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Performance assessment of carbon cycle climate models using field observations

C. Heinze (1), B. Pfeil (1), L. Bopp (2), F. Joos (3), T. Froelicher (3), I. Totterdell (4), S. Liddicoat (4), J. Segschneider (5), E. Maier-Reimer (5)

(1) University of Bergen, Geophysical Institute and Bjerknes Centre for Climate Research, (2) Laboratoire des Sciences du Climat et de l'Environnement / IPSL, (3) University of Bern, Climate and Environmental Physics, (4) UK Met Office, Hadley Centre for Climate Prediction and Research, (5) Max Planck Institute for Meteorology (Contact Email christoph.heinze@gfi.uib.no, Fax +47 55589883)

In order to achieve quantitatively accurate future scenarios for marine carbon sources and sinks, it is essential that interactive carbon cycle climate models reproduce the present ocean correctly. We analyse fields of four different carbon cycle climate models with respect to differences between the models and differences from field observations. We focus on the variables sea surface carbon dioxide partial pressure, total dissolved inorganic carbon, and anthropogenic carbon using a newly developed interface between model data and measurements. While the models render satisfactory inventories of anthropogenic carbon for the present day situation, their sea surface carbon dioxide partial pressure distributions show smoother spatial gradients than field observations. This is probably due to the discretisation and the coarse model resolution. This issue has to be taken into account for appropriate data assimilation of field observations into carbon cycle climate models for further optimisations of the models.
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