



Abstract View

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Surface Salinity and Temperature on the San Francisco-Honolulu Route June 1966-December 1970 and January 1972-December 1975

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ABSTRACT

Time-distance distributions of surface salinity and temperature, and their anomalies, were investigated for a region of weak meridional currents, using 8.5 years of observations by merchant ships on the San Francisco-Honolulu route.

Certain associations were observed in the year-to-year patterns of oceanic variability. When negative salinity anomalies in conjunction with strong, persistent salinity fronts were dominant in the outer California Current region and the Transition Zone, salinity anomalies were generally positive from 150°W to the Hawaiian Islands, and surface temperature anomalies were cold over both the eastern and western parts of the route. In contrast, when positive salinity anomalies were dominant in the eastern part of the route, salinity fronts were transient or weak, salinity anomalies were generally negative west of 150°W, and temperature anomalies were warm over most of the route. These combinations suggest that advective processes resulting from variations in meridional currents dominated the local salt and heat budgets. Observed changes would thus imply long-term fluctuations of the southward surface circulation in the eastern limb of the North Pacific anticyclonic gyre, being strong from mid-1966 into early 1967 and again in 1972–73, but weak from mid-1967 through 1968 and again in 1974 to mid-1975.

The regimes of strong salinity fronts and negative salinity anomalies moved through the Transition Zone toward Honolulu at speeds of 2.2–2.5 cm s⁻¹, at separations of 500–800 km, and persisted up to 18 months. It is suggested that a possible relation to westward propagation of annually forced extratropical baroclinic waves (White, 1977) be investigated.

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