Abstract View

Volume 1, Issue 1 (January 1971)

Journal of Physical Oceanography
Article: pp. 45–60 | Abstract | PDF (1.97M)

Remote Sensing of Ocean Currents and Sea Surface Temperature Changes Derived from the Nimbus II Satellite

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DOI: 10.1175/1520-0485(1971)001<0045:RSOOCA>2.0.CO;2

ABSTRACT

Nimbus II High Resolution Infrared Radiometer (HRIR) data, sensitive in the 3.4–4.2 μ window, were analyzed over several oceanic regions. Current boundaries such as the north wall of the Gulf Stream have been located consistently within 10 km of the positions indicated by airplane radiation data. With present techniques, primarily designed for meteorological purposes, the Gulf Stream boundary has been seen, at least in significant parts, in about 50 out of 175 days. Similar results have also been obtained in analyses of the Agulhas Current boundary, and the boundary between the Brazil and Falkland Currents. The satellite radiation observations suggest that the Brazil-Falkland Current boundary which is associated with a surface temperature gradient is as sharp and strong as the Gulf Stream North Wall. The Agulhas Current exhibits a similar temperature gradient along its western boundary, separating it from the Benguela Current surface waters.

Comparisons of equivalent blackbody temperatures over the Gulf Stream from Nimbus II with low flying radiometer-equipped aircraft showed that the satellite data were on the average 0.5C warmer.

Seasonal sea surface temperature variations of 9C over the Persian Gulf and Somali region and the upwelling along the Somali Coast during the southwest monsoon were clearly detected in the nighttime HRIR data.

Daytime observations within the 3.4–4.2 μ window have also shown qualitatively the location of major current boundaries.

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