

How Water Moves

Pollutants reach water sources through runoff.

Distribute NYC Water Story Worksheet and play the NYC Water Story interactive as a whole group or if individual computers are available in partners or small groups.

Stop the NYC Water Story after the “Storm Water” section in “Down the Drain” and ask the following questions.

Discussion

Key Idea: Pollutants reach water sources through runoff.

The *NYC Water Story* asserts that storms wash oil, pesticides, litter, etc. into sewers, thereby polluting rivers and beaches.

Question: Why do storms contribute to pollution?

Answer: The water picks up chemicals from land and brings the chemicals to individual waterways.

Question: How can we reduce the amount of pollutants that reach the waterways?

Answer: Reduce litter; maintain vehicles to prevent leaking oil or antifreeze; minimize the use of fertilizers and pesticides; clean up pet waste; avoid using salt to de-ice in the winter.

Historical New York City Water Story

Did you know that before Europeans settled on the island of Manhattan that:

- Two freshwater streams came together in Times Square before emptying out into the Hudson?
- A stream used to run down 5th Avenue through Washington Square Park?
- The Manhattan shores of the East River were filled with marshes?
- The Flying Squirrel and the Snapping Turtle used to make their home in the area that is now the approach to the Brooklyn Bridge?
- Canal Street got its name from a creek that used to stretch across the bottom tip of Manhattan?
- On 31st and 32nd streets between Lexington and Park Avenues there used to be a small pond teeming with life?
- There used to be a huge tulip tree forest that included a meandering stream at Columbus Circle?

Find Your Own Water Story:

If you would like to adapt this lesson to include your city or town's water story, do a quick search on the web to find the "source of water" in your town. Most cities/counties have websites that describe the water supply. You can create a lesson on this information, or ask students to do their own research and present it to the class as a poster or brochure.

Surface Water and Groundwater

All of New York City's drinking water comes from surface water, but 21% of the freshwater used in the United States comes from the ground. Some water seeps underground when it falls as rain, snow or sleet. The gravel or sand underground act like a sponge to absorb and hold the water, just like when you are digging at the beach and discover water when you dig down deep. In order to access stored underground water, people use well pumps to bring stored water to the surface. An area that holds a lot of water, which can be pumped up with a well, is called an aquifer. Wells pump groundwater from the aquifer and then pipes deliver the water to cities, houses in the country, or to crops.

NYC's Combined Sewer System

New York City has a combined sewer system. This means that sewage and storm water runoff (i.e. rain and snowmelt) empties into a single pipe system. On dry days, this combination is not a problem. The sewage runs normally to the sewage plant to be treated. On wet days, trouble occurs. The storm runoff enters the sewage system adding substantial liquid to the pipes. To prevent the pipes from overflowing and backing up, the contents empty directly into the surrounding water bodies without being cleaned. This process is called Combined Sewer Overflow and it leads to high levels of bacteria and nitrogen waste (human feces) in area water bodies on the days it rains. To prevent this problem, newer cities now build two sets of pipes-one for sewage and one for runoff. Old cities, like ours, are stuck with the dirty system.