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Abstract

To evaluate whether chronic impacts on biota are caused by 50 Mton CO₂ injection per year into the ocean, we simulated transport and dilution of injected CO₂ using an offline oceanic general circulation model (OGCM) with a horizontal resolution of 0.1 by 0.1 degrees. Carbon dioxide is continuously injected for 30 years into a site with 1 degree in longitude and 3 degrees in latitude. Most of the CO₂ dissolved water is transported in the longitudinal direction. In addition, inter-spatial correlation of the CO₂ concentration is relatively higher in the longitudinal direction than in the latitudinal direction. Therefore, a site with large latitudinal width is effective to decrease CO₂ concentration in order to reduce/avoid biological impacts. CO₂ concentration increases first several to 10 years, but shows signs of levelling off after the initial increase. As the simulated maximum CO₂ concentration is 80% of the “predicted no effect concentration” (PNEC) which is an index to estimate concentration causing no effects on biota, we conclude that 50 Mton CO₂ injection per year causes no chronic impacts.