Stream Table Experiment with Pontchartrain Conservancy

LOUISIANA STATE MUSEUM

Living with Hurricanes: Katrina and Beyond – Post-video Activity
Watch the video at: https://louisianastatemuseum.org/education/virtual-field-trip/hurricane-katrina

Activity type: Hands-on activity exploring erosion, deposition, and subsidence

Objective: By experimenting with a stream table, students will discover how waterflow causes erosion and deposition and how these processes affect communities.

Louisiana Student Standards: 6-MS-ESS3-4, 7-MS-LS2-5, 7-MS-LS2-4, 8-MS-ESS3-2, 8-MS-ESS3-3, HS-EVS1-1, HS-EVS1-2, HS-EVS1-3, HS-ESS2-2, HS-ESS3-3, HS-ESS3-6, HS-LS2-7

Introduction

Water shapes the landscape in many ways. The movement of water can cause **erosion**, which is the wearing away of earth surface materials such as rocks, sediment, and soils. It can cause **deposition**, which is the build-up or accumulation of these materials. Water can also cause land to sink or cave in, which is known as **subsidence**. These changes can occur slowly over time, or happen rapidly due to a major weather event or natural disaster.

The Mississippi River shaped the landscape of southeast Louisiana. Human-made interventions such as levees, canals, spillways, and outlets have further shaped the environment. Sometimes, these human-made interventions can speed up or slow down processes of erosion, deposition, and subsidence. This can result in major impacts on local communities. For example, levees interrupted the natural deposition process that creates wetlands and marsh at the mouth of the Mississippi River. Years of development and oil and gas drilling caused erosion of the wetlands. New Orleans and other Louisiana communities were vulnerable to flooding during Hurricane Katrina partly because the diminished wetlands could not block and absorb the storm surge. Learn how water movements shape the landscape and affect communities with a stream table.

Activity summary

Build a stream table.

Design a watershed area with a river and neighborhoods of houses.

Experiment with how waterflow affects the landscape and communities on the stream table.

Discuss how waterflow, elevation, levees, erosion, and deposition affect your landscape.

Follow the instructions from Pontchartrain Conservancy on the next page!

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DIY Stream Table Instructions

Materials:

- 1 plastic storage bin with lid (approximately 40” L x 18” W x 6” H)
- Coarse sand
- Small plastic houses
- 6 wooden blocks (approx. 4” L x 1.5” W x 1.5” H)
- 1 hand-held plastic squeegee
- 1 piece of wood (approx. 12” L x 4” W x 2” H)
- 1 bucket

Tools:

- Drill

Making the stream table:

1. Drill five holes along the bottom seam at one end of the plastic bin
2. Pour sand into the storage bin.

Activity: Stream table simulation

1. Place the stream table on a workspace and rise one end of it using a large piece of wood. Ensure that the side with drainage holes is hanging off the table over a bucket to catch the water that drains. Explain that the lower side of the table represents a large body of water (i.e. the Gulf of Mexico). Have students shape their watershed and include a major river using the tools provided.

2. Allow students to debate and decide where to place communities (small houses). Have students make predictions about where they will see erosion and deposition. Ask students to place their communities on the model without pushing them into the sand.

3. Run the simulation with water. You can use a hose with an option to limit the flow of the water, or you can use a pitcher or tow of water. Ensure that the water flows in the riverbed of the model’s major river. Ask students to point out where erosion is taking place. Where is the sediment being deposited? How are their communities doing? Why?

4. Allow students to build levees using the small pieces of wood to protect their communities. Limit the amount of wood to ensure that they must make tough choices for who will be

protected by the levees. Remind students that they cannot move the remaining houses in their communities and must place the levees where they think they will be of the most benefit. Ask students to make predictions about how this will change the outcomes. Will they still see erosion and deposition? Where?

5. Run the simulation again, but add a tributary that has formed due to flooding caused by increased snow melt at the headwaters, rain, etc. This should be in addition to the main river. You can pour this water from a small cup from one of the upper corners at the same time as the flow from the hose into the main riverbed. How are the levees performing? Where is there erosion? Is there deposition? Discuss the subsidence that is occurring as the sediment is not replenished due to the levees. Which parts of the community were vulnerable? Why?

Have fun with it! There are so many ways to utilize this tool!

Learn more!

Check out Pontchartrain Conservancy's Educator Essentials to learn more! You'll find curriculum collections and professional development resources. Create an account and start exploring at:

https://scienceforourcoast.org/PC-programs/education/educator-essentials/