Newsletter

Vermont Monitoring Cooperative

Vermont's Cooperative Forest Ecosystem Monitoring & Research Program

Fall-Winter 2010-11 Volume 14 Issue 1

VMC Update

The essence of the VMC's mission guides both the long-term vision and day to day activities of our organization. That mission is "to provide the information needed to understand, manage, and protect Vermont's forested ecosystems within a changing global environment." We seek to ensure that data trends implying major change in Vermont forest ecosystem health are readily available to scientists, managers and the public. Clear communication and readily available datasets are central to our success. Vermont-alertness can be achieved if the many of us who care deeply about conservation are observant and can confidently and readily share with others what we see.

Wes Jackson of the Lands Institute in Salinas, Kansas is a national spokesperson on the importance of protecting soil and a proponent of humanity becoming more dependent on perennial agriculture in order to have healthy and productive soil resources into the future. When visiting Burlington, he pleaded with us to have more "eyes" focused on and watching out for the land for the benefit of posterity.

Forests are remarkable ecosystems dominated by perennial vegetation that Vermonters appreciate for its aesthetics, wildlife habitat, wood products, and other critical ecosystem services such as cleaning our water and air. The Vermont Monitoring Cooperative is a voluntary group of people who collectively are very knowledgeable about Vermont forest ecosystems. The VMC promotes sharing observations, information and ideas about trends in the health of forest ecosystems and environmental factors that can affect forest health.

We are grappling with determining and assessing the best indicators of forest health that will adequately guide management and policy in the future. The time scale of interest or concern about change is reflected in part by the ecosystem component being considered. For example, Wes Jackson's articulate and passionate warnings about the need to stop topsoil erosion are immediate as well as longer term in major grain-producing regions. Topsoil losses can be highly visible and have large impacts on aquatic ecosystems besides devastating highly productive croplands.

What about the forest soils of Vermont…how much do we really know about annual and decade or longer changes of the soils in response to environmental changes occurring at the global or continental scale? Are there unseen changes occurring that threatened the health and productivity of our forests systems and will cause these forests to be less supportive of the physical and psychic well-being of future human generations? Are soil changes, together with changes in climate, threatening the populations of other species in our forests. Are today's extremely valuable urban forest and wilder forested ecosystems thriving and can these important parts of our communities adapt to current and projected environmental change?

Vermont forests provide us so much value and pleasure that we need to be highly attentive to and thoughtful about their long-term health. The Vermont Monitoring Cooperative supports continuous communication and information exchange among forest scientists and managers. We believe that this information network is much stronger with the inclusion of all our citizens. Thank you for checking into this website. Please visit us often and let us know what you see happening in the forests, your hopes for this spectacular 70% of our State, and any concerns that you may have.

—Lawrence Forcier, VMC Principal Investigator

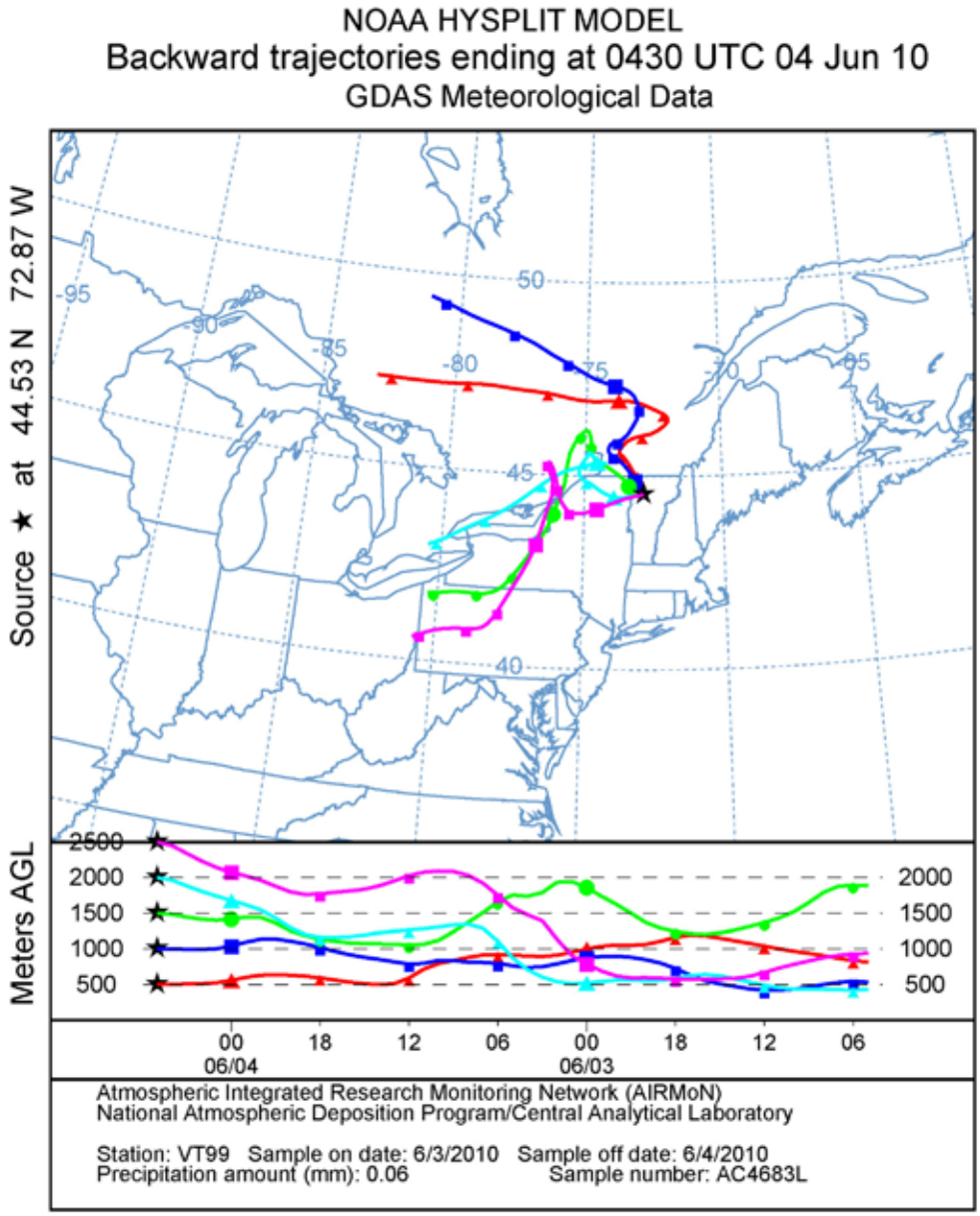
INSIDE THIS ISSUE:

Back Trajectories Now Available for Event-based Precipitation Samples

Miriam Pendleton, VMC Field and Program Technician

The Atmospheric Integrated Research Monitoring Network (AIRMoN) has a new feature on-line. Using the NOAA HYSPLIT Model, AIRMoN is producing back-trajectories for each AIRMoN precipitation sample collected at its seven sites. The VMC's air quality site located at the Proctor Maple Research Center in Underhill has participated in the AIRMoN network since its inception in 1992. AIRMoN samples are collected within 24 hours of a precipitation event so the temporal resolution is quite fine, making identifying sources of pollution remarkably accurate.

Starting at a particular site at the midpoint of a precipitation event, five different altitudes are traced back in time 48 hours. The starting altitudes in the atmosphere are 500m, 1000m, 1500m, 2000m, and 2500m. By the end of the back-trajectory, those altitudes will be different as each air current is traced backwards. The figure shows the complexity of some weather systems that are sampled in Underhill, but all five tracks contribute to the sample. The trajectories will be archived online at:
http://nadp.isws.illinois.edu/dl/clehmann/NOAA/Trajectories/



Getting to Know Our VMC Steering and Advisory Committee Members

Miriam Pendleton, VMC Field and Program Technician

Beginning with this issue of the VMC newsletter, we are initiating a new series in which members of our Advisory and Steering Committees will answer questions posed to them by the VMC staff. We hope this new feature provides insight on what the Cooperative does well and where our committee members think VMC should focus its efforts to best accomplish our mission and keep VMC relevant to Vermonters and others into the future.

In the current issue, we are starting with Ed O'Leary, Director of Operations at the Vermont Department of Forests, Parks and Recreation, and Rich Poirot, Air Quality Planner at the Vermont Department of Environmental Conservation, Air Pollution Control Division. Ed is the Chair of the VMC Steering Committee and works to promote stewardship of the land by getting people engaged in outdoor recreation. Rich has been involved in VMC from the start of the organization and oversaw some of the earliest acid precipitation monitoring programs running at our Underhill, Vermont monitoring site. We hope that everyone finds this series interesting and informative.

–The VMC Staff

Questions for Ed O'Leary:

How has environmental monitoring influenced or been tied to your view toward forest health and ecosystem sustainability?

It is essential, to me, to conduct an assessment of and continue the monitoring of the health of the ecosystems we manage, in order to properly carry out our stewardship responsibilities. Maintaining forest health is vital in order to manage these natural resources in a sustainable manner. Without a proper baseline and periodic assessment of forest health conditions, management can't be successfully carried out.

What is most important to you with respect to forest health monitoring in Vermont at this time?

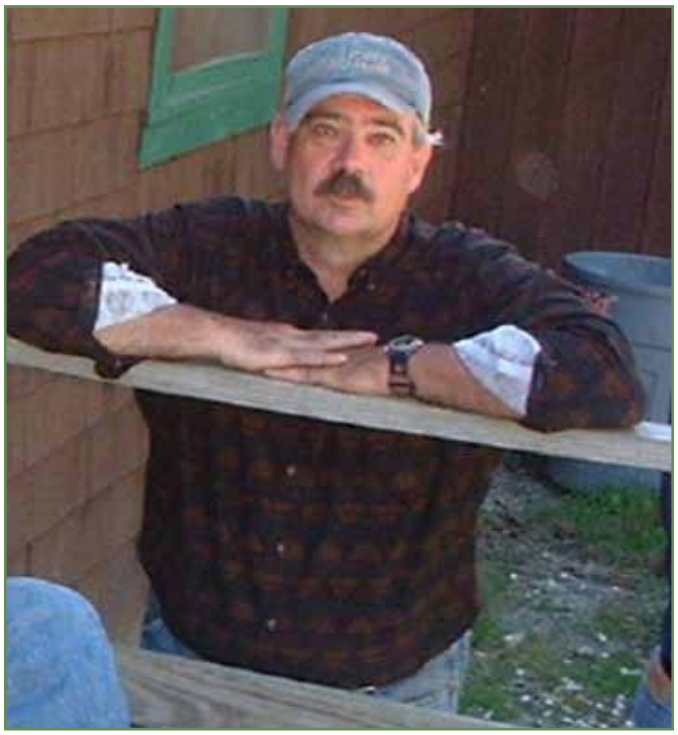
We need to be constantly vigilant with regard to the introduction of exotic invasive insect species such as Emerald Ash Borer and Asian Long-horned Beetle, which are currently not present in Vermont. We need to have an action plan in place as to what will be done should these insects arrive. We also need to acquire and possess the proper knowledge and tools needed to deal with those exotic invasive insect species that are already here in Vermont, which can, if left unchecked, have a significant detrimental impact on our forest resource. In addition, we need to formulate appropriate strategies to deal with currently present exotic invasive plant species, such as Oriental Bittersweet, Honeysuckle and Japanese Knotweed, to name a few, which are currently presenting major obstacles in sustainable management of some forested regions of Vermont.

How do you perceive VMC's potential and ideal impact on environmental research related to Vermont forests?

VMC possesses the potential to be the primary clearinghouse for state-of-the-art information and science on environmental monitoring in Vermont. Used effectively, it can provide significant positive benefits to the sustainable management of Vermont's forests.

How does VMC need to evolve or change to remain poised to address future forest health and other environmental issues?

As long as VMC recognizes that environmental threats to Vermont's forests have changed in the past and will continue to change, it can successfully remain poised to address future forest health issues. Constantly supporting new research, gathering and compiling the latest scientific data, and making it readily available to the active managers of Vermont's forest, will go far in providing a vitally important and necessary support system for sound natural resource management in the state.



Ed O'Leary, Director of Operations at Vermont Department of Forests, Parks and Recreation and Chair of VMC Steering Committee.

Getting to Know Our VMC Committee Members, continued

Questions for Rich Poirot:

What is the most interesting meteorological/atmospheric event or trend change that you have witnessed during your professional career?

When I started working for the Vermont DEC in the mid 1970s, atmospheric sulfur dioxide emissions in the US were at an all-time high of over 30 million tons per year. A large portion of those emissions came from the tall stacks of coal burning power plants in the Midwest which were often directly upwind of Vermont. Over the past 35 years, those upwind sulfur emissions have been cut by nearly 2/3, along with smaller but significant reductions of upwind nitrogen oxide emissions. VMC-related monitoring data have shown corresponding reductions in the ambient air concentrations of sulfur and nitrogen oxides, sulfate and nitrate particles (that cause health effects and regional haze), ozone pollution (caused in part by nitrogen oxides), sulfuric and nitric acids in precipitation, and in the acidity content of some Vermont lakes and streams, as well as in the severity and extent of ozone damage to sensitive forest tree species. This has been a remarkable (partial) success story, as substantial progress has been observed, but additional emissions reductions are needed to protect ozone-sensitive and acid-sensitive species in Vermont's forested and aquatic ecosystems. The Interstate Transport Rule, recently proposed by EPA, should make a good start on reducing future upwind sulfur and nitrogen emissions, and continued air quality, deposition and environmental monitoring by the VMC will be critical to tracking and refining the needed future emissions reductions.

Can you give examples of VMC data that have had an impact on environmental policy, legislation, or regulation?

In the early 1990s, a power company called Interpower proposed building a coal-fired power plant and cogeneration facility in Halfmoon, New York, about 50 kilometers upwind of the Lye Brook Wilderness Area. A number of VMC partners, including the Green Mountain National Forest, UVM, U. Mass, ANR Water Quality, Air Quality, and Forest and Parks participated in or provided data and technical analyses that were used in the permit review process. The Forest Service, with help from other VMC cooperators, successfully argued that the proposed new source would need to obtain emissions "offsets" – reducing sulfur emissions from another nearby source by more than it would have emitted – as a condition of its permit to operate, so that it would not increase the acidification of sensitive aquatic ecosystems in the Wilderness Area.

Years later, forest, water, air and deposition data and analyses provided by the same VMC cooperators contributed to a successful multibillion dollar law suit filed by EPA, Vermont and 7 other states against several older, uncontrolled Midwestern coal burning power plants operated by American Electric Power Company (AEP). In the 2007 settlement agreement, AEP agreed to spend nearly $5 billion upgrading its pollution controls for sulfur and nitrogen oxides, with additional funding of other environmental improvement measures. In Vermont, some of the AEP settlement funds are being used to support community climate change planning activities, and on buyback incentives to replace inefficient diesel generators and outdoor wood-fired boilers.

What are the most important uses that you see for environmental monitoring data?

Climate change is likely to be the overarching environmental issue for the foreseeable future. VMC monitoring data, establishing baseline conditions for so many different components of Vermont's forest and aquatic ecosystems over the past several decades, will be critically important to detect, understand, and develop forest management strategies to mitigate or adapt to changing climate conditions and associated interactions with other environmental stressors.

Rich Poirot, Air Quality Planner at the Vermont Department of Environmental Conservation, Air Pollution Control Division and original member of the VMC Advisory Committee.

Program from October 2010 VMC Annual Meeting

Welcome and Introductory Remarks
Lawrence Forcier, Principal Investigator, Vermont Monitoring Cooperative

Forest Ecological Integrity: A Flexible Framework for Assessing Ecosystem Health
Brian Mitchell, Program Manager, The Northeast Temperate Network, National Park Service

The Mount Mansfield Paired Watershed Study and the Value of Long-term Monitoring
Jamie Shanley, Research Hydrologist, U.S. Geological Survey

Bird Nerds on the Mountain: 20 Years of Bird Monitoring and Demographic Research on Mt. Mansfield
Steve Faccio, Conservation Biologist, Vermont Center for Ecostudies

Twenty Years of Amphibian and Reptile Monitoring in Vermont at Mt. Mansfield, Lye Brook, and Statewide
James Andrews, Coordinator of the Vermont Reptile and Amphibian Atlas, Vermont Family Forests

Panel: *Contemporary and Future Concerns about Forest Ecosystems*
Adrienne Wojciechowski, Senior Policy Advisor, Senator Patrick Leahy's Washington, DC Office
Michael Bohne, Forest Health Group Leader, State and Private Forestry, U.S. Forest Service
Barbara Burns, State Forest Health Coordinator, Vermont Department of Forests, Parks and Recreation
Jamey Fidel, Forest and Biodiversity Program Director, Vermont Natural Resources Council
Eric Sorenson, Community Ecologist, Vermont Fish & Wildlife Department
Moderated by Kimberly Wallin, Research Assistant Professor, University of Vermont

Posters

Mercury Bioaccumulation and Trophic Transfer in the Terrestrial Food Web of a Montane Forest
C.C. Rimmer, E.K. Miller, K.P. McFarland, R.J. Taylor, and S.D. Faccio
Vermont Center for Ecostudies, Ecosystems Research Group Ltd, and Texas A&M University

Wind Channeling in the Champlain Valley: An Examination of the Lake Champlain 2009 Halloween Gale
J.M Goff, National Weather Service in Burlington, Vermont

Increased Tree Mortality in Vermont
S. Wilmot, R. DeGeus, Vermont Forestry Division, and R. Morin, U.S. Forest Service Northern Research Station

Ground Truthing Environmental Analyses with Long-term Flow Monitoring:
An Example from the Mt. Mansfield Paried Watershed Study
B. Wemple, University of Vermont, and J. Shanley, U.S. Geological Survey

2010 Research and Monitoring Projects on the Green Mountain National Forest
M.B. Dewey, U.S. Forest Service, Green Mountain & Finger Lakes National Forests

For presentations, contact information and project data, please visit our website at http://www.uvm.edu/vmc/

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Reminder to Cooperators:

Researchers conducting work in 2011 on state or federal land or at VMC study sites must update their study site permit and project description with VMC. Any changes should be sent to Carl Waite at cwaite@uvm.edu. In addition, if your research is located on the Green Mountain National Forest, please contact VMC and Brian Keel, Research and Monitoring Coordinator of the GMNF, at (802) 362-2307 ext 214 or bkeel@fs.fed.us.

If an existing project remains active and unchanged, please confirm your status with VMC to ensure your study site permit remains active. If you need a copy of your study site application on file, please let us know.

Thank you!

For more information about VMC, please visit our website at http://www.uvm.edu/vmc.

VMC Main Office: 705 Spear Street, South Burlington, VT 05403
Phone: (802) 656-0683 • Facsimile: (802) 656-8683

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705 Spear Street
South Burlington, VT 05403