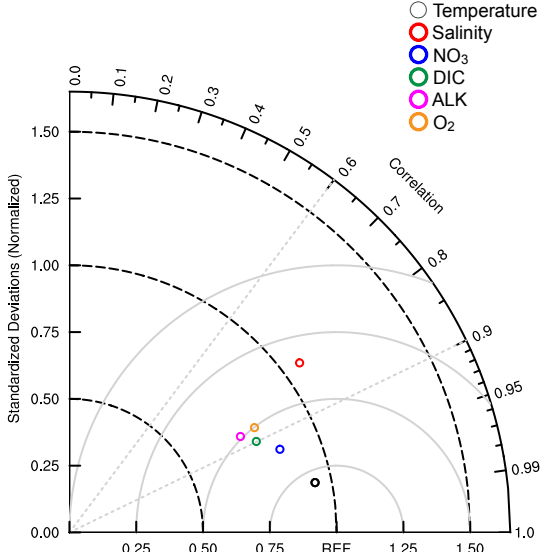


Figure S1. Zonal distribution of nitrate (NO₃), dissolved inorganic carbon (DIC) and alkalinity (ALK) for the Atlantic and Indo-Pacific Ocean in the observation (left) and model (right).



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Figure S2. Physical and biogeochemical variables in the pre-industrial experiments are compared with observational datasets in a Taylor diagram.

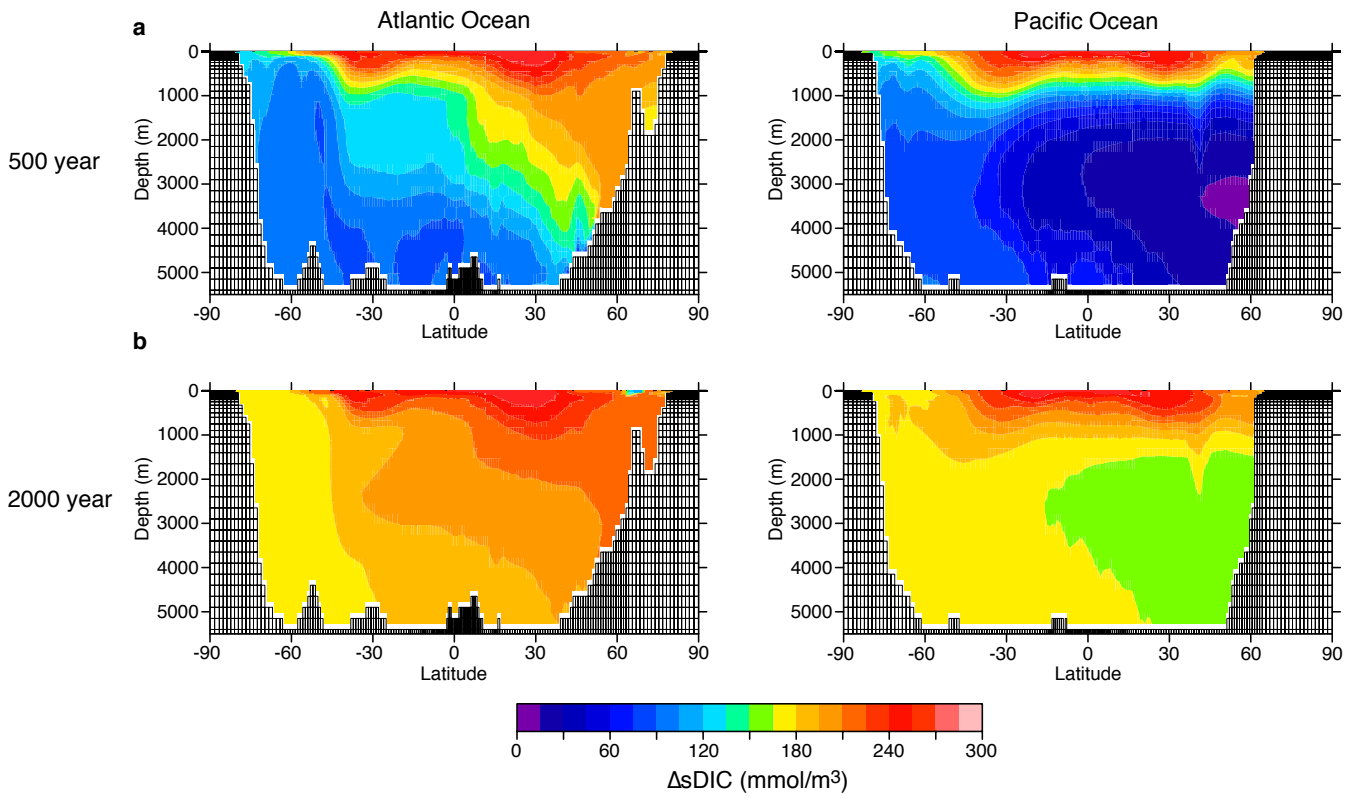


Figure S3. Zonal mean distribution of changes in the salinity-normalized DIC for (a) 500 years and (b) 2000 years in the constant-climate run (CTL). The left and right panels show the Atlantic and Indo-Pacific Oceans, respectively.