



## Abstract View

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# Associations between Sea Surface Temperature Gradient and Overlying Mid-Tropospheric Circulation in the North Pacific Region

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### ABSTRACT

An attempt was made to verify and further investigate a proposed relationship between the location of the maximum east-west sea surface temperature anomaly gradient ( $\Delta$ SSTA) and the location of the maximum meridional component of the anomalous 700 mb geostrophic wind (VgA) in the North Pacific on a monthly and seasonal time scale. Previous empirical studies, mostly of a case study type, had suggested collocation of maximum values of these variables in the same time period, particularly during the cold seasons. Using 31 years of monthly sea surface temperature and 700 mb height data for the North Pacific, the two variables were computed for each month and 3-month periods for each 10° longitude sector from 125°W to 155°E, and for each of three latitude bands (55–40°N, 40–25°N, 55–25°N). From these calculations, the spatial relationships of the two variables were determined by counting frequencies of the collocation of maximum VgA and  $\Delta$ SSTA for each month or season and latitude band, and by computing correlation coefficients between VgA and  $\Delta$ SSTA for each month or season and latitude band. Important seasonal and latitudinal differences were found for the strength of the relationship. It was concluded that the proposed relationship was best for the northernmost latitude band (55–40°N), during winter and summer periods, and for 3-month means when compared to monthly means. Statistically significant relationships were found in several instances, indicating that the proposed relationship is probably a manifestation of real physical coupling between the mean and atmosphere.

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