



**Ocean Carbon and Biogeochemistry
Scoping Workshop on**

***Terrestrial and Coastal Carbon
Fluxes and Exchanges in the
Gulf of Mexico***

May 6-8, 2008
St. Petersburg, FL

<http://www.whoi.edu/sites/GMxCarbon>

Overview of Meeting

- **Meeting Leaders:** Lisa Robbins and Paula Coble, USF Marine science
- **Steering committee** of 7: Paula, Lisa, Wei-Jun Cai, Eileen Hoffman, Scott Denning (NACP), Brent McKee, Ben De Jong (Mexico) and Steve Lohrenz (ex officio)
- **Participants:** Approximately 90 participants from 23 states and 2 representatives from Mexico carbon programs
- Program managers from carbon programs: NSF, NOAA, NASA, MMS, NACP, and Mexican Carbon Program

Goals

Bring together researchers to discuss **state of knowledge** in GOM carbon fluxes, data gaps and overarching questions in the Gulf of Mexico System.

Discuss **potential integrated research** projects relating to carbon fluxes and exchange in the Gulf of Mexico

Facilitate scientific collaboration for future research and proposals.

Structure

Two days of plenary talks and breakout sessions

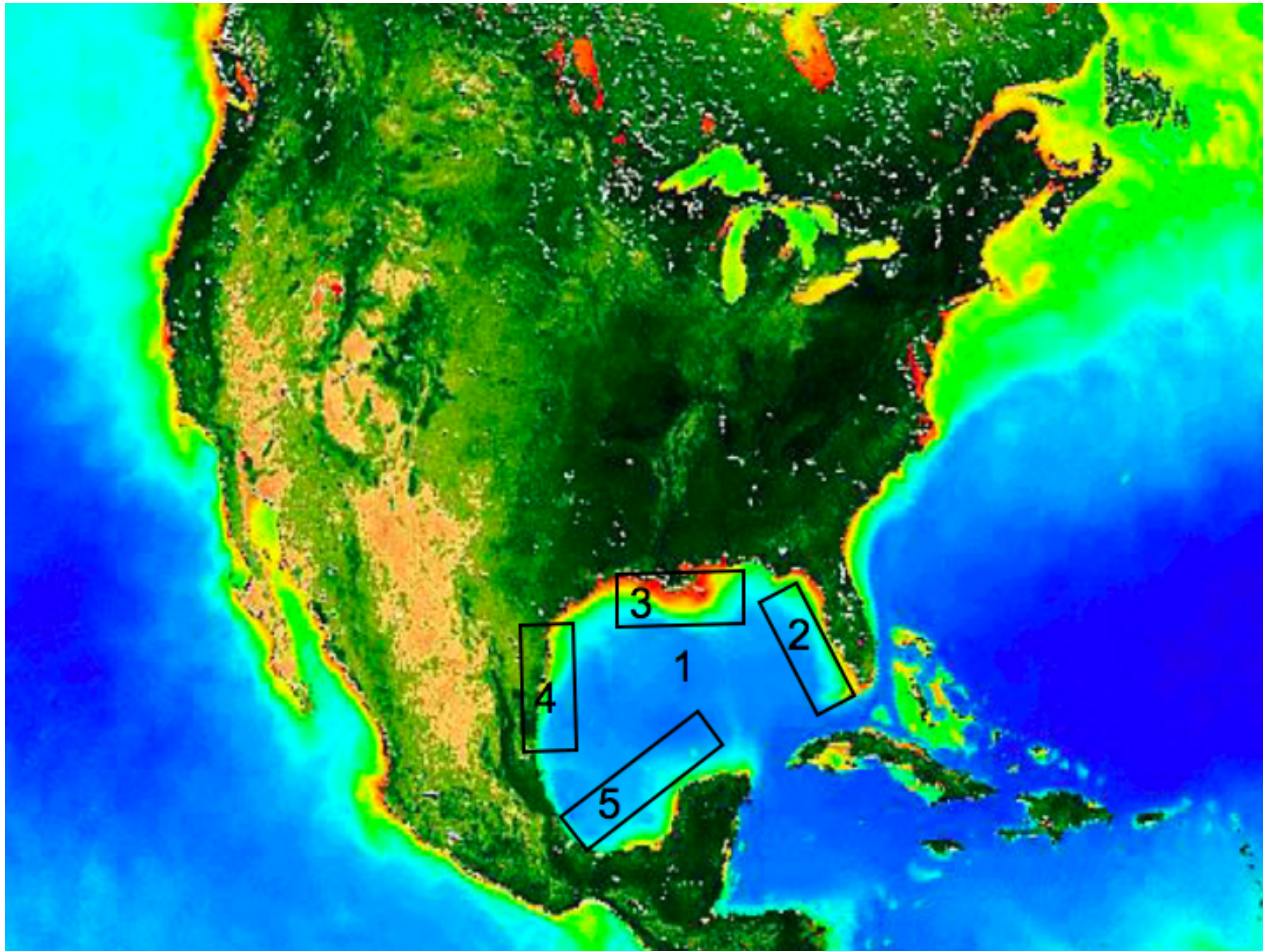
1. What we know and data gaps of the system
2. Carbon dynamics, including scales of variability, infrastructure required to study carbon fluxes and modeling frameworks for integration across the system.

Overarching question

What are the net fluxes of total carbon through the key interfaces defining the Gulf of Mexico system, how can future changes in these fluxes be predicted, and how will these changes impact ecosystems?

- *Quantification of net fluxes of total carbon* (dissolved and particulate, organic and inorganic) is needed over sufficiently long timescales to represent irreversible transfers between reservoirs.
- *Key interfaces* of interest are land–atmosphere, soil–river, estuary–ocean, seafloor–water column, ocean–atmosphere, shelf–GOM interior, and GOM–Atlantic.
- The *Gulf of Mexico system* is here defined as including watersheds, margins, the open Gulf of Mexico, and the overlying atmosphere.
- Anticipated *future changes* include both climate change and human-induced perturbations.
- Successful *prediction* of future changes will require process- and synthesis-level understanding of internal carbon cycling as well as the roles of relevant non-carbon elements (e.g., nitrogen, phosphorus).
- *Ecosystem* refers to all physical and all biological components, including human, of the environment.

Five regions, 2-5 include adjacent watersheds



Major Recommendations

1. The Gulf of Mexico should be studied as a whole system and not an aggregate of parts
 - The landward boundaries of the GOM are best defined not by its tidal shores but by the upslope and recharge boundaries of its watersheds and aquifer.

2. Carbon-flux research in the GOM should be two-pronged in approach:
 - Make use of historical data
 - Formulate a macroscopic carbon budget
 - Tune existing and new models that link watersheds and ocean, to identify unknowns and to better define the important process-level questions
 - Process-oriented studies—including not just carbon but also the biogeochemistry of C-relevant species.
 - Planning should be driven by step one above.

Additional Recommendations

Support for long-term observations in watersheds and ocean is critical.

- Augmentation of USGS water quality stations
- Maintain NOAA observation program
- Continuity of NASA satellite observation
- Continuity of flux towers, land and ocean
- Improved satellite algorithms for complex coastal water
- Support other local and international observation efforts

Improved climate projections for the GOM area is greatly needed. Existing climate predictions lack appropriate data and show large discrepancies.

Additional Recommendations

- A shared integrated modeling effort that is connected to the measurement efforts
- The establishment of a Gulf of Mexico data management center to provide a one-stop-shopping connection to all measurement, modeling, and remote sensing products
- A common communication effort that uses existing networks and outreach opportunities to involve stakeholders and decision-makers in research efforts
- Better integration with NACP

A Few Additional Recommendations

- Need to also consider biogeochemistry of carbon-relevant species
- Need to understand how variability in inputs effect variability in the adjacent GOM.
- Outreach and societal relevance should be strong components of the program that is tightly integrated with other efforts.
- Improvement is needed in our approach to understanding the frequency and location of extreme events within the study area.
- International collaborations between countries adjacent to the GOM which the program could greatly enhance and strengthen

What we need from the OCB Office

- Web-based information resources such as identifying existing research efforts
- Web-based community dialog (wiki)
- Assistance with data mining as a resource
- Assistance in logistical support for field campaigns
- Assistance with data management will be critical as the program progresses.
- Coordination of future meetings

Timetable

Draft to SC July 31

Draft to community Aug. 31



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USA
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By Author, Author, and Author

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U.S. Department of the Interior

U.S. Geological Survey