

Groundwater and Lakes Monitoring Options



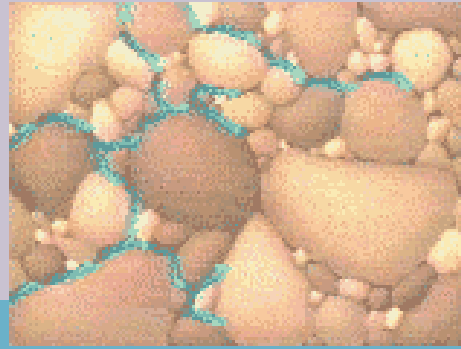
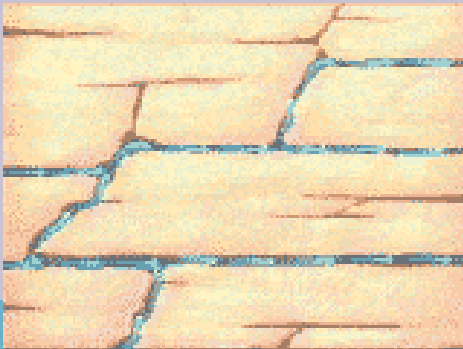
Wisconsin Lakes Conference April 2010
N. Turyk
Water Resource Scientist



Groundwater Monitoring

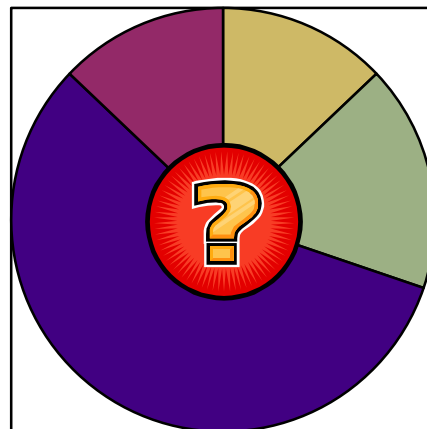
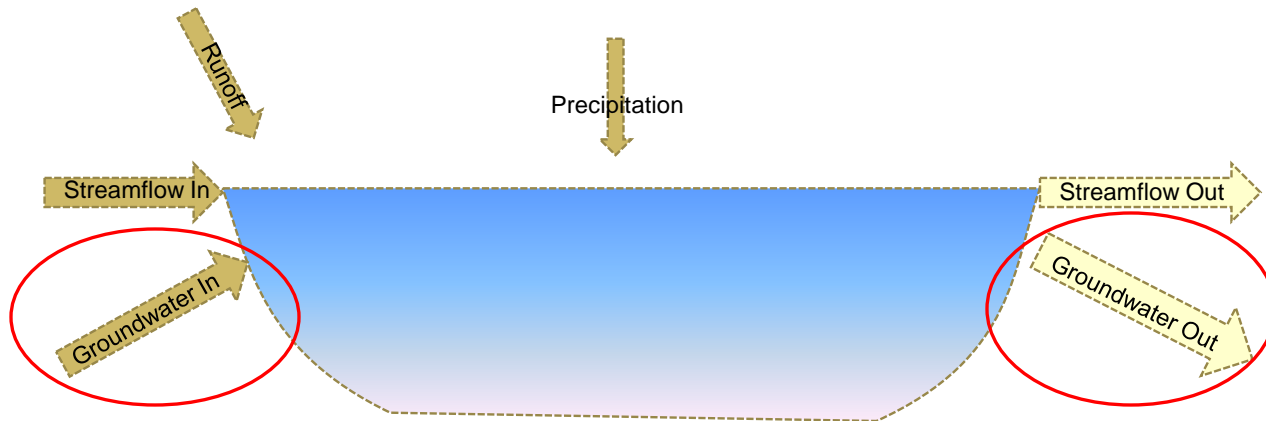


- How much/what proportion of groundwater is entering a lake?
- Where groundwater is entering a lake?
- What is the water quality of groundwater entering a lake?
- What are the options for sampling groundwater that is entering a lake?



Water Budget for a Lake

The amount of groundwater entering each lake is different!

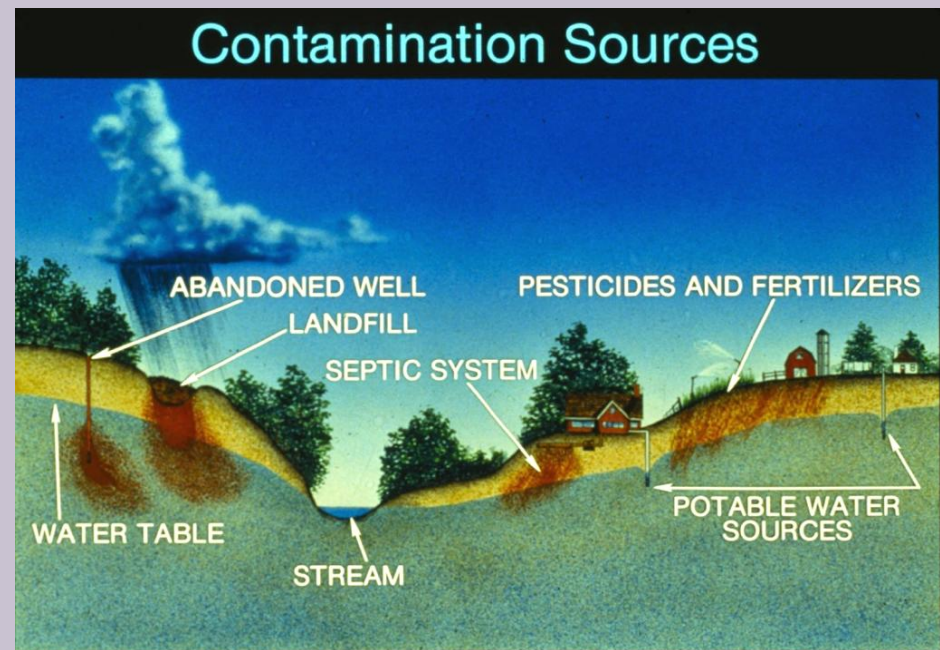


- Groundwater
- Runoff
- Tributary Inflow
- Precipitation

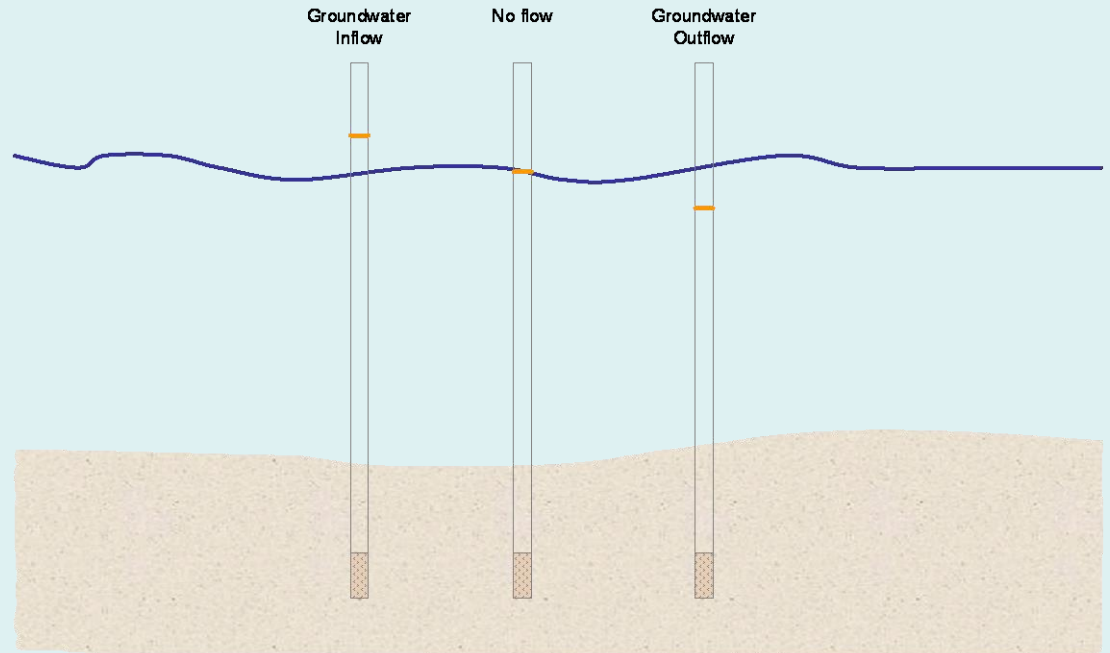
Options for Measuring Groundwater Volume and Water Quality

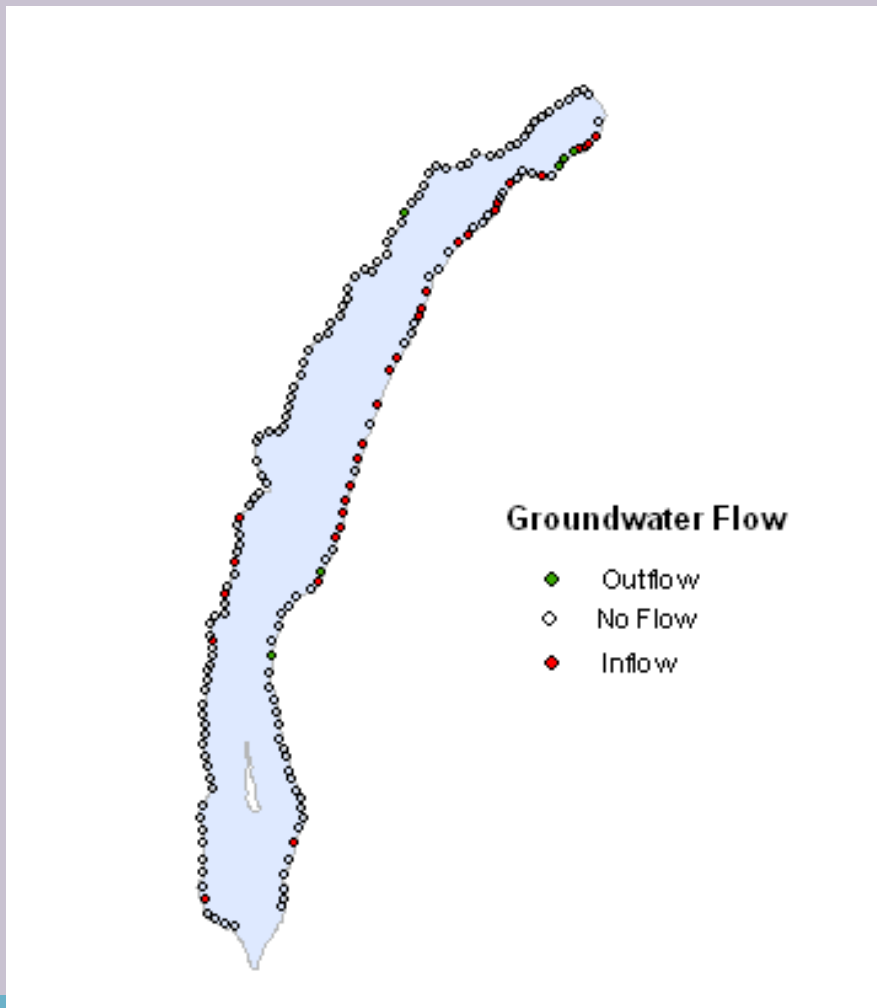


- Wading in the shallows
- Observations – open water in winter
- Mini wells
- Seepage meters
- Private wells

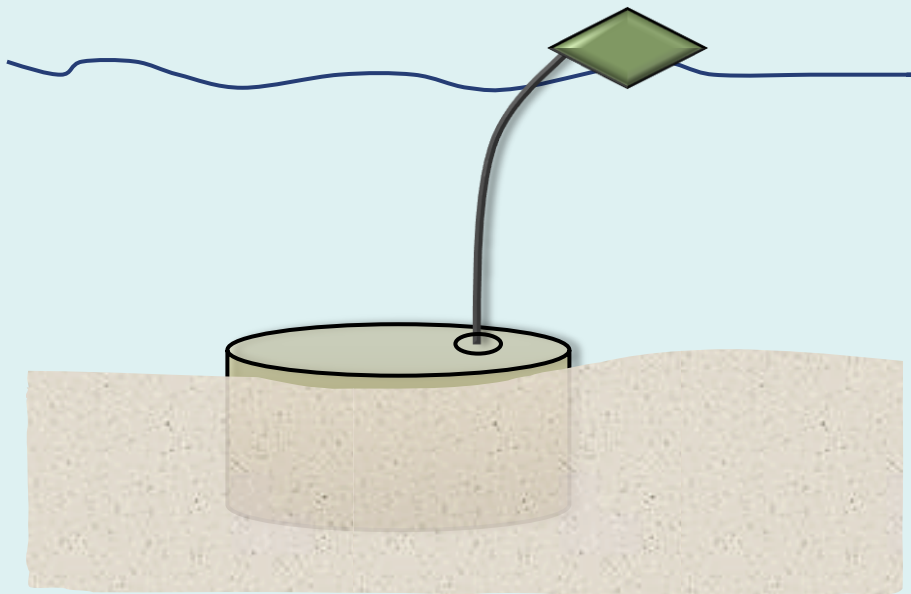


Mini Piezometers (wells)





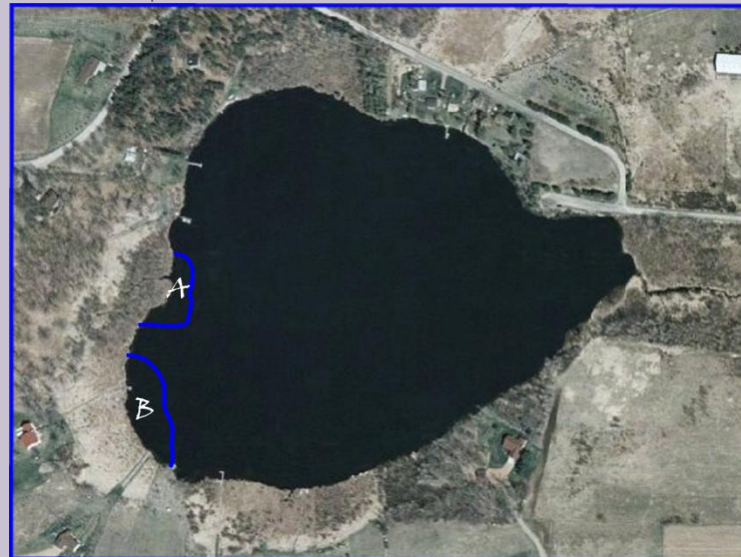
Seepage Meters



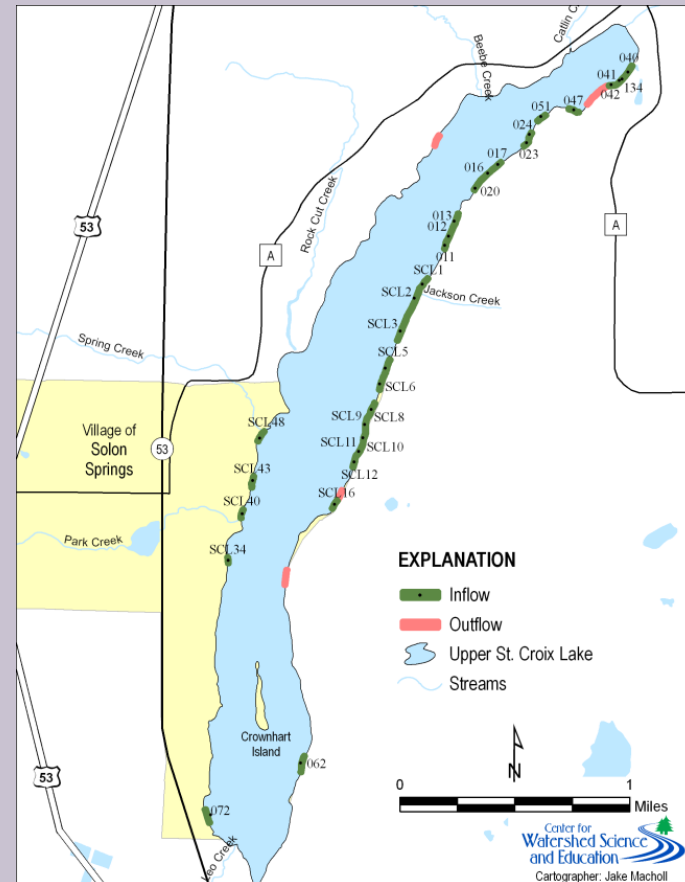
Open Ice Observations



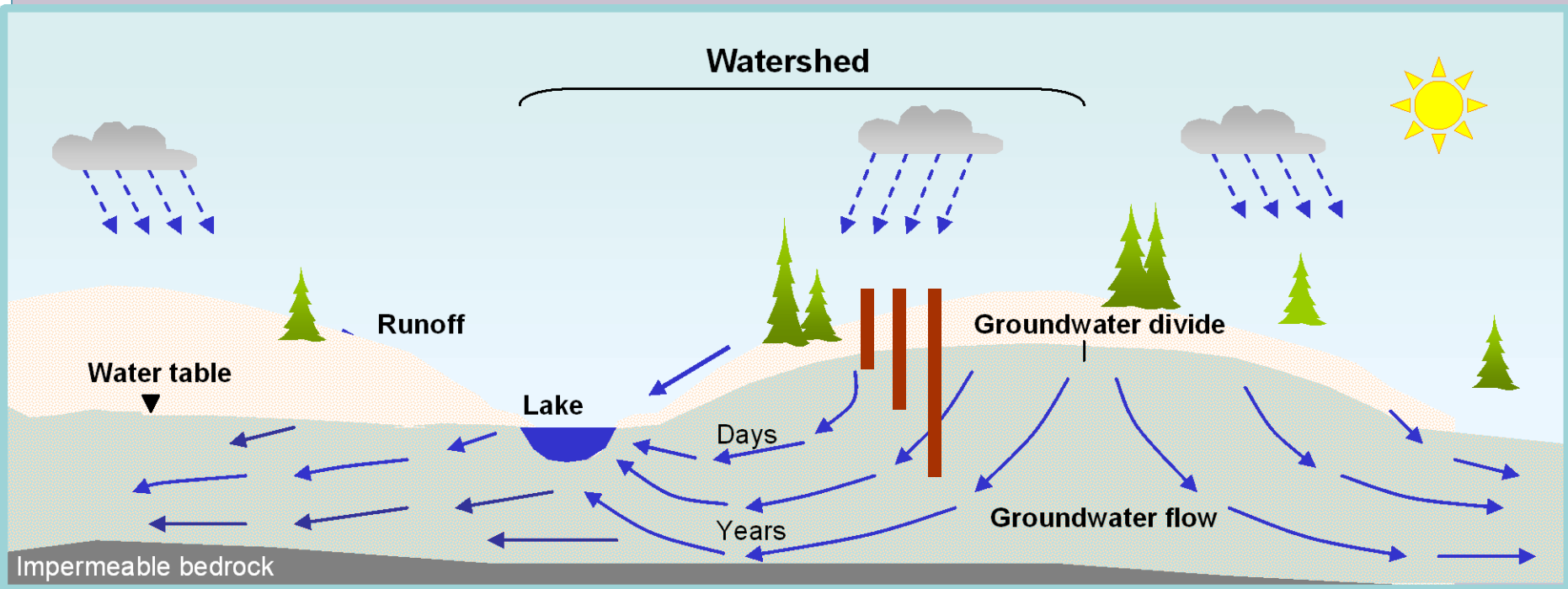
- Early in the day or on a cloudy day
 - 30°F to 45°F
 - not below zero the night before
- Estimate the distance from shore to where the ice begins
- Talk with ice fishers and residents to determine if there are other areas that are frequently open



Open Ice and Mini Piezometers



Private Well Samples

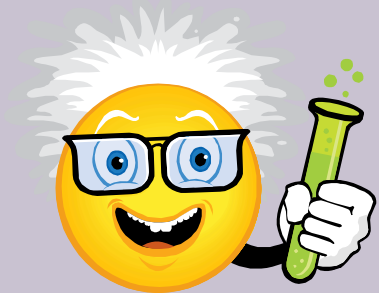


Water Quality -

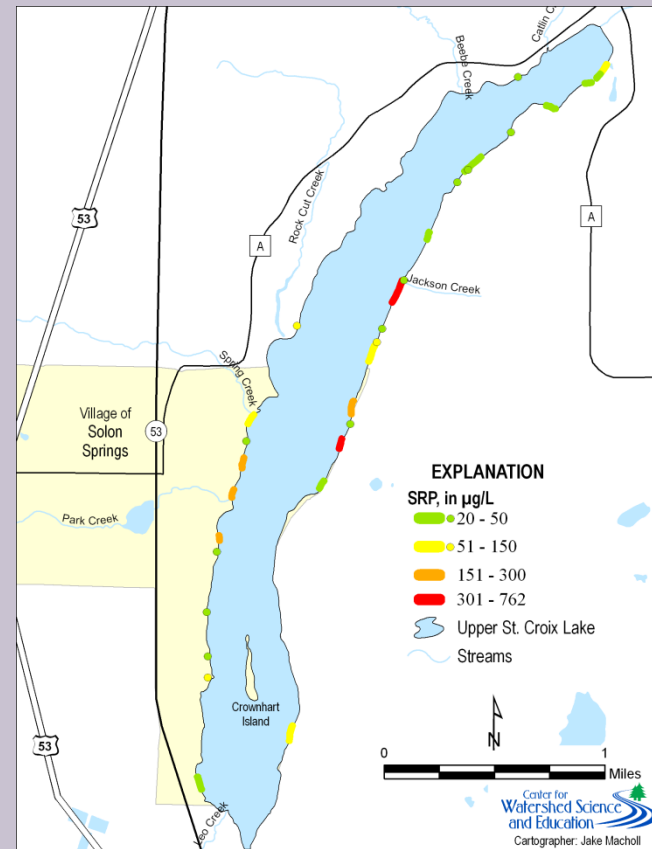
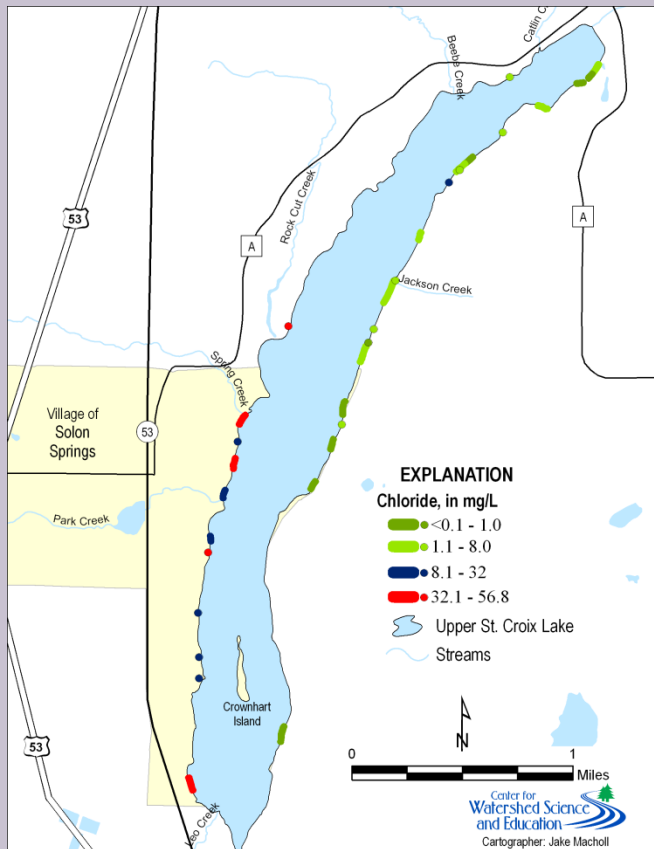
Analyses and measurements depend upon the question you are trying to answer!

Some Common Measurements

- Temperature
- pH
- Specific conductance
- Nutrients (laboratory)
- Pesticides (laboratory)
- Chloride (laboratory)



A Few Water Quality Results





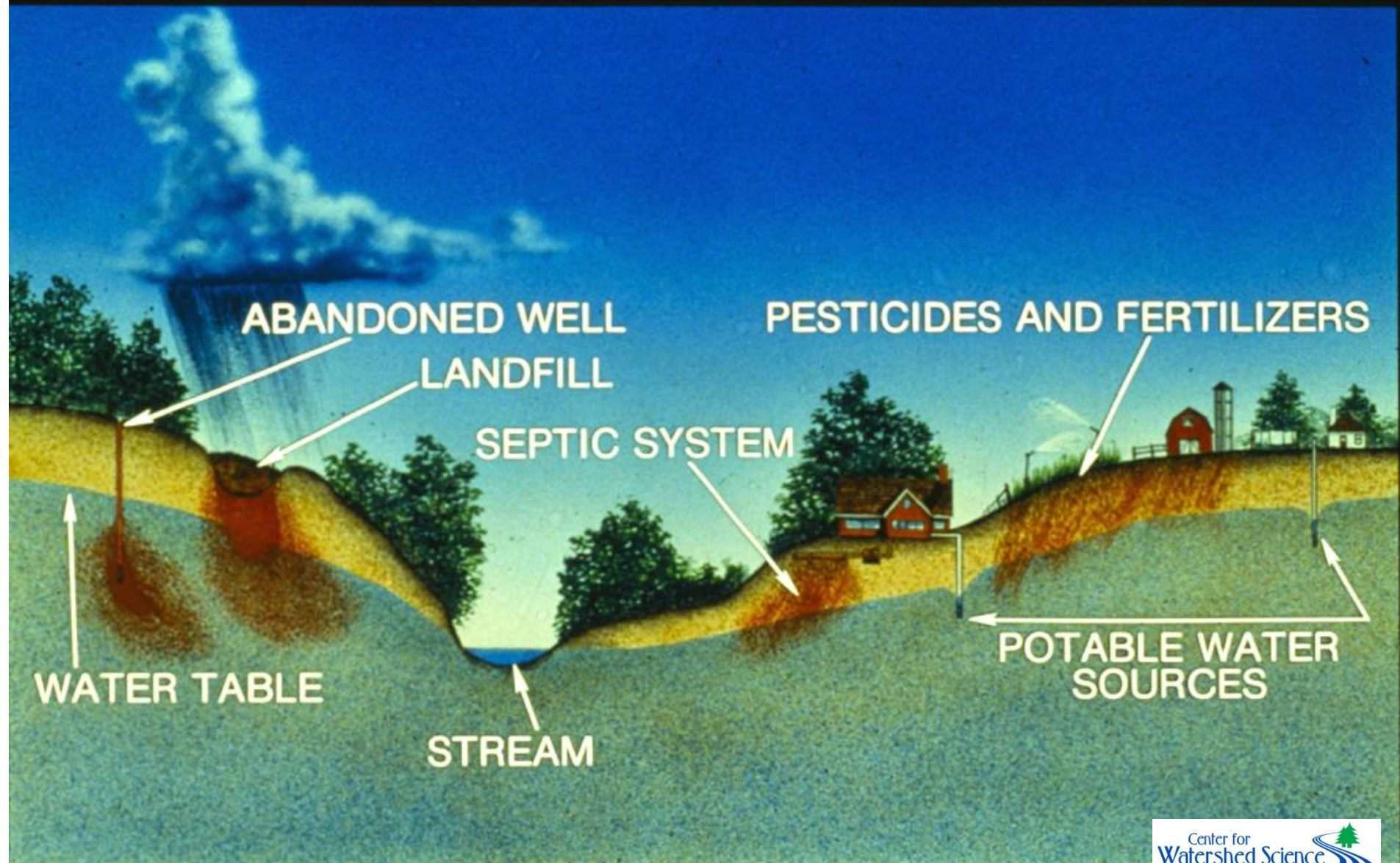
**Landuse affects amount
of nutrients &
contaminants in soil**

Groundwater and Landuse

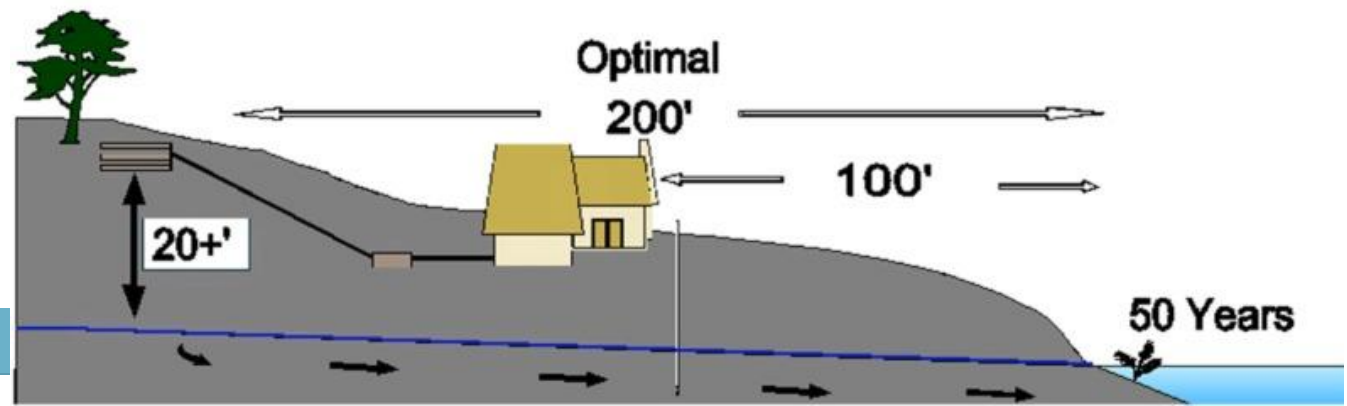
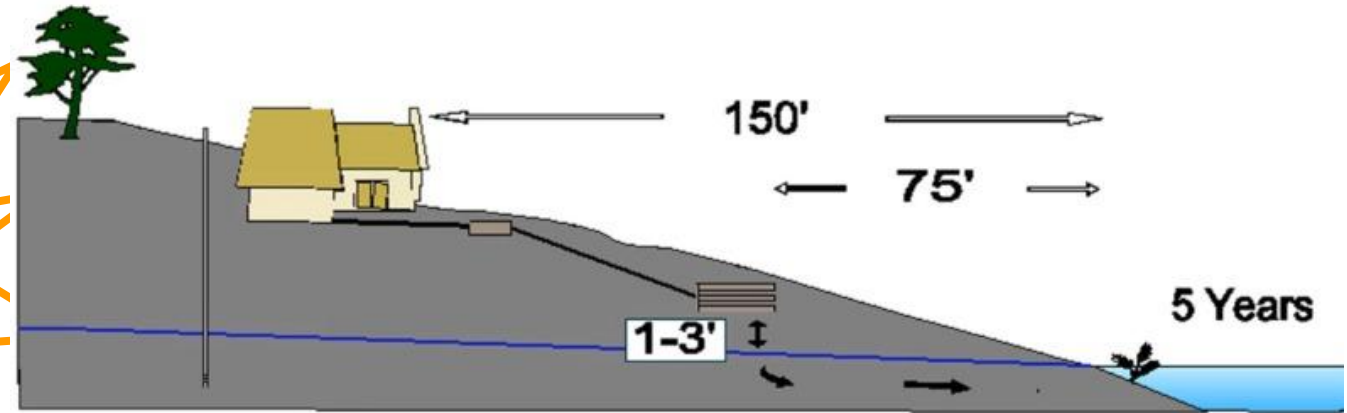
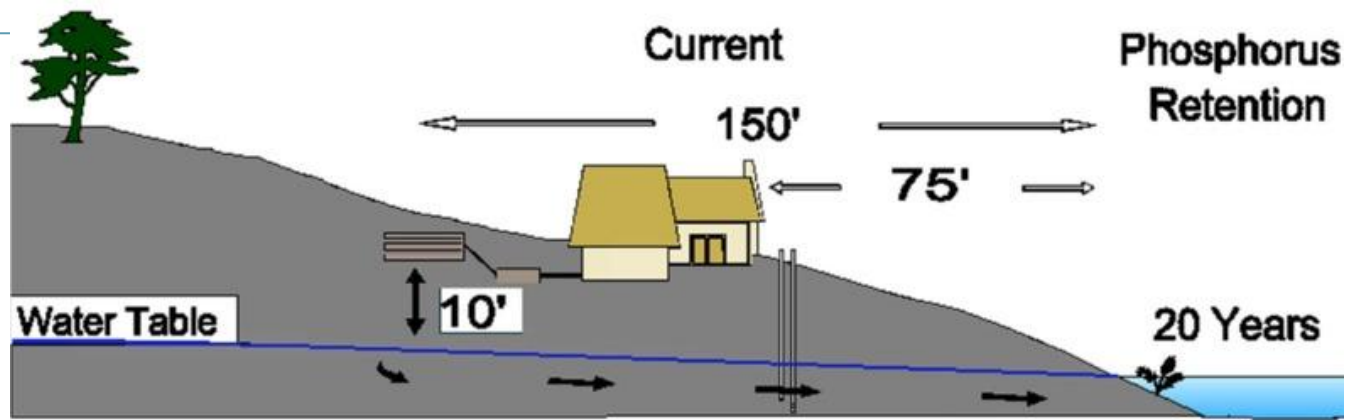
**Rain soaks through soil,
dissolves nutrients,
& becomes groundwater**

**Groundwater that flows
to lake carries minerals,
nutrients, & contaminants**

Contamination Sources



Septic systems and water quality



Standard septic systems are designed to remove pathogens NOT nutrients.

