



Storm Surges and Seiches - Lesson 2 Activity: Impacts

Part 2 - Data sheet (Key)

1. Using a NOAA chart of the coastal area of Toledo, investigate where water levels would have been during the October 2001 storm surge. (Numbers printed in the water area of the chart are depths). During the October 2001 storm, the water level dropped six feet below normal.

- Draw a line on the chart at a depth of 6 feet. This line represents the new, temporary Toledo shoreline when the surge was at Buffalo.
- Use the scale on the lower left side of the chart to estimate how far from shore the water moved.

Distance of new shoreline from original shoreline in kilometers: **4.8 kilometers.**

Distance of new shoreline from original shoreline in miles: **3 miles.**

2. Buffalo is at the eastern end of Lake Erie. Using USGS maps of Buffalo and Toledo, investigate the shoreline at each location. Compare the differences between the two locations:

- Find and highlight the 180 meter contour in Buffalo and Toledo.
- Use the scale on the bottom of the map to estimate the distance from shore to the 180 meter contour line (1 centimeter = 1 kilometer and 0.4 inch = 0.6 mile). There is a 5 meter interval between contours.

Buffalo

Distance from shoreline to 180 foot contour (West Lackawanna, NY) in kilometers: **Distance is 0.1 centimeters which equals 0.1 kilometer (100 meters) on the map.**

Distance from shoreline to 180 foot contour (west Lackawanna, NY) in miles: **0.06 miles (328 feet).**

Toledo

Distance from shoreline to 180 meter contour (west of the Erie state game area) in kilometers: **Distance is 2 centimeters which equals 2 kilometers (2000 meters) on the map.**



Distance from shoreline to 180 meter contour (west of the Erie state game area) in miles: **1.2 miles (6561.7 feet).**

3. By using records accumulated over many years of storms and their effects on water levels, researchers have determined how often storms occur that cause a certain change in lake level. Using USACE storm probability tables, find the probability of a storm surge the size of the surge in October 2001 occurring in Buffalo.
 - The probability of the occurrence of a storm surge the size of the surge in October 2001 occurring in Buffalo in October? **Approximately 20 percent**
 - What is the size of the largest storm surge predicted for Buffalo, NY? **Approximately 8 feet**
 - During which month is a storm surge of this size predicted? **December**
 - During which month are the smallest storm surges predicted? **July**
 - What is the probability of the occurrence of a storm surge the size of the surge in Buffalo October 2001 occurring in Toledo? **Approximately 3 percent** During which month? **December**
 - What is the size of the largest storm surge predicted for Toledo? **5 feet**
 - During which month is a storm surge of this size predicted? **April**
 - During which month are the smallest storm surges predicted? **August**

4. How do the effects of storm surges differ in Buffalo vs. Toledo? Why?

Storm surges are predicted to be larger in Buffalo. Most storms move from west to east across Lake Erie. Winds moving west to east are most likely to cause a water to pile up at Buffalo, resulting in a storm surge.