



# Watersheds

## **Audience**

Activity designed for 12 years old and up.

## **Goal**

Students will learn watershed basics and be able to identify the differences between point and nonpoint pollution.

## **Objective**

- To learn the definition of a watershed and the basics of how they work.
- To better understand the difference between point and nonpoint pollution.
- To create a model watershed.

## **Conservation Message**

Clean water is a necessity for our everyday life; we cook with it, brush our teeth with it and drink it! Watersheds serve many functions. They act as filters for our drinking water, provide water for agriculture, offer recreational opportunities and even provide habitat for plants and animals.

## **Background Information**

A watershed is an area of land that is generally elevated, and drains water off, through or over it to a body of water. This makes up a network of rivers and streams that lead to larger bodies of water such as lakes and oceans. Topography, which is the arrangement of the land, determines where and how the water flows throughout the watershed.

Watersheds vary in size from a single county to thousands of square miles. No matter the size each watershed serves many important purposes. A watershed begins at high elevations such as mountains and hills, this is known as the headwaters. The headwaters flow downward throughout the watershed forming wetlands, floodplains and tributaries, and eventually leading to a larger body of water. As water travels throughout the watershed it filters through the land and picks up pollutants.

There are two types of watershed pollution, point source pollution and nonpoint source pollution. Point source pollution is any type of pollution where the source can be directly identified. For example, a pipe, well or ditch is considered a point source

pollution because we can “point to the source” and see that is where the pollution is coming from. Conversely, nonpoint source pollution is not directly identifiable, and the source is not easily found. Agricultural runoff such as fertilizers or pesticides as well as industrial chemicals are considered nonpoint source pollutions because we are not able to pinpoint where this pollution originated. Point source pollution is more easily contained because we can trace the pollution back to the cause and hopefully decrease the amount of runoff. The biggest threat to our watersheds is nonpoint source pollution and habitat degradation.

### What can you do about it?

#### Scoop that poop!

When we take our dogs for a walk, we need to pick up their waste. Many people think that dog dirt is a naturally occurring part of the ecosystem however, domesticated dogs are not included in these ecosystems. Pet waste is considered raw sewage that can transmit bacteria and viruses. Un-scooped poop can make it into our streams, rivers, underground water, and sometimes even our drinking water. Once poop reaches bodies of water, it increases algae which can be detrimental to our fish populations. You can help solve this problem by scooping the pet waste in your yard regularly. Also, when you take your pet on walks always bring baggies and properly dispose of the pet waste. Take extra baggies to share with others and educate them about the importance of picking up after their pets.

#### Great Gardening

A major contributor to nonpoint source pollution is the overuse/misuse of fertilizers, pesticides and herbicides. While they may be necessary for your garden, try to limit the amount you use and make sure to follow the instructions on the packaging. If you must use pesticides and herbicides, check the weather before applying. Avoid windy or rainy to avoid contaminating places that don't need the treatments. A way to limit your chemical-use could be by introducing a native predator species to your garden to take care of the pesky insects. For example, ladybugs eat aphids! They would be a great resource for pest control in your garden.

#### Reduce, Reuses and Recycle

See if there is anything that you can reduce in your household. For example, turn off the light when you leave a room, this way you can reduce the amount of energy you are using. Another great way is by reducing the amount of plastic you use. Instead of buying water bottles, fill a pitcher that can be kept in the fridge. And use a reusable water bottle when traveling, this also helps you save money!

Find ways to reuse items around your house. Reuse bubble wrap or packing peanuts received in the mail for packages you are sending out. You can also take those items to

your local post office; most are happy to reuse those. During holidays, save leftover ribbons and wrapping paper to use the again following year. You can also donate unused/unwanted items to charity; you may not need them but someone else might! Recycling programs can significantly cut down on the amount of waste that ends up in landfills, streets and streams. If you can't reduce or reuse it, the next best thing is recycling. The most common recyclable items are plastic items like detergent bottles, water bottles, milk jugs, and soda bottles. Steel and aluminum can also be recycled such as cans and steel food containers. Paper is also commonly recycled, however, just remember you can't recycle paper towels!

### **Materials**

- Clear Shower Curtain or Large Trash Bag
- Aluminum Food Pan
- Spray bottle with water
- Different size cups and/or bowls
- Tape
- Food Coloring
- Instant Pudding and/or Gelatin Mix
- Sprinkles
- Sand
- Small Houses, Animals, Trees, Buildings, etc. (optional)
- Stack of books

### **Length of Activity**

40 minutes

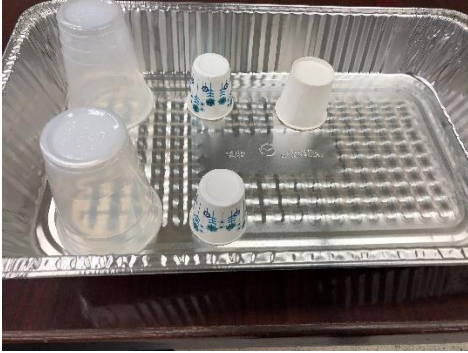
### **Procedures**

- Slightly elevate your aluminum food pan by putting a few books underneath one end. Elevate about 3 inches.

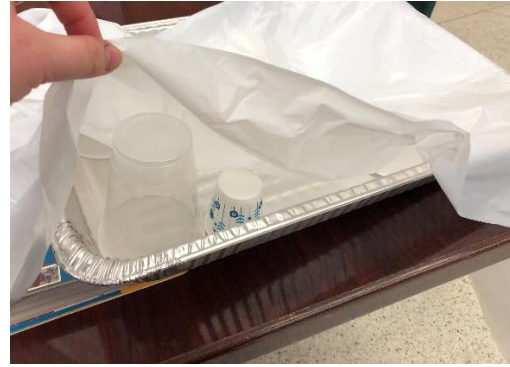


- Place cups and bowls upside-down inside your tray. On the elevated end, place your tallest items; these will be your mountains and headwaters. Feel free to get creative with other placements.

- Tape your cups and bowls down to the pan. They just need to stay in place, you do not need to completely secure.



- Place the shower curtain or trash bag over the top of the pan. This will represent the ground.



- Add your decorative items. You can create a city, a farm or any other time of development that you wish.



- Now time for the food coloring, sand, and pudding/gelatin mix.
  - Food coloring - Make small droplets throughout watershed. Pretend there is a garden in one area. Place drops there to represent fertilizer, herbicide or pesticides.
  - Pudding/Gelatin Mix – Sprinkle throughout watershed. Sprinkle around a farm or neighborhood area, this will be animal waste that wasn't picked up.
  - Sand – Sprinkle throughout watershed.

Sand could represent the dirt at a construction site or a farm that hasn't been planted yet.

- Sprinkles – Sprinkle throughout watershed.  
Sprinkles could be trash left behind after a birthday party in a nearby park.



- A huge rainstorm is coming your way! Grab the spray bottle. Starting at the mountain end of your watershed (that is where a storm would originate) spray water while moving around your watershed.
- The water will start traveling down your model and pooling in the lowest point creating a lake. Notice that the food coloring, sand, sprinkles and pudding are being taken by the water. What does the water in your lake look like?



- Clean off the watershed and start over! See what happens when you eliminate some of the nonpoint source pollutants.