

Name _____

Date _____

Hurricane!

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body meant to review and assess technical information relating to climate change. As of 2013, 195 countries are members of the IPCC, with thousands of scientists from around the world volunteering their expertise to contribute to the IPCC's work. In 2007, they drafted a summary report which indicated that large, flooding storms are predicted to increase in intensity in northeastern North America. These types of storms could be hurricanes, nor'easters, blizzards and large storms in general. How do you think these regional storm events might change our local stream ecosystems? In this activity, you will learn how the flow of water in a stream changes during a flood and why the timing of a flood can make a big difference in its overall impact.

Part 1: Reading

Read the Poughkeepsie Journal article from April 22, 2007, and answer the following questions:

1. According to the USGS, how important was the April 2007 flood?
2. What natural factors contribute to the severity of a flood?
3. What human factors contribute to the severity of a flood?
4. How can actions taken in your community impact flooding in other communities?
5. What actions can be taken to reduce the impacts of future flooding?

Part 2: Create your graphs

Open the Excel spreadsheet "Hurricane." There are three different worksheets within this file. Click on the worksheet titled 'Hurricane Floyd.' In this worksheet, you'll find data from Hurricane Floyd, which swept through New York in September 1999. Create a graph showing the change in flow (in cubic feet per second, or cfs) during this storm. Next, go to the worksheet with the data from the April 2007 flood. Create a graph showing the change in flow during this event. Notice that both of these data sets include precipitation data for the months in which the floods occurred—you'll need this information in order to answer the questions below.

Part 3: Questions

Based on your graphs, answer the following questions:

1. How much rain caused each of the floods? Which event had more rain? Based only on this information, which storm do you think would cause more flooding?
2. When and how high was peak flow for the Hurricane Floyd flood? If it is difficult to answer this by looking at your graph, you may have to go back to the data and find the date of the peak flow and look more closely at the time.
3. When and how high was peak flow for the April 2007 flood?
4. What was the normal rate of discharge before the two floods?
5. Think about which storm caused more rain to fall and which storm had a higher stream flow rate. Why do you think this happened? Does this match with your predictions to question #1? Why or why not?
6. Notice the shape of the curves for the 2 different floods. How do they differ? Why?

Part 4: Historical Change

1. The Excel spreadsheet “Hurricane” contains a 3rd worksheet with historical peak flow data from Wappinger Creek at Red Oaks Mill. Plot the data and find the floods of September 1999 and April 2007. Were they historically the largest floods, or were there other times when the peak flow was higher?
2. Using the internet or the library, look up one of the floods you see on your graph. When did that flood occur, and what were some of the consequences?

Part 5: Future Change

Read about predictions of storm intensity under various global warming scenarios. “Confronting Climate Change in the Northeast” by the Union of Concerned Scientists includes two relevant sections: pgs 15-31 explains the impacts on coastal systems, while pgs 62-65 explains the impacts on water in the northeast. The report can be downloaded at:

<http://www.northeastclimateimpacts.org/> (<http://bit.ly/12xMaVa>). You can also use the following NASA Earth Observatory article to learn more about hurricanes

<http://earthobservatory.nasa.gov/Features/Hurricanes/> (<http://1.usa.gov/10VFRI2>). Answer the following questions based on this reading.

1. What is a hurricane? What category of storm causes the most damage? What kind of damage does it cause?
2. How many storms, on average, occur in the Atlantic Ocean each year?
3. Have the numbers of hurricanes been increasing or decreasing over the past 30 years? What evidence did you find to support your answer?
4. Based on the climate change report, what are the potential impacts of increasing storms on coastal systems? On water resources?
5. What impact are you the most concerned about? Why?
6. What impact are you the most concerned about? Why?