Geophysical Research Abstracts
Vol. 21, EGU2019-3088, 2019
EGU General Assembly 2019

Effect of the Decadal Kuroshio Extension Variability on the Seasonal Changes of the Mixed-Layer Salinity Anomalies in the Kuroshio-Oyashio Confluence Region

Yu Geng

Institute of Oceanology, Chinese Academy of Sciences, CAS Key Laboratory of Ocean Circulation and Waves, Qingdao, China (gengyu115@mails.ucas.ac.cn)

This study investigates the seasonal variations of the mixed-layer salinity anomalies (MLSAs) under the decadal variability of the Kuroshio Extension (KE) in the Kuroshio-Oyashio Confluence Region (KOCR: 35–40˚N, 140–150˚E). Our analysis reveals that the seasonal variation trend of the MLSA is almost opposite in the stable and unstable states of the KE. In the stable (unstable) state, the increasing (decreasing) MLSA in the KOCR reaches its maximal positive (minimal negative) value in late summer and then decreases (increases) gradually. An exploration of the budget of the MLSA shows that ocean dynamics explain more than half of the seasonal MLSA changes in the two states and exceed the contribution of atmospheric forcing (approximately 18%). The leading oceanic processes include advection of the mean mixed-layer salinity by anomalous Ekman and geostrophic currents and advection of the MLSA by mean geostrophic currents, which explain 13.80%, 12.90%, and 20.73% (11.59%, 13.36%, and 24.90%) of the MLSA temporal changes in the stable (unstable) states, respectively. The difference in the MLSA between the two states is primarily derived from the discrepancies in the anomalous ocean currents in the KOCR and south of Japan, salinity anomalies in the south of Japan, and sea surface temperature anomalies affecting atmospheric forcing between the two modes of the KE. Moreover, the most apparent influences are concentrated in summer and early autumn because of the shallower mixed layer in terms of atmospheric forcing and obvious velocity changes and the distribution of climatological salinity for ocean processes.