THE LOWER FOX RIVER

watershed monitoring program

Science. Education. Community.

University of Wisconsin-Green Bay

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University of Wisconsin Green Bay

Lower Fox River Watershed Monitoring Program

Who are we?

- A collaboration of northeast Wisconsin high schools, UW-Green Bay, and agency scientists

What do we do?

- Monitor the health of the tributaries in the Lower Fox River Basin
- Collect water quality and habitat data

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Lower Fox River Watershed Monitoring Program

Mission:

To collect top quality data on our water resources, as well as to foster scientifically literate citizens that work together to enhance the economic and social well-being of our community by protecting our most valuable natural assets.

Vision:

To strengthen the existing student monitoring program, as well as expand its impact by creating an educational program that will target a broader audience.

Monitoring the Fox River Watershed

1980: Listed as one of the 43 Great Lakes Areas of Concern (AOC)

Problems:

- Contaminated sediment
- Poor water quality
- Lost of altered habitat

Monitoring the Fox River Watershed

Lower Green Bay and Fox River AOC:

- Last 7 miles of the Fox River
- Extends into Lower Green Bay (Long Point Tail)

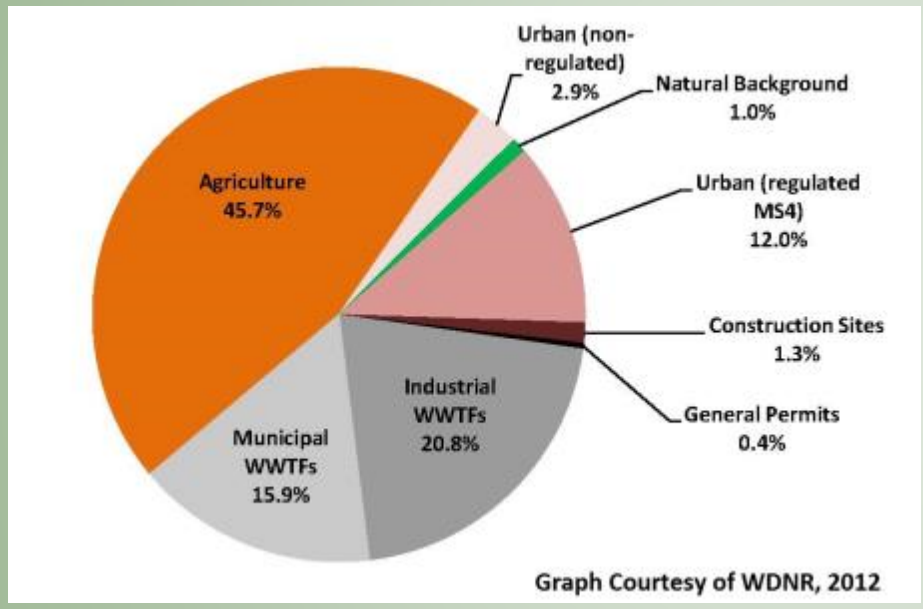
"Watershed approach" necessary to fully restore AOC

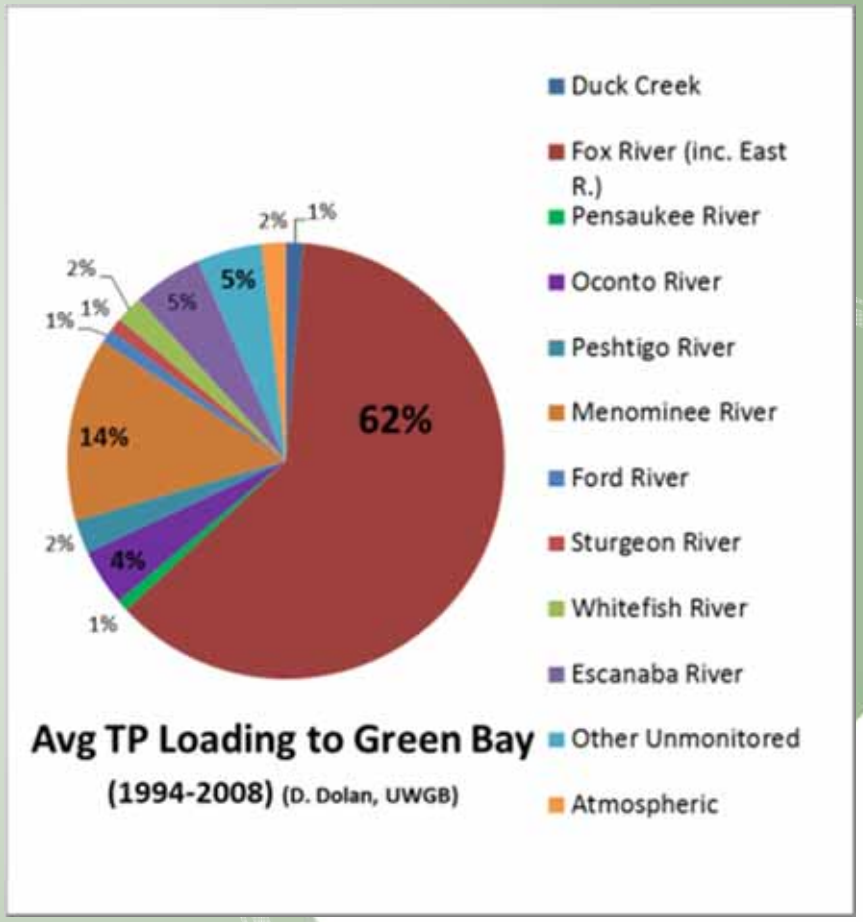
Major Threats to the Watershed

Primary threats:

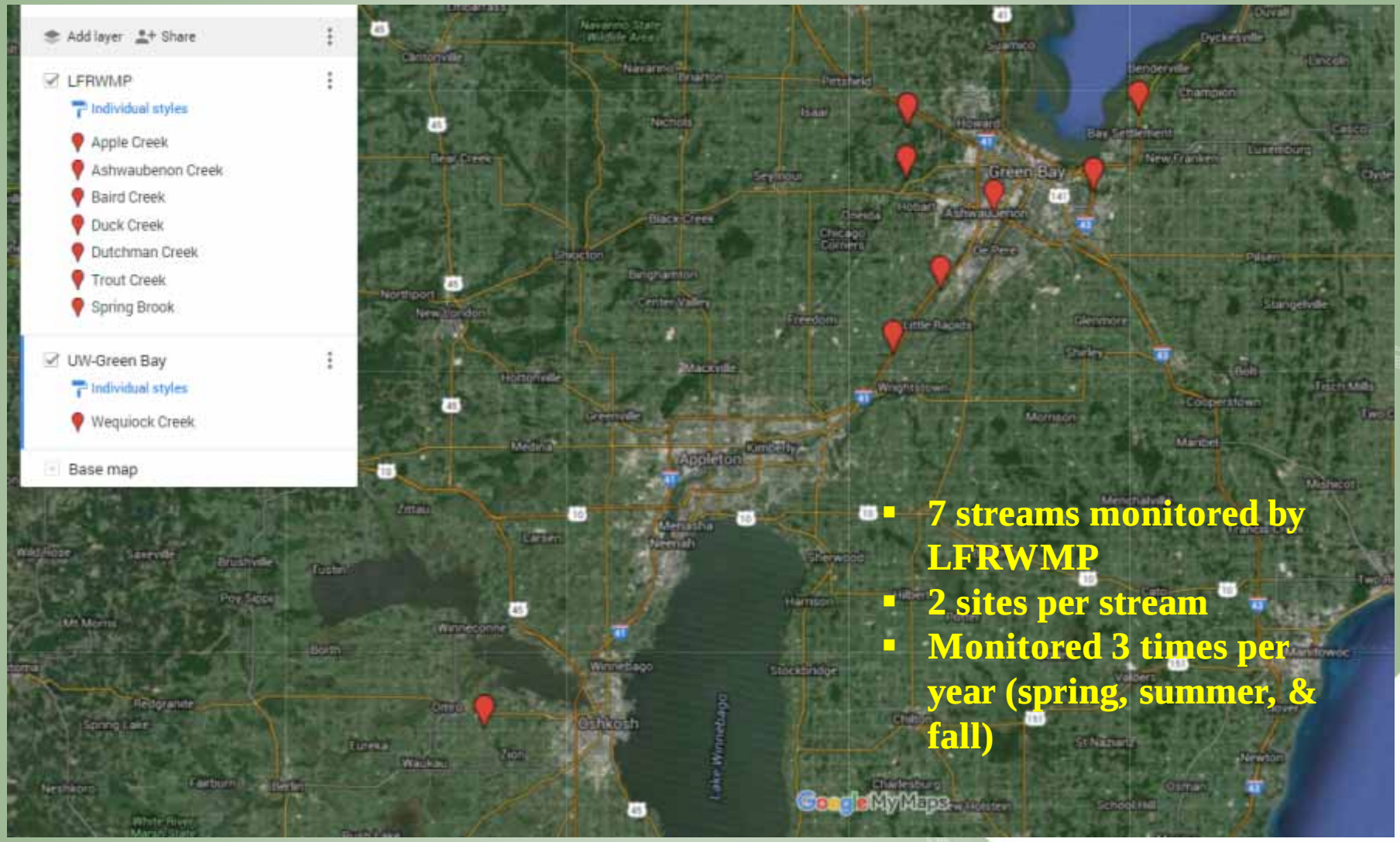
- PCB
- Hyper Eutrophication: "Dead Zone"
  - Excessive nutrient loading – phosphorous
    - Point sources
    - Non-point sources: urban and rural runoff

Sources of Phosphorus to Green Bay





LFRWMP Sites

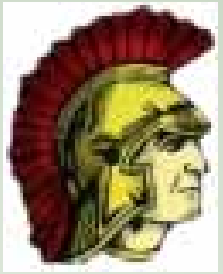


- 7 streams monitored by LFRWMP
- 2 sites per stream
- Monitored 3 times per year (spring, summer, & fall)

Participants

Eleven high schools:

- Appleton East
- Appleton North
- West De Pere
- Green Bay East
- Luxemburg-Casco
- Green Bay Preble
- Green Bay Southwest
- Ashwaubenon High School
- Oshkosh North
- Pulaski High School
- Oneida Nation High School



Parameters Measured

NUTRIENTS:

- Soluble Reactive Phosphorus
- Ammonia Nitrogen
- Nitrate Nitrogen


Parameters Measured
Stream Flow
Turbidity
Conductivity
pH
Dissolved Oxygen

Parameters Measured

- Frogs
- Birds
- Macroinvertebrates
- Stream Habitat

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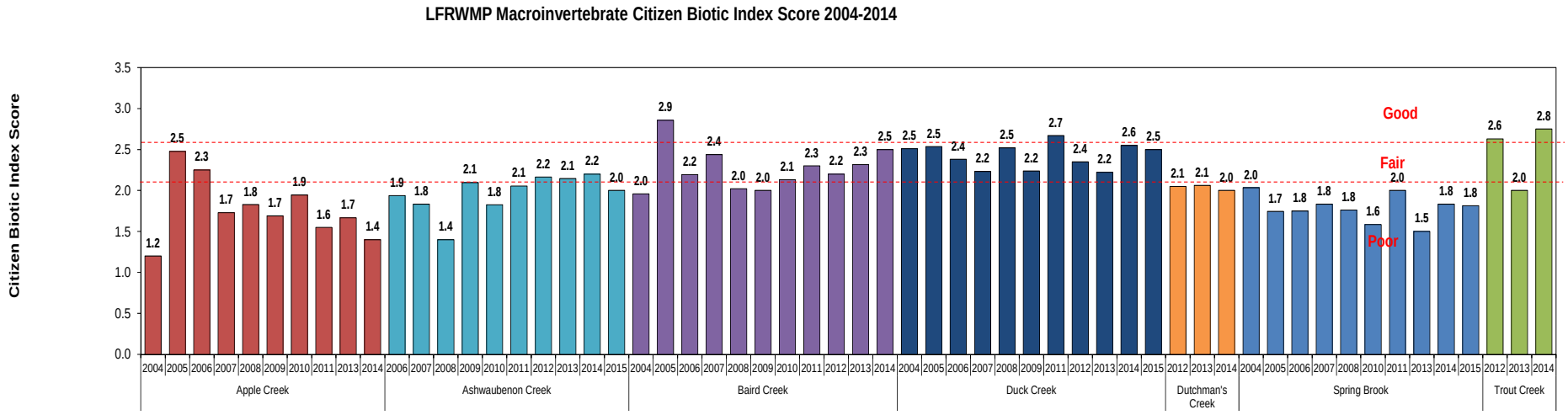
Quality Long-Term Data

- Standardized Methods and Equipment
  - (SWRP, WDNR/UWEX WAV, others)
- QA/QC review by project staff
- Student-generated database includes more than:
  - 2500 water quality measurements
  - 160 biotic indexes
  - 400 bird point counts
  - 130 amphibian observation points

Environmental Benefits

Over 10 years of base-line data – demonstrates consistency between years and streams

New monitoring projects beginning in the Lower Fox River watershed – potential for collaboration



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Educational Benefits

- Since 2003, more than 700 students have participated
- Hands-on-science
  - Data collection and management
  - Data analysis

"I like the fact that we don't just learn in the classroom, but we apply it in the field. Stream monitoring gives me real life experience. I now have a general understanding of what I would do and makes me want to pursue my career in natural science even more!" – Ryan, West De Pere HS

Community Benefits

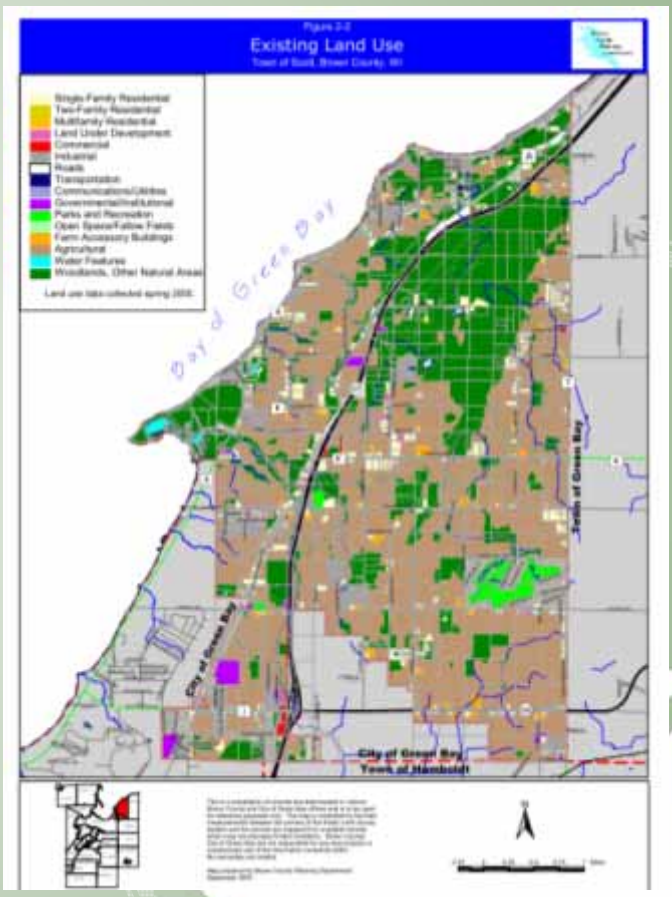
- **Place-based education:** building a connection between the students and their environment

"My involvement has helped me to realize that our local watershed and ecosystem are in danger, and people like us need to take action to help preserve the Fox River Watershed for future generations to enjoy" – Peter, Pulaski High School

Wequiock Creek Watershed Monitoring

Wikipedia.org

Wequiock Creek Watershed Monitoring



Wequiock Creek Watershed Monitoring

Data sondes

Stream height gauges

Wequiock Creek Watershed Monitoring

Healthcare.siemens.com

Total Phosphorous (TP)

Total Suspended Solids (TSS)

Wequiock Creek Watershed Monitoring

The future

What's Next?

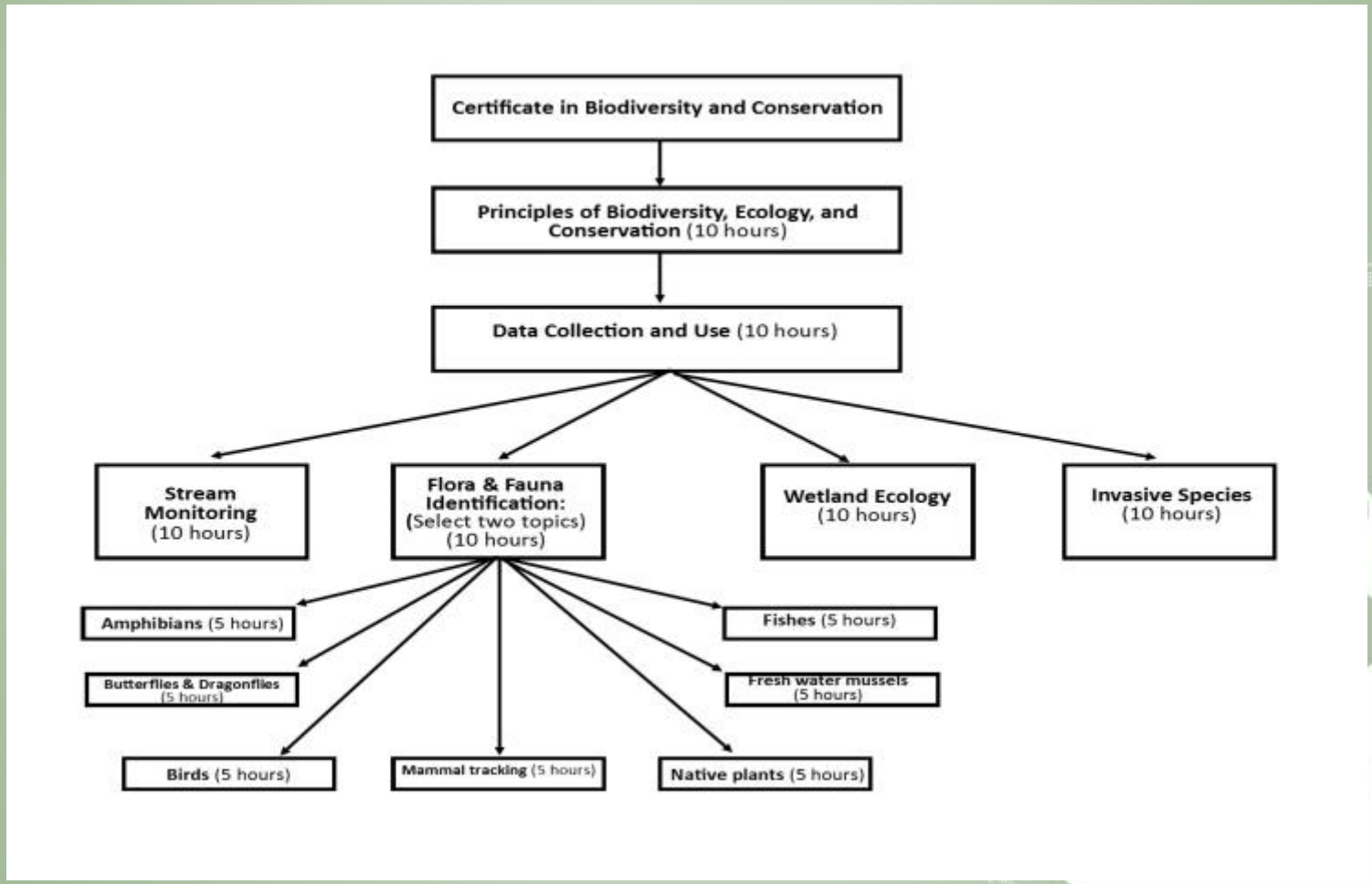
Certificate in Biodiversity and Conservation

- UW-Green Bay's Cofrin Center for Biodiversity and LFRWMP
- Online, non-credit certificate program

Goals of the program:

- Building on the success of LFRWMP to create a program designed for adult learners
- Develop a sustainable revenue source for LFRWMP

Certificate in Biodiversity and Conservation



Acknowledgements

- Arjo Wiggins Appleton, Ltd (Windward Prospects Ltd)
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- UW Milwaukee, Biology Program (Tim Ehlinger, et al.,)
- Georgia Pacific, Inc
- Wisconsin Coastal Management Program, NOAA
- UWEX, LFR AOC Citizen Advisory Committee
- Bud Harris, Jill Fermanich, UW Green Bay
- Area High Schools
- Oneida Tribe

Questions?

Phosphorus

- **Total Phosphorus (TP)**: a measure of all the forms of phosphorus, dissolved or particulate, that are found in a sample

- **Soluble Reactive Phosphorus (SRP)**: a measure of the filterable (soluble, inorganic) fraction of phosphorus – directly taken up by plant cells

Sources of Phosphorus

- **Fertilizers:** generally contain phosphorus in the form of orthophosphate. Tends to remain attached to solid particles rather than dissolving in water. Phosphates are carried into surface water with storm runoff and snow melt.
- **Animal waste:** essential in metabolism, so is present in animal waste.
- **Development:** wetlands drained for development result in a release of phosphorus that was previously buried. Removing natural filters (i.e., trees, shrubs, and natural standing water) can increase phosphorus concentrations through stormwater

Water Quality Targets

Tributary Streams in the Lower Fox River Basin	0.075 mg/l (TP)	TBD for each tributary stream (TSS)
Lower Fox River (main stem from the outlet of Lake Winnebago to the mouth of Green Bay)	0.10 mg/l (TP)	20 mg/l (TSS)
Lower Green Bay (Area of Concern) Narrative Target for the TMDL	Water clarity and other conditions suitable for support of a diverse biological community, including a robust, expanded area of submerged aquatic vegetation in shallow water areas.	