

Seminole County Water Atlas Learning Kit

Rainfall & Water Level Graphs *Handout*

Students make and analyze graphs to discover relationships between rainfall and water level

Water Atlas Curriculum Lesson 34

Procedure:

PART ONE

A. Preparation

1. Make a new folder in your student folder on the server and label it Rock Lake (or any lake). This is where you will save all your documents on your lake study.
2. Now go to: <http://www.Seminole.WaterAtlas.org/>

B. Collect Data

1. Using the Water Resource Search tool, find the pages for Rock Lake (or a lake of your choice).
2. When the lake Overview/Current Conditions page comes up, go to the Photos Tab. Save a picture of the lake to your folder.
3. Next, click Data & Mapping Tab at the top of from the top menu. Open "Data Download & Graphing" > Surface Water Hydrology.
 - a. Select filtering by Water Atlas and Water Body Name and click Submit.
 - b. Choose Seminole County; Type in Rock Lake (or the name of the lake you chose).
 - c. Choose "Give me all station data"
 - d. Download your data as an Excel file. Move the downloaded file to your lake study folder.
4. Return to the "Overview/Current Conditions" page for your lake. (Back arrow or navigate from the home page) Click on the "Water Levels & Flows" tab. What is the historic water level (average) for your lake in feet above mean sea level?
Historic Level: _____ft.

C. Make A Graph

1. Open the Hydrology Data Excel document you saved to your folder. Save a copy and title it Water Level Graph.
2. Change the heading "level_ft." to say "Lake Level (ft)"
3. Insert a column after "Lake Level" and title the column "Historic Level (ft)."
4. Return to the Water Atlas website page for your lake. Find the Historic Lake Level (the average for all of the recorded levels) for your lake. Notice that lake levels are in feet above mean sea level. Minimize the web browser window.
5. Enter the value for Historic Lake Level and fill all cells in this column down to the last row containing data. (Highlight the Historic Lake Level and all of the cells below to the last row with data. In the menu, select Edit > Fill > Down)
6. Highlight the headers and data in three columns: "Sample Date," "Water Level," and "Historic Level."
7. Using the Excel chart tool, create a line graph showing the trend over time. Be sure and title your graph and axes. Save your graph in Excel format to your student folder.

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D. Compile And Analyze In A Word Document

1. Open a new Word document. Write a title and save in your student folder.
2. Go to File > Page Setup and change the margins to 0.75 in.
3. Insert (or paste in) the photo of your lake. Save.
4. Position the photo attractively on the page.
 - a. Center the photo using the type tools. (Think of it as an object, or a very large word!)
 - b. To move the picture up or down, click on the left edge of the picture. The curser will be on the lower left and will move the picture up or down.
 - c. To move your curser below the photo, click on the right edge and the curser will be on the lower right, as if at the end of a word. Press Return.
5. Open the Excel graph in your folder. Select the graph and copy it. Paste the graph into your Word document.
6. If necessary, resize the photo and/or the graph to leave space for your conclusion: Select the picture. Select a side or corner square. Click and drag. Keep the proportions the same for the picture. (Click and drag the corner squares.) Make the graph as wide as possible to better show the data. (Click and drag the side squares.)
7. Analyze the graph. Write one or more paragraphs.
 - a. What observations or conclusions can you make about the level of your lake compared with the Historic Average over this period of time?
 - b. What relationships do you think there are between rainfall and lake level? What question can you ask? Form an hypothesis about rainfall and lake level. Record the question and hypothesis. Make a prediction.
8. Preview. Be sure your student information is on the document and the page orientation (landscape or portrait) is correct. Save your document and print it out.

PART TWO

A. Print additional information.

Note: You will be using the website graphing tool. If the graph does not come up, press Ctrl-R (Windows) or Cmd-R (Mac) to refresh the graph.

1. Print a two-year graph of water levels.
 - a. Return to the General Info webpage for your lake. (Use the search box, top right.)
 - b. Click on the "Water Level & Flows" Tab on the info bar.
 - c. In the box with Water Levels information, click on Two Year Graph.
 - d. Scroll down and follow the print directions. Print the graph. Note: This will print the graph and the credits page that gives credit to the website and shows your data is from scientific sources. To avoid multiple copies, print only page one.
2. Print a two-year graph of rainfall in/near your watershed.
 - a. Visit the University of Florida's Florida Automated Weather Network (FAWN) site to collect rainfall data: <http://fawn.ifas.ufl.edu/>

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- b. On the FAWN site, find the map that shows where the data collection stations are. Identify the station that is closest to your chosen lake, and note its name.
- c. Use the FAWN report generator tool to download to your student folder a data spreadsheet file with monthly rainfall summaries for the last 24 months for the station nearest your chosen lake.
- d. Open the rainfall data file using Microsoft Excel or another spreadsheet program. Use the "Insert Charts" tool to make a graph of monthly rainfall data. The x-axis should be months, the y-axis should be the rainfall amount for each month. Label the graph accordingly, and be sure to include the units for the rainfall (inches or centimeters, for example).
- e. Save your file and print out the rainfall graph.

B. Analyze the data. Can you find any relationships or trends between rainfall and lake level?

1. Locate the corresponding range of dates on the two graphs made with the Watershed Atlas graphing tool. Consider your Question and Hypothesis about rainfall and water level. What is your conclusion?

2. Compare the two water level graphs. Locate the range of dates on both graphs. What additional information do you see on the first graph?

3. Judging by the changes in lake level, what do you predict other records will show about the rainfall for this watershed for the period when the lake was below average?

4. How can you check your predictions? (Newspapers, etc. other records of rainfall.)

ADVANCED ACTIVITY:

Most scientific data is in metric units so let's change our data to meters.

1. On the Excel document you created in Part 1C above, insert a column after level_ft. Title it level_m.
2. 1 m =3.28 ft. Change your measurements to meters. Put your cursor in E2 and write a formula to change feet to meters. Copy the formula down to the last row having data.
3. Graph this data. (Check with your teacher on writing a series for the x axis.)

Name:

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