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How Florida Droughts Affect the Everglades and Us

There are many challenges associated with Everglades restoration, particularly with the quantity and timing of available water. Too much or too little water adversely affects the Everglades ecosystems, Florida residents living in urban areas, and the economy of the state. The periods of low rainfall in combination with water supply operations create lower water levels in the Everglades, resulting in droughts. Precisely, a drought is defined as “a prolonged period of abnormally low rainfall, leading to a shortage of water”.

The severity of drought depends on the amount of time that a region receives below average rainfall. Since drought has considerable impacts in both natural and built environments, it is very important to understand drought related questions such as:

1. How do droughts occur?
2. What are the effects of droughts on the Everglades and us?
3. What we can do to mitigate droughts in Florida?

In Florida, major droughts have occurred in the previous four decades. Among them, the 1999-2001 drought was the worst drought in the state’s history. During those years, Florida received little rainfall and the water basins and streams began to go dry. There was not enough water to replenish the Biscayne aquifer which is a major source of drinking water supply of south Floridians. The average annual rainfall in Florida is about 54 inches (greater than any other state but Louisiana); however, it is not evenly distributed in time and area and has some unusual characteristics that tend to produce periods of water shortages, causing droughts.

To better understand the potential impacts of droughts on the Everglades and us, watch this video: <https://youtu.be/Pea6AEdJ9HI> of the Economic Impact of Droughts in South Florida presentation by the 2011 Arthur R. Marshall Foundation Summer Interns.

Directions: Have students watch the Economic Impact of Droughts in South Florida presentation. After watching, have your students use their critical thinking and analysis skills to complete the student activity worksheet. Please keep in mind this video presentation is intended for higher grade levels, however this activity may be adapted for younger grades.

Standards: LAFS.8.W.1.2, SC.912.L.17.17, SC.912.L.17.16, SC.912.17.18, SC.912.L.17.20, LAFS.1112.SL.1.1, LAFS.1112.W.3.7

[Student Activity Worksheet](#) (attached below)

[Student Activity Worksheet Answer Key](#) (attached below)



Name: _____

For additional information visit:

● The U.S. Drought Monitor (USDM) online map:

<https://www.drought.gov/drought/states/florida>

● Long-term drought conditions by the Florida Division of Emergency Management:

<https://www.floridadisaster.org/hazards/drought/>

Everglades Literacy Lesson Connections:

Grades 9-12 Water Use and Society: Lesson 2: A Question of Quantity

<https://www.evergladesliteracy.org/9th-12th-water-use-and-society>

--Students will look at a typical water conservation plan and analyze it from the viewpoint of various stakeholders.

Grades 9-12 Everglades Restoration: Lesson 3: A look at CERP

<https://www.evergladesliteracy.org/9th-12th-everglades-restoration>

--Students will analyze information about various current and ongoing Comprehensive Everglades Restoration Plan (CERP) projects and report on the progress that is being made.

Grade 8 Human Impacts: Lesson 1: Sponging Off the Everglades

<https://www.evergladesliteracy.org/eighth-grade>

--Students will participate in a lab experiment where they identify the different water users in the Everglades and how much water is consumed by each user group. Students will recognize ways to conserve water and discuss why water conservation is important to the Everglades.



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How Florida Droughts Affect the Everglades and Us Activity Worksheet

Directions: Watch the “Economic Impact of Droughts in South Florida” presentation: <https://www.youtube.com/watch?v=Pea6AEdJ9HI>. After watching, use your critical listening and analysis skills to complete the activity and answer questions.

Part 1: Listen closely to the presentation and match the statements on the left (times where the statement may be found in the presentation are to the left) to the correct statements on the right to complete the informative sentences.

1. _____ (1:11-1:22) This stage of apathy between droughts needs to change into...

2. _____ (2:51-3:00) Here in South Florida we have some of the high rates of evapotranspiration (ET),...

3. _____ (3:12-3:18) Droughts and floods are also human concepts. In the absence of humans...

4. _____ (3:31-3:38) Problems arise in times of drought. In Florida, droughts can be drastically exacerbated by

5. _____ (4:26-4:32) Between 1998 and 2011 there had been 4 droughts...

6. _____ (4:41-4:51) We have plenty of water in South Florida- with an average rainfall of 54 inches per year. However, due to lack of storage and mismanagement, ...

7. _____ (6:33-6:46) Many of the effects of drought are short term, ending as...

8. _____ (8:27-8:49) Currently in 2007, there had been over 4,000 wildfires....

9. _____ (11:10-11:30) A Forestry study found that in situations of higher...

10. _____ (16:02-16:09) Drought policies should outline clear sets of...

11. _____ (19:51-20:01) Supporting CERP and other restoration efforts is crucial if we hope to better cope with droughts in the future and avoid...

A. ...increased demand of water and uneven distribution of this precious resource.

B. ... costing millions perhaps billions in drought management.

C. ...which have burned over 200,000 acres. We have calculated the cost of suppression to be over \$14 million dollars for 2011, and over the course of CERP that would amount to over \$171 million dollars if these drought trends continue.

D. ...a proactive drought prevention stage before the water supply runs dry.

E. ...danger conditions, reported health problems from smoke and ash, and the spread of fire to nearby vacation regions, 45-55 percent of tourists would make substantial alternations- either changing or cancelling their trip plans.

F. ...the wide-ranging adverse impacts that come with them.

G. ...thus we should have the high rainfall rates and water storage.

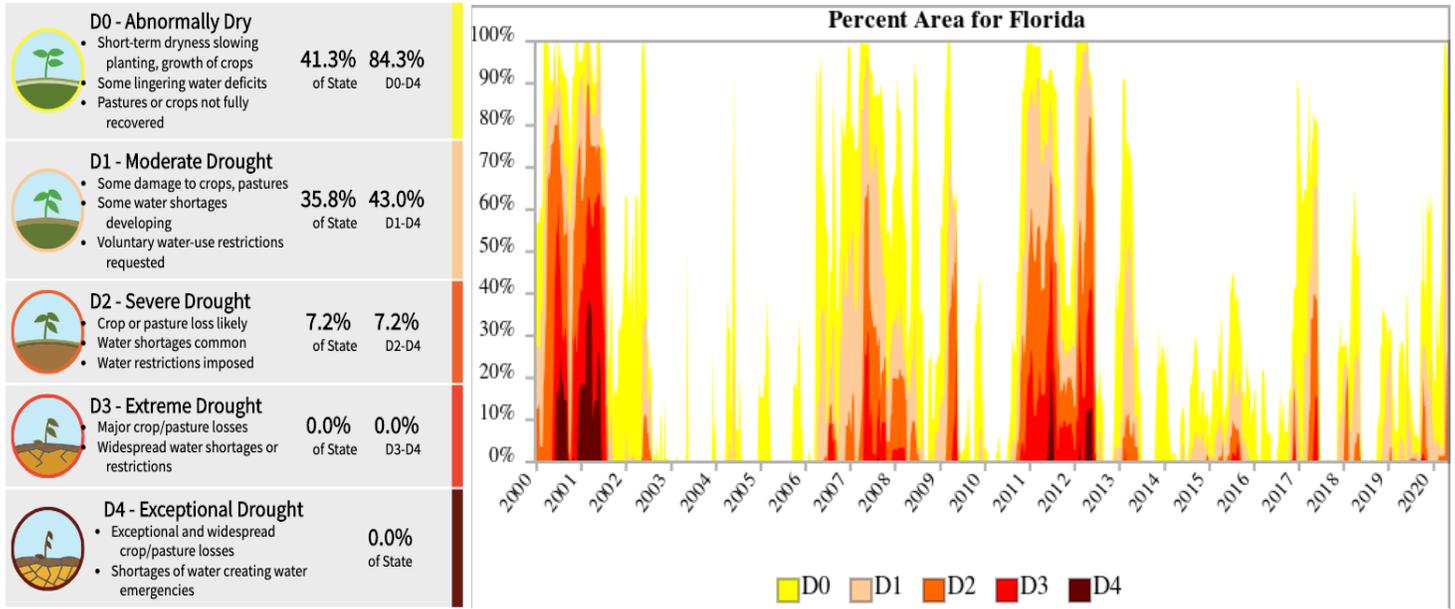
H. ...the natural system copes with both extremes just fine.

I. ...most of this water goes to tide.

J. ...the drought comes to an end. However, many environmental effects of droughts hinder the area for longer time.

K. ...principles upon which to base management of drought and its impacts.

Part 2: Utilizing the associated maps and graphs, answers the questions below.



Photos both retrieved from the National Integrated Drought Information System at <https://www.drought.gov/drought/states/florida>

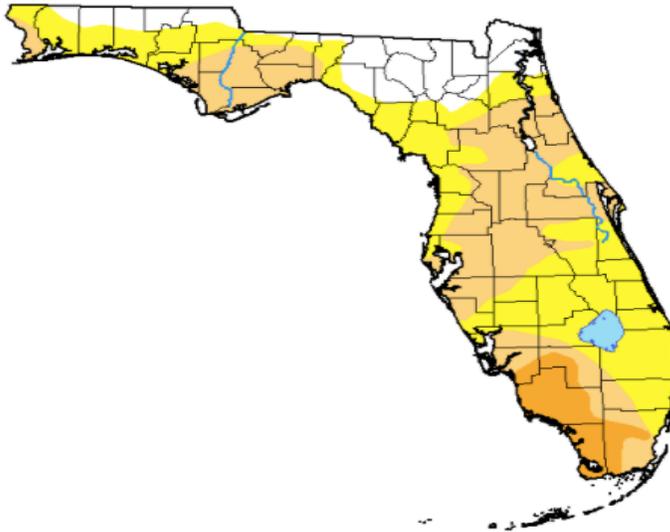
1. As mentioned in the presentation, many drought impacts are often short term, however, many environmental drought impacts hinder the area for longer periods of time. Looking at the drought “Percent Area for Florida” graph and legend above, which years caused the biggest concerns for long term environmental impact? Explain your answer.

2. Looking at the drought “Percent Area for Florida” graph and legend above, what kinds of environmental effects are we currently undergoing in 2020 due to the present drought conditions?

U.S. Drought Monitor Florida

Name: _____

April 28, 2020
(Released Thursday, Apr. 30, 2020)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	15.72	41.23	35.83	7.22	0.00	0.00
Last Week 04-21-2020	2.27	32.53	38.79	26.40	0.00	0.00
3 Months Ago 01-28-2020	56.90	38.95	4.15	0.00	0.00	0.00
Start of Calendar Year 12-31-2019	75.86	15.55	8.59	0.00	0.00	0.00
Start of Water Year 10-01-2019	56.91	19.51	17.40	5.56	0.61	0.00
One Year Ago 04-30-2019	72.38	23.11	4.51	0.00	0.00	0.00

Intensity:

 None	 D2 Severe Drought
 D0 Abnormally Dry	 D3 Extreme Drought
 D1 Moderate Drought	 D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Deborah Bathke
National Drought Mitigation Center



droughtmonitor.unl.edu

Photo retrieved from the Florida of Emergency Management at <https://www.floridadisaster.org/hazards/drought/>

3. Looking at the drought conditions chart above, how have drought conditions changed from last week to current time (according to the map current= April 28th, 2020)? Explain your answer.

4. Explain how current drought conditions (according to the map current= April 28th, 2020) might impact the Everglades.

5. Explain 3 things you learned from the presentation and/or from the maps above.

How Florida Droughts Affect the Everglades and Us

Activity Worksheet Answer Key

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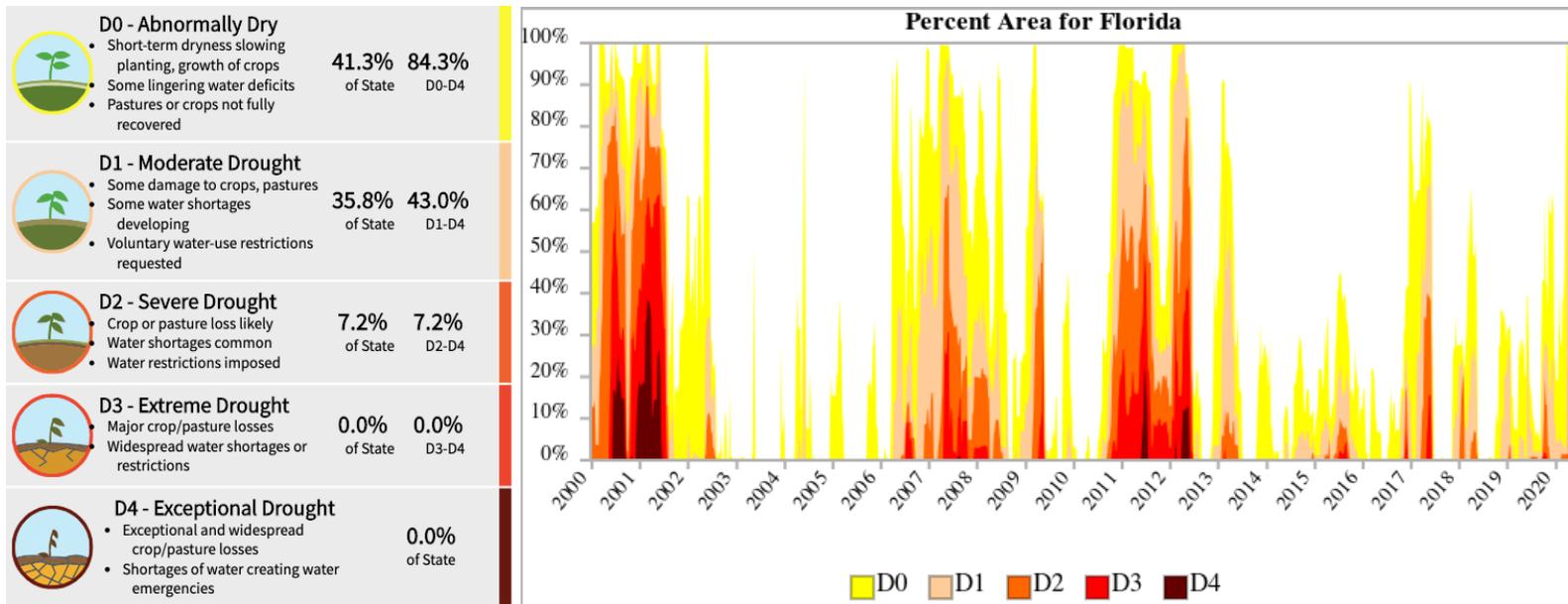
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Part 2: Utilizing the associated maps and graphs, answers the questions below.



Photos both retrieved from the National Integrated Drought Information System at <https://www.drought.gov/drought/states/florida>

1. As mentioned in the presentation, many drought impacts are often short term, however, many environmental drought impacts hinder the area for longer periods of time. Looking at the drought “Percent Area for Florida” graph and legend above, which years caused the biggest concerns for long term environmental impact? Explain your answer.

Answer: Looking at the Percent Area for Florida drought map and legend, the years 2001, 2008, 2011, and 2012 caused the biggest concerns for long term environmental impacts. The legend shows that the D3 intensity of extreme drought and the D4 intensity of exceptional drought both cause the largest long-term environmental impacts.

2. Looking at the drought “Percent Area for Florida” graph and legend above, today in 2020, what kinds of environmental effects are we currently undergoing due to the present drought conditions?

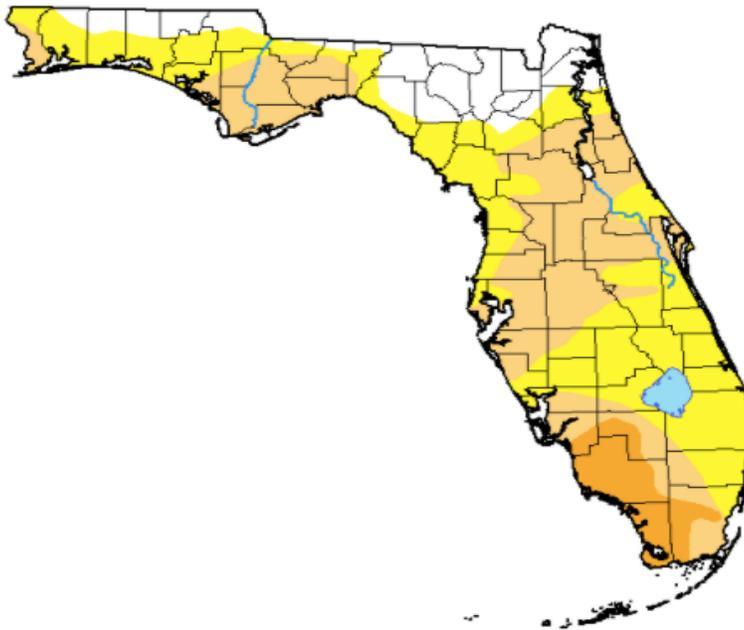
Answer: Looking at the Percent Area for Florida drought map and legend, Florida is currently experiencing D0, D1, D2, and D3 intensity droughts. These level drought conditions are affecting the environment by: D0= short term dryness slowing planting and the growth of crops, lingering water deficits, pasture or crops not fully recovering. D1= Some damage to crops, pastures, some water shortages developing, voluntary water-use restrictions requested. D2= crop or pasture loss likely, water shortages common, water restrictions imposed. D3= Major crop/pasture losses, widespread water shortages or restrictions.

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3. Looking at the drought conditions chart above, how have drought conditions changed from last week to current time (according to the map current= April 28th, 2020)? Explain your answer.

Answer: Last week in April 2020, the drought conditions were much more drier. Referencing the key on the top right, we can analyze the difference in percent area for drought conditions at different times. For instance, last week, the percent area of drought in a D2 intensity was at 26.4% whereas this week the percent area of drought in a D2 intensity was at 7.22%.

4. Explain how current drought conditions (according to the map current= April 28th, 2020) might impact the Everglades.

Answer: Currently we are experiencing mostly D0 and D1 drought intensities, with about 77 percent of Florida area being in D0 and D1 intensity zones. No drought conditions account for about 15.72 percent of Florida area, and D2 accounts for about 7.22 percent of Florida area. From the presentation, we learned that in times of drought, wildlife habitats are damaged, therefore declines in plant and animal populations are possible. Increases in forest fires are also seen.

5. Explain 3 things you learned from the presentation and/or from the maps above.

Answer: Answers will vary.