Newsletter
Vermont Monitoring Cooperative
Vermont's Cooperative Forest Ecosystem Monitoring & Research Program

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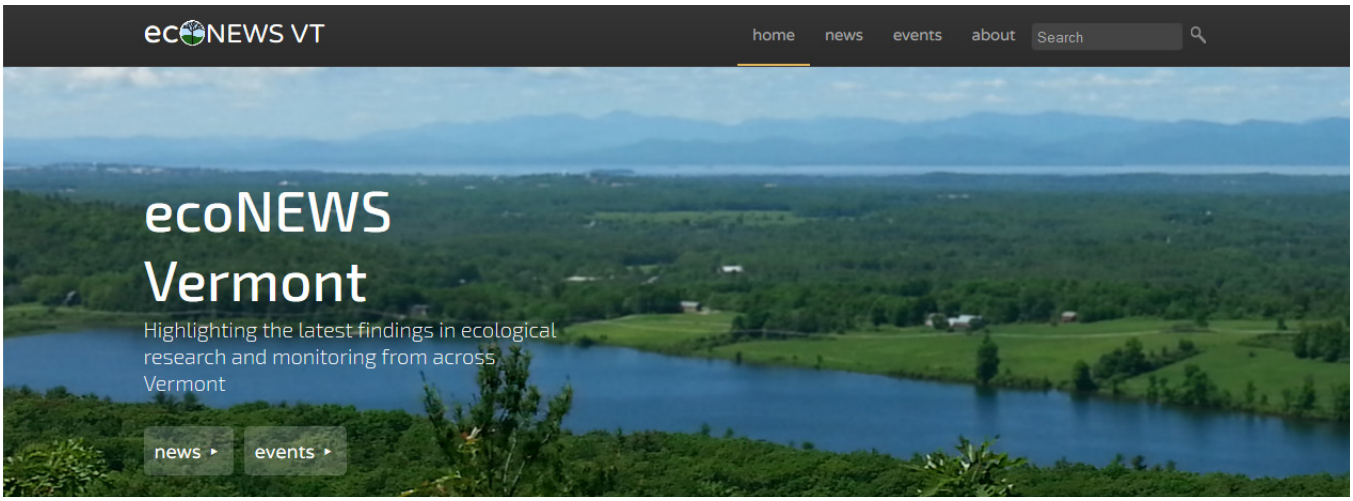
Introducing ecoNews VT!



The ecoNEWS VT website will carry research findings and news from VMC and other collaborators.

This is the final edition of our stand-alone VMC newsletter before the release of **ecoNEWS VT**, an exciting new web publication that will report on all kinds of topics of interest to VMC cooperators and other like-minded folks. It's in keeping with the collaborative nature of the VMC to be part of this new outlet for environmental news which seeks to gather and report on new research and monitoring around Vermont. Staff have been hard at work building a new website and working with our partners to develop initial content for the newsletter. Articles will include summaries of technical reports, research highlights, upcoming events, and rapid communications of new research and monitoring findings from around the state. Content will be regularly added to a new **ecoNEWS VT** website, and a quarterly e-mail of highlights will be sent to all subscribers.

Along with the VMC, other **ecoNEWS VT** collaborators are Lake Champlain Sea Grant, the Vermont Water Resources and Lake Studies Center, the Northeastern States Research Cooperative, Vermont Cooperative Fish and Wildlife Unit, the Rubenstein School of Environment and Natural Resources, and the Rubenstein Ecosystem Science Laboratory. The goal is to help these organizations get the most up-to-date information out to people who can use it in their fields, be it a political staffer giving policy advice, a State Agency of Natural Resources employee, a municipal worker charged with managing stormwater, a volunteer on a town conservation commission, or a classroom teacher – really anyone whose informed decision contributes to a better outcome for Vermont's ecosystems.

If you currently receive the VMC Newsletter and would like to begin receiving **ecoNEWS VT**, please go to http://www.econewsvt.org/about/subscribe to sign up. If you participate in one or more of the partner organizations and would like to submit material to the publication, your organization should have a point person to direct your information to Elissa Schuett (elissa.schuett@uvm.edu) of Lake Champlain Sea Grant and the Vermont Water Center. Elissa will work with you to summarize your material and publish the summary with links to your research or event on the **ecoNEWS VT** website.

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INSIDE THIS ISSUE:

Happy Trails, Tom Simmons, Long-time VMC Cooperator

VMC Staff

Long-time VMC cooperator Tom Simmons along with Gary Sawyer, both of the Vermont Department of Forests, Parks & Recreation (FPR), were honored at a retirement party on June 11, 2014. The celebration was held, appropriately, at Underhill State Park on Mount Mansfield, where Gary had practiced forest stewardship and Tom had assessed monitoring plots for a number of VMC projects over many years. It was a raw and rainy evening, but spirits were not dampened; the planned barbeque went ahead and many people attended with delicious food to share. FPR Commissioner Mike Snyder and Director of Forests Steve Sinclair spoke admiringly of both honorees whose combined careers total more than 77 years of service! Congratulations to both of these dedicated forest professionals.

In particular, Tom, in his role as a Forestry Specialist, has been instrumental in many VMC projects and is one of our original cooperators. The VMC database lists Tom on 16 projects, officially, but he helped out on many more. Whether it was drilling holes in the soil with a euphemistically named "hand held" motorized post-hole digger for the base of the Forest Canopy Research Tower or hauling bulky or heavy items up Mount Mansfield to set up various monitoring/research plots , Tom always lent a hand.

Tom Simmons measures tree diameter in forest monitoring plot.

One of his signature data-sets, from a long-term monitoring perspective, is the nearly 25 year record of phenology data that Tom collected. According to Wikipedia, "Phenology is the study of periodic plant and animal life cycle events and how these are influenced by seasonal and interannual variations in climate, as well as habitat factors (such as elevation)….." Tom collected detailed information on bud break and leaf out in the spring, followed by fall color and leaf drop of trees and selected understory species in the fall, creating an invaluable long-term record which initially was used to study the impact of Pear Thrips on sugar maple bud development. These data also helped in understanding how individuals of the same species and different species fared at different elevations and how trees responded to weather events, such as early fall or late spring frosts.

VMC Projects on Which Tom Cooperated

Birch condition survey

Forest Health Monitoring: North American Maple Project

Forest Health Monitoring: Seasonal variation in crown ratings

Forest Inventory of the Ecosystem Management Demonstration Project area: Understory vegetation list

Forest Inventory of the Ecosystem Management Demonstration Project area: Revised FOREX

Forest Inventory of the Ecosystem Management Demonstration Project area: Tree health

Leaf and Twig Survey: Leaf and twig damage survey

Leaf and Twig Survey: Leaf and twig size

Ozone Bioindicator Plant Monitoring

Tree Phenology Monitoring: Bud development

Tree Phenology Monitoring: Fall color and leaf drop

Tree Phenology Monitoring: Understory plant phenology

Forest Pest Monitoring: Forest Tent Caterpillar

Spruce Budworm and Hemlock Looper Monitoring

Forest Pest Monitoring: Gypsy Moth Monitoring

Forest Pest Monitoring: Pear Thrips Monitoring

"[Tom] has made major contributions to long term monitoring of forest health in the state. His dedication to monitoring has allowed us to maintain nearly 25 years of tree phenology monitoring at Mount Mansfield, establishment of forest health monitoring plots on Mansfield and in the Lye Brook Wilderness Area, pest monitoring, aerial detection surveys, soil sampling, ozone bioindicator plant surveys, and before the Vermont Monitoring Cooperative began, he was active in the national lilac phenology monitoring program."

-Sandy Wilmot, VT Forest Health Specialist

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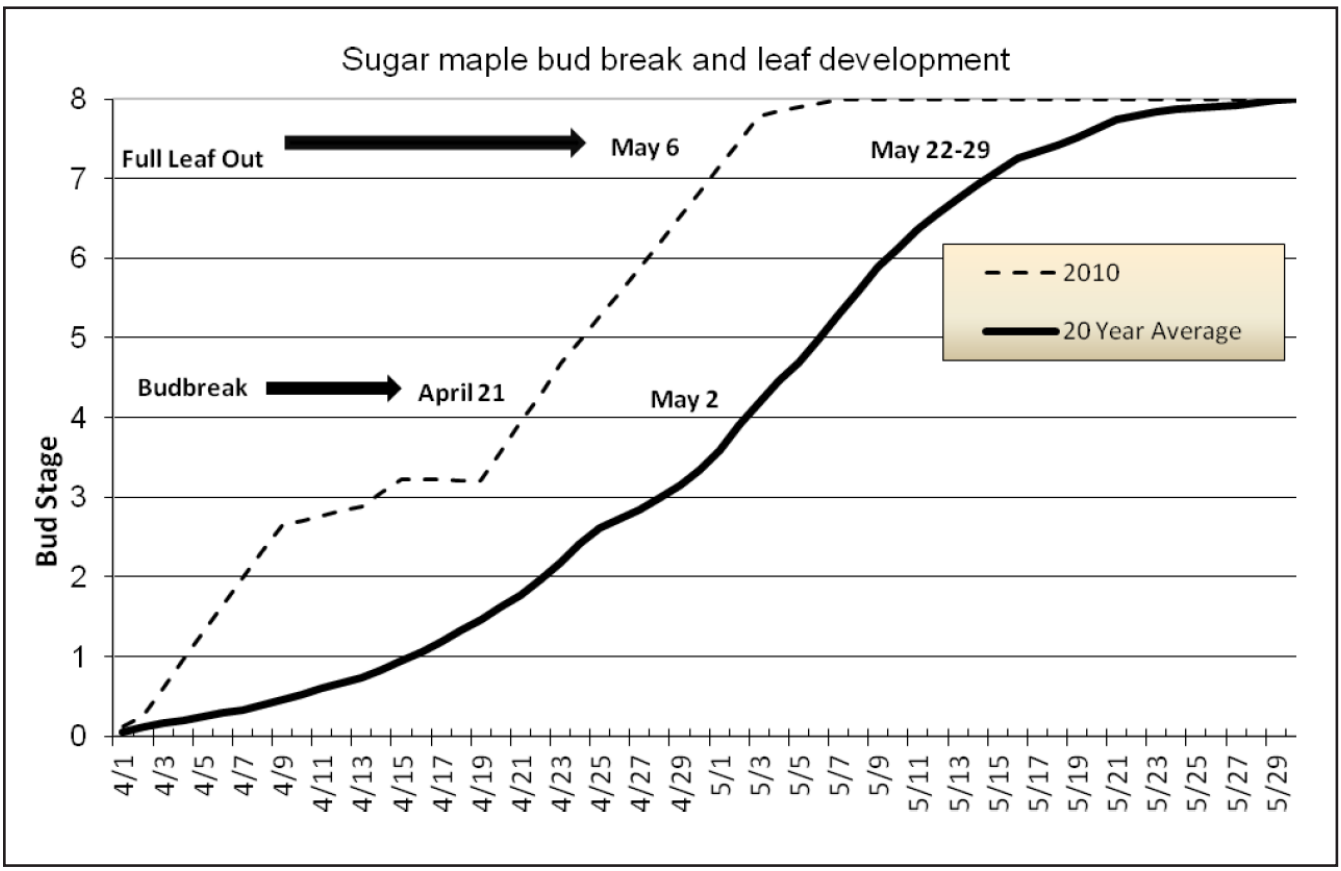
Tom Simmons *continued from Page 2*

At the inception of this project, the data were gathered to get baseline information on fundamental tree processes with respect to weather phenomena and insect pest activity and tree stress-response. More recently, this data-set illustrates how climate change is influencing tree physiology with bud break happening earlier and fall senescence occurring later over recent years. Having the elevational gradient will enable researchers to see if regeneration or species ranges are influenced. A record of this length can begin to show trends despite the "noise" of yearly variability. Tom's phenology monitoring record is an example of the foundation on which research is based, and having 25 years of meticulously collected information is priceless.

Tom is an indicator of sorts at the Proctor Maple Research Center where some of his phenology subjects grow. With his first appearance in early spring, spotting scope and clipboard in hand, it was a sure bet that sugaring season was soon to end. We wonder who will be next season's harbinger of spring.

Tom, all of your friends and colleagues at the VMC want to thank you for 25 years of dedicated service and wish you a long, happy, and rewarding retirement. "Happy Trails!"

Retirement party for long-time VMC cooperator Tom Simmons (center in white jacket) of the Vermont Department of Forests, Parks and Recreation.



Sugar maple trees are monitored for the timing of bud break and leaf out in the spring at the Proctor Maple Research Center as part of the Vermont Monitoring Cooperative. In 2010, bud break was 11 days earlier than the 20 year average and full leaf out was about 16 days earlier.

VMC Launches State-Wide Forest Health Monitoring Plots

Jennifer Pontius and Miriam Pendleton

Forests across the region are dealing with chronic stressors such as climate change, extreme weather events, and acid deposition, along with potential new threats posed by exotic invasives such as the hemlock woolly adelgid and emerald ash borer. For decades the VMC collaborative has worked to monitor these stressors and detect any changes or patterns in forest condition. However, input from VMC's Advisory and Steering Committees indicated that current efforts may not meet the geographic and temporal detail necessary to represent forests across the state with sufficient sensitivity to effectively inform management activities. To this end, VMC collaborators from UVM, VTFPR and USFS State and Private Forestry and Northern Research Station, spearheaded by Sandy Wilmot, Barbara Burns, and Jen Pontius worked to develop an expanded field network for enhanced forest health monitoring across Vermont.

Student Intern Ellen Loftis takes forest plot measurement.

This new network will provide information on current conditions and will monitor long-term trends and yearly variability in forest productivity, crown condition, canopy structure, species demographics, invasive species distributions, mortality, and regeneration patterns. The goal is to provide a more comprehensive, annual assessment of forest structure, function, and condition that can be linked to biotic stresses (such as insect pests or invasive plant species) and abiotic stresses (drought or severe weather or the chronic impact of climate change). In addition to a more intensive picture of annual changes, this information will also contribute ground truth data for accuracy assessments for Aerial Detection Surveys and satellite assessments of forest condition.

When fully implemented, the network will consist of over 50 intensive monitoring plots around Vermont, at paired locations with historical forest health data (e.g. USFS Forest Inventory and Analysis Phase 3 plots, VTFPR Hardwood Health plots, VMC intensive plots at Mt. Mansfield and Lye Brook) representing all major forest types and species found in Vermont. VMC has three interns who will be establishing and measuring the new forest health plots beginning in July, along with a new PhD student, David Gudex-Cross who will compare measurements and methods between the new, expanded plot network and other existing assessments of forest health across the state. This crew has already trained with FPR staff to learn the proper protocols for data collection and measurements and has been working with FPR staff to measure the long-term Mt. Mansfield plots before striking out on their own to establish and measure new plots.

Graduate student David Gudex-Cross and Student Intern Justin Sackel take forest plot measurements.

Analyses of yearly measurements of forest productivity, health, structure, and function can track subtle changes in forest productivity, condition, and demographics over time. Linked to other environmental data sets for climate, acid deposition, and landscape characteristics, this data will aid in understanding how biotic and abiotic stressors can affect forest health and can also help detect patterns where forests are most sensitive to decline. Such information is required to better understand how forests are changing, but also to model potential changes to forest structure and function into the future.

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Strategic Planning for VMC

VMC Staff

The Vermont Monitoring Cooperative (VMC) has conducted environmental monitoring for over two decades. In 2014, our Steering Committee decided VMC should revisit its mission statement and core goals to ensure that both are relevant and applicable to mitigating future threats and meeting challenges facing Vermont's forested landscapes.

> ***"The VMC mission is to serve Vermont through improved understanding of long-term trends, annual conditions and interdisciplinary relationships of the physical, chemical, and biological components of forested ecosystems in Vermont. The VMC facilitates the collection of environmental data and provides to Vermonters and others the information needed to understand, protect, and manage forested ecosystems within a changing global environment."***

The VMC partnership grew out of a concern about acid precipitation and its effects on forest health, but are we poised to address future threats and challenges? This was the question posed by our Steering Committee, and at their behest, a strategic planning meeting was held June 5 at the Aiken Forestry Sciences Lab on Spear Street. Leaders and representatives from our partnering organizations gathered to discuss VMC's future direction and priorities. We are grateful that busy people made time in their schedules to participate in this meeting.

Much of the meeting dealt with how VMC can expand its work as the nexus for the ecosystem monitoring, research, and management professional community. By identifying gaps in the current VMC work program, expanding collaboration and networking opportunities, and aligning our efforts to better serve missions of our partner agencies and stakeholders, the Committee proposed several new avenues for VMC to explore.

Questions that were asked and answered included: Who uses our data? How can we expand our visibility beyond our own cooperators and local audience to forestry professionals, other ecosystem researchers, and management professionals at regional and national levels? The VMC database has information from soils to atmosphere waiting to be mined and synthesized. How can we capitalize on this?

The information and advice gathered from these exercises will help guide the VMC for the next five years, but we will be checking along the way to determine how well we are doing with respect to these new goals and objectives. The VMC staff will incorporate these ideas from the strategic planning meeting into this plan to guide our future efforts.

Through an on-line survey, VMC is also soliciting ideas from our cooperators and others who work with VMC and the data we maintain. The survey will ask respondents to provide basic demographic information, prioritize objectives, rank activities, and supply additional ideas and information that they feel are important. To participate in the survey please visit http://www.uvm.edu/vmc/strategic-planning-survey/. With this input, the VMC can better meet the needs of researchers, ecosystem professionals, and policy makers who in turn can make informed decisions for the public good.

Forest Health Monitoring Plots

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In addition to statistical analyses on field data, measurements of defoliation and dieback will be used to conduct a rigorous accuracy assessment of both aerial insect and disease detection surveys and various remote sensing satellite data products and national insect and disease risk maps. Comparison of yearly assessments from this plot network to other field and remote sensing forest health data can highlight the strengths and weaknesses of various assessment methods and inform how such efforts can be used to direct management and policy decisions.

Data will be processed and made available through the VMC online database so that other land managers and researchers can find connections between forest health, ecosystem function, and the ecosystem services provided to the citizens of Vermont.

Plot structure follows USFS Forest Inventory and Analysis design, with 4 24-foot sub-plots located at each full plot. Parameters measured at each sub-plot include:

For all trees greater than 5cm DBH:

- Species
- DBH (diameter at breast height)
- Tree height
- Canopy position (Forest Health Monitoring protocol
- Vigor rating (North American Maple Project protocol)
- Crown dieback (FHM protocol)
- Uncompacted Live Crown Ratio (FHM protocol)
- Foliage transparency (FHM protocol)
- Digital Canopy Transparency
- Defoliation class (NAMP protocol)
- Special damages (VT FHM protocol)
- Yearly increment growth

Additional metrics for each plot:

- Hemispherical photos to quantify leaf area index, gap fraction and plot canopy transparency.
- Non-native invasive plant abundance (VT NAMP protocol)
- Browse presence/absence (VT NAMP protocol)

Measurements on a 6-foot radius micro-plot:

- Total seedling (height < 1m) counts by species
- Sapling species, counts and DBH

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Of course, you can always send your news to VMC at vmc@uvm.edu. We'd love to hear about what you're up to! Jim Duncan of the VMC is developing the website and will provide technical support. So be sure to look for VMC news and reports from our dedicated cooperators in the first installment of **ecoNEWS VT** this fall!

Reminder to Cooperators

Researchers conducting work in 2014 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 or (802) 656-0683. In addition, if your research is located on the Green Mountain National Forest, please contact VMC and Melissa Reichert, at mmreichert@fs.fed.us or (802) 747-6754.

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.

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Vermont Monitoring Cooperative | The University of Vermont | USDA Forest Service | Vermont Agency of Natural Resources