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On the Equilibrium Shape of the Thermocline in a Shore Zone

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ABSTRACT

The typical *spring* thermal regime of Lake Ontario shows a thermocline surface of either a “wedge” or of a “lens” shape persisting in the shore zone for a considerable period. The *summer* regime is characterized by frequent uptilts or downtilts on the thermocline, with an amplitude comparable in the shore zone to the equilibrium depth of top or bottom layers. These observed facts are explained in terms of a simple theory based on the postulates of geostrophic flow and conservation of potential vorticity. Thermocline shapes and velocity distributions calculated for a constant-depth shore-zone model exhibit many of the observed characteristics of the spring and summer regimes. It is therefore suggested that inertial adjustment to geostrophic equilibrium is a primary mechanism in the formation of near-shore tilted thermoclines.

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