[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-OS Ocean Sciences & Ocean Environment

[A-OS09]Marine ecosystems and biogeochemical cycles: theory, observation and modeling

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The ocean accounts for about 50% of global net primary production. This production is significant for carbon cycling and ecosystem functioning, and is related directly or indirectly to a variety of climatic and ecological phenomena. The responses to natural and anthropogenic environmental stressors that influence marine production and diversity can cause perturbations to marine ecosystems that alter trophic dependencies and interactions among organisms at a range of space and time scales. Quantification of the principal mechanisms driving spatio-temporal variability of marine ecosystem remains to be done, especially in terms of evaluation of uncertainty in responses. As a result, evaluating vulnerability of marine ecosystems to environmental change requires systematic and holistic approaches that integrate physics to ecology and are based in observations and modelling. This session aims to provide a venue for discussing recent advances in understanding marine biogeochemical cycles, ecosystems and their interactions. Observational and modeling studies that consider linkages between biogeochemical and ecosystem processes, biodiversity and biogeochemistry, and the effects of multiple stressors are especially encouraged.

[AOS09-P11]Modeling the coastal ecosystem complex: present situation and challenges

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To enhance numerical modeling of the coastal ecosystem complex (CEC), we reviewed the CEC and related concepts along with the current coastal ecosystem model framework in this study. We identified two model implementation paths from the initial objectives to numerical models: specific model building, and the use of existing model frameworks. As the CEC is still at the conceptual stage, both paths are possible. Four important ecological features of CEC modeling (population connectivity, habitat heterogeneity, ontogeny of organisms, and trophic interactions) were also identified. Models for population connectivity, species distributions, life histories, and food webs were categorized using these features. We found that some previously established concepts (between–habitat interactions, coastal ecosystem mosaic, and seascape nursery) overlap with the CEC concept. Several existing integrated model frameworks were reviewed, focusing on their potential to simulate CEC processes. Building specific models for the CEC at the current conceptual stage will be challenging, and modification of existing models will be needed if they are to be used for CEC modeling. Habitat function, ontogenetic development in early life stages, and recruitment variability are important factors when modifying existing models for the development of CEC models. Although model complexity should become high to reproduce observed ecoclogical processes, an intermediate level of model ccomplexity is feasible to decrease parameter uncertainty in models for fisheries management.