

# THE URBAN

HOW TO SURVEY  
WATER FLOW ACROSS  
YOUR CAMPUS

# WATER CYCLE





# WATER AUDIT



Name(s) \_\_\_\_\_ Date \_\_\_\_\_

Location \_\_\_\_\_

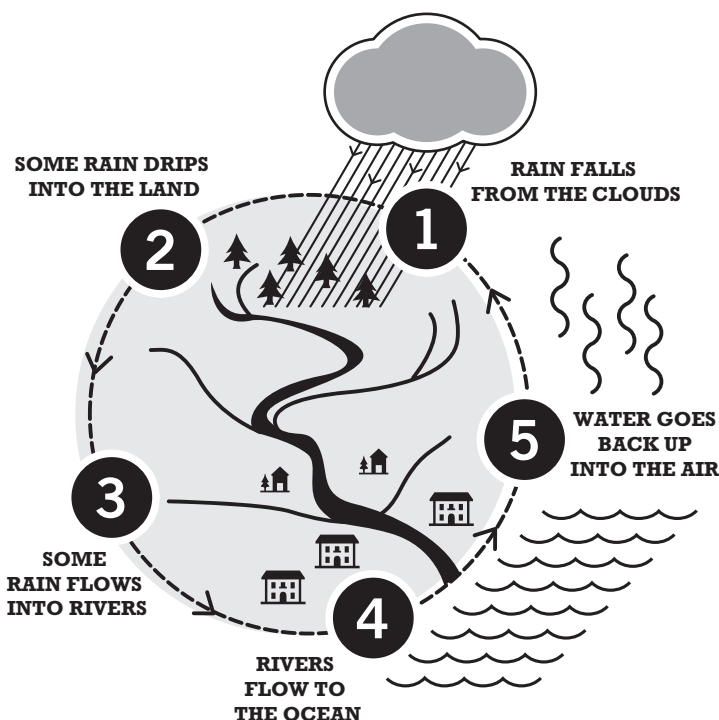
- 1) Obtain a map of the school. A simple, hand drawn map can be used, if a map is not available.
- 2) Use colored markers or pencils to mark the map and identify what is found.
- 3) Walk around the entire area looking for the items listed below on the audit and marking their location on the map.

## LOOK FOR...

- 1 **Places where water can get into the ground (grass, bare dirt, garden, etc.)**  
Use **GREEN** to show these places on your map.
- 2 **Sources of water (faucets, drinking fountain, sprinkler, hose, etc.)**  
Use **BLUE** to show these places on your map.
- 3 **Places where water travels (gutters, down spout, drain, concrete, asphalt, etc.)**  
Use **PURPLE** to show these places on your map.
- 4 **Trash and other things that could be harmful to water (food trash, candy wrappers, motor oil, pet waste, etc.)**  
Use a **RED X** to show these items on your map.

- a) Use arrows to show the direction water would travel. Remember water flows from higher points to low ones.
- b) Circle on your map where you found trash and other areas of concern.

## THE HYDROLOGIC CYCLE



The continual circulation of water from the atmosphere to the earth and its return to the atmosphere through precipitation, percolation, and evaporation is also known as the water cycle.

The cycle begins when rainwater falls onto the earth and percolates down into the soil. The soil acts as a natural filter, cleaning the water that collects in aquifers (underground layers of soil that store water). This underground water is called ground water and supplies water to wells and natural springs. When it rains, water that is not absorbed by soil travels over land as runoff, flowing downhill and collecting in streams and rivers, which flow into lakes and oceans. Evaporation occurs when the sun draws water from lakes, rivers and oceans into the atmosphere where rain clouds form, completing the cycle.



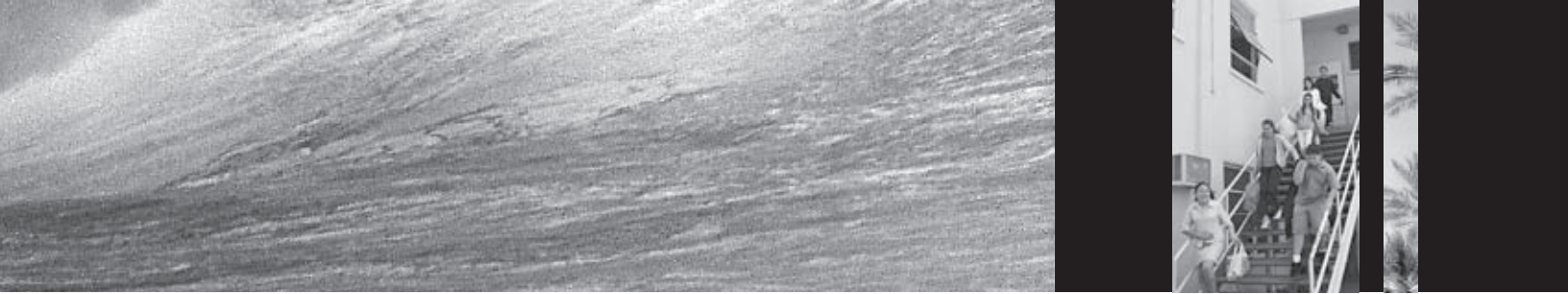
### WHY IS URBAN RUNOFF DANGEROUS?

Urban runoff from rainwater and water from garden hoses, sprinklers, and other outdoor sources, travels over concrete and asphalt picking up pollutants (cigarette butts, automotive fluids, trash, pesticides, and pet waste) and carrying them straight to the ocean.

In our neighborhoods, clogged catch basins filled with trash attract rats and rodents, and create unpleasant odors. Clogged storm drains increase street flooding and cost millions of tax dollars to clean. At the ocean local officials close beaches regularly after rain storms due to the pollutants and toxins flowing through storm drains into Santa Monica Bay and San Pedro Bay; swimmers who swim near these discharge areas have increased risk of viral infections and illness; and marine life is harmed or killed.

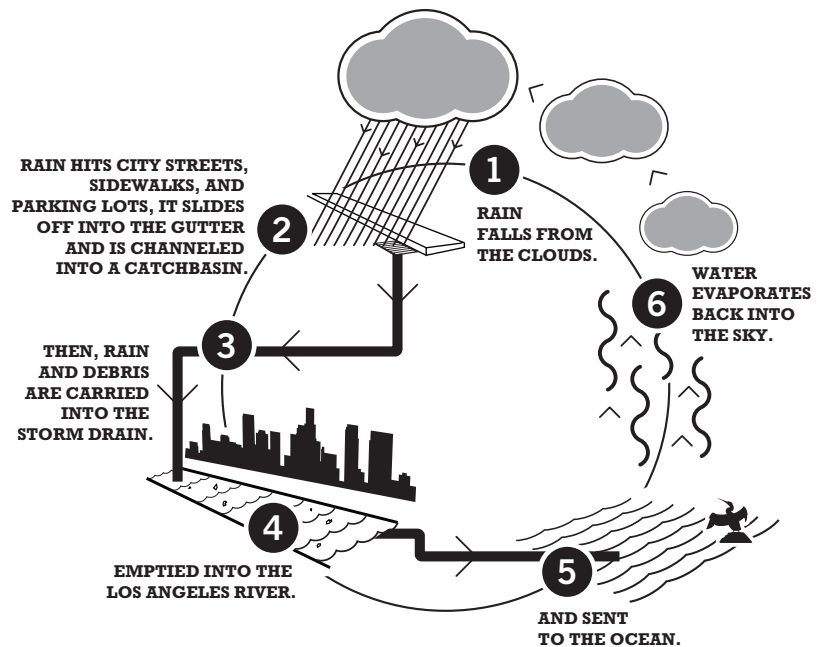
### THE CAMPUS WATERSHED

Your school campus is part of this urban water cycle. The land area of the school directs water from rain, sprinklers, faucets and garden hoses across your campus everyday. As the water travels, it picks up trash and other pollutants and carries them into the storm drain system, negatively impacting the environment beyond your campus. You, your peers, teachers, administrators, and maintenance staff are responsible for what flows off the campus, into the storm drains and to the ocean.



## WHAT HAPPENS TO THE CYCLE IN AN URBAN ENVIRONMENT?

As a city grows, land is cleared and developed creating miles of paved surfaces (streets and parking lots), buildings and houses. These surfaces severely limit the amount of rainwater that can be absorbed by soil. To prevent this water from flooding streets, engineers created a flood control or storm drain system. This complex system of catch basins, underground pipes, and open flood control channels carry urban runoff straight to the ocean, without any treatment. This, however, interrupts the natural hydrologic cycle by discharging water directly to the ocean, rather than allowing much of it to absorb slowly into the ground. Without this natural system of filtration, water reaches the ocean directly, carrying with it any pollutants it may have picked up along the way.



## WHAT IS HAPPENING ON YOUR CAMPUS?

- 1 Conduct a water audit on your campus.
- 2 Record where water flows over the watershed, what it may take with it, and where it goes.
- 3 Use the attached audit to record what you find.
- 4 Continue your investigation by seeking answers to the questions on the back of the audit.



Generation Earth Student Action Guides are available to students working on a project. These guides are designed to help you plan a project, create and prioritize tasks, keep track of progress, and evaluate the results.

**CHECK WITH YOUR TEACHER OR ADVISOR FOR HOW TO GET THESE FREE GUIDES, OR CALL 818.623.4870.**

# MORE TO DO AND QUESTIONS TO ASK



**1** Does your school campus have dry, compacted ground that doesn't absorb water and sends dirt and debris into the street gutters and drains?

**2** Are there any areas of concern, such as clogged catch basins, blocked storm drains, leaky faucets or areas where water floods?

**3** Are there areas where concrete and asphalt can be removed to make space for trees and areas that allow water to soak into the ground?

**4** Based on the path water takes across campus, what pollutants does it pick up along the way?

**5** Set up an interview with the facilities manager and/or maintenance staff to find out what potentially harmful products they use including fertilizers and cleaning products.

**6** After nutrition and lunch, what happens to the trash that is sprayed off the ground with hoses?

## TAKE ACTION

### BASED ON YOUR FINDINGS, CREATE A PLAN TO REDUCE POLLUTED RUNOFF. IDEAS INCLUDE:

- 1** Get mulch (ground up leaves and branches) from the school district or other local source and place it below trees, in planters, and on bare, exposed dirt. Mulch absorbs water, and slows the flow of water so it can seep into the ground.
- 2** Create an awareness campaign on the benefits of keeping trash and other pollutants off the ground.
- 3** Talk to campus maintenance about buying and using non-toxic fertilizers, cleaning products, etc.
- 4** Design a rain garden or planted swale (a slightly depressed area of land) in an area that typically floods to allow water to soak into the landscape.
- 5** Write articles in the school newspaper on how your campus is helping to reduce urban runoff based on people making different choices.

**DETERMINE YOUR URBAN RUNOFF REDUCTION GOALS AND CHALLENGE STUDENTS, TEACHERS AND SCHOOL ADMINISTRATION TO MEET THEM.**

## TEN THINGS YOU CAN DO TO HELP REDUCE POLLUTED RUNOFF

- 1 Reduce, reuse and recycle, and keep litter and hazardous waste off the ground.
- 2 Fix sprinklers and other sources of water so they don't spray onto concrete and asphalt surfaces.
- 3 Direct water from hoses and other sources of water into grass and planters, instead of the street.
- 4 Place mulch (ground up leaves and branches) below trees, in planters, and on exposed, bare dirt.
- 5 Direct rain downspouts from the roof to flow into grass and planters instead of across concrete, gutters and the storm drains.
- 6 Plant trees to capture rainfall and direct the water into the soil below.
- 7 Create berms (small embankments) around the edges of grass and other planters to prevent water from flowing over concrete, and enabling it to seep into the ground.
- 8 Report clogged stormdrains to 1-888-CLEAN LA.
- 9 Keep cars tuned up to prevent oil leakage onto the street.
- 10 Pick up after pets.



**AN ENVIRONMENTAL EDUCATION PROGRAM**  
**OF THE COUNTY OF LOS ANGELES, DEPARTMENT OF PUBLIC WORKS**

