

THE FOREST THREATNET



October/November 2013



In rural Rwanda, rivers are filled with sediment due to soil erosion from farming practices.
Photo by Ge Sun.



Danny C. Lee, PhD
Eastern Threat Center Director

FOREST SCIENCE BENEFITS WATER RESOURCES, AIDS DEVELOPING COUNTRIES

Eastern Threat Center researchers and collaborators are expanding a web-based planning tool designed to project future water availability in the United States, Mexico, and Africa.

The Water Supply Stress Index (WaSSI) model predicts how climate, land use, and human population changes may impact forests' ability to provide ecosystem services, including water supply, carbon sequestration, recreation, and wildlife habitat. Natural resource managers use WaSSI to visualize the effects of management options on ecosystem productivity and make informed decisions for short- and long-term strategies to sustain ecosystem services.

The enhanced online WaSSI tool features: 1) English and Spanish user guides, 2) expanded climate and land use change options, information, and future scenarios for eastern African countries Rwanda and Burundi; and 3) geographically relevant maps in user-friendly formats.

“Deforestation and climate change pose significant threats to water resources in the populous Rwanda region in spite of ongoing international conservation efforts,” says **Ge Sun**, Eastern Threat Center research hydrologist and lead WaSSI developer. “Expanding the model’s capabilities in developing countries helps refine conservation strategies in areas responding to

population growth, extreme weather, and other human influences impacting water resources.”

Created in 2005, WaSSI is a collaborative effort among federal agencies, universities, and non-governmental organizations. The multi-disciplinary WaSSI development team has conducted workshops in Mexico and Africa and continues to improve the tool’s application throughout the United States.

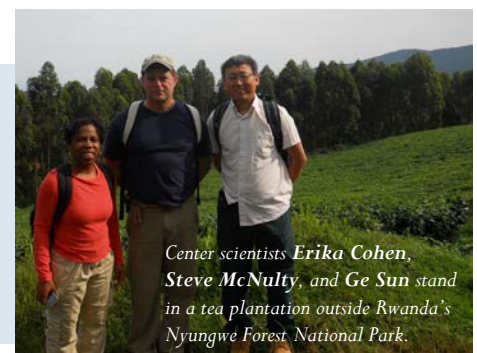
More information:

www.forestthreats.org/wassi

INSIDE THIS ISSUE

Eastern Threat Center Highlights. Timber salvage economics. Elevational biodiversity. TACCIMO and future forests. Stowaway pests. Bugfest. Invasive plant research. Awards. Publications, products, and events.

Western Threat Center Highlights. Vulnerability assessments. Fuel monitoring. Climate change and people.



Center scientists **Erika Cohen**, **Steve McNulty**, and **Ge Sun** stand in a tea plantation outside Rwanda’s Nyungwe Forest National Park.

EASTERN THREAT CENTER HIGHLIGHTS

Does Salvaging Beetle-Killed Timber Make Economic Sense?

Standing dead pine trees resulting from a mountain pine beetle epidemic are a common sight across the western United States. Salvaging this wood for timber is an option that could also address safety issues and lessen the threat of severe wildfires. A Southern Research Station-led study involving Eastern Threat Center research ecologist **Frank Koch** and North Carolina State University cooperating scientist **Kevin Potter** assessed the economics of salvaging dead pines in several western states to determine which areas may benefit from revenues--and which may not. [Read more in CompassLive...](#)

Researchers Take Biodiversity Studies in New Directions

Biodiversity (the variety of species occurring in a given area) is often studied in terms of patterns across a horizontal landscape, but researchers are beginning to understand the vertical patterns of biodiversity as well. Eastern Threat Center research ecologist **Qinfeng Guo** led a study of mountainous regions across the world to examine how elevation influences biodiversity and how elevational biodiversity patterns differ between the northern and southern hemispheres and across latitudes. The [study](#), published in *Scientific Reports*, provides information that can support conservation efforts as plant and animal species are increasingly stressed by climate change and human actions.

TACCIMO Aids Future Forests

From the North Carolina mountains to South Carolina's coastal plain to the tropics of Puerto Rico, climate change is on the minds of forest planners. They are revising their land and resource management plans under the Forest Service's new [Planning Rule](#) with help from the [Template for Assessing Climate Change Impacts and Management Options \(TACCIMO\)](#). [Read more in CompassLive...](#)



Red brome, an invasive annual grass, infests a western landscape.

Photo by John M. Randall, The Nature Conservancy, Bugwood.org.

WESTERN THREAT CENTER RESEARCH HIGHLIGHTS

Vulnerability Assessment Review Prompts Recommendations

To navigate through the complexities of climate change, land managers often conduct special studies, known as vulnerability assessments (VAs), to identify concerns and prioritize management activities. But do VAs tell the whole story? The Western Threat Center supported a Rocky Mountain Research Station (RMRS) [review](#) of VAs for the Southwest and determined that differences in scale and approach across available studies led to an incomplete picture of the region's vulnerability to climate change impacts. The reviewers recommend that managers critically examine methods when using VAs to support decision making, and to communicate needs to researchers.

New Monitoring System Keeps Pace with Changing Fuels

Land managers rely on modeling tools to understand fire behavior and to support threat assessment and decision making. These tools require up-to-date spatial data depicting the amount and condition of fuels across the landscape, so the Western Threat Center is supporting the RMRS's development of a satellite-based system for annually monitoring and

updating fuels information. The system will be particularly useful to managers of non-forested regions where wildland fuels respond quickly to inter-annual variations in vegetation productivity, especially when annual invasive species such as cheatgrass and red brome are present.

Researchers Assess Impacts to People from a Changing Climate

Natural resource agencies must assess and respond to climate change impacts on both ecological systems and the human communities that influence, interact with, or rely on them. Western Threat Center and RMRS scientists are collaborating on a spatial analysis of ecological, economic, and social data to better understand the vulnerability of people and communities to climate-related changes in forests and grasslands in the Northwest. Results will help managers assess potential tradeoffs associated with natural resource management, and can inform the development of policies and programs that meet the needs of people and communities.

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

RESEARCHERS MOBILIZE AGAINST RISKY STOWAWAY PESTS

Sometimes there is more to global trade than meets the eye. While consumers and economies may benefit from expanding market opportunities and a seemingly endless array of readily available goods, harmful pests could be lurking as people and products are transported between countries. A network of researchers, known as the [International Pest Risk Mapping Workgroup \(IPRMW\)](#), met at an October workshop in Raleigh, NC, to share information about how exotic insects, diseases, and plants can move and spread—and threaten agricultural and natural resources.

Eastern Threat Center research ecologist **Frank Koch**, a founding member of the IPRMW, served on the planning committee for the workshop, which generated knowledge and ideas important to policy makers engaged in international trade issues and the associated risks. Armed with information from IPRMW efforts, policy makers can develop science-based decisions about precautions necessary during international trading activities to prevent losses and sustain healthy crops, livestock, forests, and economies around the world.

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

Logs at New Zealand's Port of Tauranga are fumigated prior to export to minimize the chance of accidentally spreading forest pests. Photo by Frank Koch.



EASTERN THREAT CENTER HIGHLIGHTS

Invasive Plant Research Grows

Over the past couple of decades, researchers have studied the ecological and economic impacts of non-native plant invasions at a relatively small scale. Now, a [National Science Foundation](#) grant will enable researchers to take a "big picture" view through space and time in order to develop regional-level forecasts of invasive plant dynamics. Eastern Threat Center research ecologist **Qinfeng Guo** and partners from the Southern Research Station and Purdue University are collaborating on a project to examine plant life histories as captured by long-term datasets and to generate information to help land managers prevent and mitigate damage from invasive plants.

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

Eastern Threat Center Honored

Southern Research Station Director Rob Doudrick recently announced the 2013 Station Director's awards, including Eastern Threat Center research.

- The [ForWarn](#) team received the Partnership Award for "outstanding collaborative work across government agencies in the development of an effective forest disturbance monitoring tool useful at the National level."
- The [TACCIMO](#) team received the Science Delivery award for "exemplary service in providing advanced scientific knowledge to land managers through a user-friendly, online information system."

Congratulations to all the award winners!

"Bad Bugs" Create Buzz at Annual Bugfest

For the second year in a row, the Southern Research Station (SRS) created a "buzz" at the [North Carolina Museum of Natural Sciences'](#) Bugfest. The Station's exhibit, "Most Wanted: Bad Bugs in the Forest," warned even the cleverest of beetles to beware, since researchers armed with state-of-the-art tracking tools are on a mission to detect and reduce the impacts of invasive species.

Volunteers from the SRS, Eastern Threat Center, and [South Atlantic Landscape Conservation Cooperative](#) welcomed wannabe arthropods, their parents, and other bug lovers at the SRS exhibit, sharing researchers' role in the battle against the bugs.

Above: A Bugfest participant learns about the southern pine beetle at the SRS exhibit.

Right: At the SRS Bugfest exhibit, wannabe arthropods gained a unique view of the world from a bug's perspective.

Photos by Perdita Spriggs.



Each September, the largest insect-related festival in the nation draws more than 30,000 multicultural children and adults to check out the latest news in a bug's life. This year, the Raleigh-based free event featured over 100 bug-related exhibits, crafts, games, and activities, and several larger-than-life presentations in the museum's immersive Daily Planet Theater. [Read more in CompassLive...](#)



Center News, Publications, Products, and Events

- North Carolina State University cooperating scientists **Guofang Miao**, **Keren Cepero**, and **Jihong Song** have joined the Center in collaborative research activities. Welcome!
- Research ecologist **Frank Koch** has been appointed to represent Forest Service Research & Development as part of the Forest Health Monitoring national management team.
- The December [First Friday All Climate Change Talks](#) will feature Northern Research Station's Lindsey Rustad discussing "Smart Forests for the 21st Century – How Wired Forests are Changing the Way We Do Science."
- A new [video](#) highlights the **ForWarn** forest monitoring tool and how Center researchers helped water managers in Asheville, NC, investigate an unexpected forest disturbance.
- Center researchers reveal their most exciting discoveries and share their stories about becoming scientists in a new series of [scientists' cards](#) for middle school students.
- Highlights of the Eastern Threat Center's accomplishments in research, science delivery, and partnerships in 2013 are now available [online](#).
- [New Publications and Products](#) (search [Treearch](#) for all pubs and abstracts):

- **Koch, F.H.***, D. Yemshanov, and R.A. Haack. 2013. Representing uncertainty in a spatial invasion model that incorporates human-mediated dispersal. *NeoBiota* 18:173-191.

*Research ecologist **Frank Koch** served as a contributing author, manuscript reviewer, and associate editor for this [special issue](#) of *NeoBiota*.

- **Potter, K.M.** and **W.W. Hargrove**. 2013. Quantitative metrics for assessing predicted climate change pressure on North American tree species. *Mathematical and Computational Forestry & Natural Resource Sciences* 5(2):151-169.
- **Sun, G.** et al. 2013. Impacts of Global Change on Water Resources in Dryland East Asia. In Chen, J., S. Wan, G. Henebry, J. Qi, G. Gutman, **G. Sun****, and M. Kappas (eds): *Dryland East Asia: Land Dynamics amid Social and Climate Change*. HEP & DeGruyter. Chapter 8.

Research hydrologist **Ge Sun served as a co-editor and contributing author for this [book](#).



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 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) or **Stephanie Worley Firley** (sworleyfirley@fs.fed.us). USDA is an equal opportunity employer and provider.