



Is the present ocean carbon data base sufficient for calibrating prognostic models?

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In worldwide efforts, comprehensive data sets for surface ocean carbon dioxide partial pressure and ocean interior carbon variables (TCO_2 , alkalinity, oxygen) are being compiled. These data sets provide extremely useful insight in the operation of the ocean and ongoing carbon fluxes. Are these data sets sufficient, however, to constrain the marine carbon model components in prognostic Earth system models which are used for future climate projections, e.g. within the process of the Intergovernmental Panel on Climate Change? There is growing evidence for significant decadal and inter-annual carbon flux changes between the ocean and the atmosphere, both in the North Atlantic and the Southern Ocean. As coupled Earth system models produce their own internal variability, these models will never be able to exactly reproduce the observed events as it may approximately be feasible with component models that are forced by observed data. We will summarise to which extent the present CARBOOCEAN data base will contribute to an accurate performance assessment of prognostic ocean carbon cycle models and where gaps in the representativeness of this data base exist.