



Coupling bio-optics into a marine ecosystem model to enable comparison with ocean colour data

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Ocean colour data can be used to monitor ocean plant biomass (phytoplankton) and hence give global insight into the ocean carbon cycle. However, the light backscattered out of the ocean can not inform us about the vertical structure of the biomass - for this a marine ecosystem ocean model is required. Typically ocean colour is converted to chlorophyll concentrations which are then used for validation of, or assimilation into, ocean ecosystem models. However, converting to chlorophyll concentrations can introduce errors and since chlorophyll is not generally a model state variable but rather is estimated from intracellular ratios of carbon to chlorophyll and carbon to nitrogen within the phytoplankton, further errors may be introduced. Here I take a different approach to using ocean colour data - I model remotely sensed reflectance (R_{rs}) within a marine ecosystem model by estimating absorption and backscattering based on the state of the ecosystem. Comparison of satellite-observed R_{rs} with R_{rs} from a 1-d marine ecosystem model are presented to assess the feasibility of the long term aim of assimilation of R_{rs} into global 3-d models of climate prediction.