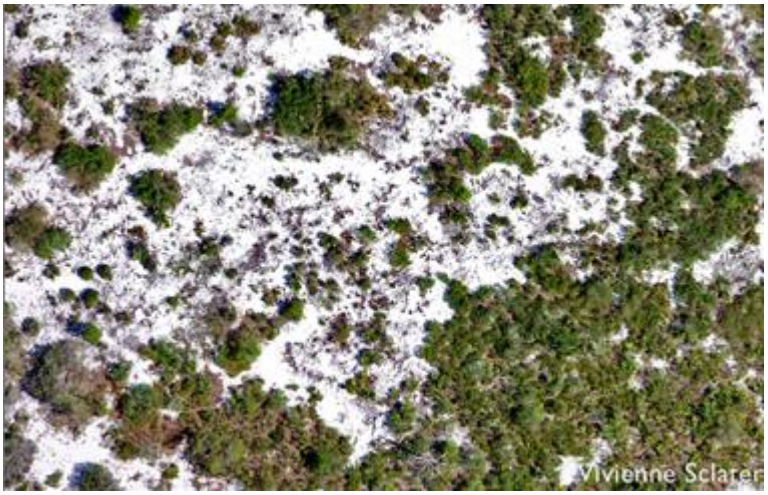
ARCHBOLD JUNE 2018 NEWS

for curious minds

In This Issue:

Minding the Gap



Aerial view of rosemary scrub showing gaps in the white sand.

Katherine Charton came to Archbold as a Plant Ecology intern in 2017 with a special interest in spatial ecology and developing technologies. With encouragement to explore her own ideas from Dr. Eric Menges, Archbold Plant Ecology Director, **Charton charted a new path forward to remotely map 'gaps' (open areas) in Florida rosemary scrub using satellite and drone technologies.** Open gaps in the otherwise shrubby vegetation of Florida rosemary scrub support many rare

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and endemic plant species, including more than 20 federally listed species. Charton shared, ‘The plant ecology program has spent countless hours in the field physically mapping gaps, so I was excited to find a new way to do this remotely with guidance from Archbold GIS Manager Vivienne Sclater. Remote mapping will save time and allow us to answer even larger, landscape level questions about plant systems.' Her initial results showed a significant correlation between her remotely-mapped and field-mapped gaps. Charton is just getting started adding, **‘My next question is how we can use the new gaps found using the drone mapping process to better understand where species are found and why they are found there.’**

The Chemical Ecology of Laurel Wilt

Female Redbay Ambrosia Beetle (2 mm length).

You’ve probably heard of laurel wilt, but do you know the tiny actors behind the story? **The Redbay Ambrosia Beetle (*Xyleborus glabratus*) is the primary vector for laurel wilt**. A recent arrival from Southeast Asia, the female wood-boring beetle transfers spores of a fungal pathogen (*Raffaelea lauricola*) to host trees in the Lauraceae family (e.g., Redbay, Swampbay, Silkbay, Avocado). The resultant fungal gardens provide food for the beetles, but they also trigger a strong host defensive response that impedes water transport resulting in systemic wilt followed by death of the tree.

"Archbold Biological Station is one of America’s iconic centers of continuous research and education in field biology. It is a prototype of what we need all across America."
— Edward O. Wilson

After 46 years and 35 years respectively, Fred Lohrer and Mark Deyrup will be retiring from Archbold in June. A small celebration is planned.
If you would like to share best wishes, amusing stories, or other thoughts about Fred and Mark, please email Sharon Hawkins your insights by June 13!

For the past five years, Dr. Paul Kendra (USDA Research Entomologist) conducted lab and field studies at Archbold to understand the terpenoid chemical cues that attract Redbay Ambrosia Beetles to laurel trees. Describing this work here as, 'the highlight of his professional career', he has published over 30 articles on the subject. This research culminated in development of a lure highly enriched in (-)-α-copaene now being used in the USA and Mexico for early detection of this pest. 'Chemical attraction is only the initial step in a complex interaction between host tree and beetle', he reports. In a review just published in 'Open Chemistry', Kendra writes, 'Host location and acceptance by an ambrosia beetle is a multi-step process that requires perception and interpretation of a series of cues presented in proper sequence and in proper context. Further improvement of pest detection systems for the Redbay Ambrosia Beetle should be possible through novel combinations of appropriate attractant cues.'

Becoming a Researcher

Stacy Smith measuring plant regeneration after a prescribed fire in the Florida scrub.

Stacy Smith began working at Archbold 11 years ago as a Plant Ecology Research Assistant. It was her first research position after spending several years assisting restoration projects in Arizona, California, and throughout Florida. She recalls, **'Before**

The Return of the Rains

Watch this one minute video for a peek into the dramatic and beautiful onset of wet season in the amazing Florida scrub at Archbold. The rains began two weeks ago filling up the nearly 1000 seasonal ponds in the Florida scrub at Archbold. Total rainfall for May 2018 is 11.4 inches. Our record for May rainfall is 11.98 inches in 1932.

Archbold, I had never seriously considered a career in ecological research. While working on my first project here, an experimental restoration of Florida scrub, I was exposed to other aspects of ecology like plant demography, fire ecology, and reproductive biology. I went from carrying out restoration to interpreting research data and translating results into land management recommendations.' Smith made major contributions to all aspects of Archbold's many long-term plant research projects doing everything from field work to designing experiments to education and outreach. Most of all, she appreciates the sheer diversity of research projects led by Dr. Eric Menges, Archbold Plant Ecology Director. She added, 'I consider my time at Archbold pivotal in defining my future career. Here at Archbold, I became a scientist.' **Smith left Archbold a few weeks ago for a new chapter in Gainesville, FL reflecting, 'I now have an even greater appreciation for the Archbold research and conservation community being a very special place.** I came to Archbold early in my career with a variety of experiences, but none of those compared to what I gained at Archbold. I have pretty high standards for my future employer(s).'

Buck Island Ranch Ambassadors

Archbold scientists Dr. Hilary Swain, Dr. Betsey Boughton, Dr. Amartya Saha, and Vivienne Sclater meet with other LTAR network scientists in El Reno, Oklahoma.

Archbold and the University of Florida's Range Cattle Research and Education Center collectively

Check out our Youtube Videos!

sent a team of delegates to the weeklong annual meeting of the Long-Term Agroecosystem Research (LTAR) network on April 22 in El Reno, Oklahoma. 'LTAR is a national initiative by the U.S. Department of Agriculture, whose goal is to build knowledge to sustainably intensify agriculture, while minimizing or reversing environmental impact,' explains LTAR Data Manager Shefali Azad. The Archbold-University of Florida collaboration comprises one out of 18 sites in the network. With more than 130 agricultural scientists, economists, sociologists and data managers in attendance, the meeting focused on discovery, collaboration, and cross-site comparisons. For example, what emerging technology is the research team in Oklahoma using to measure methane emitted by cattle when grazing in pastures? Dr. Hilary Swain, Archbold Executive Director and LTAR Leadership committee member, said, 'We presented one poster display highlighting our Archbold-University of Florida LTAR objectives, and two collaborative research posters, one on a GPS cattle tracking system developed by University of Florida and a second poster on reviewing the ecosystem values from agricultural landscapes that benefit people. **It was a highly productive meeting to learn and share research about Florida's ranches in this national science debate.'**

Museum Day

Angela Tringali (in blue), Post-Doctoral Research Fellow in the Avian Ecology Program, shows visitors some of the bird skins kept in Archbold's

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Directions to Archbold Biological Station

Eight miles south of Lake Placid. Entrance is 1.8 miles south of SR 70 on Old SR 8.

Natural History Collection during the public tour held on International Museum Day.

Archbold was one of seven Highlands County museums and 37,000 museums across 156 countries to celebrate International Museum Day on May 18. This year's theme was 'Hyperconnected Museums: New Approaches, New Publics.' Archbold offered a free public tour of its 270,000-specimen Natural History Collection to celebrate the day. **Researchers from the Entomology, Plant Ecology, and Avian Ecology Programs introduced the visiting public to the Collection and demonstrated how they are digitizing the specimen data to make it fully accessible for anyone in the world.** Six visitors from Highlands County took advantage of a special behind-the-scenes tour of the Collection. They met with Dr. Mark Deyrup, Research Biologist in the Entomology Program, who explained, 'Our founder, Richard Archbold, started collecting species here many years ago. In the Entomology Collection, we are still working hard to identify and catalog all the bug specimens collected, because there are so many!' Making up ~250,000 of the 270,000 specimens, the bug specimens are the hub of the Natural History Collection at Archbold. Archbold's bug collection is one of the largest of any field station, offering a remarkable overview of the species at Archbold and in the surrounding region. As Archbold works to digitize its outstanding Natural History Collection, it will become part of an ever-growing community of hyperconnected museums.

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