LAKE WAUSAU WATER QUALITY LAND USE PRACTICES SHORELANDS AND THE WATERSHED

N. Turyk

Water Resource Scientist

Center for Watershed Science and Education

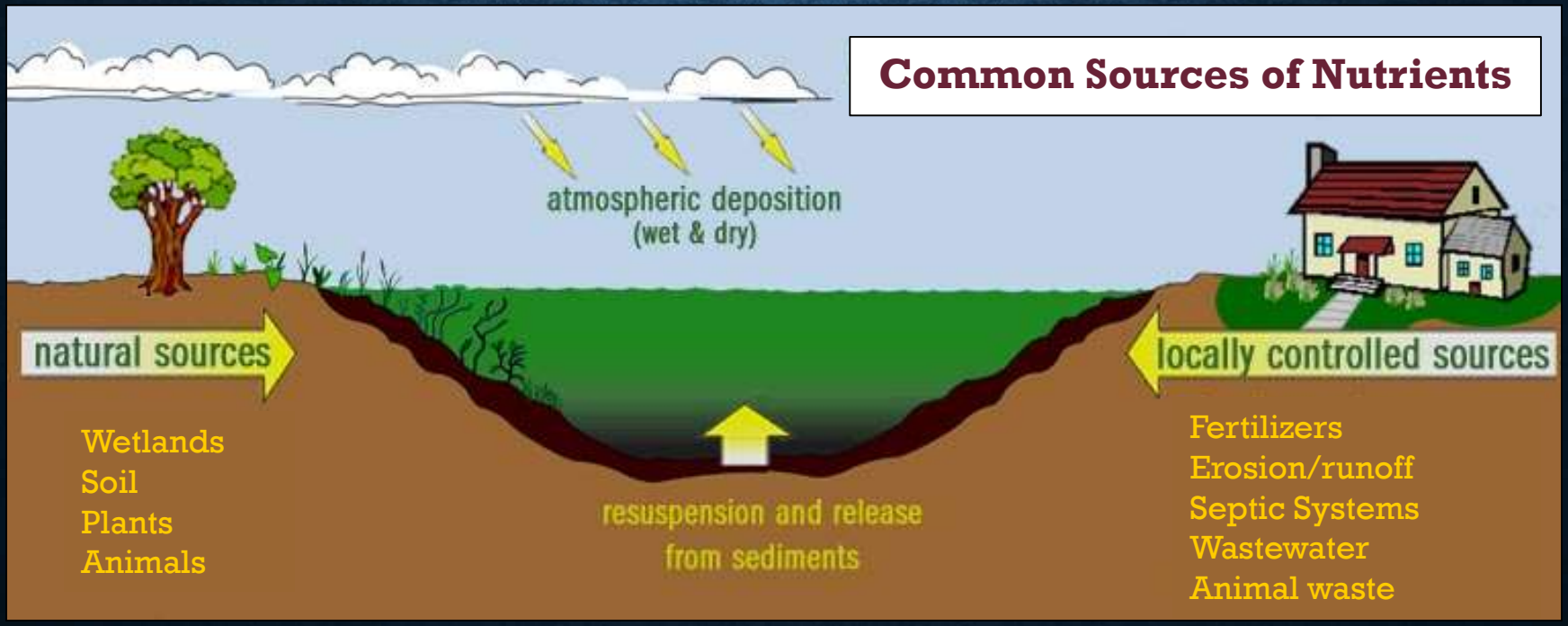
University of Wisconsin-Stevens Point

DISCUSS RELATIONSHIP BETWEEN WATER QUALITY & LAND USE PRACTICES

- Water Quality in Lake Wausau
- Near Shore
  - How does Lake Wausau measure up?
  - Options for improvements
  - Which strategies are needed to
    - protect what is good
    - repair the areas that are not as healthy.
- Watershed
  - What do we know?
  - What are next steps?

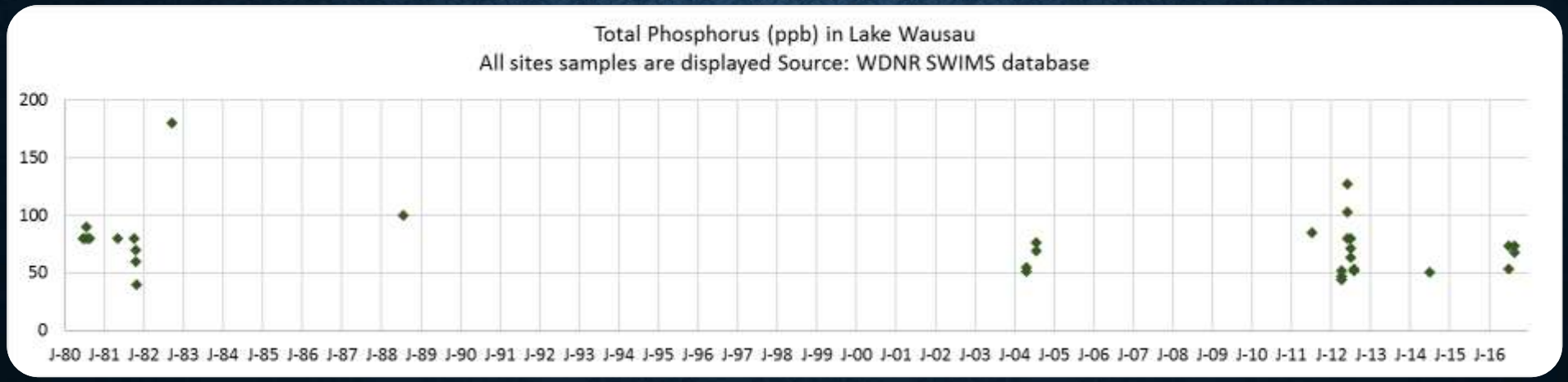
NUTRIENTS

- Phosphorus
- Nitrogen



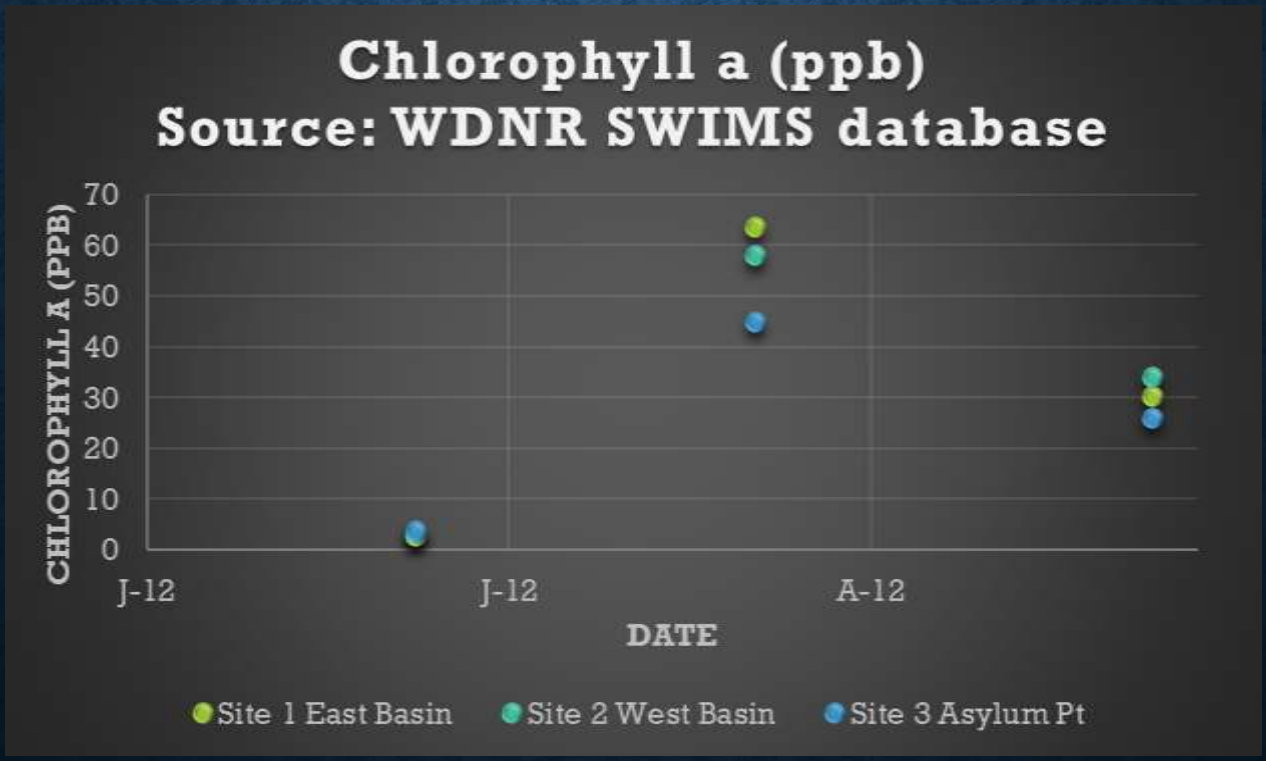
WATER QUALITY: PHOSPHORUS

- Data is lacking
- Too little data to describe long-term trends or seasonal variation of phosphorus in Lake Wausau.
- Recommendation: Volunteer monitoring through the WDNR's CLMN program.



WATER QUALITY: CHLOROPYLL A (ALGAE)

- Data is insufficient to assess health of Lake Wausau
- Month-to-month variability
- Site-to-site variability
- Recommendation: Volunteer monitoring through WDNR CLMN program

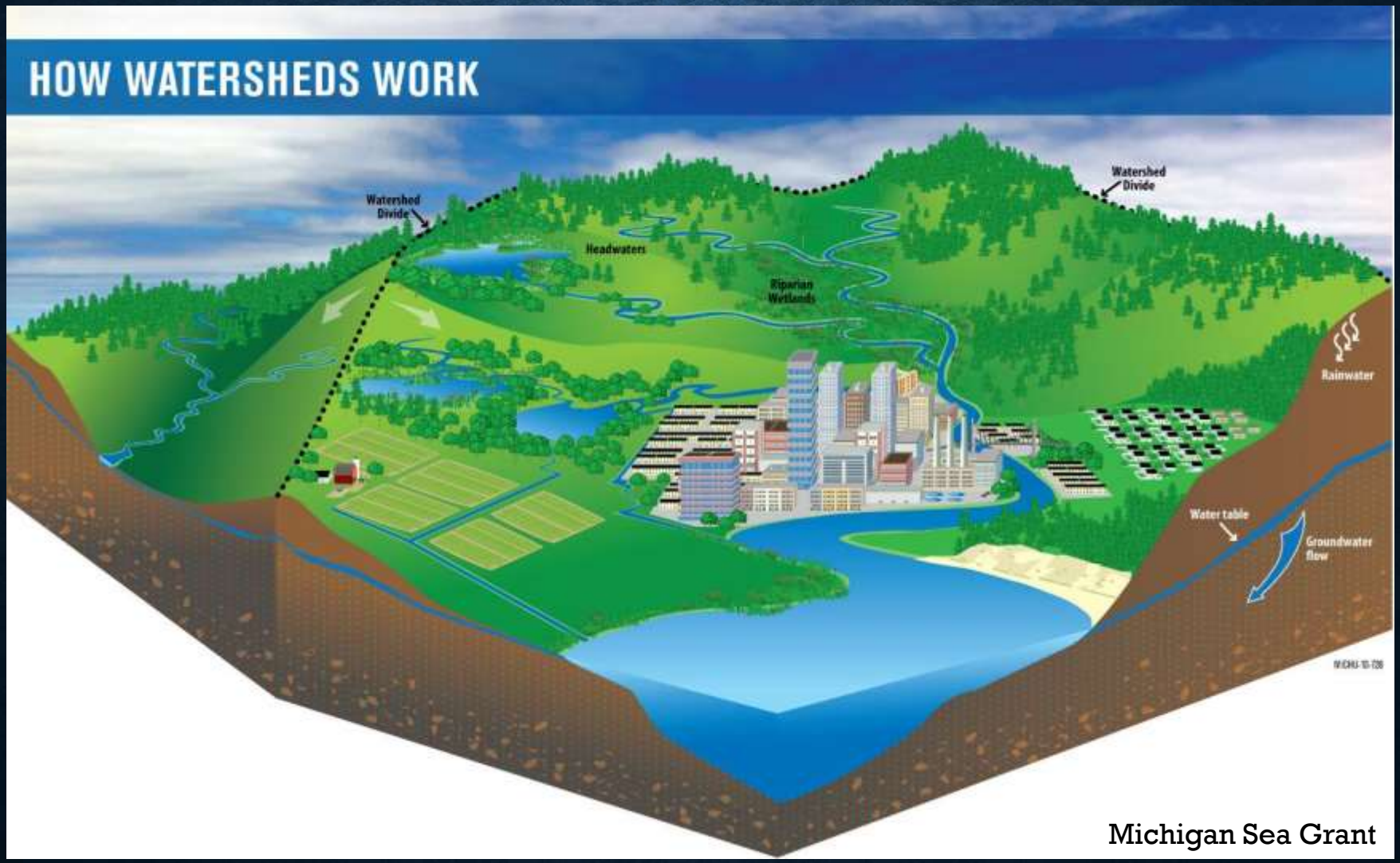


WATER QUALITY: OTHER PARAMETERS

Data was limited - with that in mind:

- Nitrogen concentrations were relatively low.
- Dissolved oxygen was sufficient to support the fish species present in Lake Wausau.
- Water is stained from tannins.
  - Limits the depth that aquatic plants can grow
  - Can limit algal growth
  - Makes water clarity appear poor
- Water is moderately hard.
  - Sufficient calcium for formation of bones, teeth, shells
  - Not sufficient to control phosphorus

LAND TO WATER



Michigan Sea Grant

WHY A HEALTHY SHORELAND?

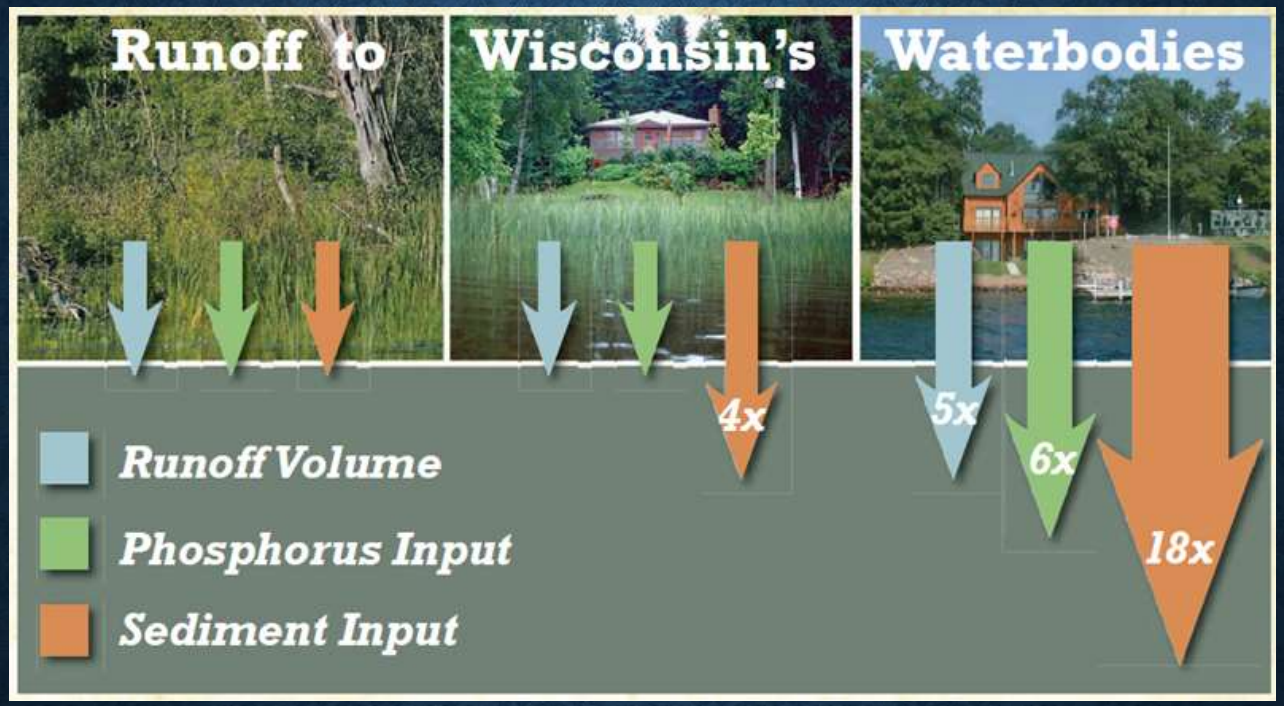
- Reducing polluted runoff
- Flooding and erosion control
- Habitat for fish and wildlife
- Privacy and natural beauty

LIFE HAPPENS HERE!

RUNOFF CARRIES POLLUTANTS

- Soil particles (clouds water, grows plants)
- Nutrients (nitrogen, phosphorus)
  - 1 pound of phosphorus can grow 500 pounds of algae!
- Herbicides/Pesticides
- Oil, Gas, Metals (Parking Lots, Street Runoff)

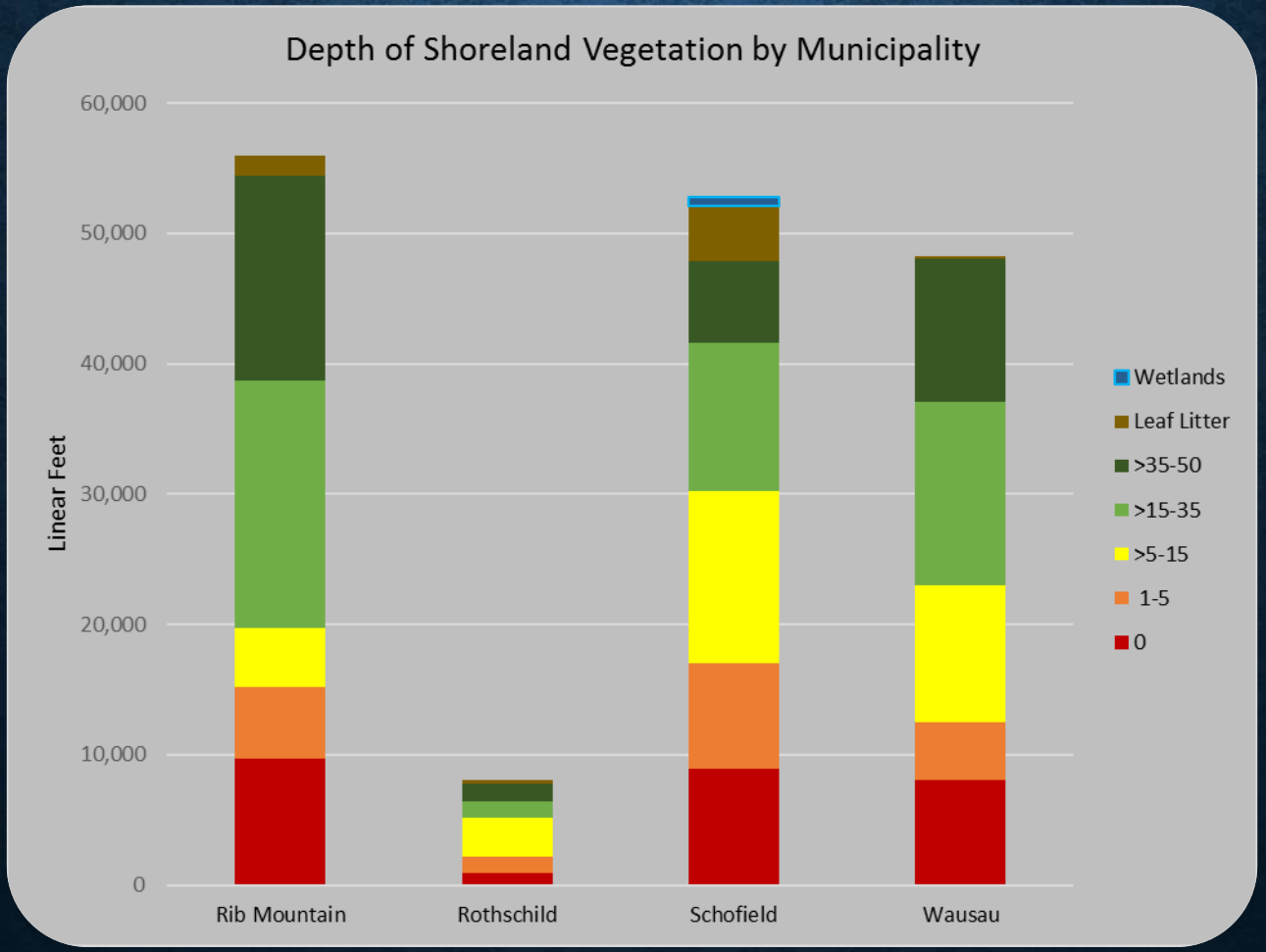
NEAR SHORE LAND USES AND PRACTICES



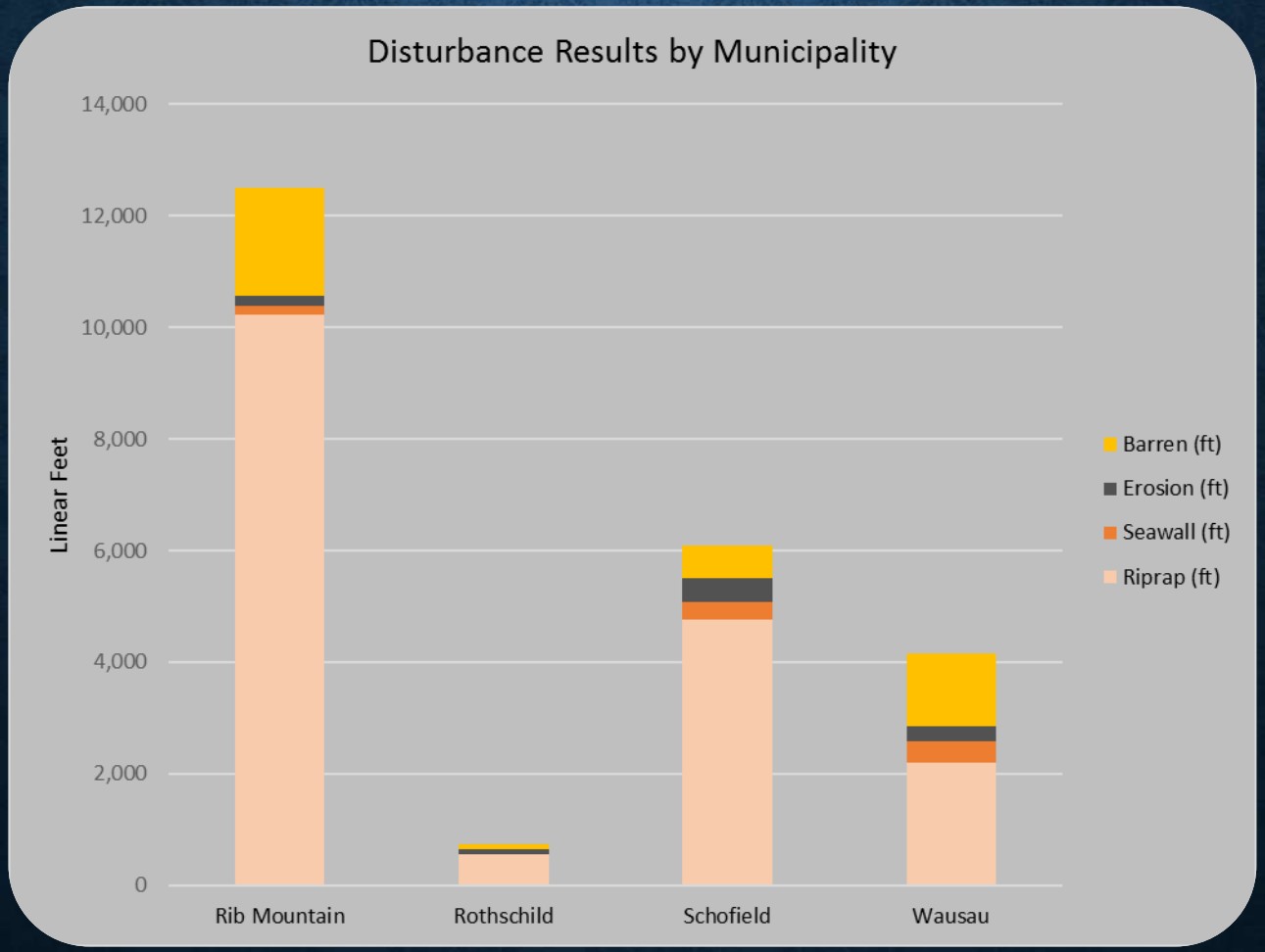
- Minimize hard surfaces
- Remove unneeded hard surfaces (extra parking spots)
- Direct runoff from hard surfaces away from the lake


Lake Wausau Shoreland Survey, Summer 2013
Unmowed Vegetation < 3 Ft Tall
Distance Inland from Waters Edge (Ft)
0
1
5
15
35
50
>50
Poor
Excellent
Other Shoreland Cover
Wetlands
Leaf Litter
Trees and Shrubs
Absent
Present

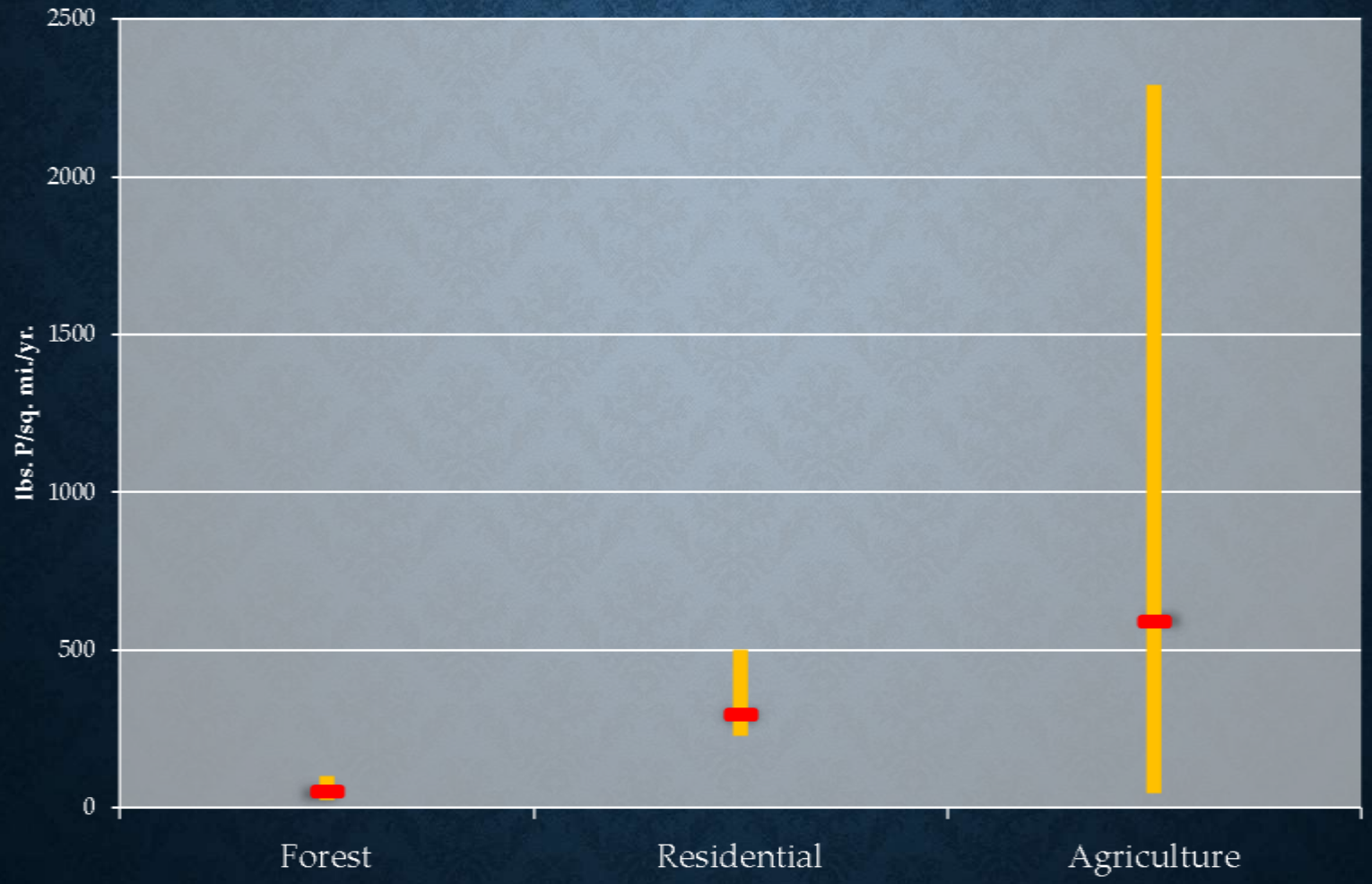
LAKE WAUSAU SHORELAND VEGETATION



LENGTH OF SHORELAND BARREN, EROSION, SEAWALL, RIPRAP



LAND MANAGEMENT MATTERS!



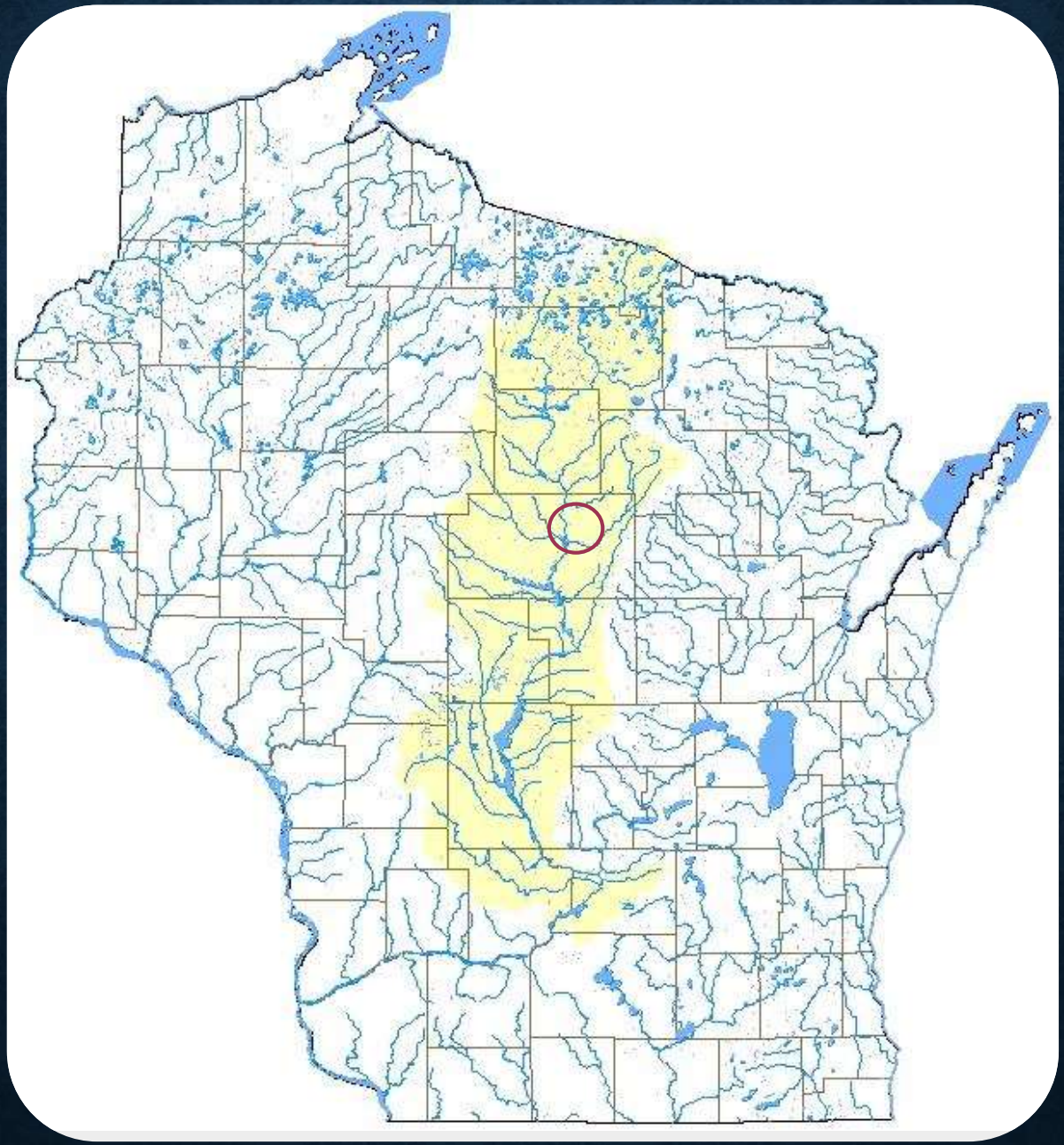
Panuska and Lillie, 1995

Reduce runoff and increase infiltration

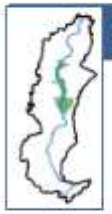
- Rain gardens, retention basins
- Rain barrels

Meander pathway to the lake

RUNOFF MANAGEMENT



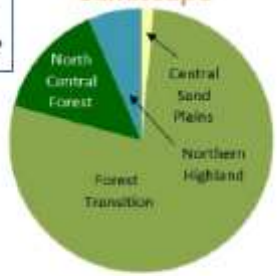
https://www.youtube.com/watch?v=GaensnYw_RI



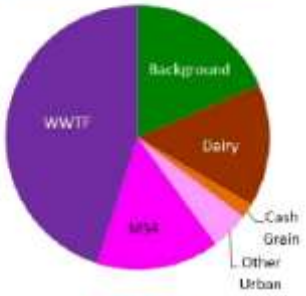
Ave. Annual Phosphorus Load = 65.5 tons | Lincoln, Marathon, and Portage County | 539.0 square miles |

Upper Wisconsin River Corridor

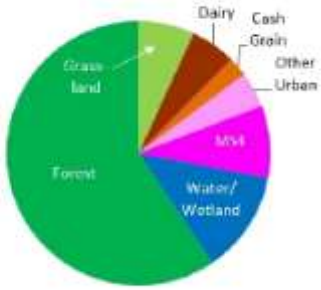
Ecological Landscape



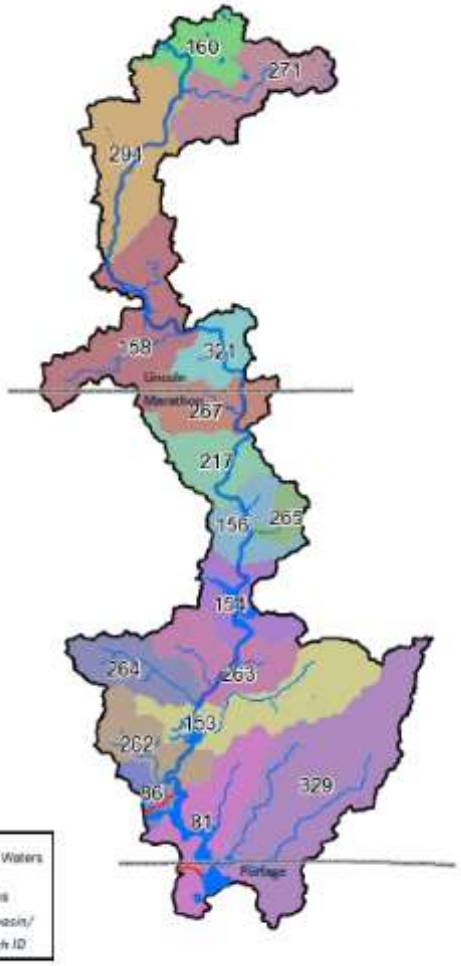
Sources of Phosphorus



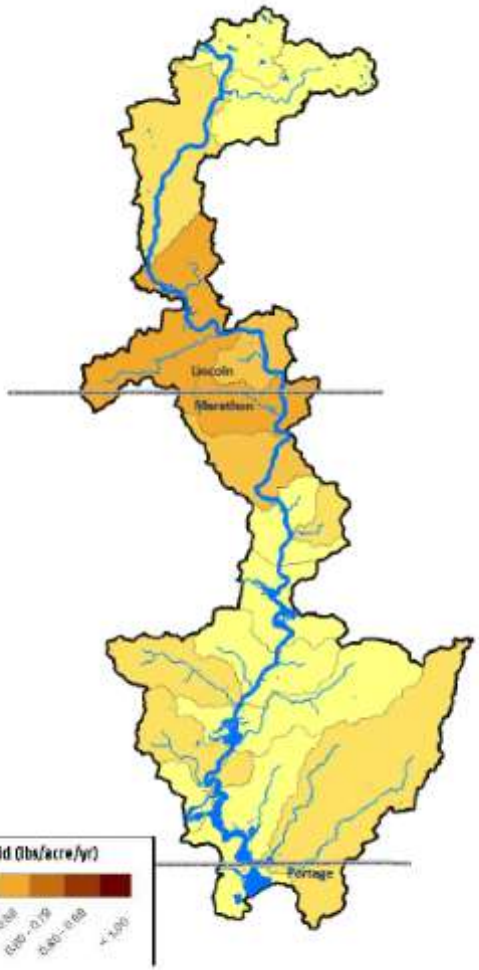
Land Use



IMPAIRED WATERS



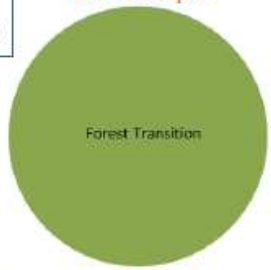
PHOSPHORUS YIELD



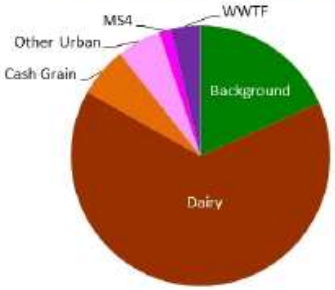
Ave. Annual Phosphorus Load = 52.5 tons | Langlade, Marathon, and Taylor Counties | 488.2 square miles |

Rib River Watershed

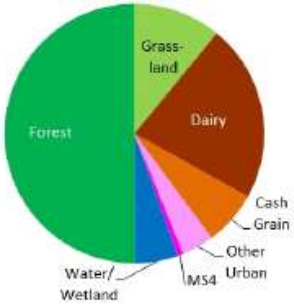
Ecological Landscape



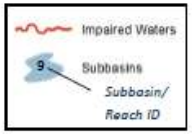
Sources of Phosphorus



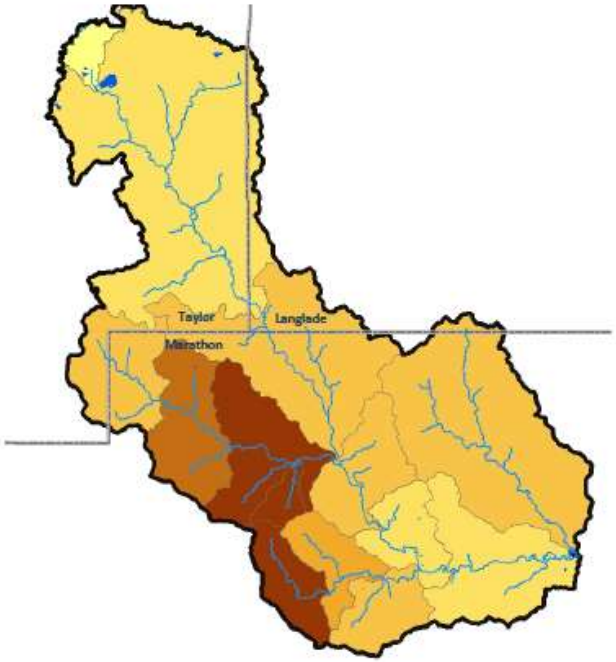
Land Use

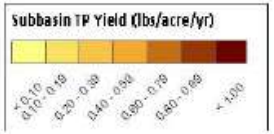


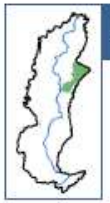
IMPAIRED WATERS



NONPOINT SOURCE PHOSPHORUS YIELD



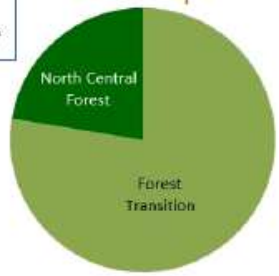




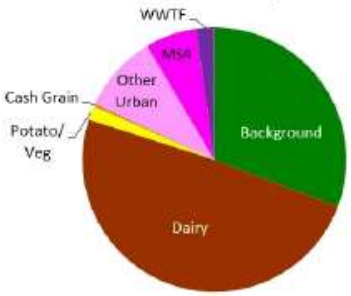
Ave. Annual Phosphorus Load = 25.7 tons | Langlade and Marathon Counties | 455.2 square miles |

Eau Claire River Watershed

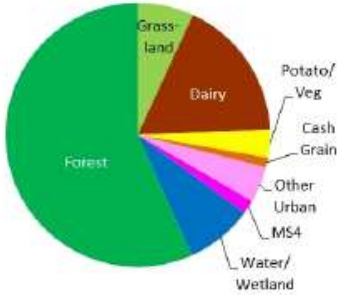
Ecological Landscape



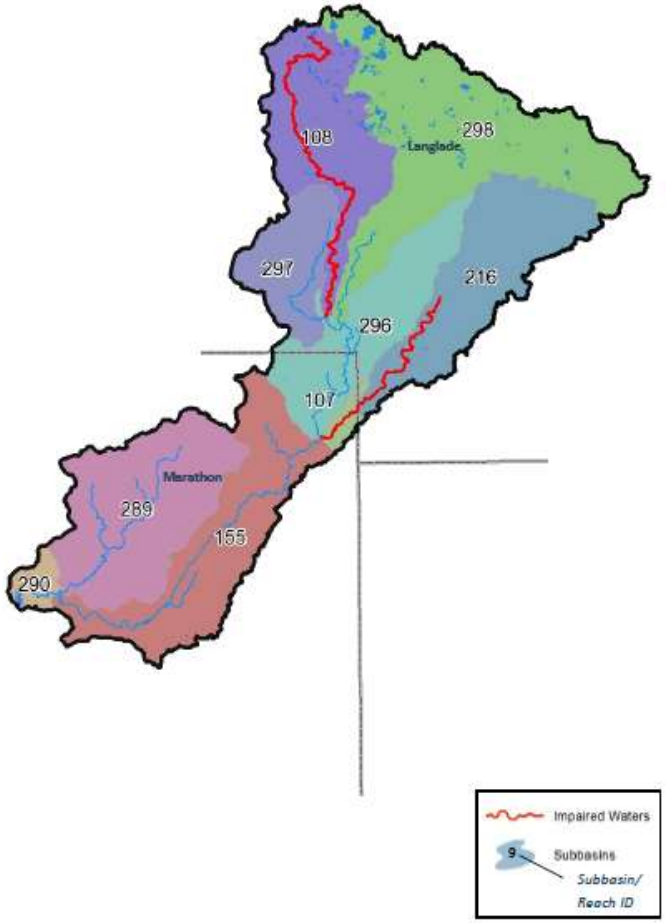
Sources of Phosphorus



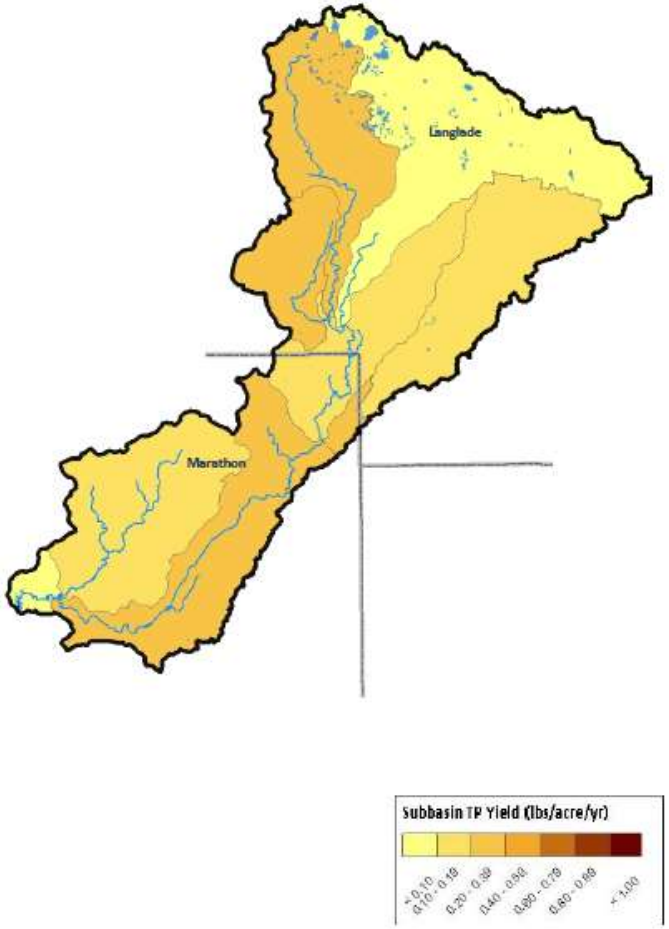
Land Use



IMPAIRED WATERS



NONPOINT SOURCE PHOSPHORUS YIELD



AGRICULTURAL BEST MANAGEMENT PRACTICES

- Manure Management
- Fertilizer Budgets
- Erosion Control
- Runoff Management
- Crop Rotation
- Cover Crops
- Rotational Grazing Plans and Fencing
- Water Sources to keep livestock out of lakes/streams

- Wetland Restoration
- Shoreland Management

RECOMMENDATIONS: WISCONSIN RIVER WATER QUALITY IMPROVEMENT PROJECT (TMDL)

- Get involved at public meetings and during public comment periods.
- Improvement plans will be developed for the Upper Wisconsin River, Big Rib, and possibly Eau Claire Rivers.

PARTICIPANT SUGGESTIONS FROM THE LAKE WAUSAU MEETING 1/22/2015

PARTICIPANT SUGGESTIONS FROM THE LAKE WAUSAU MEETING 1/22/2015

Incentives related to healthy shorelands
Provide incentives or planting assistance
Monitor growth rate
Increased government support
DNR support
Establish community value for shoreland quality
What have other lakes done
Planting clinic
Planting workshop
Create demonstration project that can be viewed by community members
Education and planting workshop
Assign ambassadors to educate the uninformed

PARTICIPANT SUGGESTIONS FROM THE LAKE WAUSAU MEETING 1/22/2015

Messages about healthy shorelands
A cleaner lake could make for more uses of the lake or more lakeside attractions
More vegetation on shoreline will give a more "up north" feel
Explain the importance of healthy water
Discuss cause and effect
Explain benefits of transitioning to a healthy shoreland
Set example for neighbors
Discuss herbicide/pesticide uses
Communicate to landowners and fisherman not to "dump" clippings and leftovers into the lake
Understand the long term effects
Making people aware what plants can and cannot be planted on shore

OPTIONS

Shorelands: Protection

- Knowledgeable shoreland property owners
  - Media, presentations, backyard walks, demonstration sites
- Conservation easements by property owners (long term)
- Purchase of land for protection (long term)
  - WDNR Lake Protection Grants, Knowles-Nelson Stewardship Funds
  - Land owned by government, sporting club, lake group
- Shoreland zoning ordinances (can be changed)
  - Enforce state ordinance in unincorporated areas
  - Develop ordinances in incorporated areas
- Acknowledgements
  - awards, reduced dues, newsletter

OPTIONS

Shoreland Restoration:

- Knowledgeable shoreland property owners
  - Media, presentations, backyard walks, demonstration sites
  - Choose messages that are relevant to the recipient
- Do it yourself (DIY)
  - Brochures and websites
- Incentives
  - WDNR Healthy Lakes Grants (variety of practices)
    - How do people know about these?
    - Who coordinates?
  - Reduced taxes or dues
  - Competitions
  - Acknowledgements
    - awards, reduced dues, newsletter