

# Shape Shifter Lake Handout

Students examine a bathymetric map and the changing shape of a lake during drought and flood

**INSTRUCTIONS:**

1. Go to [www.Seminole.WaterAtlas.usf.edu](http://www.Seminole.WaterAtlas.usf.edu), click on Explore > Water Resources. Next, type in “Rock Lake” in the Water Resources box and in the Filter By Topic box and select “Bathymetric Map & Depth Info.” and select it on the list.
2. Click the picture box that says “View contour map.” Print out the map.
3. What was the elevation of the lake when this map was made?  
\_\_\_\_\_ feet above mean sea level (msl)
4. Complete the table to the right to show the elevation (above sea level) of each contour line. (*Contour line: line on a map that joins points of equal elevation.*)
5. How far apart are adjacent contour lines, in feet? (This is the contour interval) \_\_\_\_\_
6. Go back to the Water Levels & Flows page for Rock Lake. What is the Historic Range for the water level of Rock Lake? Low \_\_\_\_\_ High \_\_\_\_\_
7. Do you think the high and low lake levels will affect the shape of the lake? Make a prediction. Form a hypothesis. Use the back of this sheet for more space.
8. Use the table above, and the printed map. Find the contour line closest to the elevation of the lake when its surface was the lowest ever recorded. Trace around it.
9. Make a cut from the bottom of the page to that low-water contour line and cut around the line. Cut away the 0 to 400 ft. scale for later use. Leave the right margin on the scale so you can hold it. Set aside the scale and the part of the lake you cut out. Glue the paper with the middle cut out to a sheet of blue paper.
10. What does the cut out part, the blue part represent? \_\_\_\_\_
11. The homeowners aren’t at all happy about the level of the lake! Why?

| <i>Contour Depth</i> | <i>Contour Elevation</i> |
|----------------------|--------------------------|
| 0 ft.                | 77.953 ft. above msl     |
| -2 ft.               | 75.953 ft. above msl     |
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12. Find the dock on the southwest side of the lake. About how far is the water from the end of the dock? Use the paper scale you cut out.
  - a. about 50 feet
  - b. less than 10 feet
  - c. more than 100 feet
  - d. they can still fish off the dock
  
13. The neighbors on the western-most side of the lake are considering growing a crop of corn in the rich lake bottom. About how many feet of lake bottom do they have to work with between their yards and the lake? Use the scale.
  
14. Students at Rock Lake Middle School (at the northwest corner of the map) have been doing lake studies in the part of Rock Lake east of the driveway.  
About how far across was the lake at that point when the map was made? \_\_\_\_\_  
About how far across is it at low water? \_\_\_\_\_
  
15. When it starts to rain again, the storm water runs over the land or through storm drains into the lake. Rainwater infiltrates (enters) the ground, and then percolates down to the water table. The water moves downhill through the ground, and seeps into the lake. The water rises into its floodplain.  
We do not have a contour map for the land around the lake. We don't know if there are steep slopes, or gentle slopes. But, we can estimate the contour line of the high water. Oaks will not grow where their roots are under water for a part of the year. The high water mark of a lake often is the "tree line," the line of trees closest to the lake.
  - a. Examine your second aerial contour map to find the trees closest to the lake. Trace your best estimation of the tree line. This would be a good first estimation of how high the water rises.
  - b. Cut on this line just as you cut on the low water contour line. Set aside the lake you cut out. Glue the part of the paper with the hole cut out onto a piece of blue paper as before.
  - c. Glue the lake cutouts to a third piece of paper. Label the shifting shorelines according to elevation.

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16. There are some trees that can grow with their roots in water for a part of the year. Six such trees are Red Maple, Bald Cypress, Pumpkin Ash, Chinese Tallow, and Wax Myrtle (which might be called a shrub). Go to the Ecology tab. Click on List of Plant Species.
  - a. Are there any of the above trees around Rock Lake? List them.
  - b. Are there any invasive species? They are also called exotic plant pests. List them.
  - c. We need to “ground truth” the tree line. This means, “go look.” Some of the trees on the map may be trees that can stand high water, so they wouldn’t indicate the high water: no-trees-below-this-point line. Each group take a different tree. Click on the reference. Look at the photos under the images tab. Each group become an expert on one tree. Print a photo for identification. Do a Google Image search for more images, if needed.
  - d. What is the current level of Rock Lake? \_\_\_\_\_ Mark another contour on the aerial of Rock Lake to show the size and shape you expect to see when you reach the lake.
  - e. Go to the lake. Take the tree ID photos and any guidebooks you have. Look at the trees. Could the trees be within the floodplain, or might they mark the high water mark? Edit your estimated high water mark if needed.
  - f. Compare what you see with the shorelines and the lake cutouts. Edit your estimation of the current size and shape of Rock Lake if needed.
17. Return to the classroom. Restate the hypothesis and your prediction, and then write your conclusions about Shape-Shifting Lake Shores.
18. Write a paragraph about the effects of changing water levels on the shapes of lakes. Include details and use the lake models for illustration.

### **Food for thought!**

1. Does the changing depth and shape of the lake have any effect on animals that live in the lake, or depend on the lake for food? Explain.

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- 2. Does the way people use water (wasting water, or conserving water) have any effect on lakes?

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