Teacher's Guide
Alafia River Watershed Excursion

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT — High School

View excursions at: *WaterMatters.org/Watersheds*

Lesson Time: One block or class period (approximately 50 minutes)

Grades: 9–12

Objective: Using context clues and relevant facts in the excursion, students will understand the importance of a watershed's health, the characteristics of local watersheds and how human actions affect the environmental quality of valuable habitats and the species of plants and animals in them.

Next Generation Sunshine State Standards:

SC.912.L.17.1:	Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.
SC.912.L.17.7:	Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems.
SC.912.L.17.8:	Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, nonnative species.
SC.912.L.17.10:	Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.
SC.912.L.17.12:	Discuss the political, social, and environmental consequences of sustainable use of land.
SC.912.L.17.16:	Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.
SC.912.L.17.18:	Describe how human population size and resource use relate to environmental quality.
SC.912.L.17.20:	Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

Common Core Curriculum Standards:

Grades 9–10

LACC.910.WHST.1.1e	Text Types and Purposes
LACC.910.RST.1.1	Key Ideas and Details
LACC.910.RST.1.2	Key Ideas and Details
LACC.910.RST.2.4	Craft and Structure

Grades 11–12

LACC.1112.WHST.1.1e	Text Types and Purposes
LACC.1112.RST.1.2	Key Ideas and Details
LACC.1112.RST.2.4	Craft and Structure
LACC.1112.RST.2.6	Craft and Structure

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Lesson Plan and Activities

Vocabulary:

Watershed:	An area of land that water flows across as it moves toward a common body of water, such as a stream, river, or coast
Ecosystem:	A biological community of interacting organisms and their physical environment
Karst terrain:	The land surface produced by water dissolving bedrock; characterized by sinkholes and caverns
Floodplain:	Lands next to water bodies and low-lying areas that temporarily store excess floodwater and help slow and disperse floodwaters
Reservoir:	A natural or constructed area where surface water is collected and stored for later use
Sinkhole:	A natural depression in the land surface caused when bedrock erodes underground and dissolves from acidic water
Pioneer community:	The initial community of colonizing species
Stormwater runoff:	Rainwater that picks up pollution as it washes over roads, parking lots, driveways, rooftops and other hard surfaces and washes into water bodies
Runoff:	The excess rain that flows over land, down streets and through storm drains into rivers, lakes and estuaries

Engage: (15 minutes) Students will take the pretest included before beginning this lesson. Review the vocabulary terms and ask aloud the following questions to activate prior knowledge:

- Describe what type of living and nonliving things you would find in a typical Florida ecosystem.
- What is the aquifer made of?
- What is the cause of a sinkhole?
- Why do land and water need to be protected?
- How can environmentally important lands be protected?

Explore/Explain: (20–25 minutes) Pass the student worksheet out and ask students to go to *WaterMatters.org/Watersheds*, scroll to the bottom of the webpage and click on the Alafia River Watershed Excursion. Instruct students to click the Onward button of each photo until they reach the Map. Then students should continue through the links at the top of the webpage while completing the worksheet.

continued on page 3

Lesson Plan and Activities *continued from page 2*

Extend: (10 minutes) Bring the class together after 20–25 minutes to discuss some of the questions on the student worksheet. If time allows, consider using "Think-Pair-Share" and pair students with one another to share their answers. Then ask each pair to share one of their answers with the class.

Evaluate: (5 minutes) Students will take the posttest (same as pretest) after viewing the excursion and completing the worksheet and lesson.

Additional links:

- Visit *WaterMatters.org/education/resources* to view all six virtual watershed excursions and the coordinating teacher's guides. At this site, you can also view the Florida Watersheds video (11 minutes) and download the coordinating middle or high school teacher's guides.
- Take the Watershed Pledge with your class at *WaterMatters.org/education/*.

Teacher Answer Key
Alafia River Watershed Excursion

Southwest Florida Water Management District

Pre-/posttest Answer Key

1. c.
2. b.
3. c.
4. a.
5. c.

Student Worksheet Answer Key

(1) 270,000 acres
(2) largest
(3) Polk
(4) sinkholes, caverns and disappearing streams and springs
(5) Floridan aquifer system
(6) carbonic acid and organic acids
(7) sinkhole
(8) flow
(9) Live oak and the sabal palm
(10) alive
(11) Alafia Banks (or Birds of the Banks)
(12) 40 to 70 miles
(13) agriculture
(14) ornate pottery and elaborate burials
(15) Captain Pedro Menéndez de Avilés
(16) Cattle, citrus and logging
(17) 1920s
(18) C.W. II Young Regional Reservoir
(19) 117,000
(20) floodplain
(21) phosphate mine pits
(22) Answers may include: fishing, biking, boating, hiking, picnicing, birding
(23) Reduction in wildlife habitats, degradation of the natural beauty and creation of demands on water resources
(24) Habitat degradation, invasive plant infestation and exposure to runoff from an upstream agricultural watershed
(25) Answers will vary — may include stormwater treatment of agriculture runoff, addition of freshwater wetland habitats, improved water quality, removal of Brazilian pepper, establish seagrasses in tidal channels and lagoons, educational programs

Pre- and Posttest
Alafia River Watershed Excursion

Southwest Florida Water Management District

1) The history of the Alafia River watershed includes the following events except:
   a. European settlers tried to colonize the land many times unsuccessfully.
   b. Tampa Bay was once a freshwater lake before the sea level elevated.
   c. The Indians helped the Spanish explorers settle on the land.

2) The Alafia River watershed has karst terrain, which means:
   a. Its waters are filled with tannins, leaf detritus and other organic materials.
   b. The land surface was produced by dissolved bedrock.
   c. The river provides a vast amount of phosphates.

3) Which of the following statements about the Alafia River watershed is true?
   a. Springs do not contribute water to the Alafia River.
   b. The Alafia River watershed is dominated by pine trees.
   c. The Alafia River watershed is the largest watershed in Hillsborough County.

4) What mineral is the Alafia River watershed known for?
   a. Phosphate
   b. Limestone
   c. Nitrate

5) What strategy is used to restore the Alafia River watershed?
   a. Stormwater treatment of agricultural runoff
   b. Lands are protected and habitats are preserved.
   c. Both a. and b. are correct

Student Worksheet
Alafia River Watershed Excursion

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Go to the Alafia River Watershed Excursion at: *WaterMatters.org/Watersheds*

Directions: Click the Onward button of each photo until you reach the Map. Then follow the links at the top of the webpage. Fill in the blanks on this worksheet as you complete the tour.

Tab 1: Map — Hover over the stars to read about key areas of the Alafia River.

Crystal River Springs group is the **(1)**_____ springs group in Florida.

Tab 2: Geology

The Alafia River Watershed, the largest in Hillsborough County, is **(1)** _____acres.

Click Onward. After a prolonged drought and increased water needs, the Alafia River now has the **(2)**_____ outflow of any river in the bay. About one-third of this watershed is in **(3)**_____ County while the majority is in Hillsborough County.

Click on the Karst link on the top right in Geology. This watershed is an example of a karst terrain because water dissolves bedrock and creates what characteristics? **(4)**_____ _____. The subterranean reservoir made from limestone is called the **(5)** _____.

Click on the Sinkholes link on the top right in Geology. As rainwater passes through soil, it picks up **(6)**_____and_____ that causes limestone to erode. Some geologists believe Tampa Bay was once a huge lake that began as a large **(7)**_____ until the earth warmed and the sea levels rose to form the current Tampa Bay.

Click on the Springs link on the top right in Geology. Water from springs supplies **(8)**_____ to rivers and other water bodies. Lithia Springs and Buckhorn Springs are significant to the Alafia River.

Student Worksheet
Springs Coast Watershed Excursion

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Tab 3: Ecology

Click Onward. Many species of trees thrive in flatwoods and sandhills. What two species dominate along the river and in lowlands? **(9)**_____ and _____.

Click on the Live Oak link on the top right in Ecology. Live oaks are evergreens, appearing to be **(10)**_____ in the dead of winter. This is how they got their name.

Click on the Birds link on the top right in Ecology. The **(11)**_____ is the most productive nesting colony in Florida.

Tab 4: History

Click Onward. Then click the following links in History:

Paleo — Archaeologists believe humans occupied Southwest Florida 12,000 years ago when sea levels were lower and the gulf shoreline was **(12)**_____ miles west of its current location.

Archaic — Paleo-Indians developed **(13)**_____ during the Transitional Period about 3,000 – 2,500 years ago. The Weedon Island culture was marked by

(14) _____.

Voyage — In 1528, Spanish explorer Panfilo de Narvaez made landfall in Tampa Bay and was greeted by hostile Indians. Narvaez and his men left the state after a long struggle to survive. In 1567,

(15)_____ established a fort in Pinellas County.

Settlement — In 1843, the soldier Benjamin Moody arrived with his family and built one of the first homes in the pioneer community of Peru that later became Riverview. What were the region's main industries? **(16)** _____, _____ and _____. The mining of phosphate provided an essential ingredient in fertilizer, and mining companies became popular throughout the watershed. Mining proved to be too expensive and labor-intensive and by the **(17)** _____most mining companies were out of business.

Resevoir — The **(18)**_____ is a large water storage area that may provide up to 25 per cent of Tampa's water needs for six months.

Student Worksheet
Springs Coast Watershed Excursion

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Tab 5: Recreation

The population in the watershed is **(19)** _____. The Alafia River watershed has many areas of recreation. Click on these areas to learn more:

Alafia River Corridor — The Southwest Florida Water Management District helps to conserve this land to protect the river, it's **(20)**_____ and habitats. This area was formerly **(21)**_____ , which are mostly revegetated.

Edward Medard Park — What are two recreational activities you can do here?

(22)_____.

Tab 6: Restoration

What is the effect in the Alafia River watershed of people migrating from rural areas to suburbs?

(23) _____

_____

Seventeen percent of land in the Alafia River watershed is protected. The Southwest Florida Water Management District has purchased land to protect, restore and manage water resources.

Click on Cockroach Bay. Name one of the environmental problems from which this tract has suffered in the past. **(24)**_____.

(25) Describe some of the actions being taken to restore the Alafia River watershed at Cockroach Bay.

_____

_____.

To view pictures, videos and panoramas of the Alafia River watershed, click on Gallery.