

“Sounding” Like Lake-Effect Snow: Evaluating the Thermodynamic and Synoptic Setup of Northwest Indiana Lake-Effect Events Using Local Profiles and Numerical Modeling

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Lake-effect snow presents significant hazards for Northwest Indiana, which necessitates the need for accurate forecasts for these events. Recent radiosonde observations were taken routinely with radiosonde launches by Valparaiso University’s Aviation Team surrounding lake-effect events. From these soundings, thermodynamic environments are analyzed in conjunction with numerical simulations and official Green Bay soundings of 12 lake-effect precipitation events. This study will use the data from the sounding profiles and from numerical simulations to determine similarities and differences within the thermodynamic and synoptic environments surrounding these events. Through analysis of these pre-storm local environments, unique thresholds will be identified in environmental parameters associated with the setup and formation of lake-effect events over the southern Lake Michigan region. Creating a mean sounding for Northwest Indiana of these lake-effect setups would be optimal for aiding forecasts of similar future events. This analysis should allow observation of model biases and enhance the ability to predict lake-effect snow.

Information about the Authors:

This is a group of junior and senior meteorology students gaining experience in the field of research under the guidance of Professor Kevin Goebbert. In previous years, the Aviation Team from the Meteorology Department was provided a grant from MIT in order to launch radiosondes during icing and convective events in support of aircraft safety. Their efforts inspired the authors to use the data for a new research project that will focus on lake-effect snow environments, a challenging topic that is of primary interest to meteorologists forecasting for the Great Lakes Region. Exposure to the field of research through this project has provided the foundation for continuing our education through graduate studies.

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