



March/April 2014

# THE FOREST THREATNET



Oak leaves emerging in spring—Photo by USDA Forest Service



Danny C. Lee, PhD  
Eastern Threat Center Director

## SOUTHEAST CLIMATE HUB TO AID LANDOWNERS 'SERCH'-ING FOR MANAGEMENT ADVICE

Raleigh, North Carolina, the state's capital, is well known as a hub of cultural, educational, technological, and political activity. Now the city is gaining new attention as a hub of climate change knowledge and assistance.

On February 5, US Department of Agriculture Secretary Tom Vilsack [announced](#) the formation of seven Regional Hubs for Risk Adaptation and Mitigation to Climate Change.

These Climate Hubs will provide science-based information and outreach to help farmers, ranchers, and forest landowners manage resources in the face of climate change and related threats, such as wildfire, invasive species, drought, and extreme weather.

Eastern Threat Center research ecologist **Steve McNulty** is the Director of the [Southeast Regional Climate Hub](#), or SERCH, based at North Carolina State

University in Raleigh. "The main objective is to take the good science that's already been done, make sure it gets converted into usable land management practices, and get that information to the landowner," says McNulty.



Steve McNulty

SERCH is a collaborative effort involving staff from USDA's Forest Service, Natural Resources Conservation Service, and Agricultural Research Service as well as numerous partnering organizations. A SERCH "sub hub" located in Río Piedras, Puerto Rico, will be focused on issues relevant to resource management in the Caribbean.

[Read more in CompassLive...](#)

### New Guide Supports Management of Changing Southern Forests

Since 2010, collaborating scientists and land managers from across the South have pooled knowledge and expertise with one goal in mind: to provide a "state-of-the-science" analysis that can support forest management decision making through changing conditions. Their work under the Climate Change Adaptation and Mitigation Management Options (CCAMMO) project, led by the Southern Research Station (SRS), has been published as a comprehensive guide for science-based efforts to reduce forest threats and ensure continued production of valuable goods and ecosystem services. Eastern Threat Center scientists co-authored several chapters in the CCAMMO book addressing water stress, wildfire, invasive species, carbon sequestration, and more.

[Read more in CompassLive...](#)

### INSIDE THIS ISSUE

**Eastern Threat Center Highlights.** Trees at risk. Evaluating nitrogen runoff prediction tools. Kids' science club. Women's History Month. Museum hosts research executives. Tribal partnership activities. Publications, products, and events.

**Western Threat Center Highlights.** New Forest Service planning tool.



SRS Director Rob Doudrick presents NC Museum of Natural Sciences director Emlyn Koster with a partnership appreciation coin (p. 3).

## EASTERN THREAT CENTER HIGHLIGHTS

### Which Tree Species are Most at Risk in a Changing Climate?

A walk in the woods or a stroll on a tree-lined street could be a very different experience just a few decades from now. Higher temperatures, altered precipitation patterns, and longer growing seasons predicted for the future could require that some tree species will have to move – or be moved – into new areas where habitat will be more suitable. Some tree species may be able to stay in place by adapting to new conditions, yet others may succumb to the pressures of climate change if they are unable to adapt.

In a [recently published study](#), Center research ecologist **Bill Hargrove** and North Carolina State University cooperating scientist **Kevin Potter** described measures to project habitat changes for 172 North American tree species and predict which species are most at risk as part of a collaborative project known as Forecasts of Climate-Associated Shifts in Tree Species, or [ForeCASTS](#). “Of all 172 tree species we analyzed, all but two are expected to lose suitable habitat by 2050,” says Potter. “These results may seem overwhelming, but this information can help land managers and decision makers prioritize tree species for conservation activities.” [Read more in CompassLive...](#)

*Carolina hemlock, which grows on high elevation slopes and ridges, is expected to lose areas of suitable habitat in a changing climate. Photo by Will Cook, [www.carolinanature.com](http://www.carolinanature.com).*



### From Forests to Water Supplies, Researchers Evaluate Tools for Predicting Nitrogen Runoff

Plants require nitrogen to grow and thrive, and often receive a boost from applications of nitrogen-containing fertilizer. But increased plant growth and yield can be at the expense of water quality when fertilizer runs off into rivers, lakes, and streams. A group of researchers reviewed a series of models used to predict nitrogen’s movement from managed forests through the surrounding environment, identifying the strengths and limitations of each model. The researchers concluded that, given landscape and management complexities, no single model can adequately address nitrogen’s fate following fertilizer use in southern U.S. forests. Center research hydrologist **Ge Sun** is among the co-authors of this SRS-led [study](#), and researchers tested one of the models using a Center [research site](#) in coastal North Carolina consisting of loblolly pine plantations. [Read more in CompassLive...](#)



*Malheur National Forest, northeastern Oregon—Photo by Dave Powell, USDA Forest Service, Bugwood.org*

## WESTERN THREAT CENTER HIGHLIGHTS

### Easy Access to Forest Planning Knowledge is on DECK

US Forest Service Land and Resource Management Plans (LMPs) gather all knowledge for a specific National Forest or project and represent a substantial investment of time, expertise, and collaboration to maintain or restore sustainable ecosystems and the services they provide. Currently, LMPs exist as documents on each national forest’s website or in hardcopy at a forest or district office. The Forest Plan Database and Exchange of Current Knowledge (FP\_DECK) is a web-based planning tool in development by the Eastern and Western Threat Centers designed to compile LMPs in a single location and make them electronically accessible to all.

FP\_DECK will allow users, such as Forest Service planners and managers, to easily search for a stand type, or a management area, such as campgrounds or research national areas within a single plan or across multiple LMPs as templates to develop appropriate, consistent management plans, or to explore plan direction at different operational scales within a Forest. FP\_DECK will also support users who need to translate stand or habitat types among federal and state agencies and states. With these features as well as geospatial mapping capabilities, the ultimate goal of FP\_DECK is to improve information exchange and to promote management consistency and communication. The FP\_DECK project is a partnership effort involving multiple regions from the National Forest System. A prototype FP\_DECK website is expected later in 2014.

*More information: [www.fs.fed.us/wwetac](http://www.fs.fed.us/wwetac)*

## OLD MICROSCOPE SPARKS NEW IDEA FOR KIDS' SCIENCE CLUB

When he was a child, Center research ecologist **Bill Hargrove** burnt off his eyebrows making rocket fuel, blew up a sealed jar of cultured yeast, and started a bathroom fire while doing sterile transfers for a carrot tissue culture. Fortunately, he survived his early scientific experiments and is now inspiring a new generation of young students.

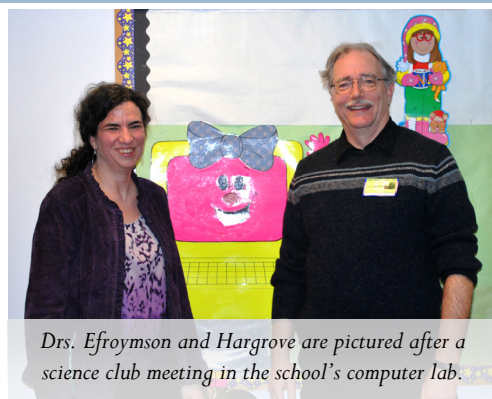
Hargrove and his wife, Dr. Rebecca Efrogmson, are pioneering an extramural science club at Haw Creek Elementary School in Asheville, NC. Each monthly club meeting features real-life scientists who lead lively discussions and activities about diverse scientific topics.

During the first club meeting last year, students looked at living creatures found in drops of pond water through a light microscope—Hargrove's own childhood microscope. "I used to spend hours in junior high school looking at protozoa through that microscope. My family got used to having stinky jars of pond water on every available window sill," says Hargrove. Students also controlled a scanning electron microscope over the internet to observe insect specimens that they had mailed weeks earlier to the national [Bugscope project](#).

At other meetings, students have built simple robots that could move and follow a light source; explored rockets, airplanes, and space, including outdoor rocket and airplane demos; and delved into electronics. Students have also surveyed archaeology, constructed pickle and lemon batteries, learned about biofuels and solar power, and have even touched human brains as part of a recent meeting focused on psychology, following a discussion about respectful conduct and ethics.

Hargrove and Efrogmson—both busy researchers and parents of two—hope to excite students about the possibilities of careers in science, especially those underrepresented in scientific fields, including women and minorities. Hargrove explains that kids today belong to a "software generation" and feels that free range tinkering is critically important for developing minds. "I think that kids often don't get any 'feel' for science. But if they can experiment in a safe environment, they realize that science is just normal, regular stuff. No magic at all. Then the fear is gone, demystified, and they can get on with learning."

*Read more in [CompassLive...](#)*



*Drs. Efrogmson and Hargrove are pictured after a science club meeting in the school's computer lab.*

## EASTERN THREAT CENTER HIGHLIGHTS

### NC Museum of Natural Sciences Hosts Research Executives

The USDA Forest Service Research Executive Team explored the [North Carolina Museum of Natural Sciences](#) during their business meeting held at the museum's [Nature Research Center](#) in Raleigh, NC. Forest Service research and development leaders from Washington, DC, and seven regional research stations throughout the United States and Puerto Rico participated in the three-day strategic working session. The Southern Research Station's (SRS) partnership with the museum was highlighted as a model for future collaborative science sharing opportunities.

### Tribal Partnerships Address Climate Challenges and Opportunities

Managers of tribal lands are facing unprecedented challenges to natural resource sustainability due to climate change and related disturbances. Working with partners, including scientists and staff from the SRS and Eastern Threat Center, tribal land managers are gaining an edge with access to tools and resources to support planning activities and are collaborating to reach shared conservation goals across all lands. **Lori Barrow**, Forest Service liaison to the [South Atlantic Landscape Conservation Cooperative](#), describes a recent climate change adaptation planning workshop and a new effort to preserve culturally significant native plants in the Forest Service Office of Tribal Relations [winter newsletter](#).

### Celebrating Women's History Month

Women's History Month began as a national weekly celebration when Congress established "Women's History Week" on March 7, 1982 – the monthly observance began in 1987. This year's theme, "Celebrating Women of Character, Courage, and Commitment," honored the determination and tenacity of women. Many courageous and remarkable women in history, including those in the [Forest Service](#), have advanced our nation forward toward equality, liberation, and acceptance of women's rights. The commitment of generations of women and their victories, struggles, and stories as pioneers is truly an inspiration. The SRS co-sponsored the Women's Day of Training, which included the useful career-related presentation, "Taking the Lead: Inspiring Yourself."

*Right: Margaret Stoughton Abell was the first female forester in the Forest Service. [Read more in \[CompassLive...\]\(#\)](#)*



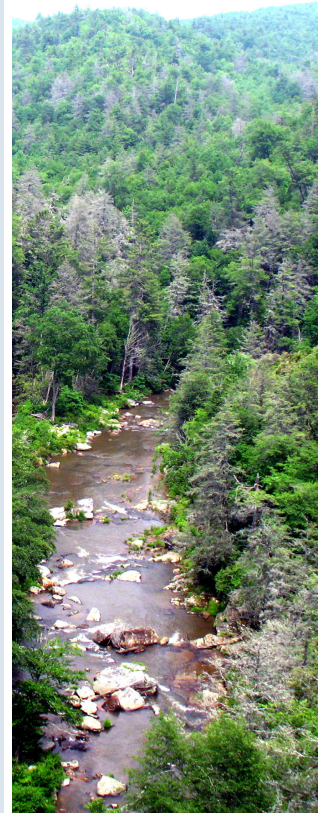
**Center News, Publications, Products, and Events**

- Two North Carolina State University (NCSU) cooperators have joined the Eastern Threat Center. **Shanlei Sun** is a postdoctoral researcher studying land surface processes, land-atmosphere interaction, ecohydrology, and climate simulation and prediction. **Ginger Balmat** is a graduate student assisting with development of the [Template for Assessing Climate Change Impacts and Management Options](#) (TACCIMO). Welcome!
- May's [First Friday All Climate Change Talks](#) will feature Northern Research Station's Marla Emery who will discuss engaging tribal communities with climate change.
- Center research ecologist **Qinfeng Guo's** collaborative work is the subject of a *Natural IQ* article, "[North of the Border: Are Nonnative Species Moving Northward As the Climate Changes?](#)" *Natural IQ* is a regionally-focused Forest Service science journal written for middle school students.
- **Steve McNulty** discusses climate change impacts and how SERCH (see p. 1) can help farms and forests in recent podcasts from [WUNC](#) and [WCOM](#).
- [New Publications and Products](#) (search [Treesearch](#) for all pubs and abstracts):

**Potter, K.M.; Conkling, B.L.**, editors. 2013. Forest Health Monitoring: National Status, Trends and Analysis, 2011. General Technical Report SRS-185. Asheville, North Carolina: U.S. Department of Agriculture, Forest Service, Southern Research Station. 149 p.  
- Draft reports for 2012 and 2013 are also [available online](#).

**Treasure, E.; McNulty, S.; Moore Myers, J.; Jennings, L.N.** 2014. Template for assessing climate change impacts and management options: TACCIMO user guide version 2.2. General Technical Report SRS-186. Asheville, North Carolina: U.S. Department of Agriculture Forest Service, Southern Research Station. 33 p.

Vose, J.M.; K.D. Klepzig, editors. 2013. Climate Change Adaptation and Mitigation Management Options: A Guide for Natural Resource Managers in Southern Forest Ecosystems. Boca Raton, FL: CRC Press. 492 p.  
- Eastern Threat Center scientists co-authored several chapters in this book.

**ForWarn**

Appalachian forests are rapidly changing as an invasive insect, the hemlock woolly adelgid, kills hemlock trees. **ForWarn** researchers are tracking this staggering loss. Learn more at [www.forwarn.forestthreats.org](http://www.forwarn.forestthreats.org). Photo by Steve Norman.

**CONTACT US****USDA Forest Service Research and Development • Eastern Forest Environmental Threat Assessment Center**

The interdisciplinary Eastern Threat Center develops new technology and tools to anticipate and respond to emerging forest threats. The Eastern and Western Threat Centers are a joint effort of the USDA Forest Service Research and Development, National Forest System, and State and Private Forestry. The Eastern Threat Center is headquartered with the Southern Research Station in Asheville and has offices in Raleigh and Research Triangle Park, NC.

**Eastern Threat Center**  
**Danny C. Lee, PhD, Director**  
**Asheville, NC**  
Southern Research Station  
200 W.T. Weaver Blvd.  
Asheville, NC 28804  
(828) 257-4298

**Research Triangle Park, NC**  
Forestry Sciences Laboratory  
3041 E. Cornwallis Road  
Research Triangle Park, NC 27709  
(919) 549-4000

**Raleigh, NC**  
North Carolina State University  
Centennial Campus  
920 Main Campus Drive  
Venture Center II, Ste. 300  
Raleigh, NC 27606  
(919) 515-9489

**Western Threat Center**  
**Nancy E. Grulke, PhD,**  
**Director**  
**Prineville, OR**  
3160 NE Third St.  
Prineville, OR 97757  
(541) 416-6693

For additional information, contact the Eastern Threat Center communications team: **Perdita Spriggs** ([pspriggs@fs.fed.us](mailto:pspriggs@fs.fed.us)) or **Stephanie Worley Firley** ([sworleyfirley@fs.fed.us](mailto:sworleyfirley@fs.fed.us)). USDA is an equal opportunity employer and provider.