Watersheds 101

What is a Watershed?
- Land area that drains into a common water body
- Surface water
- Ground water
- Soils
- Vegetation
- Wildlife and Livestock

Cedar Creek Watershed

Watershed Functions
- Hydrological
  - Water Capture
  - Water Storage
  - Water Release
- Ecological
  - Providing diverse sites for biogeochemical reactions to take place
  - Providing habitat for plants and animals of various kinds

Hydrology: The Water Cycle
Human Impacts on the Hydrologic Cycle

Cedar Creek Reservoir Segmentation

The Phosphorus Cycle

Eutrophication

- Increase in chemical nutrients - typically compounds containing nitrogen or phosphorus in an ecosystem
- Promotes excessive plant growth and decay and is likely to cause severe reductions in water quality

Water Quality Standards

- Used by TCEQ regulatory programs to establish reasonable limits on permitted dischargers
- Numeric Standards - Segment specific numbers
- Narrative Standards - Descriptive standards to protect aesthetics and designated uses - Screening limits - non-segment specific numeric standard for nutrients

Water Quality Parameters

Chemical
- Dissolved Oxygen (DO)
- Electrical Conductivity
- pH
- Fecal Coliform
- Nitrogen
- Total Phosphorus
Water Quality Parameters

Physical
- Temperature
- Turbidity
- Total Suspended Solids
- Stream Flow (Discharge)

Pollutant
Any substance that, when present in a hydrologic system at sufficient concentration, degrades water quality in ways that are or could become harmful to human and/or ecological health or that impair the use of water for recreation, agriculture, industry, commerce, or domestic purposes.

Pollutants: Types and Impacts

Point Source Pollution
Pollution resulting from collection and discharge at a defined point
- Waste Water Treatment Plant Discharges
- Industrial Waste Discharge
- Confined Animal Feeding Operations

Nonpoint Source Pollution
Pollutant sources that are spread over a landscape
- Fertilizers, herbicides, and insecticides
- Oil, grease, and toxic chemicals
- Sediment
- Salt (irrigation)
- Acid (abandoned mines)
- Bacteria (livestock/ pet waste, septic systems)
- Atmospheric deposition
- Hydromodification (channel modification and dams)

Texas Surface Water Quality Standards
Each body of water is managed for one or more uses
- Contact/Noncontact Recreation
- Domestic Water Supply
- Industrial Water Supply
- Fish Consumption
- Aquatic life
- Navigation
- Livestock Watering and Wildlife
- Irrigation
Management Tools

- Education & Outreach
- Best Management Practices
- Permitting (NPDES)
- Regulations (TCEQ and EPA)