

# THE FOREST THREATNET



May/June 2014

*Multiflora rose, an exotic invasive species, blooms in mid- to late spring in many eastern forests.  
Photo by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.*



*Danny C. Lee, PhD  
Eastern Threat Center Director*

## EASTERN THREAT CENTER ADDS VALUE TO NATIONAL SCIENTIFIC EFFORTS

### Message from the Director

Greetings! It's been an unusually newsworthy spring. First, there was the launch of the [USDA Southeast Regional Climate Hub](#) (covered in the [last news update](#)). Then in April, the final report of the [National Cohesive Wildland Fire Management Strategy](#) was delivered to Congress and released to the public. Finally, the [National Climate Assessment](#) was released by the White House in early May. These overarching efforts have three principal attributes in common. First, each addresses many of today's most prominent and far-ranging environmental threats. Second, they involve a wide spectrum of partners and stakeholders. Finally, all are built on a strong and rigorous scientific foundation. Also common to all is the significant and continuing role of the Eastern Threat Center. For example, Threat Center staff help lead the national science team that

supported development of the Cohesive Strategy. Similarly, several of our scientists were lead authors on reports focused on water, forests, and regional issues that form the basis of the National Climate Assessment. I'm very proud of the outstanding work of our unit and the significant national value of our efforts.

- *Danny C. Lee*

### Center Researchers Contribute to National Sustainability Check

Alaska's unique ecological and cultural landscape—and the changes occurring in a shifting climate—provided a fitting backdrop for the 29th annual meeting of the [US Regional Association of the International Association for Landscape Ecology \(US-IALE\)](#) in May. Eastern Threat Center researchers **Kurt Riitters**, **Bill Hargrove**, and **Steve Norman**; North Carolina State University cooperating scientist **Kevin**

**Potter**; and other Center partners were among the approximately 300 experts who shared knowledge at the meeting in Anchorage, themed “Cumulative Impacts and Landscape Initiatives: A Sustainability Check During Climate Change.”

“The US-IALE meeting is ideally suited for presentation of Center research because of the variety of audiences, the depth of the research expertise, and the large number of students attending,” says Riitters, who has served as US-IALE president since 2012. In addition to several research presentations, Center science and the [ForWarn](#) forest monitoring tool were prominently featured in a [special symposium](#). US-IALE celebrated Hargrove and partners from Oak Ridge National Laboratory with the “[Outstanding Paper in Landscape Ecology](#)” award, and honored Riitters with a certificate of appreciation for his service.

### INSIDE THIS ISSUE

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**Western Threat Center Highlights.** TACCIMO resources for western regions.



*Forest Service scientists bridge the gap with tribal governments (p. 3). Photo by US Forest Service.*

## EASTERN THREAT CENTER HIGHLIGHTS

### Climate Change Science Rocks the Cradle of Forestry

The [Cradle of Forestry](#), a historic site in North Carolina's Pisgah National Forest, is so named because it marks the birthplace of forest conservation in America. Now, the Cradle is celebrating a new first with the unveiling of an exhibit offering interactive opportunities for visitors to learn about [climate change in the southern Appalachian region](#). The likenesses of Eastern Threat Center scientists **Steve McNulty**, **Ge Sun**, and **Erika Cohen** are featured as life-size cutouts and in videos describing their work and offering practical ideas for children and their families to conserve resources and lessen the impacts of climate change. As part of the exhibit's opening day, the scientists themselves visited the exhibit at the Cradle's Forest Discovery Center and shared their enthusiasm for forest science with students from the nearby Schenck Job Corps Center. Some of the students requested autographs on collectible scientist cards—a rare "rock star moment," according to McNulty. [Read more in CompassLive...](#)



Center scientists **Steve McNulty**, **Erika Cohen**, and **Ge Sun** stand with their likenesses at the Cradle of Forestry. Photo by Michael Robinson, SRS.

### International Symposium Addresses a Critical Piece of the Hydrologic Puzzle

Evapotranspiration, or plant water use, can be difficult to assess. But its role in the hydrologic cycle provides important information about water supplies, ecosystem productivity, and climatic changes. In April, experts from around the world gathered in Raleigh, NC, to share knowledge and best practices during a symposium dedicated to the challenges of measuring and monitoring evapotranspiration. [Read more in CompassLive...](#)

### Does Carbon in Wetland Soils Go With the Flow?

Hidden in wetland soils is a critically important benefit: storage of carbon that would otherwise enter the atmosphere as carbon dioxide, a climate-warming greenhouse gas. But what happens to this carbon when wetlands dry out because of seasonal water level fluctuations, climate variability, or land use changes related to human development? In a [recently published study](#),

researchers from North Carolina State University and the Eastern Threat Center characterize the factors that drive soil carbon loss as the water table rises and falls in a seasonally flooded, forested wetland. [Read more in CompassLive...](#)

*Roots are exposed due to soil erosion during a flooding event. Photo by Randy Cyr, Greentree, Bugwood.org.*



### When It Rains, It Pours...and Increases Soil Erosion Potential in a Changing Climate

When nutrients and organic matter in soils are washed away during a rain event, decreased soil fertility affects food production, sediment entering streams and rivers threatens water quality and wildlife, shifting soils create unstable land conditions in ecosystems and communities, and disturbed soils with reduced carbon storage abilities can contribute to global warming. In a changing climate with altered precipitation patterns, some areas in the United States may be particularly vulnerable to increased soil erosion and these related problems. Eastern Threat Center researchers and partners at North Carolina State University have identified these areas in a [recently published study](#). [Read more in CompassLive...](#)

## WESTERN THREAT CENTER HIGHLIGHTS

### Climate Change Planning Tool Goes West

Originally developed in partnership with national forest planners and managers in the southern United States, the [Template for Assessing Climate Change Impacts and Management Options](#) (TACCIMO) has expanded to support resource planning and management for a wide range of issues and locales. The Eastern and Western Threat Center have collaborated to further the TACCIMO tool's expansion with the inclusion of peer-reviewed climate change science specific to the Forest Service's western regions. Climate change science from newly published literature will be continuously added to the TACCIMO database as will information on focal resources of interest in each western region to help planners and managers effectively and efficiently sustain forest resources in a changing climate.

For assistance with TACCIMO in the West or for more information about climate change effects for specific focal resources, contact Western Threat Center technical information specialist Lisa Balduman at [lbalduman@fs.fed.us](mailto:lbalduman@fs.fed.us).

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

## RESEARCHERS TRACK “GRAY GHOSTS” ACROSS THE SOUTHERN APPALACHIANS

People living in the Appalachian Mountains of the eastern United States have long enjoyed a rich culture of storytelling. Often rooted in a deep connection to the natural world, stories from Appalachian folklore serve to entertain as well as to educate; sometimes, important life lessons emerge, especially from tales of demise. A present-day ghost story has captured the attention of Eastern Threat Center researchers who are using high-tech tools to follow the footprints of lost life.

The ghosts in this story are eastern and Carolina hemlock trees being killed in increasing numbers by an exotic invasive insect, the hemlock woolly adelgid. Often called gray ghosts because of their pale, skeleton-like appearance, the dead hemlocks are obvious across the mountain landscape. Using the satellite-based **ForWarn** forest monitoring tool, scientists are able to see just how devastating the hemlock losses have become across the southern Appalachians, where the hemlock woolly adelgid thrives in the warmer temperatures and is killing trees much more quickly than in the more northern areas of the hemlocks' range.

**ForWarn** delivers weekly maps showing levels of U.S. forest vegetation greenness

and can distinguish deciduous and evergreen vegetation. Because hemlocks are evergreen, their decline and death are most noticeable during the winter months. In locations where losses from dead and dying hemlocks are extensive, **ForWarn** maps show an overall greenness decline during the growing season as well.

“What’s truly staggering is how rapidly southern Appalachian forests are changing due to the losses of these trees,” says Center research ecologist **Bill Hargrove**. “While these rapid losses make it difficult for land managers to protect hemlocks in all areas, **ForWarn** can reveal where trees are declining so that managers can make informed decisions about prioritizing areas for on-the-ground monitoring and management.”

As researchers and land managers focus on the casualties of the hemlock woolly adelgid, something can be learned from this ghost story. “Perhaps the widespread damage caused by the hemlock woolly adelgid example serves as a cautionary tale: everyone must play a part in preventing the introduction and spread of destructive invasive species,” says Hargrove. [Read more in CompassLive...](#)



*Gray ghosts are a common sight in the southern Appalachians. Photo by Steve Norman, Eastern Threat Center.*

## EASTERN THREAT CENTER HIGHLIGHTS

### Forest Service and Tribes Meet to Bridge a Gap Across Lands

When tribal elders and natural resource managers come together with the Forest Service and other federal agencies, informal discussions serve to broaden goals for sustaining the environment, explains **Serra Hoagland** in an interview recorded at the 2014 To Bridge A Gap conference, an annual event held around the nation to facilitate such discussions. In [the interview](#), which aired on KUAF public radio, Hoagland and Northern Research Station scientist Mike Dockry highlight tribes' traditional knowledge and practices that contribute to and serve as a model for sustainable natural resource management. [Read more in CompassLive...](#)

### Researchers Turn Up the Heat on Thousand Cankers Disease

Black walnut trees are prized by people and wildlife alike, but these trees are under threat in the eastern United States due to thousand cankers disease, the result of an invasive fungus carried by the walnut twig beetle. The Eastern Threat Center provided support for a Southern Research Station-led project to test heat treatments for black walnut logs. In this [recently published study](#), researchers determined the minimum temperature and heating time required to eliminate pests and prevent the spread of thousand cankers disease if logs are transported. [Read more in CompassLive...](#)

### Asian American and Pacific Islander Heritage Month

May provided an opportunity to celebrate and honor accomplishments that generations of Asian Americans, Native Hawaiians, and Pacific Islanders have contributed to American history. This year’s theme, “I Am Beyond,” captured their aspiring spirit and determination to excel despite seemingly insurmountable challenges. An important example shared throughout history highlights the Chinese railroad workers (*right*), lauded for their significant contributions to the first [transcontinental railroad](#). The railroad connected the eastern and western United States and laid the foundation for extraordinary economic prosperity. This year marks 145 years since the railroad’s completion, and the Chinese laborers were posthumously inducted into the [Labor Hall of Honor](#) in May.



*Photo courtesy of the Northeastern Nevada Historical Society and Museum*

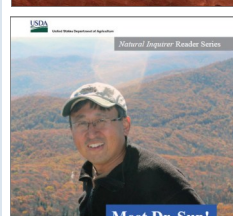
### Center News, Publications, Products, and Events

- Growing numbers of Native American students are enrolling in natural resource programs. Center biological scientist **Serra Hoagland** co-authored two articles for *Evergreen* magazine to summarize available opportunities.
- A spinoff, according to NASA, is "a technology, originally developed to meet NASA mission needs, that has been transferred to the public and now provides benefits for the Nation and world as a commercial product or service." *ForWarn* is one such spinoff featured in NASA's most recent *Spinoff* report, which has been published annually since 1976.
- Now even the youngest students can learn about Center scientists and their research questions! Research ecologists **Ge Sun** and **Qinfeng Guo** are featured in the *Natural Inquirer's* new Reader Series for grades K-2.
- To aid busy professionals and others who wish to understand the fundamentals of climate science, the [Climate Change Resource Center](#) has released an interactive online education module, "Climate Change Science and Modeling: What You Need to Know."
- Visit the [First Friday All Climate Change Talks \(FFACCTs\)](#) webpage for archived resources and upcoming FFACCTs topics.
- The Eastern Threat Center will host the 31st annual US-IALE meeting (see p.1) in Asheville, NC, April 2-8, 2016. Save the dates!
- *New Publications and Products* (search *Treesearch* for all pubs and abstracts):

Segura, C., **G. Sun**, **S. McNulty**, and Y. Zhang. Potential impacts of climate change on soil erosion vulnerability across the conterminous United States. *Journal of Soil and Water Conservation* 69(2):171-181.

**Potter, K.M.** and C.W. Woodall. 2013. Does biodiversity make a difference? Relationships between species richness, evolutionary diversity, and aboveground live tree biomass across U.S. forests. *Forest Ecology and Management* 321:117-129.

**Guo, Q.F.** and J. Olden. 2014. Spatial scaling of non-native fish richness across the United States. *PLoS ONE* 9(5):e97727.



## CONTACT US

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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.

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