

Day 1 Plenary Talks, Carbon Cycle Land-Ocean Coupling – Processes, Fluxes, and Fates

Day 1 Breakout sessions

1. River/Estuary Breakout

What are the critical processes influencing carbon transport and transformation in rivers and estuaries? What is the role of microbially-mediated transformations? What is the role of autochthonous sources of DOC? Role of tidal wetlands in retention and transformation of materials? How do coastal margins influence boundary conditions for continental atmospheric carbon exchange?

- a. What are the data, measurement, and modeling needs to address these?
- b. What are the key spatial and temporal scales
- c. What modeling frameworks are needed to address these?
- d. Role of climate change and resource management in moderating fates, sources and sinks of terrestrial carbon

Co-Chairs: John Paul and Miguel Goni

Reporters: Regina Easley

2. Terrestrial/Watershed Breakout

What are the uncertainties of carbon transport within watersheds? What is the role of watershed land types and usage in influencing delivery of materials to rivers? How do different sources and modes of delivery influence the form and fate of carbon?

- a. What are the data, measurement, and modeling needs to address these?
- b. What modeling frameworks are needed to address these?
- c. Role of climate change and resource management in moderating carbon transport

Co-Chairs: Simone Alin and Charles Perry

Reporters: Lori Adornato

3. Ocean/Terrestrial/Atmosphere Breakout

What are the uncertainties regarding the flux and fate of terrestrial carbon in the Gulf of Mexico (sources, sinks, preservation, remineralization and transport)? What are the levels of variability? What controls whether the region is a source or sink for atmospheric CO₂? How do coastal margins influence boundary conditions for continental atmospheric carbon exchange?

- a. What are the data, measurement, and modeling needs to address these?
- b. What are the key spatial and temporal scales
- c. What modeling frameworks are needed to address these?
- d. Role of climate change and resource management in moderating fates, sources and sinks of terrestrial carbon

Co-Chairs: Liz Gordon and Carlos Del Castillo

Reporters: Laura Lorenzoni

Day 2 Plenary Sessions – Scales, infrastructure, modeling

Day 2 Breakout Sessions

Scales

Many of the interesting and important processes and fluxes occur on very short scales and require a long-term (decadal?) and intensive measurement regimes.

1. What are the appropriate space, and time scales to understand carbon fluxes, and carbon species of interest in each of the major ecosystems?
 - a. Similarities and differences between land-ocean regions?
2. What are strategies for assuring continuity and frequency of sampling across all regions?
3. What ancillary data sets do we need to measure to provide a complete picture of carbon fluxes?

Co-Chairs: Ron Benner and Nazan Atilla

Reporters: David John

Infrastructure

1. What kind of sampling infrastructure and data management will be needed for carbon flux research? To what extent can existing infrastructure be used? Is there a need for standardization of measurements?
 - a. coastal observing system
 - b. coastal and land-based measurements of atmospheric fluxes
 - c. river observatories
 - d. satellite observations
 - e. field expeditions (NASA?)
 - f. lab experiments
2. How will these systems be integrated with modeling efforts? What strategy is needed for integrating data across all regions?
3. What is the strategy for educational outreach and linkages to other programs?

Co-Chairs: Bob Chen and Kathy Tedesco

Reporters: Robyn Conmy

Modeling and Prediction

1. What kind of models are available now? What are we missing?
2. How do the models link up to each other? Can they be integrated with each other or they are separate?
3. What kind of data and observations are still needed for these models (data gaps)?
4. How will short scale process dynamics be integrated into climate/long-term prediction models (requires reconciling scales while retaining information about dynamics)?

Co-Chairs: Barnali Dixon and Chris Anderson

Reporters: David Butman