Abstract View

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Model and Observed Circulation Throughout the Annual Temperature Cycle of Lake Michigan

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ABSTRACT

Monthly average currents and temperatures predicted by a three-dimensional, numerical model of Lake Michigan are compared with observations made in that lake during June–October 1976. The observed data are from 17 current meters with integral temperature recorders that were concentrated on a transverse section of the southern basin of the lake. A brief interpretation of the overall aspects of these data is given and the evolution of a deep temperature anomaly in the west-central basin is discussed. Model results are evaluated in terms of their comparability with the dominant features of the observed data. Lakewide-average temperatures in the model are reasonable and the signs of the computed and observed currents show some agreement. However, the model exaggerates upwelling along the upwind (western) shore, leading to temperature predictions that worsen progressively throughout the stratified season. The present study and other recent work suggest the need for improved mixed-layer physics in lake models.