



## Abstract View

[Volume 4, Issue 3 \(July 1974\)](#)

### Journal of Physical Oceanography

Article: pp. 467–486 | [Abstract](#) | [PDF \(1.29M\)](#)

# Effects of a Cold-Air Outbreak on Shelf Waters of the Gulf of Mexico

**W.D. Nowlin Jr. and C.A. Parker**

*Dept. of Oceanography, Texas A&M University, College Station 77843*

(Manuscript received October 22, 1973, in final form January 18, 1974)

DOI: 10.1175/1520-0485(1974)004<0467:EOACAO>2.0.CO;2

### ABSTRACT

Two surveys of the waters over an area of the continental shelf in the northwestern Gulf of Mexico were made during January 1966. The first observation period was just before a major outbreak of cold, dry air; the second was about 15 days later with the region still under the influence of this outbreak. Waters were well mixed to 100 m, or the bottom in shallower depths. During the 15-day period temperature decreased nearly 5°C and salinity increased about 1‰ near the shore. Some 150 mi offshore, temperature decreased only 2°C and salinity showed no significant change.

Study of the change in  $T$ - $S$  relationships before and after the outbreak indicates the strong possibility that subsurface water types generally found beneath the Subtropical Underwater core in the Gulf were formed locally over the shelf by evaporation and sensible heat exchange to the atmosphere.

For the period between observations, the mean rates of change of vertically-averaged salinity, temperature and heat content were computed. Neglecting advection, the local rate of heat extraction averaged about  $400 \text{ cal cm}^{-2} \text{ day}^{-1}$  within 50 mi from shore and generally increased to  $700\text{--}1500 \text{ cal cm}^{-2} \text{ day}^{-1}$  at the offshore survey limits. These values agree reasonably well in magnitude and spatial distribution with estimates of heat fluxes using bulk formulas and meteorological data taken during the post-outbreak cruise. Average values of sensible and latent heat fluxes for the region were  $255$  and  $542 \text{ cal cm}^{-2} \text{ day}^{-1}$ , respectively, which generally agree with estimates by other workers for outbreak conditions. Such estimates are reviewed.

#### Options:

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

#### Search CrossRef for:

- [Articles Citing This Article](#)

#### Search Google Scholar for:

- [W.D. Nowlin](#)
- [C.A. Parker](#)



© 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.