

**HUBBARD BROOK ECOSYSTEM STUDY  
56TH ANNUAL COOPERATORS' MEETING  
234 Mirror Lake Road  
North Woodstock, NH 03262**

|       |   |   |
|-------|---|---|
|       |   | <b>Wednesday, July 10, 2019</b>   |
| 8:00  | Lindsey Rustad, John Battles, Pam Templer | Welcome and Announcements   |
|       | <b>Session I</b>                          | <b>Multiple Element Limitation</b>  |
| 8:10  | Fahey, Tim                                | Response of root growth and mycorrhizal colonization to N and P enrichment  |
| 8:20  | Abbott, Sarah                             | Belowground C allocation estimated as soil respiration minus aboveground litter inputs  |
| 8:27  | Butler, Samuel                            | Something about N-15 Tracing of Soil Transformation   |
| 8:32  | Kostro, Cody                              | And You Thought There Were No Earthworms in Our Forests!  |
| 8:34  | Young, Alexander                          | Sugar Maple Leaf and Twig Traits Vary With Height in the Canopy and Nutrient Addition   |
| 8:39  | Hong, Dan                                 | The Timing of Senescence Affects Foliar N and P Resorption  |
| 8:46  | Dillon, Gretchen                          | Invasive beech scale insects may have been favored by N pollution   |
| 8:50  | Mann, Thomas                              | Infant Mortality in the MELNHE Stands   |
| 8:55  | Congress, Sarah                           | Space Wars and the Fight for Light in Young and Mid-aged Stands   |
| 9:00  | Giovati, Amy                              | Mycorrhizal mushrooms respond to N and P additions  |
| 9:05  |   | <b>Discussion, Session I</b>  |
|       | <b>Session II</b>                         | <b>Green Water</b>  |
| 9:10  | Dong, Zheng                               | Hydrological response of high elevation watersheds in the conterminous United States to climate change under the Representative Concentration Pathway scenarios |
| 9:20  | Kirchner, James                           | Seasonal partitioning of precipitation into discharge and evapotranspiration, inferred from end-member splitting analysis                                       |
| 9:30  | Green, Mark                               | Quantifying short-term controls on evapotranspiration   |
| 9:40  | Kelsey, Eric                              | Synoptic-Scale Weather Pattern Regulation of Evapotranspiration   |
| 9:45  | Vadeboncoeur, Matt                        | The effect of tree size and position on wood carbon isotopes varies across species  |
| 9:55  | Ollinger, Scott                           | Disentangling the role of photosynthesis and stomatal conductance on rising forest water-use efficiency   |
| 10:00 |   | <b>Discussion, Session II</b>   |
| 10:05 | Rustad, Lindsey                           | <b>Introductions</b>  |
| 10:25 |   | <b>Break</b>  |
|       | <b>Session III</b>                        | <b>Rotting Rocks &amp; Heavier Biogeochemistry</b>  |
| 10:55 | Bailey, Scott                             | What Makes a Watershed Tick? Hints from C-Q & X-Y-Z   |
| 11:00 | Bower, Jenny                              | Between a Rock and a Soil Place: Examining Lateral Weathering Gradients Using a Whole-Regolith Approach   |
| 11:05 | Ross, Don                                 | The art and science of micro-images from the bedrock of Watershed 3   |
| 11:10 | Rasnake, Nathaniel                        | Topographic Influences on Spatial Variation of Podzols across Hydrologic Gradients  |
| 11:12 | Duston, Stephanie                         | Efficacy of anion exchange resins in sorption and desorption of dissolved organic matter  |
| 11:17 | Peterson, Delaney                         | Using soil type and topography to predict variability in groundwater and stream chemistry   |
| 11:19 | Possinger, Angela                         | Organo-mineral interactions and soil carbon mineralizability with variable saturation frequency   |

**HUBBARD BROOK ECOSYSTEM STUDY  
56TH ANNUAL COOPERATORS' MEETING  
234 Mirror Lake Road  
North Woodstock, NH 03262**

|       |                      |  |
|-------|----------------------|--|
| 11:29 | Driscoll, Charles    | Changes in the speciation of aluminum in space and time  |
| 11:39 |                      | <b>Discussion, Session III</b>   |
| 11:44 |                      | <b>Announcements, Photo, and Lunch</b>   |
|       | <b>Session IV</b>    | <b>Hubbard Brook and Beyond</b>  |
| 13:20 | Woodall, Christopher | Hubbard Brook Experimental Forest within the larger context of the US Forest Service   |
| 13:30 | Besley, John         | The Culture of Engagement at Hubbard Brook (and Harvard Forest), Round 2   |
| 13:40 | Garlick, Sarah       | Embedding Public Engagement with Science at Hubbard Brook: Insights from Year 2 of an NSF- funded Research-Practice Partnership  |
| 13:50 | Lindt, Nikki         | Tumbling Forests of North  |
| 13:52 | Lovett, Gary         | Imported Forest Pests: Progress on Policy and Stakeholder Engagement   |
| 14:02 | Kosiba, Alexandra    | Leveraging Hubbard Brook data for regional compilations and syntheses  |
| 14:04 | Martin, Mary         | Hubbard Brook Information Management Update  |
| 14:07 |                      | <b>Discussion, Session IV</b>  |
|       | <b>Session V</b>     | <b>Responses to Heat and Ice</b>   |
| 14:12 | Templer, Pamela      | Effects of warmer growing season temperatures and a reduced winter snowpack on carbon fluxes in a northern hardwood forest       |
| 14:22 | Harrison, Jamie      | Effects of climate change across seasons on water uptake dynamics in a northern hardwood forest.                                 |
| 14:32 | Pries, Caitlin       | How freezing and warming affect respiration across the soil profile  |
| 14:37 | Reinmann, Andy       | Response of Soil Respiration to Chronic and Extreme Climate Manipulations at Hubbard Brook                                       |
| 14:42 | Asbjornsen, Heidi    | Double Drought Dare – Pushing Thresholds of Northern Hardwood Forest Response to Drought?  |
| 14:47 | Rustad, Lindsey      | Cool Response Round-up and Conundrums from ISE (Hubbard Brook Ice Storm Experiment)  |
| 14:57 | Campbell, John       | Development of a low-cost ice accretion measurement methodology for a volunteer observation network                              |
| 15:07 | Likens, Gene         | Unusual Sequence of Ice Cover Formation on Mirror Lake   |
| 15:12 |                      | <b>Discussion, Session V</b>   |
| 15:17 |                      | <b>Break</b>   |
|       | <b>Session VI</b>    | <b>Bugs, Gases, and Lighter Biogeochemistry</b>  |
| 15:45 | Stewart, Anthony     | Taking a breath at depth: Soil oxygen in Hubbard Brook soils   |
| 15:50 | Denison, Whitney     | Variation in Traces Gas Fluxes   |
| 15:52 | Kreitinger, Liz      | Are deep soils denitrification hotspots?   |
| 15:54 | Fisher, Nathaniel    | Controls on Denitrification at Three Soil Depths West of Watershed 6   |
| 15:59 | Uribe, Angelina      | Soil denitrification potential and N <sub>2</sub> flux two decades following experimental calcium additions; preliminary results |
| 16:04 | Lang, Ashley         | Variability in leaf litter decomposition along a mycorrhizal gradient  |
| 16:14 | Palmer, C            | Molecular characterization of mycorrhizal fungi  |
| 16:16 | Vietorisz, Corinne   | Canopy tree species and soil type impact ectomycorrhizal community composition and function                                      |
| 16:21 | Groffman, Peter      | Microbes and pH: A new synthesis   |
| 16:31 |                      | <b>Discussion, Session VI</b>  |

**HUBBARD BROOK ECOSYSTEM STUDY  
56TH ANNUAL COOPERATORS' MEETING  
234 Mirror Lake Road  
North Woodstock, NH 03262**

|       | <b>Session VII</b> | <b>Those With Feet; Some with Wings</b>                               |
|-------|--------------------|---|
| 16:36 | Christenson, Lynn  | Where the Wild-life are   |
| 16:38 | Kovari, Stephen    | Using Camera Traps to Study Wildlife at Hubbard Brook                 |
| 16:48 | Hallworth, Michael | Spatial and temporal trends in bird abundance in the HBEF             |
| 16:58 | Rodenhouse, Nick   | How studies of bird food at Hubbard Brook became key global data sets |
| 17:08 | Ralston, Jessica   | Monitoring bat activity over Mirror Lake                              |
| 17:13 |                    | <b>Discussion, Section VII</b>  |
| 17:18 | Rustad, Lindsey    | <b>Announcements</b>  |
| 18:00 |                    | <b>Dinner and Tent Dance</b>  |

|      |                      | <b>Day 2: Thursday, July 11, 2019</b>   |
|------|----------------------|---|
| 8:00 | Rustad, Lindsey      | <b>Announcements</b>  |
|      | <b>Session VIII</b>  | <b>The Wetter Side of Hubbard Brook</b>   |
| 8:15 | McDowell, William H. | Long-term, continuous stream chemistry records provide new insights into watershed function                                     |
| 8:20 | Zietlow, David       | Hydrologic Checkpoint   |
| 8:30 | Burchsted, Denise    | Tracking logs in the headwaters of Hubbard Brook  |
| 8:35 | Thellman, Audrey     | Variable windows of metabolic opportunity and altered light patterns may introduce algae in the Hubbard Brook stream ecosystems |
| 8:40 | Vought, Olivia       | Long-term dynamics of moss at Hubbard Brook: A fifty-year study   |
| 8:42 | Lowe, Winsor         | Mechanisms of phenotype-environment matching in a stream salamander   |
| 8:52 | Swartz, Leah         | Hydrologic variability decreases survival through metamorphosis in a stream salamander  |
| 9:02 | Warren, Dana         | Where are the fish in the Hubbard Brook stream network, and is their distribution changing?                                     |
| 9:07 | Barton, Chris        | Modeling Fracture Networks and Bedrock Flow in the Mirror Lake Watershed  |
| 9:12 |                      | <b>Discussion, Session VIII</b>   |
|      | <b>Session IX</b>    | <b>Processing Elements Six and Seven</b>  |
| 9:17 | Pardo, Linda         | Identifying controls on nitrate sources and flowpaths using a hydrogeological framework   |
| 9:27 | Fakhraei, Habibollah | Nitrate and Potassium Response to Land Disturbance in Watersheds of the Hubbard Brook Experimental Forest                       |
| 9:37 | Goodale, Christine   | Nitrogen Pools and Isotopic Composition over a Chronosequence   |
| 9:42 | LoRusso, Nicholas    | Dissolved organic matter transformation in calcium-treated and reference watersheds at HBEF                                     |
| 9:52 | Shanley, Jamie       | Carbon cycling - scaling up from Sleepers River   |
| 9:54 |                      | <b>Discussion, Session IX</b>   |
| 9:59 |                      | <b>Break</b>  |

**HUBBARD BROOK ECOSYSTEM STUDY  
56TH ANNUAL COOPERATORS' MEETING  
234 Mirror Lake Road  
North Woodstock, NH 03262**

|       | <b>Session X</b>      | <b>Seeing the Forest for the Trees and Understory</b>  |
|-------|-----------------------|--|
| 10:30 | Battles, John         | Forty years of forest dynamics in an old-growth northern hardwood forest   |
| 10:40 | Fraser, Olivia        | Stand Density and Biomass in relation to LiDAR-derived Topographic Metrics at HBEF and BEF, NH   |
| 10:45 | Fuss, Colin           | Modeling forest soil and ecosystem C and N dynamics during succession or species composition change  |
| 10:55 | Matthes, Jackie       | Forecasting future forest dynamics at Hubbard Brook  |
| 11:05 | Ding, Alex            | Monitoring sugar maple regeneration throughout New Hampshire using citizen science   |
| 11:07 | Cleavitt, Nat         | Life's a beech: 20 years of tree dynamics in the HB Valley   |
| 11:17 | Wentzell-Brehme, Sage | Establishing baseline for understory conditions and tree regeneration pre-hemlock woolly adelgid   |
| 11:19 | Schaberg, Paul        | The DEN tree-ring database is "live" and includes Hubbard Brook data   |
| 11:24 | Hoy, Joann            | Valleywide flora   |
| 11:26 | Studer, Liz           | Trouble with Trillium: Modeling spring ephemeral populations under four canopy trees   |
| 11:31 | Berry, Eric           | Population Dynamics of Round-Leaved Orchids <i>Platanthera macrophylla</i> and <i>P. orbiculata</i> in the Hubbard Brook Experimental Forest |
| 11:41 |                       | <b>Discussion, Session X</b>   |
| 11:46 | Rustad, Lindsey       | <b>Announcements</b>   |
| 11:56 |                       | <b>Lunch</b>   |