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PHOTOSYNTHETICALLY AVAILABLE RADIATION (PAR) IN THE NAVY COASTAL OCEAN MODEL (NCOM): ECOSYSTEM SENSITIVITY TO PAR TEMPORAL/SPATIAL RESOLUTION AND DATA SOURCES

We examine the sensitivity of a coupled bio-physical simulation model of the California Current System (CCS) to photosynthetically available radiation (PAR) fields used to force the biological component. A regional, high-resolution, circulation model (NCOM-CCS) has been coupled to the nine-component ecosystem model of Chai et al. (2001) and modified for this temperate coastal system. A baseline case with constant PAR is used for comparison. The Comprehensive Ocean-Atmosphere Data Set (COADS) provides monthly climatological PAR fields, allowing us to examine the effects of weather (clouds, etc.) on the model. The first set of sensitivity studies uses monthly mean, daily averaged, and hourly clear-sky PAR fields computed with a radiative transfer model (RADTRAN) to examine the effects of temporal resolution of the PAR input to the model. The COAMPS (Coupled Ocean Atmosphere Mesoscale Prediction System) Reanalysis atmospheric model for the Eastern Pacific supplies hourly solar shortwave radiation values (PAR is a constant fraction of shortwave radiation) at the ocean surface. The ecosystem response in the atmospheric model based solutions is compared to the response in the climatology based solutions.