

What's a Wetland?

CHARACTERISTICS OF WETLANDS

SKILLS: *engaging in a discussion, informative writing*

COMMON CORE STANDARDS/FLORIDA STANDARDS: SL.4.1; SL.5.1; W.4.2; W.5.2

NEXT GENERATION SCIENCE STANDARD: 5-ESS2-1

MATERIALS FOR EACH GROUP OF FOUR:

- copy of game directions and game cards on page 4
- scissors
- paper bag

STEPS:

- 1 Have students brainstorm a list of bodies of water, such as lakes, rivers, seas, ponds, streams, and oceans. List student responses on the board.
- 2 Write *wetlands* on the board and ask students if it should be included on the “bodies of water” list. Explain that wetlands are not bodies of water but rather land that is covered or saturated by water for certain periods of time. The amount of water present in wetlands fluctuates as a result of rainfall patterns, snow melt, dry seasons, and long droughts. The presence of water, then, is not a good indicator that an area is a wetland. Some of the most well-known wetlands, such as the Everglades, are often dry.
- 3 Explain that scientists identify wetlands based on three characteristics related to soil, vegetation, and *hydrology*, which is the science that encompasses the behavior of water as it occurs in the atmosphere, on the surface of the ground, and underground. Display these characteristics on the board and discuss them with students.
 - **Water:** Wetlands have a prolonged presence of water at or near the soil surface. Water drives the wetlands’ natural system—the soils that form, the plants that grow, and the fish and wildlife communities that use the habitat.
 - **Soil:** Wetland soils are *hydric*, which means they have developed under periodic saturated conditions. (See the sidebar.)
 - **Vegetation:** Wetlands plants are ones that have adapted to live in water-saturated, hydric soils for all or part of the year.



Hydric Soils and Hydrophytes

A hydric soil is soil that formed due to saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions. Anaerobic conditions are where microbes use up the oxygen in the soil, making the soil unsuitable for most plants. Plants that can grow in these conditions—such as marsh grasses—are called *hydrophytes*. Together, hydric soils and hydrophytes give clues that a wetland is present.

What's a Wetland?

CHARACTERISTICS OF WETLANDS

4 Give each group of four students the materials listed. Explain that students will play a game to help them remember the three identifying traits of wetlands. Have students in each group cut apart the cards and directions and place the cards in the bag. Then have groups play the game as described.

5 To assess understanding after the game, have each student write a paragraph that explains how to tell if an area is a wetland.

Extensions for Grades 2-3:

After sharing the basic traits of a wetland, conduct shared research with your students to find out about the water, soil, and vegetation in a different habitat, such as a desert, grassland, or forest. Together create a chart similar to the one shown that compares wetlands to your chosen habitat. *Common Core Standards/Florida Standards W.2.7-8; W.3.8; Next Generation Science Standard 2-LS4-1; Next Generation Sunshine State Standards SC.2.L.17.2; SC.2.N.1.1; SC.3.N.1.2*

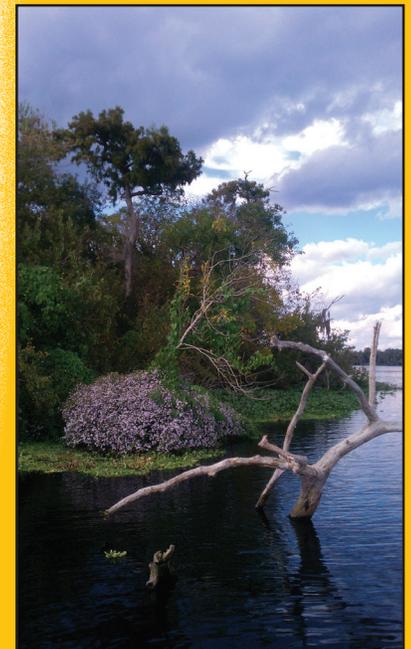
	Water	Soil	Vegetation
Wetland			
Desert			

Extensions for Grades 6-8:

Have small groups of students identify and research wetlands around the state of Florida and write short reports. Direct students to include in their reports the name and location of the wetland and an explanation of the hydrology, soil, and vegetation found there. *Common Core Standards/Florida Standards W.6.7-9; W.7.7-9; W.8.7-9; Next Generation Science Standard MS-ESS3-1; Next Generation Sunshine State Standard SC.8.L.18.1*

Where there's a wetland, there's always a river, right?

You might think the answer to this question is "Yes." After all, rivers are wet! But the answer is actually, "Not really." A wetland is an area that is flooded or saturated by water often or for long periods of time. In some wetlands, that water comes from surface water such as lakes; oceans; and rivers, like the St. Johns River. But in other wetlands, that water comes from groundwater or has flowed after a rainfall to a depressional area. It may even be an area with clay soils where the water that has flowed to it can't percolate into the ground. So not all wetlands have a river connection.



What's a Wetland?

CHARACTERISTICS OF WETLANDS

For more information on the characteristics of wetlands, see

- <http://water.epa.gov/type/wetlands/>
- <http://www.sjrwmd.com/waterbodies/wetlands.html>
- <http://soils.ifas.ufl.edu/wetlandextension/about.htm>
- <http://plaza.ufl.edu/realmic/FLwetlands/whatis.htm>
- <http://academic.emporia.edu/aberjame/wetland/soils/soils2.htm>

For more information on wetlands found in Florida, see

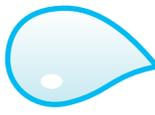
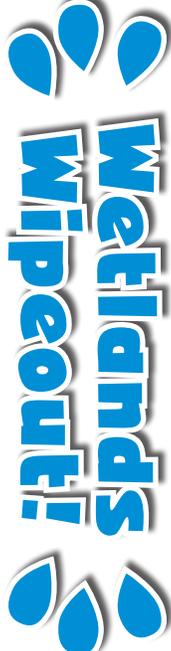
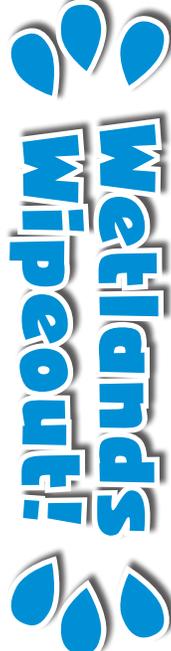
- http://www.swfwmd.state.fl.us/publications/files/waterweb_wetlands.pdf
- <http://soils.ifas.ufl.edu/wetlandextension/types.htm>
- <http://plaza.ufl.edu/realmic/FLwetlands/maps.htm>

For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://theriverreturns.org/>
- <http://dep.state.fl.us/Northeast/stjohns/default.htm>

Directions for "Wetlands Wipeout!"

1. In turn, a player reaches into the bag without looking, draws a slip, and reads the trait aloud. He then places the slip in front of him.
2. If a player draws a slip labeled with a trait he has already collected, he returns it to the bag.
3. If a player draws a "Wetlands Wipeout!" slip, he must return any slips he has collected to the bag.
4. Play continues until one student wins the round by being the first to collect all three traits. Return all slips to the bag and play again. The player who wins the most rounds is the game winner.

 <p>water-saturated, hydric <u>soil</u> that is saturated with water for all or part of the year</p>	 <p>water-saturated, hydric <u>soil</u> that is saturated with water for all or part of the year</p>	 <p>water-saturated, hydric <u>soil</u> that is saturated with water for all or part of the year</p>	 <p>frequent and prolonged presence of <u>water</u> at or near the soil surface</p>	 <p>frequent and prolonged presence of <u>water</u> at or near the soil surface</p>	 <p>frequent and prolonged presence of <u>water</u> at or near the soil surface</p>	 <p>frequent and prolonged presence of <u>water</u> at or near the soil surface</p>
		 <p><u>vegetation</u> that has adapted to live in water-saturated, hydric soils for all or part of the year</p>	 <p><u>vegetation</u> that has adapted to live in water-saturated, hydric soils for all or part of the year</p>	 <p><u>vegetation</u> that has adapted to live in water-saturated, hydric soils for all or part of the year</p>	 <p><u>vegetation</u> that has adapted to live in water-saturated, hydric soils for all or part of the year</p>	 <p>water-saturated, hydric <u>soil</u> that is saturated with water for all or part of the year</p>

Bogs, Swamps, Marshes, and Fens

TYPES OF WETLANDS

SKILLS: researching a topic, summarizing, making a presentation

COMMON CORE STANDARDS/FLORIDA STANDARDS: W.4.7-9; W.5.7-9;
SL.4.4-5; SL.5.4-5

NEXT GENERATION SCIENCE STANDARD: 5-ESS2-1

NEXT GENERATION SUNSHINE STATE STANDARD: SC.5.L.17.1

MATERIALS:

- print and online resources related to bogs, swamps, marshes, and fens
- poster board (optional)
- markers or colored pencils (optional)

STEPS:

- 1 Introduce these terms: *bog*, *swamp*, *marsh*, and *fen*. In pairs, have students discuss what they think they know about each term. Then explain that these terms are names for types of wetlands.
- 2 Assign each pair of students one type of wetland to research. (You may wish to divide marsh into *salt marsh*, *estuary*, and *freshwater marsh*; swamp into *forested swamp* and *shrub swamp*, and bog into *northern bog* and *pocosin* to have seven topics instead of four.) Direct students to use available resources to find out the following information about their assigned wetland.
 - What characteristics distinguish your wetland from other types of wetlands?
 - What plants and animals live there?
 - What adaptations do these plants and animals have that allow them to live in a wetland?
 - Where are these wetlands located?
- 3 After students have gathered their research, instruct them to creatively summarize and present their information in a slide-show presentation, a poster, a skit, or another format of their choice.
- 4 Provide time for the groups to share their projects with the class.
- 5 As a follow-up, challenge students to investigate to find out the types of wetlands that are found in Florida, particularly those around the Palatka area and Putnam County. (See the box of information on page 6.)



✓ **Marshes** are frequently or always covered with water. They are home to emergent soft-stemmed vegetation. Nutrients are plentiful, which means marshes are home to a great variety of plant and animal life.

✓ **Swamps** are characterized by woody vegetation, such as trees and shrubs.

WETLANDS

Bogs, Swamps, Marshes, and Fens

TYPES OF WETLANDS

Extensions for Grades 2-3:

Project online photos of swamps and marshes. Have each student share with a partner what she thinks makes a marsh a marsh and a swamp a swamp. Conduct a class discussion; then read together a brief text or online description of each wetland type. Wrap up the discussion by having each student pair create a Venn diagram that compares the two wetlands. *Common Core Standards/Florida Standards RI.2.7; RI.3.7; W.2.8; W.3.8; Next Generation Science Standard 2-LS4-4; Next Generation Sunshine State Standards SC.2.N.1.1; SC.3.N.1.6*

Extensions for Grades 6-8:

Post a laminated world map. Have students help you mark South Africa, Vietnam, northern Australia, southern India, southern Florida, and western Brazil. Explain that these regions have important wetlands. Discuss their latitudes (which are all between the Tropic of Cancer and the Tropic of Capricorn) and how the climate of these regions influences the wetlands. Then ask, "Can wetlands exist in areas with cooler climates?" After students share their opinions, have them research this question. *Common Core Standards/Florida Standards W.6.7-8; W.7.7-8; W.8.7-8; Next Generation Science Standards MS-ESS2-5; MS-ESS2-6; Next Generation Sunshine State Standard SC.6.E.7.6*

For more information on the types of wetlands, see:

- http://water.epa.gov/type/wetlands/types_index.cfm

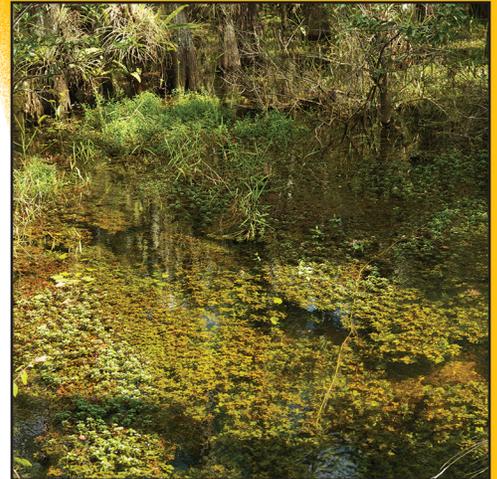
For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://theriverreturns.org/>
- <http://dep.state.fl.us/mainpage/res/ed.htm>

What types of wetlands are found in Florida?

Tracking down wetlands in Florida? You'll find these types in the Sunshine State:

- **hardwood swamps:** forested swamps found along rivers and streams
- **bayheads:** forested swamps usually dominated by evergreen trees and shrub species
- **cypress wetlands:** wetlands dominated by bald cypress and water tupelo trees
- **deep marshes:** marshes that have a depth of 6" to over 3' during the plant growing season
- **shallow marshes:** marshes that have up to 6" of standing water during the plant growing season
- **hydric hammocks:** forested swamps dominated by hardwood species and sabal palms
- **wet prairies:** marshes that occur in poorly drained areas



✓ **Bogs** have spongy peat deposits, acidic waters, and a floor covered by a thick layer of sphagnum moss. Bogs get all or most of their water from precipitation. They are low in the nutrients plants need to grow.

✓ **Fens** are peatlands like bogs, but they receive water from groundwater instead of precipitation. Because fens are not as acidic as bogs and have higher amounts of nutrients, they are home to a greater diversity of plant and animal life.

Magic Water Filtration System

WETLANDS' FUNCTION OF IMPROVING WATER QUALITY

SKILLS: observation, inference skills, informative writing

COMMON CORE STANDARDS/FLORIDA STANDARDS: W.4.7;
W.5.7; W.4.8; W.5.8

NEXT GENERATION SCIENCE STANDARD: 5-ESS3-1

NEXT GENERATION SUNSHINE STATE STANDARD: SC.4.N.1.7

MATERIALS:

- mixture of sand and dirt
- water
- large, clear container, such as a large vase or pitcher
- small bowl
- tablespoon
- long-handled spoon

Note: This activity will occur over several days.



STEPS:

- 1** Explain to students that researchers claim that, based on evidence, wetlands are important to water quality. Have students predict how this might be true.
- 2** Fill the large container with water. (Leave room at the top to add more water later.) Mix two heaping tablespoons of the sand and dirt mixture and water in the small bowl. Then add it to the large container. Stir the contents. Ask students to describe the water and predict what will happen as the movement of the water slows. After students record their ideas, set the container aside. Ask students not to disturb it.
- 3** The next day, mix more sand and dirt mixture with water and add it to the large container. This time, do not stir the mixture. Have students predict what will happen to this newly added dirty water; then have them observe the container and record their observations. Set the container aside.
- 4** On the following day, have students observe the container and compare its contents to yesterday's observations. (*Students should note that, like the previous day, all particles have settled to the bottom of the container.*) Ask students why this might be and how this activity models how wetlands might filter or cleanse water. Have students record their thoughts.



Magic Water Filtration System

WETLANDS' FUNCTION OF IMPROVING WATER QUALITY

5 Point out that the sand and dirt that were added to the water eventually dropped to the bottom of the container. Wetlands slow the flow of water. Because the flow of water is slowed, any suspended sediment and pollutants drop out of the flow, just like the sediments that were added to the container eventually dropped to the bottom. The result is a natural cleansing that helps keep pollution, toxins, and nutrients out of the water supply.

6 Have each student write a letter to a friend to explain the experiment and what it demonstrated about the role of wetlands in improving water quality.

Plants Do Their Part, Too!

Plants actually play a major role in the Filtration process. Plant roots and stems block the flow of water and cause the sediments to drop out of suspension. They also absorb much of the materials as sources of nutrients.



Extensions for Grades 2-3:

Give each pair of students a wipe-off marker and a small whiteboard or laminated piece of poster board. Have each student pair brainstorm a list of ways they use water. After students share their ideas, explain that water is a natural resource. A *natural resource* is something that is found in nature and is valuable to humans and the functioning of the environment. Ask students to tell how other living things use water as a natural resource. *Common Core Standards/Florida Standards SL.2.1; SL.3.1; Next Generation Science Standard 2-ESS2-3; Next Generation Sunshine State Standard SC.3.L.17.2*

Extensions for Grades 6-8:

Assign one of the following economic benefits of wetlands to each of five small research teams: water quality, flood control, fisheries, recreation, and habitat. Have each team research its benefit and then create a visual that illustrates its findings. Provide time for groups to share their project with the class. *Common Core Standards/Florida Standards RI.6.2; RI.7.2; RI.8.2; SL.6.4; SL.7.4; SL.8.4; Next Generation Science Standard MS-LS2-5; Next Generation Sunshine State Standard SC.7.E.6.6*

For more information on the function of wetlands, see:

- <http://water.epa.gov/type/wetlands/outreach/upload/functions-values.pdf>
- <http://plaza.ufl.edu/realmic/FLwetlands/important.htm>
- <http://idahoptv.org/dialogue4kids/season6/wetlands/whycare.cfm>

For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://theriverreturns.org/>
- <http://dep.state.fl.us/mainpage/res/ed.htm>

Besides improving the quality of water, wetlands have other important functions:

- Wetlands provide a place for excess water to go and be stored, thus reducing the frequency and intensity of flooding.
- Wetlands provide recreational activities, such as hunting, fishing, kayaking, canoeing, photography, and bird watching.
- Seventy-five percent of all fish and shellfish commercially harvested in the U.S. spend part of their lives in wetlands.
- Wetlands are home to a huge diversity of wildlife and support many endangered species of plants and animals.



WETLANDS DETECTIVES

Wetlands can come under natural threats or threats caused by humans. Be a wetlands detective! Read each situation. Write the threat to the wetlands and the potential result. Then tell whether it is a natural threat or a human threat.



SITUATION 1

A large area of the southeastern United States has received very little rain for over three years. This area usually has 15 inches of rain in one season, but this season it only saw five inches of rain. That is just one third of its normal rainfall!

Threat: _____

Result: _____

Natural or human? _____

SITUATION 2

The population of a city is growing. Developers have looked to drain and fill in wetlands. They want to build houses, shops, and factories on this land. This will help the city grow and provide more jobs for the people in the city.

Threat: _____

Result: _____

Natural or human? _____

SITUATION 3

Some scientists believe that Earth's climate is getting warmer. A warmer climate means an increase in water temperature. Warmer water contains less oxygen, and many aquatic animals cannot survive with lower oxygen levels. Warmer water may also contribute to more algae, which will decompose and use more oxygen in the process.

Threat: _____

Result: _____

Natural or human? _____

Rainfall that is not absorbed by the soil is called *runoff*. Pollutants such as pesticides and nutrients from lawns and gardens can also threaten wetlands if they are washed off the landscape with the runoff. Pet waste and oil and gas from vehicles are also threats.



© 2014 Georgia-Pacific. Text and design by The Education Center, LLC

Common Core Standards/Florida Standards
 RI.4.1; RI.5.1
 Next Generation Science Standard 5-ESS3-1
 Next Generation Sunshine State Standard
 SC.4.L.17.4

Note to the teacher: Have students in grades 2–3 work together to examine just Situations 1 and 2. *Common Core Standards/Florida Standards* RI.2.1; RI.3.1; *Next Generation Science Standard* 3-LS4-4. Have students in grades 6–8 focus on how climate change contributes to wetlands loss. *Common Core Standards/Florida Standards* RI.6.1; RI.7.1; RI.8.1; *Next Generation Science Standard* MS-ESS3-3, 4, 5; *Next Generation Sunshine State Standard* SC.6.E.7.2

WETLANDS DETECTIVES

For more information on the threats to wetlands, see:

- <http://water.epa.gov/polwaste/nps/urban.cfm>
- <http://www.epa.gov/gmpo/education/pdfs/WorldBackyard4.pdf>
- <http://www.environment.nsw.gov.au/wetlands/ThreatsToWetlands.htm>



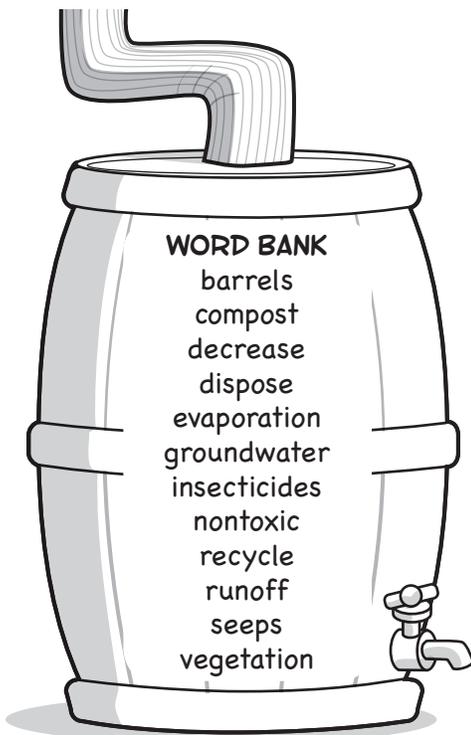
LET'S CLEAN UP OUR ACT!

What can you do to help keep our wetlands wonderful? More than you think! Read each statement below.

Fill in the blank with a word from the word bank.



1. You can decrease the number of hard surfaces, like concrete, that increase the amount of _____ from your property.
2. To cut down on the amount of runoff on your property, you can landscape your yard with _____, gravel, or other porous materials.
3. You can also redirect rain gutters and downspouts away from buildings and into rain _____ and gardens or soil.
4. Consider using natural soil supplements like _____ or rotted manure.
5. Composting can _____ the amount of fertilizer needed.
6. Don't over-water lawns and gardens, which can increase the leaching of fertilizers into _____.
7. If you water lawns early in the morning, you can reduce the amount of water lost to _____.
8. You can also recycle and _____ of all trash properly.



9. One important thing you can do is dispose of paints, _____, used oil, polishes, and other hazardous chemicals properly.
10. Consider buying _____ products whenever you can.
11. Instead of washing your car at home, you can take it to a professional car wash. Professional car washes are required to reuse and _____ the water on-site.
12. Never dump used motor oil onto the ground. Just one quart of oil that _____ into groundwater can pollute 250,000 gallons of water!



© 2014 Georgia-Pacific. Text and design by The Education Center, LLC

Common Core Standards/Florida Standards
 RI.4.4; RI.5.4; RI.4.10; RI.5.10
 Next Generation Science Standard 5-ESS3-1
 Next Generation Sunshine State Standard
 SC.4.L.17.4

LET'S CLEAN UP OUR ACT!

ANSWER KEY

1. runoff
2. vegetation
3. barrels
4. compost
5. decrease
6. groundwater
7. evaporation
8. dispose
9. insecticides
10. nontoxic
11. recycle
12. seeps

For more information on wetlands restoration and what you can do to protect wetlands, see:

- <http://water.epa.gov/type/wetlands/restore/index.cfm>
- <http://water.usgs.gov/nwsum/WSP2425/restoration.html>
- <http://water.epa.gov/action/adopt/index.cfm>