



Abstract View

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On the Ocean Temperature Distribution in the Gulf of Alaska, 1974–1975

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ABSTRACT

Infrared data gathered by the NOAA 3 and 4 satellites have made it possible to construct a detailed synoptic view of sea surface temperatures in the northern Gulf of Alaska. These satellite data are compared with simultaneous oceanographic data to yield information on vertical subsurface features.

Generally two surface temperature regimes characterize the northern gulf throughout the year. Relatively Warm surface water occurs over the continental shelf, while colder water is found farther offshore, beyond the shelf break. A narrow (5–10 km) coastal band, with relatively low temperatures, apparently due to terrestrial runoff, was not always present. Wave or eddy-like features were observed along the boundary between the warm and cold surface water regimes.

Lateral advection and vertical mixing both contribute to maintenance of these two major surface temperature regimes. Offshelf lateral advection and/or upwelling brought colder water into the northern gulf between July 1974 and February 1975, and led to an offshelf temperature decrease of nearly 2°C at 200 m depth. Such temperature decreases at depth were not evident in the shelf waters. The upper layer (<100 m) vertical stability was greater in the offshelf region, and confined the sea-air heat loss there to a relatively shallow layer. Since the water density is controlled primarily by salinity at the temperatures and salinities found in the Gulf of Alaska, sea surface temperature changes reflect both heat loss and vertical density (salinity) structure.

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