

THE FOREST THREATNET



September/October 2015

Researchers mapped the forests of 2000 and 2012 and examined the patterns of change across ecological regions and biomes. In this aerial photo of land near Hiram, Georgia, tree cover as of 2012 is shown in transparent green; tree cover loss from 2000 to 2012 is shown in transparent blue. Photo courtesy of National Agriculture Imagery Program.



Danny C. Lee, PhD
Eastern Threat Center Director

REFLECTIONS ON TRANSITIONS

It's October and the hills surrounding Asheville, North Carolina, are ablaze. Fortunately, it's not wildfire, but rather the striking autumn spectacle of the Eastern deciduous forest with the yellows, reds, oranges, and purples that capture the eye and the imagination. It's perhaps my most favorite time of the year to be in the woods. October is a time of transition for the forests and, coincidentally, a time of transition for us as well—marking the beginning of a new fiscal year.

We begin each year by looking back to see where we've been and what we've accomplished, and then look ahead to the coming year. At the Eastern Threat Assessment Center, we have a lot to be proud of in 2015. Follow the link below to our accomplishment highlights and I think you'll agree that it's been a busy and productive year.

Our staff continues to discover new insights, create new tools, and share those products with other scientists and land managers. Taken individually, it's an impressive list. There are few environmental threats that we don't address in some direct or tangential way. Less apparent but perhaps more important is the interconnectedness of all these efforts. There's tremendous leveraging that occurs among expertise and technology, where we both help and learn from each other and partners. In an era of shrinking budgets and manpower it's the only way to continue to be successful. It's one of our greatest strengths, and so I look back with pride and ahead with great anticipation and excitement.

- Danny C. Lee

View 2015 accomplishment highlights:
<http://www.forestthreats.org/research/projects/2015-accomplishment-highlights>

Patterns Matter: Researchers Look Beyond the Numbers to See the True Impacts of Global Forest Loss

Between 2000 and 2012, the world lost forest area and gained forest area. But the losses exceeded the gains, according to researchers who compared tree cover data from those years and estimated a global net loss of 1.71 million square kilometers of forest—an area about two and a half times the size of Texas. That's only part of the story, though. "In addition to the direct loss of forest, there was a widespread shift of the remaining global forest to a more fragmented condition," says **Kurt Riitters**, Center research ecologist and lead author of a study describing the phenomenon, [recently published in the journal *Landscape Ecology*](#). "Forest area loss alone underestimates ecological risks from forest fragmentation. The spatial pattern of forest is important because the same area of forest can be arranged in different ways on the landscape with important consequences for ecosystem processes."

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

INSIDE THIS ISSUE

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Western Threat Center Highlights. Socioeconomic vulnerability assessment in southern California.

EASTERN THREAT CENTER HIGHLIGHTS

New Tools Inform and Assist Conservation Efforts in the Appalachians

Resource managers, scientists, industries, and the public throughout the Appalachian Mountains have some new online tools to help them understand the sustainability, and vulnerabilities, of the region's natural assets including forest products, water, food, nature-based tourism, and many other benefits provided by ecosystems. Available through the

A typical valley in the central Appalachians provides valuable ecosystem services. Photo by Appalachian LCC.



Appalachian Landscape Conservation Cooperative's (LCC) Web Planning Portal, [Ecosystem Benefits and Risks](#) provides synthesized information from regional inventories and assessments. The

companion [Guide to Ecosystem Services](#) features more detailed descriptions and map examples of resource use and changing landscapes, and links users to relevant online data and tools. Center ecologist **Lars Pomara** is collaborating with the Appalachian LCC and the University of North Carolina Asheville's National Environmental Modeling and Analysis Center to develop these online resources, which are designed to encourage protection of and investments in ecosystem services that support populations in Appalachia and beyond.

Report Assesses Southeast's Climate Vulnerabilities and Management Strategies

Forestry and farming in the southeastern United States have long been the economic drivers of the region, sustaining people through the products and ecological benefits they provide as well as the cultural traditions they inspire. With working lands across the Southeast facing numerous challenges from population growth, land fragmentation, and the effects of weather extremes and climate change, land managers need to understand the risks and how to confront them. To fill this need, the Eastern Threat Center-hosted [Southeast Regional Climate Hub](#) (SERCH) published an [Assessment of Climate Change Vulnerability and Adaptation and Mitigation Strategies](#), part of a series of similar reports developed by [USDA Climate Hubs](#) across the nation. The report describes the Southeast's key resources, what's at stake for working lands under pressure, what land managers can do to adapt to changing conditions and reduce climate-warming greenhouse gas emissions during operations, and USDA agencies and programs that can help.

More information: <http://globalchange.ncsu.edu/serch>

Biological Scientist Honored for Professional Support



Johnny Boggs. Photo by Perdita Spriggs, U.S. Forest Service.

For 18 years, Center biological scientist **Johnny Boggs** has worked with a research team studying the effects of global change on the hydrology, soil functions, and health of forested watersheds. He has planned field data collection outings to maximize resources and efficiency and diagnosed and repaired field equipment when unexpected problems arose, all while maintaining a 100 percent safety record. He has implemented a strategy for ensuring quality and continuity of field data collection by a variety of staff and interns and has developed databases and written software programs for managing and analyzing the large datasets they generate. He has also co-authored 17 scientific papers describing the team's body of work. These efforts are among those recognized by Southern Research Station (SRS) Director Rob Doudrick, who recently named Boggs the recipient of the 2015 SRS Director's Award for Research Professional Support. Boggs will receive the award during a ceremony on November 17. [Read more in CompassLive...](#)

WESTERN THREAT CENTER HIGHLIGHTS

Researchers Evaluate Landscape Change and Potential Impacts to Southern Californians

In southern California, wildfire risk, drought, and land use change threaten key ecosystem services such as water quantity (water runoff and recharge), water quality (including sediment erosion management), biodiversity, cultural resources, carbon storage, and recreation. To understand the impacts on people who depend on these ecosystem services, the Western



Santa Clara River. Photo by U.S. Forest Service.

Wildland Environmental Threat Assessment Center is providing support for a new assessment of socioeconomic vulnerability in the region. Researchers are using a relatively small 'model' watershed, the headwaters of the Santa Clara River, to identify key sources of information to inform the study, and will apply a similar approach to assess vulnerabilities associated with these ecosystem services as well as air quality and energy on four southern Californian National Forests: Los Padres, Angeles, San Bernardino, and Cleveland. Scientists from the Forest Service Pacific Southwest Region and Rocky Mountain Research Station, University of California, Davis, and Michigan State University lead the research team, and are joined by dozens of cooperators providing specialized information and data.

More information: www.fs.fed.us/wwetac

EASTERN THREAT CENTER HIGHLIGHTS

On National Forests and Grasslands, All Droughts are not Created Equal

Researchers say today's droughts are setting in more quickly and becoming more intense. How does this affect the productivity of national forests and grasslands and their ability to provide fresh water to millions of Americans? Center scientists collaborated with Southern Research Station and university researchers to model the impacts of the five most extreme droughts between 1962 and 2012 across the conterminous United States and estimate their potential impacts on each of 170 national forests and grasslands. Their findings, [recently published in *Forest Ecology and Management*](#), indicate that the "top five" droughts, on average, resulted in a 22 percent reduction in annual precipitation on national forests and grasslands. Potential impacts included reductions in ecosystem water use by 8 percent, water yield by 37 percent, and productivity by 9 percent. The highest potential reductions were found in the West and Southeast.

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

Southern Research Station Volunteers Get "Buggy About Pollinators" at Bugfest

Are insects needed to produce coffee? What about apples and chocolate? Children and families learned the answers to these questions during a pollinator game at the Southern Research Station (SRS) exhibit, themed "Buggy About Pollinators," at the annual [Bugfest](#) in Raleigh. Held at the North Carolina Museum of Natural Sciences, Bugfest is a free, fun-filled event that invites people of all ages to learn more about the world of insects. Center resource information specialist **Erika Mack**, research ecologist **Frank Koch**, and North Carolina State University cooperating scientist **Barb Conkling** were among the SRS volunteers who staffed the exhibit and engaged in hands-on activities that highlighted the importance of pollinators, especially native bees. Nearly 32,000 people attended Bugfest.

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



Barb Conkling talks with Bugfest attendees at the SRS exhibit. Photo by U.S. Forest Service.

Is Water Quality in the Neuse River Basin Protected After Timber Harvests?

On lands managed for timber, leaving a forested buffer between timber harvest areas and waterways is one example of a Best Management Practice (BMP) that can protect water quality, but, until recently, the effectiveness of BMP strategies had not been evaluated in the North Carolina Piedmont region. Eastern Threat Center biological scientist **Johnny Boggs** led a study, [published in the *Journal of Forestry*](#), that put BMPs in the Piedmont to the test. He and colleagues measured sediments and nutrients in small streams within paired watersheds draining into the Piedmont's

The Neuse River begins in North Carolina's Piedmont region and flows for 275 miles to the Atlantic Ocean. Photo by Ken Thompson, courtesy of Wikimedia Commons.



Neuse River, which runs through many timber-producing forests. The researchers

found increased levels of sediments and nutrients immediately after harvests had taken place, but concluded that BMPs do indeed protect the Neuse River's water quality because these changes were not severe enough to harm aquatic ecosystems.

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

Research Fellow Rides the Canadian Airwaves During International Conference

For hydrologist **Dennis Hallema**, a recent conference presentation in Kelowna, British Columbia, turned into an opportunity to speak about an urgent research issue in front of an even larger audience. Following his talk at the [4th International Conference on Forests](#)

[and Water in a Changing Environment](#), Hallema (an Oak Ridge Institute for Science and Education fellow working with the Eastern Threat



A large part of the Douglas fir and larch forest outside Kelowna, Canada, was burned in the 2003 Myra Canyon fire. Photo by Dennis Hallema.

Center) was

approached by a producer for CBC Radio One. The following morning, Hallema spoke live on air with CBC host Chris Walker about the effects of wildland fires on water supply in the United States. The interview, which was broadcast July 8 on CBC Radio One Daybreak South, focused on a [collaborative study](#) that began in October 2014 with funding from the Joint Fire Science Program. [Read more in *CompassLive...*](#)

Center News, Publications, Products, and Events

- Save the date! The Eastern Threat Center will host the annual meeting of the US Regional Association of the International Association for Landscape Ecology (US-IALE) in Asheville, NC, April 3-7, 2016. Visit the [meeting website](#) for the latest news and announcements.
- Visit the [First Friday All Climate Change Talks \(FFACCTs\) webpage](#) for archived resources and upcoming FFACCTs topics.
- October marks the 70th observance of National Disability Employment Awareness month (right), which honors and celebrates the contributions of American workers with disabilities. [Read the Presidential Proclamation.](#)



- [New Publications and Products](#) (search [Treesearch](#) for all pubs and abstracts):

Potter KM, & Conkling BL, eds. 2015. Forest Health Monitoring: National Status, Trends and Analysis, 2014. General Technical Report SRS-209. Asheville, North Carolina: U.S. Department of Agriculture, Forest Service, Southern Research Station. 190 p.

Riitters, K., J. Wickham, **J.K. Costanza**, and P. Vogt. 2015. A global evaluation of forest interior area dynamics using tree cover data from 2000 to 2012. *Landscape Ecology*. doi:10.1007/s10980-015-0270-9

McNulty, S., S. Wiener, E. Treasure, J. Moore Myers, H. Farahani, L. Fouladbash, D. Marshall, R. Steele, D. Hickman, J. Porter, S. Hestvik, R. Dantzler, W. Hall, M. Cole, J. Bochicchio, D. Meriwether, and K. Klepzig, 2015: Southeast Regional Climate Hub Assessment of Climate Change Vulnerability and Adaptation and Mitigation Strategies, T. Anderson, Ed., United States Department of Agriculture, 61 pp.

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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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