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Technology in the Field

Cameras, phones, tablets and drones. What do they have in common? Now, one may think of all the different ways these devices are linked to one another. Or perhaps we can think about all of the ways these devices can be used. However, it may come as a surprise to know that all of these devices are actually used for science. At Archbold Biological Station research and fieldwork is conducted with one or a combination of these devices throughout the year.

Smartphones and tablets have the ability to download applications that are designed to perform a specific function directly for the user or another application program. Mobile data collection apps are developed from ArcGIS online (a geographic information system) for the purpose of collecting information more efficiently without losing effectiveness. ArcGIS applications allow one to create a survey full of different questions and answers that are relevant to the research conducted, regardless of network availability. Many of the different programs at Archbold Biological Station use these apps. For example, the Restoration Ecology and Herpetology Program use a Trimble, a type of handheld GPS device, to map gopher tortoise burrows and the ArcGIS app to update gopher tortoise burrow activity status. The Plant Ecology Program uses the same application for rare plant searches. The researchers at Buck Island Ranch use the app to help them navigate to sampling locations and measure plant abundance and diversity. With these new apps on smartphones and tablets, researchers can ultimately eliminate the need for pen and paper in the field.

Camera traps are also another resource many biologists use. Typically a camera trap includes a digital camera connected to an infrared sensor. Once an animal moves past this sensor, the camera will start recording an image or video to a memory card. Camera traps can be left in the field for continuous periods for weeks or even in some cases months. Camera traps provide data on exactly where species are, what they are doing and how large their populations are. They can provide a bigger picture of whole communities of species, and how they are structured and interacting over space and time. A few years ago, Archbold Biological station used camera traps on an area called Red Hill to monitor gopher tortoise burrows. During the study, researchers found that bobcats were using the burrows as hunting blinds. Check out Archbold Biological Station's Facebook page to see this in action Some of the species that are caught on camera traps include: bobcats, bears, sand hill cranes and feral hogs.

Finally yet importantly is Archbold Biological Station newest addition in new age technology- the drone. The drone or an unmanned aerial vehicle, was originally used for military purposes but recently become more commercialized. Now scientists and hobbyists alike are utilizing drones now more than ever for a variety of purposes. Archbold Biological Station's GIS and Land Management Program uses the drone to map out fires to examine how extensive they are. The drone is also used to capture and map the gaps of rosemary balds. These rosemary balds are mapped because rare plant species or "gap specialists" rely on these open spaces between the large rosemary plants to survive. Though Archbold Biological Station has only used drones for a short period of time, GIS/Data Manager Vivienne Sclater says "there are endless research possibilities looking toward the future."

Now more than ever it is easy to conduct science with technology. Even hobbyists can go out and conduct research from their own phones. Citizen science applications such as iNaturalist and Project Noah helps scientists and other researchers collect data from all over the world that they would otherwise not be able to get.



Photo 1: An image of the DJI Phantom 4. The same drone used by Archbold Biological Station.



Photo 2: A drone's view of a prescribed fire burn on Red Hill in 2018. Taken by GIS/Data Manager Vivienne Sclater.