



# Southern Forest Health Research and Management Update



Spring 2016

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## Science and Program Highlights

### Methodological Advancements Promise a Way Forward for Wood Decomposition Research

Woody debris gets attacked by a wide range of insects in forests, but measuring the importance of these organisms to wood decomposition is no easy task. A key challenge is experimentally excluding insects without unintentionally affecting microbial activity. In two recent articles, research entomologist **Michael Ulyshen** (SRS 4552) and his collaborators describe methods for overcoming this major source of uncertainty in decomposition research. In the first paper, to be published in *Basic and Applied Ecology* (doi:10.1016/j.baae.2016.03.001), Ulyshen worked with graduate student Allison Stoklosa at Mississippi State University to test a novel approach for measuring how mesh bags affect wood decomposition relative to unenclosed wood. They found that wood placed in mesh bags decomposed significantly faster than unenclosed wood that also experienced no insect activity, and that using mesh bags to exclude insects is likely to underestimate the effect of these organisms on decomposition.

In the second paper, in press in *Applied Soil Ecology*, Ulyshen and his co-authors used open pans to exclude termites from wood instead of mesh bags. The pans had screened bottoms that were either completely closed to exclude termites or had openings cut into them to permit termite access (Fig. 1). Because the pans were open from above, there were no differences in microclimate among treatments, and the closed pans were successful at excluding termites over the 20-month study period. Researchers recently installed a long-term decomposition study using the same pan design. This approach should allow the contributions of termites to wood decomposition to be measured over almost the entire process without the confounding effects of altered microclimate. For more information, contact Michael Ulyshen ([mulyshen@fs.fed.us](mailto:mulyshen@fs.fed.us)).

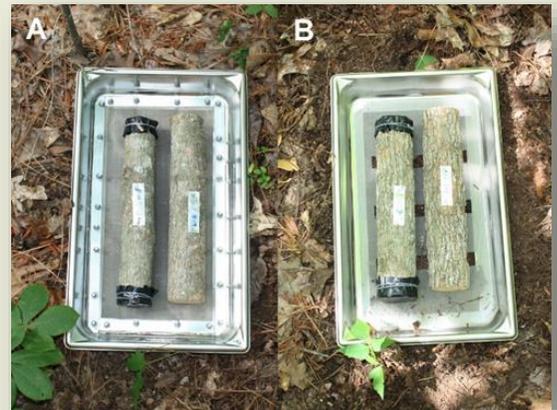
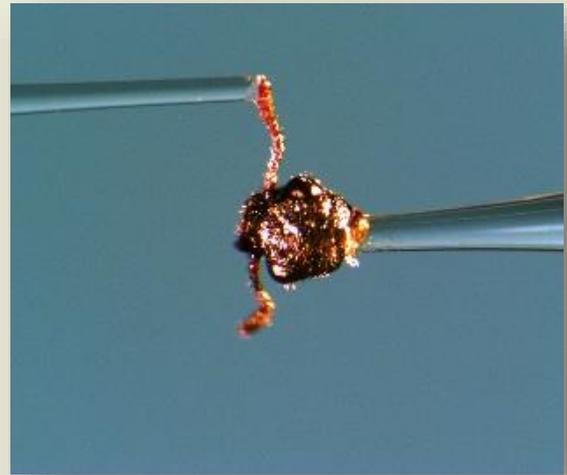


Fig. 1. Open-topped pans designed to exclude termites from decomposing wood (A) without altering the microclimate relative to similar pans permitting termite access (B)

## Hemlock woolly adelgid predators sensitive to certain tree odors

The predator beetle *Laricobius nigrinus* has been released in the eastern U.S. to help control populations of the hemlock woolly adelgid, an invasive tree-killing insect. Recent work by SRS 4552 entomologist **Will Shepherd** and others provides additional evidence that these beetles use their antennae to “smell” airborne compounds produced by hemlock trees. The study demonstrated that *L. nigrinus* antennae were responsive to several conifer-produced compounds, particularly nonanal and myrcene in aerated foliage samples. These compounds may influence the prey-finding efficiency of *Laricobius* predators. Results are published in the Journal of Entomological Science (<http://www.treesearch.fs.fed.us/pubs/50264>). For more information, contact Will Shepherd [williamshepherd@fs.fed.us](mailto:williamshepherd@fs.fed.us).



*Head of a *Laricobius nigrinus* predator beetle mounted on electrodes used to detect antennal responses to volatile compounds. Photo by Will Shepherd*

## German scientist Sebastian Seibold visits the Southern Research Station



*Sebastian Seibold in front of a plot installed in South Carolina for his global decomposition experiment*

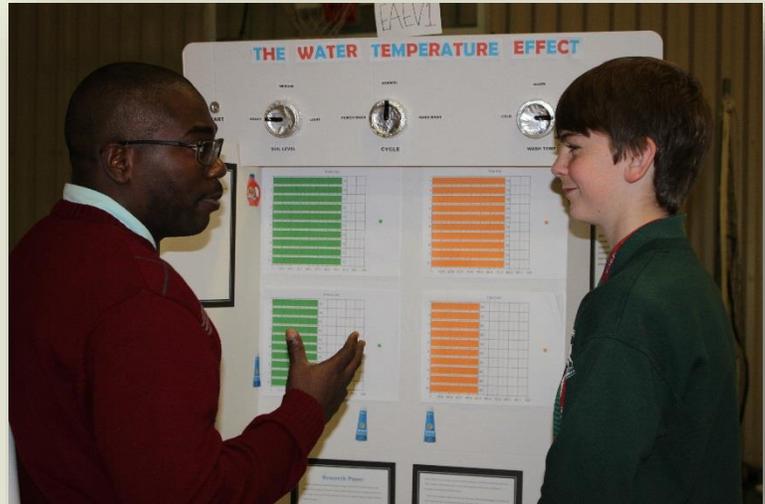
The Insects, Diseases, and Invasive Plants unit at Athens, GA is hosting Dr. **Sebastian Seibold**, a visiting scientist from Germany, from mid-February until late April. Dr. Seibold received his Ph.D. from Technische Universität München (Technical University of Munich) last year and is currently travelling abroad on a fellowship through the German Academic Exchange Service. Dr. Seibold shares an overlapping interest in environmental science and forest ecology with SRS Research Entomologist **Michael Ulyshen**, so they began collaborating on papers through email in 2014. The two have now met and are able to work side by side thanks to the Forest Service’s International Visitor Program (IVP) and Dr. Seibold’s fellowship.

During his visit, Seibold will be working with Ulyshen on a number of projects concerning the diversity of insects in dead wood and the roles these organisms play in wood decomposition and nutrient cycling. They are also working on a collaborative project to be presented at the International Congress of Entomology. After his stay in Athens, Seibold will move on to the University of Toronto to complete his fellowship. Dr. Seibold is grateful to the Forest Service’s IVP and the German Academic Exchange Service fellowship for paving the way for his first visit to the southeastern United States.

## In The News

### Scientists Lend Expertise in Judging Local Science Fairs

Staff from Unit 4552 in Pineville, LA, and Forest Health Protection (FHP), Alexandria Field Office, assisted two area schools by providing science fair judges. **Rabiu Olatinwo, Will Shepherd, Brian Strom, Jessica McKenney, and Stacy Blomquist** from Unit 4552, along with **Jaesoon Hwang, Wood Johnson, Alex Mangini, Jim Meeker, and James Smith** from FHP judged Junior High students' science fair projects in categories such as animal science, chemistry, cellular and molecular biology, microbiology, plant science, and physics just to name a few.



*Dr. Rabiu Olatinwo discusses a science project with a local student.*

Local science teachers have difficulty identifying science fair judges with a good understanding of the scientific process and a willingness to share their expertise. With true appreciation for the scientific soundness and creativity of local science fair projects, these employees filled this gap and also provided memorable “scientist-to-scientist” experience to the aspiring chemists, biologists, and engineers of the future.

### Forest Health Committee Hold its First Winter Meeting in Nashville



*The SGSF Forest Health Committee in downtown Nashville during the 2016 Winter Meeting.*

The former Forest Health Task Force was elevated to an official committee within the Southern Group of State Foresters in 2015. The state forest health coordinators and FHP staff convened in Nashville, January 11-14, 2016 for the first official meeting as a committee. Organizers capitalized on the opportunity to conduct much needed orientation for the new state forest health coordinators (TN, KY, AR, TX, VA, SC, LA) and conduct basic programmatic training from FHP. The remainder of the week was spent addressing the 2016 Forest Health Committee work plan, sharing success stories, and developing strategies to further forest health programs as a region.

## Boy Scout wins honors at NC State Science Fair with SRS Partner Project

**William David**, a 7th Grader at Asheville Catholic School, won the Environmental Protection Agency Award for Promoting Sustainability at the 2016 North Carolina Science and Engineering Fair on April 1-2 in Raleigh, N.C. Williams began his project titled “In Search of Invaders: Walnut Twig Beetle Detection Trapping on Glenn’s Creek Greenway” last summer with SRS research entomologist **Bud Mayfield** and biological science technician **Bryan Mudder**. William set out funnel traps along a greenway to determine whether an invasive species, the walnut twig beetle, had invaded the trees. Fortunately, no walnut twig beetles were found during the survey. In addition to looking for the walnut twig beetle, William also identified and counted all of the bark and ambrosia beetle species he collected in the traps, and evaluated two different lure treatments. For more information, please contact Bud Mayfield at [amayfield02@fs.fed.us](mailto:amayfield02@fs.fed.us)



*William David helps SRS Scientist Bud Mayfield hang walnut twig beetle traps.*

## Staff Changes

### Linda Cortes details as Program Support Assistant for RWU-4552



RWU 4552 is extremely fortunate to have Linda Cortes detailing as the Program Support Assistant for RWU-4552 in Asheville from March – May 2016. Linda has provided excellent and invaluable assistance this spring with budget, purchasing, agreements, travel, and numerous other duties. Linda has been in government service for 32 years, most recently as an Office Automation Assistant with SRS Office Services at the Asheville headquarters. Welcome and thank you, Linda!

### Jim Morrow hired as Program Support Assistant for RWU-4552

SRS 4552 is pleased to announce that Jim Morrow has accepted a permanent job offer as the new Program Support Assistant for our unit and is scheduled to begin on May 16. Jim will be located in Asheville and will provide administrative support to employees in Asheville, Pineville and Athens. Jim has been with the Forest Service for 23+ years in Business Operations and will be transitioning to SRS 4552 from his current position as Office Automation Assistant with Office Services. Welcome and congratulations, Jim!



# Technology Transfer

## Publications (in print/press):

1. Audley, J., A. E. Mayfield III, S. W. Myers, A. Taylor, W. E. Klingeman III. 2016. **Phytosanitation methods influence posttreatment colonization of *Juglans nigra* logs by *Pityophthorus juglandis* (Coleoptera: Curculionidae: Scolytinae).** Journal of Economic Entomology 109: 213-221.
2. Case, A.E., A.E. Mayfield, S.L. Clark, S.E. Schlarbaum, B.C. Reynolds. 2016. **Abundance and frequency of Asiatic oak weevil (Coleoptera: Curculionidae) and associated defoliation on American, Chinese, and hybrid chestnut (*Castanea*).** Journal of Insect Science 16(1): 29; 1–8. doi: 10.1093/jisesa/iew012.
3. Cram, Michelle M., Stephen W. Fraedrich. 2015. **Inoculation of fumigated nursery beds and containers with arbuscular mycorrhizal products for eastern redcedar production.** Tree Planters' Notes 58 (2): 33-39.
4. Hanula, J.L., A.E. Mayfield, III, L.S. Reid, and S. Horn. 2016. **Influence of trap distance from a source population and multiple traps on captures and attack densities of the redbay ambrosia beetle (Coleoptera: Curculionidae: Scolytinae).** Journal of Economic Entomology (in press). doi: 10.1093/jee/tow068.
5. Hanula, J.L., M.D. Ulyshen, S. Horn. 2016. **Pollinator-friendly best management practices for North American pollinators: Thinning, understory shrub control, and removing invasive species.** Natural Areas Journal (in press).
6. Menard, R.D., S.R. Clarke, S.W. Fraedrich, T.C. Harrington. 2016. **First Report of Laurel Wilt, Caused by *Raffaelea lauricola*, on Redbay (*Persea borbonia*) in Texas.** Plant Disease (in press).
7. Miller D.R., J.D. Allison, C.M. Crowe, D. Dickinson, R.W. Hofstetter, A.S. Munson, T.M. Poland, L. Reid, B.E. Steed, J.D. Sweeney. 2016. **Pine sawyers (Coleoptera: Cerambycidae) attracted to  $\alpha$ -pinene, monochamol and ipsenol in North America.** J. Econ. Entomol. (in press).
8. Nino-Dominquez, Alicia, Brian T. Sullivan, Jose H. Lopez-Urbina, and Jorge E. Macias-Samano. 2016. **Responses by *Dendroctonus frontalis* and *Dendroctonus mesoamericanus* (Coleoptera: Curculionidae) to semiochemical lures in Chiapas, Mexico: possible roles of pheromones during joint host attacks.** Journal of Economic Entomology 109(2): 724-731.
9. Pureswaran, Deepa S., Richard W. Hofstetter, Brian T. Sullivan, Kristen A. Potter. 2016. **The role of multimodal signals in species recognition between tree-killing bark beetles in a narrow sympatric zone.** Environmental Entomology. doi: <http://dx.doi.org/10.1093/ee/nvw022>.
10. Seybold, S., C. Bässler, R. Brandl, B. Büche, A. Szallies, S. Thorn, M.D. Ulyshen, J. Müller. 2016. **Microclimate and habitat heterogeneity as the major driver of beetle biodiversity in dead wood.** J. of Applied Ecol. (in press).
11. Stoklosa, A.M., M.D. Ulyshen, Z. Fan, M. Varner, S. Seibold, J. Müller. 2016. **Effects of mesh bag enclosure and termites on fine woody debris decomposition in a subtropical forest.** Basic and Applied Ecology (in press).
12. Strom, B.L., J.R. Meeker, J. Bishir, J.H. Roberds, X. Wan. **Southern pine beetle in loblolly pine: simulating within stand interactions using the process model SPBLOBTHIN.** In: Schweitzer, Callie J.; Clattberbuck, Wayne K.,; Oswald, Christopher M., eds. 2016 Proceedings of the 18<sup>th</sup> Biennial Southern Silvicultural Research Conference, Gen. Tech. Rep. SRS-212, Asheville, NC, USDA FS, Southern Research Station, p 293 – 301.
13. Sullivan, B.T. 2016. **Semiochemicals in the natural history of southern pine beetle *Dendroctonus frontalis* Zimmermann and their role in pest management.** Advances in Insect Physiology. Doi: 10.1016/bs.aip.2015.12.002 (in press).
14. Ulyshen, M.D., S. Seibold, J. Muller. 2016. **Bark coverage and insects affect rates of wood decomposition in a subtropical forest.** Applied Soil Ecology (in press).
15. Wyka, Stephen A., Joseph J. Docola, Brian L. Strom, Sheri L. Smith, Douglas W. McPherson, Srdan G. Acimovic, Kier D. Klepzig. 2016. **Effects of *Grosmannia clavigera* and *Leptographium longiclavatum* on western white pine seedlings and the fungicidal activity of Alamo<sup>®</sup>, Arbotect<sup>®</sup>, and TREE-age<sup>®</sup>.** Arboriculture & Urban Forestry 42(2): 84-94.

## Submitted Publications (accepted/in review):

1. Audley, J., A. Taylor, W.E. Klingeman, A.E. Mayfield, S.W. Myers (in review). **Insecticide dip treatments to prevent walnut twig beetle colonization of black walnut logs.** Forest Products Journal.
2. Ulyshen, M.D., S.V. Diehl, D. Jeremic. 2016. **Termites and flooding affect microbial communities in decomposing wood.**

## Presentations and Lectures:

1. Fraedrich, S.W. 2016. **Laurel Wilt.** Forest Health and Protection, School of Forestry and Natural Resources, University of Georgia, Athens, GA, March 2016 (invited lecture).
2. Heminger A., A. Mayfield, G. Wiggins, J. Grant, J. Elkinton, T. McAvoy, A. Tait, J. Lombardo, B. Mudder, S. Salom. 2016. **Impact assessment of *Laricobius nigrinus* (Coleoptera: Derodontidae), a predator of hemlock woolly adelgid, *Adelges tsugae* (Hemiptera: Adelgidae).** Invited presentation to HWA Biological Control Working Group, 12 Jan 2016, Annapolis, MD.
3. Horn, S., J.L. Hanula. 2016. **Pollinator recovery after privet control. “Open the Garden Gate to Pollinators”**— Coastal Georgia Cooperative Invasive Species Management Area Annual Meeting, Richmond Hill, GA. January 21, 2016 (invited presentation).
4. Lapham, M., C.F. Miniat, A. Mayfield, R. Jetton, D. Zietlow, S.T. Brantley, R. Rhea. 2016. **Shade and Infestation Affect Eastern Hemlock Nutrient Content.** Poster presented at N.C. HWA Bio-Control Forum, 25 Feb 2016, Montreat, N.C.
5. Lapham, M., C.F. Miniat, A. Mayfield, R. Jetton, D. Zietlow, S.T. Brantley, R. Rhea. 2016. **Shade and hemlock woolly adelgid (HWA) infestation affect Eastern Hemlock (*Tsuga canadensis*) nutrient content.** Presented at the 25th Annual Southern Appalachian Forest Entomologist/Pathologist Seminar on 4 Mar 2016, Crossnore N.C.
6. Lucardi, R.D. 2016. **Cogongrass (*Imperata cylindrica*): the South’s most wanted weed,** Coweeta Hydrologic Laboratory (USFS) and Coweeta LTER (UGA). January 2016. Otto, NC (invited presentation).
7. Lucardi, R.D. 2016. **Increasing the accuracy and efficacy of Federal Noxious Weed interceptions at our nation’s ports,** 27th USDA Interagency Research Forum on Invasive Species, January 2016, Annapolis, MD (presentation).
8. Mayfield, A., J. Audley, A. Taylor, R. Camp, B. Klingeman, L. Castrillo, J. Vandenberg, M. Griggs, S. Myers, P. Merten, S. Fraedrich, B. Mudder A. Tait. 2016. **Evaluating Potential Management Tools for the Walnut Twig Beetle.** Southern Appalachian Forest Entomologist/Pathologist Seminar, 4 Mar 2016, Crossnore, NC.
9. Mayfield, A.E. III, B.C. Reynolds, C.I. Coats, N.P. Havill, C. Brownie, A.R. Tait, J.L. Hanula, S.V. Joseph, and A.B. Galloway. 2016. **Establishment, hybridization and impact of *Laricobius* predators on insecticide-treated hemlocks: exploring integrated management of the hemlock woolly adelgid.** Presented at N.C. HWA Bio-Control Forum on 25 Feb 2016, Montreat, N.C.
10. Miller D. 2016. **Factors affecting trap catches of pine sawyers (*Monochamus* species).** 27th USDA Interagency Research Forum on Invasive Species, Annapolis MD (presentation).
11. Miller D.R., C.M. Crowe, M.D. Ginzler, C.M. Ranger, P.B. Schultz. 2016. **Comparing bottle traps to multiple-funnel traps for ambrosia beetles.** 27th USDA Interagency Research Forum on Invasive Species, Annapolis MD (poster).
12. Miniat, C.F., K.J. Elliott, T. Cofer, P. Clinton, S.T. Brantley, D. Zietlow, R. Jetton, M. Lapham, A. Mayfield, R. Rhea, P.V. Bolstad, W.T. Swank, J.M. Vose. **Hemlock Research at Coweeta.** Invited seminar presented at the North Carolina Hemlock Woolly Adelgid (HWA) Biological Control Forum, 24 Feb 24 2016, Montreat, NC (presented by Miniat).
13. Motley, K., N. Havill, D.W. Ross, A. Mayfield, K. Wallin. 2016. **Assessing the potential of two species of silver fly, *Leucopis argenticollis* and *Leucopis piniperda*, as biological control agents of hemlock woolly adelgid, *Adelges***

**tsugae, in the eastern U.S.** 27th USDA Interagency Research Forum on Invasive Species, 12-15 Jan 2016, Annapolis, MD (poster).

14. Ross, D.W., A.L. Arsenault, N. Havill, A. Mayfield, K.F. Wallin, M. Whitmore. 2016. **First releases of western US silver flies (*Diptera: Chamaemyiidae*) for biological control of hemlock woolly adelgid in the East.** 27th USDA Interagency Research Forum on Invasive Species, 12-15 Jan 2016, Annapolis, MD (poster).
15. Sumpter, K., S. Salom, B. Carlyle, A. Mayfield III, T. Anderson, T. McAvoy. 2016. **Evaluating a potential area-wide IPM strategy for managing hemlock woolly adelgid in the eastern United States.** HWA Biological Control Working Group, 12 Jan 2016, Annapolis, MD.
16. Sweeney J., P. Silk, R. Webster, C. Hughes, P. Mayo, J. Gutowski, T. Mokrzycki, D. Miller, K. Ryall, M. Quinfan, L. Yan, J. Francese. 2016. **Effect of trap color, trap height and lure on detection of potentially invasive bark and wood boring beetles.** 27th USDA Interagency Research Forum on Invasive Species, Annapolis MD.
17. Whitney, T.D., R.D. Lucardi, K.J.K. Gandhi. 2016. **Range-wide dieback of eastern white pine: overview, likely drivers, and future work,** Annual Meeting of the Northeastern Forest Pest Council. March 2016. Kingston, ON, Canada (invited presentation).

### Other Tech Transfer:

1. Blomquist, Stacy, Jess McKenney, Rab Olatinwo, and Will Shepherd. Menard HS Science Fair Judges, Alexandria, LA, January 26, 2016.
2. Williams, Mary. Facilitator's Training; A Project Wet, Project Wild and Project Learning Tree workshop, Mansfield, GA at Charlie Elliot Wildlife Center, March 14-15, 2016.

USDA Forest Service  
Forest Health Protection, Southern Region:  
<http://www.fs.usda.gov/main/r8/forest-grasslandhealth>

Southern Research Station  
RWU 4552: Insects, Diseases and Invasive Plants of Southern Forests:  
<http://www.srs.fs.usda.gov/idip/index.html>

