

**NC Essential Standards  
Earth/Environmental Science  
Watershed Ties to Curriculum**

	<b>Essential Standard</b>	<b>Clarifying Objectives</b>	
<b>High School</b> <b>EEn.2.2</b> <b>YES!</b>	Understand how human influences impact the lithosphere. <b>Waterways reflect the way we treat the land or lithosphere</b>	EEn. 2.2.1	Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present.
<b>EEn.2.4</b> <b>YES!</b>	Evaluate how humans use water.	EEn. 2.4.1	Evaluate human influences on freshwater availability
		EEn. 2.4.2	Evaluate human influences on water quality in North Carolina’s river basins, wetlands and tidal environments.
<b>EEn.2.8</b> <b>YES!</b>	Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth. <b>More people consume and impact natural resources within their watershed.</b>	EEn. 2.8.3	Explain the effects of uncontrolled population growth on the Earth’s resources.
<b>8<sup>th</sup> grade</b> 8.P.2	Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.	8.P.2.2	Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation. <b>(OK if teaching about dams in a watershed for hydropower)</b>
<b>8.E.1</b> <b>YES!</b>	Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.	8.E.1.1	Explain the structure of the hydrosphere including: • Water distribution on earth • Local river basins and water availability
<b>YES, if!</b>	<b>Only if we are teaching about the largest watershed—the ocean—and are discussing the impact of NPS on the marine ecosystem. The cleaner we keep inland waterways, the cleaner &amp; more resilient we can keep the ocean!</b>	8.E.1.2	Summarize evidence that Earth’s oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms: • Estuaries • Marine ecosystems • Upwelling • Behavior of gases in the marine environment • Value and sustainability of marine resources • Deep ocean technology and understandings gained
<b>YES, if!</b>	<b>Only if water quality monitoring is taught to hit home the watershed concept.</b>	8.E.1.3	Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including: • Temperature • Dissolved oxygen • pH • Nitrates and phosphates • Turbidity • Bio-indicators

<b>YES!</b>		8.E.1.4	Conclude that the good health of humans requires: <ul style="list-style-type: none"> <li>• Monitoring of the hydrosphere</li> <li>• Water quality standards</li> <li>• Methods of water treatment</li> <li>• Maintaining safe water quality</li> <li>• Stewardship</li> </ul>
8.L.3	Understand how organisms interact with and respond to the biotic and abiotic components of their environment.	8.L.3.1	Explain how factors such as food, water, shelter and space affect populations in an ecosystem
		8.L.3.3	Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide and oxygen).
<b>7<sup>th</sup> grade</b> <b>7.E.1</b> <b>YES, if!</b>	Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth’s atmosphere, weather and climate and the effects of the atmosphere on humans.	7.E.1.6	Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship. <b>OK if teaching about “air deposition” and how air quality impacts water quality. What goes up, must come down. A good connection to make!</b>
<b>6<sup>th</sup> grade</b> <b>6.E.2</b> <b>YES!</b>	Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans.	6.E.2.4	Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship. <b>This is where we can teach about the importance of preventing soil erosion and sedimentation which significantly impacts our watersheds. Sediment is #1 NPS pollutant by volume.</b>
<b>YES, if!</b>	<b>Water pollutants can change ecosystems within a watershed that impacts populations (plants, animals &amp; humans.)</b>	6.L.2	Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.
<b>YES!</b>	<b>Water quality and soil quality in a watershed affects all organisms and their ability to survive.</b>	6.L.2.3	Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.
<b>5<sup>th</sup> grade</b> <b>5.L.2</b> <b>YES!</b>	Understand the interdependence of plants and animals with their ecosystem. <b>A watershed may include several different ecosystems.</b>	5.L.2.1	Compare the characteristics of several common ecosystems, including estuaries and salt marshes, oceans, lakes and ponds, forests, and grasslands. <b><u>See 5<sup>th</sup> Grade Social Studies:</u></b>

	<b>The health of the watershed may determine the health of the ecosystems contained within it.</b>		<b>5.G.1.2</b> <b>Explain the positive and negative effects of human activity on the physical environment of the U.S., past and present.</b>
<b>YES!</b>	<b>The health of the abiotic components (soil &amp; water &amp; air) within a watershed impact the health of the biotic organisms (plants &amp; animals &amp; people) that live in that watershed.</b>	5.L.2.3	Infer the effects that may result from the interconnected relationship of plants and animals to their ecosystem.
<b>4<sup>th</sup> grade</b> <b>4.L.1</b> <b>YES!</b>	Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.	4.L.1.1	Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.
<b>YES!</b>	<b>Only if teaching the negative impacts of NPS pollution in a watershed on various species and how they adapt their behavior. Ex: A fish can move upstream to cleaner water, but a mussel is sessile and cannot.</b>	4.L.1.2	Explain how animals meet their needs by using behaviors in response to information received from the environment.
<b>YES!</b>		4.L.1.3	Explain how humans can adapt their behavior to live in changing habitats (e.g., recycling wastes, establishing rain gardens, planting trees and shrubs to prevent flooding and erosion).
<b>?</b>	<b>How one deer survives and the others in the herd do not? Getting into genetics? Ask a 4<sup>th</sup> grade teacher!</b>	4.L.1.4	Explain how differences among animals of the same population sometimes give individuals an advantage in surviving and reproducing in changing habitats. <b>May be a stretch</b>
<b>3<sup>rd</sup> grade</b> <b>3.E.2</b> <b>YES!</b>	Compare the structures of the Earth's surface using models or three-dimensional diagrams.	3.E.2.1	Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).
<b>YES!</b>		3.E.2.2	Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.
<b>3.L.2</b> <b>YES, if!</b>	Understand how plants survive in their environments. <b>OK if you teach that healthy soil with good structure acts as a sponge, absorbing water which is good for plants and reduces stormwater runoff in the watershed!</b>	3.L.2.4	Explain how the basic properties (texture and capacity to hold water) and components (sand, clay and humus) of soil determine the ability of soil to support the growth and survival of many plants. <b>Living roots hold soil in place, preventing erosion &amp; sedimentation in streams. Good for the watershed!</b>

<b>2<sup>nd</sup> grade</b> None			
<b>1<sup>st</sup> grade</b> <b>1.E.2</b> <b>YES, if!</b>	Understand the physical properties of Earth materials that make them useful in different ways.	1.E.2.1	Summarize the physical properties of Earth materials, including rocks, minerals, soils and water that make them useful in different ways.
<b>YES, if!</b>	<b>OK if you teach that healthy soil with good structure acts as a sponge, absorbing water which is good for plants and reduces stormwater runoff in the watershed!</b>	1.E.2.2	Compare the properties of soil samples from different places relating their capacity to retain water, nourish and support the growth of certain plants. <b>Living roots hold soil in place, preventing erosion &amp; sedimentation in streams. Good for the watershed!</b>
1.L.1 <b>YES, if!</b>	Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive. <b>OK if you teach that healthy soil with good structure acts as a sponge, absorbing water which is good for plants and reduces stormwater runoff in the watershed!</b>	1.L.1.1	Recognize that plants and animals need air, water, light (plants only), space, food and shelter and that these may be found in their environment. <b>Living roots hold soil in place, preventing erosion &amp; sedimentation in streams. Good for the watershed!</b>
<b>YES, if!</b>	<b>Give local watershed examples!</b>	1.L.1.2	Give examples of how the needs of different plants and animals can be met by their environments in North Carolina or different places throughout the world.
<b>YES!</b>	<b>We can cover bare soil with mulch so it doesn't erode into streams. We can plant native plants so their living roots will hold soil in place and feed the important soil microbes we can't see but need to live!</b>	1.L.1.3	Summarize ways that humans protect their environment and/or improve conditions for the growth of the plants and animals that live there (e.g., reuse or recycle products to avoid littering).
<b>Kindergarten</b> None			