

Andrews Forest NEWSLETTER

Issue 5

Fall 2008

NSF Support for Long-Term Research at the Andrews Forest

The Andrews Forest LTER program was just granted its sixth cycle of six-year funding from the National Science Foundation (NSF). Coined “LTER6,” the proposed research maintains continuity of existing long-term experiments and measurement programs and establishes three major goals that build on the data and understanding we have developed over previous decades of study.

One of the goals of LTER6 is to project likely ecosystem responses to a changing environment. We will make a special effort to understand how regional-scale changes in climate might affect ecosystem processes at the local level.

Mountains define our landscape, and during LTER5 we learned that microclimate patterns and processes in this complex terrain are more complicated than previously thought. These complexities influence ways that biodiversity, hydrology, and carbon and nutrient cycling respond to ecosystem drivers. A second goal of LTER6, therefore, is to understand the influences of complex terrain on multiple, interacting ecosystem processes. We will examine, for example, the interdependence of leaf budding, insect emergence, and arrival and nesting of migratory birds and how these biological cycles are affected by climate variations.

The third goal of LTER6 is to connect human systems with ecological systems. With the overall goal of intensifying connections of our program with society and the social sciences, we will consider relationships between ecosystem change and social change, as mediated by ecosystem services such as water supply and water quality, carbon sequestration, fuel, and fiber.

Canopy Connections

Canopy Connections brings students into the canopy of the old-growth forest. Under the guidance of professional tree climbers, students ascend several stories into an old-growth canopy using specialized climbing gear and rope. While settled in “treeboats” high up in the canopy, students engage in creative writing, art, science inquiry projects, and quiet observation time. The program is designed to provide a transformational experience and to help students appreciate the outdoor world as well as their own capabilities.

A pilot program in Spring 2008 enabled three eighth-grade classes to ascend into designated climbing trees near the Andrews Forest headquarters.

The program has gained media attention: student climbers were featured in local newspapers and were filmed for television’s *Discovery*.

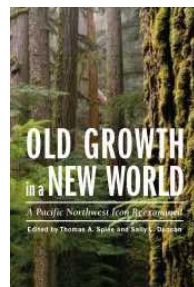
Canopy Connections is a partnership between the H.J. Andrews Experimental Forest, the Environmental Leadership Program at the University of Oregon, and the Pacific Tree Climbing Institute.



Students from the McKenzie school district participate in Canopy Connections. Photo by Chris Pietsch/The Register-Guard.

Funding for the program is provided by donations to the Andrews Forest Fund. Additional donations would allow the program to continue in the future (see Page 4 for more details on the Andrews Forest Fund).

“Old Growth in a New World”



The deep roots of Andrews Forest old-growth science are tapped in the new book *Old Growth in a New World: A Pacific Northwest Icon Reexamined* edited by Tom Spies and Sally Duncan and published by Island Press in fall of 2008. This is a collection of 27 essays authored from many points of view—ecologists, social scientists, environmentalists, forest industry folks, a philosopher. The writers look back over the last few decades at the place of old growth in society and look forward to what might be the societal place of old growth in coming decades.



HJ ANDREWS EXPERIMENTAL FOREST

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The H.J. Andrews Experimental Forest Where Ecosystems Are Revealed

The H.J. Andrews Experimental Forest is the hub of a cooperative program of research, education, and research-management partnership involving Oregon State University and the USDA Forest Service's Pacific Northwest Research Station and Willamette National Forest. The mission of this partnership is to support basic and applied research concerning forests, streams, and watersheds, and to foster strong collaboration among ecosystem science, education, natural resource management, and the humanities.



Letter from the Leadership

Most readers of this newsletter already know that the H.J. Andrews Experimental Forest is part of a nation-wide network of Long Term Ecological Research (LTER) sites. The National Science Foundation provides funding for LTER programs in six-year cycles. Towards the end of each grant cycle a site must prepare and submit a detailed proposal that outlines their plans for the next cycle. The Andrews LTER program submitted a proposal for its sixth cycle (affectionately known as "LTER6") last February. LTER proposals are reviewed rigorously, and continued funding is not guaranteed! We were very happy to learn that the reviews of our proposal were unanimously positive and that our site was granted six more years of funding.

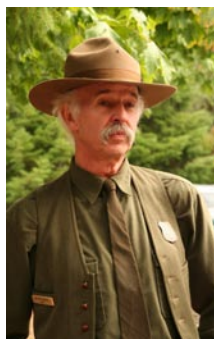


The central mission of all LTER sites, as their name implies, is to study the dynamics and changes in ecosystems over long time periods. Many of the long-term experiments and measurements at the Andrews Forest (paired-watershed experiments, for example) have been in place for half a century, and some of them (including tree growth and mortality) have been in place for nearly a century. The data from these long-term studies become increasingly valuable the longer they are continued, so one priority of our LTER6 work is to maintain continuity of the long-term experiments and measurement programs. The LTER6 proposal also outlines new research programs and substantial improvements to our cyberinfrastructure (connecting data, computers, and people to enable scientific inquiry and education). Details on the new research and the important first steps in achieving the LTER6 vision are outlined in this Newsletter.

—Barbara Bond, Lead Principal Investigator of the Andrews Forest LTER, Ruth H. Spaniol Chair, Department of Forest Ecosystems and Society, Oregon State University (photo by Cheryl Hatch/OSU).

60th Anniversary and Centennial Celebration

The September 19 celebration of the Andrews Forest 60th anniversary and the Experimental Forests and Ranges centennial brought together 95 guests: old timers, new comers and many folks in between. Highlights included attendance by Congressional staff who read complimentary letters from Oregon's Senator Wyden and Congressman DeFazio. An afternoon program provided opportunities for visitors to learn about current science, management, and education programs. Gifford Pinchot (enacted by Tony Farque) attended the event and offered



Gifford Pinchot at the Andrews Forest. Photo by Lina DiGregorio

historical perspective and useful comments about the importance of having the public understand and support the work of the Forest Service and scientists, "a challenge in a society increasingly disconnected from the land."

More Dirt on DIRT

Kate Lajtha and Bruce Caldwell (Oregon State University) recently received a National Science Foundation Long-Term Research in Environmental Biology grant to extend their DIRT (Detrital Input and Removal Treatment) experiment for the coming five years (see the Fall 2007 Newsletter). DIRT, started at Andrews Forest in 1997, is a multi-decade experiment that manipulates inputs of organic matter to the forest floor and soil by increasing needle litter inputs, increasing the input of decayed wood, eliminating aboveground litter inputs, eliminating belowground inputs, and eliminating both above- and belowground inputs. This experiment is designed to address questions such as: What controls the long-term storage of carbon in forest soils? Can added inputs of organic litter increase soil carbon storage, or is maximum soil carbon storage determined exclusively by climate and soil mineralogy? By following changes in carbon stored in the soil of DIRT plots over the next few decades, the study will track and interpret carbon stabilization and loss with the different experimental treatments and with climate change.

Physical and Virtual Access to the Forest

A new National Science Foundation grant, titled “Enhancing Physical and Virtual Access to Research and Education at the H.J. Andrews Experimental Forest,” will provide a welcome boost to the research and education capabilities at the Andrews Forest.

The “physical access” component of this proposal comes in the form of a new Tucker Sno-Cat. This will not be the first Sno-Cat at the Andrews—two others were purchased in 1989, and one even before that—but after almost 20 years of use to access climate and stream gaging stations for long-term data collection and to transport researchers and students to high elevation research sites, the old machines are showing their age.

The “virtual access” component of the new proposal will fund the first stage of an ambitious cyberforest vision for the Andrews Forest. Ultimately, the goal is to create a wireless cloud throughout the entire 6,400-ha site. With this “cloud” nestled over the Forest, we envision being able to conduct field classes throughout the site and to provide real-time, two-way video connectivity to students anywhere in the world with internet access. Networks of sensors, such as acoustic sensors used to monitor behavior and population dynamics of birds, will send data wirelessly to Headquarters and over the internet in real time. We also aim to establish a network of towers for wireless communications that connect the Andrews Forest to Oregon State University. The technical capability is alluring, but even more exciting is the enhanced capability to measure, monitor and understand the complex ecosystems at the Andrews Forest and to share with colleagues and students all over the world.



Wireless communications tower being tested at the Andrews Forest. Photo by Adam Kennedy.

Faculty Faces—John Selker



John Selker. Photo by Lina DiGregorio.

John Selker, Professor in the Department of Biological & Ecological Engineering at Oregon State University, has a passion for employing new technologies to further scientific inquiry. Selker pioneered the use of fiber-optic cable distributed temperature sensing (DTS) to measure temperature along lengths of cable over distances of 4+ km with a resolution of 1 meter. In a complex environment like the Andrews Forest the temperature of air, soil, snow, and water can vary dramatically over the landscape. Selker and his team of graduate students are able to track the temperature of flowing stream water, groundwater, and air at a precision of 0.01°C. In September 2007 and June 2008, Selker hosted DTS workshops that drew researchers and industry representatives from across the world. Selker is collaborating with other Andrews Forest researchers to better understand cold air drainage, energy budgets, surface and groundwater interactions, and biogeochemical processes in small watersheds.

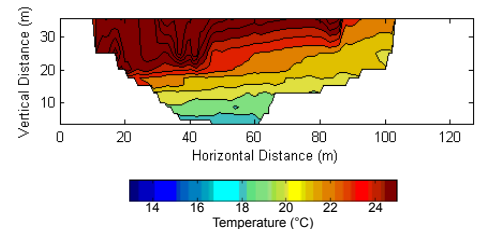


Photo: Workshop participants employ DTS cables in Watershed 1 at the Andrews Forest. Photo by Lina DiGregorio. Figure: Air temperature in a cross-section of Watershed 1 recorded by DTS on Sept 24, 2007 at 2PM. Note that the stream of cool air (blue) flowing down the valley at the bottom of the watershed.

Where are They Now? Rolf Anderson

Rolf Anderson has been engaged with the Andrews Forest program for more than 25 years. As leader of planning for the Willamette National Forest in the 1980s, Anderson served as a principle contact with the science community for the Supervisors Office and strongly supported the flow of science perspectives into the land management plan for the Willamette Forest. When he became Ranger at the Sweet Home Ranger District just north of the Andrews Forest, Anderson actively engaged with the science community through the Central Cascades Adaptive Management Area. Even after retirement in 1998, Anderson has kept busy serving as a Board member and President of the McKenzie River Trust, a non-profit land trust that acquires, restores, and stewards western Oregon lands that are critical for conservation. In this capacity he has enlisted the help of Stan Gregory, Randy Wildman, Fred Swanson and other Andrews

Forest researchers to help with management strategies and ecological monitoring at the 1000-acre Green Island Trust property at the confluence of the McKenzie and Willamette Rivers.



Rolf Anderson in 2008. Photo by Joe Moll

Anderson states, “The enduring memory I take from my years spent working with the Andrews Forest community is the model of rapid technology transfer. In a time of new awareness about interrelationships in the natural world affecting management of our forests, Andrews Forest scientists took deliberate steps to interact with land managers, discussing current findings and implications. This activity was a major influence on National Forest management and planning.”

Reflections

The Long-Term Ecological Reflections program has continued to prosper with new writers in residence, publications about Reflections, and a gathering of two dozen writers from around the Northwest at the Andrews Forest in September. After viewing PVC tubes used to measure carbon dioxide exhaled from rotting logs in Mark Harmon's log decomposition experiment, Jerry Martien, poet from the northern California coast, wrote his poem "return of the dead log people" from the point of view of the decaying logs, inviting us to join them in the state of decay:

*"thank you for your participation
in the blue river bone orchard's first
bicentennial morticultural conference:
the role of the dead in carbon
budgeting...
But don't think of it as over and done
we are still everything to come...
but in your breath now
our breath
and in our breath
these words
which you will remember by a new
stiffness in your limbs...
we eagerly await your input."*



A decomposing Pacific Silver Fir (*Abies amabilis*) log with a respiration chamber used to measure carbon dioxide exhalation in Harmon's 200-year log decomposition experiment. Photo by Jay Sexton.

Sounds of the Forest

Listen to the forest sounds and learn about the research at the Andrews Forest on *The Natural World*, a radio program hosted by John Cooney. The program aired on public radio on October 23, 2008.
www.klcc.org/OnlineAudio.asp

Take a Hike!



Trail sign for the Lookout Creek Old-growth Trail. Photo by Cameron Bergen.

The Lookout Creek Old-Growth Trail winds its way through a classic stand of old-growth forest along Lookout Creek. The 3.5-mile trail is a favorite of the public. Recent trail improvements and a new trail brochure were made possible through a contribution to the Andrews Forest Fund and through work of the Willamette National Forest.

Learn about some essential characteristics of an old-growth forest by downloading the trail brochure or by traversing the online virtual trail created by the Environmental Leadership Program at the University of Oregon.

A downloadable, informative trail brochure and the link to the virtual trail are available on the Andrews Forest website at <http://andrewsforest.oregonstate.edu/about/facility/visitor.cfm?topnav=102>.

Teacher, Teacher

Jill Semlick, a high school biology and ecology teacher at the Pauling Academy in Portland, Oregon, participated in the NSF-funded program, Research Experience for Teachers, at the Andrews Forest in the summer of 2008. Semlick shadowed six Andrews Forest researchers as they did their field work. She took video and still images which she wove together into several presentations titled, "How Biologists 'Do' Biology." In her classroom, Semlick shares a video with her students each week. The students take away ideas to use in their class research project on flying squirrels. Semlick reports, "My students enjoy and request the presentations, I think because they make science accessible to them. They see their teacher (me) in the role of student, doing an assignment, which ultimately makes them consider science, college and research as viable personal goals."



Cones on Western Hemlock (*Tsuga heterophylla*). Photo by Lina DiGregorio

Support for the Andrews Forest

The Andrews Forest Program is dedicated to research and education about forests, streams, watersheds, and our engagement with the land.

The Andrews Forest Fund is a way for individuals and organizations to support the important work at the Andrews Forest. Recent gifts to the Andrews Forest Fund have supported work on the Lookout Creek Old-Growth Trail (page 4), the Canopy Connections education program (page 1), and the Visiting Scholars Program.

By making a contribution to the Andrews Forest Fund, you can make an investment in the long-term viability of our forested ecosystems. Tax-deductible donations of funds, appreciated securities, or property of any amount can be used to support the Andrews Forest Program. To make a gift, please contact the OSU Foundation (800-354-7281) or go to our online giving page at <http://andrewsforest.oregonstate.edu/about/forestfund.cfm?topnav=171>