

## Worldwide Grassroots Science Initiative at Buck Island Ranch – December 15, 2017



Collaboration is the key to successful science and conservation. Most of Archbold Biological Station's research collaborations occur at local or regional scales, involving working with other scientists or institutions who can offer complementary expertise, or share facilities, resources, or study sites. Some questions, however, are best answered through larger collaborative networks. The Nutrient Network (NutNet) is bringing together grassland researchers from around the world to contribute location specific data to a multi-year planet-wide ecology experiment, and Archbold is part of the project.

Archbold's Director of Agro-ecology Research, Dr. Betsey Boughton oversees the NutNet experiment at one of Archbold's satellite offices, the MacArthur Agro-ecology Research Center (MAERC) at Buck Island Ranch. She explains, "We are participating in a grassland experiment where the same experiment is being conducted in over 60 grasslands around the globe."



The network was founded by a group of young scientists twelve years ago, who were frustrated that there had been no globally coordinated experiment to track changes in ecosystems. NutNet's strength comes from its uniform execution across multiple partner sites who volunteer to participate. Ecology is a powerful tool for describing Earth's systems of living and non-living things that we call ecosystems, but field work is site specific and so are many of its findings. For example, even if you can show that conditions in one place resulted in an observable outcome, how do you know for sure that the same is true elsewhere? NutNet's grassroots approach to collaboration solves that problem, because the same questions are being asked in different places and the results can be compared. Betsey Boughton says, "I really enjoy being in the network because I get to interact with ecologists all over the world. Sharing data with others is a fulfilling part of my job."



Archbold's Director of Agro-ecology Research, Dr. Betsey Boughton. Photo: Dustin Angell



Highlands County's grasslands support some of the highest numbers of cattle in the state. These working wildlands provide us with jobs, food, and community, as well as wildlife habitat and water management services for the state. Archbold's Education Coordinator, Dustin Angell leads swamp buggy tours at Buck Island Ranch. He says, "Florida's ranches look more like National Parks than they do most people's expectations of agricultural lands. When I give tours for people who are new to Florida's heartland, they are surprised by how beautiful the ranch landscape is. They even ask me where all the cows are. We have 3,000 head of cattle, but they have a lot of room to spread out on our grasslands and woods."



Archbold researcher Dr. Betsey Boughton collects biomass samples for a NutNet experiment. Photo: Dustin Angell

People in Florida and around the world rely on grasslands, but these ecosystems are changing due to human activities. NutNet wants to understand how land management practices like fertilizer use and grazing techniques are affecting the grassland ecosystems. Archbold is stepping up their involvement. Dr. Boughton says, "2017 was our third year in the network, but our second year of adding different combinations of nitrogen, phosphorus, and potassium fertilizer and excluding deer and rabbits from some of the plots. All plots will be exposed to occasional cattle grazing and prescribed fire every 2 or 3 years. The plots are also valuable for our research interns to conduct short-term projects. One of our current interns, Jaide Allenbrand from Kansas, is going to investigate the beneficial root fungi of the grass in the experimental plots."

Archbold Biological Station's interest in understanding and preserving Florida's ranches and their ecosystems is part of their long-term commitment to Buck Island Ranch. For nearly 30 years, Archbold has run the 10.5 thousand acre ranch as both a working cow-calf operation and a biological field station. Researchers study plants and wildlife, water and air quality, and the environmental effects of ranching practices. The ranch also hosts visiting researchers from around the country and it partners with scientists, agencies, and neighboring ranchers toward conservation goals. NutNet is an example of how collaboration is making one Highlands County ranch part of a global sustainability effort.



Archbold researcher Dr. Gregory Sonnier collects biomass samples for a NutNet experiment. Photo: Dustin Angell