Water and the Land

Activity Guide

GLOBE Observer

Overview

Participants pour water onto different kinds of surfaces and discover differences in how those surfaces absorb it.

Purpose

To become more aware of what happens to rainwater when it hits land surfaces that differ in permeability

Time

10 minutes (more time if the group of participants is large)

Materials

- Samples of surface types (can be found at a garden center), such as:
  - Stone, brick, concrete, tile or other non-permeable surface
  - Clay
  - Gravel
  - Sand
  - Sod (or turf): grass and the surface layer of earth held together by the roots of the grass)
- Paint trays - enough to hold land surface samples
- Jug of water

Background

(From the University of Delaware, Cooperative Extension)

Permeable or porous surfaces allow water to percolate into the soil to filter out pollutants and recharge the water table. Impermeable/impervious surfaces are solid surfaces that don't allow water to penetrate, forcing it to run off. Urban and suburban sites typically contain large expanses of impermeable surface, causing a host of problems:

- **Pollution of surface water.** When stormwater runs off impermeable surfaces, it picks up pollutants as it flows into storm drains. The contaminated water then flows directly into rivers, lakes, wetlands and oceans, generating problems for environmental and public health.
- **Flooding of surface water and erosion of stream banks.** During periods of heavy rainfall, large amounts of impermeable surfaces generate large amounts of runoff. This sudden influx of runoff into rivers can cause flash flooding and erosion of stream banks.
- **Water table is not adequately recharged.** Because impermeable surfaces send rainwater into storm drains rather than allow it to percolate down to our aquifers, groundwater may be used faster than it is recharged.
- **Formation of stagnate water puddles.** On impermeable surfaces where runoff has no drainage route, stormwater can puddle for long periods of time. Stagnate puddles can become breeding places for undesirable insects such as mosquitoes.
- **Heat island effect.** Due to the heat-absorbing quality of asphalt and other paving materials, sites with high ratios of impermeable surfaces increase ambient air temperatures and require more energy for cooling.

Preparation

- Place the land cover surface samples in the shallower ends of the paint trays.
- Put a small piece of wood under the shallower end of each of the paint trays so they are tilted toward the deeper ends.
- Fill the jug of water.

Steps

1. Gather the group of participants. Have them take turns pouring one-half cup of water over each of the kinds of surface samples, and observe whether the water is absorbed by the sample or runs off.

2. Discuss the kinds of surfaces that cover much of the lands we live on, the effects that impermeable surfaces have, and how those surfaces could be changed to serve the same purposes while becoming more permeable to water.

Extension

Download and share images of different land cover types and features from the Landsat Image Gallery.

Ask the participants what they think is represented in these images? Do they recognize certain kinds of land surfaces or other features?