

Watersheds: Water and Land (and people too!)

Lakes Conference
April 12, 2019

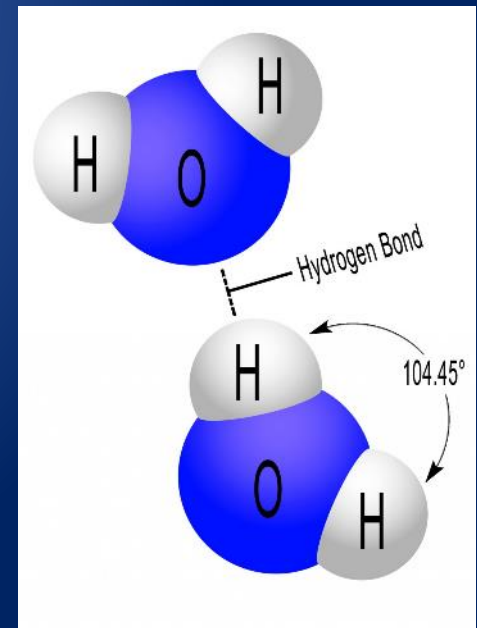
Daniel Zerr

Natural Resources Educator



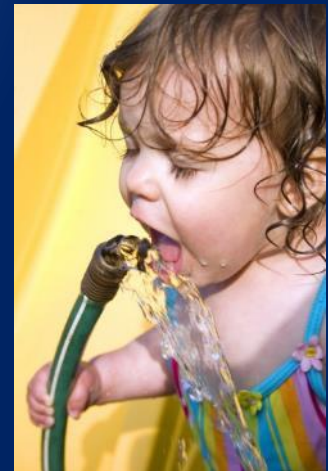
Interesting Facts About Water

- Water is found naturally on Earth in three forms: liquid, gas and solid.
- Frozen water is less dense than liquid water, so ice floats on water.
- Water molecules are slightly polar.
- Water can dissolve more substances than any other liquid.
- Cohesion and Adhesion.
- High Specific Heat.

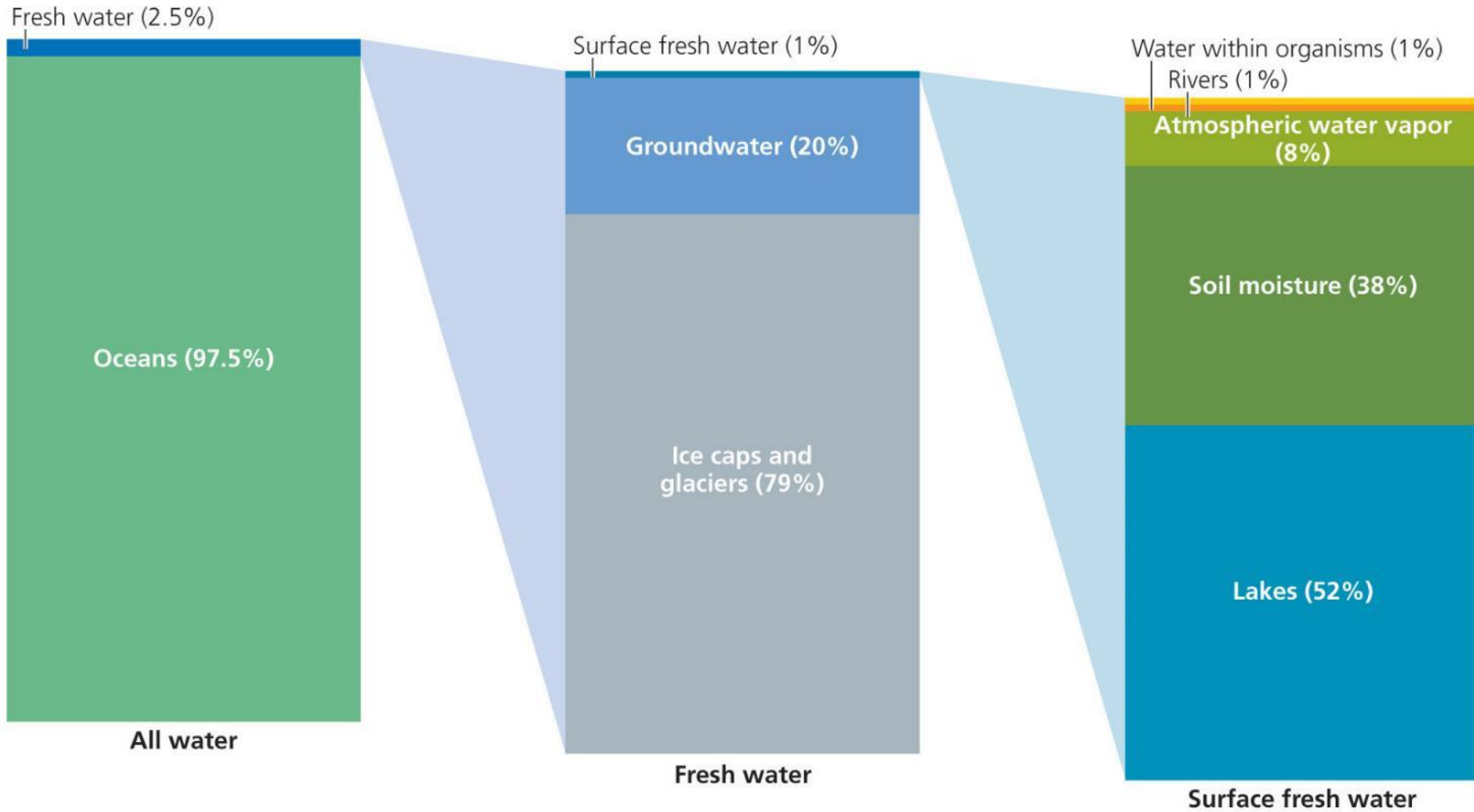


Interesting Facts About (Humans and) Water

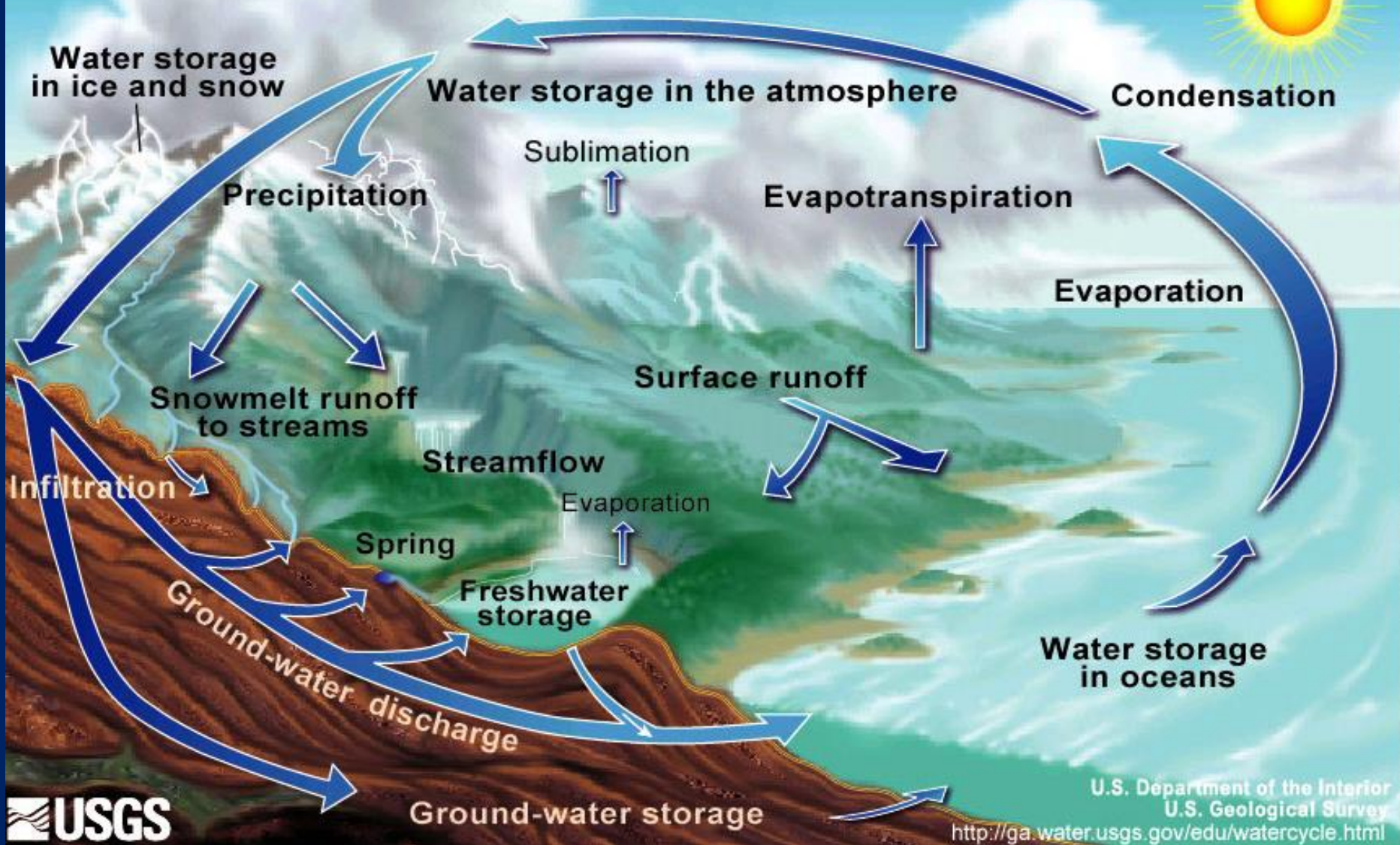
- The human body is about 70% water.
- Humans can go nearly a month without food, but not more than a few days without water.
- Of the fresh water people use globally, 70% is for agriculture, 20% is for industrial purposes, and 10% is for residential and municipal use.
- We all need water, and lots of it!



Water Water Everywhere...



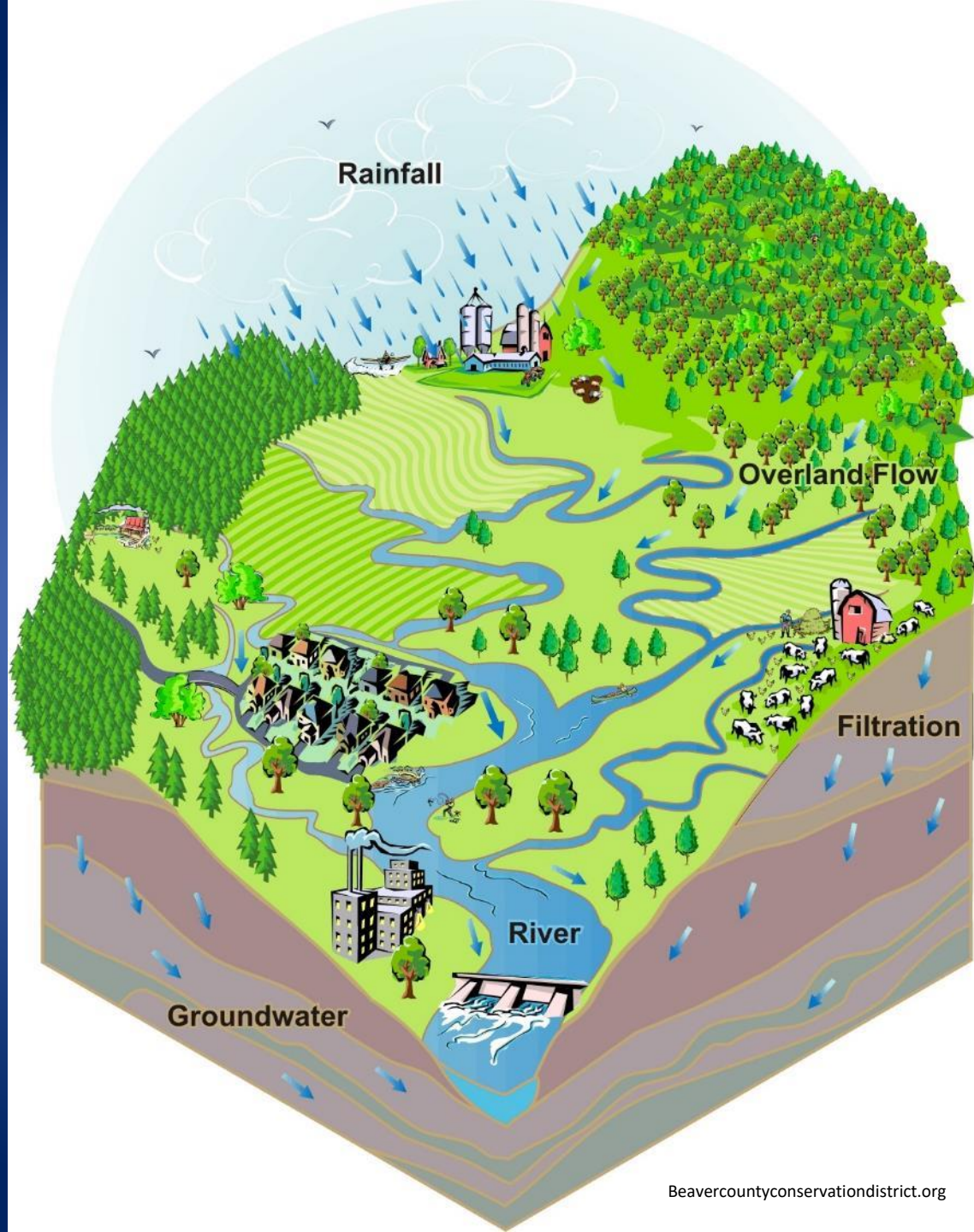
The Water Cycle



U.S. Department of the Interior
U.S. Geological Survey
<http://ga.water.usgs.gov/edu/watercycle.html>

Watersheds

- An area that all drains to a particular stream, river, lake, or ocean.
- Includes all surface land area, smaller streams within that watershed, and groundwater flow.
- Watersheds are “nested” within each other. Small watersheds are usually part of larger watersheds.



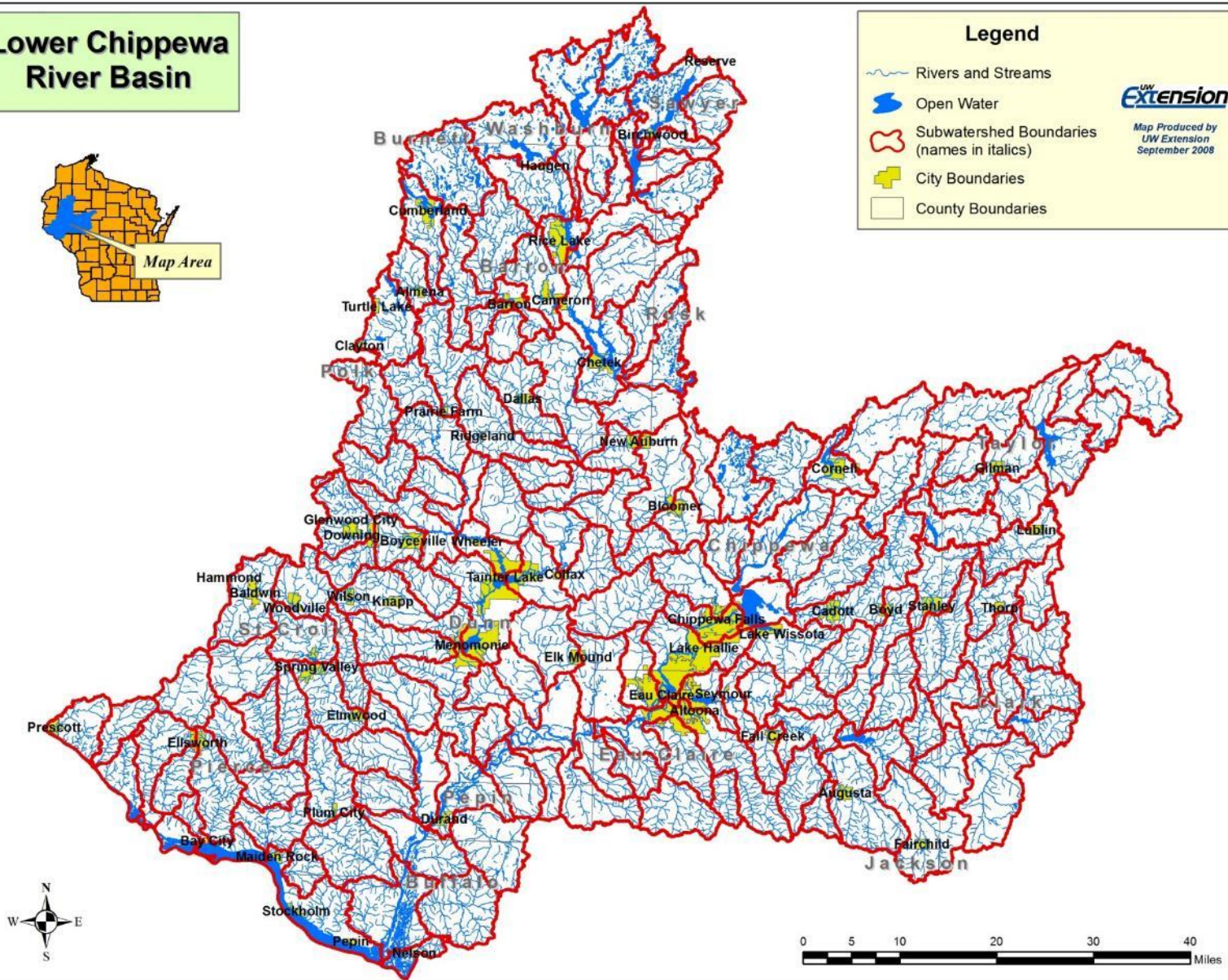
Watersheds: It all flows somewhere!

Lower Chippewa River Basin



- ### Legend
- Rivers and Streams
 - Open Water
 - Subwatershed Boundaries (names in italics)
 - City Boundaries
 - County Boundaries

UW Extension
Map Produced by
UW Extension
September 2008



Watersheds

Farms



Cities

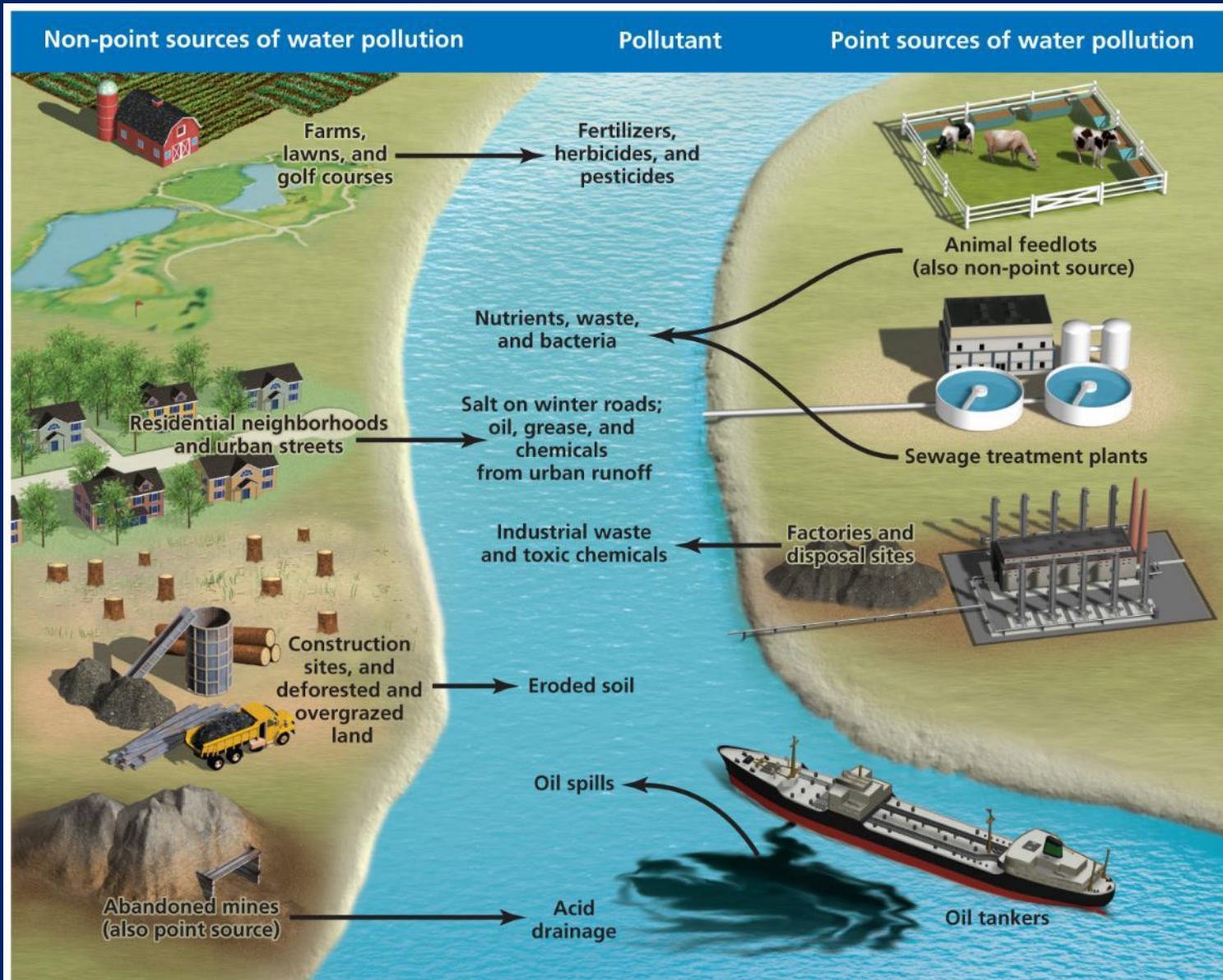


Industry



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Pollution

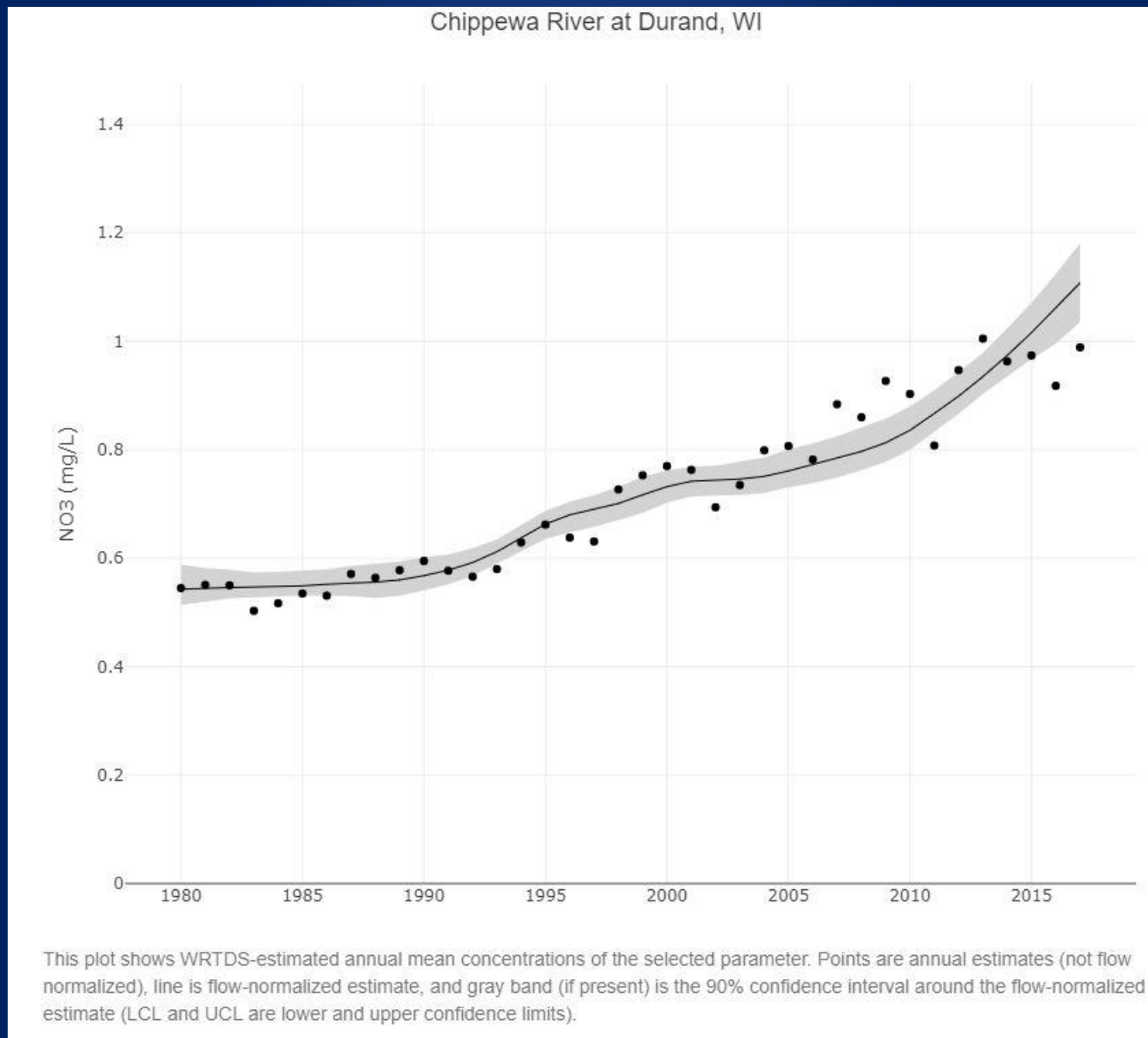


How Do We Measure Watershed Health?

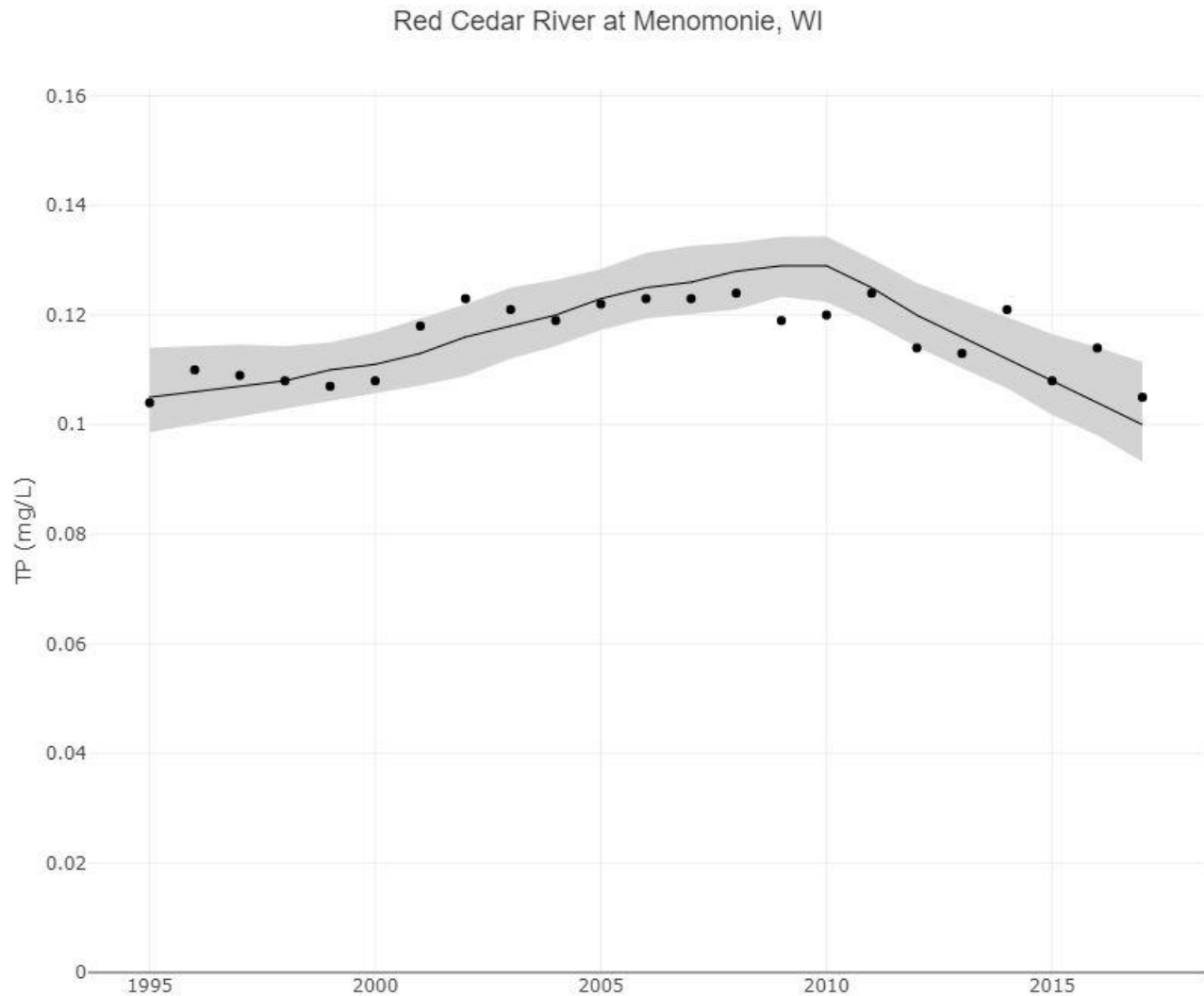
- Surface Water Quality
 - Nitrogen
 - Phosphorous
 - pH
 - Temp
 - Turbidity
 - TSS
 - Chlorophyll a
- Water Critters
 - Macroinvertebrates
 - Fish
 - Fresh water mussels
 - Others



Surface Water Nitrates



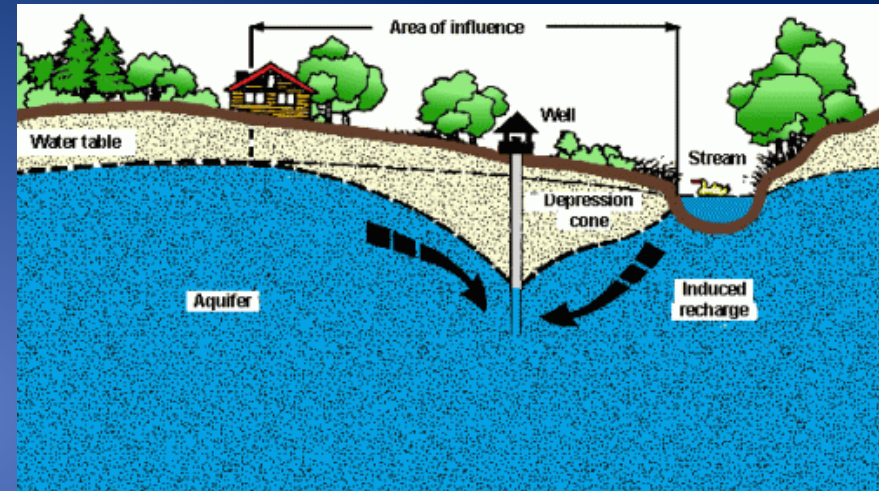
Surface Water Phosphorus



This plot shows WRTDS-estimated annual mean concentrations of the selected parameter. Points are annual estimates (not flow normalized), line is flow-normalized estimate, and gray band (if present) is the 90% confidence interval around the flow-normalized estimate (LCL and UCL are lower and upper confidence limits).

How Do We Measure Watershed Health?

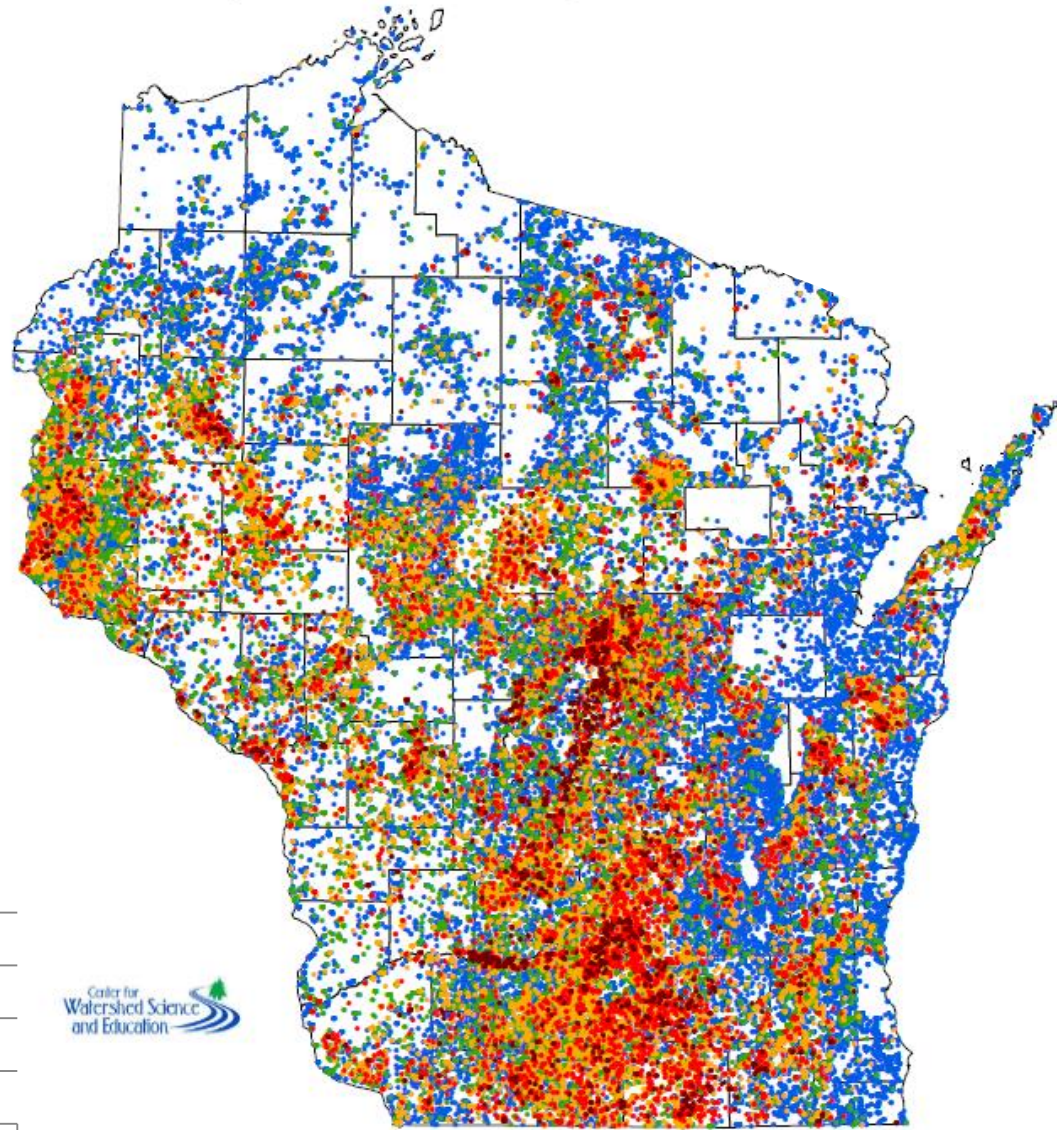
- Groundwater Quality
 - Nitrates
 - Coliform bacteria
 - Pesticides
 - Arsenic
- Groundwater Quantity
 - Depth to groundwater



Private Well Nitrate-Nitrogen Concentrations



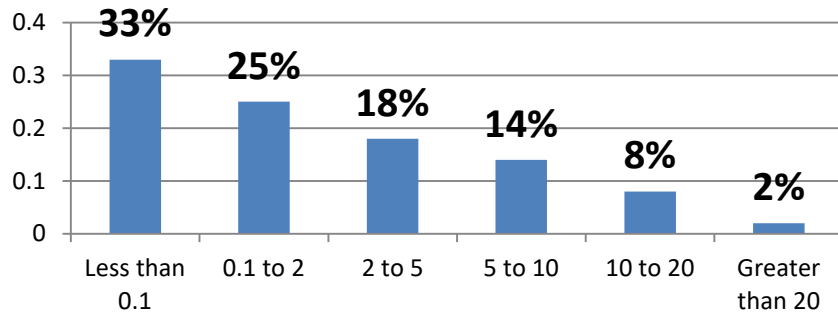
*Maximum displayed where overlapping values occur.



Center for Watershed Science and Education

Multiply by 4.23 to convert to NO₃-

Percent of Samples by Nitrate-N Range



Disclaimer: This map represents well water data in the Center for Watershed Science and Education database, WI DNR Groundwater Retrieval Network. It does not represent all known private wells.

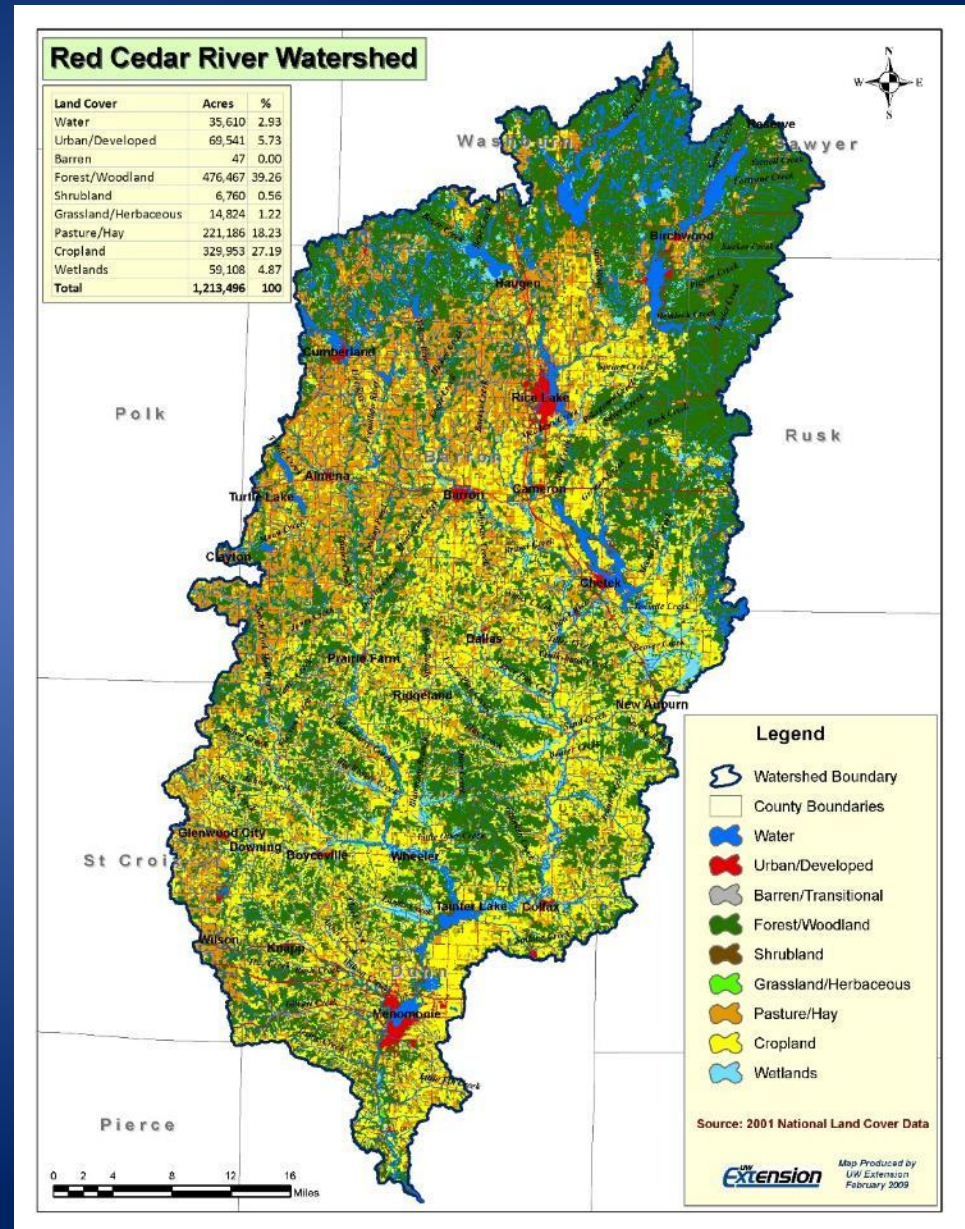
Groundwater Depletion



Lake Huron, Waushara County, WI. Photo by Ryan Schuessler

How Do We Measure Watershed Health?

- Land Cover
- Natural land cover generally means better water quality
- Watersheds with an abundance of forest, natural grasslands and wetlands are generally healthy



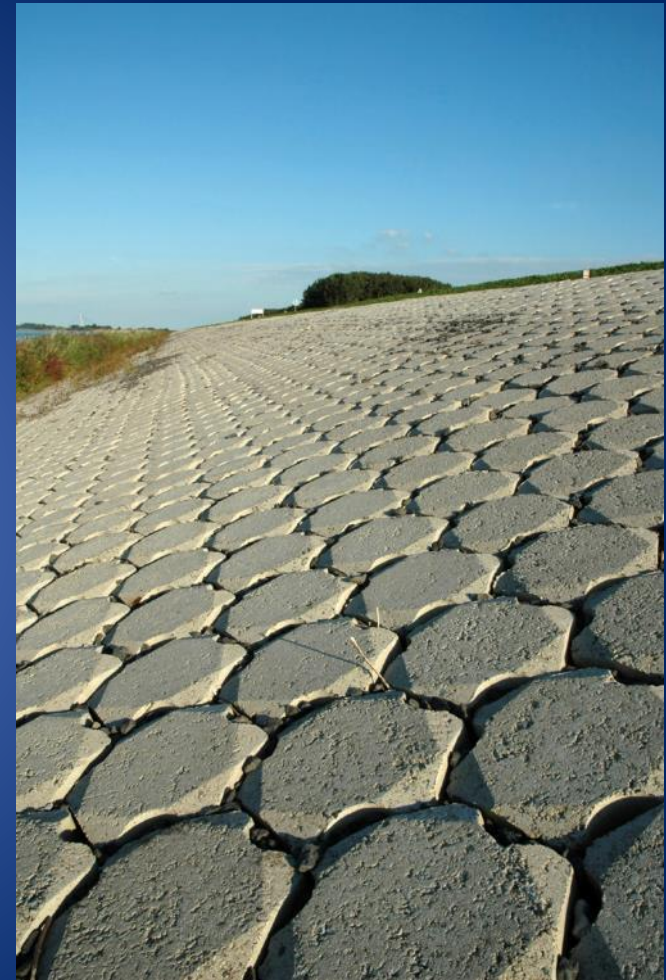
Ways We Modify and Change Watersheds



Ways We Modify and Change Watersheds



Ways We Modify and Change Watersheds



Ways We Modify and Change Watersheds



How Do We Measure Watershed Health?

- Soil Health
 - Soil organic matter
 - Soil biodiversity
 - Water retention
 - Soil aggregation
 - Percolation
 - Carbon sequestration
 - Fertility
 - Fewer chemicals needed
 - Reduced erosion



NRCS



What Can You Do?

- Practice no-till farming, plant cover crops, and plant marginal farmland to natural vegetation
- Install grass waterways to control soil erosion in natural flow areas
- Change agricultural practices to minimize use of phosphorus and manure applications (nutrient management)
- Keep livestock away from streams and rivers



Town of Grant project



NRCS



Greener Loudoun

What Can You Do?

- Maintain septic systems to prevent failure and leaking of phosphorus and nitrates into water bodies



- Use phosphorus-free products
 - fertilizers (or go without!)
 - dishwasher detergent
 - laundry detergent



What Can You Do?

- Don't dump pollutants or other liquids down storm drains
- Pick up after your pets
- Use proper erosion control on construction sites



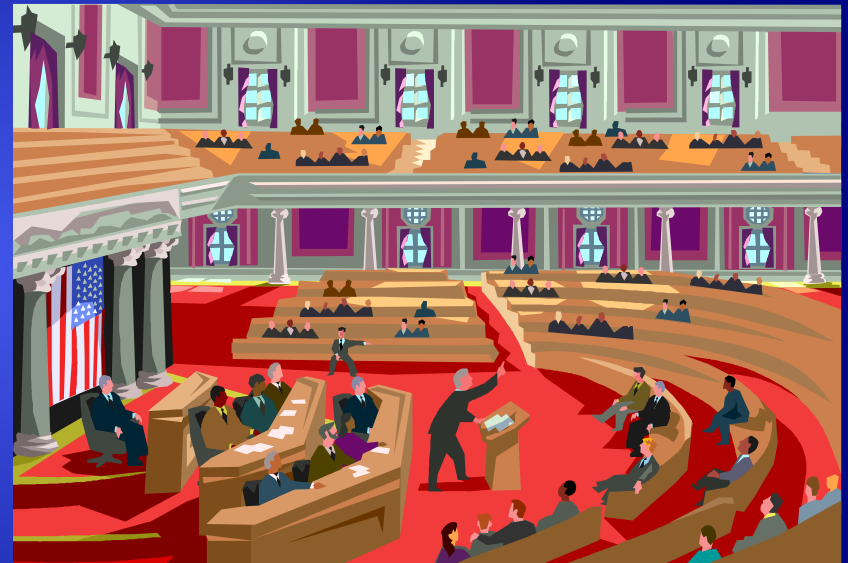
Photo Courtesy of Sandy, UT



Photo Courtesy of Hickory, NC

What Can You Do?

- Network and partner with other individuals or groups who may be working on water-related issues and events
- Talk to your local and state government officials about the need for proper resources to address the problems



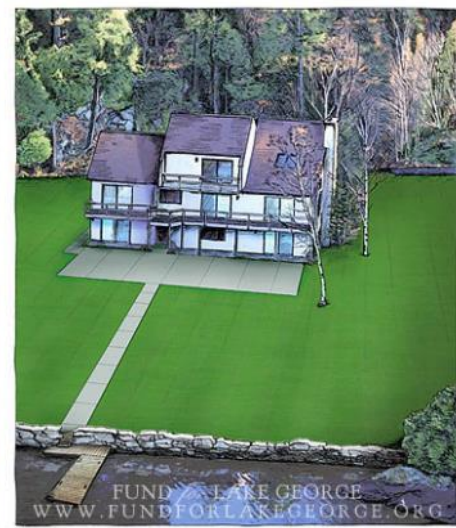
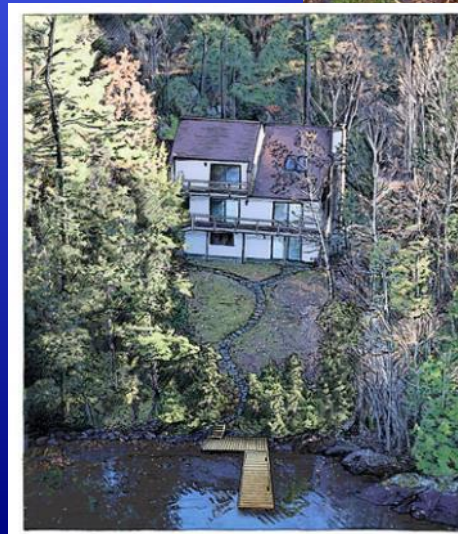
What Can You Do?

- Talk to your family and friends about what you learn and what you're doing to help
- Participate in clean-ups and other events designed to keep our environment, including our lakes and rivers, clean and sustainable



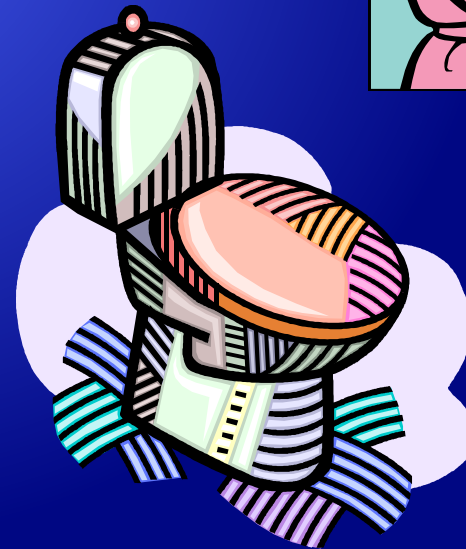
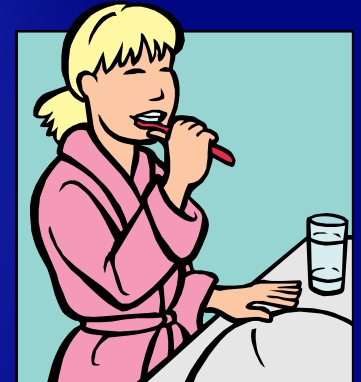
What Can You Do?

- Build rain gardens in your yard to keep runoff from carrying pollutants to rivers and lakes
- Businesses and cities can use innovative practices to infiltrate runoff and rain water
- Plant buffers of natural vegetation next to rivers and lakes



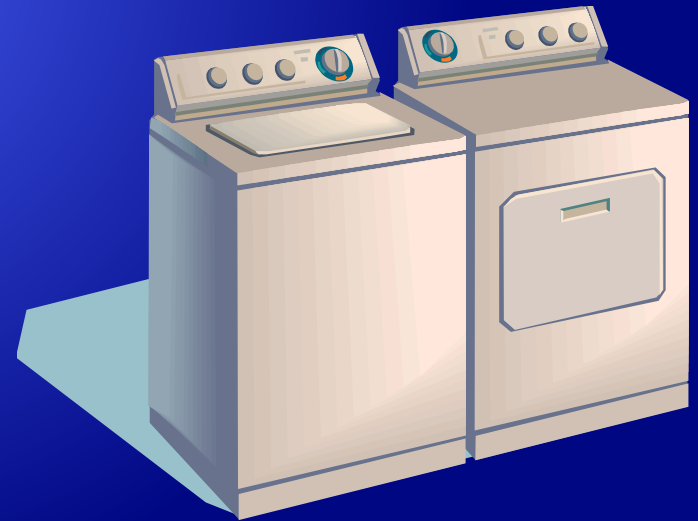
What Can You Do?

- Conserve water whenever possible.
- Shut off the tap when brushing your teeth.
- Flush less or use low-flush toilets.
- Use low flow shower heads.



What Can You Do?

- Pick up trash and dispose of it properly to keep out of water bodies.
- Buy a reusable water bottle and fill from the tap.
- Don't run the dishwasher/clothes washer unless you have a full load.
- Shop smart for appliances that use less water.



What Can You Do?

- Remember, water is life, and we need to keep it clean and available for everyone, and healthy watersheds = clean water!



Questions

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