

**NERRS Estuaries 101 Middle School Curriculum**  
**Activity 3: Water Going Up, Water Going Down**  
**Next Generation Science Standards (NGSS) Alignment**

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Developing and Using Models</b>            Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.</p> <ul style="list-style-type: none"> <li>• Develop and/or use a model to predict and/or describe phenomena. [Exercise 3]</li> <li>• Develop and/or use a model to generate data to test ideas about phenomena in natural or designed systems, including those representing inputs and outputs, and those at unobservable scales. [Exercise 3]</li> </ul> <p><b>Analyzing and Interpreting Data</b>            Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. [Exercise 1, 2]</p> <ul style="list-style-type: none"> <li>• Construct, analyze, and/or interpret graphical displays of data and/or large data sets to identify linear and nonlinear relationships. [Exercise 2]</li> <li>• Use graphical displays (e.g., maps, charts, graphs, and/or tables) of large data sets to identify temporal and spatial relationships. [Exercise 2]</li> <li>• Distinguish between causal and correlational relationships in data. [Exercise 2]</li> <li>• Analyze and interpret data to provide evidence for phenomena. [Exercise 2]</li> </ul>	<p><b>ESS2.C: The Roles of Water in Earth’s Surface Processes</b></p> <ul style="list-style-type: none"> <li>• Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4) [Exercise 1]</li> <li>• Water’s movements—both on the land and underground—cause weathering and erosion, which change the land’s surface features and create underground formations. (MS-ESS2-2) [Exercise 2]</li> </ul> <p><b>ETS2.A: Interdependence of Science, Engineering, and Technology</b>            By the end of grade 8. Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. In order to design better technologies, new science may need to be explored (e.g., materials research prompted by desire for better batteries or solar cells, biological questions raised by medical problems). Technologies in turn extend the measurement, exploration, modeling, and computational capacity of scientific investigations. [Exercise 2]  <i>Relating to data loggers, teachers would need to explain how the data loggers work.</i> [Exercise 2]</p>	<p><b>Cause and Effect: Mechanism and Explanation</b></p> <ul style="list-style-type: none"> <li>• Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. [Exercise 2]</li> <li>• Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS2-5) [Exercise 1,2]</li> <li>• Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. [Exercise 2]</li> </ul> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>• Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (MS-ESS2-1) [Exercise 1]</li> </ul>