

Coastal Carbon and Ecology Breakout

- Discussion of NACP and related objectives of OCB and OCCC
 - What are common interests of these programs in the coastal zone?
 - Large carbon signal that is unaccounted for in the continental carbon budget – coasts may be a conduit for terrestrial carbon
 - NACP Workshop report coming out soon
- Recognition of many prior coastal studies and syntheses, but we still lack a comprehensive measuring approach to constrain fluxes of carbon and other elements
- Lack of confidence in magnitudes of coastal signals and understanding of coastal processes has limited our ability to incorporate these systems into larger scale models
 - What are the processes specific to the coastal zone that need to be added to large scale global models?
 - Coasts may represent a potentially large signal, particularly in some regions
 - Global scale models may lack fine scale resolution needed in the coastal zone
- Current models cut off the coasts at the shelf edge or “blue water line”
 - How important are the intricacies of the shelf processes and can they be ignored and still produce an accurate carbon budget?
 - Some potential mechanisms include:
 - Lateral transport or cross shelf exchange
 - Denitrification and nitrogen fixation
 - Benthic-pelagic interactions, nepheloid layers, carbon burial, and sediment transport
 - Ballasting and increased role of lithogenic materials in coastal margins
- What about changes in ecological processes and their sensitivity to climate? Is it best to view this as a question of impacts on ecological processes as opposed to impact on global carbon budgets?

What are the key questions?

- How critical are the intricacies of coastal processes for accurate modeling of carbon budgets?
 - Potential Mechanisms
 - Lateral transport or cross shelf exchange
 - Denitrification and nitrogen fixation
 - Benthic-pelagic interactions, nepheloid layers, carbon burial, and sediment transport
 - Ballasting and increased role of lithogenic materials in coastal margins
 - Finer resolution of models to better match scales in coastal regions

What are the key questions?

- We currently lack an understanding of the magnitude of carbon fluxes in ocean margins. What will it take to better constrain this?
 - Need for more intensive observations
 - Constrain air-sea fluxes, land-sea interactions and cross-shelf exchanges
 - Better integration and coordination of different measurements
 - Ship-based and moored time-series
 - Satellite-based assessments

What are the key questions?

- What are the impacts of climate change on coastal ecological processes, and potential implications for biogeochemical cycles (including carbon)?
 - Nitrogen cycle issues - balance between N fixation and denitrification
 - Potential changes in community diversity, genetic expression, and functional group activities
 - Mapping different habitats and ecosystem types and their distribution (e.g., sea grasses and carbonate dissolution)
 - Acidification impacts
 - Stoichiometry of inputs and nutrient utilization

What could OCB do?

- Leverage NOAA's large scale carbon monitoring network
 - Establish a testbed for modeling that incorporates coastal processes
 - Develop a series of process studies in parallel with the modeling effort that will support
- Provide data management along with metadata analysis in interoperable format (dedicated support within projects for this)
- Provide a web-based “dating service” to promote collaboration and establishment of teams of investigators