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Comparison of Model and Observed Currents in Lake Michigan

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ABSTRACT

Results from four deterministic numerical-hydrodynamical models for Lake Michigan are compared to data from the field program of the Federal Water Pollution Control Agency (FWPCA) for September 1963, and to other limited data from which lake currents can be inferred. Fourier norms and average angle statistics show that model and observed currents at fixed locations do not compare well. Comparability does not improve when near-inertial motions are removed or when motions having periods up to 72 h are removed. This lack of agreement is practically unavoidable and results primarily from inadequate knowledge of the wind field and probably from the grid scale used in the models. Qualitative agreement between the model and FWPCA currents is seen in lakewide plots of several-day average motion. Surface currents inferred from satellite imagery are grossly similar to model currents under the appropriate, average wind conditions.

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