Abstract View

Volume 5, Issue 4 (October 1975)

Journal of Physical Oceanography
Article: pp. 761–772 | Abstract | PDF (929K)

Mesoscale Variability of Sea Surface Temperatures

Cleveland G. Holladay

Department of Meteorology, The Florida Slate University, Tallahassee 32306

James J. O'Brien

Ocean Science and Technology Division, Office of Naval Research, Arlington, Va. 22217

(Manuscript received August 12, 1974, in final form May 15, 1975)

DOI: 10.1175/1520-0485(1975)005<0761:MVOSST>2.0.CO;2

ABSTRACT

Results of an investigation of the nature of the mesoscale variability of sea surface temperature (SST) in the upwelling zone off the central coast of Oregon are presented. A knowledge of SST mesoscale variability is important toward understanding the mesoscale air-sea interaction process in an upwelling zone. Almost-daily sea surface temperature data gathered by remote sensing techniques provided the basis for this investi- gation. These data were gathered over a period of 60 days during the COHO Project in summer 1973. In order to study the influence of wind forcing on the mesoscale SST field, wind data were gathered from an anemometer located at Newport, Ore.

Some important results of this investigation are: 1) the daily SST fields respond rapidly to wind forcing; 2) the three-week mean SST's tend to follow the large-scale bathymetry; and 3) identification of SST eddies from day to day on daily perturbation (from the three-week means) maps is made difficult because of the existence of strong horizontal flow and strong shear in the longshore current. Other important results are revealed by a two-dimensional spectral analysis of the daily horizontal sea surface temperature fields and the perturbation fields. This analysis indicates that a large amount of variance of the sea surface temperature is concentrated in the 16-40 km wavelength range, and over the range of scales from 4-20 km the isotropic part of the temperature variance spectrum obeys a 3 power law. These spectral results are important biologically and physically. An interesting feature of the mesoscale SST field, which is also important biologically and physically, is the existence of strong horizontal SST gradients called "oceanic fronts."

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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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