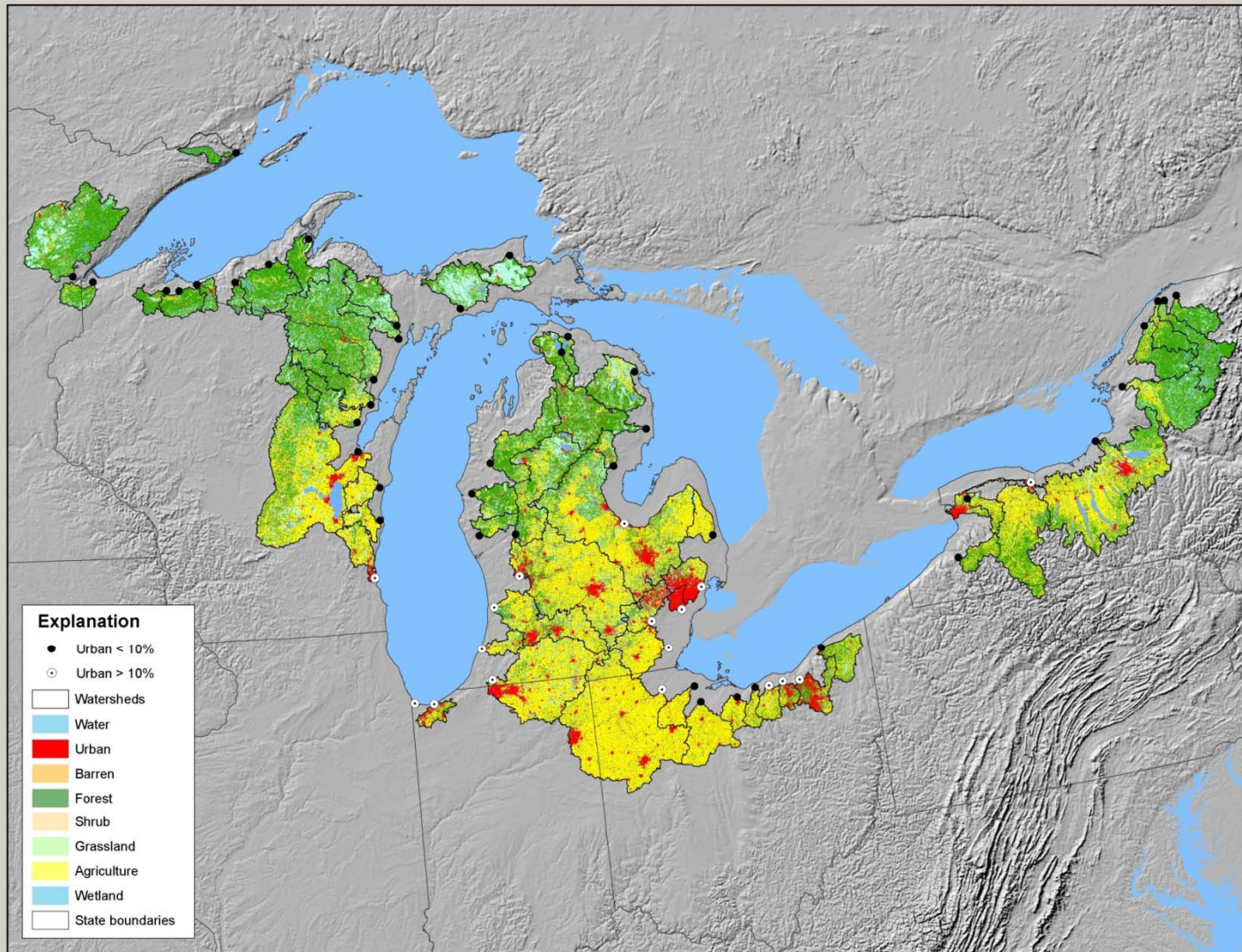


**Tributary Monitoring  
associated with GLRI #76,  
#78 and the DOI backbone  
for GLOS**

USGS GLRI Nearshore Projects

# National Monitoring Network for Coastal Waters (NMN) Tributary Sites



# Three Coordinated Projects

- Determine Baseline and Sources of Toxic Contaminant Loadings. (Template #78) (\$690K); Forecast/Nowcast Great Lakes Nutrient and Sediment Loadings (Template #76) (\$500K); Implementation of the Great Lakes Observing System (support for DOI backbone) (Template #59) (\$3M)
- Each project has a monitoring component, a modeling component, a data management component, and an instrumentation component.
- I will discuss the monitoring component during this presentation. Ed Bugliosi will discuss the modeling component this afternoon. Nate will discuss the database component tomorrow and I will discuss the instrumentation component tomorrow.
- These projects provide a representation, while incomplete, of integrating USGS projects.
- Three projects combined: Salary \$1.6M, Equipment/Supplies \$1.6M, Laboratory .5M, and Overhead .5M
- Salary apportioned (currently) at about \$700K monitoring, \$600K database, and \$300K modeling

# Monitoring Objectives

- Expand tributary monitoring throughout the Great lakes Basin to provide baseline information, provide support for measuring restoration progress, assess new contaminant threats, support contamination effects efforts, and model loads and potential load changes.
- Will include the use of real-time sensors and the development of surrogate regression equations to potentially reduce the cost of long term monitoring.

# Monitoring Approach

- Will sample water column and sediment chemistry, and install integrated passive organic bio-concentrating samplers (POCIS/SPMD).
- May include the use of Chromophoric dissolved organic matter sensors (CDOM) and autonomous underway vehicles (AUV) to relate tributary impacts to embayments and the near shore.
- Analytes of interest include suspended sediment, and nutrients, chemicals of emerging concern, legacy contaminants, human and animal viruses.

# Water Column

- Sample at stream gage location at about half of the NMN sites.
- Collect monthly and storm event samples.
- Use automated samplers when feasible.
- Add multi-sensor probe at most sites.
- Physical Parameters, Nutrients, Major Ions, Suspended Sediment, Pharmaceuticals and Personal Care Products

# Water Monitoring (continued)

- Monitor further up the basin at three of the tributaries.
- 2 urban watershed (3 sites), 1 ag watershed (3 sites),
- Look for sub-basins without multiple point sources (such as WWTP, CSSO's, and CAFO's) to help differentiate between sources of contaminants at the mouths of the rivers.

# SPDM and POCIS samplers

- POCIS (Polar Organic Chemical Integrative Sampler) is used to monitor hydrophilic contaminants which could be potentially endocrine disrupting or acutely toxic.
- Semipermeable Membrane Devices (SPMDs) are used as bioaccumulators of lipophilic environmental contaminants





# Analysis by NWQL

- POCIS

LC 8068 Wastewater  
Indicators---\$256.67

LC 8069 Pharmaceuticals (Lab  
Schedule 2080)---\$223.02

LC 8226 Pharmaceuticals by  
WWI---\$82.01

LC 8095 Halogenated Organic  
Compounds--\$223.69

- SPMD

LC 8098 Wastewater  
indicators--\$261.06

LC 8225  
Pharmaceuticals by  
WWI--\$82.01

LC 8026 PAHS and  
SVOC's--\$338.50

LC 8027 Pesticides (LC  
2010)--\$229.12

LC 8380 Organochlorine  
and PCB's---\$581.81

# Sediment Traps

- Install horizontal sediment traps at AOC's to gather baseline data before and after remediation.
- Collect suspended sediment samples for ppb organic analysis for PAH's and Total PCB's in Bed sediment, Alkylated PAH's in bed sediment.
- Bottom samples for OC's and PCB's in bed sediment.

# Possible use of AUV or CDOM

- YSI Ecomapper
- Chromophoric Dissolved Organic Matter (CDOM) Fluorescence Sensor
- Tie the river sensors in with work being done in the embayment, near shore, and mid-deep shore, and beach health monitoring.
- automated langrangian water-quality assessment systems (ALWAS),

