

A preliminary hindcast experiment for CMIP6/OMIP using COCO4.9: comparison with a case forced by a new dataset JRA55-do

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A preliminary experiment for CMIP6/OMIP (Griffies et al., 2016) has been conducted by using an ice-ocean coupled general circulation model COCO4.9 (Hasumi, 2006), which is the ice-ocean component for the Model for Interdisciplinary Research on Climate version 6 (MIROC6; Tatebe et al., 2017, in preparation). Following the CMIP6/OMIP protocol, we have performed five cycles of 62-year-long experiment forced by 1948-2009 atmospheric forcing (Large and Yeager, 2009). The last cycle of the experiment shows realistic results. We have also conducted another experiment, in which the model has the same setting but is driven by a new surface dataset, JRA55-do version 1.1 (Tsujino et al., 2017, personal communication), based on the Japanese 55-year Reanalysis or JRA-55 (Kobayashi et al., 2015; Harada et al., 2016). Results of the two experiments are compared, with a focus on Arctic sea-ice. Over the last 30 years of the 20th century, climatological sea-ice extent and volume for summer and their interannual variability are similar between the two cases. On the other hand, decreasing trend in sea-ice extent and volume over the same period are significantly larger in the JRA55-do case.

Keywords: CMIP6, OMIP, JRA-55, ice-ocean coupled model, global climate modeling, Arctic Ocean