



**Environmental System Science
Principal Investigator (PI) Meeting
April 28-29, 2015
Bolger Center, Potomac, MD**



Monday, April 27, 2015

7:00-8:30pm **Meeting Check In (Franklin Building)**

Tuesday, April 28, 2015

6:30-8:00am **Breakfast (Osgood Building)**

7:00-8:00am **Meeting Check In (Franklin Building)**

8:00–9:55am **Overview of Programs and Strategic Directions (Ben Franklin Hall) Kuperberg**

8:00-8:05am Welcome and Introductory Comments.....M. Kuperberg

8:05-8:10am BER Programs.....S. Weatherwax

8:10-8:20am CESD Programs & Strategic Directions.....G. Geernaert

8:20-8:35am Science Communications.....R. Borchelt

8:35-8:55am TES Program Goals, Objectives, Activities and Highlights.....D. Stover

8:55-9:15am SBR Program Goals, Objectives, Activities and HighlightsD. Lesmes

9:15-9:25am Accelerated Climate Model for Energy (ACME) Update.....D. Koch

9:25-9:35am Regional and Global Climate Modeling and Analyses.....R. Joseph

9:35-9:45am CESD Data Activities.....J. Hnilo

9:45-10:10am **Break**

10:10-12:15pm **Plenary Session I –Capturing the Structure and Function of Terrestrial Environments across Scales (Ben Franklin Hall) Lesmes**

10:10-10:45am From Archaea to the atmosphere: Can genome-scale resolution improve earth system models of climate change?..... S. Saleska

10:45-11:15am Subsurface sensing is hotting up! Heated fiber optics for water content and flux in the subsurface from 0.1 to 10,000m.....J. Selker

11:15-11:45am Nutrient cycle impacts on forest ecosystem carbon cycling.....J. Fisher

11:45-12:15pm Google Earth Engine.....D. Thau

12:15-2:00pm **Lunch (Osgood Building)**

12:30-2:00pm Lunch with Facilities & Community Resources

EMSL/JGI (Room 18/19).....N. Hess/S. Tringe

ARM/AmeriFlux (Room 17A/17B)..... L. Berg and M. Torn

Google Earth Engine discussion and demonstration (Room 17 A/B).....D. Thau

2:00-5:00pm **Poster Session I (Franklin Building: Rooms 9A/B, 15/16, 20 and 21)**

2:00-3:30pm Poster Subsession A

3:30-5:00pm Poster Subsession B

5:30-7:00pm **Dinner (Osgood Building)**

7:00-8:30pm **Concurrent Sessions - I (Franklin Building)**

Concurrent Session 1: Recent Advances in Tropical Ecosystem Research (Room 18/19) **Stover**

7:00-7:20pm NGEE Tropics Update.....J. Chambers

7:20-7:40pm Tropical Response to Altered Climate Experiment (TRACE): Adventures in warming a wet tropical forest in Puerto Rico.....T. Wood

7:40-8:00pm Ecophysiological controls on Amazonian precipitation seasonality and variability.....J-E. Lee

8:00-8:20pm Drivers of redox biogeochemistry in humid tropical forests.....W. Silver

8:20pm Discussion

8:30pm Adjourn

Concurrent Session 2: Environmental Microbiology (Room 1) **Bayer**

7:00-7:20pm Toward a predictive understanding of the response of belowground microbial carbon turnover to climate change drivers in a boreal peatland.....J. Kostka

- 7:20-7:40pm Microbial diversity and greenhouse gas dynamics in coastal wetlands.....S. Tringe
- 7:40-8:00pm The diversity and possible subsurface biogeochemical roles of enigmatic bacteria and archaea from massive candidate phyla radiations.....J. Banfield
- 8:00-8:20pm Efforts towards understanding the links between microbial community structure and function within ENIGMA.....D. Elias
- 8:20pm Discussion
- 8:30pm Adjourn

Concurrent Session 3: Land-Atmosphere Interactions (Room 17 A/B) Lesmes/McFarlane

- 7:00-8:30pm Moderated discussion by Larry Berg and Margaret Torn on approaches for improving the understanding of land-atmosphere interactions at ARM and Ameriflux sites.
- 8:30pm Adjourn

Concurrent Session 4: Next Generation Sensors, Networking, Data Assimilation and Modeling (Ben Franklin Hall) Hirsch

- 7:00-7:05 Session Introduction.....M. Mayes
- 7:05-7:15pm Translating sensing technological opportunity into environmental understand from the Dead Sea to Africa (Oregon Statue Univ).....J. Selker
- 7:15-7:25pm The NGEE Arctic Tram for fine resolution observations of surface energy and vegetation properties (NGEE Arctic).....S. Wullschleger/M. Torn
- 7:25-7:35pm Role of continuous field measurements in determining deep soil carbon response to warming (LBNL TES SFA).....P. Nico
- 7:35-7:45pm NMR sensors for *in-situ* monitoring of soil moisture content (Vista Clara, Inc.).....D. Walsh
- 7:45-7:55pm SPRUCE: Automated measurement systems and their management in support of large-scale manipulations (SPRUCE).....P. Hanson
- 7:55-8:05pm HD TomoGPR: Ground Penetrating Rada system for fine root analysis (RNET Technologies).....G. Sabin
- 8:05-8:15pm Above and below ground hydrogeophysical monitoring and simulation to quantify coupled hydrological and thermal processes important for carbon cycling (LBNL SBR SFA).....B. Dafflon

- 8:15-8:25pm High frequency measurements to inform solute source areas within a Catchment (ORNL SBR SFA).....S. Brooks
- 8:25-8:35pm Autonomous, high-performance computing enabled 4E electrical resistivity monitoring (PNNL SBR SFA).....T. Johnson
- 8:35-8:45pm Sensor network for modular ecosystem model development (ORNL TES SFA).....D. Wang
- 8:45-9:00pm Open Forum and Discussion.....All
- 9:00pm Adjourn

Wednesday, April 29, 2015

- 6:30-8:00am **Breakfast (Osgood Building)**
- 8:00-9:00am **Plenary Session II: Advancements from DOE Early Career Awards (Ben Franklin Hall)** **Lesmes**
- 8:00-8:15am Geospatial representation of the circumarctic-scale permafrost carbon feedback.....D. Hayes
- 8:15-8:30am Computational Bayesian framework for quantification of predictive uncertainty in environmental modeling.....M. Ye
- 8:30-8:45am Quantifying river dynamics and floodplain exchanges using remotely sensed imagery.....J. Rowland
- 8:45-9:00am Multi-system analysis of microbial biofilms.....M. Marshall
- 9:00-12:00pm **Poster Session II (Franklin Building: Rooms 9A/B, 15/16, 20 and 21)**
- 9:00-10:30am Poster Subsession C
- 10:30-12:00pm Poster Subsession D
- 12:00-1:30pm **Lunch (Osgood Building)**
- Radionuclides Working Group (Room 1).....B. Powell
- 1:30-2:30pm **Plenary Session III – Advances in Radionuclides Research (Ben Franklin Hall)** **Hirsch**
- 1:30-1:50pm Fe and S biogeochemistry in redox dynamic environments; progressing towards a predictive understanding of U biogeochemical transformations.....K. Kemner

1:50-2:10pm Subsurface biogeochemistry of actinides.....A. Kersting

2:10-2:35pm Molecular coupling between subsurface organic matter, sediment microbial processes, and uranium biogeochemistry.....J. Bargar

2:30-4:00pm **Concurrent Sessions – II (Franklin Building)**

Concurrent Session 5: Advances in Soil Organic Matter Research (Room 1) **Stover**

2:30-2:50pm Innovative FT-ICR MS approaches to the analysis and interpretation of soil organic matter.....M. Tfaily

2:50-3:10pm News from a whole-profile soil warming experiment.....M. Torn

3:10-3:30pm Multifunctional roles of natural organic matter in biogeochemical transformation of metals.....B. Gu

3:30-3:50pm Belowground C allocation and plant-microbe interactions in two contrasting boreal peatlands.....A. Finzi

3:50pm Discussion

4:00pm Adjourn

Concurrent Session 6: Dynamic Vegetation & Trait-Based Modeling (Room 17 A/B) **Kuperberg**

2:30-2:50pm Dynamic Global Vegetation Modeling activities.....N. McDowell

2:50-3:10pm NGEE Tropics: Towards prognostic plant traits in emerging novel climates....C. Koven

3:10-3:30pm A path forward to improve the representation of root traits in the terrestrial biosphere models..... C. Iversen

3:30-3:50pmTBD

3:50pm Discussion

4:00pm Adjourn

Concurrent Session 7: Multi-scale Watersheds (Ben Franklin Hall) **Lesmes**

2:30-2:35pm Introduction.....D. Lesmes

2:35-2:39pm Genomes-to-Watershed LBNL SFA 2.0 snapshot.....S. Hubbard

2:39-2:51pm A floodplain perspective on subsurface nitrogen cycling.....K. Williams

- 2:51-3:03pm Genome-scale characterization of subsurface microbial activity relevant to the nitrogen cycle.....H. Beller
- 3:03-3:15pm Multi-scale, genome-informed approach to modeling the subsurface carbon-nitrogen cycle.....C. Steefel
- 3:15-3:19pm PNNL Subsurface Biogeochemistry SFA snapshot.....J. Zachara
- 3:19-3:37pm Temporal and spatial dynamics of groundwater and surface water exchange..T. Johnson
- 3:37-3:55pm Multi-scale biogeochemical processes and modeling.....C. Liu
- 4:00pm Adjourn

Breakout Session 8: Methane/Hydrobiogeochemistry (Room 18/19) **Bayer**

- 2:30-2:50pm Seasonal oxygen dynamics in a thermokarst bog in interior Alaska: Implications for rates of methane oxidation.....R. Neumann
- 2:50-3:10pm Initial responses of methane cycling to deep peat warming in a Minnesota bog.....J. Keller
- 3:10-3:30pm Spatial constraints in microbial processes controlling carbon mineralization in soils.....S. Fendorf
- 3:30-3:50pm Methane emissions from upland forests.....S. Pitz
- 3:50pm Discussion
- 4:00pm Adjourn

4:15-5:30pm **Plenary Session IV – Arctic Science and Policy (Ben Franklin Hall)** **Kuperberg**

- 4:15-4:30pm NGEE-Arctic - capturing process understanding in large-scale models...S. Wullschleger
- 4:30-4:45pm Arctic Council - translating science to inform adaptation actions in the Arctic.....Tom Armstrong (Madison River Group)
- 4:45-5:00pm Arctic research and international relationsAdrianna Muir (U.S. Department of State)
- 5:00-5:15pm Arctic research and US perspectives..... Simon Stevenson (White House, OSTP)
- 5:15-5:30pm **Closeout/Announcements**

5:30-7:00pm **Dinner (Osgood Building)**

7:00pm **Adjourn**

Team Meetings (Franklin Building)

6:30pm NGEE-Tropics (Room 1).....J. Chambers

7:00pm NGEE-Arctic (Room 17 A/B).....S. Wullschleger

7:00pm SPRUCE (Room 18/19).....P. Hanson