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Evaluation of simulated ocean carbon in the CMIP5 earth system models

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We maintain a centralized model output archive containing output from the previous generation of Earth System Models (ESMs), 7 models used in the IPCC AR4 assessment. Output is in a common format located on a centralized server and is publicly available through a web interface. Through the same interface, LSCE/IPSL has also made available output from the Coupled Model Intercomparison Project (CMIP5), the foundation for the ongoing IPCC AR5 assessment. The latter includes ocean biogeochemical fields from more than 13 ESMs. Modeling partners across 3 EU projects refer to the combined AR4-AR5 archive and comparison as OCMIP5, building on previous phases of OCMIP (Ocean Carbon Cycle Intercomparison Project) and making a clear link to IPCC AR5 (CMIP5). While now focusing on assessing the latest generation of results (AR5, CMIP5), this effort is also able to put them in context (AR4). For model comparison and evaluation, we have also stored computed derived variables (e.g., those needed to assess ocean acidification) and key fields regridded to a common 1°x1° grid, thus complementing the standard CMIP5 archive. The combined AR4-AR5 output (OCMIP5) has been used to compute standard quantitative metrics, both global and regional, and those have been synthesized with summary diagrams. In addition, for key biogeochemical fields we have deconvolved spatiotemporal components of the mean square error in order to constrain which models go wrong where. Here we will detail results from these evaluations which have exploited gridded climatological data. The archive, interface, and centralized evaluation provide a solid technical foundation, upon which collaboration and communication is being broadened in the ocean biogeochemical modeling community. Ultimately we aim to encourage wider use of the OCMIP5 archive.