Numerical Experiment of Anthropogenic CO_2 in the North Pacific

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Abstract

The uptake of anthropogenic CO_2 by the ocean in the North Pacific is simulated using a three-dimensional general circulation model (GCM). Atmospheric pCO_2 is prescribed for the period 1800 to 1986 to find the uptake by the ocean. The absorption rate of CO_2 into the model ocean in 1986 is 0.7 GtC yr^{-1} and the uptake in the simulated period is 37 GtC. Those results do not contradict the previous model and observational studies. The distribution of CO_2 in the subpolar region especially in the Bering Sea is affected by the model restoring condition of the temperature and salinity to the observed in the marginal seas, although the total amount of CO_2 accumulated in the model ocean is not. Details of the difference of the distributions of CO_2 simulated using the two circulations derived by the GCMs are discussed.