



## Abstract View

[Volume 10, Issue 6 \(June 1980\)](#)

### Journal of Physical Oceanography

Article: pp. 843–852 | [Abstract](#) | [PDF \(516K\)](#)

# The Nature of the Poleward Heat Flux Due to Low-Frequency Current Fluctuations in Drake Passage

**Frank Sciremammano Jr.**

*School of Oceanography, Oregon State University, Corvallis 97331*

(Manuscript received August 31, 1979, in final form February 11, 1980)

DOI: 10.1175/1520-0485(1980)010<0843:TNOTPH>2.0.CO;2

### ABSTRACT

Values of poleward heat flux due to low-frequency current fluctuations in Drake Passage are presented for 19 long-term current meter records obtained during 1975, 1976 and 1977. Most of the measurements (10) are in the center of the passage near the historical location of the Polar Front where the flux is found to average  $1.7 \text{ W cm}^{-2}$ . While the variability is large at this location (range of  $0.9\text{--}2.8 \text{ W cm}^{-2}$  and a standard deviation of  $0.7 \text{ W cm}^{-2}$ ), all measurements are within the same order of magnitude. There is no obvious depth dependence in the measured flux.

The heat flux process is dominated by events with time scales of 5–60 days and longer which occur on the order of 3–10 times per year at any location. In general, three or fewer events contribute most of the flux for the year. These mesoscale disturbances, generally meanders or migrations of the Polar Front or rings formed from it, result in a large spatial variability in the measured flux. For example, current meters operating concurrently and separated by 40 and 13 km gave heat flux values which differ by factors of 2.7 and 2.1, respectively, during 1977.

These findings suggest that caution should be exercised in the extrapolation of mean heat flux values obtained from point measurements in the Southern Ocean. Besides the temporal and spatial problems resulting from the discrete nature and small scale of the heat flux processes, the eventual fate of the mesoscale structures must be determined before the global relevance of the estimates can be evaluated.

#### Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

#### Search CrossRef for:

- [Articles Citing This Article](#)

#### Search Google Scholar for:

- [Frank Sciremammano](#)



© 2008 American Meteorological Society [Privacy Policy and Disclaimer](#)

Headquarters: 45 Beacon Street Boston, MA 02108-3693

DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826

[amsinfo@ametsoc.org](mailto:amsinfo@ametsoc.org) Phone: 617-227-2425 Fax: 617-742-8718

[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.