THE ANNUAL AND INTERANNUAL VARIATIONS IN OCEAN HEAT TRANSPORTS IN THE NORTH PACIFIC (1956-1964)

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ABSTRACT

The variation in the net heat advected into the North Pacific from 1956 to 1964 was computed by a new method proposed in this study which allows computation of the net heat flux using hydrographic data from the Kuroshio area only. This is a first attempt at such calculations since Montgomery (1954, 1974) showed that computing the heat transport for a single ocean current is meaningless if the transport of the current is not constant in time. The results of these calculations were then investigated and the net heat flux variations were related to both changes in the transport of mass and changes in the mean temperature of flow of the Kuroshio. A more quantitative analysis indicated that 60-70% of the variance of the net heat transport was due to changes in the volume transport and 30-40% was due to changes in the flow temperature. The interannual variations in the net heat flux were largely a result of changes in transport while the mean annual variations were closely related to the changes in flow temperature. The net heat flux values were also compared with sea-surface temperature anomalies in the North Pacific, but no relation was found.