

EERIE LAKE ERIE

The Great Lakes-St. Lawrence Seaway System extends almost 4,000 kilometers (2,500 miles) from the North Atlantic Ocean to the heart of the North American continent. It effectively creates a north coast for the United States and a south coast for Canada along which millions of tons of waterborne freight are transported each year. The Great Lakes also influence the region's weather. The seasonal progression of the pattern of ice cover for the Great Lakes has a crucial impact on the weather and economy of a large region of both countries. This activity will investigate the pattern of freezing and thawing of one of the smaller Great Lakes, Lake Erie, to determine its influence on the region's weather and maritime economy.

OBJECTIVES:

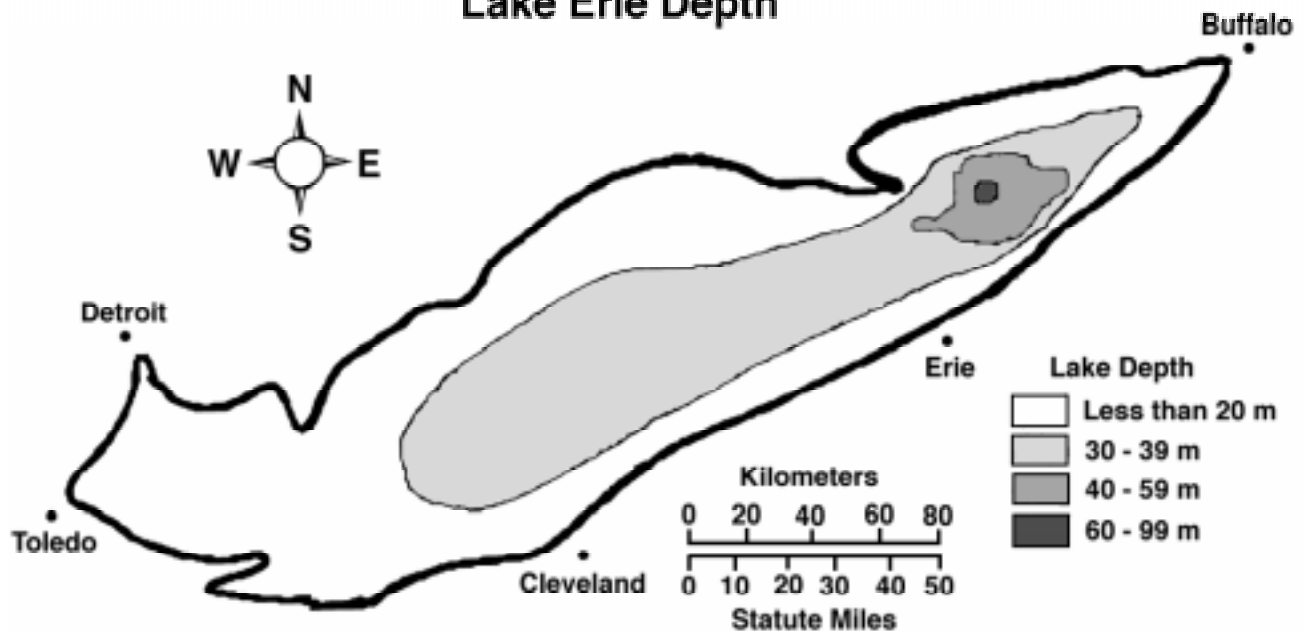
After completing this activity, you should be able to:

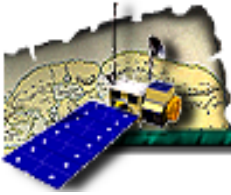
- Describe the pattern of freezing and thawing of Lake Erie.
- Describe an influence of this pattern on regional snowfall and maritime commerce.

INVESTIGATIONS:

1. With an average depth of less than 20 meters (65 feet), Lake Erie is the shallowest of the Great Lakes. According to the map labeled *Lake Erie Depth*, the west basin of Lake Erie is (deeper) (shallower) than the east basin.
2. In general, shallower areas of a lake store less heat, cool off faster in autumn, and are usually the first to form ice in winter. From Lake Erie Depth map, it seems likely that winter ice would first form in the (east) (west) basin.
3. Check your prediction by comparing the depth map with the long-term average ice cover maps for January and February. For Lake Erie, the ice cover begins in the (deeper) (shallower) basin and spreads to the (deeper) (shallower) basin.

Lake Erie Depth





Visit to an Ocean Planet



4. In general, the deeper areas of a lake are the last to form ice in winter and the first to lose ice in the spring. But for Lake Erie, with the prevailing wind blowing from southwest to northeast along the length of the lake, floating ice is transported to the (eastern) (western) basin.
5. According to the ice cover diagrams, Coast Guard ice breaking assistance would most likely be required for ships attempting to transport cargo in the eastern basin of Lake Erie between the ports of Erie, PA and Buffalo, NY in early (January) (March).
6. A lake-effect snow is a highly localized fall of snow immediately downwind from an unfrozen lake. It occurs, in part, because of the energy and moisture that the open lake waters add to the cold air blowing across it. Because winds during lake-effect snows often blow from the west, the roads most likely to be closed by lake effect snows are those between (Detroit and Toledo) (Erie and Buffalo).
7. The formation of an insulating ice cover limits the transfer to the air of the energy and moisture that is necessary for the development of lake-effect snow. Based on the ice cover maps for January and February, of the two months, the one with the greater potential for lake-effect snow is (January) (February).

SOURCE

The Maury Project, American Meteorological Society.

