



## Hydrosphere Learning Progression

### Grades K-2: GLOBE Protocols Aligned with NASA and NGSS



**NGSS Disciplinary Core Ideas Learning Progression:** Wind and water change the shape of the land. Water is found in many types of places and in different forms on Earth. Living things need water, air and resources from the land, and they live in places that have the things they need. Through a series of learning activities, GLOBE protocols and NASA classroom resources, teachers can bring authentic science data collection into their classrooms. In the Elementary GLOBE story books the characters demonstrate the process of science as they make observations and record data in their science journals.

<p><b>NGSS Performance Expectations:</b>                  2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land                  2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area                  2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid</p>		
<p><b>GLOBE Application: Environmental observations, data collection and learning activities to develop Earth science concepts.</b></p>		
<p><b>NGSS Science Practices:</b></p> <ul style="list-style-type: none"> <li>• <b>Developing and Using Models:</b> Develop a model to represent patterns in the natural world</li> <li>• <b>Constructing Explanations and Designing Solutions:</b> Compare multiple solutions to a problem.</li> <li>• <b>Obtaining, Evaluating and Communicating:</b> Obtain information using various texts, text features, and other media that will be useful in answering a scientific question.</li> </ul>	<p><b>NGSS Disciplinary Core Idea:</b></p> <ul style="list-style-type: none"> <li>• <b>ESS2.A: Earth Materials and Systems</b> Wind and water can change the shape of the land.</li> <li>• <b>ESS2.B: Plate Tectonics and Large-Scale System Interactions</b> Maps show where things are located. One can map the shapes and kinds of land and water in any area.</li> <li>• <b>ESS2.C: The Roles of Water in Earth's Surface Processes</b> Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.</li> </ul>	<p><b>NGSS Crosscutting Concepts:</b></p> <ul style="list-style-type: none"> <li>• <b>Stability and Change</b> Things may change slowly or rapidly.</li> <li>• <b>Patterns</b> Patterns in the natural world can be observed.</li> </ul>
<p><b>Hydrosphere Protocols</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Water Temperature</a></li> </ul> <p><b>Atmosphere Protocols</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Clouds</a></li> <li>• <a href="#">Precipitation</a></li> </ul> <p><b>GLOBE Site Definition:</b> Students identify the characteristics associated with their local body of water and make observations of how their site changes throughout the year. The Elementary GLOBE storybook Discoveries at Willow Creek can be used to facilitate this investigation.</p>	<p><b>GLOBE Learning Activities:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Seashores on the Move</a>: In this activity, students review the cause of sea level rise, build a model of a coastal community, make predictions about what features will be at risk of flooding as sea level rises, test their predictions by raising the sea level in their model, and plan for changes that will help keep their community from flooding. (2-ESS2-2, 2-ESS2-3)</li> </ul> <p><b>Elementary GLOBE Books:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">What in the World is Happening With Our Climate</a> (eBook option available) (2-ESS2-1, 2-ESS2-3)</li> <li>• <a href="#">Discoveries at Willow Creek</a> (Students make observations of Willow Creek at different times of the year to see how it changes.) (2-ESS2-2)</li> </ul>	<p><b>Guiding Questions:</b></p> <ol style="list-style-type: none"> <li>1. How does water change the shape of land areas? What kinds of things can we do to prevent water from changing the shape of land areas?</li> <li>2. What are the different types of water areas found where you live?</li> <li>3. How do changes in the amount of sea ice change the shape of coastlines? What impact will this have on humans that live in those areas?</li> </ol>
<p><b>NASA Resources: Data and lessons drawn from NASA's Earth science research program</b></p>		
<p><b>Extension Learning Activities/Resources:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">NASA Climate Change Educational Modules</a>:</li> <li>• <a href="#">NASA Wavelength K-2 List of Learning Resources</a> <a href="http://nasawavelength.org/list/2034">http://nasawavelength.org/list/2034</a></li> </ul>	<p><b>My NASA Data Visualization Tool:</b> <a href="#">Earth System Data Explorer</a></p> <p><b>Variable Suggestions:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Cryosphere: Monthly Snow and Ice Amount (ISCCP)</a></li> <li>• <a href="#">Clouds: Monthly Cloud Coverage (CERES)</a></li> <li>• <a href="#">Precipitation: Monthly Precipitation (GPCP)</a></li> <li>• <a href="#">Daily Sea Surface Temperature (GHRST)</a></li> </ul>	<p><b>NASA Learning Activities:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Identifying Landforms and Bodies of Water on a Map</a></li> <li>• <a href="#">Water bodies, where are they?</a></li> <li>• <a href="#">Ocean World: Earth GLOBE Toss Game</a></li> <li>• <a href="#">What's Causing Sea-Level Rise? Land-Ice vs Sea-Ice</a></li> </ul>



