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Numerical Study of the Seasonal Variations of the Subtropical Front and the Subtropical Countercurrent

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ABSTRACT

Response of the Subtropical Countercurrent and the Subtropical Front in the North Pacific Ocean to seasonally changing wind stress and thermal condition are examined using the same idealized numerical model that the author used in 1984 for steady state modeling of the Subtropical Countercurrent and the Subtropical Front. The model reproduces the main features of the observed seasonal variations reasonably well, especially that the Subtropical Countercurrent is strong in spring and weak in fall. It is also shown that the seasonal variation of wind stress and thermal condition intensifies the annual mean strength of the Subtropical Countercurrent.

The relative importance of the seasonal variations of wind stress and thermal condition is examined using models in which only one of these changes and the other is fixed. The results indicate that the seasonal variation of the Subtropical Countercurrent is mainly due to the seasonal change of wind stress, while the seasonal change of thermal condition is mostly responsible for the intensification of the annual mean of the Subtropical Countercurrent and the Subtropical Front.

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