The Role of a Wetland: Sponge and Filter

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Introduction

A wetland serves as a filter and a sponge. It absorbs extra rainwater preventing flooding. In areas where wetlands have been replaced by buildings and streets, there is often flooding during rainstorms.

A wetland filters the sediment as the water runs off from the rain, rivers, and storm drains into the ocean. It also contains bacteria that can clean some of the toxins out of the water. Unfortunately, with more than 91% of the wetlands gone in California, the amount of pollution that enters the remaining wetland areas from storm drain runoff far exceeds their ability to clean.

Wetlands, like this coastal salt marsh, help prevent flooding during the rainy season by absorbing and holding excess water.

Goal

To develop a greater understanding of the absorption and filtration abilities of a wetland.

Materials

- plastic drink bottle with bottom cut off
- piece of window screen material to fit over top
- gravel
- sand
- water with sediment stirred into it
- a sponge
- clean water
- blue or red food coloring
- a dish
- a stalk of celery with leaves attached
- a small jar

Methods

1. Discuss how a wetland serves as a sponge. To demonstrate, put sponge on dish and pour water on sponge. Notice how sponge absorbs water.
2. Talk about pollution that washes off streets and into the water cycle. Squeeze a few drops of food coloring onto the sponge. Continue pouring water over the sponge, showing how sometimes, with enough water, wetlands become saturated. What happens to the water when it is heated by the sun? What will happen to the pollution?
3. Discuss how plants that live in wetlands absorb the water they use through capillary action and that if there is pollution in the water, it will also be absorbed by plants, some which we eat. Demonstrate by putting the celery in the jar with colored water and wait for a few hours or overnight to see the coloring change in the leaves of the celery.
4. Demonstrate how the wetland serves as a filter. Take the plastic bottle and insert the piece of screen in the base of the neck. Layer gravel, then sand, then gravel. Pour water through to moisten. Pour sediment water into bottle to demonstrate the filtration of a wetland. Pour water with food coloring (pollution) into the bottle. Discuss how wetlands can clean much of the water, but not all toxins are removed. Discuss how to help keep wetlands healthy by reducing sources of pollution that come from our homes. Ask what toxins people introduce into the water cycle and ways these toxins can be reduced or eliminated.

California Science Standards
Grade 7: Life Science 1b, I&E 7d
Grade 8: I&E 9a
Grade 9-12: Biology 1a, Ecology 6a, b