

Assessment of iron cycling in the CESM-BEC model using high resolution CLIVAR data

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We use high resolution CLIVAR dissolved iron measurements and the Tagliabue et al. 2012 dissolved iron dataset to quantitatively assess simulation of the iron cycle in the global scale Biogeochemical Elemental Cycling (BEC) model. The goals of this study were to evaluate iron cycling in the BEC model and to better understand what parameters are driving model errors. Comparisons and statistical analysis of field observations to model simulations were conducted at the same geographical location and depth in the water column. We found that the BEC model does well in simulating dissolved iron distributions with correlation coefficients >0.5 in many regions. The model is able to capture general characteristic features and basin specific features of dissolved iron in the ocean. Parameters governing iron scavenging, implicit iron ligands and the iron sedimentary source seem to be responsible for model errors. The next step in improving iron cycling simulation in the BEC model is to use available dissolved iron measurements to further constrain and improve the mentioned parameters.