

SETTLE DOWN

Ages 7-14

Learning Objectives

- Students will learn how mangrove wetland plants trap sediments, which prevents them from being deposited in streams, rivers, lakes, and the ocean.

Summary: Students will construct a model to show how wetland plants slow down flowing water and enable potentially harmful suspended sediments to settle.

Subject Area: Science

Time: 30-60 minutes

Background: When floodwaters are slowed by mangroves, the silt and other sediments they carry settle among the roots and stems of wetland plants. This helps to protect the ocean downstream from a build-up of sediment that could otherwise clog the gills of aquatic animals and bury their eggs. It also helps protect water supplies from pollutants and other impurities, because other wetland plants can take up and use nutrients and other chemicals that the silt may contain. If it weren't for wetlands, these impurities might eventually contaminate rivers, lakes, groundwater (including an island's freshwater lens), and other water supplies, some of which may be used as sources of drinking water.

Before the Lesson

- Ensure all necessary resources (or alternatives) are available.
- Prepare an area for the activity to take place that can get wet, water may spill out of containers during this activity.

Materials

- One 1-litre (2-quart) jar with a tight-fitting lid
- A variety of sediments, (small rocks, sand, sandy dirt, and clay)
- Clock or stopwatch
- Piece of artificial grass or piece of a fiber doormat
- Flat sheet of wood or plastic similar in size to the artificial grass or doormat
- Two shallow pans (sheet-cake pans work well)



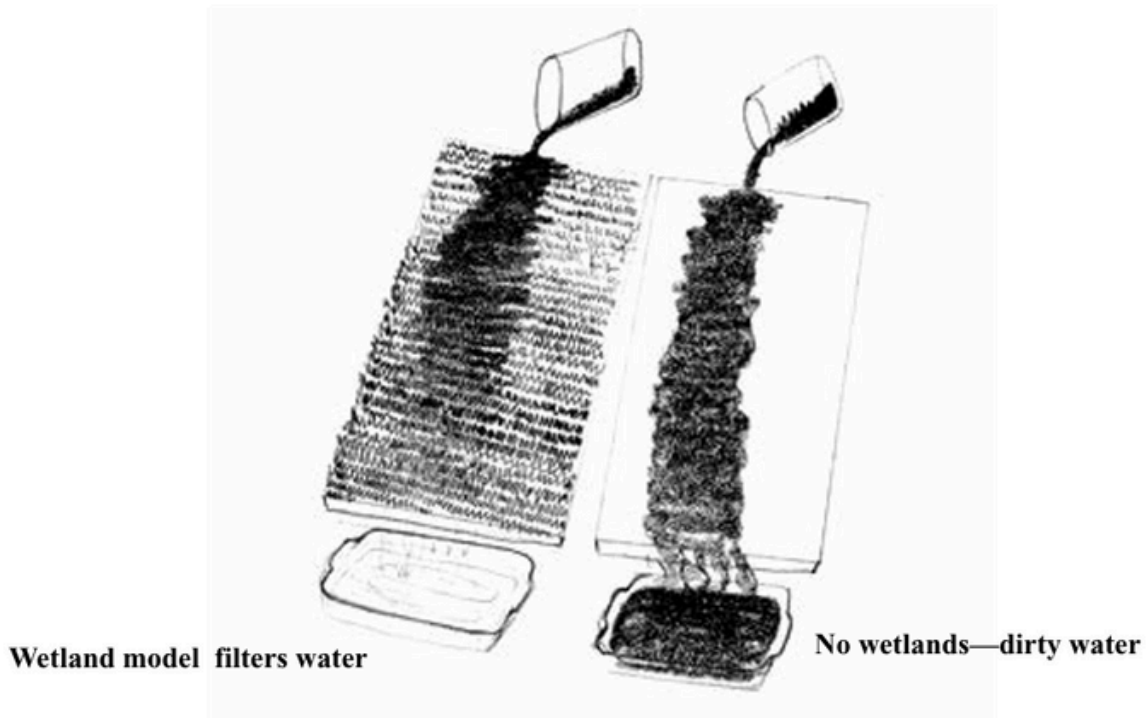
Activity - Wetland Models

Procedure

1. Explain that flowing water carries sediment of different sizes. The faster the water flow, the larger the sediment particles that can be transported in suspension. As the water is slowed, the larger particles settle out first. In still water, the finer sediments (clay and silt) will settle to the bottom.
2. Mix the different sediments (sand, dirt, etc.) together in the jar, filling it one-half to three-quarters full. Top off the jar with water, and put the lid on. Have a student shake the jar until the contents are thoroughly mixed, then set the jar on the table in front of the class. Begin timing.
3. As the sediments begin to settle, explain that muddy water loaded with sediments can be harmful to wildlife. Ask the students to think of reasons why. [For example, it clogs filter feeders like clams and oysters, smothers fish eggs, impairs plant and coral growth by blocking light, “blinds” sight-feeding animals, and clogs fishes’ gills so they cannot breathe.] Would more sediments settle to the bottom if the water were flowing quickly or slowly? [The slower the flow, the smaller the particles that will settle out.]
4. Check the sediment jar (it will take a while to settle). How long did it take to settle out completely? Did the sediments settle in layers—that is, by particle size?
5. Next, describe how wetlands can slow the flow of water in a system by simply “being in the way” of the water.
6. Set up the wetlands models (the doormat or artificial grass and the flat piece of wood) so they are both on a slight tilt. Explain that the doormat or artificial grass is a healthy wetland filled with plants, and that the piece of wood is a damaged wetland where the plants have all died or been removed. In both wetlands, water enters through a stream, flows through the wetland, and eventually ends up in a lake or the ocean.



7. Place the pan at the low end of each “wetland” and pour water simultaneously onto the high end of each.



Discussion/Reflection

- Have students answer the following questions
 - Which model does the water flow through faster?
 - In which model do more sediments settle out?
 - Which “wetland” would have cleaner water flowing from it?
 - How would channeling (dredging a ditch through) a wetland affect water quality downstream, where the wetland meets the sea? How would this affect people?

References

- Mangrove Action Project, Marvellous Mangroves - A Wetlands Education Resource Book for the West Indies