



FEMC

Forest Ecosystem Monitoring Cooperative



The
UNIVERSITY
of VERMONT

RUBENSTEIN SCHOOL
OF ENVIRONMENT AND NATURAL RESOURCES



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2017 Forest Ecosystem Monitoring Cooperative Conference

Beyond Communication: Advocating for Science and our Forests

December 15, 2017 – Davis Center – University of Vermont

About the Forest Ecosystem Monitoring Cooperative

For over 25 years, the Forest Ecosystem Monitoring Cooperative (formerly the Vermont Monitoring Cooperative) has brought together practitioners from a range of disciplines and institutions to work together on monitoring and assessing forested ecosystems. The result is one of the largest and longest consistent records of forest ecosystem health in the country.

The primary mission of the FEMC is to **“is to serve the northeast temperate forest region through improved understanding of long-term trends, annual conditions, and interdisciplinary relationships of the physical, chemical, and biological components of forested ecosystems.”**

The History of the Forest Ecosystem Monitoring Cooperative

Established in 1990 as a partnership among the USDA Forest Service, the State of Vermont Agency of Natural Resources and The University of Vermont (UVM), the mission of the Forest Ecosystem Monitoring Cooperative (FEMC) mirrors and builds upon the priorities of these partners and their counterparts in the larger region. The FEMC serves as a hub to facilitate collaboration among federal, state, non-profit, professional and academic institutions towards ongoing monitoring of forested ecosystems across the region and an improved understanding of forested ecosystems in light of the many threats they face. In May 2017, the Cooperative changed its name from the Vermont Monitoring Cooperative as new state partners began participating in the FEMC. The cooperative now includes significant partnerships in Maine, Massachusetts, New Hampshire and New York.

The Services of the Forest Ecosystem Monitoring Cooperative

The FEMC staff supports the activities of a much larger network of actively engaged collaborators across governmental, academic, research and non-profit organizations. FEMC staff work with these collaborators to provide:

- Coordination and facilitation of monitoring and research activities across organizations, disciplines and state boundaries;
- Data support including: retrieval, archive, management, sharing, analysis and synthesis;
- Coordination and support of long-term ecosystem monitoring;
- Yearly syntheses of key ecosystem components, providing up-to-date assessments of current forest condition as well as long-term trends;
- An annual conference where ecosystem professionals come together for a day of sharing, learning and networking across disciplinary and organizational boundaries.

Getting Involved with the Forest Ecosystem Monitoring Cooperative

Interested in getting involved? The FEMC has numerous committees and activities that could use your support, and we would love to hear from you! Contact Jim Duncan (james.duncan@uvm.edu) if you would like to learn more.

About the 2017 Conference

This year, the theme for the conference is:

Beyond Communication: Advocating for Science and our Forests

2017 marks the 27th year of the Monitoring Cooperative and its first year as the Forest Ecosystem Monitoring Cooperative! This year's conference promises to deliver a dynamic array of talks and workshops designed to help collaborators build capacity to communicate and market their work to a broader stakeholder audience. This conference will help participants develop messages and share information in such a way that the public sees the value of forest ecosystem monitoring and research in our region and its relevance to their lives.

A special thank you to our Conference

Facilitators Emily Drew, Alexandra Kosiba, Carolyn Loeb and Christian Schorn for their help in moderating our contributed talks sessions.

Schedule at a glance

9:00 – 9:20	Welcome
9:20 – 10:00	Keynote Presentation: Communicating for Impact
10:00 – 10:25	Successful Science Communication Flash Talks
10:50-12:10	Contributed Talks Session 1
12:10 – 1:20	Lunch
1:20 – 2:40	Contributed Talks Session 2
3:00 – 4:30	Working Groups
4:30 – 5:30	Poster Session and Social Hour

News from the Cooperative in 2017

2017 was a busy year for FEMC, including work on both expanding the Cooperative membership and also developing new tools and analyses to improve assessment of forest ecosystem condition. Some highlights:

Forest Indicators Dashboard giving easy-to-use scores and trends in nearly 20 key datasets to quickly summarize how our forests are doing
<https://www.uvm.edu/femc/indicators>

Northeastern Forest Health Atlas, providing access to mapped disturbance data and field research dating back to 1918 for a 5-state region
<https://www.uvm.edu/femc/forest-health-atlas>

Updates on 2016 data and long-term trends in the FEMC Long-term Monitoring update, and expansion to other states with the FEMC Regional Monitoring Update
https://www.uvm.edu/femc/products/long_term_update

Regional expansion continues with new state committee meetings and ongoing partner projects

Building the best data management portal, including additional features, data-driven applications, and member status in the DataONE network.

Increasing staff capacity with Ali Kosiba as Project Coordinator, Mike Finnegan as Database/Web Developer and John Truong as Project/Field Coordinator

Just a sample! Check out more of our work this year at the registration desk.

Beyond Communication: Advocating for Science and our Forests

9:00 to 5:30, December 15, 2017

Davis Center -- University of Vermont -- Burlington, VT



Agenda

- 8:15 – 9:00** **Registration and Coffee** (*Livak Fireplace Lounge. Coffee and poster setup in Sugar/Silver Maple*)
- 9:00 – 9:20** **Introduction and Welcome** (*Sugar/Silver Maple*)
- 9:20 – 10:00** **Communicating for Impact – Keynote Presentation** (*Sugar/Silver Maple*)
- Tad Segal**, President and Founder of Outreach Strategies
Tad Segal is a senior communications and advocacy strategist specializing in complex campaigns impacting public policy on sustainability issues at the domestic and international levels. As a mission-driven organization, Outreach Strategies is engaged in some of the most exciting and innovative integrated media, stakeholder engagement and international education campaigns to protect our air, land and water both in the U.S. and around the world. With deep experience in a variety of environments, including large coalitions, agency, corporate and government settings, he specializes in complex communications campaigns that impact public policy on sustainability issues. His keynote will address the key frameworks and approaches used in advocating for science-based decision making.
- 10:00 – 10:25** **Successful Science Communication** (*Sugar/Silver Maple*)
- 5-minute flash talks demonstrating effective communication strategies and campaigns*
- The Short, Sweet and Engaging Story of Freshwater Mussels**
Mark Ferguson, Zoologist, Vermont Department of Fish and Wildlife
- So What? How to Grab & Hold People's Attention About Science**
Bridget Butler, Principal, Bird Diva Consulting
- Reaching Decision Makers: Using Science to Inform Policy**
Jamey Fidel, General Counsel and Forest and Wildlife Program Director, Vermont Natural Resources Council
- Science for impact? Know your audience**
Julianna White, University of Vermont Gund Institute for Environment, CGIAR Research Program on Climate Change, Agriculture and Food Security
- The Making of Outdoor Radio** Kent McFarland and Sara Zahendra (Vermont Center for Ecostudies) and Chris Albertine (Vermont Public Radio)

10:25 – 10:50 Plenary Wrap Up and Coffee Break (*Sugar/Silver Maple*)

10:50 – 12:10 Contributed Talks 1 (*Rooms listed below*)

Learn about new and ongoing research, monitoring, conservation and outreach initiatives related to the forested ecosystem through several concurrent sessions of presentations.

Abstracts are available at the registration desk.

Contributed Talks Session 1 Schedule

	Engaging Stakeholders and Influencing Forest Policy <i>Moderator: Alexandra Kosiba Room: Silver Maple</i>	Water Quality Assessments Across Scales <i>Moderator: Emily Drew Room: Frank Livak</i>	Trends and Patterns in Wildlife and Fisheries <i>Moderator: Carolyn Loeb Room: Mildred Livak</i>
Time			
10:50 to 11:10	Imported Forest Pests: Science Applied to Policy <i>Gary M. Lovett</i>	Using LiDAR to Map Eroded Forest Roads in the Lake Champlain Basin, Vermont <i>Sean MacFaden</i>	Eastern Ribbonsnakes and Common Gartersnakes in Vermont: One Rare and One Abundant <i>Jim Andrews</i>
11:10 to 11:30	Bridging the Gap between Invasive Species Research and Management: Challenges and solutions in New York State <i>Carrie Brown-Lima</i>	Dealing with Non-Detects: Using Censored Environmental Data Wisely <i>Rebecca M. Harvey</i>	An Overview of Ongoing Moose Mortality and Productivity Research in Northern Vermont. <i>Jacob R. DeBow</i>
11:30 to 11:50	The NSRC and FEMC as partners for a better future in the Northern Forest Lands <i>William B. Bowden</i>	High-frequency water quality measurements reveal differences in storm hysteresis and loading in relation to land cover and seasonality <i>Matthew C.H. Vaughan</i>	A Regional Investigation of Mercury in Small Mid-trophic Fishes and Predatory Game Fishes of Streams in the Northeastern United States <i>Karen Riva Murray</i>
11:50 to 12:10	Effective Communication with a Municipal Audience <i>Jens Hilke</i>	Water Quality Blueprint - Nature-Based Solutions for Clean Water in Lake Champlain <i>Dan Farrell</i>	From Vermont to the Dominican Republic: factors driving variation in apparent survival of Bicknell's Thrush on the breeding and wintering grounds <i>Jason M. Hill</i>

12:10 – 1:20 Lunch (*Sugar/Silver Maple*)

1:20 – 2:40

Contributed Talks 2 (*Rooms listed below*)

Abstracts are available at the registration desk.

SPECIAL TRACK This track of talks connects to a working session and special collection of posters throughout the afternoon.

Contributed Talks Session 2 Schedule

Time	Forest Ecology and Silviculture <i>Moderator: Alexandra Kosiba</i> <i>Room: Mildred Livak</i>	Environmental Change and Long-Term Monitoring <i>Moderator: Christian Schorn</i> <i>Room: Jost</i>	SPECIAL TRACK Can We Manage the Impacts of Climate Change on Sugar Maple and Maple Sugaring? <i>Moderator: Toni Lyn Morelli</i> <i>Room: Frank Livak</i>
1:20 to 1:40	How weather and other factors influence fall leaf color displays <i>Paul G. Schaberg</i>	Update on Vermont Long-term Soil Monitoring Project <i>Thomas Villars, Don Ross</i>	Finding the sweet spot: Climate optimum for maple syrup production <i>Joshua Rapp</i>
1:40 to 2:00	Regional spatiotemporal patterns of forest disturbance using aerial detection surveys <i>Alexandra M. Kosiba</i>	Evaluating trends and environmental drivers of sugar maple and red oak growth in the state of Vermont <i>Rebecca L. Stern</i>	Climate Effects on Maple Phytochemistry and Producer Perceptions and Responses <i>Selena Ahmed and David Lutz</i>
2:00 to 2:20	Windstorm and salvage harvest in northern mixed deciduous forests change forest structure, but not plant community diversity or richness. <i>Sarah Pears</i>	Ridges, Valleys, Bedrock & Soil: Using the Physical Landscape to Conserve Species in a Changing Climate <i>Bob Zaino and Liz Thompson</i>	What Sap with That?: A look at how Native Americans are Adapting to Climate Change and Maple Sap Production. <i>Autumn Brunelle</i>
2:20 to 2:40	Seventy years of northern hardwood silviculture: long-term compositional and structural evolution after repeated group selection <i>Nicole S. Rogers</i>	Factors Affecting Use of Climate Change Science and Decision Support Tools for Forest Management in Vermont <i>Clare Ginger</i>	Ziizabokdoke: A cultural tradition of sugar making for one Midwestern tribe and seven generations of change <i>Bonnie Ekdahl and Alex Bryan</i>

2:40 – 3:00

Coffee Break (*Silver Maple*)

3:00 – 4:30

Workshops (*Rooms listed below*)

Revisit the science communication and advocacy topics from the morning plenary to learn more techniques, hone skills or learn from experts in the field. Descriptions of sessions can be found below.

SPECIAL TRACK Can We Manage the Impacts of Climate Change on Sugar Maple and Maple Sugaring?

Organizer: Toni Lyn Morelli, DOI Northeast Climate Science Center and University of Massachusetts

Room: Frank Livak Ballroom

Climate Change and an Ecologically Functional Landscape: How Can We Plan for and Achieve Conservation Success?

Organizers: Bob Zaino (Vermont Fish and Wildlife), Eric Sorenson (Vermont Fish and Wildlife), and Liz Thompson (Vermont Land Trust)

Room: Sugar Maple Ballroom

Informing policy: How scientists can engage with lawmakers

Roundtable Participants: Rebecca Ellis, Jamey Fidel, Neil Kamman, David Mears

Organizer: Joanne Garton, Vermont Department of Forests, Parks and Recreation

Room: Jost Foundation Room

Media Training for Scholars: Getting News Coverage for Science

Organizer: Basil Waugh, Gund Institute for the Environment, University of Vermont

Room: Chittenden Bank Room

Stakeholder Engagement in Research and Results

Organizers: Julianna White (Gund Institute for Environment and CGIAR) and Bridget Butler (Bird Diva Consulting)

Room: Williams Family Room

4:30 – 5:30

Poster Session and Social (*Silver Maple*)

Enjoy conversation and over 28 posters and demonstrations at the end of the day. Poster titles are listed at the end of the agenda.

SPECIAL TRACK Includes posters in the special track “Can We Manage the Impacts of Climate Change on Sugar Maple and Maple Sugaring?”

Working Group Descriptions

SPECIAL TRACK Can We Manage the Impacts of Climate Change on Sugar Maple and Maple Sugaring?

Organizer: Toni Lyn Morelli, DOI Northeast Climate Science Center and University of Massachusetts

This special track of talks, posters, discussion, and scenario planning throughout the afternoon will bring together researchers and collaborators from state and federal agencies, tribal partners, and private industry (including you!) from around the region to learn and discuss "Can We Manage the Impacts of Climate Change on Sugar Maple and Maple Sugaring?". The tapping of maple trees is a cultural touchstone for many people in the northeast and Midwest and Native American tribes have collected and boiled down sap for centuries. Because the tapping season is dependent on weather conditions, there is concern about the sustainability of maple sugaring as climate changes throughout the region. In addition, Northern Hardwood species like sugar maple are expected to contract their range northward eventually. In spite of this, maple syrup production is increasing rapidly, with demand rising as more people appreciate this natural sweetener. The ACERnet team of researchers from across the US and Canada will present on research earlier in the afternoon that has been funded through the Department of Interior Northeast Climate Science Center to address the impact of climate change on syrup quality, tapping timing, and maple distribution. Informed by the needs of state and federal resource managers, tribal groups, and other maple syrup producers, the research team has analyzed how climate variation and climate change is impacting the chemical composition of sap throughout the northeast region. They will also present on climate change adaptation options, including the potential use of less climate-sensitive red maples as alternatives to sugar maple.

This Working Group session will discuss climate adaptation options, for managers and producers to share insights and strategies, and to use scenario planning to brainstorm on what maple sugaring will look like in the future.

Following the working session, we will have a Poster session focused on the impacts of climate change on the culture and ecology of sugar maple - relevant contributions welcome.

Climate Change and an Ecologically Functional Landscape: How Can We Plan For and Achieve Conservation Success?

Organizer: Bob Zaino (Vermont Fish and Wildlife Department), Eric Sorenson (Vermont Fish and Wildlife Department), and Liz Thompson (Vermont Land Trust)

In 2015, the Vermont Fish and Wildlife Department and Vermont Land Trust produced "Vermont Conservation Design: Maintaining and Enhancing an Ecologically Functional Landscape." This effort identified the highest priority forest blocks, and surface waters and riparian areas needed to sustain the state's biological diversity into the future. We'd like to use this work, and other recent regional conservation planning efforts as a jumping off point for a wide-ranging discussion about the science and implementation of conservation planning. Questions include: Is the concept of an ecologically functional landscape the right one for dealing with climate change adaptation and evolution? How do we know if a landscape is self-adapting to climate change, and when do we intervene in species migration and natural community dynamics? What types of monitoring and assessment are needed to recognize success? How do we take dispersed conservation ideas, plans, and organizations and build towards a coherent whole? And, even if the science is right, how do we get large-scale conservation done? How do we overcome societal constraints? How can we use scientific conservation planning efforts to create a positive vision of people living within an ecologically functional landscape?

Working Group Descriptions Continued

Informing Policy – expert testimony and other ways to engage with lawmakers

Organizer: Rebecca Ellis, Jamey Fidel, Joanne Garton, Neil Kamman, David Mears

Join a diverse group of environmental leaders and decision makers to explore how and why science informs policy in today's information-rich government. This discussion will mine the experiences of our roundtable participants as public officials, environmental advocates, legislators, and educators, touching upon the varied techniques and strategies that successfully communicate important research findings to broad audiences.

Panelists:

Rebecca Ellis, Deputy Commissioner, Vermont Department of Environmental Conservation

Jamey Fidel, General Counsel & Forest and Wildlife Program Director, Vermont Natural Resources Council

Neil Kamman, Senior Policy Advisor, Vermont Department of Environmental Conservation

David Mears, Director, Environmental Law Center, Vermont Law School

Media Training for Scholars: Getting News Coverage for Science

Organizer: Basil Waugh, Gund Institute for the Environment, University of Vermont

Garnering news coverage for your scientific efforts can amplify the impact and recognition of your work. Tailored for researchers, this media training presentation will help scholars and scientists to understand 1) what makes news, 2) key elements of successful media outreach, 3) and how to stay in control of interactions with journalists.

Stakeholder Engagement in Research and Results

Organizer: Julianna White and Bridget Butler

After discussing successful examples of engaging the public in our results, participants will examine how to 1) involve stakeholders in their own research (stakeholder mapping, planning for involvement) and 2) engage stakeholders with research results (verbal and visual messages, strategies). This will be an interactive session; participants will share ideas, provide feedback, and hone messages.

Poster Titles and Presenters

Abstracts available online - <https://www.uvm.edu/femc/cooperative/conference/2017/agenda>

SPECIAL TRACK (Re)expansion of the maple syrup industry in New England: projecting where the taps will be in a changing environment

Presenter: Joshua Rapp, *Harvard Forest*

An Investigation of Nutritional Effects On Beech Bark Disease Causal Organisms

Presenter: Gretchen Lasser, *Department of Forest and Natural Resources Management, SUNY-ESF*

SPECIAL TRACK Assessing a strategy of climate change adaptation for maple syrup producers in the Southern Appalachians: Diversification of maple species as sap sources.

Presenter: Ryan Huish, *The University of Virginia's College at Wise*

SPECIAL TRACK Battle of the Babies: Beech Interference with Maple Regeneration

Presenter: Daniel S. Hong, *SUNY-ESF*

Citizen Science in Action: 15 Years of the LaRosa Partnership Program

Presenter: Elijah Schumacher/ Jim Kellogg, *DEC WSMD*

Earthworm Cocoons: The Cryptic Side of Invasive Earthworm Populations

Presenter: Maryam Nouri-Aiin, *Department of Plant and Soil Science, University of Vermont*

Effects of Human Visitation on Mammals as Detected by Trail Cameras in Colchester, Vermont

Presenter: Jade Jarvis, *Biology Student Saint Michael's College*

SPECIAL TRACK Effects of Long-Term Nutrient Addition on Acer saccharum Sap Flow

Presenter: Alexandra Rice, *SUNY ESF, 1 Forestry Drive, Syracuse, NY 13210*

Effects of woody shrub and tree density on species richness and habitat preference

Presenter: Alyssa Valentyn, *Saint Michael's College*

Forest Health Indicators Dashboard: Assessing the condition of forested ecosystems

Presenter: Jennifer Pontius, *RSENR University of Vermont and USFS Northern Research Station*

SPECIAL TRACK Future distribution of sugar-maple dominated forests on the Green Mountain National Forest under climate change

Presenter: Anthony W. D'Amato, *University of Vermont, Rubenstein School of Environment and Natural Resources; Department of Interior Northeast Climate Science Center*

Hydraulic safety margins and air-seeding thresholds in roots, trunks, branches, and petioles of four northern hardwood trees

Presenter: Brett A. Huggett, *Bates College*

Is gene flow extensive and inhibiting adaptation of red spruce (*Picea rubens*) along an elevational gradient?

Presenter: Brittany M. Verrico, *Dept. of Plant Biology, University of Vermont, Burlington, Vermont, USA*

SPECIAL TRACK Maple syrup in a changing climate

Presenter: Joshua Rapp, *Harvard Forest*

Monitoring the Health of Vermont's Forests: Long-Term Trends and Natural Communities

Presenter: Caroline Drayton, *Forest Ecosystem Monitoring Cooperative, RSENR*

Poster Titles and Presenters Continued

Northeast Forest Information Source (NEFIS): A New, Open-Access, Online Portal for Research Related to the Northern Forest

Presenter: Meg Fergusson, *Center for Research on Sustainable Forests (CRSF) at the University of Maine*

Northeastern States Research Cooperative: Research Project Impacts

Presenter: Shari Halik, *University of Vermont*

ourVTwoods.org Outreach Display

Presenter: Kate Forrer, *UVM Extension*

Putting an Ear to the Ground: Monitoring the Impacts of Climate Change on Working Forests

Presenter: Jennifer Hushaw, *Applied Forest Scientist, Climate Services Program, Manomet, Inc.*

SPECIAL TRACK Qualitative Contributions to Climate Adaptation: Living History and Knowledge of the Sugar Maple

Presenter: Lena Wilson, Allissa Stutte, Devon Brock-Montgomery, *Red Cliff and Bad River Bands of Lake Superior Chippewa*

Soil Nutrients Effect on Fall Leaf Retention in Northern Hardwood Forests.

Presenter: Madison Morley, *State University of New York College of Environmental Science and Forestry*

SPECIAL TRACK Specific leaf area and amino acids vary within sugar maple canopies and across fertilization treatments

Presenter: Alexander, *SUNY-ESF*

The "Future Forests Geo-visualization and Decision Support Tool": Linking science and management in a geospatial, multi-criteria structured decision support framework

Presenter: Jennifer Pontius, *UVM and USFS NRS*

The effect of acid-mine drainage on the diversity of sensitive species of macroinvertebrates in two branches of a Vermont stream

Presenter: Mariah J. Witas, *Saint Michael's College*

The Nature Conservancy Dam Screening Tool

Presenter: Shayne Jaquith, *The Nature Conservancy*

SPECIAL TRACK The Northeast Climate Science Center: Improving the way climate science informs resource management

Presenter: Toni Lyn Morelli, *U.S. Geological Survey, Department of Interior Northeast Climate Science Center*

The Power of Collaboration: Building Relationships and Fostering Public Support

Presenter: Elizabeth Spinney, *Vermont Department of Forests, Parks & Recreation*

Water Quality Blueprint - Nature-Based Solutions for Clean Water in Lake Champlain

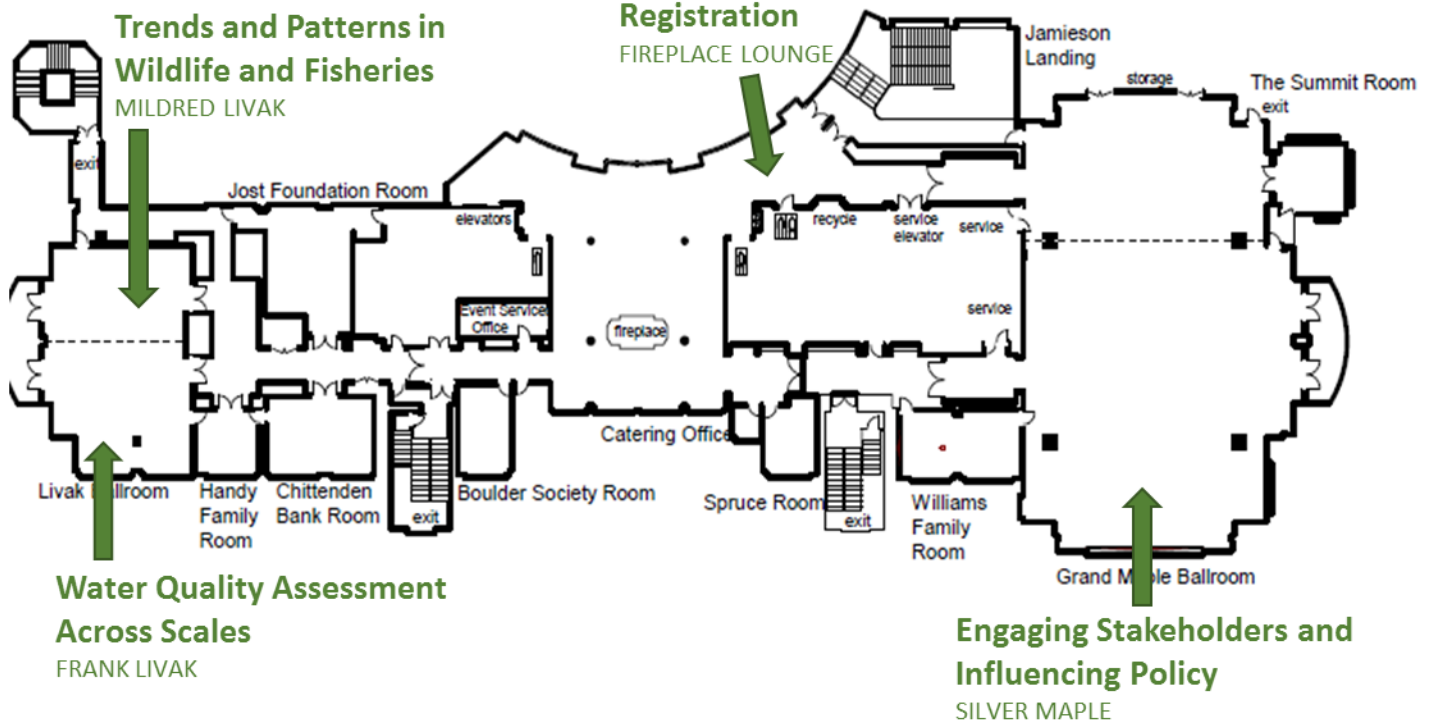
Presenter: Dan Farrell, *The Nature Conservancy of Vermont*

Xylem-vessel networks and drought resistance in northern hardwood trees

Presenter: Jay Wason, *Yale School of Forestry & Environmental Studies*

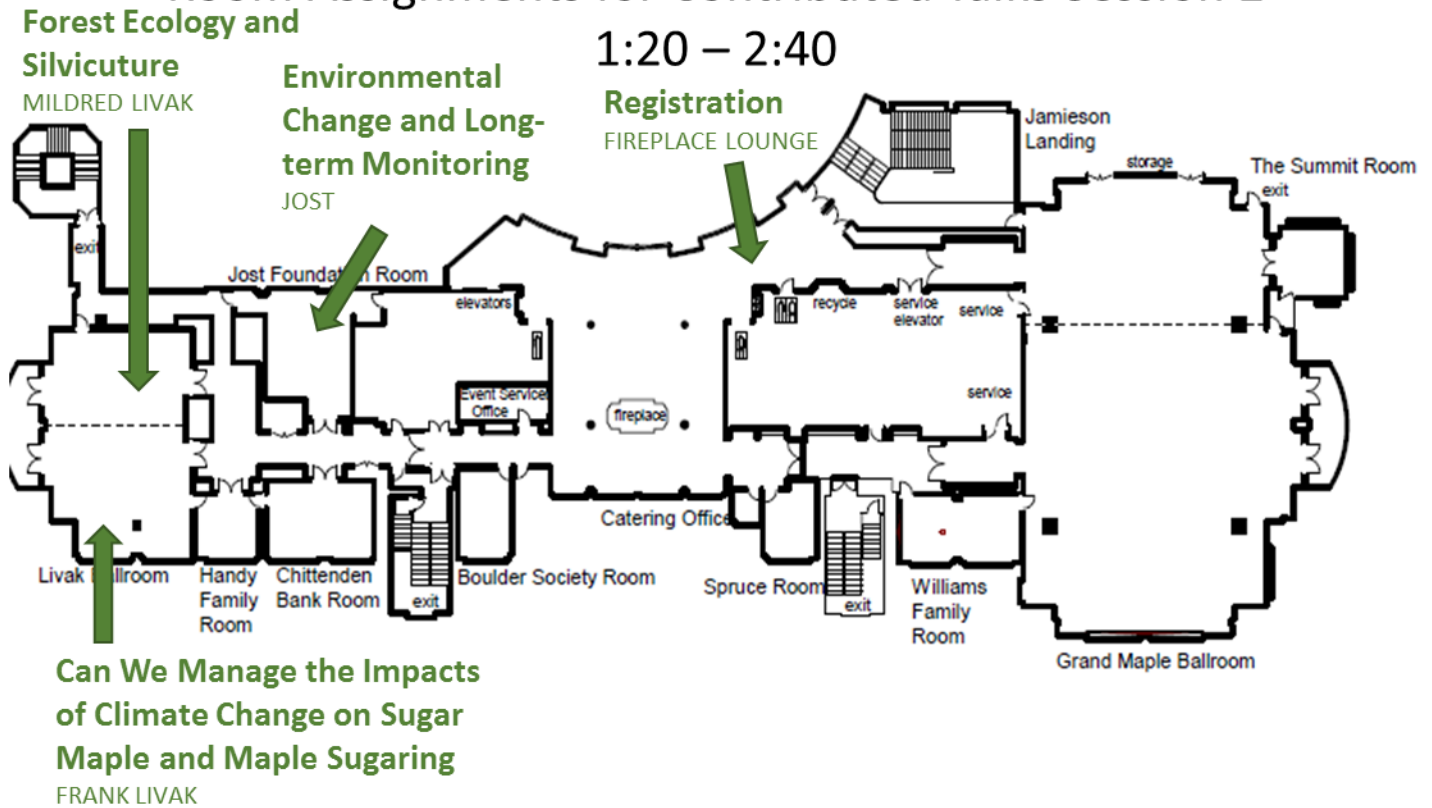
Room Assignments for Contributed Talks Session 1

10:50 – 12:10



Room Assignments for Contributed Talks Session 2

1:20 – 2:40



Room Assignments for Working Groups and Poster Session 3:00 – 5:30

