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Temporal Analysis of Conditions in the Great Lakes using Data from Buoys in Lake Erie

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Abstract

Climate change will have an impact on regional winds in Southern Ontario, which in turn will impact waves and currents in the Great Lakes. Additional impacts of these changes can include increased coastal erosion, degradation of nearshore ecology, damage to local fisheries and increased natural hazards such as heavy flooding and increased intensity of rip currents.

Through analyses of wind speed and wind direction data from fourteen NOAA buoys in Lake Erie, average monthly northerly and easterly vector data was generated for each year a buoy had been in operation. The monthly vector data was transformed into charts to display the temporal patterns of the buoys in the lake. Temporal ranges of some of the buoys date back to 1980, providing long-term data to compare with conditions of today.

The data in conjunction with spatial analysis tools such as GIS could give us insights into locations in the Lakes that are at highest risk for consequences of climate such as coastal erosion and flooding. The temporal data can also help us pinpoint times and areas of extreme events. This analysis can help inform what we may see in the future of climate change and provide a basis for policy decisions and protective actions along the Great Lakes and other large fresh water bodies in the world.