

A sunset scene over a body of water, likely Lake Michigan. The sun is low on the horizon, creating a bright orange and yellow glow. The sun's reflection is visible on the water's surface. Silhouettes of trees are visible in the foreground and background, framing the scene.

Illinois Lake Michigan (nearshore) PCB TMDL

Christine Urban
USEPA Region 5
Spokane River Workshop
February 2016

Outline

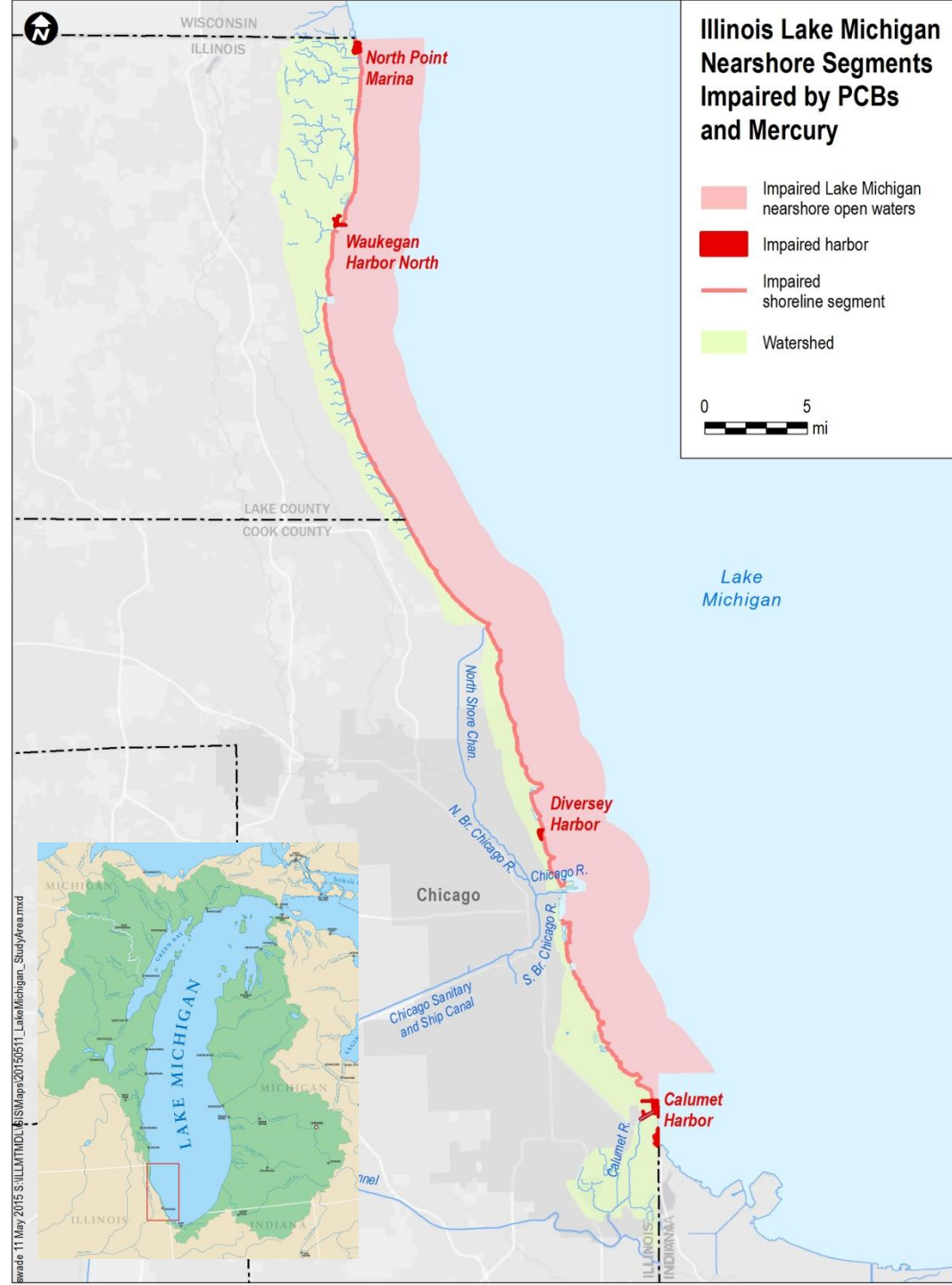
- Project Background
- Source Assessment
- TMDL Allocations
- Implementation

Project Study Area

Illinois EPA has identified 56 Lake Michigan nearshore segments that are impaired due to PCBs

- 51 shoreline segments
- 4 harbors
- 1 open water segment

Considered as one lumped segment for purposes of TMDL development



Lake Michigan Background

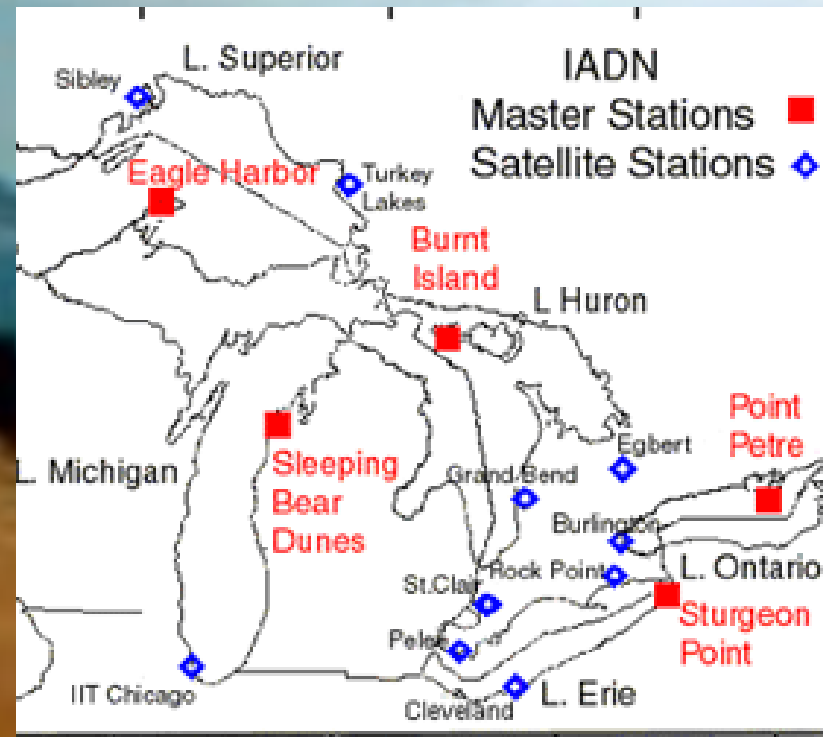
- 45,000 square miles
- complete change of water about every 100 years
- Coast is home to 25 harbors and hundreds of marinas
- the Great Lakes Water Quality Agreement (GLWQA),
 - Restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes
 - virtually eliminate" anthropogenic sources of toxic substances

Lake Michigan Background

- GLWQA (Annex 15) U.S. EPA and Environment Canada operate IADN toxic substances monitoring network

- U.S. EPA-GLNPO reports annual average total PCB concentrations and average annual decrease in concentrations.

- Five master stations(red) located in rural areas for background conditions for each of the Lakes. Monitor PCBs in air and precipitation



PCB Water Quality Standards

- Numeric water quality criteria for PCBs
 - Human Cancer Value of 26 pg/l
- Fish consumption advisory triggered
 - 0.06 mg/kg fish tissue

PCB Impairments

- All water quality measurements were below detection
- Impairment is due to fish tissue concentrations above target levels for human consumption

Species	Count of Samples	Average Concentration (mg/kg)
Carp	52	4.329
Black bullhead	3	1.027
Lake trout	30	0.811
Rock bass	10	0.276
Sunfish	7	0.189
Largemouth bass	4	0.225
Bloater	7	0.270
White sucker	6	0.237

Target value is 0.06 mg/kg

TMDL Development

- USEPA supporting Illinois EPA in TMDL development
- Draft TMDLs completed
 - Currently in public comment period
- Available at:

<http://www.epa.illinois.gov/topics/water-quality/watershed-management/tmdls/reports/index#lake-michigan-nearshore>



Illinois Lake Michigan (nearshore)
PCB TMDL Report

Prepared for:
USEPA
Contract No. EP-C-12-052,
Task Order No. 0003
Public Review Draft
December 15, 2015



Outline

- Project Background
- Source Assessment
 - Where are the PCBs coming from?
- TMDL Allocations
- Implementation

Source Assessment Results

- Dominant source of PCBs to the Lake Michigan is direct atmospheric deposition
 - Common for lakes, not necessarily for rivers
- Stormwater loading uncertain
 - All concentration measurement are non-detect, but at very high detection limits
- Wastewater contribution negligible

Outline

- Project Background
- Source Assessment
- TMDL Allocations
 - Total allowable load
 - Allocation between source categories
- Implementation

Allowable Load

- Allowable load calculated using a direct proportionality approach
- 94.7% load reduction required
 - Average carp tissue data = 1.13 mg/kg
 - Fish tissue target = 0.06 mg/kg
- Allowable load = Existing load reduced by 94.7%
= 0.65 kg/yr

TMDL Allocations

- Total load must be allocated between sources
- Atmospheric sources
 - Must be reduced by 94.7%
- Stormwater sources
 - Small compared to atmospheric sources, but must be controlled to ensure compliance with targets
 - TMDL requires stormwater sources to attain water quality standards

Outline

- Project Background
- Source Assessment
- TMDL Allocations
- **Implementation**
 - How will reductions be attained?

PCB Implementation Plan

- What will be done to reduce loading to acceptable levels?
 - Complicated by the fact that the TMDL program has no direct regulatory control over atmosphere sources of PCB
- Categories of control
 - Institutional Best Management Practices (BMPs)
 - Contaminated Sites and Soil Remediation BMPs
 - Treatment Control BMPs

Institutional Best Management Practices

- Information sharing and governmental practices to avoid or dispose of, products containing PCBs
 - Public education and outreach about the sources of PCBs, what to do with them, and safer alternatives
 - Survey of the state's electric utilities to confirm the presence of PCBs in transformers
 - Develop and implement take-back programs to accept PCB-containing waste

Institutional Best Management Practices (continued)

- Information sharing and governmental practices to avoid or dispose of, products containing PCBs
 - Conduct targeted street sweeping to prevent more material from being washed into storm drains
 - Clean up illegally dumped waste, such as old drums, electrical equipment, or demolition material, that may have PCB-contaminated caulk or paint
 - Review local/regional laws regulating waste disposal, and revise as necessary

Contaminated Sites and Soil Remediation BMPs

- Identify and clean up soil that has been contaminated from past use of PCBs
 - Removal of old equipment or drums of PCBs and proper disposal, in addition to soil remediation if PCBs have been spilled
 - Identification of older building containing PCBs and replacement of the fixtures with safer alternatives
 - Removal of caulk installed before 1979 that contains PCBs
 - Identifying and disposing of light ballasts, surfaces painted with PCB-containing paint

Treatment Control BMPs (MS4 Stormwater BMPs)

- MS4 WLA will be addressed in permits issued by IEPA requiring the implementation of BMPs
 - Engineered options for the existing infrastructure to capture soil containing PCBs and prevent it from being discharged to Lake Michigan
 - Capture of PCBs before they enter stormwater pipes
 - Infiltration trenches, basins, retention and reuse
 - Options installed within MS4 pipes
 - Filters, screens, hydrodynamic separators
 - End of pipe treatment
 - Sedimentation basins, constructed wetlands

Summary

- Concentrations of PCB in fish are well above acceptable levels
 - 95% reduction required
- The majority of the load is coming from the atmosphere
 - Outside the direct regulatory control of the TMDL program
 - Non-atmospheric loads are very uncertain
- Stormwater permits will require the implementation of BMPs, but not contain numeric limits

