

## CITIZEN SCIENCE

A major obstacle for many researchers is the lack of manpower needed to collect the data required for conducting scientific studies. Many of those researchers overcome this challenge by utilizing citizen science, a research collaboration between scientists and volunteers to collect and document data. By collaborating with experts, citizens can easily become involved in studies with simple instructions for specialized data-collection techniques. This allows individuals to become an active part in scientific studies while affording researchers the resources needed to collect expansive amounts of information, often over large geographical regions.

The term “citizen science” is relatively new, but its value as a research tool has been demonstrated through discoveries aided by this practice. Researchers at the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) collect citizen-driven data for diverse and impactful research affecting agricultural, environmental, and human systems. By involving the public in science, research projects become more relevant, responsive, and relatable than ever before, while infusing the passion of discovery in the individuals who participate.

NATURAL  
RESOURCES



AGRICULTURE



HUMAN  
SYSTEMS



### Ongoing Research



#### OYSTER RESTORATION

Oyster beds play a critical role in stabilizing Florida’s eroding coastlines, but these habitats are in steady decline. Todd Osborne, an assistant professor with the UF/IFAS Soil and Water Sciences Department, and his team have recruited Floridians who live on saltwater shorelines between St. Augustine and Palm Coast to help with restoration efforts. More than 100 volunteers are trained to become oyster gardeners at the UF Whitney Laboratory for Marine Bioscience. The participants then suspended cages of oysters beneath their docks, committing to measuring and reporting oyster-size and water-quality data each week for a year. Osborne is hopeful that the results of this citizen-based study will help identify long-term water quality and habitat suitability for oyster populations in northeast Florida while increasing citizens’ appreciation for oysters and the fragile ecosystems they inhabit.



#### RAINFALL MODELING

Years of experience equip agricultural growers with location-specific knowledge about rainfall. However, few growers have access to long-term regional data or projections for how climate change may affect future rainfall. Assistant research scientist Wendy-Lin Bartels, with the UF/IFAS School of Forest Resources and Conservation, coordinates the “Tristate Climate Learning Network” that regularly engages farmers to discuss climate risks. As a result, growers, Extension professionals and scientists collaboratively developed a rainfall intensity metric to examine rainfall changes over the past 30 years. Results show that in the southeast U.S., rainfall variability has increased in spring and summer, and rainfall intensity has increased in summer and fall. Growers will continue to provide information and share experiences during biannual meetings about how they are adapting their management decisions to further develop this study.



#### BACKYARD BARK BEETLES

Many beetles are vital to ecosystems by helping decompose dead wood, but some small, almost unnoticeable beetle species are incredibly destructive to forests and groves because they attack live trees. Entomologist Jiri Hulcr, an assistant professor in the UF/IFAS School of Forest Resources and Conservation, founded a program called Backyard Bark Beetles to track the distribution of several key bark and ambrosia beetle species in the U.S. by instructing participants to assemble a simple trap following an online tutorial. With the help of hundreds of citizen scientists, 36 beetle species have been identified so far, including the first report of a particular beetle in Michigan, outside its expected range. Hulcr’s continued ability to research and understand these beetles is enhanced by the evolving dataset provided by participants, who can view their contributions in an online interactive map.

## Research with Impact



### FLORIDA LAKEWATCH

Floridians want their local lakes to remain healthy, so the UF/IFAS Florida LAKEWATCH program channeled that desire into citizen-driven data collection. Founded in 1986, LAKEWATCH sought to solve water-quality problems. According to Director Mark Hoyer, dedicated staff, graduate students and more than 1,800 trained volunteers have made the program successful by regularly collecting and reporting water-related data. As a result, long-term water chemistry data and water-depth maps are available for more than 1,100 lakes, 175 coastal sites, 120 rivers, and five springs in Florida, many of which had never been monitored before this program. Volunteer-collected data have contributed to 37 research articles and helped establish critically important baseline measurements to help guide the evaluation of water-quality changes in relation to land use and climate fluctuations in critical Florida waterways.



### CROWDSOURCED DATA

Most mobile devices are equipped with GPS, that can provide vast amounts of real-time data from individual app users — a form of crowdsourced data. Henry Hochmair, an associate professor with the UF/IFAS Fort Lauderdale Research and Education Center, led a team that analyzed a variety of volunteered geographic information (VGI) data from bicyclists. Included in this VGI analysis was Strava™, a mobile app used extensively by athletes worldwide. Hochmair's team analyzed activity data from 158,000 roads in Miami-Dade County to identify factors associated with local bicycle ridership. Results showed that on-road bicycle accommodations, such as bike lanes, benefit commuter and non-commuter cyclists differently and are dependent on whether the lanes are on local or major roads. His team presented these and other findings to the Transportation Research Board as it decides the most efficient plan for bicycle infrastructure improvements.



### SCHOOL OF ANTS

Ants are found in almost every country worldwide, with more than 12,000 known species in total, so tracking them is challenging. Andrea Lucky, an assistant research scientist in the UF/IFAS Entomology and Nematology Department, enlisted the help of volunteers in the School of Ants program to capture and mail ants from their urban neighborhoods to the lab. Having such a geographically vast resource has led to discoveries such as finding the introduced Asian needle ant (*Brachyponera chinensis*), thought to be confined to southeastern U.S. forests, far from their known range in participants' backyards in the Upper Midwest and Pacific Northwest. With contributions from more than 1,000 volunteers, this extensive mapping system has been instrumental in expanding the known ranges of native species, monitoring invasive species, and discovering new species.

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