Watershed Issue

WaterWeb

current water info for schools

A publication of the Southwest Florida Water Management District

The WaterWeb Query

QUESTION:

What are the major watersheds in our area?

ANSWER:

Locate them on the generalized watershed map on this page.

1. Southern Coastal
2. Springs Coast
3. Hillsborough River
4. Tampa Bay/Anclote River
5. Little Manatee River
6. Myakka River
7. Peace River
8. Manatee River
9. Alafia River
10. Withlacoochee River
11. Lake Wales Ridge

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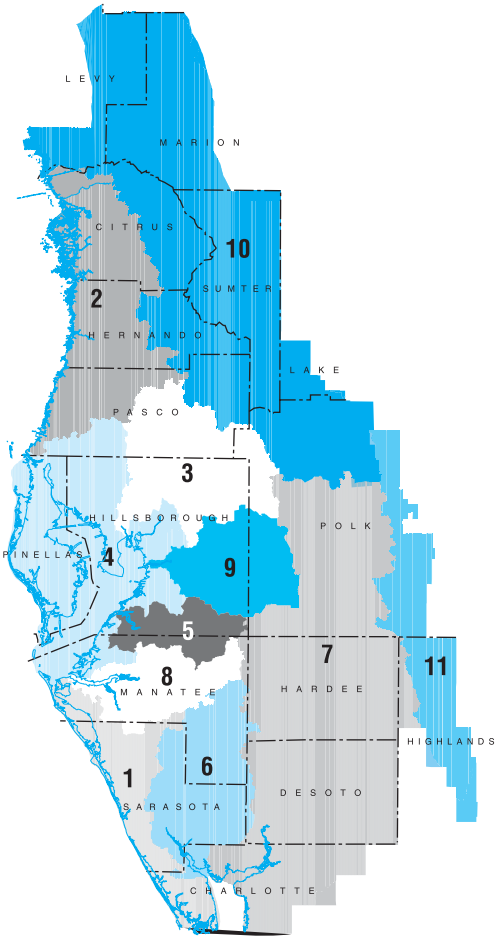
WaterWeb

Watersheds

Everyone lives in a watershed, but what is a watershed, anyway? Contrary to the way it sounds, a watershed is not a shed that holds water. The easiest way to define a watershed is to think of it as an area of land that water flows across as it moves toward a stream, river, lake or coast. A watershed is like a funnel in which surface water runs off and drains into a common collection area.

A watershed can be a closed or open system. In a closed system, the water collects at a low point and leaves only through evaporation or by seeping into the ground. In an open system, water collects in the drainage system until it overflows into larger bodies of water, such as rivers, and then it eventually moves out into the sea. Most watersheds are open systems. Viewing a watershed from an airplane would show drainage patterns that look like the branches of a tree, or a complex road system, or even the human nervous system. The different watersheds are separated from each other by areas of higher elevation. These areas are called ridge lines or divides. All of our watersheds play an important role in the quality of life in our communities and ecosystems. Regardless of exactly where you live, you *do* live in a watershed.

Did you know that there are more than 50 main watersheds in the United States? The largest of these watersheds is the Mississippi watershed, which touches 31 states and two Canadian provinces. In Florida, within the geographical boundaries of the Southwest Florida Water Management District (SWFWMD), there are 11 identified major watersheds. Do you know which watershed you live in? Try to identify your watershed in the list that appears on this page.



SPLASH! into Water Resources Education
Southwest Florida Water Management District

Southwest Florida Water Management District

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This issue of WaterWeb focuses on watersheds. All the articles and activities are designed to help you learn more about watersheds and to have fun at the same time. Don't forget to try making a model of your own watershed.

Water Quality

Protecting the quality of water resources is one of the SWFWMD's areas of responsibility. The SWFWMD employs several methods to protect and improve those resources. Perhaps the biggest threat to the quality of water bodies is from stormwater runoff, which if left untreated carries grease and oil from streets, and fertilizers and insecticides from lawns and agricultural operations to our surface water bodies, compromising water quality.

SWIM Program

Through the Surface Water Improvement and Management (SWIM) program, the SWFWMD works with federal, state and local governments, and citizen volunteers to restore habitats that provide natural filtration to runoff, stop or slow sources of pollution, preserve natural systems and perform a variety of water quality monitoring assessment projects. Rather than employ outside contractors, the SWFWMD often uses its own crews on many of these projects to cut costs and save taxpayer dollars.

Mobbly Bay Habitat Restoration

This cooperative effort between the SWFWMD and the city of Oldsmar restored and enhanced approximately 15 acres of coastal wetlands in northern Tampa Bay, and included the removal of invasive plants, creation of wetland marshes and excavation of additional open-water ponds. Critical nursery and feeding

habitats for recreational sport fish and wildlife were reestablished. Volunteer planting events organized by Tampa BayWatch included assistance from the Florida Conservation Association (FCA), Girl Scout troops and several local high schools and colleges.

Emerson Point

Purchased by Florida's Conservation and Recreation Land Acquisition (CARL) program, this rare coastal peninsula in southeastern Tampa Bay is leased to Manatee County for use as a recreational park. The SWFWMD and Manatee County entered into an agreement to restore the site. A series of meandering channels, marsh platforms, open-water ponds and intertidal wetlands were created and planted with native marsh grasses; and exotic or nuisance vegetation was removed. High school students under the Job Training Partnership Act installed more than 15,000 freshwater and saltwater plants in these newly created wetlands.

Salt Creek at Bartlett Park

The SWFWMD and the city of St. Petersburg worked on a cooperative four-acre coastal restoration project at Bartlett Park. The project restored salt marshes at Salt Creek, created new tidal channels and provided stormwater polishing features and an island hammock. Coordinated through Tampa BayWatch, student volunteers helped plant the site.

EXTENDED ACTIVITIES

1. Look around your school area. Try to identify the different kinds of pollutants that most likely would be found in stormwater runoff. Make a list of suggestions that could help improve the quality of water contained in stormwater runoff.
2. Habitat restoration projects can help provide natural filtration to runoff. Check with environmental management agencies in your area or visit the National Estuary site at www.epa.gov/nep/ to find out about habitat restoration projects going on near your watershed. Become a volunteer and ask other classmates to join you on a project.
3. Can you think of a project that could be developed to protect and improve the quality of water resources near your school? Some ideas include removal of invasive plants, pond or wetland cleanup, creating and distributing posters or performing songs, poems or skits about water resources protection to parent groups. Describe your project plan to your classmates. Explain how your project could help the quality of the watershed in which you live.

Surface Fresh Water Exists in Many Forms

Water that has not seeped into the ground and is exposed to the air is called surface water. Surface water exists in many shapes and forms. Most surface water lies in the oceans and is salt water. In fact, less than 1 percent of the earth's surface water is fresh water. Are you familiar with different forms of surface fresh water? They include rivers, lakes, streams, creeks, ponds, sloughs and wetlands. You probably live near one of them. Bodies of fresh water play a very important role in the health and well-being of watersheds.

Think about the different features and characteristics of various freshwater bodies. Creeks are generally smaller than streams, and streams are usually smaller than rivers. The term *smaller* refers to the volume of water that flows in the water body and not necessarily its length. Creeks may be dry during part of the year and swell during rainy seasons, causing water to flow into a stream, which is a larger water body. The amount of water a stream contains may also vary during the year as stormwater runoff flows toward another larger body of water such as a river or lake. How many of these water bodies have you visited?

Wetlands also play an important role in west-central Florida watersheds. Wetlands are areas of land where the water table is very close to or level with the surface of the land. These wetland areas help the environment by purifying polluted waters and acting as reservoirs for stormwater runoff. Wetlands may include ponds, marshes, swamps, bogs and sloughs. Can you describe a few of the different features of wetlands?

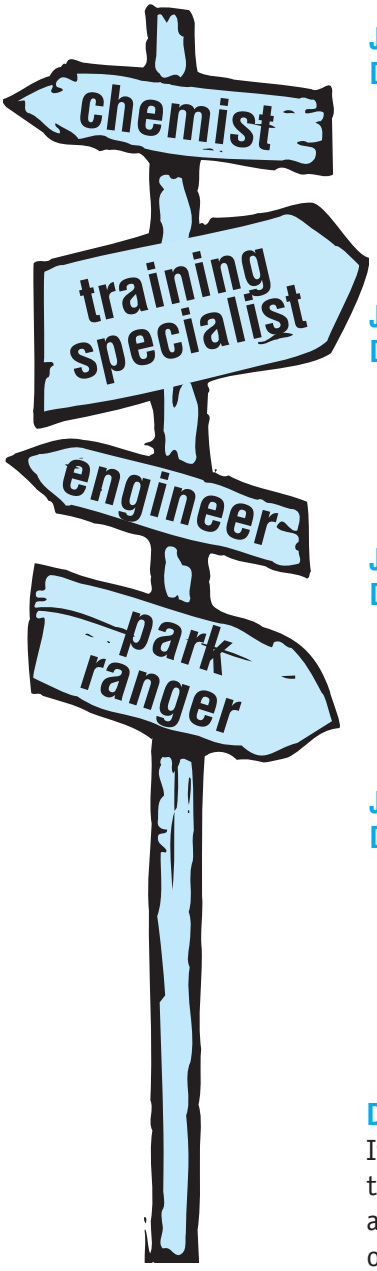
Sources of Pollution in Our Watershed

Did you know that almost no water is as pure as the two hydrogen atoms bonded to one oxygen atom that make up what is commonly called H_2O? It's true. Pollutants attach themselves to water molecules, affecting the water's purity. Some pollutants are not harmful, but others can be life threatening. Pollutants are usually grouped according to categories such as micro-organisms, suspended solids, inorganic compounds, synthetic organic compounds and radioactive materials. To list all the different pollutants that could be placed in these categories would take a long time indeed! But, the commonly known pollutants include trash, chemicals, fertilizers, pesticides, sewage, wastewater, litter, oil, soil particles, acid rain, etc. Can you add to the list? It is believed that most of these pollutants get into our water because of things we do.

Let's take a closer look at the sources of water pollution. Water pollution is often described according to its source. Two sources of water pollution are point-source pollution and non-point source pollution. An example of point-source pollution is the emptying of a pipeful of industrial waste directly into a lake or river from a manufacturing plant. You can "point" your finger directly to the source of the problem. On the other hand, non-point water pollution has a source that is more difficult to identify. An example of non-point water pollution is stormwater runoff that contains pesticides, fertilizers, animal waste, soil particles, oils or other pollutants. As the rainwater runoff moves across pavement, yards and fields, it picks up pollutants that eventually end up in various water bodies. Non-point water pollution can come from a variety of sources, so it's not so easy to point a finger at its source. But regardless of its source, we are all directly or indirectly affected by pollution in our watershed.

Career Focus

Students interested in protecting the environment have many career choices. These jobs are challenging and rewarding. And most of all, they provide us a way of working that benefits the earth. The brief job descriptions below are just a sample of the many careers that help protect the environment.



Job Title: **Chemist at a private corporation**
Description: This is a professional position in the chemical analysis of environmental samples for pesticides, herbicides and other pollutants. The primary responsibilities of this position will be the analysis of organic pollutants in environmental samples from nearby water bodies. Must have ability to plan, organize and coordinate work assignments. Written and oral reports will be prepared based on assignments.

Job Title: **Training Specialist at a recreational park**
Description: This is work preparing and conducting classes, meetings and workshops that focus on training and environmental education programs. The position is located in a recreational park. Knowledge in the theory and practice of current park management techniques is essential. Must be able to communicate effectively verbally and in written training materials.

Job Title: **Engineer at a government agency**
Description: This is civil and environmental engineering work reviewing, analyzing and inspecting surface water management systems and related permit documents. Reviews engineering drawings, reports and permits. Conducts field inspections. Uses established computer tracking system. Prepares reports and makes public presentations.

Job Title: **Park Ranger at a recreational park**
Description: This is work providing visitor services, maintenance, protection, administration and resource management at a recreational river park. Must have the ability to conduct routine inspections, investigate problems, deal with the public in a tactful and courteous manner, determine work assignments, and perform tasks related to grounds and buildings maintenance, including removal of exotic plants.

Did you find a career that interests you?

If so, which one? Why? Are you interested in finding out about other job opportunities that will allow you to protect the environment? It's never too early to begin planning for a career in your future. For additional information about environmental careers, check out these books and web sites. You'll be glad you did!

Books:

Fasulo, M., and Walker, P. 1995
Careers in the Environment
Chicago: VGM Career Horizons.

Fanning, O. 1996
Opportunities in Environmental Careers
Chicago: VGM Career Horizons.

The Environmental Careers Organization 1993
The New Complete Guide to Environmental Careers
Washington, DC: Island Press.

Web Sites:

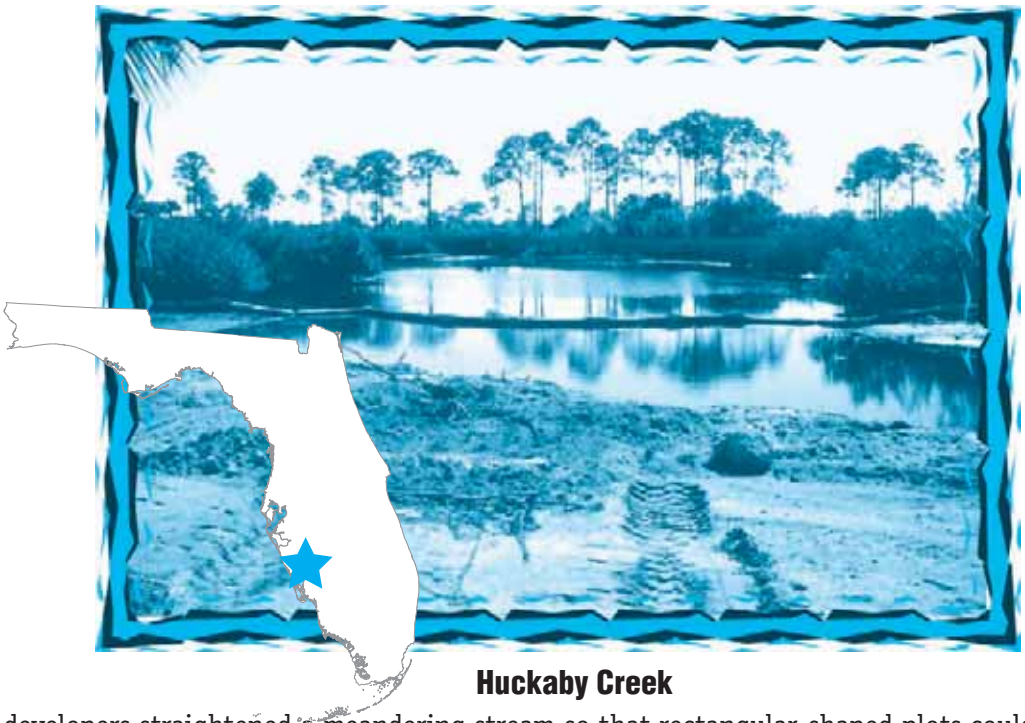
Southwest Florida Water Management District
http://www.WaterMatters.org
Click on Employment

Florida Department of Environmental Protection
http://www.dep.state.fl.us
Click on Employment Opportunities in the Contact Section

Restoring Huckaby Creek
A Hydrologic Alteration Project in Charlotte County

For centuries, changes have been made in the natural environment in order to better serve the needs of its inhabitants. The early inhabitants of southwest Florida dug canals through the islands and mangrove forests to provide more efficient canoe travel in the coastal areas. The settlers dug wells into groundwater resources and built dams on rivers seeking more constant sources of drinking water. In this century, developers drained swamps and low-lying areas to increase land areas for building homes and growing crops. Seawalls were built to straighten and harden shorelines. All of these actions combined have changed the natural flow of water in our environment.

As the quantity and flow of water is altered in an area, changes occur in the existing ecosystems. Unfortunately, these changes can often be disastrous to the inhabitants. Concrete vertical seawalls that are built along a shoreline can cause the loss of sloping mud and sand that supports hundreds of species of benthic and shallow water animals. It's possible for an entire layer of the food chain to be eliminated. For these reasons and others, more attention and funding is being targeted at hydrologic restoration projects.



Huckaby Creek

A hydrologic restoration project is an attempt to convert altered areas back to their original, natural form. This type of restoration project may include removing concrete, reshaping and grading of shorelines, planting submerged vegetation along newly restored shores, recreating marshes and wetlands, and removing exotic plants. Let's take a closer look at one of these hydrologic restoration projects.

Huckaby Creek is a tidally influenced stream that flows into Tippecanoe Bay, which lies along the northern shore of Charlotte Harbor. In the 1970s, developers straightened a meandering stream so that rectangular-shaped plots could be sold to homebuilders. During the straightening process, the dredged material was used to build a berm, an earthen mound, along the western shore of Huckaby Creek. Unfortunately, heavy rains caused surface water to rush to the end of the berm directly into Tippecanoe Bay. Before the straightening process, stormwater runoff had taken a more leisurely, cleansing trip through the field and creek before emptying into the bay.

Restoration of Huckaby Creek became possible because of a grant provided by the Florida Department of Environmental Protection and the services of local government agencies. With everyone working together, the restoration project included removal of the berm, creation of a gently sloping and curved shoreline, and planting of native submerged and shoreline vegetation along the western shore of the creek. Now stormwater runoff flows into the creek in a natural, slow manner that allows water to filter out pollutants before arriving at the bay and entering Charlotte Harbor. The restoration of the streambed will also create a healthier environment for fishes, mollusks, birds and other animals in the area.

Do you know of a successful restoration project near your home? If so, describe it to your classmates. Getting involved in a restoration project can be a very rewarding experience. It is a great way to make our world a better place for all of us!

Create Your Own Watershed

Now that you know about watersheds, how about making one of your own? Depending on your flair for creativity, you can make your watershed a simple or complex system.

Learning Goals

- To teach the function of watersheds
- To stimulate thought about the role watersheds play in the world

Subjects

- Science
- Social Studies

Materials

- large aluminum cake pan
- several pieces of crumpled paper
- large sheet of aluminum foil or plastic wrap
- variety of colored powders (cocoa, fruit drinks, etc.)
- clear water
- spray bottle
- small model pieces to represent homes, trees, cars, farm animals, etc.

Sunshine State Standards

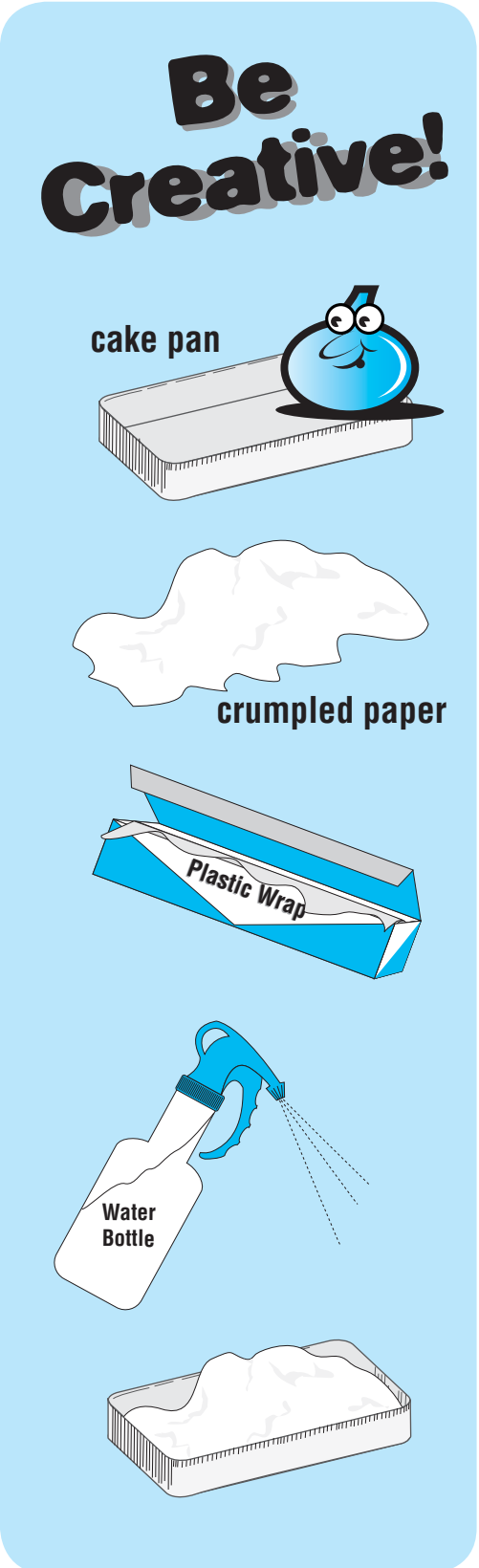
Science (6–8): Processes that Shape the Earth, SC.D.1.3, SC.D.2.3; The Nature of Science, SC.H.1.3, SC.H.2.3. *Social Studies (6–8):* People, Places and Environments, SS.B.1.3, SS.B.2.3. *Science (9–12):* Processes that Shape the Earth, SC.D.2.4; The Nature of Science, SC.H.2.4. *Social Studies (9–12):* People, Places and Environments, SS.B.2.4.

Activity

1. To set up the activity, crumple several pieces of newspaper or other paper. Place paper in cake pan to represent different elevation levels of land. Cover the paper with aluminum foil or plastic wrap. Position small model pieces as desired.
2. Use a spray bottle to spray clear water at the highest elevation. Observe results.
3. Add small amounts of colored powders to various places to represent different types of pollutants. For instance, cocoa powder may represent soil erosion, green fruit drink mix powder may represent fertilizer, etc.
4. Again, use the spray bottle to spray water at the highest elevation. Observe results.

Discussion Questions

1. What happened the first time you sprayed clear water on your watershed model?
2. What happened to the pollutants when you sprayed water again?
3. What could be done to reduce the amount of pollutants affecting your watershed?
4. How does your watershed compare with watershed models made by other classmates?

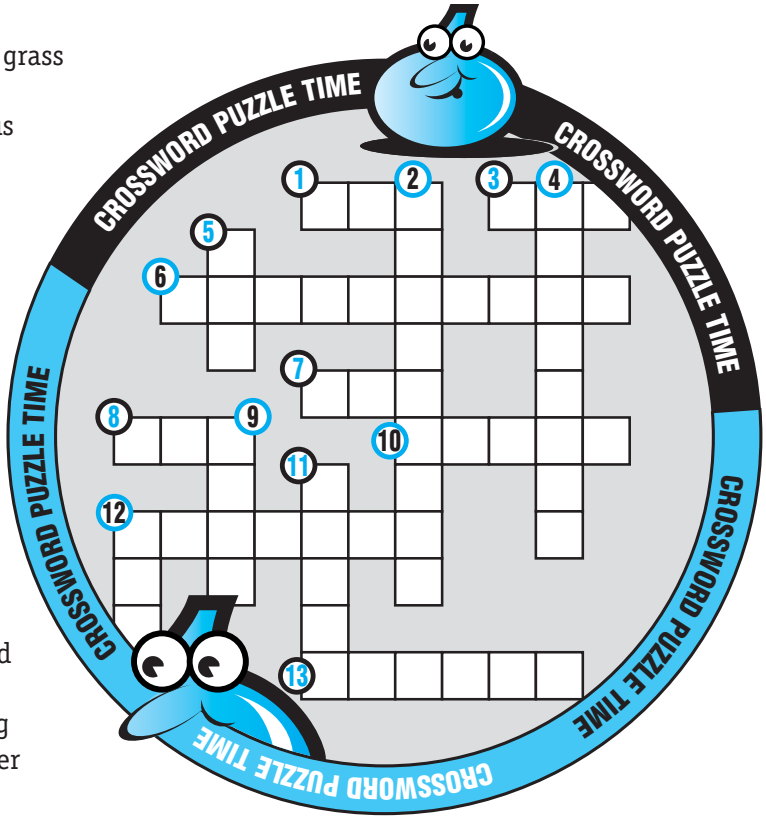


WaterWeb Crossword Puzzle

Sharpen your pencils. Complete each sentence with the correct word that fits in the puzzle.

Across

1. The moisture that often appears on trees, plants and grass in the morning is called _____.
3. We _____ the earth our efforts to protect our precious water resources.
6. Trash, chemicals, fertilizers and oil are examples of _____ that can affect the quality of water.
7. In non-point water pollution, the pollutants could appear _____ away from its source.
8. Many _____ opportunities are available for people interested in pursuing a career in the environment.
10. When people _____ in a wetland, they may not necessarily get their feet wet!
12. Rivers, lakes, streams and ponds are examples of _____ water.
13. Stormwater _____ may contain many different kinds of pollutants.



Down:

2. The land from which water drains into a river is called that river's _____.
4. Areas called _____ help the environment by purifying polluted waters and acting as reservoirs for stormwater runoff.
5. A small marsh with wet, spongy ground is called a _____.
9. A _____ is an earthen mound.
11. Two hydrogen atoms bonded to one oxygen atom make up H_2O which is called _____.
12. The _____ contains salt water.

WaterWeb SCRAMBLE

Unscramble the letters to form words. Then use these words to complete the paragraph.

tceropt _____ **scarfue** _____

furfon _____ **dershtawe** _____

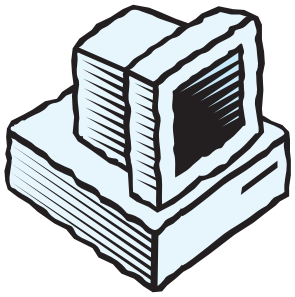
No matter where we live, we live in a _____.

Stormwater _____ can threaten the quality of water bodies.

Examples of _____ water bodies are rivers, lakes and ponds.

Remember, it's up to all of us to _____ our precious water resources.

Sites for WaterWeb Readers to Explore



Are you interested in learning more about your watershed? By going to the web site listed below, you can locate the watershed you live in within Florida. For your specific watershed, you will get an environmental profile, find information about the water, learn about the land characteristics, find out about local actions and learn about the air. After searching this site, try a few of the other sites that are linked to it.

http://cfpub.epa.gov/surf/locate/map2.cfm

Point your mouse to your specific area in Florida. Then click on it. To go to other areas, use the back arrow located in the upper left corner of the page. Do you have relatives who live in other parts of Florida or in other states? Try locating their watersheds. How is your watershed similar to or different from theirs?

Answers

Activities on page 7

SCRAMBLE Answers

protect surface

runoff watershed

Paragraph answers:

No matter where we live, we live in a watershed. Stormwater runoff can threaten the quality of water bodies. Examples of surface water bodies are rivers, lakes and ponds. Remember, it's up to all of us to protect our precious water resources.

Credits

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REV VISKH (3/05)