Key Uncertainties in the Global Carbon-Cycle:
Perspectives across terrestrial and ocean ecosystems
ASP Researcher Workshop, Aug 6-10th 2013

Hour talks will provide both an overview of the topic and details on the speaker's research: speakers should aim for ~45 minutes with ~15 minutes of discussion.

40 min talks will be focus on cutting edge research: speakers should aim for ~30 minutes with ~10 minutes of discussion.

Tuesday

19:00 Reception

19:30 Introduction of organizers and objectives of the workshop

Wednesday

8:00 Welcome (*Quinn Thomas*)

Carbon Cycle Overview

8:15 Carbon-climate feedbacks in CMIP5: land and ocean perspectives – *Jim Randerson, UC Irvine*

9:15 The changing seasonal cycle of atmospheric CO_2 – *Ning Zeng, Univ. of Maryland*

10:15 Coffee Break

10:45 Physical and biological controls on the ocean carbon storage – *Taka Ito, Georgia Institute of Technology*

11:45 Effects of nutrient limitation on land carbon uptake and its implications on climate change prediction and mitigation – *Ying Ping Wang, CSIRO*

12:45 Lunch

13:45 Challenges in soil carbon modeling and links to the river carbon cycle – *Phillipe Ciais, IPSL-LSCE*

Nutrient cycling controls and impacts on carbon cycling

14:45   Climate regulation of the oceanic N cycle – *Curtis Deutsch, Univ. of Washington*

15:45   Coffee Break

16:15   Nutrient availability determines forests' carbon sequestration – a global synthesis – *Sara Vicca, University of Antwerp*

16:55   Southern Ocean response to climate change in the CMIP5 models – *Anna Cabre, Univ. of Pennsylvania*

17:35   **Poster session I:**
- Remineralization and nutrient cycling controls
- Carbon cycle I – CMIP5 and continental to global carbon flux estimates

Thursday
Remineralization pathways and controls

8:00   The fate of particulate organic material in the oceans – *Adrian Burd, Univ. of Georgia*

9:00   Terrestrial Ecosystem Carbon Dynamics: Effects of Heterotrophic Respiration – *Serita Frey, Univ. of New Hampshire*

10:00   Coffee Break

10:30   Dissolved organic matter (DOM) - microbe interactions – *Christian Lønborg, Swansea University*

11:10   Towards modelling global soil erosion and its importance for the terrestrial carbon cycle – *Tom Vanwalleghem, Univ. of Cordoba*

11:50   Lunch

Role of individuals in ecosystem dynamics

13:00   – *Rosie Fisher, NCAR*

14:00   Capturing evolution and ecology in a global ocean model – *Tim Lenton, Univ. of Exeter*

15:00   Modelling tropical forest dynamics using an individual-based forest simulator – *Sophie Fauset, Univ. of Leeds*

15:40	Coffee Break
16:10	A cellular allocation modeling approach for representing the ecophysiology of marine primary producers – *David Nicholson, WHOI*
16:50	Breakout groups to plan out synthesis paper (1 group per paper section, students as note takers)
19:00	Group reception/dinner

Friday

Data to constrain carbon cycle feedbacks: assimilation, metrics, parameter estimation, inverse methods etc.

8:00	Using data to elucidate feedback mechanisms in the ocean carbon cycle – *Galen McKinley, Univ. of Wisconsin-Madison*
9:00	The NASA Carbon Monitoring System – *Kevin Bowman, JPL*
9:40	Strategies for applying individual-based models of forest dynamics at regional to continental scales – *Kiona Ogle, Arizona State Univ.*
10:40	Coffee Break

Role of physical climate variability

11:00	– *Jeff Chambers, LBNL*
12:00	Modeling terrestrial carbon-climate dynamics in the northern high latitudes – *Charles Koven, LBNL*
12:40	Lunch
13:40	Carbon in the Southern Ocean: Known knowns and known unknowns – *Nicole Lovenduski, Univ. of Colorado-Boulder*
14:40	Representation of the Indian Ocean biophysical interannual variability in the CMIP5-ESM models – *Rondrotiana Barimalala, Georgia Institute of Technology*
15:20	Coffee Break

Ecosystem dynamics new horizons

15:40   Role of zooplankton in marine ecosystems and modelling perspectives –
         Tom Anderson, University of Southampton

16:40   The role of biotic disturbance agents in carbon-climate connections – *Jeff
         Hicke, Univ. of Idaho*

17:40   **Poster session II:**
         - Carbon cycle II – local processes and regional flux estimates
         - New modeling approaches and the use of data to constrain carbon cycle
           feedbacks

Saturday

8:30   Breakout groups

10:30   Planning next steps

11:30   Concluding remarks

12:00   End

Poster Session I

Remineralization and nutrient cycling controls

Marcia DeLonge, UC Berkeley – *Impacts of compost and manure applications on soil C in managed grasslands*

Michelle Johnson, University of Leeds – *Improving predictions of Amazon forest dynamics with a new phosphorus cycle model*

Marguerite Mauritz*, San Diego State University – *Invasion of a semi-arid shrubland by annual grasses increases autotrophic and heterotrophic soil respiration rates due to altered soil moisture and temperature patterns.*

Levin Nickelsen*, Helmholtz Centre for Ocean Research Kiel – *Iron-light colimitation increases sensitivity of oceanic CO_2 drawdown to dust deposition*

Darren Pilcher*, University of Wisconsin – *Modeled Seasonality of the Biogeochemistry of Pre-Dreissena Mussel Lake Michigan*

Katherine Powell*, University of Colorado – *Links between soil water availability and soil respiration in semi-arid ecosystems along the Colorado Front Range*

Alexis Santos*, University of Wisconsin – *Distinguishing Nutrient and Light Drivers of Productivity Trends In the North Atlantic Intergyre Region*

Christina Schädel, University of Florida – *Circumpolar assessment of permafrost C quality and its vulnerability over time using long-term incubation studies*

Elliot Sherman*, UC Irvine – *Assessment of iron cycling in the CESM-BEC model using high resolution CLIVAR data*

Jennifer Soong*, Colorado State – *How do microarthropods impact soil carbon sequestration during litter decomposition in a tallgrass prairie?*

Claire Treat*, University of New Hampshire – *Controls on soil carbon losses in alaskan permafrost peatlands*

Julie Wolf, University of Maryland – *Refining expectations of soil organic carbon storage under future climate change with observational studies*

Carbon Cycle I – CMIP5 and continental to global carbon flux estimates

Ana Bastos*, Universidade de Lisboa – *The global NPP dependence on ENSO: La-Niña and the extraordinary year of 2011*

Heather Graven, Scripps Institution of Oceanography – *Large-scale increase in seasonal CO2 exchange by northern terrestrial ecosystems since 1960*

ChuanLi Jiang, Earth and Space Research – *Drake Passage oceanic pCO_2: Evaluating CMIP5 Coupled Carbon/Climate Models using in-situ observations*

Mati Kahru, Scripps Institution of Oceanography – *Improved estimates of primary production in the Arctic Ocean*

Emma Littleton*, University of East Anglia – *The Carbon Balance of the Terrestrial Biosphere under Climate Change*

Joseph Majkut, Princeton University – *Historical Changes to Ocean Fluxes of CO_2*

Juan Muglia*, Oregon State University – *Ocean Circulation During the Last Glacial Maximum Simulated by PMIP3 Climate Models*

Caroline Normile*, Penn State University – *Steps Towards a Multi-year Continental Inversion: Comparing Simulated CO_2 Mixing Ratios in ABL to the North American Tower Network*

Andreas Schmittner, Oregon State University – *Millennial variability of ocean circulation and biogeochemical cycles during the last ice age*

Lori Sentman, NOAA/GFDL – *Reducing Uncertainty in the Global Carbon Cycle from Land Use Application of Earth System Model Initialization*

Britton Stephens, NCAR – *Strong Observational Constraints on Seasonal Northern Extratropical CO_2 Exchange*

Shoichi Taguchi, National Institute of Advanced Industrial Science and Technology, Japan – *Surface CO_2 flux in weekly temporal resolution over the globe inferred from the CONTRAIL dataset*

David Turner, Oregon State University – *Bottom-up Scaling of Net Ecosystem Exchange over North America and Evaluation with an Atmospheric Inversion Setup*

John Worden, JPL and Caltech – *CH_4 Emissions from Tropical Fires*

Poster Session II

Carbon Cycle II – local processes and regional flux estimates

Kimberly Carlson, University of Minnesota – *Committed carbon emissions from oil palm plantation expansion onto Kalimantan peatlands*

Christopher Conrad*, University of Colorado – *The Relationship Between Wind Stress and Surface Carbonate Chemistry in the Southern Ocean*

Elizabeth Drenkard*, Woods Hole Oceanographic Institute – *Observed strengthening of the Pacific Equatorial Undercurrent in the SODA record: coupled mechanisms, ocean dynamics, and implications*

Maheteme Gebremedhin, SEA/NEON – *Carbon Balance of No-Till Soybean with Winter Wheat Cover Crop in the Southeastern United States*

Leah Johnson*, University of Washington – *The Role of Lateral Processes on Mixed Layer Spring Stratification*

Angela Kuhn*, Dalhousie University – *Re-thinking spring blooms using optimized NPZD models*

Brett Raczka*, Penn State University – *Identifying Sources of Uncertainty to Improve the Simulation of Long Term Carbon Sequestration in Northern Wisconsin*

Kay Steinkamp, NIWA – *Regional footprints and transport regimes for CO_2 measurement sites in New Zealand from backward Lagrangian dispersion modeling*

Brandon Stephens*, UC San Diego – *Production and Accumulation of Organic Carbon in the Southern California Current Region*

Yogesh Tiwari, Indian Institute of Tropical Meterology – *Carbon Climate Interactions in India*

Carl Trettin, US Forest Service – *Changes in Carbon Pools 50 Years after Reversion of a Landscape Dominated by Agriculture to Managed Forests in the Southeastern Atlantic Coastal Plain*

Fan Zhang*, Georgia Institute of Technology – *Changing seasonality of convective events in the Labrador Sea*

New modeling approaches and the use of data to constrain carbon cycle feedbacks

Bassil El Masri, University of Illinois at Champaign-Urbana – *Implementation of Dynamic Leaf Area Index in a Land Surface Model to Improve Water, Energy and Carbon Fluxes*

Yuanyuan Fang, Carnegie Institution for Science – *Can biospheric models reproduce spatiotemporal variability of CO_2 fluxes as observed through atmospheric measurements?*

Corinne Hartin, Joint Global Change Research Institute – *The Inorganic Carbon Cycle in a Simple Box Model*

Tihomir Kostadinov, University of Richmond – *Carbon-based phytoplankton functional types via remote retrievals of the particle size distribution*

Jaclyn Matthes, Boston University – *Improving long-term forecasts of ecosystem-climate dynamics through community-based model-data fusion*

Maosheng Zhao, University of Maryland – *Linking High Resolution Lidar Data and Ecosystem Model for a Robust Carbon Monitoring System*

ASP Colloquium Student Attendees

Caroline Alden, *University of Colorado*
Ana Bastos, *Universidade de Lisboa*
Sarah Brody, *Duke University*
Benjamin Bronselaer, *University of Oxford*
Christopher Conrad, *University of Colorado*
Elizabeth Drenkard, *Woods Hole Oceanographic Institute*
Yassir Eddebbar, *UC San Diego*
Yujie He, *Purdue University*
Leah Johnson, *University of Washington*
Angela Kuhn, *Dalhousie University*
Emma Littleton, *University of East Anglia*
Marguerite Mauritz, *San Diego State University and UC Davis*
Juan Muglia, *Oregon State University*
Levin Nickelsen, *Helmholtz Centre for Ocean Research Kiel*
Caroline Normile, *Penn State University*
Samantha Oestreicher, *University of Minnesota*
Darren Pilcher, *University of Wisconsin*
Katherine Powell, *University of Colorado*
Brett Raczka, *Penn State University*
Alexis Santos, *University of Wisconsin*
Elliot Sherman, *UC Irvine*
Carlos Silva, *University of Maryland*
Jennifer Soong, *Colorado State*
Brandon Stephens, *UC San Diego*
Claire Treat, *University of New Hampshire*
Fan Zhang, *Georgia Institute of Technology*