

Wetlands

# CURRENTS

current water info for high schools



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## Do you ever think about the future?

When you mention wetlands, most people think of a humid swamp edged with cypress trees, buzzing with mosquitoes and teeming with alligators. Movies like *The Swamp Thing* and *Creature from the Black Lagoon* came from the imaginations of people who were raised in a time when wetlands were considered useless and even a little frightening. Mostly due to this negative view, more than half of America's original wetlands have been destroyed — drained and converted to farmland, filled for housing development and industrial complexes, and used as dumping sites for household and hazardous wastes. All along we thought our actions were justified, but now we realize the value of wetlands.

### Is it too late?



Southwest Florida  
Water Management District

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# Introduction

Wetlands are the moist, muddy areas where water meets land. Wetlands come in many shapes, sizes and varieties. A wetland is defined as wet ground or soil that has three characteristics:

1. It is covered by water, or has waterlogged soil, for at least seven days during the growing season. Waterlogged soil is soil that contains so much water that there is no room for oxygen.
2. The soil is *hydric*, meaning it does not have enough oxygen for some plants to grow.
3. The plants in wetlands, called hydrophytes, have adapted to life in wetlands. *Hydrophyte* literally means “water loving.” These plants can grow without much oxygen from the hydric soil.

Florida is fortunate to contain almost one-fifth of all the existing wetlands found in the United States. But even though we have extensive wetland areas in our state, we can’t assume we’ll have them forever. As you may know, the population in our state grew at a rapid rate. People moving to Florida — and the buildings, roads and parking lots that come with them — put wetlands in jeopardy.

In the southern part of our state, the largest wetland restoration project in our nation’s history is taking place. It’s called the Everglades Restoration Project. Canals that were dug to drain south Florida of water are now being removed so that the Everglades can be restored to more closely resemble the original “river of grass.” Dams and other flood control structures

that interfered with the natural wet and dry seasons of wetlands are being removed. And wetland vegetation that protected the dark Everglades waters from pollutants is being restored. But restoration isn’t easy and comes at a price. The Everglades Restoration Project will take decades to complete and will cost billions of dollars.

Obviously, restoration is possible. But education and preservation are cheaper and easier ways to protect Florida’s wetlands. So do your part. Identify a wetland, monitor the health of that wetland and educate your community about the wetland’s importance.

## Classroom Activity

# The World of Wetlands

Although all wetlands contain hydric soil and are covered by water during some part of the year, they can differ greatly in other respects. Wetlands come in a variety of shapes, sizes and forms. Some occur naturally, while others have been created by humans.

### Saltwater Wetlands and Freshwater Wetlands

Wetlands can be grouped into one of two basic categories: saltwater wetlands and freshwater wetlands. Obviously, the distinction depends on whether the wetland contains salt or fresh water. Saltwater wetlands are found along coastlines where the ocean meets the shore. Freshwater wetlands are situated inland and are usually depressions in the ground where water collects. This water can come from precipitation, runoff or groundwater discharge. Both types of wetlands support a number of plant and animal species.

### Swamps Versus Marshes

Wetlands can also be classified as swamps or marshes. The basic distinction depends on whether or not the wetland contains trees. Swamps are forested wetlands, containing trees and large shrubs. Marshes, on the other hand, are primarily filled with grasses and various soft-stemmed plants. Within the Southwest Florida Water Management District, there are five primary types of wetlands. These are coastal marshes, mangrove swamps, freshwater marshes, cypress swamps and hardwood swamps.

### Coastal Marshes

As the name implies, coastal marshes are saltwater wetlands located along ocean coasts. These ecosystems contain an abundance of plant and animal life. Most coastal marshes are full of cord grass, which is the most common form of plant life in this type of wetland. Cord grass is primarily a freshwater plant that can survive and even thrive in a saline environment. Its root system helps to keep soils in place during the in-and-out motion of the tides.

### Mangrove Swamps

Mangrove swamps are often located near coastal marshes. Mangroves are unique due to their ability to obtain fresh water from salt water. Some are able to block the intake of salt at their roots, while others excrete excess salt from their leaves. There are three main types of mangrove trees: red, black and white. Reds grow closest to the ocean and are exposed to the most salt water. Red mangroves are sometimes called “walking trees” due to their roots that stick out well above the surface of the water. Black mangroves grow further inland. Whites grow the most inland and are exposed to the least amount of salt water. Mangroves contribute greatly to the life in bordering ecosystems. The trees provide shelter for many types of waterfowl, and their root systems serve as nurseries for a variety of fish and crustaceans. In turn, these animals provide food for larger predators.

### Freshwater Marshes

Freshwater marshes are pond-like areas

filled with grasses, flowers and other water plants. The soil here is saturated with water for at least one month in the growing season. These wetlands are often drained to make way for commercial or residential uses. Agricultural drainage is the main cause of marsh loss.

### Cypress Swamps

These wetlands are made up of closely spaced cypress trees. Epiphytes, such as Spanish moss and other air plants, hang from their branches. Of all wetland trees, cypresses are the most capable of surviving severe flood conditions. They often grow in standing water or poorly drained soil. Cypress trees also regenerate quickly after a fire; in fact, periodic fires help to keep other forms of vegetation out of cypress swamps. Several animals, including alligators, raccoons, otters, frogs, turtles and snakes, live in these areas.

### Hardwood Swamps

Hardwood swamps contain a variety of trees and are usually located near lakes or rivers. Occasional flooding of these freshwater bodies saturates the swamp floor for part of the year. However, this type of wetland is sensitive to change, and too much or too little water may turn it into a different type of ecosystem. Since the area can be wet or dry, depending on the time of year, many different animals make their homes here.

# What Do You Think?

Select one type of wetland and describe the ways in which this ecosystem can have a positive impact on the larger environment.

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## Question:

When I look at the water in a wetland, it often looks like a dark, tea-like liquid. What causes the water to look this way?

## Answer:

Standing water found in wetlands is caused by flooding during the rainy season and by seepage from groundwater sources. Leaves and bark from trees, such as oaks and cypress, contain chemicals in them known as tannins. Because the leaves from these plants soak in the water, the tannins seep out of the leaves and into the water. This gives the water a brown, tea-like appearance. It's the same process you use to make a cup of tea.



## Why Are Wetlands Important?

**Wetlands are essential to the natural environment.**

Here are just a handful of their valuable functions:

### **They improve water quality.**

Wetland plants and soils act as a filter, trapping pollutants as they move through the ecosystem. If the water eventually seeps into underground water supplies, it is much cleaner than it was when it entered the wetland.

### **They provide flood protection.**

During periods of heavy precipitation, water often flows into low-lying wetlands. These wetlands can store excess water and prevent damage to residential or commercial areas.

### **They prevent shoreline erosion.**

Wetlands can act as a buffer between open water and land. Without this buffer, waves hitting the shore would erode coastlines.

### **They provide wildlife habitat.**

Many plant and animal species depend on wetlands for survival. In addition, sheltered and nutrient-rich wetlands serve as ideal nursery areas for a wide variety of animals.

### **They are recreational areas.**

Humans can visit wetlands to enjoy a number of outdoor activities, including hunting, fishing, boating, hiking and bird watching.

## Whiz Quiz

Circle True or False for each statement about wetlands.

- True False** 1. Swamps contain trees.
- True False** 2. Mangrove swamps are sensitive to change and are most often found near lakes or rivers.
- True False** 3. Cypress trees are generally one of three main types: red, black or white.
- True False** 4. Freshwater marshes are often drained for agricultural purposes.
- True False** 5. Saltwater wetlands are situated inland and are usually depressions in the ground where water collects.

# Measuring Up Our Wetland Trees

## Background

Depending on the type of wetland environment, you may find cypress trees, mangroves, oaks, maples, elms, willows or pines. Trees located in wetlands must be able to thrive in waterlogged soil or water. As trees age, we know they grow in diameter, producing a new ring around their trunks each year. As you look at the trees found in a wetland, you may notice they can vary greatly not only in trunk diameter but also in height. A tree's life span may be threatened by influences such as lightning, wind, cutting, fire or fungal diseases. In this activity, you will have the opportunity to determine the size and height of a few trees in a nearby wetland.

## Learning Goal

- To develop an appreciation for the trees growing in a wetland environment.
- To develop strategies of measurement for solving real-world problems.

## Subjects

- Science
- Mathematics

## Materials

- meter stick
- 2 markers
- cord a few meters in length
- pencil
- paper



## Activity

1. You will need to do this on a sunny day so that shadows appear.
2. In a nearby wetland area, choose five different trees to study. Describe each tree on your chart. Use the sample chart as a guide.
3. Wrap the cord around the trunk of the first tree to determine its girth. Then measure the length of the cord with your meter stick. Record the measurement of the circumference on the chart.
4. Determine the diameter of the tree by using the following formula:  $c \div \pi = d$   
 $c$  = circumference  
 $d$  = diameter  
 $\pi = 3.14$   
 Record the diameter on the chart.
5. Now let's figure out what the height of the tree is without climbing to the top of

it! Place the meter stick in the ground so that it stands upright near the tree. Observe the length of the shadow made from the meter stick and mark this position on the ground. Also mark where the meter stick was positioned and measure the distance from this spot to the end of the shadow. Now observe the distance of the shadow made from the tree and measure this distance. Use the following formula to determine the height of the tree:  $T = (S \times Ts) \div Ss$

$T$  = height of tree  
 $S$  = height of meter stick  
 $Ts$  = length of tree shadow  
 $Ss$  = length of meter stick shadow  
 Record the height of the tree on the chart.

6. Complete the chart by repeating the procedures you followed for the first tree.

	Description of Tree	Circumference	Diameter	Height
1.				
2.				
3.				
4.				
5.				

## Discussion Questions

1. Describe how you would compare the various trees used in your study.
2. What types of trees are most common to this wetland area?

## Wetland Facts

Here are some interesting facts about wetlands:

- In the last 200 years, Florida has lost 9.3 million acres of wetlands.
- George Washington was one of the first people to attempt large-scale wetland drainage when he formed a company in 1763 to drain the Great Dismal Swamp for agricultural purposes. The swamp is located on the border of North Carolina and Virginia.
- Florida has 190 rare wetland-dependent species, such as the American crocodile, Florida panther, manatee and the green sea turtle.
- Wetlands are found on every continent except Antarctica.
- More than half of Alaska is covered in wetlands. It is estimated that there are between 170 to 200 million acres of wetlands in Alaska.



## Careers in Wetland Environments

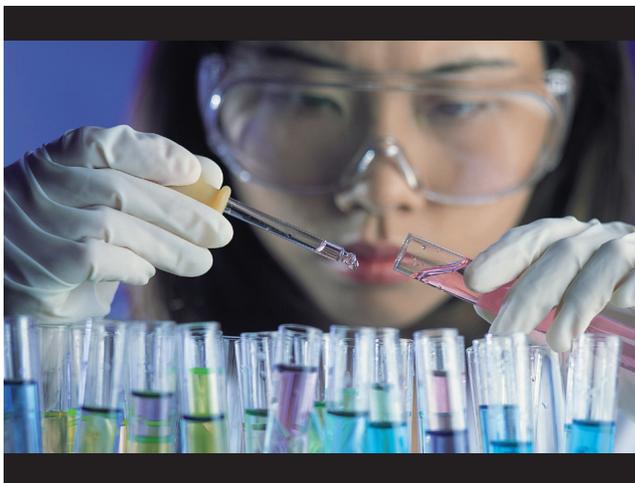
There are many different job opportunities that allow you to protect and work in wetland areas. Most careers related to environmental studies require at least a bachelor's degree.

### Botanist

A botanist is a scientist who studies plants and plant life. Botanists who want to work in outdoor settings, such as wetlands, typically focus on the scientific classifications of plants, plant exploration, plant diseases and physical characteristics of plants. A plant taxonomist, for example, may work as a consultant in wetlands evaluation, helping to identify threatened or endangered plants or defining wetland boundaries by the types of plants found in the area. Careers in botany require at least a bachelor's degree.

### Aquatic Biologist

An aquatic biologist studies the plants and animals that live in freshwater ecosystems, including wetlands. Chemical testing and studying the way water moves and flows are two areas of specialty within the field of aquatic



biology. Careers in aquatic biology require at least a bachelor's degree.

### Geologist

A geologist specializes in the study of the earth and the physical processes that change it. Within the field of geology, hydrologists and hydrogeologists concentrate on surface and underground water supplies. In wetland areas, scientists study the fluctuating depth levels and quality of the water. Careers in geology require at least a bachelor's degree.

### Zoologist

A zoologist studies animals, but not necessarily at a local zoo. There are many subfields within this field of biological sciences. Animal biologists may study microscopic cells of a specific animal or the biology of a group of animals within an ecosystem, such as a wetland. Herpetologists study reptiles and amphibians. Mammalogists study mammals. Ichthyologists study fish. Ornithologists study birds. All these animals may be found in wetlands. Careers in zoology usually require advanced education beyond a bachelor's degree.

To locate additional information about jobs for students in environmental studies, check out your local library or log on to the Internet and search for a few of the key words used in the career descriptions. Jobs in these fields are very competitive, so it's never too early to begin preparing for a successful outdoor career.

## Websites to Explore

A lot of information is available about wetlands. Your local library most likely has several books about these important places. You can also search the Internet to discover an abundance of topics related to wetlands. You may want to begin your exploration by visiting the U.S. Environmental Protection Agency (EPA) Wetlands home page at [www.epa.gov/owow/wetlands/](http://www.epa.gov/owow/wetlands/).

For a virtual tour of a wetland right here in our area, take the Green Swamp tour at the Southwest Florida Water Management District's website. Visit: [www.WaterMatters.org/greenswamp/](http://www.WaterMatters.org/greenswamp/)

### Contact Information

*Currents* is provided by the Southwest Florida Water Management District. For more copies of this newsletter or a teacher's guide, please order online at [WaterMatters.org/publications](http://WaterMatters.org/publications) or call (352) 796-7211, or 1-800-423-1476 (FL only), ext. 4757.

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