

ON THE USE OF SHIP DRIFT COMPUTED
FROM SATELLITE NAVIGATION FOR THE
INVESTIGATION OF OCEAN SURFACE CURRENTS

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN OCEANOGRAPHY

MAY 1977

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ABSTRACT

The ship drift computed by the Magnavox 702 satellite navigation system, and theoretically computed currents that are a linear superposition of geostrophic and Ekman wind drift currents, were compared numerically using the data from the El Nino Watch cruises. Two measures of their deviations, a vector difference and a scalar difference, were analyzed for errors and for direct wind effects on the ship.

Direct wind effects were found to be negligible compared to the errors in the theoretical currents and the ship drift determinations. Error equations for the ship drift vector were derived and applied to the ship drifts of the El Nino cruises. Errors ranging in magnitude from 12 to 14 cm s⁻¹ were found.

Observation of ship drift requires no additional ship time, and the calculated ship drifts are a useful tool for the detailed study of ocean surface currents. They are also useful as an aid in the contouring of hydrographic station data. Ship drifts calculated using satellite determinations of position are especially useful in areas where the surface currents are 25 cms⁻¹ or greater, or within 5° of the equator, where their accuracy in

representing the actual surface current is better than
theoretically computed currents.