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Water Volume Transport and Oscillatory Current Flow through the Straits of Mackinac

James H. Saylor and Peter W. Sloss

Great Lakes Environmental Research Laboratory, NOAA, Ann Arbor, Mich. 48104

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ABSTRACT

Currents flowing through the Straits of Mackinac were recorded for a period of nearly 100 days during the summer and fall of 1973. Current meters were placed at four moorings on a north–south cross section at the Straits' narrowest constriction and arranged to measure vertical profiles of horizontal current velocity. The mean water volume transport from Lake Michigan to Lake Huron was measured at nearly $1900 \text{ m}^3 \text{ s}^{-1}$. Seasonal variations in the vertical structure of the mean current flows are related to density stratification of the water mass. Spectral analyses of the current records revealed many periodic features of the flow field which were superimposed on the mean discharge. The periodic components are identified and correlated with oscillations of water level in the Michigan and Huron lake basins.

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