



## Lake Superior Chemical Committee

Jesse Martus | Lake Superior Lakewide Action and Management Coordinator

June 6, 2022

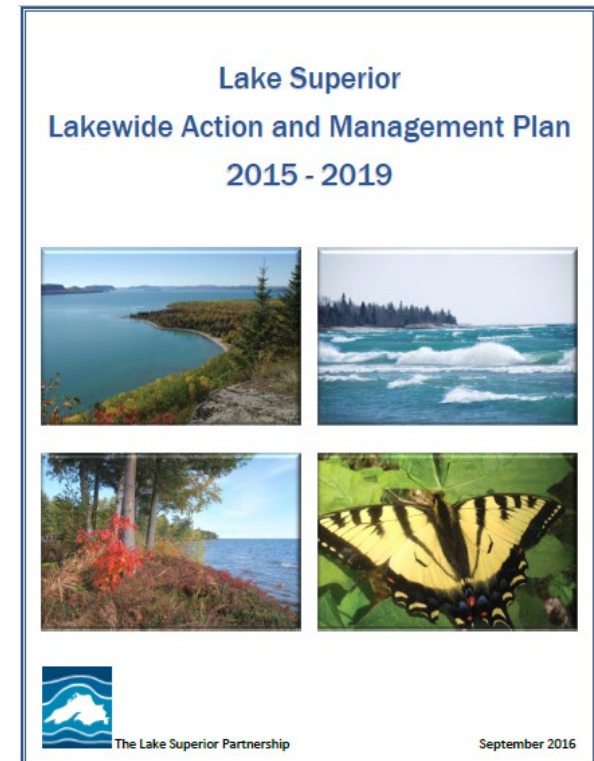
# Great Lakes Restoration Initiative (GLRI)

- Non-regulatory federal program
  - Accelerates efforts to protect/restore Great Lakes
- First funded in 2010
- 5-year Action Plans direct priorities
- Relation to the LAMP
  - Funds projects lead by AOC and LAMP Coordinators
  - Primary funding source for lake management actions
- 5 Focus Areas in Plan:
  - **The Chemical Committee works on Focus Area 1, Toxic Substances**



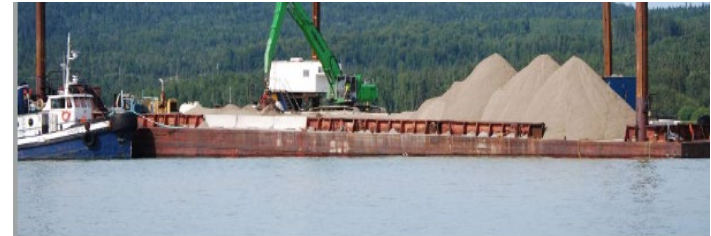
# Lakewide Action and Management Plan (LAMP)

- Binational action plan for restoring and protecting the Lake Superior ecosystem.
- LAMP Coordinators in Minnesota
  - John Jerezcek, DNR
  - Jesse Martus, MPCA
- 5 Focus Areas within the Great Lakes Action Plan to Implement LAMP Objectives
  - DNR – Invasive species & habitat
  - MPCA – **Toxic substances** & Nonpoint Source Pollution Impacts on Nearshore Health



# Binational Strategies for Chemicals of Mutual Concern (CMC)

- Great Lakes Wide Annex 3 Committee
  - Tasked with determining CMCs and writing CMC strategy papers
- USEPA and Environment Climate Change Canada
- Implement CMC Strategies



## Great Lakes Binational Strategy for Mercury Risk Management

June 2021

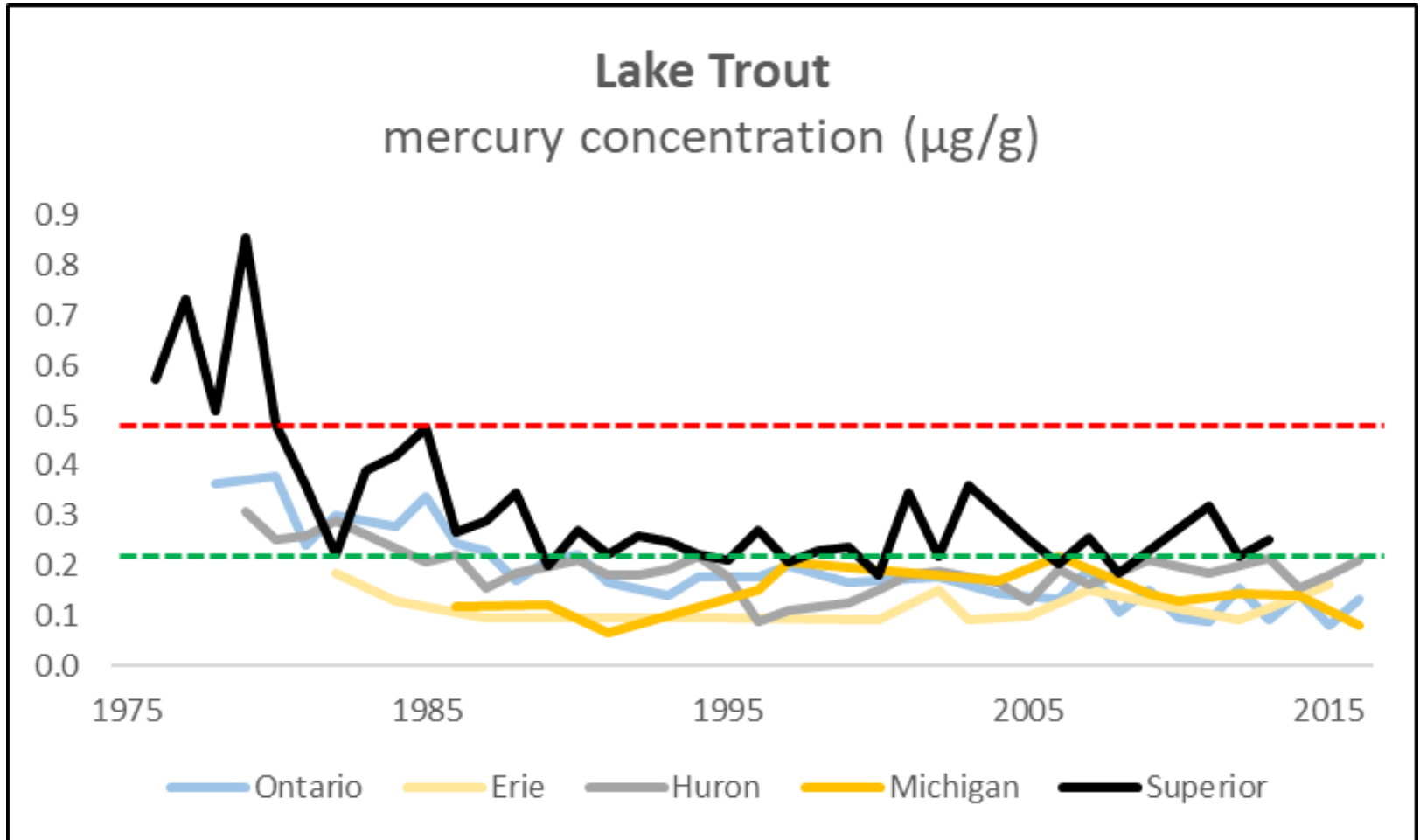
Prepared by Environment and Climate Change Canada and  
the United States Environmental Protection Agency



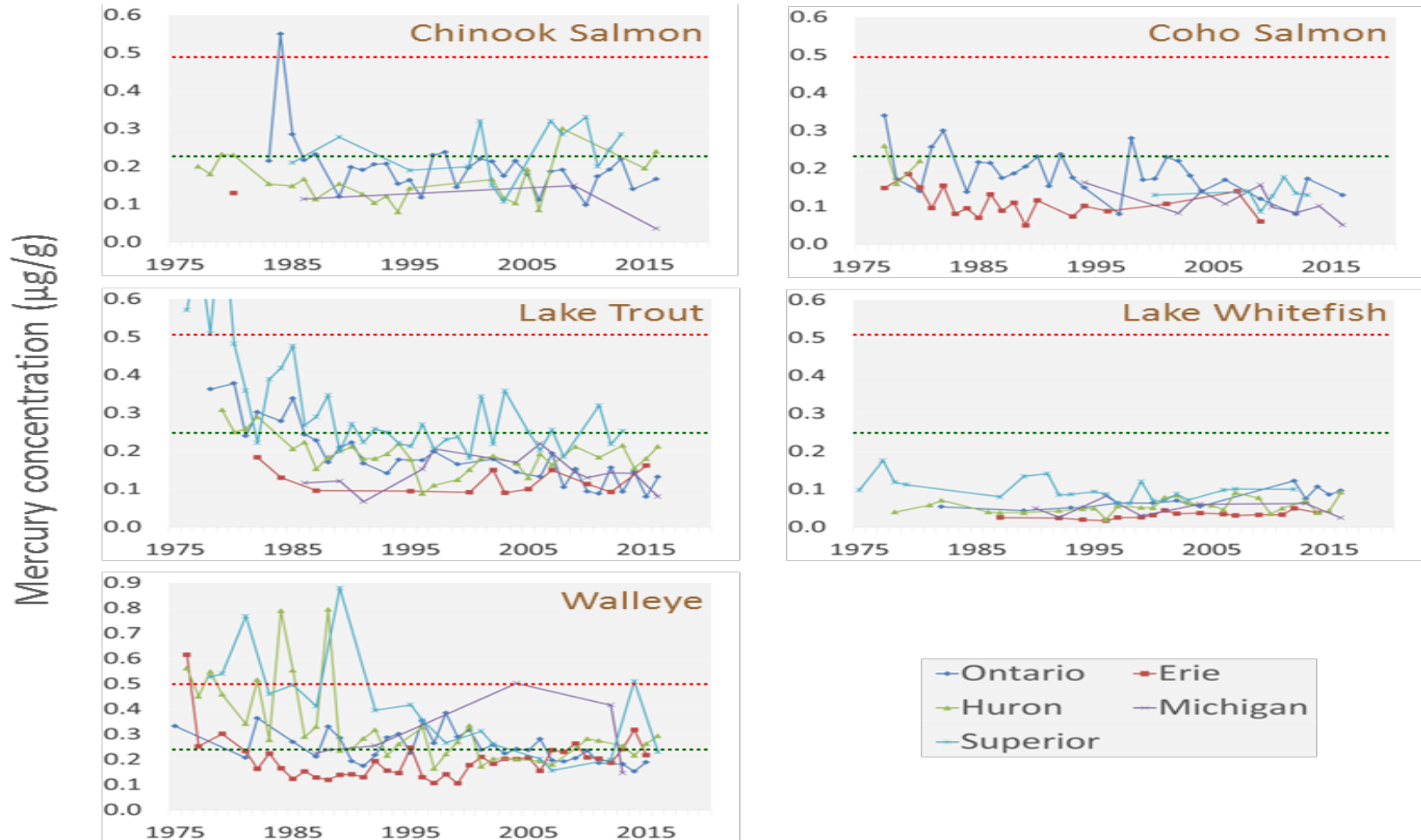
# Contaminants: Conditions Based on SOGL 2019 Reports

State of the Sub-Indicator	Status - Trend
Treated Drinking Water	Good - Unchanging
Contaminants in Edible Fish	Fair – Unchanging
Toxic Chemicals in Sediment	Good – Unchanging
Toxic Chemicals in Water	Fair – Improving
Toxic Chemicals in Whole Fish	Fair – Unchanging
Toxic Chemicals in Herring Gull Eggs	Good – Improving
Toxic Chemicals in the Atmosphere	Fair - Improving

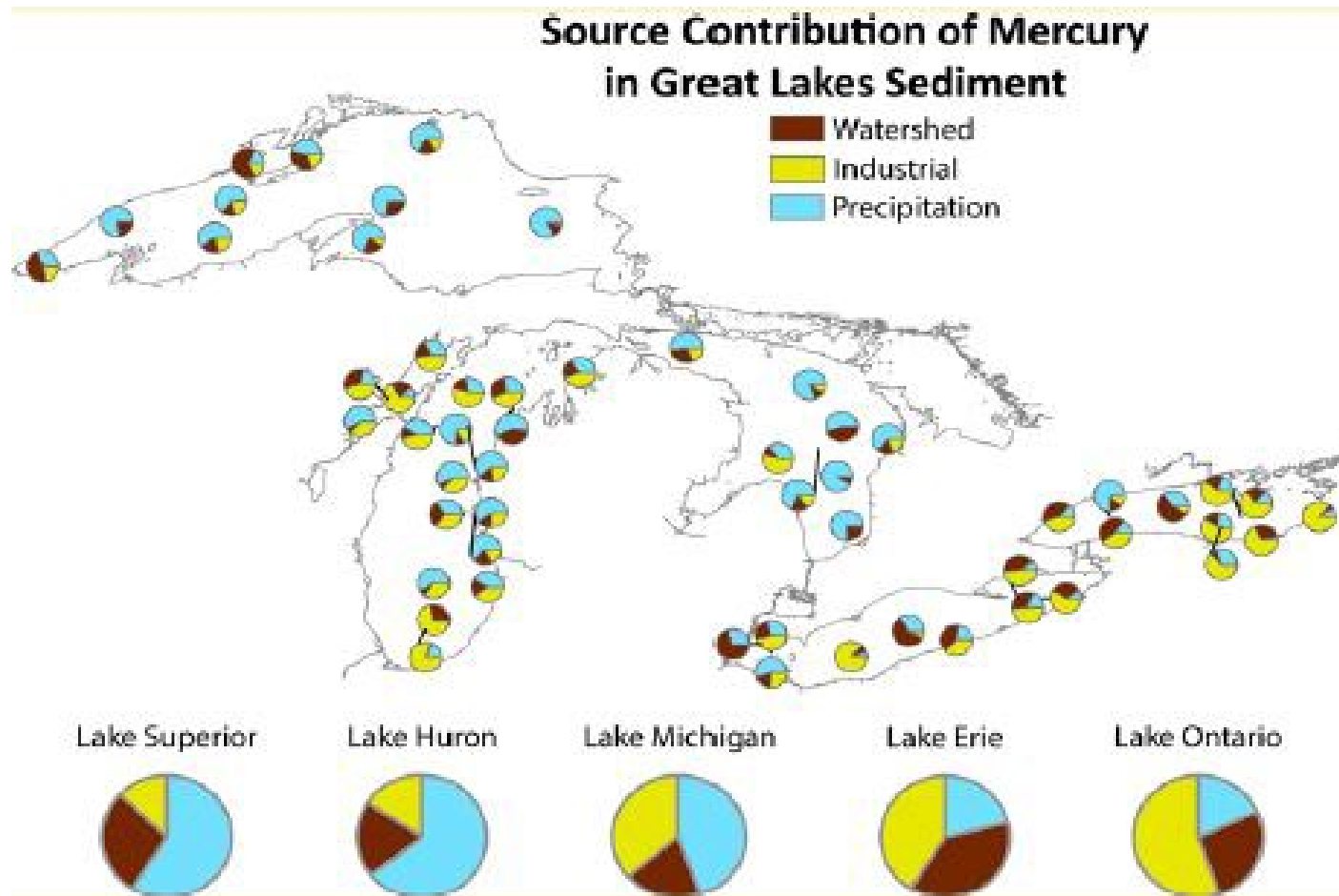
# Mercury in Lake Trout



# Mercury in Lake Superior Fish Compared to Other Great Lakes



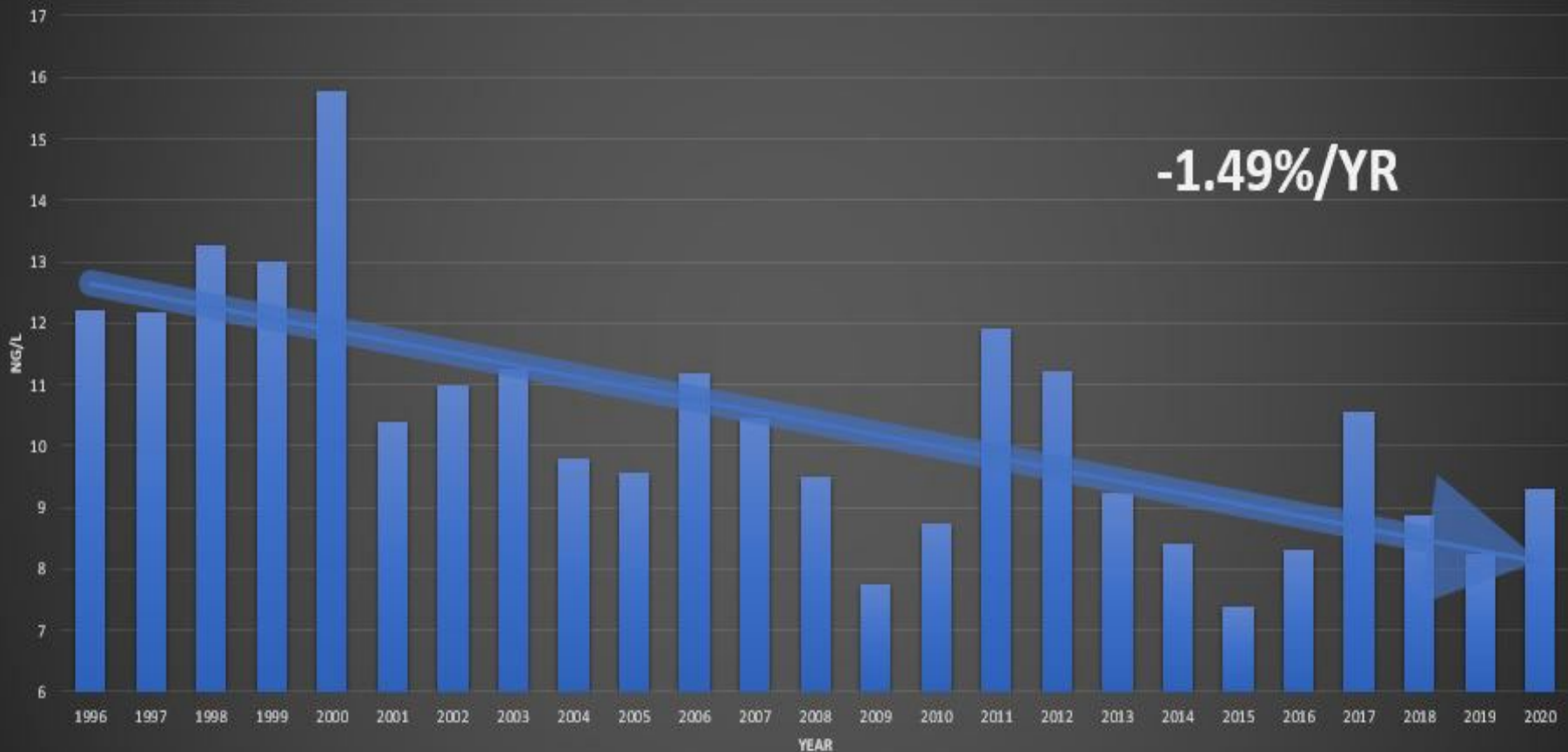
# Mercury Sources in Great Lakes Sediment



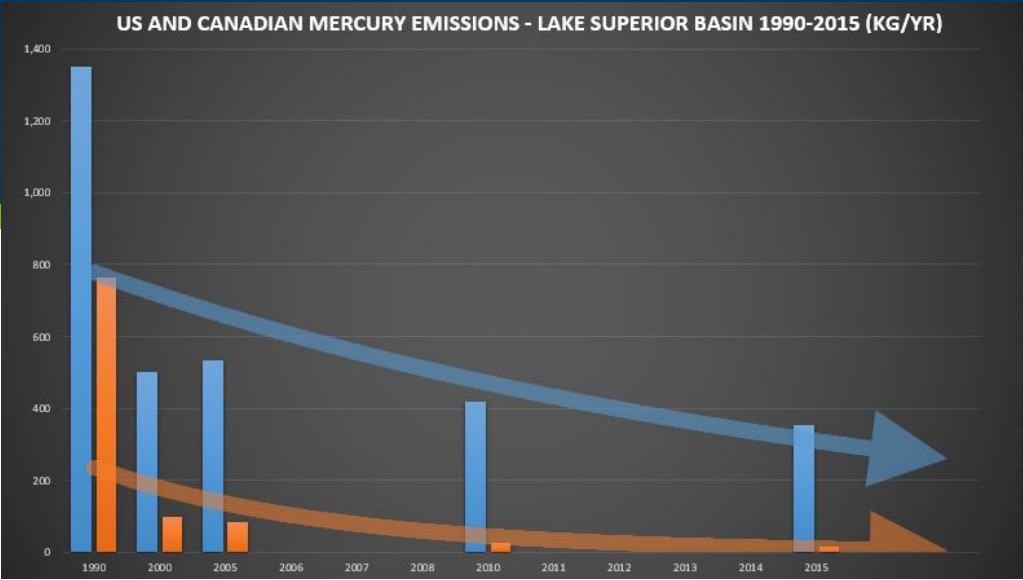


# Decreasing Trend in Mercury Deposition

Lake Superior Basin Weighted Mean THg Wet Deposition Concentrations (1996-2020)

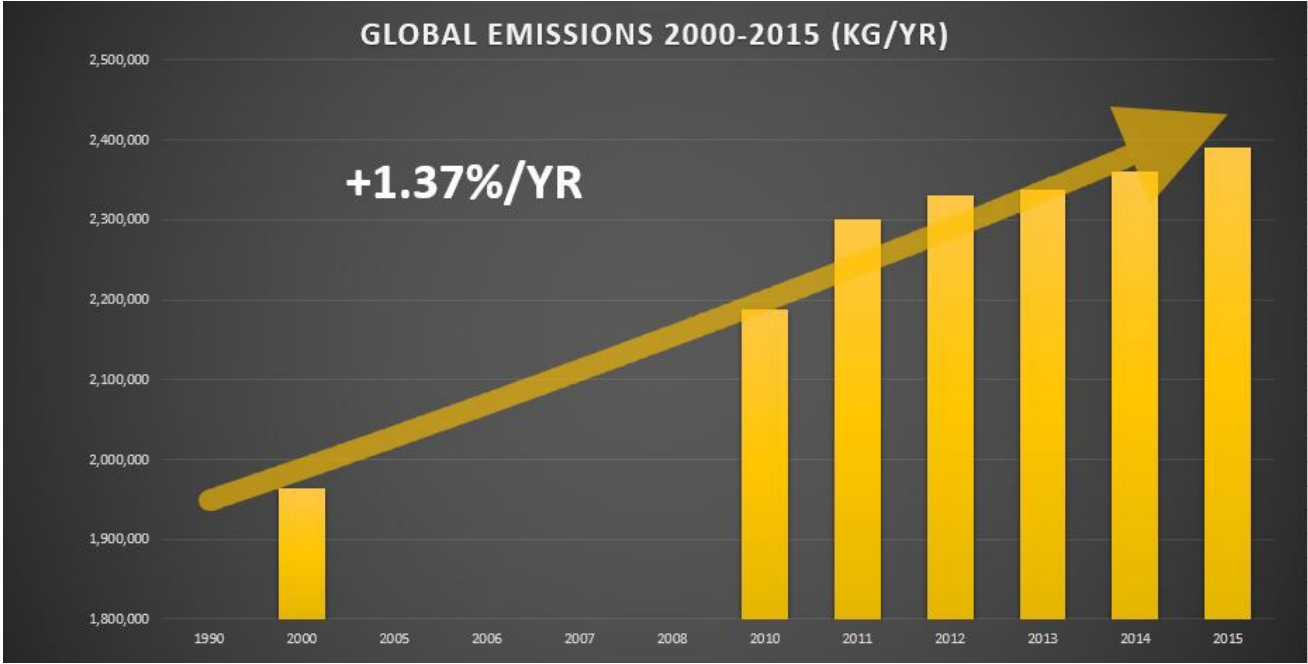


# Mercury Emissions

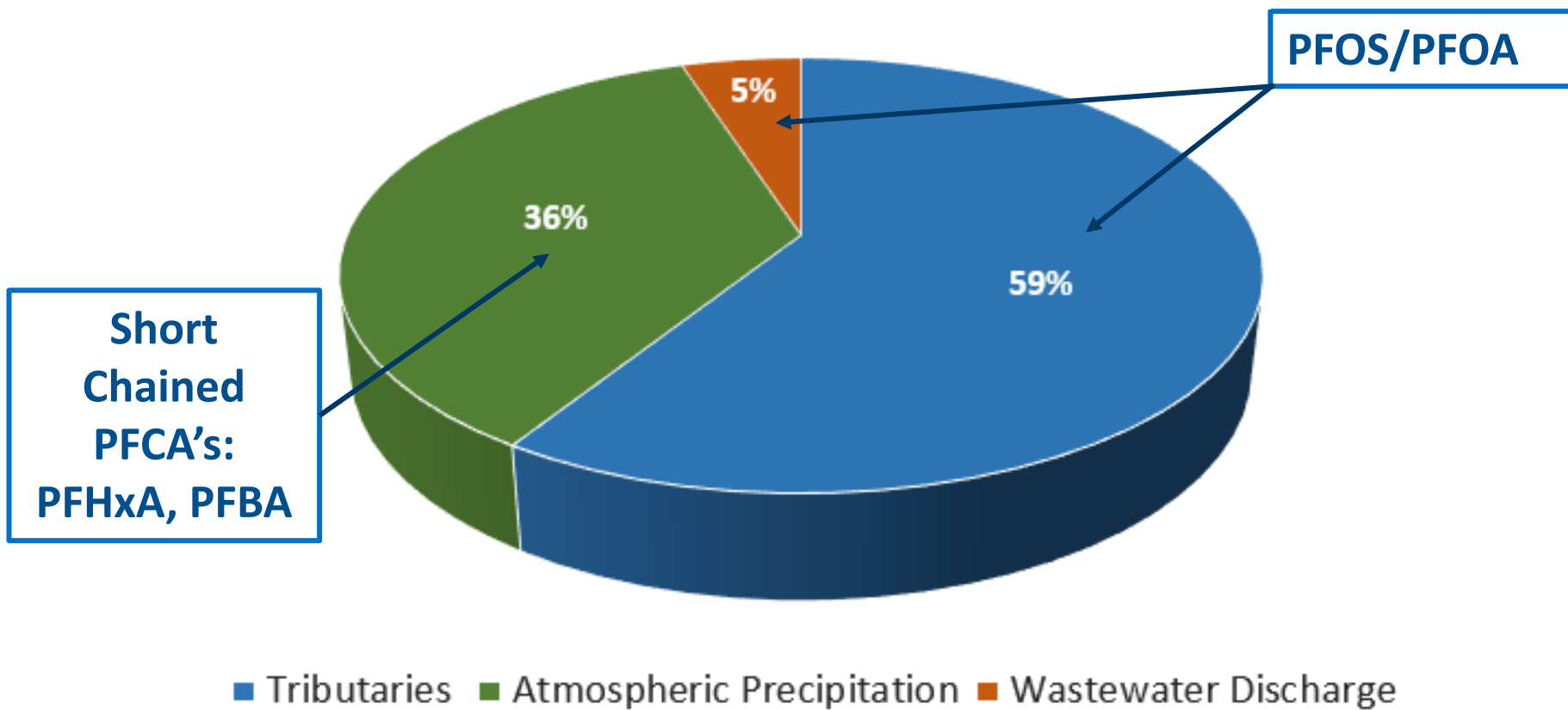


Local Emissions Decreasing

Global Emissions Increasing

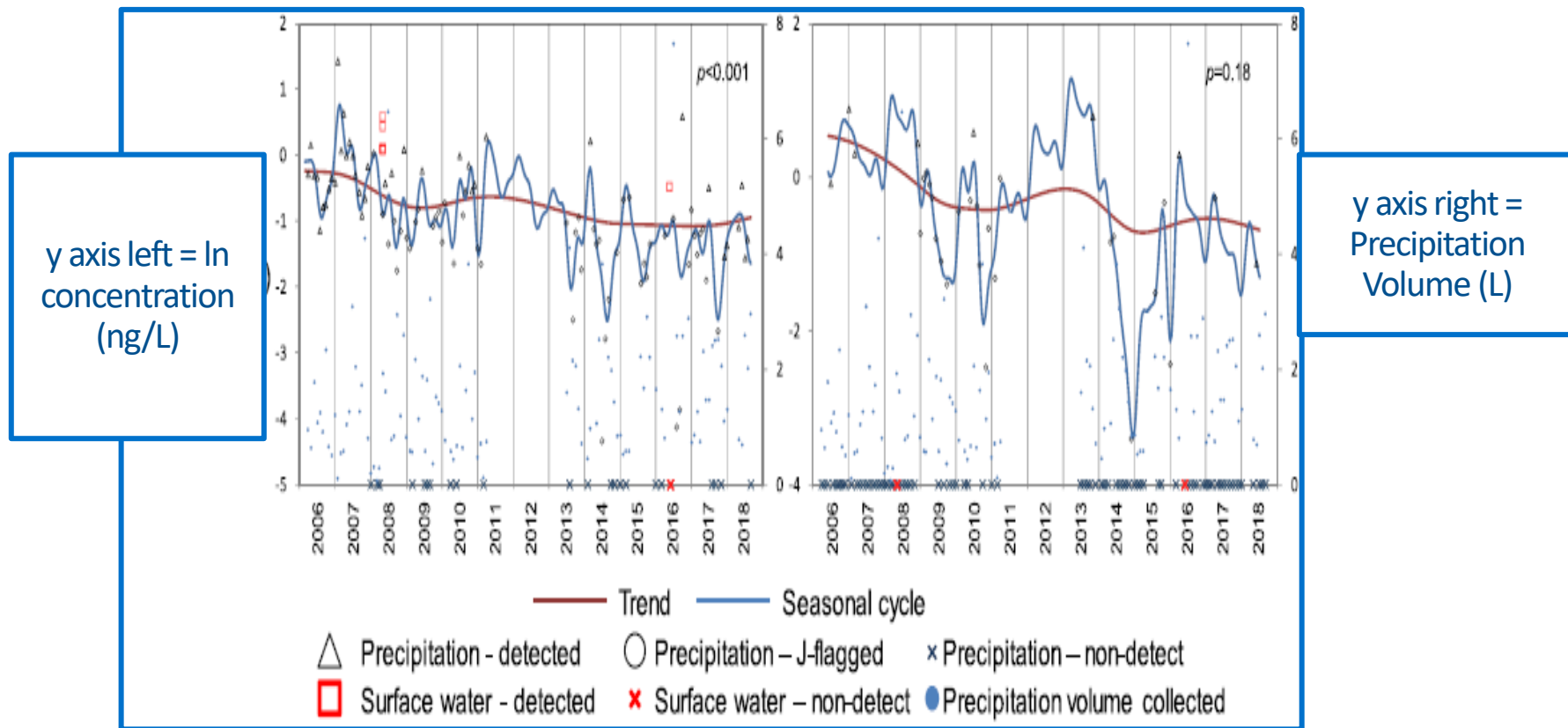


# Lake Superior PFAS Sources



# PFAS Trends in Air: PFOA and PFOS

## Trends for PFAS in Air at Sibley Peninsula Site<sup>4</sup>

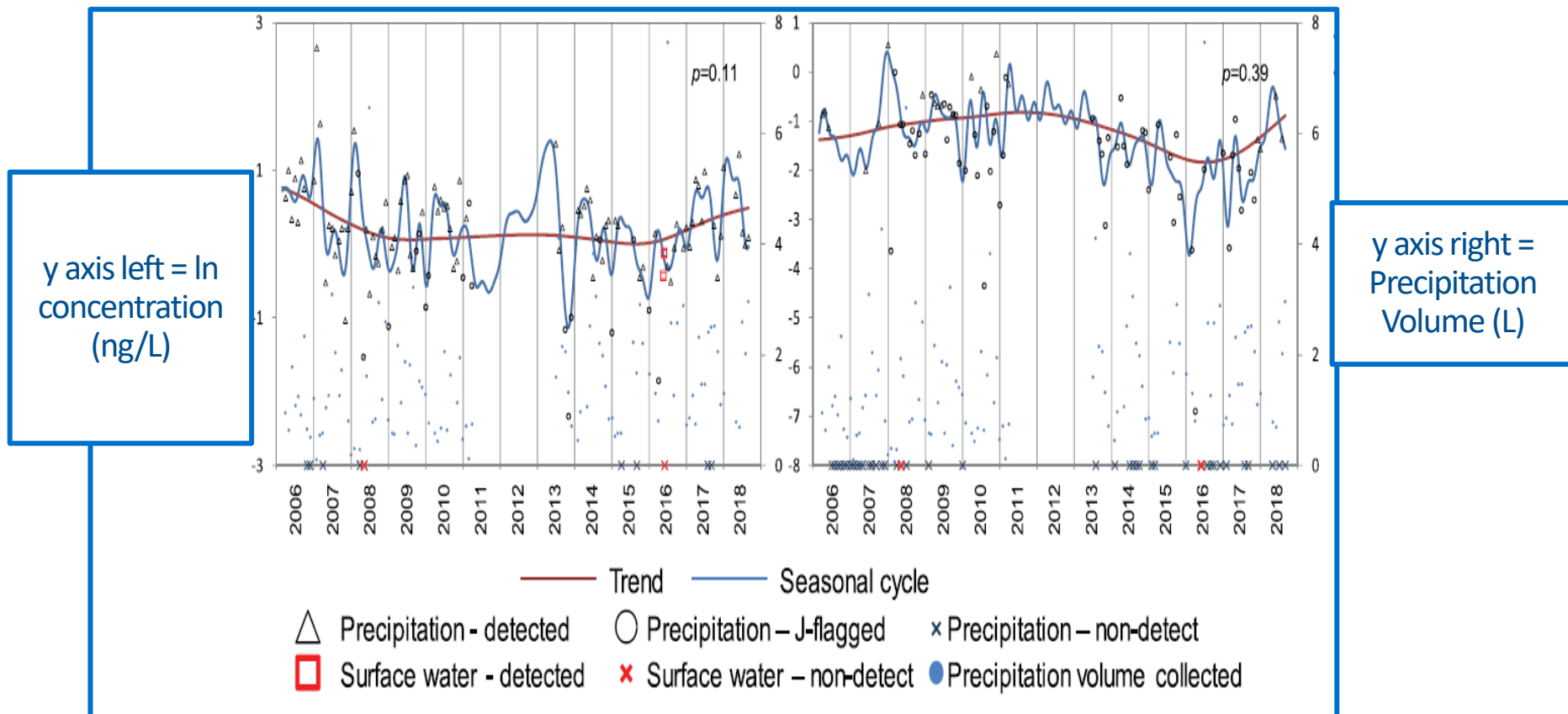


y axis left = ln concentration (ng/L)

y axis right = Precipitation Volume (L)

# PFAS Trends in Air: PFBA & PFHxA

## Trends for PFAS in Air at Sibley Peninsula Site<sup>4</sup>



y axis left = ln concentration (ng/L)

y axis right = Precipitation Volume (L)

# Lake Superior Conclusions

- Lake Superior is more **sensitive to atmospherically deposited contaminants** due to its large surface area and water clarity
- Although PFAS loading is **dominated by tributary sources, Lake Superior has higher relative proportions of short-chained PFAs**, compared to other Great Lakes.<sup>37</sup>



# Lake Superior Conclusions

- There is a general **decrease globally in PFOS** and an **increase in PCFAs** since they have replaced longer chained compounds.<sup>9</sup>
- **More monitoring is required** to establish reliable temporal trends both aquatically and in sediment.



- Mercury Monitoring in Ditched Peatlands (USGS) 2019-2022
- Mercury Load Monitoring in Lake Superior Tributaries (USGS) 2021-2023
- Mercury Source Identification via Isotopes (USGS) 2021-2023





- PFAS Load Monitoring in Lake Superior Tributaries (USGS) 2022-2023
- Contaminant Monitoring in Lake Superior Sediments (NRRI) 2021-2023
- Evaluating Persistent Chemicals in Lake Superior Fish (FWS) 2022-2024
- Evaluating Persistent Chemicals in Lake Superior Fish-Eating Birds (FWS) 2022-2024



# Thank you!

**Jesse Martus**

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