

# 2013 ASP Graduate Student Colloquium: Carbon-Climate Connections in the Earth System

National Center for Atmospheric Research, Boulder, Colorado

## Agenda

### Sunday, 28 July

18:00-20:00 Reception/introductions @ Zolo Grill (2525 Arapahoe Ave)

### Monday, 29 July

NCAR Fleischmann Building - Walter Orr Roberts Board Room (lower level - enter from outside)

8:00 Bus pickup - Millennium Hotel

08:30-09:00 Matthew Long - Introductions

09:00-09:55 David Schimel - Carbon and climate on geologic timescales

09:55-10:15 Break - ML FB Board Room

10:15-11:10 Peter Gent - A history of coupled climate modeling

11:10-12:05 Britton Stephens - The global carbon cycle as seen by the atmosphere

12:05-13:05 Lunch - On your own (ML Cafeteria)

13:05-14:05 Susan Solomon - Radiative forcing by anthropogenic constituents

14:05-15:00 Inez Fung - Modeling the global carbon cycle

15:00-15:20 Mark Moore & Peter Buss - Computing setup

15:20-15:40 Break - ML FB Board Room

15:40-16:35 Keith Lindsay - Tools for analyzing climate model output I

16:35-17:30 Group - Introduction to projects

17:30 Bus return

### Tuesday, 30 July

NCAR Fleischmann Building - Walter Orr Roberts Board Room (lower level - enter from outside)

8:00 Bus pickup - Millennium Hotel

08:30-09:25 Susan Solomon - Cumulative emissions and the long tail of carbon removal

09:25-10:20 Gordon Bonan - Characterization of the terrestrial environment

10:20-10:40 Break - ML FB Board Room

10:40-11:35 Gordon Bonan - Modeling Terrestrial ecosystems: Biogeophysics/canopy processes

11:35-12:30 Ying-Ping Wang - Global nitrogen and phosphorus cycles

12:30-13:30 Lunch - On your own (ML Cafeteria)

13:30-14:25 David Schimel - Modeling Terrestrial ecosystems: Biogeochemistry/feedbacks

14:25-14:45 Break - ML FB Board Room

14:45-16:00 Keith Lindsay - Tools for analyzing climate model output II

16:00-17:30 Projects

17:30 Bus return

### Wednesday, 31 July

NCAR Fleischmann Building - Walter Orr Roberts Board Room (lower level - enter from outside)

8:00 Bus pickup - Millennium Hotel

08:30-09:25 Matthew Long - Ocean carbon biogeochemistry: thermodynamics, carbon chemistry, gas exchange

09:25-10:20 Inez Fung - Conceptualizing and quantifying climate-carbon feedback

10:20-10:40 Break - ML FB Board Room

10:40-12:10 Fung/Schimel/Doney/Long - Hands-on session: Coupled carbon-climate system

12:10-13:10	Lunch - On your own (ML Cafeteria)
13:10-14:30	Fung/Schimel/ Doney/Long - Hands-on session: Coupled carbon-climate system
14:30-14:45	Break - ML FB Board Room
14:45-15:40	Galen McKinley - Ocean carbon biogeochemistry: Productivity, export, remineralization
15:40-16:35	Scott Doney - Marine ecosystem modeling I
16:35-17:30	Ben Houlton - Fundamentals of nutrient limitation: Consilience of plant ecophysiology and
17:30	Bus return

<b>Thursday, 1 August</b>	
	NCAR Fleischmann Building - Walter Orr Roberts Board Room (lower level - enter from outside)
8:00	Bus pickup - Millennium Hotel
08:30-09:25	Annalisa Bracco - Global overturning circulation
09:25-10:20	Scott Doney - Marine ecosystem modeling II
10:20-10:40	Break - ML FB Board Room
10:40-12:00	Doney/McKinley - Hands-on session: Modeling marine ecosystems
12:00-13:00	Lunch - On your own (ML Cafeteria)
13:00-13:55	Matthew Long - Ocean uptake of anthropogenic CO <sub>2</sub> : Capacity, kinetics, biology
13:55-14:50	Galen McKinley - Climate interactions and feedback in the ocean carbon cycle
14:50-15:10	Break - ML FB Board Room
15:10-16:05	Ben Houlton - Frontiers in global nutrient cycles: Questions, opportunities and techniques
16:05-17:30	Open project time
17:30	Bus return

<b>Friday, 2 August</b>	
	NCAR Fleischmann Building - Walter Orr Roberts Board Room (lower level - enter from outside)
8:00	Bus pickup - Millennium Hotel
08:30-09:25	Annalisa Bracco - Upper ocean physics
09:25-10:20	Scott Doney - Phytoplankton ecology
10:20-10:40	Break - ML FB Board Room
10:40-11:35	Inez Fung - Inferring fluxes from atmospheric observations
11:35-12:30	David Schimel - FluxNet data and scaling
12:30-13:30	Lunch - On your own (ML Cafeteria)
13:30-14:30	Schimel/Fung/Stephens/Chatterjee - Hands-on session: Flux constraints
14:30-15:00	Break - ML FB Board Room
15:00-17:00	Schimel/Fung/Stephens/Chatterjee - Hands-on session: Flux constraints
17:00	Bus return

<b>Saturday, 3 August</b>	
08:00-17:00	Rocky Mountain National Park excursion

<b>Monday, 5 August</b>	
	NCAR Mesa Lab (morning) & Fleischmann Building Board Room (afternoon)
8:00	Bus pickup - Millennium Hotel
08:30-09:25	Will Weider - Soil decomposition
09:25-10:25	Deutsch - Hands-on session: Coupled-carbon cycle model
10:25-10:45	Break - ML Outside of Main Seminar Room

10:45-12:15 Deutsch - Hands-on session: Coupled-carbon cycle model  
 12:15-13:15 Lunch - On your own (ML Cafeteria)  
 13:15-14:10 Jim Randerson - Fire and climate  
 14:10-15:00 Projects - Fleischmann Building  
 15:00-15:30 Break - ML FB Board Room  
 15:30-17:30 Projects - Fleischmann Building  
 17:30 Bus return

**Tuesday, 6 August** NCAR Mesa Lab

8:00 Bus pickup - Millennium Hotel  
 08:30-09:25 Clara Deser - Natural variability in the climate system  
 09:25-10:20 Samuel Levis - Land-use and carbon cycling  
 10:20-10:40 Break - ML Outside of Main Seminar Room  
 Jim Randerson - Disturbance and land use change processes: impacts on carbon fluxes in terrestrial ecosystems  
 10:40-11:35 Rosie Fisher - Community dynamics and climate  
 11:35-12:30 Lunch - On your own (ML Cafeteria)  
 12:30-13:30 Project time and proposal presentations  
 13:30-14:45 Break - ML Outside of Main Seminar Room  
 14:45-15:00 Project time and proposal presentations  
 15:00-16:00 Project time and proposal presentations  
 16:00 Bus return

**ASP Researcher Workshop, 6-10 August 2013**

18:45 Bus pickup -Boulder Inn  
 19:00-19:30 Reception for Researcher Workshop - Millennium Hotel (Millennium Room)  
 19:30-21:00 Introduction of organizers and objectives of the workshop  
 21:00 Bus return

**Wednesday, 7 August** NCAR Mesa Lab

7:30 Bus pickup - Millennium Hotel & Boulder Inn  
 8:00-8:15 Quinn Thomas - Welcome  
**Carbon Cycle Overview**  
 Jim Randerson - The state of the carbon cycle in CMIP5 models: Processes, feedbacks, and future research directions  
 8:15-9:15 Ning Zeng - The changing seasonal cycle of atmospheric CO<sub>2</sub>  
 9:15-10:15 Break - ML Outside of Main Seminar Room  
 10:15-10:45 Taka Ito - Physical and biological controls on the ocean carbon storage  
 10:45-11:45 Ying Ping Wang - Effects of Nutrient limitation on land carbon uptake and its implications on climate change prediction and mitigation  
 11:45-12:45 Lunch - On your own (ML Cafeteria)  
 12:45-13:45 Phillipe Ciais - Challenges in soil carbon modeling and links to the river carbon cycle  
**Nutrient Cycling Controls and Impacts on Carbon Cycling**  
 14:45-15:45 Curtis Deutsch - Climate regulation of the oceanic N cycle  
 15:45-16:15 Break - ML Outside of Main Seminar Room  
 16:15-16:55 Sara Vicca - Nutrient availability determines forests' carbon sequestration - A global synthesis  
 16:55-17:35 Anna Cabre - Southern Ocean response to climate change in the CMIP5 models

17:35-19:00 **Poster Session I - ML Outside of Main Seminar Room (drinks & appetizers)**

- Remineralization and nutrient cycling controls
- Carbon cycle I - CMIP5 and continental to global carbon flux estimates

19:00 Bus return

Thursday, 8 August NCAR Mesa Lab

7:30 Bus pickup - Millennium Hotel & Boulder Inn

***Remineralization Pathways and Controls***

8:00-9:00 Adrian Burd - The fate of particulate organic material in the oceans

9:00-10:00 Serita Frey - Terrestrial ecosystem carbon dynamics: Effects of heterotrophic respiration

10:00-10:30 Break - ML Outside of Main Seminar Room

10:30-11:10 Christian Lønborg - Dissolved organic matter (DOM) - microbe interactions

Tom Vanwelleghem - Towards modeling global soil erosion and its importance for the terrestrial carbon cycle

11:10-11:50

11:50-13:00 Lunch - On your own (ML Cafeteria)

***Role of Individuals in Ecosystem Dynamics***

13:00-14:00 Rosie Fisher -

14:00-15:00 Tim Lenton - Capturing evolution and ecology in a global ocean model

15:00-15:40 Sophie Fauset - Modeling tropical forest dynamics using an individual-based forest simulator

15:40-16:10 Break - ML Outside of Main Seminar Room

David Nicholson - A cellular allocation modeling approach for representing the ecophysiology of marine primary producers

16:10-16:50

16:50-19:00 Break-out

19:00-20:45 Group Reception/Dinner (ML Tree Plaza)

20:45 Bus return

Friday, 9 August NCAR Mesa Lab

7:30 Bus pickup - Millennium Hotel & Boulder Inn

***Data to Constrain Carbon Cycle Feedbacks: Assimilation, Metrics, Parameter Estimation, Inverse Methods, Etc.***

8:00-9:00 Galen McKinley - Using data to elucidate feedback mechanisms in the ocean carbon cycle

9:00-9:40 Kevin Bowman - The NASA Carbon Monitoring System

Kiona Ogle - Strategies for applying individual-based models of forest dynamics at regional to continental scales

9:40-10:40

10:40-11:00 Break - ML Outside of Main Seminar Room

***Role of Physical Climate Variability***

11:00-12:00 Jeff Chambers -

12:00-12:40 Charles Koven - Modeling terrestrial carbon-climate dynamics in the northern high latitudes

12:40-13:40 Lunch - On your own (ML Cafeteria)

13:40-14:40 Nicole Lovenduski - Carbon in the southern ocean: Known knowns and known unknowns

Rondrotiana Barimalala - Representation of the Indian Ocean biophysical interannual variability in the CMIP5-ESM models

14:40-15:20

15:20-15:40 Break - ML Outside of Main Seminar Room

***Ecosystem Dynamics New Horizons***

15:40-16:40 Tom Anderson - Role of zooplankton in marine ecosystems and modeling perspectives  
16:40-17:40 Jeff Hicke - The role of biotic disturbance agents in carbon-climate connections  
18:00-19:00 **Poster Session II - ML Outside of Main Seminar Room (drinks & appetizers)**  
- Carbon cycle II - Local processes and regional flux estimates  
- New modeling approaches and the use of data to constrain carbon cycle feedbacks  
19:00 Bus return

**Saturday, 10 August** Millennium Hotel, Century Room

8:00 Bus pickup at Boulder Inn  
8:30-10:30 Break-out Groups  
10:30-11:30 Concluding remarks  
12:00 End  
12:00 Bus return

**Monday, 12 August** NCAR Foothills Lab, Building 2 (FL2)

8:00 Bus pickup - Millennium Hotel  
08:30-09:30 Nikki Lovenduski - Key biomes: Southern Ocean  
09:30-10:30 Curtis Deutsch - Glacial/interglacial CO<sub>2</sub> variability  
10:30-11:00 Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)  
11:00-12:30 Projects  
12:30-13:30 Lunch - On your own (FL2 Cafeteria)  
13:30-15:30 Projects  
15:30-16:00 Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)  
16:00-17:30 Projects  
17:30 Bus return

**Tuesday, 13 August** NCAR Foothills Lab, Building 2 (FL2)

8:00 Bus pickup - Millennium Hotel  
08:30-09:30 Curtis Deutsch - Marine N cycle  
09:30-10:30 David Schimel - Benchmarking modeled carbon-climate feedbacks  
10:30-11:00 Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)  
11:00-12:30 Projects  
12:30-13:30 Lunch - On your own (FL2 Cafeteria)  
13:30-15:30 Projects  
15:30-16:00 Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)  
16:00-17:30 Projects  
17:30 Bus return

**Wednesday, 14 August** NCAR Foothills Lab, Building 2 (FL2)

8:00 Bus pickup - Millennium Hotel  
08:30-09:30 Bas van Ruijven - Integrated assessment modeling  
09:30-10:30 Joeri Rogelj - Carbon-climate uncertainty and policy implications  
10:30-11:00 Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)  
11:00-12:30 Projects  
12:30-13:30 Lunch - On your own (FL2 Cafeteria)

13:30-15:30	Projects
15:30-16:00	Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)
16:00-17:30	Projects
17:30	Bus return

Thursday, 15 August	NCAR Foothills Lab, Building 2 (FL2)
8:00	Bus pickup - Millennium Hotel
08:30-09:30	Diane McKnight - Freshwater to coastal systems
09:30-10:30	Hanna Lee - Key biomes: Arctic Ecosystems
10:30-11:00	Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)
11:00-12:30	Projects
12:30-13:30	Lunch - On your own (FL2 Cafeteria)
13:30-15:30	Projects
15:30-16:00	Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)
16:00-17:30	Projects
17:30	Bus return

Friday, 16 August	NCAR Foothills Lab, Building 2 (FL2)
8:00	Bus pickup - Millennium Hotel
08:30-10:00	Final project presentations
10:00-10:30	Break - Inside old COMET Classroom (Now MMM Classroom @ FL2-1024)
10:30-12:00	Final project presentations
12:00	Bus return