Sea level variability in the last 50 years has been simulated using a global ocean circulation model based on the HYCOM. The longitudinal grid spacing of the ocean model is 1.5 degree and the latitudinal grid spacing is 1/3 ~ 1 degree in the south of 65N with finer resolution near the equatorial region. By applying the arctic bipolar patch grid, north of 65N have variable resolution finer than 0.5 degree in general. The model has 30 vertical layers with maximum depth of 4500 m. The intrinsic energy loan sea ice module of HYCOM is also applied. The atmospheric forcing is adopted from the monthly surface heat and momentum fluxes of ECMWF 40 year Reanalysis (ERA-40) and ERA-interim data.

Comparisons between the modelled and observed sea level variability using the Global Sea Level Observing System (GLOSS) data show that the model simulation of the SSH variability is very similar to the observed one, especially in the Pacific Ocean. It is shown that the ENSO related sea level variability as well as the sea level rising trend related with the global warming are the most prominent features in the western Pacific Ocean. It is noteworthy that the modelled sea level rise trend is very sensitive to the selection of the calculation period as shown by the observation based works.