



Key Topics & Learning Objectives

Water Resource Management: Local Control and Local Solutions

Key Topics:

1. Understanding how groundwater and surface water systems function.
2. Understanding the importance of water quality and quantity as a foundation in a healthy ecosystem
3. Understanding a variety of water quality indicators in different landscapes.
4. Understanding a variety of water quantity indicators in different landscapes
5. Understanding how sustainable and best management practices enhance and protect water quality and quantity for humans and wildlife.
6. Understanding the differences of local, regional, and national systems that manage natural resources and the importance of each in water resources.
7. Understanding the social, economic, political impacts of natural resources management and decision making.

Key Topic #1: Understanding how groundwater and surface water systems function.

Objective 1. Knowledge of hydrologic cycle

Objective 2. Knowledge of groundwater and surface water interactions

Objective 3. How human activities effect groundwater and surface water

Resources: Please note the page numbers for # 1

1. Groundwater and Surface Water: A Single Resource. USGS Circular 1139 - pages 2-76
2. Encyclopedia of the Great Plains (2 pages)

Key Topic #2: Understanding the importance of water quality and quantity as a foundation in a healthy ecosystem.

Objective 1. Understanding the connection between groundwater and surface water and how they affect each other.

Resources: Please note the page numbers for # 1

1. Groundwater and Surface Water: A Single Resource. USGS Circular 1139 - pages 9-53
2. Water Matters (4 pages)

Key Topic #3: Understanding a variety of water quality indicators in different landscapes

Objective 1. Knowledge of water quality impacts such as agriculture practices, urban development, nitrates, toxic algae, etc.

Objective 2. Understand the indicators of water health, including physical, chemical and biological properties and its role in the hydrological system.

Resources: Please note the page numbers for # 9

1. Conservation Implications of Climate Change: Soil Erosion and Runoff from Cropland (4 pages)
2. The nitrate contamination concern (6 pages)
3. Soil Characteristics that influence nitrogen and water management (6 pages)
4. NET News: Nitrates a costly, persistent problem for small towns (2 pages)
5. Drinking Water: Nitrate-Nitrogen (4 pages)
6. Fact Sheet: Precautions and Facts Regarding Harmful Algal Blooms (2 pages)
7. Here's how Midwest Farmers are fighting agricultural water pollution (4 pages)
8. University of Nebraska Lincoln Urban Nonpoint Source Pollution (2 pages)
9. Groundwater and Surface Water: A Single Resource. USGS Circular 1139 - pages 61-66 and 77

Key Topic #4: Understanding a variety of water quantity indicators in different landscapes

Objective 1. Knowledge of water quantity impacts such as agriculture practices, urban development, groundwater levels

Objective 2. Understanding of stream gauges and groundwater maps.

Resources: Please note the page numbers for # 4

1. Impacts of urbanization on hydrological and water dynamics, and urban water management. (18 pages)
2. Protecting Water Quality from Urban Runoff (2 pages)
3. Water Administration, Streamgaging (1 page)
4. Groundwater and Surface Water: A Single Resource. USGS Circular 1139 - pages VI, 9-21, 33-60, 67-71 & 76
5. EPA Water Monitoring & Assessment, Stream Flow (2 pages)

Key Topic #5: Understanding how sustainable and best management practices enhance and protect water quality and quantity for humans and wildlife

Objective 1. Understand the importance of moving toward sustainable practices to protect water quality and quantity.

Objective 2. Understand best management practices that improve water quality and quantity such as improved agriculture practices, urban planning and water efficiency.

Objective 3. Understand the role of technology: flow meters, observation wells, Airborne Electromagnetic (AEM) surveys, Unmanned Aerial Vehicles (UAV) (drones, GIS, etc.), precision agriculture, etc.

Resources:

1. North Platte Natural Resource District Flow Meters (2 pages)
2. Use of Five Nitrogen Source and Placement Systems for Improved Nitrogen Management of Irrigated Corn (3 pages)
3. NebGuide: Planning Your Riparian Buffer: Design and Plant Selection (4 pages)
4. NebGuide: Landscape Plants for Wildlife (4 pages)
5. Overview of NWQI EQIP Programs (1 page)

Key Topic #6: Understanding the differences of local, regional, and national systems that manage natural resources and the importance of each in water resources

Objective 1. Knowledge of various conservation agencies including Nebraska's Natural Resources Districts, and how partners work together for conservation success.

Objective 2. Understanding Nebraska's Natural Resources Districts structure and what makes it unique from other conservation districts in the U.S.

Resources:

1. Water Management in Nebraska (3 pages)
2. NACD: About Districts (2 pages)
3. Nebraska's Unique NRD system key to addressing groundwater quality (2 pages)

Key Topic #7: Understanding the social, economic, political impacts of natural resources management and decision making.

Objective 1. Describe the social, economic and political impacts of regulating water quality and quantity.

Objective 2. Understand the delicate balance behind decision making – funding projects, social responsibility, regulatory authority.

Resources:

1. Groundwater Fundamentals (3 pages)
2. Understanding social and economic influences on natural resource management (5 pages)