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Atmosphere-Ocean Interaction over the Kuroshio-Oyashio Extension
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The variability of the upper ocean heat content in western boundary currents and their extension (hereafter WBC) is strongly controlled by low frequency changes in the WBC strength and position. In the North Pacific, these changes are primarily forced by previous basin-scale wind stress fluctuations via Rossby wave propagation. The growing evidence that sea surface temperature (SST) anomalies in the Kuroshio-Oyashio Extension (KOE) region influence the large-scale atmospheric circulation, motivates us to investigate the links between KOE SSTs and WBC changes, and the extent to which ocean-atmosphere feedback processes enhance low-frequency variability.

We are in the initial phase of this project which will include: 1) analyses of atmosphere and ocean data sets, 2) diagnosis of Pacific decadal variability in global climate model simulations and 3) experiments with specified SST anomalies in the KOE region using a high-resolution atmospheric GCM. We will outline the full research plan for our project but focus on the first two tasks. Specifically, We use an empirical patterns-based approach applied to daily SST, surface air temperature, and surface specific humidity to estimate the effect of air-sea coupling on total and persistent variability. We also explore the role of KOE fluctuations in Pacific decadal variability in the NCAR CCSM4.

キーワード: air-sea interaction, western boundary current, North Pacific, Kuroshio Extension, surface heat fluxes
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