

**Lesson Summary:** Students will learn to use the Watershed Excursion Tool to develop their own Watershed Point of Interest Report and then answer FCAT-type questions.

**Grade Level:** 6-11

**Time Allotted:** One class period to review and gain skill in the use of the Water Atlas Watershed Excursion (WSE) tool. One or more class periods for using WSE tool to develop and publish a Watershed Point of Interest Report.

## Performance Objectives

*References are to the Next Generation Sunshine State Standards (2007).*

### Social Studies

- SS.8.G.2.1 Use geographic terms and tools to analyze case studies of regional issues in different parts of the United States that have had critical economic, physical, or political ramifications. SS.6.G.1.4 Utilize tools geographers use to study the world.
- SS.7.G.6.1 Use Global Information Systems (GIS) or other technology to view maps of current information about the United States.
- SS.8.G.5.1 Describe human dependence on the physical environment and natural resources to satisfy basic needs in local environments in the United States.

### Science

- SC.7.E.6.6 Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.

### Language Arts

- LA.7.6.4 The student develops the essential technology skills for using and understanding conventional and current tools, materials and processes. (LA.7.6.4)
- LA.6.1.7.3 The student will determine the main idea or essential message in grade-level text through inferring, paraphrasing, summarizing, and identifying relevant details.
- LA.6.6.4.2 The student will determine and apply digital tools (e.g., word processing, multimedia authoring, web tools, graphic organizers) to publications and presentations.

### Math

- MA.6.S.6.1 Determine the measures of central tendency (mean, median, and mode) and variability (range) for a given set of data.
- MA.7.G.4.4 Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.

## Prior Knowledge

Students should complete the "Watersheds" Lesson (#27).

## Overview

Students will be introduced to the Water Atlas [Watershed Excursion](#) (WSE) tool and will use this tool to select a watershed, explore the geography and resources of the watershed and select one of several pre-assigned points of interest and create a "story" that describes the point of interest (Watershed Point of Interest Report). The student will navigate to one or more water resource pages for water resources located within the selected watershed and download and graph water quality and water hydrology data for these resources using the Water Atlas Data Download system. The student will prepare a report that describes the selected point of interest and includes information on nearby water resources, recreational resources and historic places of interest. The report will be written either using the WSE directly or by using word processing software and copy the report to the WSE using a Word Copy tool.

## Key Vocabulary

### Database

A structured set of data held in a computer which is accessible in many ways. A spreadsheet is a form of database. A database is useful because it holds various types of data and can be searched and sorted with a computer.

### Hydrology

The science that deals with as it occurs in the atmosphere, on the surface of the ground, and underground.

### Point of Interest (POI)

A specific point location that someone may find useful or interesting. As the main gantry at the Kennedy Space Center.

### Query

A form of questioning or an inquiry. Many times associated with the requesting of information from a database.

### Spatial Database

A database that stores data that is related to objects in space, including points, lines and polygons.

### Spatial Query

A type of query that request spatial information (exact place, place adjacent to, place within a certain distance etc.) from a map or spatial database.

## **Water Quality**

The chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular use, such as fish habitat or drinking water.

## **Waterbody**

Any significant accumulation of water, including oceans, lakes, rivers, ponds, canals and wetlands.

## **Watershed**

The lands and waters that drain to a specific location.

## **Materials**

- Computer with internet access
- General description of points of interest collected by student or teacher.
- Digital photos of points of interest (JPEG format, each less than 1 megabyte in size).

## **Resources**

*These resources are available on the Orange County Water Atlas:*

### Advanced Mapping Tool

<http://maps.wateratlas.usf.edu/orange/>

(Select Advanced Mapping tool from main page of the [Orange County Water Atlas](#).)

### Watershed Excursion

<http://www.orange.wateratlas.usf.edu/wse/>

(select Watershed Excursion from "Explore" menu on [Orange County Water Atlas](#) main page).

### Watersheds "Learn More"

[http://www.orange.wateratlas.usf.edu/shared/learnmore.asp?toolsection=lm\\_watershed](http://www.orange.wateratlas.usf.edu/shared/learnmore.asp?toolsection=lm_watershed)

## Using the Watershed Excursion Tool *Lesson Plan*

*Students learn to use the Watershed Excursion Tool, develop a Watershed "Point of Interest."*

### Procedure

#### Engage/Elicit

Questions 1-3 should be reviewed and answered by the student with some teacher assistance. Discuss questions 4-6 and have students experiment with queries using Watershed Excursion Handout. Use item 7 as an outline for discussing the Orange County Water Atlas Watershed Excursion.

1. Ask the students what they remember about watersheds and ask them to use the Water Atlas to help them name four watersheds in Orange County.
2. Ask the students what types of water resources are found in Orange County.
3. Assign the students at least one watershed to explore and have them use the Orange County Water Atlas to find the assigned watershed. Once they have located the assigned watershed page on the Water Atlas have them use the "Map It!" button to view the watershed on Advanced Mapping and locate at least two of the major water resources within the watershed. Ask them to use the info tool to determine the size of the watershed.
4. Ask the students if they know what a database is and what it means to query a database.
5. Ask the students if they have ever queried a spatial database.
6. Ask the students if they have ever used Google Earth or used or watched their parents or an adult use a GPS map unit. Then explain that these are spatial queries.
7. Ask each student or student group to go to the WSE tool at: <http://www.orange.wateratlas.usf.edu/wse> and then discuss the different features of the Watershed Excursion as listed below (Reference Using the Watershed Excursion Handout):
  - a. The text that describes watersheds and basic information about watersheds.
  - b. Introduce the View Map feature and discuss the map legend and the use of zoom controls and find and select feature. Move the mouse "hand" across map, then left mouse click and move the map, next double left click the mouse to show one way of zooming map in and double right click mouse to show one way of zooming map out, then move hand over the watershed icon and point out that the hand changes to a select and the name of the watershed is shown. Finally, show how to use the zoom in and out feature. Allow the student to work with the map navigation features.
  - c. Introduce the View Photo Gallery and let the student review some of the photos available in the photo gallery.
  - d. Move down the page and show student the watershed list and explain how the use the list to select a watershed of interest.
  - e. Discuss the "Tell Your Story" function and how this feature will be used to publish student point of interest reports.
  - f. Now select a watershed first using the list and then using the map.
  - g. Explain the "breadcrumb" and its use in navigating between pages.
  - h. Select a point of interest (POI) within the Watershed either by using the map or list.

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- i. Now have the student select a story that is available on the POI page and make sure the student also views the Photo Gallery.
- j. Discuss how the "Story" feature will be used to write a Watershed Point of Interest Report (use Watershed Excursion Hand Out).

### Explore

1. Guide students to the Orange County Water Atlas Advanced Mapping Tools. This tool will be used to explore different types of database and spatial database queries. Use handout 2 to assist the student in using this tool.
  - a. Where on the map is your school? – Address query (asks questions of a street address database)
  - b. What watershed is your school located in? – A "within polygon query" (asks questions related to the address which is a point and the watershed which is a polygon).
  - c. What lakes are within the same watershed as your school? – A map select query (selects a webpage with additional information based on a map location).
  - d. When were water quality samples last taken from the lake nearest your school? – A point data query (selects a point and returns information or the destination of information about that point).
2. Guide students to the Orange County Water Atlas Watershed Excursion.
  - a. Ask student to select the watershed that their school is within. (Teacher should use the WSE Admin feature to add your school and nearby lakes and streams as points of interest).
  - b. Have student find their school from the list of points of interest and explore the information found there.
  - c. Have students select and read the Tell Your Story, Story about their school. (Teacher should have added this story prior to class).
  - d. Have student find one or more additional points of interest near the school and explore these.
  - e. Demonstrate how a story is written and published on the WSE.

### Explain

Have each student write a short story which might include an imagined visit to the point of interest, an encounter with some wildlife, a new technology, a historic site, or other interesting features found at the point of interest and an imagined scientific investigation of the "health" of a water resource near the point of interest. This final item can be improved by having student use the Water Atlas to gather data and graphs of data.

### Extend

1. Assign a single POI for students to further explore (teacher should load a POI which is near or on a water resource that has adequate water quality and other data available on the Water Atlas).

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2. Have students form groups of three or four and work together to write and edit Water Resource Point of Interest Reports (using Tell Your Story) which include scientific data, general information, map images and links to other information. Assist students in selecting the water resource(s) for which is adjacent or near the assigned POI.
3. Plan a field trip to the POI to learn more about it and gather photographs and (if a GPS is available) the photograph locations and locations of other items of interest. These data may then be used for a class project that results in a well documented report that can be uploaded to the WSE and Water Atlas.

### **Exchange/Evaluate**

1. Have students grade their FCAT practice questions, being sure to understand what they got wrong and why they chose it.
2. Evaluate their answers to the watershed questions.
3. Evaluate their "stories" paying special attention to the related data included and their statement about these data.
4. Select one or more "story" for the assigned POI and submit the story for publication. Stories are first approved by Orange County prior to publication.

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