

**ORNL TES SFA Sessions and Presentations at the AGU Fall Meeting  
10-14 December 2018, Washington D.C.**

**Monday AM - Poster**

**B11C-2154 Integrating environmental metabolomics and proteomics to describe changes in carbon decomposition resulting in increased greenhouse gas flux under whole ecosystem warming at the Spruce and Peatland Responses Under Changing Environments (SPRUCE) experimental site**

Rachel Wilson<sup>1</sup>, Malak Tfaily<sup>2</sup>, Max Kolton<sup>3</sup>, Paul J Hanson<sup>4</sup>, Heino M Heyman<sup>5</sup>, Jennifer E Kyle<sup>6</sup>, Randy Kolka<sup>7</sup>, Stephen D Sebestyen<sup>8</sup>, Natalie Griffiths<sup>4</sup>, Joel E Kostka<sup>9</sup> and Jeff Chanton<sup>10</sup>, (1)Florida State University, Tallahassee, FL, United States, (2)Pacific Northwest National Laboratory, Environmental Molecular Sciences Laboratory and Biological Sciences Division, Richland, WA, United States, (3)Georgia Institute of Technology Main Campus, Atlanta, GA, United States, (4)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (5)Alaska Pacific University, EBSD, Richland, WA, United States, (6)Pacific Northwest National laboratory, Richland, WA, United States, (7)USDA Forest Service, Northern Research Station, Grand Rapids, MN, United States, (8)USDA Forest Service, Northern Research Station, Vallejo, CA, United States, (9)Do Not Wish to Give out, Atlanta, GA, United States, (10)Florida State University, Dept. of Earth, Ocean, & Atmospheric Science, Tallahassee, FL, United States

**Monday Talk**

**B13D-02 The persistence of root carbon in soil: data and modeling gaps; 13:55 - 14:10 *Walter E Washington Convention Center - 150B***

Avni Malhotra


**B13E-05 A Large-scale Warming Experiment Reveals Changes to Stream Flow and Solute Concentrations in a Northern Peatland Ecosystem; 14:40 - 14:55 *Walter E Washington Convention Center - 143A-C***

Natalie Griffiths

**B14D-05 Fast and Accurate Semi-Analytical Approximations for the Solution of Coupled Leaf Photosynthesis Equations; 17:00 - 17:15 *Walter E Washington Convention Center - 149AB***

Anthony P Walker, Oak Ridge National Laboratory, Oak Ridge, TN, United States

**Tuesday**

**Full Session B21F: Estimating Critical Biogeochemical Processes Across the Soil–Plant–Atmosphere Continuum Using Cutting-Edge Techniques I eLightning; 8 to 10 AM;  Walter E Washington Convention Center - eLightning Theater I**

**B21F-01 Visualizing Experimental Whole-Ecosystem Warming Treatments on Vegetation and Ecosystem Phenology at the SPRUCE Experiment***Misha Krassovski* 08:01

Misha Krassovski<sup>1</sup>, Paul J Hanson<sup>2</sup>, Andrew D Richardson<sup>3</sup>, William R Nettles IV<sup>2</sup> and Ryan Heiderman<sup>4</sup>, (1)Oak Ridge National Laboratory, Carbon Dioxide Information Analysis Center, Oak Ridge, TN, United States, (2)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (3)Northern Arizona University, Flagstaff, AZ, United States, (4)Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, TN, United States

**B21F-06 Evaluating a Microbial Functional Group-based Model to Explain Greenhouse Gas Productions and Consumptions from Puerto Rican Tropical Forest Soils***Debjani Sibi* 08:16

Debjani Sibi<sup>1</sup>, Melanie A Mayes<sup>1</sup>, Christine O'Connell<sup>2</sup>, Xiaofeng Xu<sup>3</sup>, Whendee L Silver<sup>4</sup>, Carla López-Lloreda<sup>5</sup>, Brian Yudkin<sup>6</sup>, Ryan Quinn<sup>7</sup>, Jianqiu Zheng<sup>8</sup>, Julia Brenner<sup>7</sup>, Jana R Phillips<sup>7</sup>, Jana R. Phillips<sup>1</sup>, Gisela Gonzalez<sup>6</sup> and Brent D Newman<sup>9</sup>, (1)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (2)University of California Berkeley, Berkeley, United States, (3)San Diego State University, San Diego, United States, (4)University of California Berkeley, Berkeley, CA, United States, (5)Luquillo Critical Zone Observatory, Río Grande, PR, United States, (6)Luquillo Critical Zone Observatory, Rio Grande, United States, (7)Oak Ridge National Laboratory, Oak Ridge, United States, (8)University of Tennessee, Knoxville, United States, (9)Los Alamos National Laboratory, Los Alamos, NM, United States

**ED21B-10 The News on Under Ground Parts From Around The World; 09:06 - 09:12** *Marriott Marquis - Marquis 1-2*

Colleen M. Iversen, Oak Ridge National Laboratory, Climate Change Science Institute, Environmental Science Division, Oak Ridge, TN, United States

**Tuesday PM Poster Session**

**Full Session:** B23K Seeing Is Believing: Advances in Understanding of Root–Rhizosphere Dynamics Posters

13:40 - 18:00 *Walter E Washington Convention Center - Hall A-C (Poster Hall)*

## Wednesday

### **B33D-05 Impacts of Elevated CO<sub>2</sub> and Whole Ecosystem Warming on Photosynthesis and Respiration of Two Ericaceous Shrubs in a Northern Peatland; 14:40 - 14:55, Walter E Washington Convention Center - 149AB**

Eric J Ward<sup>1,2</sup>, Jeff Warren<sup>3</sup>, Mirindi Eric Dusenge<sup>4</sup>, Danielle Way<sup>4</sup>, Stan Wullschlegler<sup>5</sup>, Anthony W King<sup>1</sup> and Paul J Hanson<sup>6</sup>, (1)Oak Ridge National Laboratory, Environmental Sciences Division and Climate Change Science Institute, Oak Ridge, TN, United States, (2)US Geological Survey, Wetland and Aquatic Research Center, Lafayette, LA, United States, (3)Oak Ridge National Laboratory, Climate Change Science Institute, Oak Ridge, TN, United States, (4)University of Western Ontario, London, ON, Canada, (5)Oak Ridge National Laboratory, Climate Change Science Institute, Environmental Science Division, Oak Ridge, TN, United States, (6)Oak Ridge National Laboratory, Oak Ridge, TN, United States

### **B34C-05 Seasonal and diurnal asymmetrical variations of sun-induced chlorophyll fluorescence revealed by high-resolution measurements in a central US forest; 17:00 - 17:15 *Walter E Washington Convention Center - 147B***

Lianhong Gu, Oak Ridge National Laboratory, Oak Ridge, TN, United States, Jeffrey D Wood, Assistant Research Professor, School of Natural Resources, Columbia, MO, United States, Ying SUN, Assistant Professor, School of Integrative Plant Science, Ithaca, NY, United States and Christine Chang, Cornell University, School of Integrative Plant Science, Ithaca, United States

## Thursday AM Poster

### **B41H-2825 Combining soil flux and soil gas profiles to constrain CH<sub>4</sub> emission pathways in a Northern peatland – a data-model fusion study**

Shuang Ma<sup>1</sup>, Rachel Wilson<sup>2</sup>, Jiang Jiang<sup>3</sup>, Jeff Chanton<sup>2</sup>, Xingjie Lu<sup>4</sup>, Zhenggang Du<sup>5</sup>, Daniel M Ricciuto<sup>6</sup>, Paul J Hanson<sup>7</sup> and Yiqi Luo<sup>4</sup>, (1)Northern Arizona University, The Center for Ecosystem Science and Society, Flagstaff, AZ, United States, (2)Florida State University, Dept. of Earth, Ocean, & Atmospheric Science, Tallahassee, FL, United States, (3)Nanjing Forestry University, Department of Soil and Water Conservation, Nanjing, China, (4)Center for Ecosystem Science and Society, Northern Arizona University, Flagstaff, AZ, United States, (5)East China Normal University, Shanghai, China, (6)Oak Ridge National Laboratory, Environmental Sciences Division and Climate Change Science Institute, Oak Ridge, TN, United States, (7)Oak Ridge National Laboratory, Oak Ridge, TN, United States

## Thursday AM Talk

### **B42D-01 Tracking the Fate of new C in Northern Peatlands by a Compound-Specific Stable Isotope-Labeling Approach coupled with multiple analytical techniques and gas fluxes analysis; 10:20 - 10:35 *Walter E Washington Convention Center - 150A***

Malak M Tfaily<sup>1,2</sup>, Rosalie Kae Chu<sup>3</sup>, David W Hoyt<sup>2</sup>, Jason Toyoda<sup>2</sup>, Elizabeth K Eder<sup>4</sup>, Jennifer E Kyle<sup>5</sup>, Kent Bloodsworth<sup>4</sup>, Rachel Wilson<sup>6</sup>, Max Kolton<sup>7</sup>, Joel E Kostka<sup>8</sup> and Jeff Chanton<sup>9</sup>, (1)University of Arizona, Soil, Water and Environmental Science, Tucson, AZ, United States, (2)Pacific Northwest National Laboratory, Richland, WA, United States, (3)Pacific Northwest National Laboratory, EMSL, Richland, WA, United States, (4)Pacific Northwest National Laboratory, Richland, United States, (5)Pacific Northwest National laboratory, Richland, WA, United States, (6)Florida State University, Tallahassee, FL, United States, (7)Georgia Institute of Technology Main Campus, Atlanta, GA, United States, (8)Do Not Wish to Give out, Atlanta, GA, United States, (9)Florida State University, Dept. of Earth, Ocean, & Atmospheric Science, Tallahassee, FL, United States

## Thursday PM Talk and Posters

### **B43M-3012 Quantifying Fine-root Branching Response to Experimental Ecosystem Warming Utilizing Image Analysis Software; 13:40 - 18:00 *Walter E Washington Convention Center - Hall A-C (Poster Hall)***

Stephanie Letourneau, Juniata College, Environmental Science and Studies, Huntingdon, PA, United States, Avni Malhotra, Oak Ridge National Laboratory, Oak Ridge, TN, United States and Colleen M. Iversen, Oak Ridge National Laboratory, Climate Change Science Institute, Environmental Science Division, Oak Ridge, TN, United States

### **B43I-2962 Glimpsing the Future: Boreal Peatland Ecophysiology under Whole-Ecosystem Warming and Elevated CO<sub>2</sub>**

David McLennan<sup>1</sup>, Anirban Guha<sup>2</sup>, Jeff Warren<sup>3</sup>, Joanne Childs<sup>1</sup>, Deanne J Brice<sup>1</sup>, Eric J Ward<sup>4</sup> and Paul J Hanson<sup>1</sup>, (1)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (2)Oak Ridge National Laboratory, Climate Change Science Institute and Environmental Sciences Division, Oak Ridge, TN, United States, (3)Oak Ridge National Laboratory, Climate Change Science Institute, Oak Ridge, TN, United States, (4)Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, TN, United States

### **B43M-3015 Soil warming and elevated CO<sub>2</sub> effects on CH<sub>4</sub> production pathways and homoacetogenesis in a northern Minnesota peatland**

Cory LeeWays<sup>1</sup>, Laura L McCullough<sup>2</sup>, Jason Keller<sup>3</sup>, Anya Hopple<sup>1</sup>, Paul J Hanson<sup>4</sup> and Scott D Bridgham<sup>1</sup>, (1)University of Oregon, Eugene, OR, United States, (2)University of Oregon, Institute of Ecology and Evolution, Eugene, OR, United States, (3)Chapman University, Orange, CA, United States, (4)Oak Ridge National Laboratory, Oak Ridge, TN, United States

**Full Session -- B43M: Plant–Soil Interactions Under Global Warming: Learning Mechanisms from Multiyear Field Experiments and Natural Gradients Posters - 13:40 - 18:00**

- **Walter E Washington Convention Center - Hall A-C (Poster Hall)**

**B43M-3001 Does Soil Warming Alter Lipid Composition in Plants and Soils?**

Michael W I Schmidt<sup>1</sup>, Nicholas Ouma Ofiti<sup>1</sup>, Emily Solly<sup>2</sup>, Cyrill Urs Zosso<sup>2</sup>, Margaret S Torn<sup>3</sup>, Guido LB Wiesenberg<sup>2</sup> and Michael W I Schmidt<sup>4</sup>, (1)University of Zurich, Geography, Zurich, Switzerland, (2)University of Zurich, Zurich, Switzerland, (3)Berkeley Lab/UC Berkeley, Berkeley, CA, United States, (4)Univ Zurich, Zurich, Switzerland

**B43M-3003 How do Whole-Ecosystem Warming and Elevated Atmospheric Carbon Dioxide Concentration Affect Peatland Methane Production?**

Anya Hopple<sup>1</sup>, Rachel Wilson<sup>2</sup>, Glenn Woerndle<sup>3</sup>, Cassandra Zalman<sup>3</sup>, Jeff Chanton<sup>4</sup>, Paul J Hanson<sup>5</sup>, Jason Keller<sup>3</sup> and Scott D Bridgham<sup>1</sup>, (1)University of Oregon, Eugene, OR, United States, (2)Florida State University, Tallahassee, FL, United States, (3)Chapman University, Orange, CA, United States, (4)Florida State University, Dept. of Earth, Ocean, & Atmospheric Science, Tallahassee, FL, United States, (5)Oak Ridge National Laboratory, Oak Ridge, TN, United States

**B43M-3009 Peatland Woody Vegetation Growth Response to Warming and Implications for Ecosystem Carbon Gain or Loss**

Paul J Hanson<sup>1</sup>, Natalie Griffiths<sup>2</sup>, Jana R Phillips<sup>3</sup>, Deanne J Brice<sup>2</sup>, William R Nettles IV<sup>2</sup>, Jeff Warren<sup>4</sup> and Eric J Ward<sup>5</sup>, (1)Oak Ridge National Laboratory, Environmental Sciences Division and Climate Change Science Institute, Oak Ridge, TN, United States, (2)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (3)Oak Ridge National Laboratory, Oak Ridge, United States, (4)Oak Ridge National Laboratory, Climate Change Science Institute, Oak Ridge, TN, United States, (5)Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge, TN, United States

**B43M-3014 Sensitivity of energy, water, and nutrient cycles to microtopographical parameters in ELM\_SPRUCE**

Jake Graham<sup>1</sup>, Nancy F Glenn<sup>2</sup>, Daniel M Ricciuto<sup>3</sup> and Paul J Hanson<sup>4</sup>, (1)Boise State University, Boise, ID, United States, (2)Boise State Univ, Boise, ID, United States, (3)Oak Ridge National Laboratory, Environmental Sciences Division and Climate Change Science Institute, Oak Ridge, TN, United States and (4)Oak Ridge National Laboratory, Oak Ridge, TN, United States

**B43M-3018 TOWARD THE PREDICTIVE UNDERSTANDING OF GREENHOUSE GAS PRODUCTION IN HIGH LATITUDE PEATLANDS***Joel E Kostka*

Joel E Kostka<sup>1</sup>, Max Kolton<sup>1</sup>, Tianze Song<sup>2</sup>, Rachel Wilson<sup>3</sup>, Malak Tfaily<sup>4</sup>, Jeff Chanton<sup>5</sup>, Jose Rolando<sup>2</sup>, Christopher W Schadt<sup>6</sup>, Jason Keller<sup>7</sup>, Scott D Bridgham<sup>8</sup>, Cassandra Zalman<sup>7</sup>, Natalie Griffiths<sup>6</sup>, Stephen D Sebestyen<sup>9</sup>, Randy Kolka<sup>10</sup> and Paul J Hanson<sup>6</sup>, (1)Georgia Institute of Technology Main Campus, Atlanta, GA, United States, (2)Georgia Institute of Technology, Atlanta, United States, (3)Florida State University, Tallahassee, FL, United States, (4)Pacific Northwest National Laboratory, Environmental Molecular Sciences Laboratory, Richland, WA, United States, (5)Florida State University, Dept. of Earth, Ocean, & Atmospheric Science, Tallahassee, FL, United States, (6)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (7)Chapman University, Orange, CA, United States, (8)University of Oregon, Eugene, OR, United States, (9)USDA Forest Service, Northern Research Station, Vallejo, CA, United States, (10)USDA Forest Service, Northern Research Station, Grand Rapids, MN, United States

**Friday**

**B51A-05 Upscaling Strategies for Quantitative Modeling of Soil Microbial Metagenomics in a Biogeochemical Model; 08:48 - 09:00** *Walter E Washington Convention Center - 149AB*

Melanie A Mayes

**Full Session: B52A: Plant–Soil Interactions Under Global Warming: Learning Mechanisms from Multiyear Field Experiments and Natural Gradients I – 10:20 to 12:20**

- **Walter E Washington Convention Center - 150A**

**B52A-07 Effects of temperature on natural organic matter reduction in a northern Minnesota peatland experiencing whole ecosystem warming**

Jason KellerJason Keller<sup>1</sup>, Jessica E. Rush<sup>1</sup>, Glenn Woerndle<sup>1</sup>, Cassandra Zalman<sup>1</sup>, Paul J Hanson<sup>2</sup> and Scott D Bridgham<sup>3</sup>, (1)Chapman University, Orange, CA, United States, (2)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (3)University of Oregon, Eugene, OR, United States; 11:50

**B52A-08 Growth, Cover, and Productivity of *Sphagnum* Decline Sharply with Experimental Warming in a Forested Peatland**

Richard NorbyRichard Norby, Joanne Childs and Paul J Hanson, Oak Ridge National Laboratory, Oak Ridge, TN, United States; 12:05

**Other sessions:**

**B51A-06 Temperature Response of Foliar Dark Respiration and Consequences for the Stand Carbon Budget; 09:00 - 09:12, *Walter E Washington Convention Center - 149AB***

Anthony W King<sup>1</sup>, Jeffrey S. Amthor<sup>2</sup>, Anna M Jensen<sup>3</sup>, Daniel M Ricciuto<sup>1</sup>, Eric J Ward<sup>4</sup> and Jeff Warren<sup>5</sup>, (1)Oak Ridge National Laboratory, Environmental Sciences Division and Climate Change Science Institute, Oak Ridge, TN, United States, (2)AIR Worldwide, Boston, MA, United States, (3)Linnaeus University, Department of Forestry and Wood Technology, Växjö, Sweden, (4)US Geological Survey, Wetland and Aquatic Research Center, Lafayette, LA, United States, (5)Oak Ridge National Laboratory, Climate Change Science Institute, Oak Ridge, TN, United States

**B53G-2143 Upscaling decomposition kinetics from enzyme to ecosystem: Developing a kinetic parameter database for metagenomics-informed soil biogeochemical models; 13:40 - 18:00 *Walter E Washington Convention Center - Hall A-C (Poster Hall)***

Yang Song

**B54C-05 Phenological improvement of ELM and its feedbacks to terrestrial hydrological cycle; 17:00 - 17:15 *Walter E Washington Convention Center - 147B***

Jiafu Mao<sup>1</sup>, Lin Meng<sup>2</sup>, Xiaoying Shi<sup>1</sup>, Daniel M Ricciuto<sup>1</sup>, Peter E Thornton<sup>3</sup>, Yuyu Zhou<sup>4</sup>, Paul J Hanson<sup>5</sup> and Andrew D Richardson<sup>6</sup>, (1)Oak Ridge National Laboratory, Environmental Sciences Division and Climate Change Science Institute, Oak Ridge, TN, United States, (2)Iowa State University, Dept. of Geological & Atmospheric Sciences, Ames, United States, (3)Oak Ridge National Laboratory, Climate Change Science Institute, Environmental Science Division, Oak Ridge, TN, United States, (4)Iowa State University, Ames, United States, (5)Oak Ridge National Laboratory, Oak Ridge, TN, United States, (6)Northern Arizona University, Flagstaff, AZ, United States