

# WaterWeb

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

## Extreme Weather and Mapping

### Teacher's Guide



Welcome to the extreme weather and mapping issue of WaterWeb!

As part of the Splash! Water Resources Education program, the Southwest Florida Water Management District offers

the WaterWeb water resources newsletter designed especially for middle school students. The newsletter is correlated to grades 6–8 of the Sunshine State Standards and provides an interesting way for students to increase their awareness and respect for Florida's extreme weather conditions.

This issue of WaterWeb focuses on extreme weather and mapping. It includes an overview of extreme weather conditions and mapping, an in-depth study of hurricanes, information about hail and twisters, a comparison of droughts and floods, a mapping activity about weather forecasting, puzzlers about lightning and suggestions for learning more about extreme weather conditions and forecasting. All the information and activities are designed to teach students about

the importance of weather and its impact on our environment. In addition, we have included WaterWeb Challenge, which contains items similar to those students could expect to find on the Florida Comprehensive Assessment Test (FCAT). Let WaterWeb make a splash in your classroom today!

Many other free materials are available from the Southwest Florida Water Management District and can be ordered online at [WaterMatters.org/publications](http://WaterMatters.org/publications). We also offer water resources workshops for teachers. Please contact us if you have any questions or suggestions about our water resources education programs.

**Youth Education  
Communications Department  
Southwest Florida Water Management District**  
(352) 796-7211 or 1-800-423-1476 (FL only), ext. 4757  
[WaterEducation@WaterMatters.org](mailto:WaterEducation@WaterMatters.org)



Southwest Florida  
Water Management District

## Introduction

Ask your students about any experiences they may have had with extreme weather conditions. Explain the difference between weather and climate. Weather describes the outdoor conditions on a day-to-day basis. Climate refers to weather patterns in an area over a long period of time. Read the introduction together and discuss how our water resources may be affected by extreme weather conditions. For an extra challenge, have students use the Internet or reference materials to learn about each of the specific weather instruments listed in this section.

### Sunshine State Standards

Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3.

## A Few Facts & Figures About Hurricanes Page 2

Ask students to share their experiences of the hurricane season. Read the information about one of nature's most extreme weather conditions. Then have students complete the checkup that follows and discuss their answers.

Answers: 1-F, 2-T, 3-T, 4-F

### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3.*



## Learn More About It Page 3

Discuss the various categories of hurricanes. Then ask students to explain why storm surges can cause tremendous damage and threaten lives. Emphasize the need for evacuating regions where water levels rise and overflow onto land surfaces. The strong force of rushing water can have devastating effects on inland areas. Hurricane guides often contain maps labeled with zone numbers (number 1 is the lowest-lying area) to help people identify evacuation areas. Ask students if they can identify their evacuation zone. Then have them complete the “Deadly Effects” activity and share their written responses with others.

### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3. Language Arts (6–8): Reading, LA.A.2.3; Writing, LA.B.2.3.*



## I Was Wondering... Page 3

It's interesting to learn weather concepts. Have students read the parts of Question and Answer. Then ask students to share their experiences with hail damage. To learn more about hailstones, use a search engine and look for web sites on the Internet. Ask students to find out how hail is connected to the water cycle.

### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; The Nature of Science, SC.H.2.3.*

## Twisters Page 4

Students may recall seeing films such as “The Wizard of Oz” or “Twister.” Or they may have actually had a personal experience with a tornado. Read the information about tornadoes. Then have students complete the “Analyze It” section that follows and share their responses. Ask students if their families have discussed what to do in the event of an approaching tornado. Emphasize the importance of early detection systems for predicting hazardous weather.



### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3, SC.D.2.3; The Nature of Science, SC.H.2.3. Language Arts (6–8): Writing, LA.B.2.3.*

## Opposite Extremes — Floods & Droughts Page 5

People don’t usually associate droughts with Florida because we receive an average 54 inches of rain annually. However, when the amount of precipitation is far below normal, drought conditions develop in the area. Regardless of whether we are experiencing periods with too little rainfall or too much, encourage your students to practice water conservation habits. Discuss ways in which our water resources can be affected by floods and droughts. Then have students complete the Venn diagram and discuss the results.

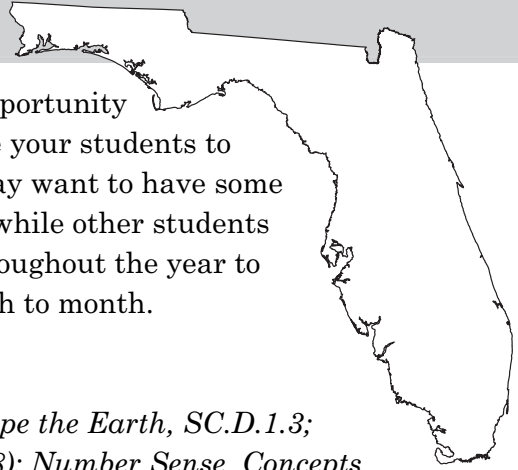


### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; How Living Things Interact with Their Environment, SC.G.1.3, SC.G.2.3; The Nature of Science, SC.H.2.3. Social Studies (6–8): People, Places and Environments, SS.B.2.3. Language Arts (6–8): Writing, LA.B.2.3.*

## You Can Make It! Page 6

The purpose of this activity is to provide students with an opportunity to create their own weather map. For best results, encourage your students to collect weather information from a variety of sources. You may want to have some students create weather maps of the entire state of Florida, while other students focus on a more local area. This activity may be repeated throughout the year to demonstrate how patterns in weather can change from month to month.



### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3. Mathematics (6–8): Number Sense, Concepts, and Operations, MA.A.1.3, MA.A.2.3; Measurement, MA.B.1.3, MA.B.2.3, MA.B.4.3; Data Analysis and Probability, MA.E.1.3, MA.E.2.3, MA.E.3.3. Language Arts (6–8): Reading, LA.A.2.3; Writing, LA.B.2.3.*

## Just for Fun Page 7

Although these puzzlers are meant to be fun, they are also designed to reinforce important concepts related to weather.

Answers: 5 miles, 8.33 kilometers; 2.2 miles, 3.66 kilometers; 6 miles, 10 kilometers.

### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3. Mathematics (6–8): Number Sense, Concepts, and Operations, MA.A.1.3, MA.A.2.3; Measurement, MA.B.1.3, MA.B.2.3, MA.B.4.3. Language Arts (6–8): Reading, LA.A.2.3; Writing, LA.B.2.3.*



## Surfing for More Info Page 8

A lot of information about extreme weather and forecasting is available on the Internet. A variety of maps are also contained on each of the sites which can help boost your students' map skills. Encourage your students to learn more about weather and mapping.



### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3. Language Arts (6–8): Reading, LA.A.2.3.*

## Tell Us What You Think! Page 8

Try to encourage all your students to complete this activity. You may even want to send their responses to us as a class set.

### Sunshine State Standards

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3. Language Arts (6–8): Writing, LA.B.2.3.*

This information will be made available in accessible formats upon request.  
Please contact the Communications Department at (352) 796-7211  
or 1-800-423-1476 (FL only), ext. 4757.

# WaterWeb

## Challenge

Items included in the Challenge are similar to those presented on the Florida Comprehensive Assessment Test (FCAT). Make copies of the Challenge and explain to students that this provides good preparation for the FCAT. Students should be allowed to use the *WaterWeb* issue as they complete the Challenge.

**Answers to multiple-choice items:** 1-a, 2-c, 3-b, 4-d, 5-b, 6-d, 7-b, 8-d, 9-a, 10-b

### ***Extended-Response Items***

#### **Question 1.**

Responses will vary. Students should be able to demonstrate a thorough understanding of one type of extreme weather condition common to Florida.

**Score 2 Points If ...** The response indicates that the student understands the nature of an extreme weather condition. The student has provided three facts about the condition.

**Score 1 Point If ...** The response indicates that the student has a partial understanding of an extreme weather condition. The student has provided two facts about the condition.

**Score 0 Points If ...** The response is inaccurate, confused or irrelevant.

#### **Question 2.**

Responses will vary. Students should be able to describe several ways a drought can impact the environment, based on information presented on page 5 of the newsletter. Providing a logical explanation of the importance of water conservation should also be included in the student's answer.

**Score 2 Points If ...** The response indicates that the student has a thorough understanding of the impact a drought can have on the environment and the importance of water conservation.

**Score 1 Point If ...** The response indicates that the student has a partial understanding of the impact a drought can have on the environment and the importance of water conservation. The student has provided a response that is basically correct, but incomplete.

**Score 0 Points If ...** The response is inaccurate, confused or irrelevant.

### **Sunshine State Standards**

*Science (6–8): Energy, SC.B.1.3, SC.B.2.3; Processes that Shape the Earth, SC.D.1.3; The Nature of Science, SC.H.2.3, SC.H.3.3. Social Studies (6–8): People, Places and Environments, SS.B.2.3. Language Arts (6–8): Reading, LA.A.2.3; Writing, LA.B.2.3.*

# WaterWeb

## Challenge

**Directions:** This is your opportunity to demonstrate what you have learned about extreme weather conditions and mapping. It is also an opportunity for you to practice answering questions similar to those on the FCAT. Do your best and meet the challenge!

For each multiple-choice item, select the best answer.

1. In this issue of *WaterWeb*, you have learned that Florida has many forms of extreme weather conditions. What type of climate exists here?
  - a. subtropical
  - b. polar
  - c. arid
  - d. subpolar
2. What is a hurricane?
  - a. a twister
  - b. an unnamed tropical storm
  - c. the strongest type of tropical cyclone
  - d. a tropical depression
3. According to the Saffir-Simpson Hurricane Scale, which type of hurricane below would cause the greatest amount of damage?
  - a. a category F1 hurricane
  - b. winds greater than 155 miles per hour
  - c. a category 4 hurricane
  - d. a category 1 hurricane
4. Which feature of a hurricane causes the most damage to people and property?
  - a. hailstones
  - b. spinning winds of a vertical funnel
  - c. waterspouts
  - d. storm surges
5. Choose the TRUE statement about droughts.
  - a. Droughts exist in areas where the amount of precipitation is above normal.
  - b. Droughts challenge the water consumption needs of all types of water users.
  - c. Droughts have very little impact on wildlife habitats.
  - d. Droughts improve the quality of soil and landscape conditions.
6. What scale is used to categorize the strength of a tornado?
  - a. Doppler Waterspout Scale
  - b. Saffir-Simpson Tornado Scale
  - c. Radar Detection and Ranging Scale, known as Doppler
  - d. Fujita Tornado Intensity Scale, known as the F-scale
7. Tampa Bay ranks third in the world for the most waterspouts. What is a waterspout?
  - a. a rotating column of air over water
  - b. a rotating column of water over water
  - c. a rotating column of water over land
  - d. a rotating column of air over land
8. What information is often included on a weather map?
  - a. amounts of precipitation
  - b. high and low temperatures
  - c. fronts
  - d. all of the above
9. What is a positive effect of lightning on our environment? Choose the best answer.
  - a. It helps to maintain a balance of electricity between the earth and the sky.
  - b. It can cause forest fires to start and spread throughout a neighborhood.
  - c. It can destroy buildings and other structures.
  - d. It can harm animals and people.
10. What is an important message of this issue of *WaterWeb*?
  - a. A network of Doppler radar systems exists only in Florida.
  - b. Florida has a variety of severe weather conditions.
  - c. Florida rarely experiences extreme weather conditions.
  - d. Most weather patterns occur in a layer above the troposphere.

