

An NACP Synthesis Activity: Model-Data Intercomparison

Bob Cook Oak Ridge National Laboratory

Mac Post Oak Ridge National Laboratory

Peter Thornton National Center for Atmospheric Research

NACP Community Meeting

December 11, 2007

San Francisco

Planning Group

- Bob Cook, Mac Post, and Peter Thornton (MAST-DC)
- Scott Denning and Andrew Schuh (CSU)
- Ken Davis (Penn State)
- Stephen Ogle (CSU)
- Dennis Ojima (Heinz Center)
- Paul Moorcroft and Mike Dietze (Harvard)
- Chris Potter (NASA Ames)
- Dave Hollinger (Forest Service)
- Yiqi Luo (OSU)
- Andrew Richardson (UNH)
- Jeff Morisette (NASA GSFC)
- Linda Heath (Forest Service)

Background

- Organize individual NACP projects into a group synthesis activity
- Investigator–led (grass roots) effort
 - Open to all investigators
 - No funding for this synthesis activity at this point (BYOB)
 - MAST-DC can assist in data compilation and distribution
- Planning discussions of a small group of NACP investigators provided an outline for this synthesis (flexible design)
- Meeting on Thursday evening (December 13 at 7:30 pm) to seek additional input and flesh out the synthesis effort

Model-Data Intercomparison

Goal: to quantify and understand spatial and temporal distributions of carbon sources and sinks since 2000 by synthesizing NACP data and models, from sites to MCI, other regions (as appropriate), and the continent

- The basis for this synthesis activity will be existing observations and model results
 - Observations: flux tower, atmospheric CO₂ concentrations, agricultural production data, remote sensing, changes in forest inventories
 - Model results: bottom up and inverse modeling
- Need to define data and data processing requirements
 - Parameters / units, temporal and spatial resolution, uncertainties
- Need to define a statistical framework for the comparison

Observations for this Synthesis

- Flux tower data from AmeriFlux and FLUXNET-Canada
- Atmospheric CO₂
- Agricultural production data
- Forest Inventory and Analysis (FIA)
- Remote Sensing

Model Results for this Synthesis

- Focus is on existing model results and uncertainties
 - May do new model runs for the site comparison
- Bottom-up (forward, ecosystem) models at sites and regions / continent
- Inverse models for regions / continent

NACP Synthesis Meeting Agenda

Thursday, December 13, 7:30 pm, Moscone South, Room 236

- Introduction / Background
- Discussion topics:
 - Specific Hypotheses
 - Developing a Synthesis Protocol
 - Observational data requirements
 - Modeling results requirements
 - Statistical Framework for Comparisons
 - Schedule
 - For making observational and model output data available
 - Workshops to present / discuss results
 - Synthesis publications / special Journal issue (?)
 - Workshop Prospectus / Proposal (<4 pp)

NACP Synthesis Meeting Model-Data Intercomparison

7:30 pm

**Thursday December 13, 2007
Room 236, Moscone South**

All Investigators are welcome
to participate in this synthesis activity.

If you are unable to attend, please contact Bob Cook and we'll add you to the email distribution.

Backup / slides for Thursday

Data Requirements

- Carbon fluxes (NEE, GPP, R_e , R_h , R_a), carbon inventories (soil, living, etc.), and turnover times
- Energy and water fluxes
- Parameters / units
- Time and spatial resolution
- Uncertainties

Model results for model-model intercomparisons

- Energy and water fluxes, soil dynamics, etc.
- Model forcing (input) parameters (expressed in same spatial / temporal resolution as outputs)

Outcomes from Thursday meeting

- Identification of participants
 - Including a method to reach those who did not attend
- Volunteers to assist with synthesis protocol and the Workshop prospectus
 - Including establishing a schedule for the activity
- Other?

Site Synthesis: Time Frame and Deadlines

February 1, 2008	Synthesis Protocol send to participants Prospectus for Workshops sent to IWG
April 15	Observational data sent to MAST-DC
April 15	Model results for sites sent to MAST-DC
April – August	Analysis and intercomparison of observations and model output
September	Site-level Intercomparison Workshop
October – November	Write papers (for special issue?)
January 2009	Present results at NACP All-Scientist Meeting Submit papers

Regional / Continental Synthesis: Time Frame and Deadlines

February 1, 2008	Synthesis Protocol send to participants Prospectus for Workshops sent to IWG
August 1, 2008	Observational data sent to MAST-DC
August 1, 2008	Model results for regions sent to MAST-DC
August - November	Analysis and intercomparison of observations and model output
November	Regional / Continental Intercomparison Workshop
December – February	Write papers (for special issue?)
January 2009	Present results at NACP All-Scientist Meeting
March	Submit papers