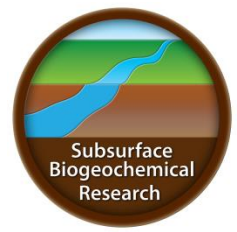




**Environmental System Science  
Principal Investigator (PI) Meeting  
April 30 - May 1, 2019  
Bolger Center, Potomac, MD**



**Monday, April 29, 2019 - Pre-meeting Activities**

8:00 am - 5:30 pm **ESS Working Group Meeting – Cyberinfrastructure** (Room 15/16; *invite only*)

1:00 pm – 6:00 pm **Meeting Check In** (Franklin Building Lobby)

Optional Meetings (open to all)

6:30 pm – 7:30 pm **ILAMB Soil BGC Working Group Meeting** (Franklin Building: Room 15/16)

7:00 pm – 8:00 pm **Modeling Microbial Dynamics Meeting** (Franklin Building: Room 4)

7:30 pm – 8:30 pm **E3SM Land Modeling Meeting** (Franklin Building: Room 15/16)

8:00pm – 9:00pm **Demystifying the Synchrotron Experience** (Franklin Building, Room 4)

**Tuesday, April 30, 2019 – Start of ESS PI Meeting**

7:00 am - 8:30 am **Breakfast** (Franklin Building)

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

8:30 am - 9:50 am **Overview of Programs & Updates**  
(Ben Franklin Hall) **Moderator: A. Swain**

8:30 Welcome and Introductory Comments .....A. Swain

8:35 BER Programs .....S. Weatherwax

8:45 CESD Programs & Strategic Plan .....G. Geernaert

8:55 TES Program Update .....D. Stover

9:05 SBR Program Update.....P. Bayer

9:15 am – 9:50 am **Complexity, Innovation, and Open Science: Building on ESS Scientific Advances**

9:15 Complexity and Innovation Update .....J. Moerman

9:20 Open Watersheds by Design Workshop Update.....J. Stegen

9:30 ESS-DIVE Update .....C. Varadharajan

9:40 Cyberinfrastructure Update.....D. Moulton

9:50 am - 10:10 am **Break**

10:10 am - 12:00 pm **Plenary Session I – ModEx Stories: Successes and Lessons Learned**

(Ben Franklin Hall) **Moderator: J. Moerman**

10:10 ModEx and permafrost hydrology: Lessons learned in NGEE-Arctic

..... S. Painter (NGEE-Arctic/TES)

10:30 Is it getting hot in here?..... M. Torn (LBNL/TES)

10:50 ModEx for advancing river corridor science along the Hanford Reach

..... X. Chen (PNNL/SBR)

11:10 Spatial and temporal nitrogen dynamics in mountainous systems..... N. Bouskill (LBNL/SBR)

11:30 What does information flow tell us about natural and model dynamics?

..... P. Kumar (U. Illinois)

11:55 Wrap-up and announcements ..... J. Moerman

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

*Optional Lunchtime Breakouts*

12:00 - 2:00 Research Opportunities with Light-Source Facilities (Reserved area in cafeteria)

..... Synchrotron User Facility POCs

12:00 - 1:00 ESS-DIVE Tutorial (Room 15/16) ..... D. Agarwaal/C. Varadharajan

1:00 - 2:00 Sage Advice for Students and Post-Docs (Room 4)..... D. Stover

1:00 - 2:00 Research Opportunities with User Facilities (Lobby)

..... Synchrotron User Facility POCs

2:00 pm - 5:00 pm **Poster Session I** (Franklin Building: Rooms 1, 9A/B, 21, and 22)

2:00 - 3:30 Poster Subsession A

3:30 - 5:00 Poster Subsession B

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

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

*SBR Town Hall* - Open Watersheds: Amplifying the Impact of SBR Science

(Room: Ben Franklin Hall) **Organizers: S. Emani /J. Moerman/ P. Bayer**

*TES Breakout A*: Linking Above and Belowground Processes

(Room 4) Organizers: R. Matamala and S. Serbin

*TES Breakout B: Terrestrial-Aquatic Interfaces*  
(Room 15/16) Organizers: V. Bailey and J. Keller

*TES Breakout C: Disturbance*  
(Room 17A/B) Organizers: N. McDowell and A. Walker

*TES Breakout D: ILAMB Soil C Demonstration and Tutorial*  
(Room 18/19) Organizers: F. Hoffman and R. Joseph

8:30 pm – 9:30 pm **Team Meetings**  
NGEE-Arctic Leadership Team Meeting (Room 18/19) (15 people)  
NGEE-Tropics Team Meeting (Room 17A/B) (~40 people)

### **Wednesday, May 1, 2019**

7:00 am - 8:00 am **Breakfast** (Franklin Building)

8:30 am – 9:40 am **Plenary Session II: ModEx Stories: Communicating Complex Science with Clarity and Creativity**  
(Ben Franklin Hall) **Moderator: D. Stover**

8:30 - 9:40 Getting science seen, heard, and understood: The power of effective science communication .....O. Ambrogio (AGU)

9:40 am - 9:55 am **Break**

9:55 am – 11:55 am **Concurrent Sessions - II** (Franklin Building)

*TES Team Meeting/Town Hall*  
(Room: Ben Franklin Hall) **Organizer: D. Stover**

*SBR Breakout A - Reaction-Scale Open-Science Design Dash*  
(Room 15/16) Organizers: S. Emani and J. Stegen

*SBR Breakout B - Watershed-Scale Open-Science Design Dash*  
(Room 17 A/B) Organizers: K. Maher and D. Moulton

*SBR Breakout C - CONUS-Scale Open-Science Design Dash*  
(Room 4) Organizers: J. Moerman and D. Chadwick

11:55 am - 1:10pm **Lunch** (Osgood Building)

*Optional Lunchtime Breakout*

11:55 – 12:40 Science Communication Breakout (Room 4) .....O. Ambrogio (AGU)

1:10 pm - 4:00 pm **Poster Session II** (Franklin Building: Rooms 1, 9A/B, 21, and 22)

1:10 - 2:40	Poster Subsession C
2:40 - 4:10	Poster Subsession D
4:10 pm - 4:20 pm	<b>Break</b>
4:20 pm - 5:40 pm	<b>Plenary Session III – ModEx Stories &amp; ESS Looking Forward</b> (Ben Franklin Hall) <b>Moderator: P. Bayer</b>
4:20 - 4:45	SBR Breakout Session Report-outs
4:20	Open-Science Design Dash.....J. Stegen/K. Maher/ D. Moulton
4:40	Discussion
4:45 - 5:10	TES Briefings
4:45	Second State of the Carbon Cycle Report (SOCCR2).....M. Mayes
4:55	Ameriflux: Year of Methane.....S. Biraud
5:05	Discussion
5:10 - 5:40	ModEx Stories: Community Reflection on the Future of ModEx .....S. Painter and K. Hofmockel
5:40 pm - 5:45 pm.....	<b>Closeout/Announcements</b> .....P. Bayer

**Tuesday, April 30, 2019**

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

***SBR Town Hall: Open Watersheds: Amplifying the Impact of SBR Science***

Room: Ben Franklin Room

Co-Chairs: Kate Maher (Stanford), David Moulton (LANL), and James Stegen (PNNL)

<b>Time</b>	<b>Talk</b>	<b>Speaker</b>
7:00	Introductory Remarks and Reflection	Paul Bayer (DOE)
7:05	Open Science Panel: Amplifying the Impact of SBR and CESD Science <u>Panelists</u> <ul style="list-style-type: none"> <li>Challenges and Successes of Taking the GCAM Model Open Source</li> <li>IDEAS-Watersheds and the ExaSheds Project</li> <li>Development of WHONDRS, an Evolving Community Resource</li> <li>The Design Process in Science</li> </ul>	Jessica Moerman (DOE)  Leon Clarke (PNNL, JGCRI)  David Moulton (LANL)  James Stegen (PNNL)  Kate Maher (Stanford Univ.)
7:30	The Design Process and Rationale	Kate Maher (Stanford Univ.) and Sujata Emani (DOE)
7:40	Example “Design Dash” Pitches <ul style="list-style-type: none"> <li>Reaction-Scale Challenge</li> <li>Watershed-Scale Challenge</li> <li>Cross-scale Challenge</li> <li>Cyberinfrastructure</li> </ul>	James Stegen (PNNL) Martin Briggs (USGS) Eoin Brodie (LBNL) Charuleka Varadharajan (LBNL)
8:00	Introduction to Breakout Session “Design Dash”	Kate Maher (Stanford Univ.)
8:15	Questions and Group Discussion	

**SBR**  
Investigators:  
Please scan QR code to access and complete the Breakout Questionnaire by 7p Tuesday April 30th



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

***TES Breakout Session A: Linking Above and Belowground Processes***

Room: 4

Organizers: Roser Matamala (ANL) and Shawn Serbin (BNL)

Format: Lightning talks (10 min each)

<b>Talk</b>	<b>Title</b>	<b>Speaker</b>
	Session Introduction	Roser Matamala (ANL) and Shawn Serbin (BNL)
1	Nitrogen acquisition in the tundra: linking belowground dynamics to aboveground traits	Verity Salmon (ORNL)
2	Vegetation-permafrost-hydrology-climate relationships along three hillslopes in the low Arctic	Amy Breen (Univ. of Alaska, Fairbanks)
3	Ecosystem-type construct to link above and belowground properties across multiple spatial scales	Baptiste Dafflon (LBNL)
4	Can't see the grassland for the trees: rooting dynamics in tallgrass prairie	Jesse Nippert (Kansas State Univ.)
5	Linking above and belowground plant traits in the Alaskan Arctic	Jennifer Fraterrigo (Univ. of Illinois)
6	Estimating effective rooting depths via aboveground growth responses under droughts	Rutuja Chitra-Tarak (Smithsonian Environmental Research Center)

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

**TES Breakout Session B: Terrestrial-Aquatic Interfaces**

Room: 15/16

Organizers: Vanessa Bailey (PNNL) and Jason Keller (Chapman Univ.)

Format: Lightning talks (5 min each)

Talk	Title	Speaker
	Session goals and format	Vanessa Bailey (PNNL) and Jason Keller (Chapman Univ.)
1	Representing TAI in Earth System Models	Ruby Leung (PNNL)
2	The Role of Geomorphology in Coastal Terrestrial-Aquatic Interfaces	Matt Kirwan (Virginia Institute of Marine Sciences)
3	Oxygen and TAI: What Do We Really Know About Aerobic Biogeochemistry?	Genevieve Noyce (Smithsonian Environmental Research Center)
4	Progress and Priorities for Understanding Terrestrial-Aquatic Interfaces: An Aquatic Biogeochemical Perspective	Nick Ward (PNNL)
5	Requirements for Model-Based Knowledge Synthesis at Terrestrial-Aquatic Interfaces	Peter Thornton (ORNL)
6	Facilitated Synthesis of Key Themes	Vanessa Bailey (PNNL) and Jason Keller (Chapman Univ.)

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

**TES Breakout Session C: Disturbance**

Room: 17A/B

Organizers: Nate McDowell (PNNL) and Anthony Walker (ORNL)

Format: Lightning talks (5 min each)

Talk	Title	Speaker
	Session Introduction	Nate McDowell (PNNL) and Anthony Walker (ORNL)
1	Drought Impacts: Responses to El Niño in Panama and Experimental Drought in Australia	Alex Pivovarov (Univ. of California, Los Angeles)
2	How will Drought Affect Tropical Soil Carbon Cycling and Storage?	Daniela Cusack (Univ. of California, Los Angeles)
3	Extreme Temperature Shifts Induce Both Acute and Chronic Stress in Temperate Trees	Jeff Warren (ORNL)
4	Interactions Between Climate Warming and Fire Will Drive Expansion of High-Latitude Deciduous Vegetation	Zelalem Mekonnen (LBNL)
5	Tropical Forest Degradation Modulates Flammability and Response to Moderate Droughts in the Amazon	Marcus Longo (Jet Propulsion Lab)
6	Tree Damage and Mortality Following Hurricane Maria	Michael Keller (US Forest Service)
7	Hurricane Disturbance and Tropical Forest Recovery in a Warmer World	Tana Wood (US Forest Service)
8	From One to Millions Trees: Winds as Recurrent and Predictable Drivers of Tree Mortality in Tropical Forest Ecosystems	Robinson Negron-Juarez (LBNL)
9	Lightning is Directly Responsible for One Third of Large Tree Mortality on Barro Colorado Island, Panama	Helena Muller-Landau (Smithsonian Tropical Research Institute)
10	Impact of Landuse Change on Soil Carbon and Radiocarbon Profiles in Lowland Tropical Forest	Karis McFarlane (LLNL)

11	Exploring the Complex Interactions Among Forest Disturbance and Regeneration, Carbon and Water Cycle Dynamics in the Tropics Using FATES	Maoyi Huang (PNNL)
	Discussion	

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

**TES Breakout Session D: Model Benchmarking and ILAMB Tutorial**

Room: 18/19

Organizers: Forrest Hoffman (ORNL) and Renu Joseph (DOE)

Format: Talks/Tutorial

Talk	Title	Speaker
	Session Introduction	Forrest Hoffman (ORNL)
1	Benchmarking and Parameter Sensitivity of FATES Predictions of Ecosystem Structure and Function at Barro Colorado Island, Panama	Charles Koven (LBNL)
2	Harmonized High-Resolution Estimates of Soil Organic Carbon Stocks and Its Uncertainties in the Permafrost Region	Umakant Mishra (ANL)
	Discussion	Forrest Hoffman (ORNL)
3	ILAMB Tutorial	Nathan Collier (ORNL)

**Wednesday, May 1, 2019**

9:55 am – 11:55 am **Concurrent Sessions - II** (Franklin Building)

**TES Team Meeting/Town Hall**

(Room: Ben Franklin Hall) Organizer: D. Stover

Time	Talk	Speaker
9:55	Program Updates and Strategic Planning	Dan Stover (DOE)
10:05	A Hidden World of Scientific Stories'	Colleen Iversen (ORNL)
10:40	Field Safety: A Necessary Ingredient of Success	Bob Bolton (University of Alaska, Fairbanks)
11:00	Early Career Award Updates (Lightning Talks) <ul style="list-style-type: none"> <li>• Drying Effects on Root Dynamics and Soil Carbon Storage in Tropical Soils</li> <li>• A Comprehensive Framework for Modeling Emissions from Tropical Soils and Wetlands</li> <li>• Constraining Soil Carbon Turnover Times in Tropical Forests with Radiocarbon Measurements and Modeling</li> </ul>	Daniela Cusack (UCLA) Melanie Mayes (ORNL) Karis McFarlane (LLNL)
11:15	Closing Thoughts and Group Discussion	Dan Stover (DOE)

9:55 am – 11:55 am **Concurrent Sessions - II** (Franklin Building)

**SBR Breakout Sessions: Open-Science Design Dash**

Room	Session	Facilitators
15/16	Reaction-Scale Open-Science Design Dash	S. Emani and J. Stegen
17 A/B	Watershed-Scale Open-Science Design Dash	K. Maher and D. Moulton
Rm 4	CONUS-Scale Open-Science Design Dash	J. Moerman and D. Chadwick