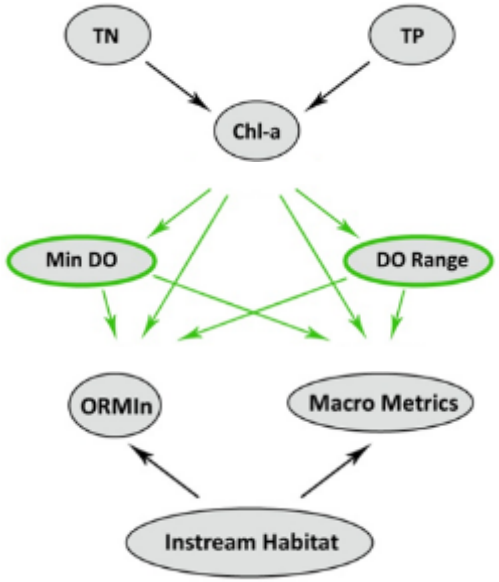


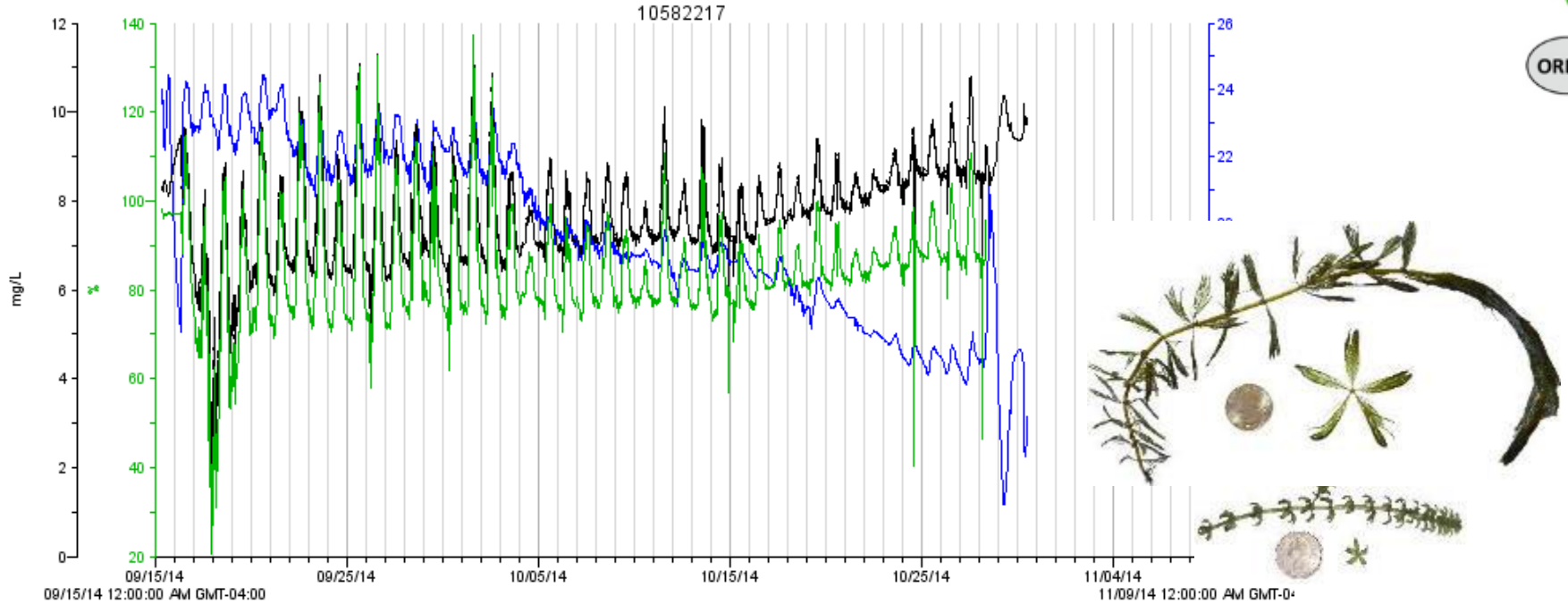


Staff Lead: Bridget Borrowdale – bborrowdale@orsanco.org

Ongoing Macro Investigations

- More paired submerged aquatic vegetation (SAV) and macro data are required to further refine both indices
  - 5 of 18 pools remain to be surveyed for SAV
  - Nutrient criteria data





Staff Lead: Bridget Borrowdale

Ongoing Macro Investigations

- More paired submerged aquatic vegetation (SAV) and macro data are required to further refine both indices
  - 5 of 18 pools remain to be surveyed for SAV
  - Nutrient criteria data
- Incorporate lessons learned from first assessment cycle applying the ORMIn (macro index)
  - Effects of SAV and flow, Taxonomic Resolution
  - Adjust/refine index and protocols accordingly
- Future targeted SAV survey
  - Macro & fish assemblage comparisons across areas of various SAV microhabitats (e.g. non-native presence, %coverage)
  - Pending funding and available personnel resources

Staff Lead: Bridget Borrowdale

Annual Bio Program Field Activities

- 2-4 probabilistic pool surveys annually
  - Fish assemblages
  - Macroinvertebrate assemblages
  - Habitat assessment (benthic substrate, aquatic macrophytes)
  - Index period is July - October
- 18 river-wide fixed stations (fish and habitat); 2004-present
- River-wide fish tissue collection
- ~~Basin-wide mobile aquarium displays~~ ON HOLD
- Other initiatives, workgroups/ partnerships

Key Dates for 2021 Biological Activities

Sampling Windows

Probabilistic Index Period: July 1st – October 31st

Fixed Station Sampling: August 2nd-20th

Latest Start Dates Allowing for Task Completion*

August 9th: All 18 Fixed Stations (Fish & Macros)

August 23rd: Full Probabilistic Surveys of all 4 pools (Fish & Macros)

October 4th: Partial Probabilistic Surveys of all pools (Fish only)

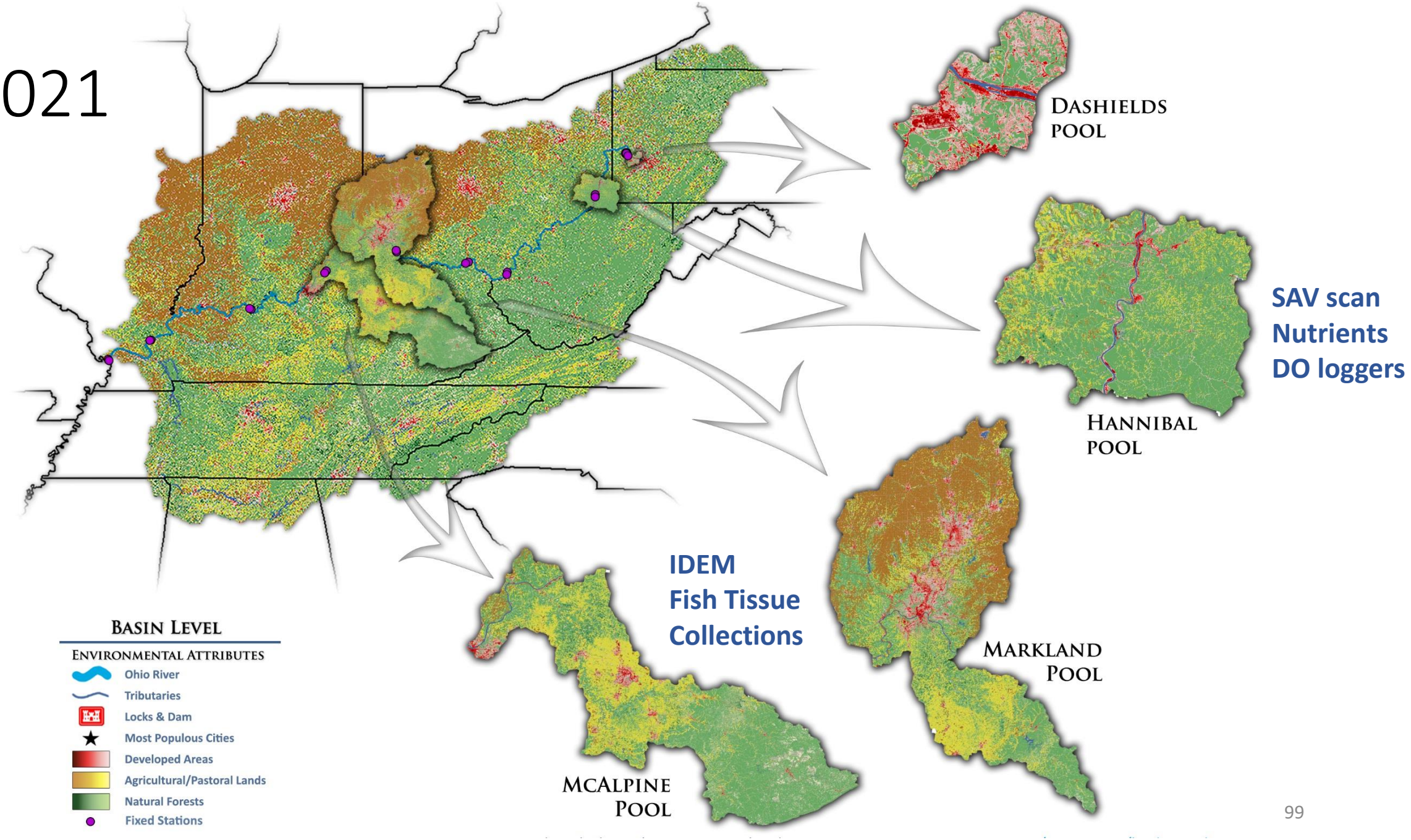
*assumes staff vaccination ✓ & acquisition of four seasonal biologists ✓

2021 Field Season Plans

- As of May 1st, 2021 COVID Field Protocols Updated
  - Allow vaccinated staff to be within 6’ without duration or masking restrictions
  - i.e. all boat based activities are permitted if crew is two weeks post complete vaccination

- Return to normal field season efforts – **prioritizing probabilistic surveys**
  - Increased to 4 pools - Dashields, Hannibal, Markland, and McAlpine
  - Hannibal SAV
    - Last pool for paired continuous DO and sestonic nutrient sampling
    - USEPA submersible probe to survey SAV beds
    - Compare to our physical means of quantifying SAV coverage
  - Fish Tissue collections on behalf of IDEM in Indiana pools
  - Accommodate any additional state and federal agency sampling requests

2021



SAV scan
Nutrients
DO loggers

IDEM
Fish Tissue
Collections

Agenda Item 7:

Source Water Protection & Emergency Response Update

Sam Dinkins

Source Water Protection & Emergency Response

Technical Committee Meeting
June 8-9, 2021
Sam Dinkins

Source Water Protection

- USDA Farm Bill
  - 2018 Farm Bill allocates $400 Million for SWP over 10 years
  - Provides funding to landowners to install BMPs
  - Evaluating potential role to facilitate funding for SWP activities in Ohio River Basin
  - Working with AWWA, EPRI, state agencies, and utilities

Harmful Algal Blooms

- Updated HAB Response & Communications Plan approved by Technical Committee
- Given the heavy PFAS work load, no HABs will be permitted in 2021!
- Continuous Monitoring Stations
  - June through October
    - Pike Island ORM 84
    - Meldahl ORM 436
  - Year-Round
    - Markland ORM 531
    - Newburgh ORM 776

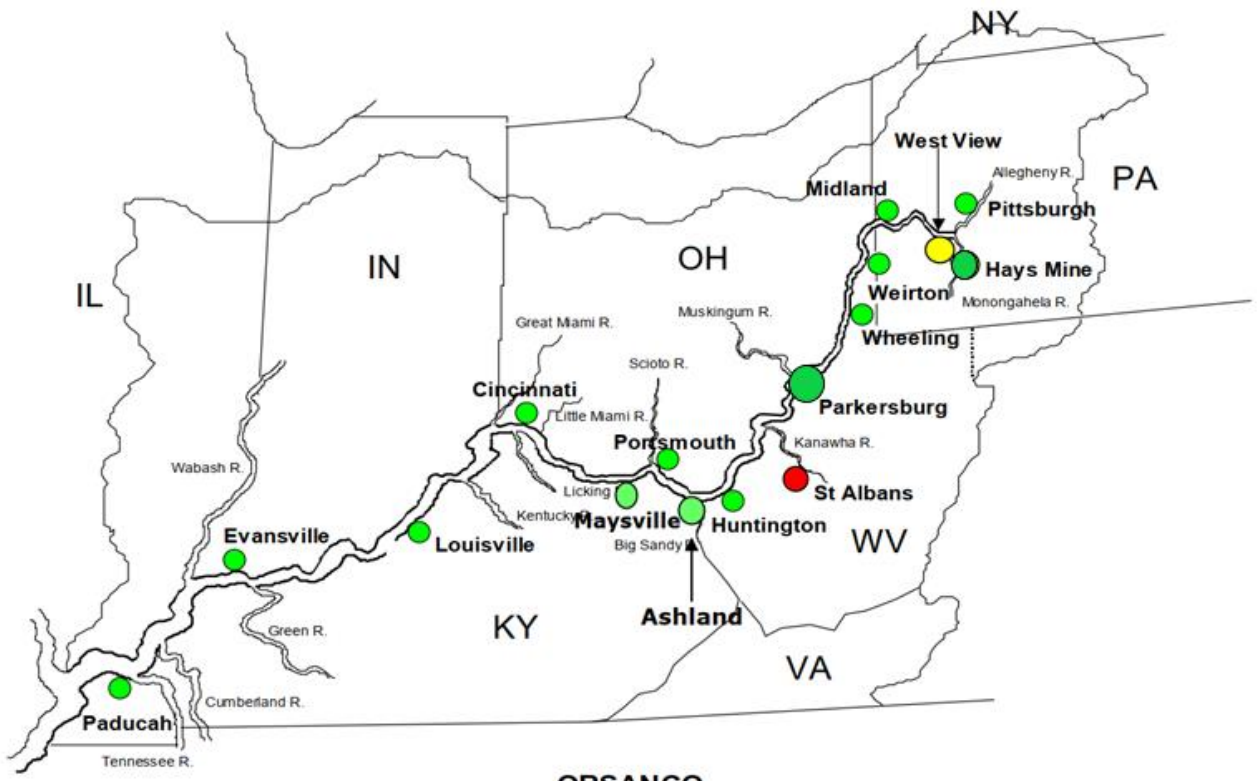
Markland, We Have a Problem

- Monitoring unit at Markland is currently down
- Barge incident severed unit from lockwall
- Working to resolve the issue

Organics Detection System Update

- Of 17 ODS sites, 16 are operational
  - 1 site non-operational: St. Albans (Kanawha)
    - Site deemed unsafe due to hydrogen tanks
  - 1 site runs samples intermittently due to limited staff time: West View Water
    - Scheduled for system training/refresher in late June
  - 16 site visits (repairs and maintenance) since Jan
    - Primarily purge & trap issues, 2 PMs
    - 1 reinstallation of CMS instrument (Midland) and 1 CMS swap (Maysville)

ODS Operational Status Map



Instrument/Software Upgrades

- GCMS Software Upgrades
  - Chromeleon 7
    - Wheeling and Huntington dates scheduled for installation in early June
    - In process of procurement from Thermo Scientific for 1 more copy for American Water PA-Hays Mine
  - WIN 10/PC Upgrades
    - On-going; will update PCs at locations before Chrom 7 install (Wheeling and Huntington PCs have been purchased-install next week)
- New CMS 5000
  - Currently at Maysville Water (previous CMS5000 being sent for repair)
  - Haven't finalized decision of when to purchase a second unit

Emergency Response

- Louisville Sub-Area Team
  - Developing sub-area plan like Cincy
  - 2020 field recon efforts postponed due to COVID
  - Oct – Held field demonstration of spill response field data collection apps
  - Allows for multiple agencies to share a common GIS platform for spill planning and response data collection
  - Field recon anticipated Aug/Sept 2021

Emergency Response (cont.)

- Have maintained full readiness throughout pandemic

- Emergency Response Directory
  - December 2020 update now available
- Making progress on Industrial Intake Directory

- Spill Response Activity
  - No spill events since last meeting required a field response by ORSANCO staff

Questions or Comments?

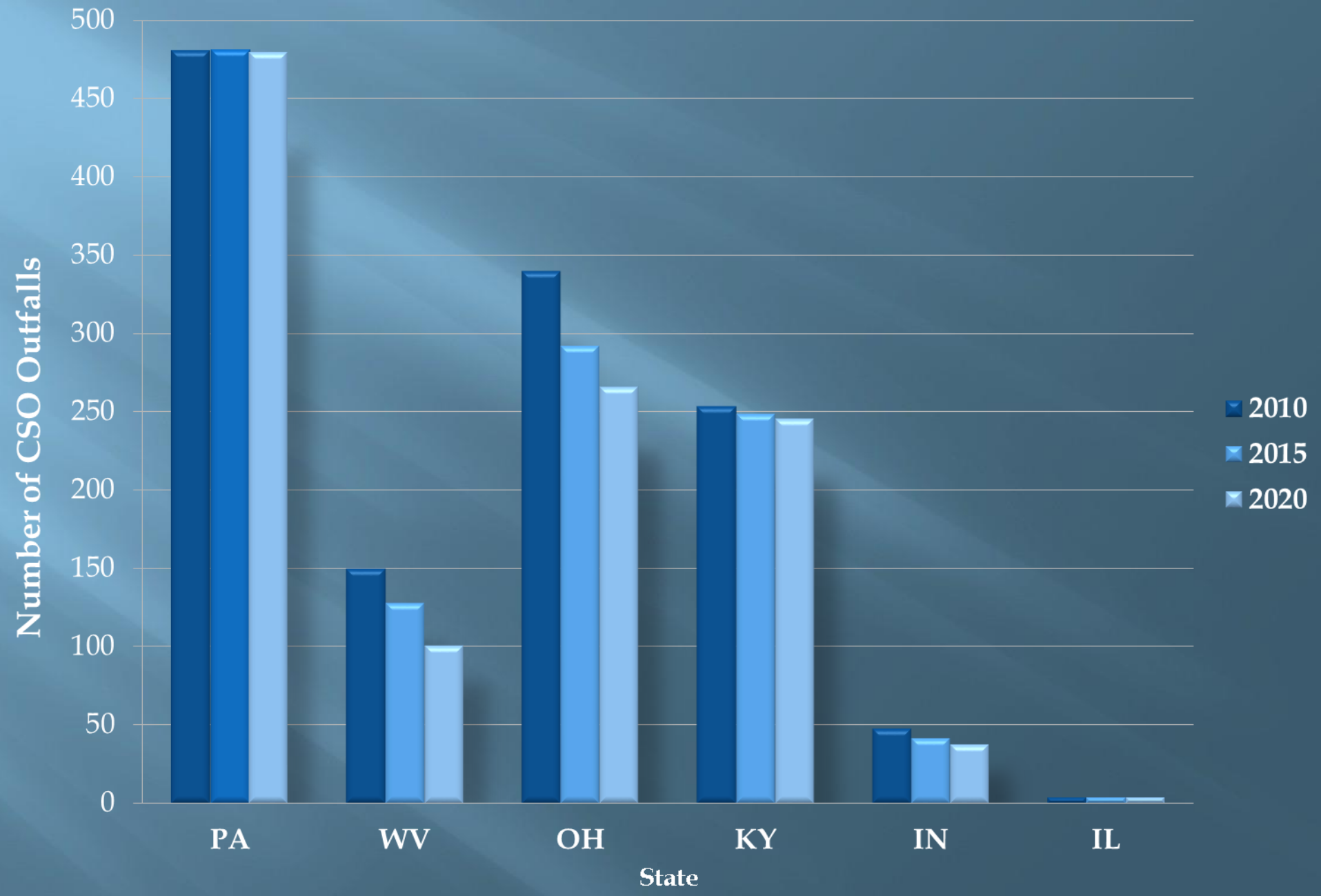
Agenda Item 8:

Status of Combined Sewer Overflow Abatement for Ohio River CSO Systems

Stacey Cochran

- Pennsylvania – 10 Communities
- West Virginia – 10 Communities
- Ohio – 10 Communities
- Kentucky – 9 Communities
- Indiana – 7 Communities
- Illinois – 2 Communities

CSO Outfalls in the Ohio River Communities

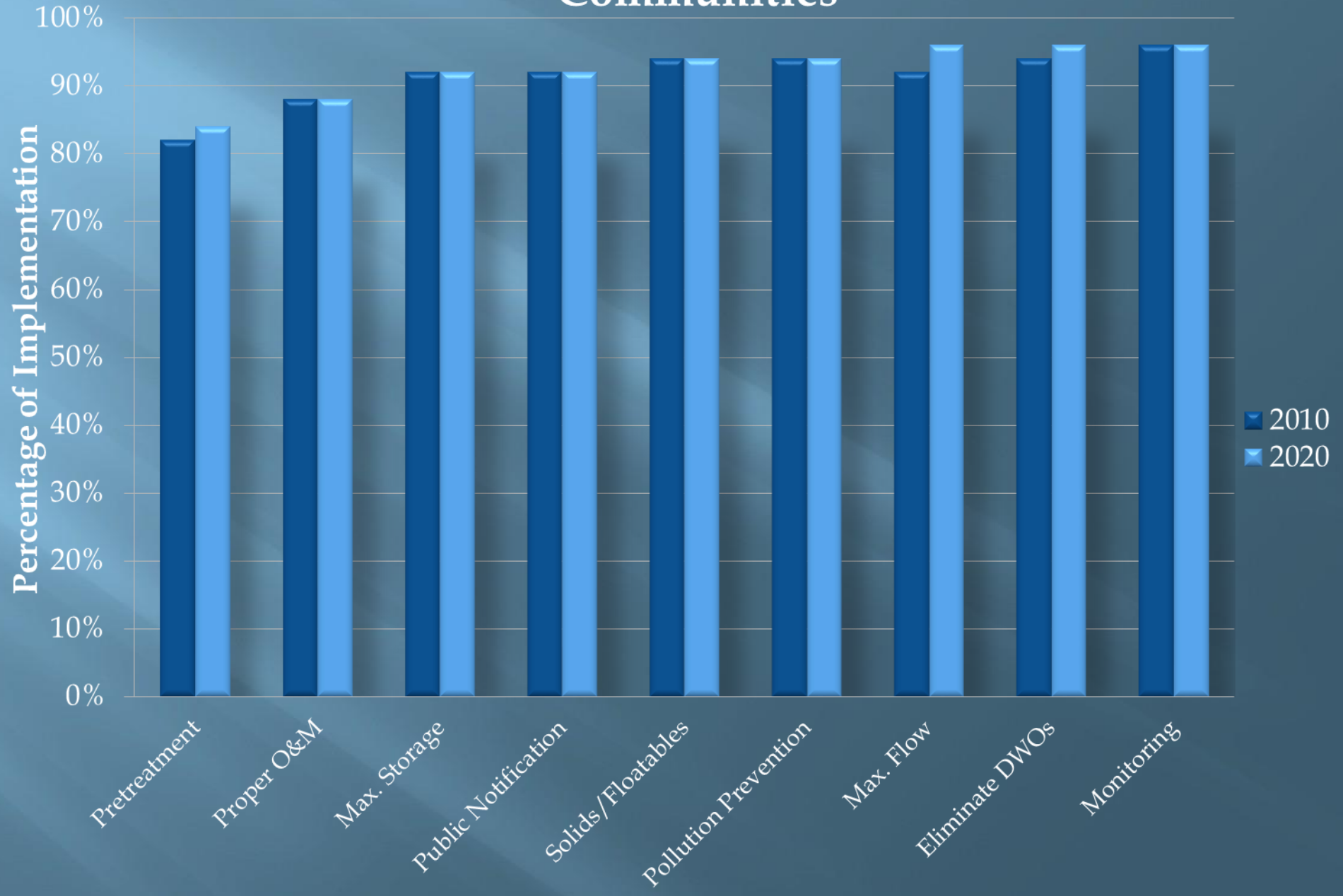


Nine Minimum Controls

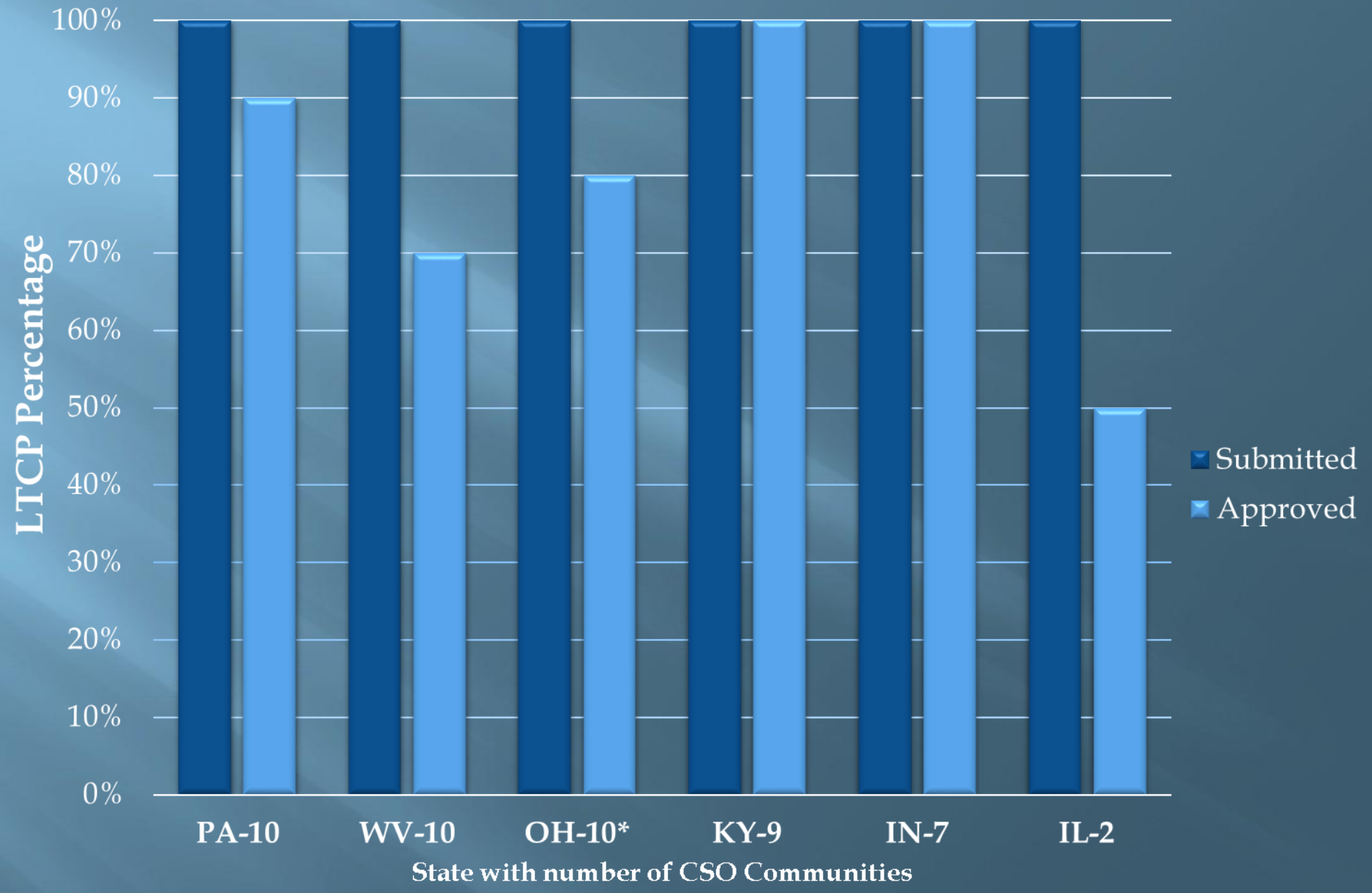
- Measures that can reduce CSOs and their effects on receiving water quality.

1. Proper Operation & Maintenance
2. Maximize Storage
3. Pretreatment
4. Maximize Flow for Treatment
5. Dry Weather CSO Prohibition
6. Control of Solids and Floatables
7. Pollution Prevention
8. Public Notification
9. Monitoring of CSO Impacts

NMC Percentage of Implementation for the 48 CSO Communities



Status of Ohio River Communities LTCP



*New Boston is not required to submit a LTCP.

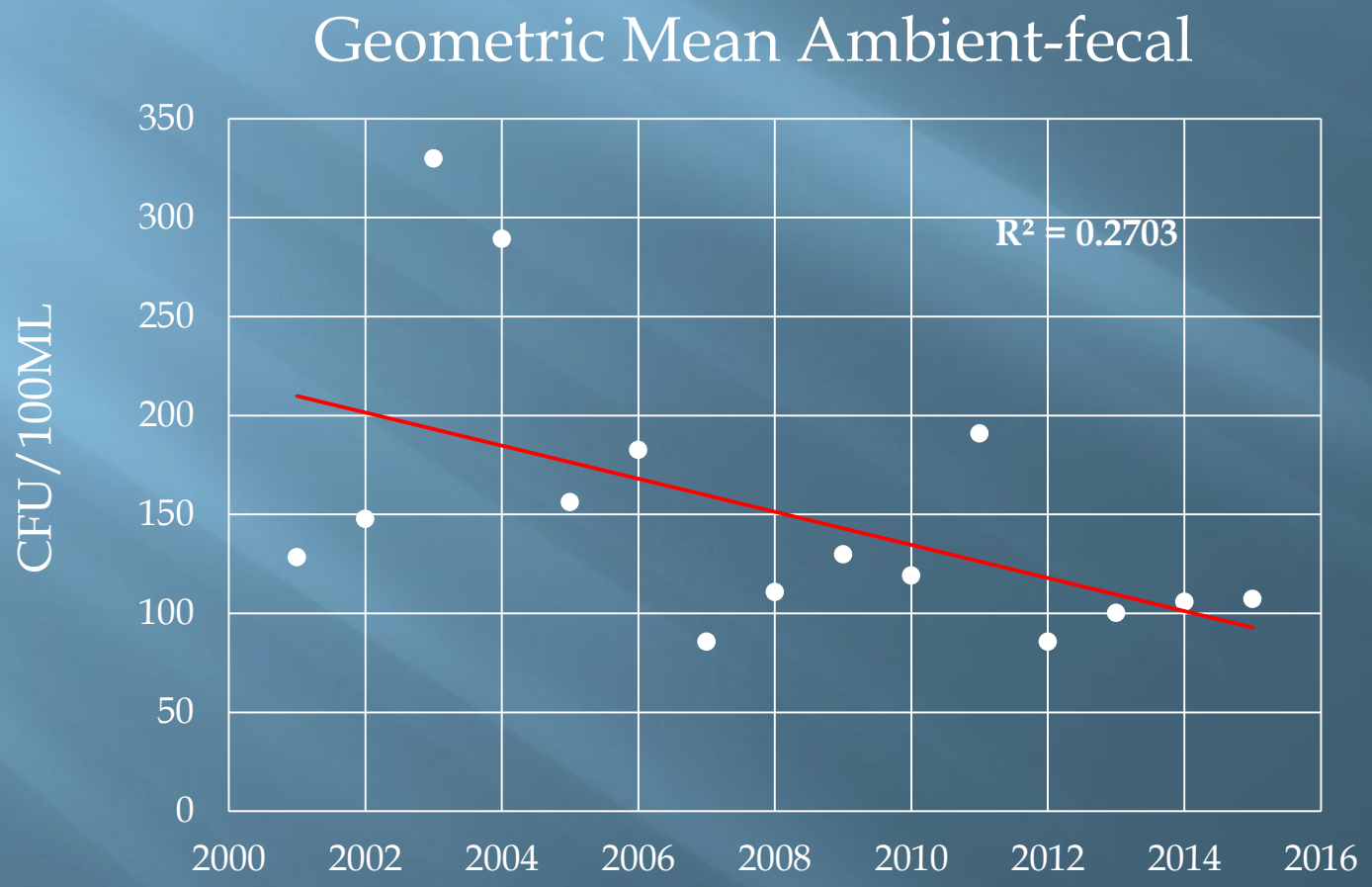
Status Highlights

- 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



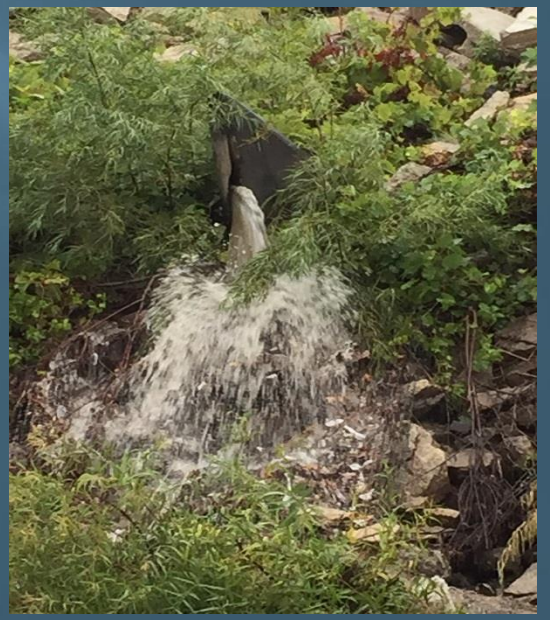
Geo mean of all sites, river-wide, by year. p=0.047

-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


NOTICE: CSO 217
Combined Sewer Overflow
Untreated storm water and sewage may discharge during and after rainfall. May contain harmful bacteria.
CINCINNATI
513-352-4900
www.MSDGC.org
OEPA
Permit:
1PX00022

Questions?



Agenda Item 9:

TEC Members Reports

- IL – Scott Twait
- IN – Eileen Hack
- KY – Katie McKone
- NY – Jeff Konsella
- 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

Agenda Item 10:

Review of ORSANCO's Bimonthly and Clean Metals Monitoring Programs

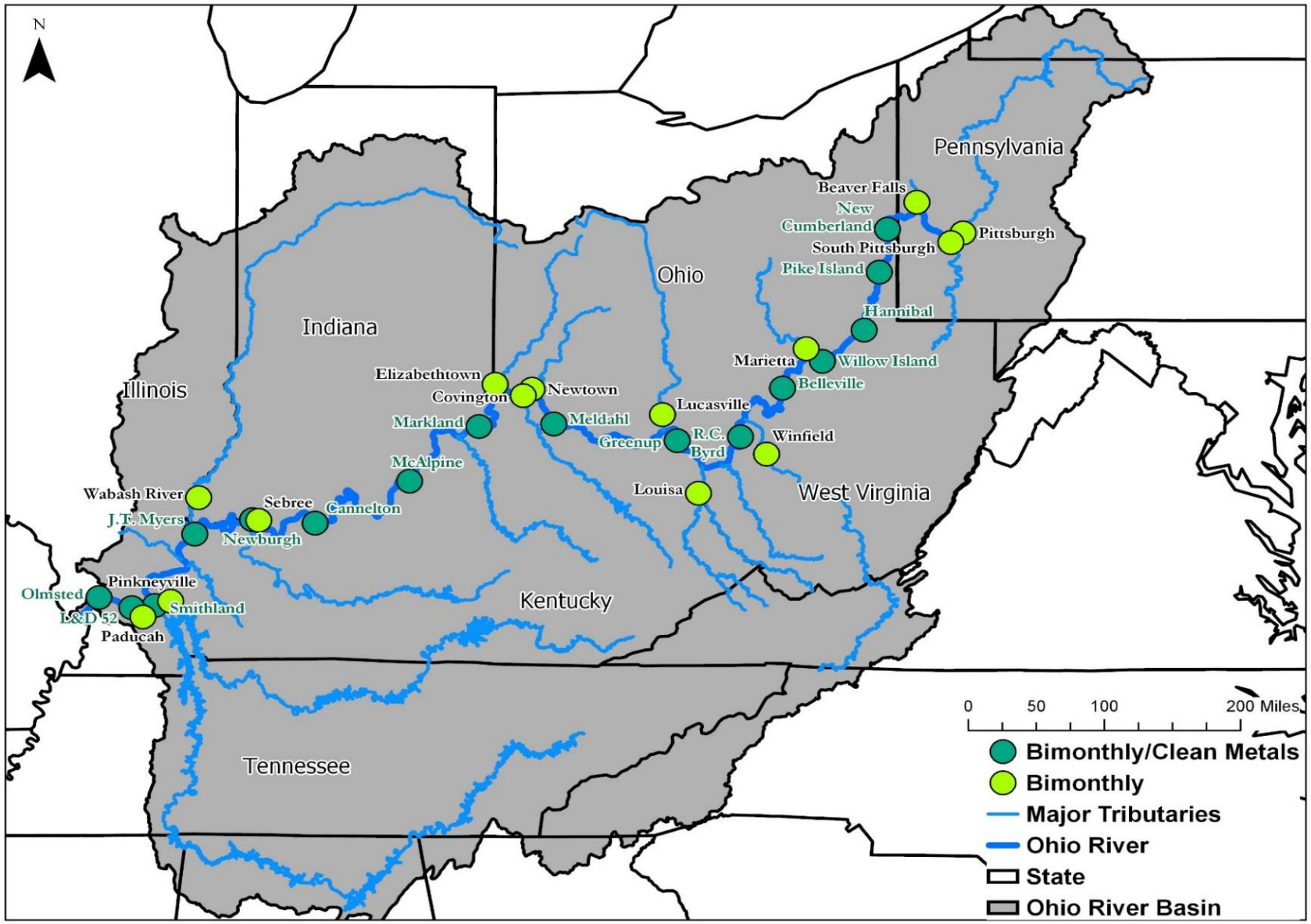
Jason Heath

Status Report

Background on Monitoring Programs

- Initiated a review of ORSANCO's Bimonthly & Clean Metals monitoring programs following the June 2020 TEC meeting.
- Bimonthly monitoring began in 1975 (monthly at the time), and moved to bimonthly in the early 90's (budget constraints). Includes conventional water quality parameters and total metals.
- Clean Metals began in 1998 which includes total and dissolved metals.
- Prior to the Clean Metals program and dissolved metals criteria, there would often be total metals criteria exceedances for lead associated with high suspended solids concentrations and flow.
- We do not have criteria exceedances for dissolved metals.
- ORSANCO uses the data from these monitoring programs primarily for 305b use assessments and trends.
- Today, exceedances occur for Total Iron & Total Mercury.

Bimonthly & Clean Metals Sampling Sites



Bimonthly Parameter List

Stations	Nutrients, Major Ions	Symbol	Units	Method Number	Reporting Limit
16 Ohio River stations 14 major tributaries	Bromide	Br-	mg/L	EPA 300.0	0.05
	Chloride	Cl-	mg/L	SM 4500 Cl E	2.0
	Hardness	Hardness	mg/L	SM 2340 B	3.0
	Ammonia Nitrogen	NH3-N	mg/L	EPA 350.1	0.03
	Nitrate-Nitrite Nitrogen	NO2-NO3-N	mg/L	EPA 353.2	0.05
	pH	pH	Std. Units	Physical	N/A
	Sulfate	SO4	mg/L	ASTM D516-90	12.5
	Specific Conductivity	SpCond	us/cm	Physical	N/A
	Total Kjeldahl Nitrogen	TKN	mg/L	EPA 351.2	0.1
	Total Organic Carbon	TOC	mg/L	SM 5310 C	0.5
	Total Phosphorus	TP	mg/L	EPA 365.3	0.01
	Total Suspended Solids	TSS	mg/L	SM 2540 D	1.0
	Total Dissolved Solids	TDS	mg/L	SM 2540 C	5.0
	Total Nitrogen	TN	mg/L	TKN+(N+N) Calculation	0.5
	Phenols	Phenols	ug/L	EPA 420.4	0.01
	Dissolved Oxygen	DO	mg/L	Physical	N/A
	Temperature	Temp	Deg. C	Physical	N/A
	Turbidity	Turbidity	NTU	Physical	N/A
5 Upper Ohio Basin Winter months only (Nov, Jan, Mar)	Cyanide	CN	ug/L	EPA 335.4	5.0

Clean Metals Parameter List

Parameter	Reporting Units	Test Method	MDL	RDL
Silver (Diss. & Total)	Ag (µg/L)	EPA 1638/200.8	0.01	0.1
Aluminum (Diss. & Total)	Al (µg/L)	EPA 1638/200.8	0.3	1
Arsenic (Diss. & Total)	As (µg/L)	EPA 1638/200.8	0.1	1
Barium (Diss. & Total)	Ba (µg/L)	EPA 200.7	3	10
Beryllium (Diss. & Total)	Be (µg/L)	EPA 1638/200.8	0.1	1
Calcium (Diss. & Total)	Ca (mg/L)	EPA 200.7	0.02	0.1
Cadmium (Diss. & Total)	Cd (µg/L)	EPA 1638/200.8	0.1	1
Chromium (Diss. & Total)	Cr (µg/L)	EPA 1638/200.8	0.3	1
Copper (Diss. & Total)	Cu (µg/L)	EPA 1638/200.8	0.09	1
Iron (Diss. & Total)	Fe (µg/L)	EPA 200.7	6	50
Hardness (Diss. & Total)	Hardness (mg/L)	EPA 200.7	0.3	1
Mercury (Diss. & Total)	Hg (ng/L)	EPA 245.7	0.2	1.5
Potassium (Diss. & Total)	K (mg/L)	EPA 200.7	0.2	0.5
Magnesium (Diss. & Total)	Mg (mg/L)	EPA 200.7	0.04	0.1
Manganese (Diss. & Total)	Mn (µg/L)	EPA 1638/200.8	0.1	1
Sodium (Diss. & Total)	Na (mg/L)	EPA 200.7	0.06	0.5
Nickel (Diss. & Total)	Ni (µg/L)	EPA 1638/200.8	0.08	1
Lead (Diss. & Total)	Pb (µg/L)	EPA 1638/200.8	0.1	1
Antimony (Diss. & Total)	Sb (µg/L)	EPA 1638/200.8	0.01	0.1
Selenium (Diss. & Total)	Se (µg/L)	EPA 1638/200.8	0.4	1
Strontium (Diss. & Total)	Sr (µg/L)	EPA 200.7	0.2	1
Thallium (Diss. & Total)	Tl (µg/L)	EPA 1638/200.8	0.01	0.1
Zinc (Diss. & Total)	Zn (µg/L)	EPA 1638/200.8	0.4	1

Review Work Group

- Has met 4 times since June 2020.
  - IL – Scott Twait
  - IN – Eileen Hack
  - KY – Katie McKone
  - OH – Audrey Rush
  - PA – Kevin Halloran
  - WV – Scott Mandirola/John Wirts
- Reviewed monitoring networks.
- States developed individual recommendations.
- Staff assigned costs to each recommendation.
- States prioritized the recommendations.
- TEC has been updated at each of its meetings.
- Recommendations of the work group were presented to Commission's Program & Finance Committee.

Add DOC, Orthophosphate and BOD to all monitoring stations

- Annual **c**osts for analytical and shipping for all three parameters combined is approximately $24,500 annually.
- Presented to Program & Finance Committee and approved to be included in the FY22 federal 106 grant application.
- Would be effective beginning Oct. 1, 2021 subject to EPA grant approval.

Add the Following New Monitoring Stations

- **Bimonthly/Clean Metals Monitoring Station on the Mainstem in PA @ ORM ~27**
  - No stations currently on the mainstem in PA.
  - Annual cost of $11,000+ to be included in FY22 federal 106 grant application (effective 10/1/21).
  - USEPA Wheeling office to provide boat & operator support.
- **Bimonthly Monitoring Station on the Kentucky River.**
  - In the top ten largest tributaries to the Ohio & largest without a monitoring station.
  - Annual cost of $3,500+.
- **Bimonthly Monitoring Station on the Salt River.**
  - In the top 15 largest tributaries and second largest trib without a routine monitoring station.
  - Second largest Ohio River tributary without a routine monitoring station.
  - Annual cost = $3,528

Continued

- **Add a Bimonthly Monitoring Station Further Downstream on the Green River for One Year and Evaluate Whether to Maintain the Original Station.**
  - The Bimonthly Monitoring Station on the Green River is located at Ohio River mile 41.3.
  - The KYDOW would like to reposition the station further downstream.
  - The benefit of this is that monitoring results would also capture influences from more of the tributary as a whole.
  - The downside is that a long-term historical record of Green River water quality would be interrupted if the station was moved.
  - Proposing to add a new station further downstream while maintaining the current location for at least a one year period, after which the need to maintain the current station could be reevaluated.
  - Total annual cost = $3,500+

Evaluate Ohio River pH Data

- Some questions/concerns about Ohio River pH data generated through Bimonthly Sampling which generates one data point every other month.
- Importance due to pH-dependent criteria.
- Compared ORSANCO Bimonthly pH data to USGS continuous data – ORSANCO data has a larger “spread”over time than USGS data.
- We plan to evaluate Bimonthly data to ORSANCO continuous data generated at HABs monitors located at Bimonthly stations.
- Decide how to move forward depending on results of evaluation.
- Present results to work group and consider options. Present results of this work at October TEC meeting.
- This is a staff time project only.

Add Alkalinity, MBAS, & Osmotic Pressure to Bimonthly Network

- PADEP includes these parameters in wastewater permits.
- Other states do not utilize these parameters.
- Annual cost at PA stations is $5,000.
- We will continue to consider funding options.

SUMMARY

- Asked for comments/recommendations from the TEC Committee at the February meeting and did not receive any.
- Program & Finance Committee support for this work.
- Additional stations will also be included in federal supplemental monitoring grant.
- Will attach this report to ORSANCO's Monitoring Strategy.

Agenda Item 11:

FY22 Proposed Technical Programs Highlights

Heath

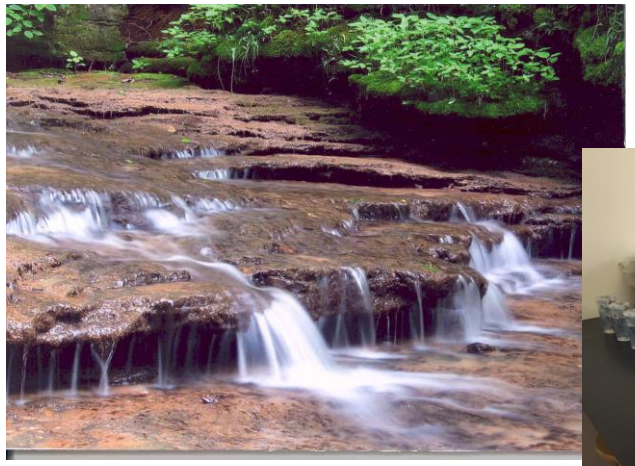
ORSANCO

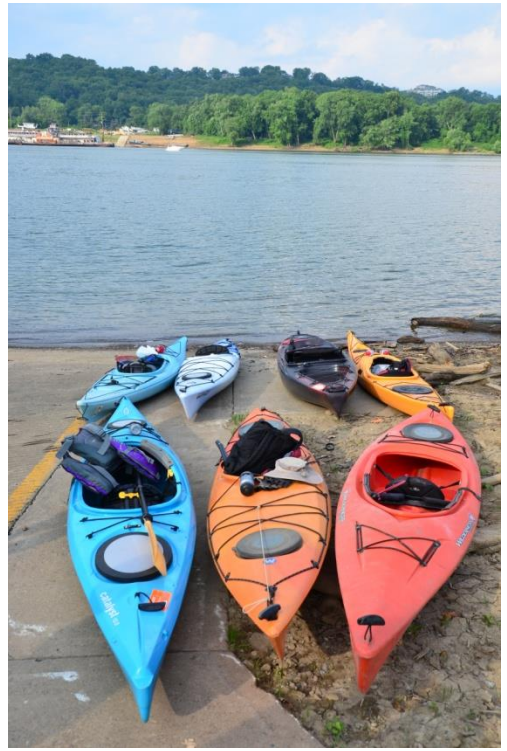
Fiscal Year 2022

July 1, 2021 – June 30, 2022

Budget Presentation

April 21, 2021





Technical Programs Highlights

Biological Programs

Water Quality Monitoring & Assessment Programs

Source Water Protection Programs

Good News!!!

- With field crews getting vaccinated, we are planning normal field activities this year.

Biological Programs

- Finished last round of NRSA 2 yrs ago
  - 2 year monitoring program repeated every 5 years.
  - Typically drop to 2 biological pools during NRSA.
  - Last field season we did not complete biological surveys due to COVID. Focus shifted to fish tissue.
  - This field season we are planning 4 pool surveys which is contingent on a full crew of 4 interns to complete the macro work.
- Fish Tissue
  - Will complete a typical year with ~40 composite samples helped compensate for less sampling during NRSA.

Biological Programs (cont.)

- Complete PCBs in fish tissue trends analysis and report (subject to receipt of 2020 fish tissues results).
- Develop methodology for Mercury in fish tissue trends analysis and begin assessment.
- Continue working to get data into WQX (STORET national aquatic data base).
- Collection of fish tissue for PFAS analysis under IDEM 604b grant.

Monitoring and Assessment Programs

- Evaluation of the Bimonthly/clean metals monitoring programs completed through mainstem states' work group with final report and program recommendations.
  - Including three additional parameters network-wide in the proposed FY22 budget.
  - Including recommendation for 4 additional monitoring stations in future priority projects.
- PFAS Study
  - Survey design completed, QAPP and sampling plan completed.
  - Initiate survey in June, complete the 2nd round in fall, 2021, and complete report in 2022.

Monitoring and Assessment Programs (Continued)

- 305b – 2022 April Report; Development of assessment methodology for HABs impairments.
- Trends assessments – FY22-23 Bimonthly/metals/bacteria; Fish Tissue PCBs & mercury.
- Standards – No activities/budget under Standards Development; Continue reviewing permits under PCS Administration. At some point we should consider updating applicable criteria in the Standards per USEPA and states criteria development.
- Mercury – wrapped up source apportionment project report last June. Utilize project data to conduct a methylation study.
- Still need to program Federal FY22 Supplemental Monitoring funds of ~ $66,000 (Oct. 1, 2021 – Sep. 30, 2022).
  - Add Bimonthly/Clean Metals sites

Source Water Protection

- Seeking Congressionally Directed Spending for ODS network replacement.
- Options for utilizing available funds for ODS unit (CMS).
- Investigate relocation of St. Albans ODS.

Other Business:

- Comments by Guests
- Announcement of Upcoming Meetings
- Adjourn

Chairman Bruno Pigott