



Abstract View

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Observations of Continental Shelf Waves off Oregon and Washington

William W. Hsieh

Department of Oceanography, University of British Columbia, Vancouver, B.C., Canada V6T 1W5

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ABSTRACT

The low-frequency current fluctuations on the Oregon shelf changed dramatically from winter to spring, 1975. A much faster offshore energy decay occurred simultaneously with a sharp decrease in the alongshore propagation speed. Cross-shelf analysis in a frequency band around 0.16 cpd showed the emergence of the third-mode shelf wave, in spring from the predominantly first-mode motion in winter. At frequencies <0.1 cpd, the current fluctuations propagated southward in winter, opposite to the direction of shelf waves.

On the Oregon and Washington shelves during summer (and early fall) 1972, the location of moorings on irregular topography rendered data interpretation difficult. Nevertheless, the general cross-shelf and alongshore properties of the current fluctuations were consistent with the first-mode shelf wave, in contrast to the situation during summer 1973 when the second mode was excited.

The excitation of relatively high modes and the generally sharp concentration of energy in one particular mode are surprising and difficult to explain with the present shelf-wave generation theories. Nonlinear resonance between wind and current is proposed as a possible explanation.

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Headquarters: 45 Beacon Street Boston, MA 02108-3693
DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826
amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718
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