WaterViz
LESSON
2

WaterViz at Hubbard Brook
a **water cycle** visualization tool

HUBBARD
BROOK

ECOSYSTEM
STUDY

Name(s):_____

Meet WaterViz*

Lesson is adapted from one originally developed by Jackie Wilson for Hubbard Brook Research Foundation.

Students will be able to:

▶ Identify the different components of the visualization.
▶ Explain how WaterViz is a simplified model of the water cycle.
▶ Demonstrate how to navigate around the "real time" visualization and past events.
▶ Interpret the relationships of variables that they visualize.

Go to: http://waterviz.org/. The Waterviz is a visualization tool that depicts water moving through various stages of the water cycle. The data in this visualization accurately reflect how water is moving through a small forested watershed in the USDA-Forest Service Hubbard Brook Experimental Forest in Woodstock, NH. The data that drive the visualization model run from September 2010 until a few days ago.

1. Welcome to Hubbard Brook! Take a moment to become familiar with water as it moves through the air, forest, soil and stream.

What do the following animated symbols represent? Click on the text that says "Visualization Key" to the right of the animation. Hover over the white circles and fill in this Key information:

Visualization Key

#	Term	Definition
1		
2		
3		
4		
5		
6		
7		
8		

2. Now return to the most recent visualization from the last few days. Click on the three-bar time stamp menu in the upper left-hand corner of the visualization. Type in 9/26/2018 at 7 AM on the time stamp window. Click on "Apply" and "OK." *What was happening at Hubbard Brook? Watch for 24 hours of data.* You can replay the animation to answer these questions.

    a. Did it precipitate? Explain.

    b. Can you see evidence of evaporation? Why or why not?

    c. Can you see evidence of transpiration? Explain. (Hint, also check the time of day.)

    d. Is there water flowing in the brook? At what rate? (record the highest red discharge number, including units)

3. Look at the visualization again. *List two climate factors that could affect the rate, or way water cycles through the environment* and explain why.

4. Click on the three-bar time stamp menu in the upper left-hand corner of the visualization. In the window, one at a time, click on and play the weather events listed below, hit "Apply" and "OK". Supply the data from the V-notch for each of the listed event visualizations: *What is the most extreme value for stream discharge in cfs during that event? Watch for 48 hours.* (To increase the speed of the visualization, find the "Update speed" bar in the upper left-hand corner. Slide the toggle bar to the far right.)
    a. Summer High Flow- _____
    b. Summer Low Flow- _____
    c. Rain on Snow- _____

5. When streamflow changes from high to low (as in events a. and b. above), *how might this affect the ecosystems in the watersheds?* Why?

6. Now, choose Tropical Storm Irene and watch the visualization for the 24-hour length of the storm. *What happened during Irene?* Describe the streamflow, evaporation, and transpiration.

7. Are there other aspects of the water cycle that are not depicted in the Waterviz?
Go to https://water.usgs.gov/edu/watercycle-kids.html to find the complete water cycle diagram. Use it to *explain your answer and why a model is a simplified version of the natural ecosystem.*

8. Continuing with the water cycle diagram, *what do you think is meant by the phrase "the sun is the driver of the water cycle"? Explain.* Use the terms *water vapor, condensation, precipitation,* and *evaporation* in your answer.

9. What have you learned from visualizing data in this way?