



Shoreline Stabilization Challenge

SUBJECT AREA: Science - Earth Science, Environmental Science.

GRADE LEVEL: Sixth through eighth.

DURATION: 45 minutes to an hour; staff will need 30 minutes to set up demonstration.

AUDIENCE SIZE: 25 to 30 students.

OVERVIEW: In the lesson, students look at different ways to protect coastlines. Students first will hear from DEP environmental scientists regarding shoreline erosion and different armoring techniques. Students will then use a hands-on model to explore the role of different materials in protecting coastlines. As they progress, students learn how and why living shorelines are being used to protect coastlines throughout Florida.



Intertidal oysters and mangroves at GTM Research Reserve.

OBJECTIVES:

The student will:

- Model and compare ways in which coastlines can be protected.
- Solve quantitative problems (percent change calculations) to illustrate differences between various coastal erosion protection solutions.
- Understand why coastal erosion is an important conservation issue with significant engineering challenges.
- Know that engineering solutions to coastal erosion include use of natural systems as well as artificial structures.
- Comprehend that coastal erosion has negative effects on human property and wildlife habitat.
- Classify methods of coastal erosion protection as “hard” or “soft” engineering.

DISCUSSION:

Once students complete the shoreline stabilization challenge, the following discussion topics will take place:

- Hard versus soft armoring techniques.
- Estuary ecosystem services.
- Benefits of living shorelines as an armoring technique.



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SUNSHINE STATE STANDARDS:

SC.6.E.6.1 - Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion and deposition.

SC.6.E.6.2 - Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas and lakes, and relate these landforms as they apply to Florida.

SC.6.E.7.8 - Investigate how natural disasters have affected human life in Florida.

SC.6.E.7.8 - Describe ways human beings protect themselves from hazardous weather and sun exposure.

SC.6.N.1.4 - Discuss, compare and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.

SC.8.N.4.1 - Explain that science is one of the processes that can be used to inform decision making at the community, state, national and international levels.

ELA.K12.EE.1.1 - Cite evidence to explain and justify reasoning.

MA.K12.MTR.7.1 - Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts:

- Connect mathematical concepts to everyday experiences.
- Use models and methods to understand, represent and solve problems.
- Perform investigations to gather data or determine if a method is appropriate.
- Redesign models and methods to improve accuracy or efficiency.