

45TH ANNUAL SAF / SFRC

SPRING SYMPOSIUM

GET PROACTIVE IN THE AGE OF DISTURBANCE



UF | IFAS
UNIVERSITY of FLORIDA

SFRC  **FLORIDA
SOCIETY OF
AMERICAN
FORESTERS**

May 2-3, 2018

Roland T. Stern Learning Center
at the
University of Florida
Austin Cary Forest Campus

We greatly appreciate the support of our Sponsors and Exhibitors

Gold Sponsors



Southern Forestry Consultants, Inc.



Silver Sponsor



Bronze Sponsor



Exhibitors





WELCOME and **THANK YOU** for joining us for the 45th SAF / SFRC Spring Symposium.

Sponsored by the **UF/IFAS School of Forest Resources and Conservation** and **Florida Division Society of American Foresters**, this year's Symposium is exploring the range of disturbances that are affecting forest health and management, and some of the proactive steps we can take to address these growing challenges. Agenda topics include: an update on breeding efforts to improve disease resistance, the role of prescribed fire in controlling or spreading invasive plants, current and future insect challenges, proactive management for extreme drought, spatial analysis strategies, and more.

Our **Sponsors and Exhibitors** are of tremendous importance in making this event possible. Please take some time to visit with them today and thank them for their support.

This event is a big team effort. A big thanks goes to everyone on the program committee that helped in the planning and/or preparation of the Symposium: Damian Adams, Michael Andreu, Terrell "Red" Baker, Kim Burch, Paloma Carton de Grammont, Eric Hoyer, John Holzaepfel, Kari Hurst, Dave Lewis, Mark Milligan, Pat Minogue, Sarah Negley, Scott Sager, and Kim Scotto.

This event, including the optional activities on the afternoon of May 3, has been approved for a total of **8.0 Category 1 SAF Continuing Forestry Education Credits**. Make sure you sign the CFE sign-in sheets for the sessions you attend.

Presentations will be linked at http://sfrc.ufl.edu/extension/spring_symposium.html

Sincerely,

A handwritten signature in blue ink that reads "Christopher M. Demers".

Chris Demers
Spring Symposium Chair
cdemers@ufl.edu
(352) 846-2375

A handwritten signature in blue ink that reads "Jib Davidson".

Jib Davidson
Florida Division SAF Chair
jib@columbiatimber.com
(352) 375-1473



45th Spring Symposium

- AGENDA -

Sponsored by the UF/IFAS School of Forest Resources and Conservation
and the Florida Division Society of American Foresters

May 2-3, 2018

"Get Proactive in the Age of Disturbance"

The Stern Learning Center at the University of Florida Austin Cary Forest Campus
10625 NE Waldo Road, Gainesville, FL 32609

Wednesday May 2 – Full Day Session

7:00 – 8:00 am	Exhibitor Setup
8:00 am – 5:00 pm	Registration, Sign in (Patio Entrance)
8:00 – 8:45 am	Association of Consulting Foresters Business Meeting , Mark Milligan, F4Tech
Sponsor Exhibits	Chairs: Kari Hurst and Eric Hoyer, Natural Resource Planning Services
8:00 am	Continental breakfast, exhibits, and networking (Annex and Deck)
9:00	Opening , Chris Demers, Spring Symposium Chair, UF/IFAS School of Forest Resources and Conservation (SFRC); Jib Davidson, Chair, Florida Division Society of American Foresters; and Terrell "Red" Baker, Director, SFRC Welcome, and update from the School of Forest Resources and Conservation
9:15	Dave Lewis, President, Society of American Foresters "Update on SAF and the Forestry Profession"
9:50	Break
10:10	Session 1 , Moderator: Chris Demers
10:20	Paloma Carton de Grammont, ProForest Program Coordinator, SFRC "The ProForest Initiative: fostering proactive strategies to address forest health"
11:00	Jason Smith, Associate Professor, SFRC "Working to save the Lauracea family and the Florida Torreya"
11:45	Lunch
12:30 pm	Sponsor Recognition , Kari Hurst and Eric Hoyer

Wednesday May 2 – Continued

12:45 pm	Session 2 , Moderator: Mark Milligan, F4 Tech
12:55	Eben Broadbent, Assistant Professor, SFRC <i>“Drone-borne LiDAR and hyperspectral imaging to monitor forest health: the GatorEye Unmanned Flying Laboratory case study”</i>
1:35	Paul Klockow, graduate student, Texas A&M University and Jason Vogel, Assistant Professor, SFRC <i>“Forest management and extreme drought: Lessons learned from a Texas disaster”</i>
2:15	Alan Long, Administrative Director, Southern Fire Exchange <i>“Prescribed fire: countering or contributing to invasive species and other forest disturbances?”</i>

2:55 **Refreshment Break**

3:15	Session 3 , Moderator: Paloma Carton de Grammont
3:20	Jeffrey Eickwort, Forest Biologist Supervisor, Florida Forest Service <i>“Southern pine beetle outbreaks: why the downward trend?”</i>
4:00	Jiri Hulcr, Assistant Professor, SFRC <i>“Ambrosia beetles on the radar”</i>
4:40	Jeffrey Eickwort <i>“Lurking at our doorstep: Emerald ash borer”</i>

5:30 **Social Hour on Deck**

6:30 **Barbeque Dinner by Hills BBQ**

Thursday May 3 – Half Day Session

7:30 am	Continental Breakfast at the Stern Learning Center
8:30	FL SAF Business Meeting , Jib Davidson, Chair, Florida Division Society of American Foresters
9:10	Session 4 , Moderator: Chris Demers
9:20	Deah Lieurance, Research & Development Manager, UF/IFAS Center for Aquatic and Invasive Plants <i>“Using the IFAS Assessment to evaluate the invasion risk of non-native species”</i>
10:00	Gary Peter, Professor, SFRC <i>“Breeding efforts to improve disease resistance in southern pines”</i>
10:40	Damian Adams, Associate Professor, SFRC <i>“Economic impacts of forest threats”</i>
11:20	Conclusion, Evaluation, CFEs

Thursday May 3 – Optional Afternoon Activities

11:30 am	Get box lunches
11:45	<p>Vans Depart for Field Trip from Austin Cary Forest. Leaders: Jib Davidson, Mark Milligan, John Holzaepfel, Jason Smith, Jiri Hulcr, and Jeff Eickwort.</p> <p>Participants will visit Rayonier properties in Alachua County to look at and discuss intensively managed loblolly pine stands affected by pitch canker on flatwoods sites. Other topics of discussion will include forest insects affecting production and genetic improvements. Approved for 3.0 Cat 1 CFEs.</p>
12:00 pm	<p>Forestry Herbicide Training begins</p> <p>Agenda:</p> <p>12:00-12:50 Herbicide hazard, labels, safety, PPE, Stacey Strickland, UF/IFAS Osceola County Extension</p> <p>1:00-1:50 Forestry herbicide technology for site prep, seedling release, mid-rotation, Clark Boyd, NuFarm</p> <p>2:00-2:50 Application and calibration techniques, Clark Boyd</p> <p>3:00 Conclusion, Evaluation, CFEs, CEUs</p> <p>Approved for a total of 3.0 Cat. 1 SAF CFEs and 3.0 FDACS CEUs: 1.5 Forest Pest Control, 1.5 Natural Areas Weed Mgmt, 1.5 487 General Standards Core, 1.5 482 General Standards</p>
3:00	Vans return, CEU Training concludes CFEs, CEUs, Adjourn

Program Committee: Damian Adams, Michael Andreu, Terrell “Red” Baker, Kim Burch, Paloma Carton de Lara, Jib Davidson, Eric Hoyer, John Holzaepfel, Kari Hurst, Dave Lewis, Mark Milligan, Pat Minogue, Sarah Negley, Scott Sager, Kim Scotto, Chris Demers (chair)

The Spring Symposium, including optional events on May 3, has been approved for a total of 8.0 Category 1 SAF CFEs. Please sign the CFE sign-in sheets provided so you get credit.

Presentations will be linked at:
http://sfrc.ufl.edu/extension/spring_symposium.html

45th SAF / SFRC Spring Symposium

"Get Proactive in the Age of Disturbance"

Presenter Bios

Presentations will be available at http://sfrc.ufl.edu/extension/spring_symposium.html

Damian Adams

Associate Professor
UF/IFAS School of Forest Resources and Conservation
dcadams@ufl.edu
(352) 846-0872

Damian Adams is Associate Professor of Natural Resource Economics and Policy in the School of Forest Resources & Conservation, at the University of Florida. His expertise is in economics and policy of natural resources. Adams' research has focused on understanding the critical role that forests play in the broader socioecological system, and optimal policy approaches for conserving forestlands. Using valuation techniques, he and his team seek to fill important knowledge gaps on economic value and feasible policy solutions regarding carbon sequestration, invasive species management, and water resource protection in both working and natural systems. He currently serves as co-director of the ProForest (Proactive Forest Health and Resilience) initiative, as co-director of CFEOR (Conserved Forest Ecosystems: Outreach and Research), and as an editor of the journal *Forests*.

Clark Boyd

Vegetation Management Lead, Southeast
NuFarm
clark.boyd@us.nufarm.com
(770) 719-8180

Clark is the Vegetation Management Lead for the Southeastern U.S. for NuFarm Limited. Established in Australia, Nufarm is one of the world's leading crop protection and seed companies. They produce products to help farmers protect their crops against damage caused by weeds, pests and disease.

Eben N. Broadbent

Assistant Professor
UF/IFAS School of Forest Resources and Conservation
eben@ufl.edu
(352) 392-4995

Eben is an assistant professor of forest ecology and geomatics at SFRC, where he co-directs the Spatial Ecology and Conservation Lab and the GatorEye Unmanned Flying Laboratory Project with Dr. Almeyda Zambrano. Eben is also an affiliated researcher with the Woods Institute for the Environment at Stanford University.

Jeffrey Eickwort

Forest Biologist Supervisor
Florida Forest Service
jeffrey.eickwort@freshfromflorida.com
(352) 395-4689

Jeff is the forest entomologist and supervisor of the Forest Health Section of the Florida Forest Service, where he has worked since 2004. This part of the agency is responsible for technical assistance, survey and monitoring, and public outreach regarding pests, diseases, and invasive plants that affect Florida's trees and forests.

Paloma Carton de Grammont

ProForest Program Coordinator
UF/IFAS School of Forest Resources and Conservation
palomacgl@ufl.edu
(352) 846-0804

Paloma manages the ProForest project, a multi-institutional initiative that brings together specialists from diverse fields in order to promote forest health and resilience through collaborative research, extension and education.

Jiri Hulcr

Assistant Professor
UF/IFAS School of Forest Resources and Conservation
hulcr@ufl.edu
(352) 273-0299

Jiri joined the School in 2012 as our resident Forest Entomologist. He studies the ambrosia symbiotic complex of beetles, fungi, and bacteria. He addresses the most fundamental questions about the evolutionary origin of this fungus-farming symbiosis, and the chemistry

that makes it function, but also how the tree-killing symbiosis is impacting trees, forests, and people.

Paul Klockow

Graduate student
Texas A&M University
pklockow@tamu.edu

Paul earned his MS from the University of Minnesota in Natural Resources Science and Management with an emphasis in silviculture/applied forest ecology. His MS work centered on understanding the impacts of harvest intensity on downed woody debris and nutrient dynamics in aspen systems of northern Minnesota. His PhD research at Texas A&M University includes understanding the impacts of extreme drought in south central US forests and subsequent coarse woody debris decomposition dynamics. He is utilizing various tools to conduct his research including Bayesian analysis and terrestrial LiDAR.

David Lewis

President
Society of American Foresters
(850) 997-6254
dlewis@southernforestry.net

Dave is the current President of the Society of American Foresters (SAF). SAF is a national organization that represents and serves over 11,000 forestry professionals in the United States. He previously served on SAF's Board from 2012 to 2014 as the District 10 representative, which encompasses Alabama, Florida, and Georgia. Additionally, Lewis has held numerous state, local, and regional offices for SAF and is an SAF Fellow. He is Vice President and a principal of Southern Forestry Consultants, Inc., a full-service forestry consulting firm founded in 1987 with offices in Enterprise, Alabama; Bainbridge, Georgia; and Monticello, Florida.

Deah Lieurance

Assistant Extension Scientist
UF/IFAS Center for Aquatic and Invasive Plants
dmlieurance@ufl.edu
(352) 294-1580

Deah manages the UF/IFAS Assessment of Non-native Plants in Florida's Natural Areas. This resource uses literature-based assessment tools to evaluate the invasion risk of non-native species that occur in the state, new species proposed for introduction, and novel agricultural and horticultural selections, hybrids, and cultivars. The overarching goal is to reduce non-native

plant invasions in Florida and throughout the Southeast US for protection of natural and agricultural areas.

Alan J. Long

Administrative Director
Southern Fire Exchange
Professor Emeritus, University of Florida
ajl2@ufl.edu

Alan retired from SFRC in 2010 but he remains active in a number of fire-related research and extension/science delivery projects. He is currently an administrator of the Southern Fire Exchange, where he works with numerous partners throughout the region to increase the use of available fire science, facilitates discussions about the relevance of research results and future research needs, and connects fire managers and researchers.

Gary Peter

Professor
UF/IFAS School of Forest Resources and Conservation
gfpeter@ufl.edu
(352) 846-0896

Gary joined SFRC in 2002 with teaching and research responsibilities in forest genomics and biotechnology. He uses a wide range of approaches to elucidate the genetic and molecular mechanisms that control stem growth, wood properties and to understand the ecological adaptations and the evolution of xylem structure and function in forest trees. In addition to this fundamental research, he leads a commercial breeding program for southern pines with the Cooperative Forest Genetics Research Program. He is co-director of the Forest Biology Research Consortium whose objectives are to understand the mechanisms that control planted pine forest ecosystem productivity, health and sustainability. Current projects include adapting planted pine forests to changes in climate and developing high terpene pines for renewable chemicals and biofuels.

Jason Smith

Associate Professor
UF/IFAS School of Forest Resources and Conservation
jasons@ufl.edu
(352) 846-0843

Jason joined SFRC in 2006. He is part of an interdisciplinary team of experts in entomology, pathology, dendrology, economics, and law; committed to use a coordinated, team approach to research and to provide outreach on emerging threats to forests.

Stacy Strickland

Director

UF/IFAS Osceola County Cooperative Extension Service

jsstrick@ufl.edu

(321) 697-3000

Stacy is the current UF/IFAS County Extension Director serving Osceola County, previously serving as the Director of Hernando and Sumter Counties simultaneously. He supervises 35 faculty and staff in the Extension Service and brings the latest agricultural techniques and technologies to Florida producers.

Jason Vogel

Assistant Professor

UF/IFAS School of Forest Resources and Conservation

jvogel@ufl.edu

(352) 846-0879

Jason's research group studies forest nutrient cycling, structure, and growth. They are interested in how resilient these forest processes and attributes are as they respond to climate change, disturbance, and management decisions. The team investigates how silviculture can be used to restore and maintain the attributes of forests that are important to society.

45th SAF / SFRC Spring Symposium

"Get Proactive in the Age of Disturbance"

Presentation Abstracts

Presentations will be available at http://sfrc.ufl.edu/extension/spring_symposium.html

Drone-borne LiDAR and hyperspectral imaging to monitor forest health: the GatorEye Unmanned Flying Laboratory case study

Eben Broadbent

School of Forest Resources and Conservation, University of Florida

Forest health varies spatially in extent and resolution, from continental scale processes to leaf level dynamics, and temporally, from short term water stress to long term changes in disturbance dynamics. The ability to measure and monitor these health related processes is unique to the type of platform and sensor used. The age of satellites began in earnest with the launch of Landsat, and now 30 years later our understanding of local to global scale processes has completely changed. Simultaneously, an age of ground and tower based sensors began – and is ongoing, as demonstrated by NEON facilities across the continent, provided a suite of bioclimatic variables at temporal resolution down to the second and continually now for decades. We are now entering the dawn of the drone age, with these systems building off the datasets provided by satellites and towers, but completing a previously vacant spatial and temporal niche – effectively linking field based measurements to aircraft to satellites. For the first time, and cost effectively, we now measure and monitor forest processes at resolutions previously not possible from any system – providing essential data to monitor forest health and help create a complete multi-platform multi-sensor monitoring framework. Here we discuss how drones play a critical role in filling this gap, and specifically highlight the new SFRC Geomatics system, named the GatorEye Unmanned Flying Laboratory, which combines laser and hyperspectral sensors to enable structural and physiological assessment similar to those previously only feasible with aircraft born systems costing 40x more.

Forest management and extreme drought: Lessons learned from a Texas disaster.

P. Klockow, Vogel, J., Moore, G., and Edgar, C.

Texas A&M University

In 2011, the state of Texas experienced an exceptional drought covering all the state's forested areas, breaking temperature and precipitation records. Previous reports of this event did not examine how stand-structure (i.e., tree diameter, relative density, species composition) interacted with the drought to affect tree mortality, particularly in the important economic and

ecologic region of east Texas. To provide insight into these factors, we used U.S. Forest Service Forest Inventory and Analysis data to construct Bayesian, logistic regression models describing individual tree mortality of three major pine groups (planted and naturally-regenerated loblolly pine, *Pinus taeda*, and shortleaf pine, *Pinus echinata*) under pre-drought and drought periods for east Texas. Pine group mortality rates increased 9.8%, 20.0%, and 26.3% for planted loblolly, naturally-regenerated loblolly, and shortleaf pine, respectively, during the drought but were not significantly higher than pre-drought. Mortality rates were highest for shortleaf pine and lowest for planted loblolly. Loblolly displayed high mortality in the smallest and largest diameters, most notably in planted pine under drought, and increasing mortality with relative density. Species composition became important under drought for naturally-regenerated loblolly with higher mortality in loblolly-dominated stands. Stand structure did not explain mortality in shortleaf pine suggesting other factors (e.g., climate, soils, etc.) are more important drivers of mortality in this species. Results of these analyses provide crucial information about forest drought response in this region and support for management actions such as thinning that could mitigate mortality from future extreme droughts in loblolly pine stands.

Prescribed fire: Countering or contributing to invasive species and other forest disturbances?

Alan J. Long

Southern Fire Exchange

Prescribed fire, a disturbance itself, is also a significant proactive treatment for two major disturbances. With invasive plants, prescribed fire is seldom a controlling factor; it may be just the opposite. However, it can provide for more effective control as part of a treatment regime as will be demonstrated with some important Southeast species. Unlike invasives, the role of prescribed fire in reducing wildfire is substantial and well documented. Supporting research and significant caveats for the wildfire reduction effect will be evaluated. Prescribed fire is also a valuable proactive tool for ecosystem restoration across Florida, wildlife management, and controlling one of a forester's worst disturbances.

Breeding efforts to improve disease resistance in Southern pines

Gary Peter, Tania Quesada, Daniel Ence, Jason Smith, Salvador Gezan, Matias Kirst, John Davis
School of Forest Resources and Conservation, University of Florida

The Cooperative Forest Genetics Research Program breeds loblolly and slash pine for improved volume growth and disease resistance. Both species exhibit genetic resistance to fusiform rust, pitch canker, and stem boring insect – fungal complexes. Resistance to fusiform rust, incited by the biotrophic fungus *Cronartium quercuum* f. sp. *Fusifforme*, is controlled by major and minor genes. Major gene resistance follows the host and fungal pathogen gene-for-gene paradigm, where host *Fr* genes interact with fungal avirulence genes. In loblolly pine, we recently mapped single nucleotide polymorphisms (SNP) near two major resistance genes and two other SNPs to linkage groups not previously shown to contain *Fr* genes. We continue to map additional *Fr* genes using genomic approaches in loblolly pine. Breeding in loblolly and slash pine can use

this information in the future for marker-assisted selection, in addition to our current field-based scores for rust resistance.

Pitch canker, incited by the necrotrophic fungus, *Fusarium circinatum*, is particularly important in slash pine, as this species is highly susceptible. We showed that resistance is inherited as a complex or quantitative trait. Due to the episodic nature of outbreaks, the US Forest Service Resistance Screening Center (RSC) performs routine screening tests for selection of seedlings tolerant to pitch canker disease. Inoculation tests are done using RSC's own protocols and spore types under controlled conditions. Recently, we identified more virulent isolates of *Fusarium circinatum* than those typically used at the RSC. We are currently comparing isolates for improved screening using these new isolates. For resistance to stem boring insect-fungal complex, pine oleoresin is a primary chemical and physical defense system. We have shown that oleoresin flow, wood terpene content, and axial resin canal number are under genetic control. Using association genetics we have identified hundreds of SNPs in genes implicated in this complex resistance mechanism. In addition, we used genetic engineering to increase wood terpene content. Ten resinosis regulators showed significantly greater wood terpene contents compared to controls. These results support molecular breeding-based approaches to improve resistance.

Economic impacts of forest threats

Damian Adams

School of Forest Resources and Conservation, University of Florida

This talk will present Florida-specific examples of forest disturbance risks, and associated effects on economic value. Examples include analysis of the potential impact of a hypothetical bark beetle threatening pines in the Southeast U.S., the impacts of the newly discovered sweetgum inscriber beetle in China, and climate change-related disturbance risks.

We greatly appreciate the support of our Sponsors and Exhibitors

Gold Sponsors



Southern Forestry Consultants, Inc.



Silver Sponsor



Bronze Sponsor



Exhibitors

