



National Aeronautics and Space
Administration

NASA Carbon Monitoring System (NASA-CMS)

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NASA-CMS Phase 1



Biomass Pilot. *The goals of the Biomass Pilot are to:*

- Utilize satellite and in situ data to produce quantitative estimates (and uncertainties) of aboveground terrestrial vegetation biomass on a national and local scale.
- Assess the ability of these results to meet the nations need for monitoring carbon storage/sequestration.



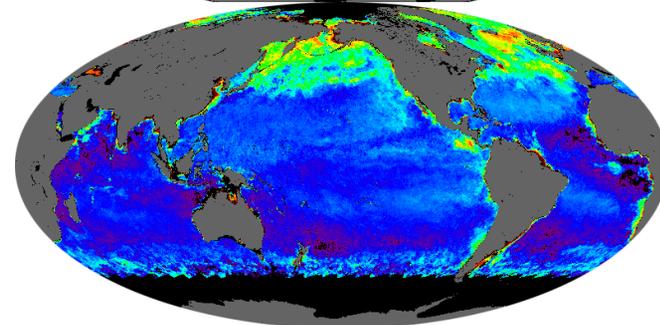
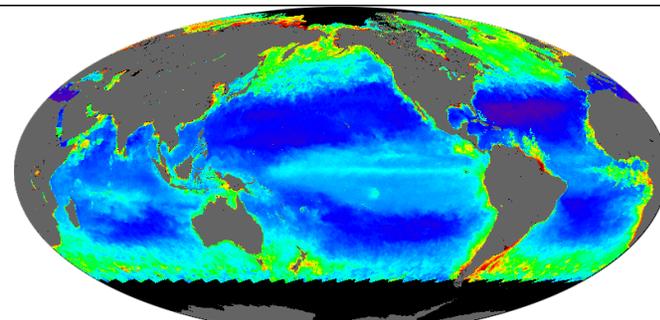
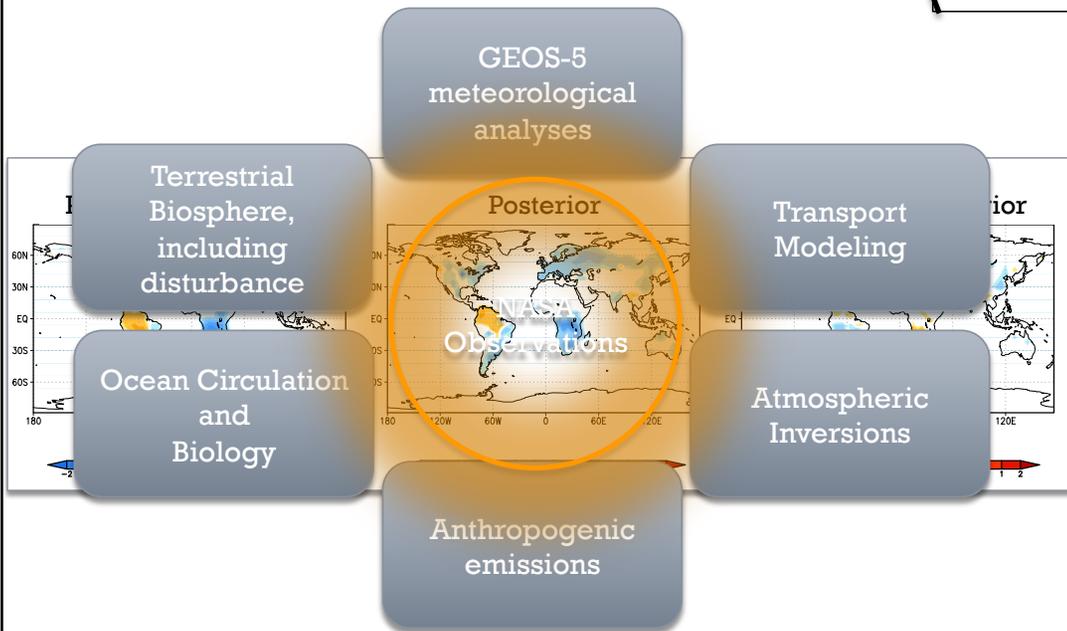
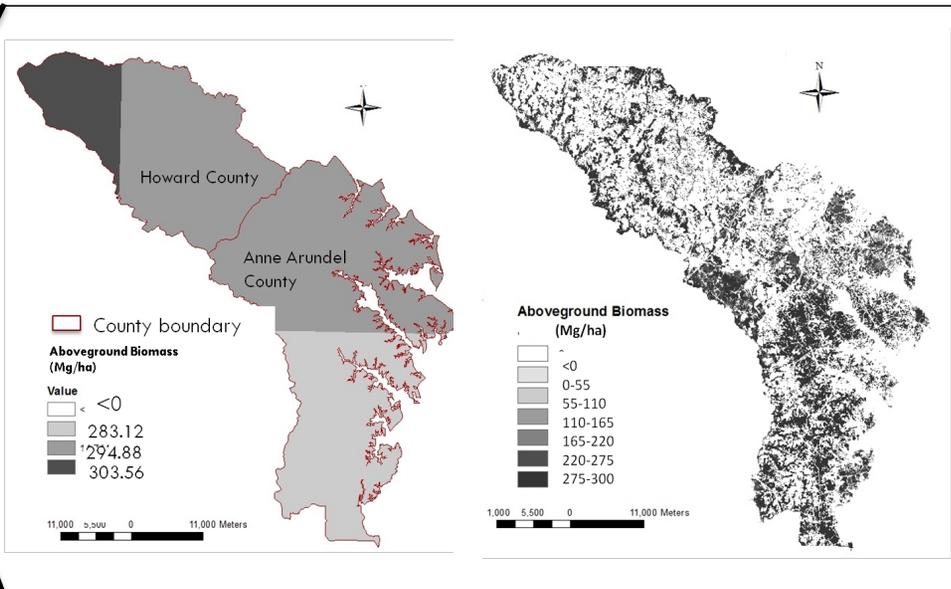
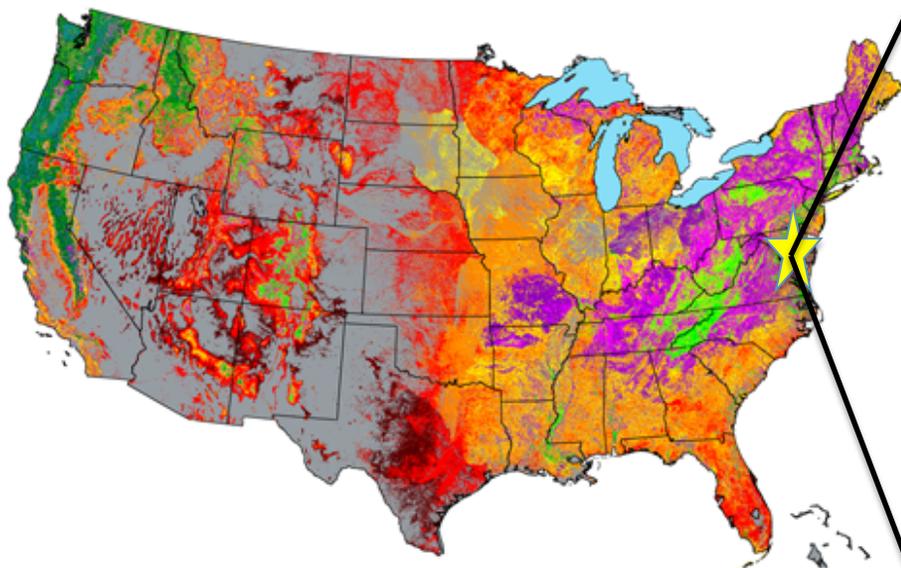
Flux Pilot. *The objectives of the Flux Pilot are to:*

- Combine satellite data with modeled atmospheric transport initiated by observationally-constrained terrestrial and oceanic models to tie the atmospheric observations to surface exchange processes.
- Estimate the atmosphere-biosphere CO₂ exchange.



Scoping Efforts. *The objectives of the Scoping Efforts are to:*

- Identify research, products, and analysis system evolutions required to support carbon policy and management as global observing capability increases.





NASA-CMS Phase 2

Atmosphere

West, Jacob,
Huntzinger,
Andrews,
French,
Lohrenz

Bowman,
Miller,
Pawson,
Lohrenz

Verdy,
Shuchman

Land

Cook, Dubayah, Kasischke,
Saatchi, Houghton, Kennedy,
Healey

Lohrenz

Oceans

Balch,
Behrenfeld



ROSES-2011 A.45

- ❖ **NASA's approach emphasizes major strengths of the NASA Earth Science program (satellite remote sensing, airborne and computational capabilities, scientific knowledge, and end-to-end system expertise).**
- ❖ **NASA's approach also recognizes a need for complementary local-scale (airborne and *in situ*) information to demonstrate methods; to aid in scaling up; and for evaluation of products.**
- ❖ **NASA's approach takes into account data and expertise that are the domain of other U.S. Government agencies and anticipates close interactions with them.**
- ❖ **NASA's approach devotes effort to rigorous evaluation of the products being produced, including errors and uncertainties.**
- ❖ **NASA's emphasis has been on regional, national, and global satellite-based carbon monitoring products relevant to national needs.**
- ❖ **NASA's approach lays the groundwork for CMS-related applications of future NASA satellite sensors now in development or in pre-formulation.**
- ❖ **A NASA CMS Science Team will be established and responsible for providing broad research community involvement in the development and evaluation of products, provide insights for choosing among multiple approaches/products, and expand on current connections to policy and applications communities.**



NASA-CMS Phase 2

Science Team

- *Who are the key user's and what are their requirements for CMS?*
- *How can uncertainties best be quantified and propagated?*
- *What are needed system level functions, system level capabilities?*
- *How can different data layers best be used together to advance science?*
- *What are NASA's capabilities, and where can it best partner?*

