

Decadal hindcasts of the Kuroshio extension using a climate model MROC4 with an eddy-permitting ocean model

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The Kuroshio Extension (KE) is an eastward jet in the western subtropical North Pacific after the Kuroshio south of Japan. In this KE region, both the oceanic circulation variability and the heat exchange variability across the air–sea interface are the largest in the mid-latitude North Pacific. The variability of the KE is potentially important for climate system over the North Pacific. In the present study, we investigate predictability of the KE using MIROC climate model (Model for Interdisciplinary Research on climate). We also focus on the KE strength and the meridional migration of the KE axis. Hindcasts experiments are conducted after initialization by the ocean data assimilation. The decadal-scale changes of baroclinic sea level height on the KE are consistent with the observations in the some cases. However, the statistical prediction skill is insufficient for the decadal prediction. In the hindcasts experiments, poor prediction skill in WSC over the North Pacific partly obstructs the prediction of the baroclinic sea level change related to the KE location. Furthermore, WSC is not initialized well in some cases, in which the hindcasted sea level height considerably departed from the observations. Meanwhile, the prediction skill of the KE strength is still poor under the linear ocean response. The poor prediction might depend on ocean internal variation.