MODELING LAKE MICHIGAN HYDRODYNAMICS: A PARALLEL WAY

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An unstructured grid, three dimensional, nonhydrostatic and a constant z-level model SUNTANS having an architecture that allows computational parallelism has been used to study the hydrodynamics of Lake Michigan. Basin scale internal waves are the dominant response of Lake Michigan due to basin wide wind forcing. These waves manifest themselves in the form of sub-inertial Kelvin waves and super-inertial Poincaré waves. Generation of these waves is influenced by the thermal stratification of the lake and the wind field. Simulations of lakes on a fortnightly scale do not get affected much due to absence of atmospheric heat fluxes. However, to simulate on a seasonal scale, inclusion of atmospheric fluxes into the model is essential. The methodology adopted to get the atmospheric forcing from other models to force the lake model and the way it has been implemented in SUNTANS is discussed. Additionally the parallel numerical techniques used to run the solver will be discussed.