



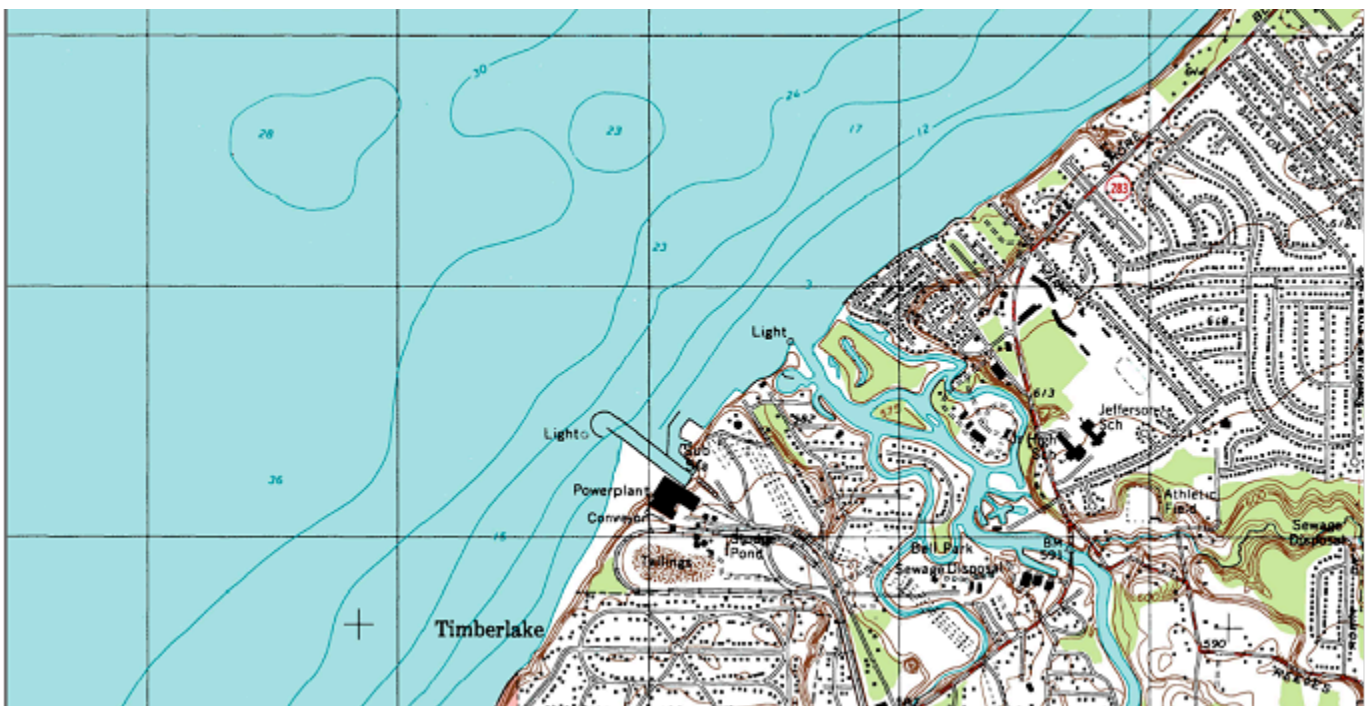
Storm Surges and Seiches - Lesson 2 Activity: Impacts

Part 3 Data sheet (Key)

People like lake shores. As a result, shores tend to become highly developed. Property values are high. Lakes, however, can be unpredictable. Storm-driven waves can destroy houses, especially if the level of the lake has risen since the houses were built. Could this be a problem at Eastlake, Ohio? Use the topographic map of Eastlake, Ohio to answer the questions below.

1. Locate the mouth of the Chagrin River on the topographic map. Draw a topographic profile of the area of houses on the northeast side of the river from the lake to Jefferson School. Start in the lake. This map was drawn in 1994. The average lake level height in 1994 was 571 feet.
 - Plot the average and highest water level for 1994 on your profile (Look up record high lake level in table below or online at USACE Historic Great Lakes Levels.)
 - Plot the elevation near Jefferson School (using elevation on topographic map).

Topographic map of Eastlake, Ohio





Lake Erie water levels (convert meters to feet)

DETROIT DISTRICT
United States Army Corps of Engineers

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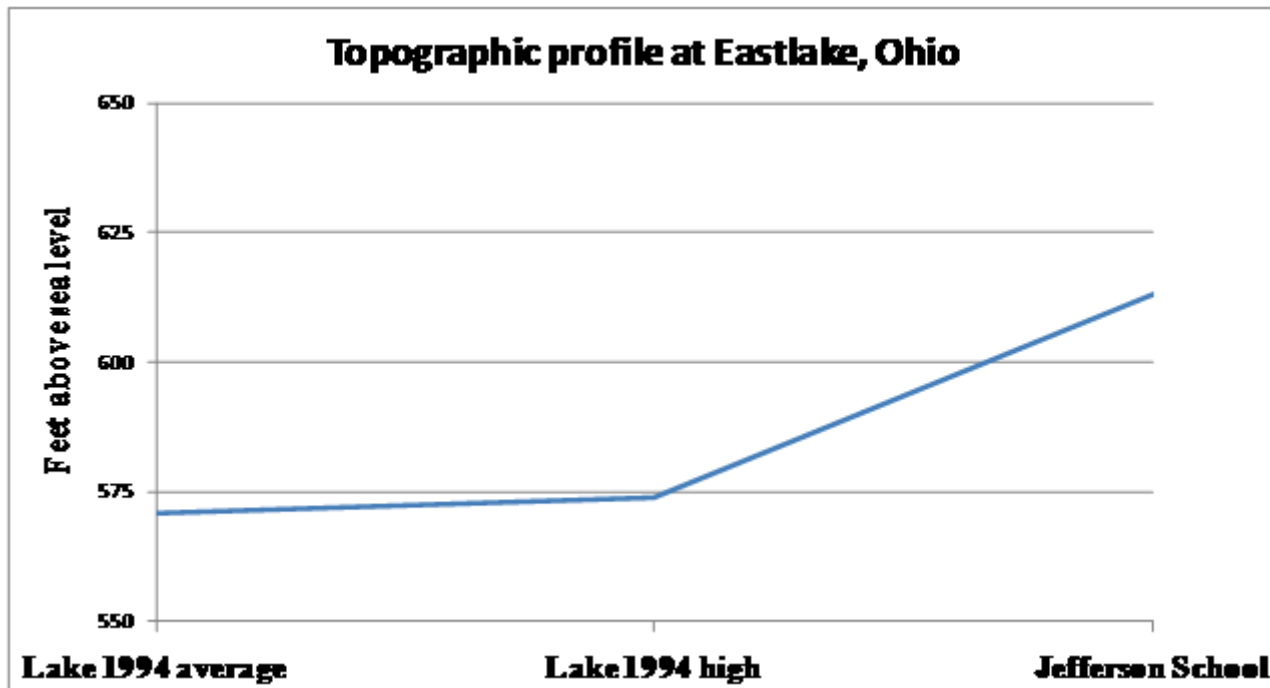
Great Lakes Water Level Table for Lake Erie

Lake Erie: 1994
(Meters, IGLD 1985)

Historic Great Lakes Water Levels												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1994	174.21	174.18	174.28	174.48	174.54	174.53	174.58	174.53	174.42	174.31	174.24	174.21
Record High	174.86	174.78	174.88	174.98	174.97	175.04	175.03	174.94	174.83	174.94	174.85	174.90

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Example topographic profile





2. Do you think the highest lake level in 1994 caused any flooding in the housing division? If so, where?

The water level increased 3 feet during 1994. The housing along the river is at approximately 582 feet. This rise in lake level was not enough to flood any of the housing. The higher lake level may have increased the rate of erosion.

3. In addition to changes in lake level related to yearly weather (precipitation, evaporation), storms raise lake levels temporarily. Strong winds blowing from west across Lake Erie have raised the lake level as much as 8 feet at Buffalo. If a storm raised the lake level near the Chagrin River as much as 3 feet above the 1994 record high, how large an area would be flooded?

If a storm raised the lake level 3 feet above the record high level in 1994, the lake level would be 577 feet. Areas near the Chagrin River are at 575 feet; therefore during a storm flooding could take place. (This did happen in 1986 and caused extensive flooding as far back as the slight rise northwest of the roads.)

4. If a storm also caused 5 foot high waves, is it possible houses might be damaged?

High waves accompanying the storm could damage houses in that area. A similar scenario occurred during the summer of 1985 and the area sustained a great deal of damage. Students could count the number of houses in the flat area adjacent to the mouth of the river. There are well over 100 houses. Not all of them, however, actually sustained damage.