2016 Vermont Monitoring Cooperative Conference

Healthy Forests, Healthy Watersheds

Davis Center, University of Vermont

Friday, December 2, 2016

Vermont Monitoring Cooperative

The University of Vermont

THE RUBENSTEIN SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES

VERMONT AGENCY OF NATURAL RESOURCES

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

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About the Vermont Monitoring Cooperative

For over 25 years, 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 VMC is to "**serve as a hub of forest ecosystem research and monitoring efforts … to facilitate an understanding of long-term trends, annual conditions and interrelationships of the physical, chemical, and biological components of forested ecosystems**"

The History of the Vermont 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 Vermont Monitoring Cooperative (VMC) mirrors and builds upon the priorities of these partners. The VMC 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.

The Services of the Vermont Monitoring Cooperative

The VMC staff supports the activities of a much larger network of actively engaged collaborators across governmental, academic, research and non-profit organizations. VMC 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 Vermont Monitoring Cooperative

Interested in getting involved? The VMC 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 2016 Conference

This year, the theme for the conference is:

Healthy Forests, Healthy Watersheds

Forests are critical to maintaining healthy, functioning ecosystems, with particular importance in regulating the flow of water, protecting water quality, and providing valuable ecological services and economic benefits including carbon sequestration, wildlife habitat, and forest products. This year we focus on forests at the watershed scale, with a particular lens on managing forests to maintain these critical functions across the landscape.

The morning plenary will feature an array of presenters from various disciplines speaking to the relationship between forests and watersheds, including metrics or strategies employed to inform forest management and how these influence watershed condition. A question-and-answer panel made up of the speakers will allow the morning speakers to explore these topics in more depth. As in past years, the afternoon will be devoted to concurrent sessions where collaborators from across the region can present their most recent work, a variety of working group sessions convened by members of our professional community, and a poster session and social hour.

Schedule at a glance

8:45 – 9:00	Welcome
9:00 – 9:15	Update on the State of the Cooperative
9:15 – 10:45	Plenary: Forest Management and Watershed Condition
11:00-12:00	Contributed Talks Session 1
12:00 – 1:00	Lunch
1:00 – 2:20	Contributed Talks Session 2
2:30 – 4:00	Working Groups
4:00 – 5:00	Poster Session and Social Hour

A **special thank you to our Conference Facilitators** Alexandra Kosiba, Julia Runcie, Rebecca Stern, Emma Tait and John Truong for their help in moderating our contributed talks sessions.

News from the Cooperative in 2016

VMC Goes Regional - Several Projects in Neighboring States Underway

VMC has been expanding its cooperators network with forest health data rescue in collaboration with the NY Department of Environmental Conservation, data archive and publication support for the Environmental Monitoring and Management Alliance, aggregation of Massachusetts monitoring and research data and more.

VMC Data Management Portal Now Open to All

Built on the latest standards for ecological and scientific data sharing, the VMC portal is now available to host and share data on the forested ecosystems of the region.

More information at http://www.uvm.edu/vmc/news/item/76

The Vermont Monitoring Cooperative Long-Term Monitoring Update – 2015

A review of long term trends in thirteen key areas affecting regional forest ecosystem health, updated for 2015.

Available online at http://www.uvm.edu/vmc/about/annual_report/2015

Cover Photo – "Forested Stream" by Rich Kirn

Agenda

8:00 – 8:45 **Registration** *(Livak Fireplace Lounge. Coffee and poster setup in Sugar/Silver Maple)*

8:45 – 9:00 **Host's Welcome and Introductory Remarks** *(Sugar/Silver Maple)*

Jennifer Pontius, *Principal Investigator, Vermont Monitoring Cooperative*

9:00 – 9:15 **Update on the State of the Cooperative** *(Sugar/Silver Maple)*

VMC Director Jim Duncan will present a brief update on the Vermont Monitoring Cooperative network, structure, services and future.

9:15 – 10:45 **Plenary Session**

Forest Management and Watershed Condition

The plenary will seek to address the current state of understanding about the links between forest management and watershed-level health. Three speakers will give focused, 15-minute talks exploring the relationship between watershed-level indicators of ecosystem condition and how forest management and planning is adapted in response to changes in these indicators.

Moderator: Dan Lambert, High Branch Conservation Services

Karl Honkonen *Watershed Forester* *USFS Northeastern Area State and Private Forestry*	Karl Honkonen will speak on science and practice of riparian forest buffer restoration.
Toni Lyn Morelli *Research Ecologist* *DOI Northeast Climate Science Center*	Toni Lyn Morelli will speak to an emerging initiative that aims to co-develop management-relevant research to improve invasive species management in the face of climate change.
Colin Beier *Associate Professor* *SUNY College of Environmental Science and Forestry*	Colin Beier will speak on the use of monitoring data to measure how forest management, land use change, pollution, and other factors synergistically impact the multiple benefits provided by northern forests.

10:45 – 11:00 **Coffee Break** *(Sugar/Silver Maple)*

11:00 – 12:00 Contributed Talks Session 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

Time	Watershed Management 1 *Moderator:* Alexandra Kosiba *Room*: Frank Livak	Watershed Management 2 *Moderator*: John Truong *Room*: Silver Maple	Monitoring and Assessment 1 *Moderator*: Emma Tait *Room*: Mildred Livak
11:00 to 11:20	The Role of Forests in Maintaining Water Quality in the Lake Champlain Basin *Kristen Underwood, University of Vermont*	Defining forest health in managed forests *Sandy Wilmot, Vermont Department of Forest, Parks and Recreation*	Regional Environmental Monitoring Through Collaborative Research at the Cary Institute of Ecosystem Studies in Millbrook New York *Vicky Kelly, Cary Institute of Ecosystem Studies*
11:20 to 11:40	Regeneration responses to management for old-growth characteristics in northern hardwood-conifer forests *William Keeton, RSENR, University of Vermont*	Vermont Conservation Design: Maintaining and Enhancing an Ecologically Functional Landscape *Eric Sorenson, Vermont Fish and Wildlife Department*	Continuous Forest Inventory across Vermont State-owned Land in the Northeast Kingdom *Emily P. Meacham, Vermont Department of Forests, Parks, and Recreation - State Lands Program*
11:40 to 12:00	Watershed-scale conservation, restoration and management in the Maine Woods *David Publicover, Appalachian Mountain Club*	Strategies for Reducing Phosphorus Loading and Sedimentation from Forestry Operations in Vermont *Gary Sabourin, Vermont Department of Forests, Parks and Recreation*	Bioassessment in Vermont's Forested Wetlands: Past, Present, and Future *Charlie Hohn, Vermont Agency of Natural Resources, Wetlands Program*

12:00 – 1:00 Lunch *(Sugar/Silver Maple)*

1:00 - 2:20 Contributed Talks Session 2 *(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 2 Schedule

Time	Landscapes *Moderator:* Rebecca Stern *Room*: Frank Livak	Wildlife *Moderator*: Emma Tait *Room*: Chittenden	Monitoring and Assessment 2 *Moderator*: Julia Runcie *Room*: Mildred Livak	Drivers of Change *Moderator*: Alexandra Kosiba *Room*: Jost
1:00 to 1:20	Modeling hemlock woolly adelgid risk and impacts of presalvage harvesting on carbon stocks in northern hemlock forests *Jennifer Pontius, USFS NRS and UVM*	Moose in Northern New England - Populations, Forest Management, and Climate Change *Peter Pekins, University of New Hampshire*	The Environmental Monitoring and Management Alliance (EMMA) and White-tailed Deer Monitoring for Management *Lynn Christenson, Vassar College*	Identifying species at risk from nitrogen deposition in forests in the northeastern U.S.: a geospatial analysis using exceedance of critical loads *Linda H. Pardo, USDA Forest Service, Northern Research Station*
1:20 to 1:40	E 15,001 Trees and Counting *Elise Schadler, Vermont Urban & Community Forestry Program*	Spruce Grouse Habitat Ecology in Maine's Commercially Managed Acadian Forest *Stephen Dunham, Cooperative Forest Research Unit; U. of Maine*	Defining and Targeting High Flows *Bill Hoadley, South Chittenden River Watch*	Do Invasive Earthworms Affect Maple Regeneration? *Josef H. Gorres, Plant and Soil Science, University of Vermont*
1:40 to 2:00	The Application of LiDAR to Watershed Management on the White Mountain National Forest *Landon Gryczkowski, White Mountain National Forest*	Rusty Blackbirds in the Northern Forest: Breeding Season Status and Habitat Associations at Local and Landscape Scales *Stacy McNulty, SUNY College of Environmental Science and Forestry*	Changing tree species distributions: a 30 year investigation into spatiotemporal trends *David Gudex-Cross, RSENR University of Vermont*	Bioaccumulation and Trophic Transfer of Methylmercury in Wood Frogs and Spotted Salamanders in Vermont Vernal Pools *Steve Faccio, Vermont Center for Ecostudies*
2:00 to 2:20	30 years of forest conversion in the Northeast: historical patterns and future projections *Alison Adams, University of Vermont*	Estimating the source of American martens (*Martes americana*) in Vermont and their genetic structure in the northeastern United States *Cody Aylward, University of Vermont*	Photopoint Monitoring in the Adirondack Alpine Zone *Julia Goren, Adirondack Mountain Club Summit Steward Program*	The Monkton Amphibian Underpass *Jim Andrews, Vermont Reptile and Amphibian Atlas*

2:20 – 2:30 Coffee Break *(Silver Maple)*

2:30 - 4:00 Working Groups *(Rooms listed below)*

Proposed, organized and run by meeting participants, this time allows for more structured networking and communication among current and potential collaborators.

A new GIS tool for assessing forest risk from nitrogen deposition and climate change: hands-on workshop -By Invitation-
Organizer: Linda H. Pardo, USDA Forest Service, Northern Research Station
Room: Aiken 101 (building next door to Davis Center)

Fine-Tuning a Wetlands Rapid Assessment Protocol -Open to All-
Organizer: Charlie Hohn, Vermont Agency of Natural Resources - Wetlands Program
Room: Chittenden

Forest disturbance in the Northeast US: Synthesizing field data and forest health aerial surveys -Open to All-
Organizer: Garrett Meigs, University of Vermont
Room: Frank Livak

How to best monitor for efficacy of invasive plant control efforts -Open to All-
Organizer: Robert Hyams, Lewis Creek Association, Habitat Restoration Solutions, LLC
Room: Jost

Vermont Water Monitoring Council Meeting -Open to All-
Organizer: Neil Kamman, VTDEC - Watershed Management Division
Room: Sugar Maple

VMC Management Portal Overview -Open to All-
Organizer: Mike Finnegan, Vermont Monitoring Cooperative
Room: Silver Maple

4:00 – 5:00 Posters & Social Hour *(Sugar/Silver Maple)*

Enjoy conversation, posters and a cash bar at the end of the day. A list of posters can be found below.

Working Group Descriptions

A new GIS tool for assessing forest risk from nitrogen deposition and climate change: hands-on workshop -By Invitation-

Organizer: Linda H. Pardo, USDA Forest Service, Northern Research Station

The GIS-based tool, Nitrogen Critical Loads Assessment by Site (N-CLAS) evaluates the impact of multiple stressors (N deposition and climate change) simultaneously for species of management concern on public and private forest lands. In addition to calculating species-specific critical loads, N-CLAS is designed to take into account the impact of site abiotic factors on the response of trees to N deposition. Application of N-CLAS across the northeastern U.S. allows us to evaluate which areas and tree species are most susceptible to impacts from N deposition. N-CLAS can determine the critical load and exceedance for individual tree species or all the species present. N-CLAS also provides information about the % of the area where deposition is in exceedance of the critical load and the % area by species at risk at any given deposition level. We are incorporating climate change scenarios in order to explore the interaction between climate change and nitrogen deposition. Thus, we will also be able to determine the fraction of the region that is susceptible to detrimental impacts of N deposition under projected climate scenarios. Use of this tool provides resource managers with a simple way to incorporate the current state-of-the-science knowledge into their planning and management decisions. This workshop will teach users how to work with this new tool to meet their resource management needs.

Room: Aiken 101 (building next door to Davis Center)

Fine-Tuning a Wetlands Rapid Assessment Protocol -Open to All-

Organizer: Charlie Hohn, Vermont Agency of Natural Resources - Wetlands Program

The Vermont Wetlands Program is updating a rapid wetland assessment protocol which will be made available to use for the public and any stakeholders interested in helping build our knowledge of Vermont wetlands. Possible target groups include conservation commissions, land trusts, land management agencies, UVM students, motivated citizen scientists, and the different branches of the Vermont Agency of Natural Resources - basically all attendees of the VMC. Data will be used to track the status of wetlands throughout the state, approximate the data that would be collected by more intensive surveys, and help select sites for these more detailed surveys. Come help us update this protocol so that it will be useful for the widest audience possible! We anticipate that this is something all of you would find helpful for your own use as well as to help build knowledge within the Wetlands program - and we know if you are a part of the protocol planning process, the methodology will be more useful to you!

Room: Jost

Forest disturbance in the Northeast US: Synthesizing field data and forest health aerial surveys -Open to All-

Organizer: Garrett Meigs, University of Vermont

This working session will focus on identifying methods, data, and outputs for linking field-based observations of forest change with aerial detection surveys in the northern forest region. The organizers will present the current status of an initiative to combine forest health aerial surveys from NY, VT, NH, ME, and MA with research data funded by the Northeastern States Research Cooperative. Participants will be asked to review the initial work to date, suggest additional field data for inclusion, and explore ways of linking forest health and disturbance data at multiple spatial and temporal scales.

Room: Frank Livak

How to best monitor for efficacy of invasive plant control efforts -Open to All-

Organizer: Robert Hyams, Lewis Creek Association, Habitat Restoration Solutions, LLC

There are a number of initiatives to control Exotic/Invasive plant populations that impact a range of natural communities within Vermont. Funding, whether federal, state, or NGO, typically covers cost of treatment for a calendar year. I believe little work is being conducted to determine efficacy outside of the first season. As a result, we are at risk of spending limited dollars and increasing chemical burden without empirical evidence to justify the means.

Room: Chittenden

Vermont Water Monitoring Council Meeting -Open to All-

Organizer: Neil Kamman, VTDEC - Watershed Management Division

The Vermont Water Monitoring Council serves to complement VMC's statewide work by convening a broad stakeholder group for whom the availability of water quantity and quality data is of significant interest. During this session, the Council will meet. Invited content is envisioned to include: 1) Flood forecasting models for Lake Champlain; 2) A sneak preview of modeling tools available to estimate phosphorus discharges from small-scale Lake Champlain catchments; 3) Updates to measured long-term phosphorus loads to Lake Champlain; 4) new developments in the LaRosa Partnership Program; 5) Introduction to the Clean Water Network; 6) Roundtable of updates from monitoring groups.

Room: Sugar Maple

VMC Management Portal Overview and Training -Open to All-

Organizer: Mike Finnegan, Vermont Monitoring Cooperative

Over the past year, several significant changes have been incorporated into the VMC's Management Portal, a web interface that enables researchers to manage their projects and datasets, while providing a public-facing side, promoting discoverability and collaboration by end users. In this Working Session, the first half hour will be spent walking through a typical use case, paying particular attention to the new features of the portal and describing the benefits they provide. The expected outcome is that participants will be chomping at the bit to use the new system! Fortunately, the remaining hour will be dedicated to helping those participants migrate their data into the portal with VMC staff's assistance available. If you plan to attend and have a dataset you wish to process, please bring it on a USB Flash drive, preferably in Comma Separated Values (CSV) format.

Room: Silver Maple

Poster Session Titles and Presenters

4:00 – 5:00, Silver Maple

Acoustic and visual monitoring of the spring phenology of snow, leaves, bugs, and birds on Mount Mansfield - John D. Lloyd, *Vermont Center for Ecostudies*

Characterization of immune genetic diversity in APOBEC3H in the Vermont population of Eastern bobcat (*L. rufus*) - Meghan Lavoie, *Saint Michael's College*

Continued Expansion of the Vermont Monitoring Cooperative's Forest Health Monitoring Network - John Truong and Kirsti Carr, *Vermont Monitoring Cooperative, University of Vermont*

Critical loads of N in Class I Areas: species and sites at risk from exceedance - Molly Robin-Abbott, *USDA Forest Service*

Key Findings from the City of Winooski's I-tree Inventory: An assessment of an urban canopy's Ecosystem Services - Holly Kreiner, *Winooski Natural Resources Conservation District*

Lake Champlain Sea Grant - Elissa Schuett, *UVM*

Landscape scale assessments of forest productivity: methods, patterns and trends - Jennifer Pontius, *USFS NRS and UVM RSENR*

Long-term biological monitoring of Ranch Brook, Stowe, Vermont - Michelle Graziosi, *Vermont Department of Environmental Conservation*

Mapping Tree Species across Northern New York and Vermont using Spectral Unmixing of Multi-temporal Landsat Imagery - David Gudex-Cross, *UVM RSENR*

Network Analysis for Watershed Management - Lindsay Barbieri, *University of Vermont, Rubenstein School for Environment and Natural Resources & Gund Institute of Ecological Economics*

Northeastern States Research Cooperative - Shari Halik/Elissa Schuett, *UVM*

The 2016 Impacts of Forest Tent Caterpillar in Vermont - Josh Halman, *Vermont Department of Forests, Parks and Recreation*

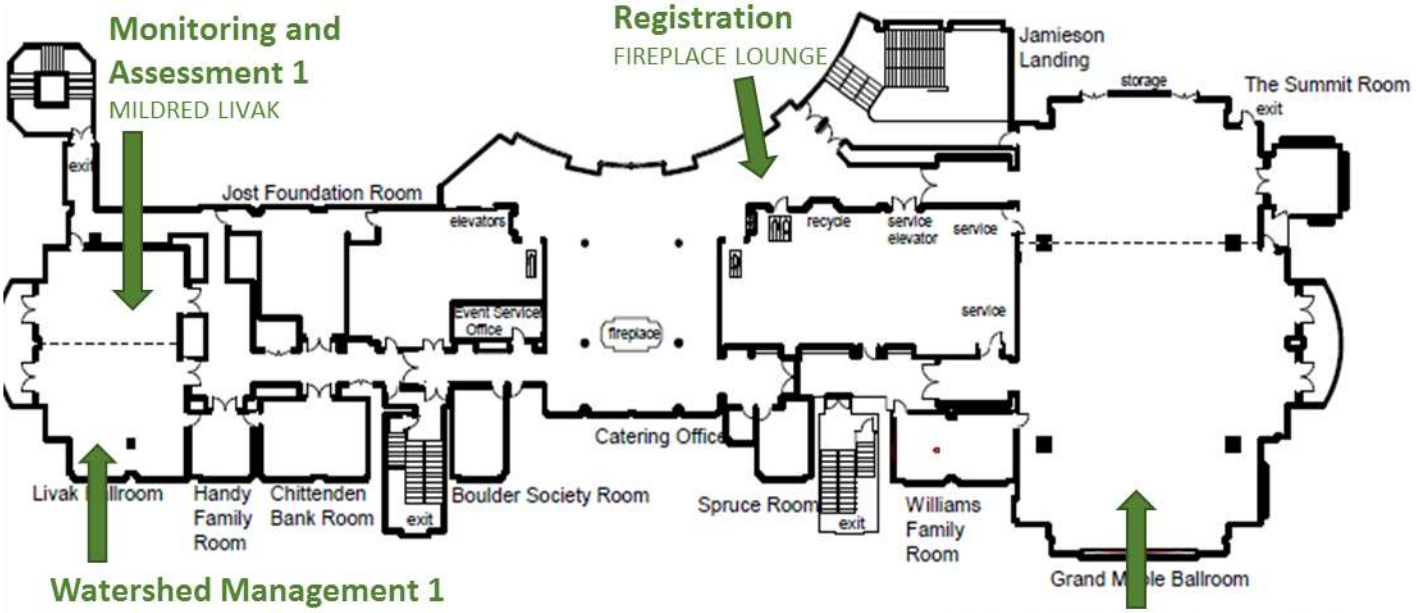
The Power of Communities: Investing in the future of healthy forests through invasive plant management and outreach - Elizabeth Spinney, *Vermont Department of Forests, Parks & Recreation*

Validation of a NN Weather Generator Methodology Based on North American Regional Reanalysis Historical Data - Rory Cummings, *Community College of Vermont / Vermont EPSCoR RACC Grant (UVM & SMC).*

Vermont Snowmobiling: Adaptation to Climate Change - William Valliere, *University of Vermont*

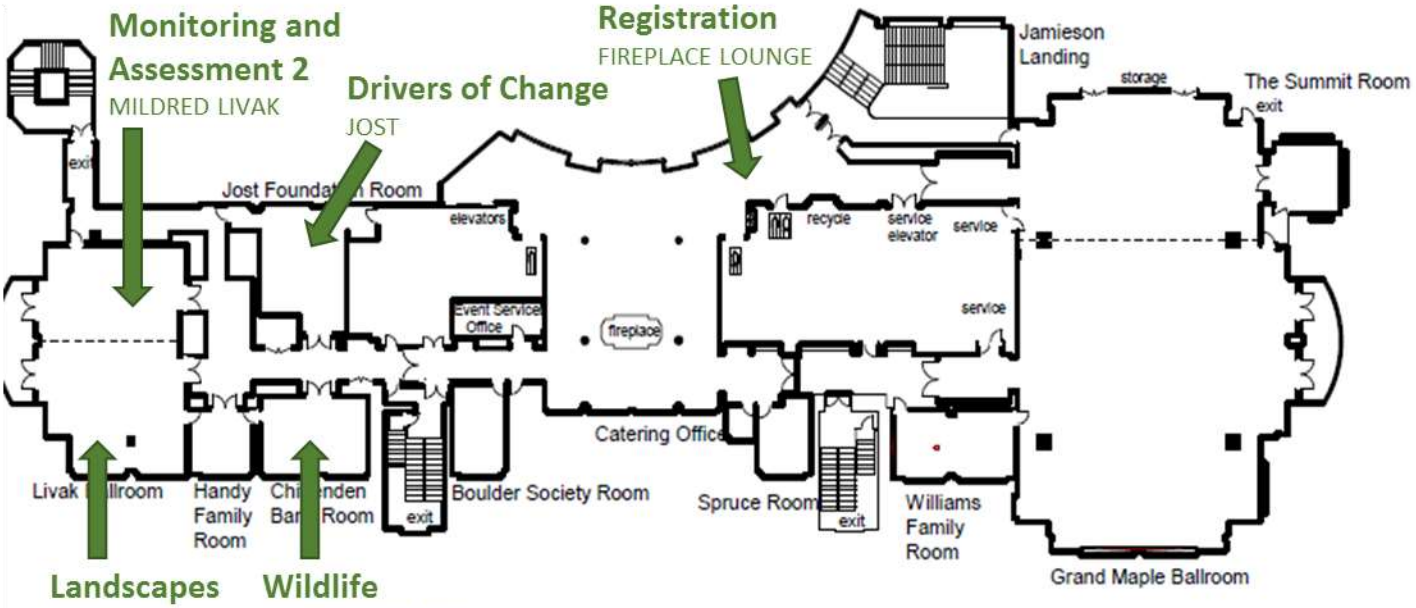
Room Assignments for Contributed Talks Session 1

11:00 – 12:00

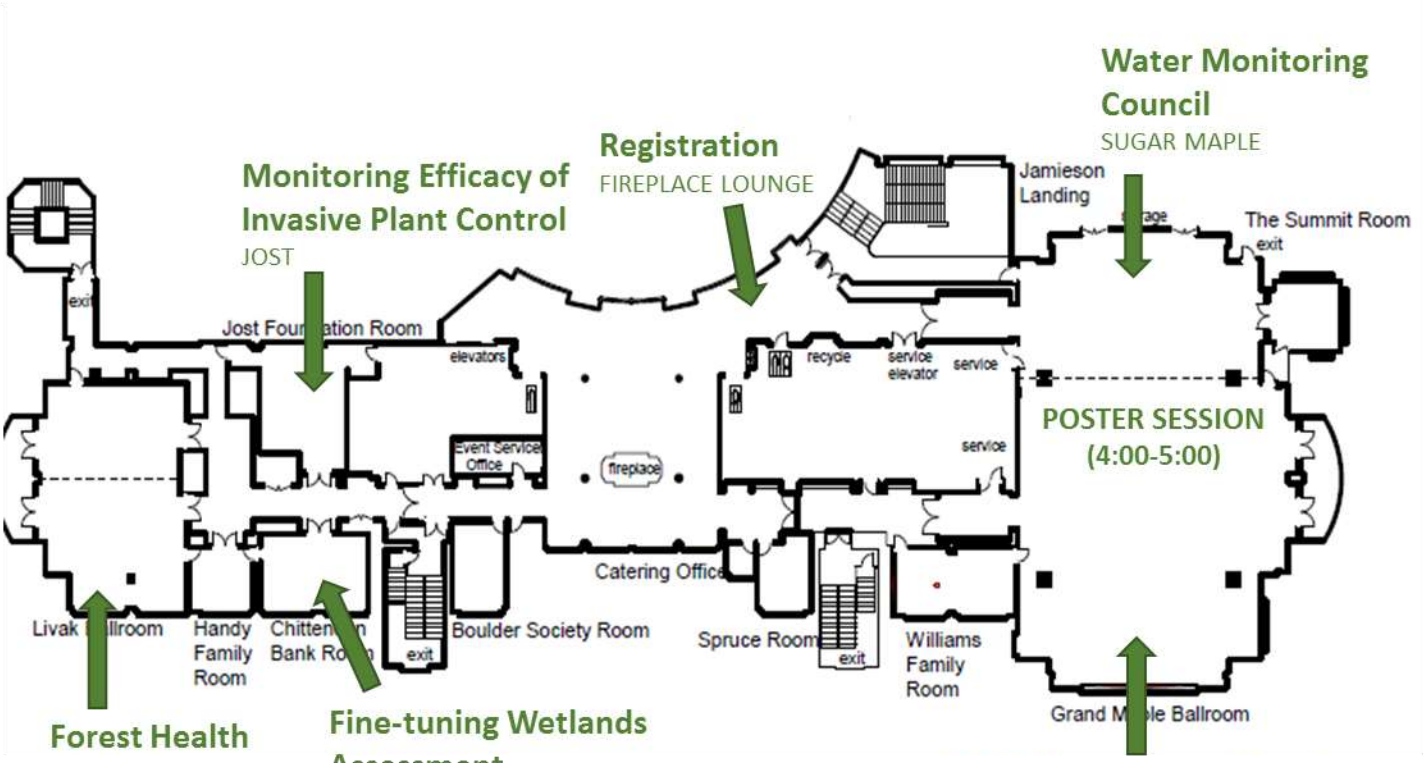


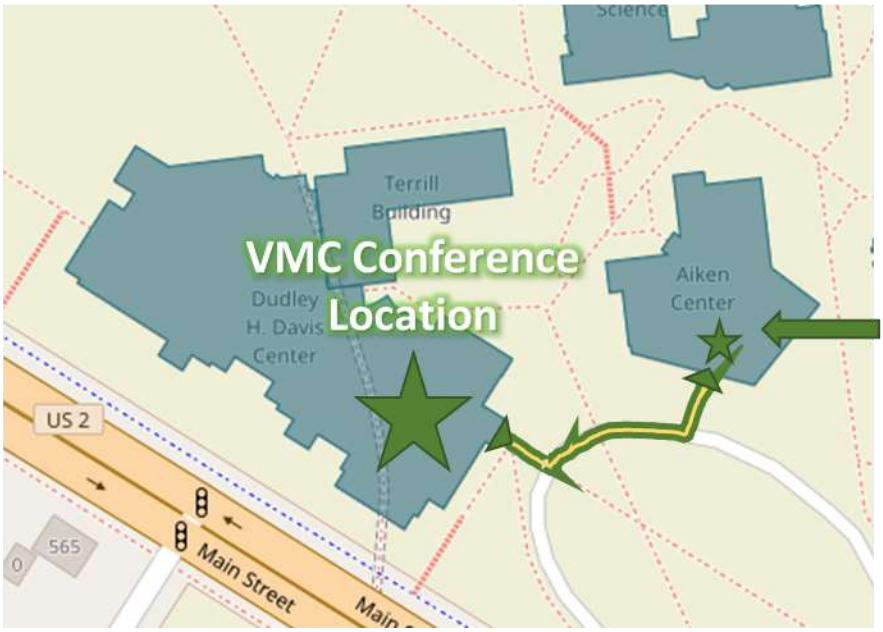
Room Assignments for Contributed Talks Session 2

1:00 – 2:20



Room Assignments for Working Groups and Poster Session
2:30 – 5:00





GIS Tool for Assessing Nitrogen Deposition Risk
AIKEN 101
Walk in the door, go down the stairs, turn left and go to computer lab on your left