

RISING WATERS

Pre-Visit Activity 4: Model Home Adaptations

“Surviving Storm Surge: Engineering Home Solutions”

Objective: Students create more resilient homes to minimize rising water impacts on coastal communities.

Introduction: The Outer Banks is a string of low-lying barrier islands that are susceptible to shoreline change, storm surge, flooding and new inlets opening during storm events. The narrow barrier island system can be dramatically impacted by storms, and communities in these areas must find engineered ways to live in areas where the waters will rise. In this activity you will explore how rising water impacts coastal communities through flooding and destruction. Engineer ways to adapt construction that currently exists in coastal areas to be more resilient during flooding events. Without moving homes to a new location, can you engineer ways for a home to better survive a flooding event?



Activity:

1. Consider what a waterfront home looks like. Do you notice any strategies used to protect these homes from rising waters?
2. On a piece of paper design a blueprint for a house that could be successful in an area susceptible to flooding during storm events.

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3. Build a 3-D model of a house with what you have available, include some adaptations to better survive storm events on the coast. The house can be designed to be located on the estuary or ocean side of a barrier island.
4. Bring your design to CSI when your class visits to test in our wave tank. Your home will be hit with storm surge, waves and wind.
5. Test and evaluate the success of your design.

Building your house models:

1. Out of materials found at your house build a basic home that fits in a 1ft X 1ft square.
 - a. Toothpicks, clay, plastic, legos, cardboard, tape, etc can all be used as materials.
 - b. Please do NOT use a lot of paint or other liquids that may leak into the testing tank.
 - c. Your basic home should be free standing.



Pictures of simple design to raise a home above the rising waters. Any materials can be used to build the home models.

2. These homes will be “tested” in a wave tank with both winds and wave variables changing to test the resiliency of the constructed homes.
3. Homes should be made to be placed in a wave tank and have storm surge rise and cover parts of the homes at times.

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4. Consider ways to minimize damage from the wind and waves.

Discussion Questions: Answer these questions after testing.

1. How did your house do in the initial wave test when the waves were smallest and the winds light?
2. When the waves and winds increased how did your housing model do?
3. Seeing the success of your model, what would you do to increase its ability to survive storm surge and high winds?
4. Based on your experience, what can be done to homes currently in flooding prone areas? What kind of adaptations can be used on existing homes?