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[Volume 4, Issue 3 \(July 1974\)](#)

Journal of Physical Oceanography

Article: pp. 415–424 | [Abstract](#) | [PDF \(668K\)](#)

Some Characteristics of Nearshore Currents along the North Shore of Lake Ontario

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(Manuscript received December 10, 1973, in final form March 5, 1974)

DOI: 10.1175/1520-0485(1974)004<0415:SCONCA>2.0.CO;2

ABSTRACT

In three periods during 1970 representative of spring, summer and fall, the horizontal currents off Oshawa in Lake Ontario were measured at distances of 3, 6, 11 and 16 km offshore. All records were spectrally analyzed for an equal number of 2-hr values within each period. Within each season, there was a tendency for the total variance to decrease with depth and with distance offshore. Total energy at any given distance offshore was lowest in spring and highest in fall. At distances between 6 and 11 km offshore in the summer period, there was an abrupt increase offshore in the percent of total variance contained in rotary-type motion near the theoretical inertial period. The offshore increase in other seasons was much smaller in magnitude.

For all seasons, flow was predominantly westward. Nearshore currents reversed from west to east flow about 6 hr after the wind changed, but farther offshore the reversal lagged the wind by about 12 hr in summer and 36 hr in fall. These observations supplemented by data of the thermal structure of Lake Ontario indicate an apparent surplus of westerly momentum in the nearshore zone of Lake Ontario's north shore.

In view of the above results, it is concluded that single-point measurements of current flow in the near-shore zone are poor indicators of the flow structure surrounding the point.

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