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[Volume 13, Issue 3 \(March 1983\)](#)

### Journal of Physical Oceanography

Article: pp. 467–473 | [Abstract](#) | [PDF \(545K\)](#)

# The Role of Local Heating in Producing Temperature Variations in the Offshore Waters of the Eastern Tropical Pacific

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(Manuscript received July 12, 1982, in final form November 22, 1982)

DOI: 10.1175/1520-0485(1983)013<0467:TROLHI>2.0.CO;2

### ABSTRACT

The role of local heating in producing annual and interannual sea-surface temperature variations in the eastern tropical Pacific is studied. Removed from the eastern boundary (122°W), and off the equator, local heating plays a major role in producing annual temperature fluctuations. At the same longitudes from 10°N to 10°S interannual variations in the yearly-average temperature and the anomalous net heat input into the ocean are of the same sign and magnitude. During the 1969 and 1972 mean warmings there was increased heat input into the ocean. Closer to the eastern boundary, oceanic processes such as advection are as important as local heating. Results from a simple model incorporating local heating, offshore Ekman transports, and upwelling suggest the following scenario for the 1972–73 El Niño. During February and March 1972 enhanced local heating and reduced offshore advection were the main reasons for anomalously warm temperatures in the open ocean adjacent to Peruvian coastal waters. From April 1972 to March 1973 temperatures remained high because of offshore transport of anomalously warm inshore waters. Whether the latter were warm because of upwelling of warmer water or transport of warmer water from farther south is not clear.

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