Buffalo's Lake Breeze Project

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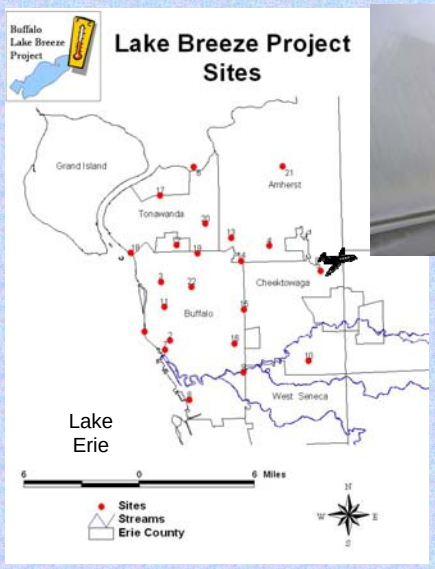
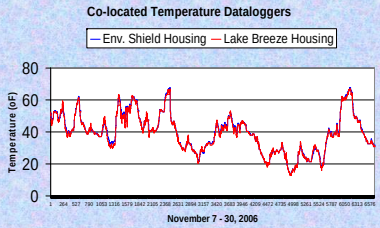
The City of Buffalo, NY is positioned on the shores of Lake Erie and the Niagara River, and proximity to these waters has a known moderating impact on air temperatures (near-shore effect). What is not known is the spatial extent to which city and suburban air temperatures are moderated by these waters. While the Buffalo Weather Office (located at the Greater Buffalo International Airport) is the official site for the cities weather records, it is located inland and outside the city of Buffalo. The questions addressed in this study are: how far inland do the waters moderating impact influence air temperatures, and how do Buffalo's air temperatures differ from those recorded by the Buffalo Weather Office? A dense network of 22 temperature data loggers was located in the city of Buffalo and surrounding suburbs. The data loggers, installed about three to five feet above the ground in environmental shelters, record air temperatures at a five-minute interval (five-minute mean). Using Geographical Information Systems (GIS) ArcView 3.2a, a number of maps have been produced to show temperature patterns across the study area.



Sampling sites and coverage area of the project

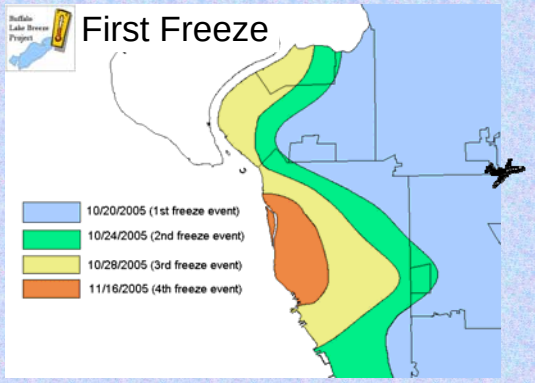
Temperature data logger and housing design – stands 3 to 5 feet above ground



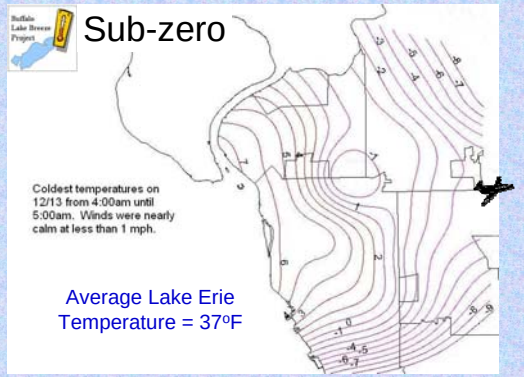
Good agreement between temperatures measured in an Environmental screen and our housing.

Funding provided by the Great Lakes Research Consortium, Great Lakes Center, and Buffalo State College. Our appreciated to the many volunteer host sites that make this network possible.

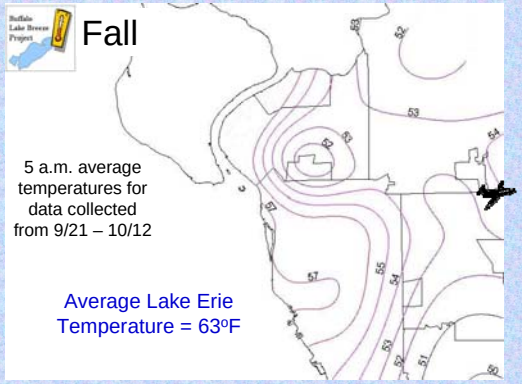
Some Quick Snap Shots of 2005-2006



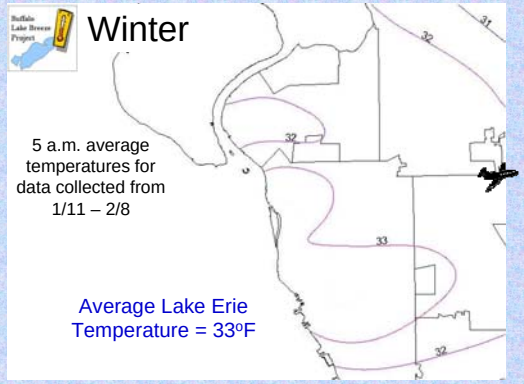
Date of first freeze. The near-shore effect where the land closer to the lake stayed warmer longer than areas inland



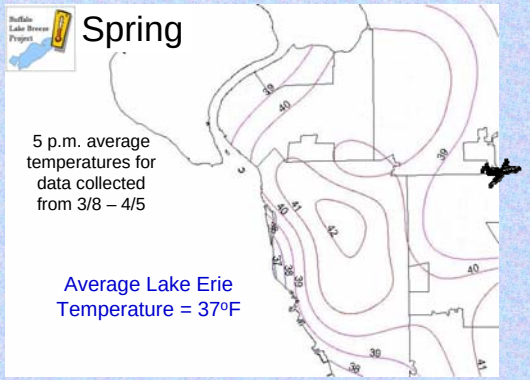
One of the year's coldest days (December 12, 2005).Temperatures near the lake and within Buffalo (heat Island) over 10°F warmer than countryside.



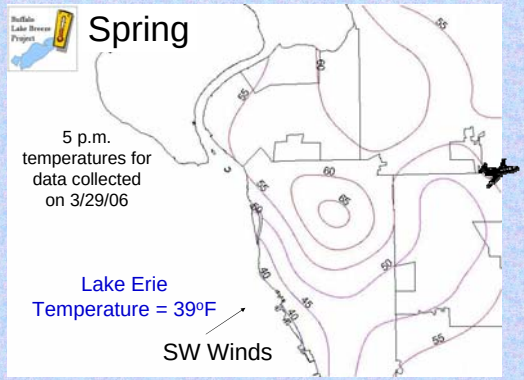
In the Fall, warmer waters and urban heat island raise inland temperatures a few degrees.



During a mild winter average water and air temperatures are similar – minimal impact on inland temperatures.



In the Spring, cooler waters keep shoreline areas about three degrees cooler than areas located one mile inland. Urban heat island provides a five degree difference within three miles from shoreline.



Areas nearest the shore are 10°F cooler than areas that are less than one mile inland. Urban heat island provides a 25°F difference within three miles from shoreline.