

AGRICULTURAL WATER QUALITY PROGRAM INTERNSHIP LARIMER COUNTY AND ROUTT COUNTY

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Intern

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INTERNSHIP OBJECTIVES

- 1) Soil Moisture Sensors
 - 1) Learn how to build and install low-cost research technology, specifically soil moisture sensors
 - 2) Analyze soil moisture sensor data for the soil moisture sensors
 - 3) Create outreach video teaching people how low-cost soil moisture sensors are made
- 2) Assist with day-to-day operations in order to gain more knowledge about soil, water quality, and agriculture

DAY-TO-DAY OPERATIONS

- Collected water and soil samples
- Learned how to 3D print
- Installed water samplers and learned about irrigation techniques
- Conducted site inspections to check sampling equipment



WHAT I LEARNED

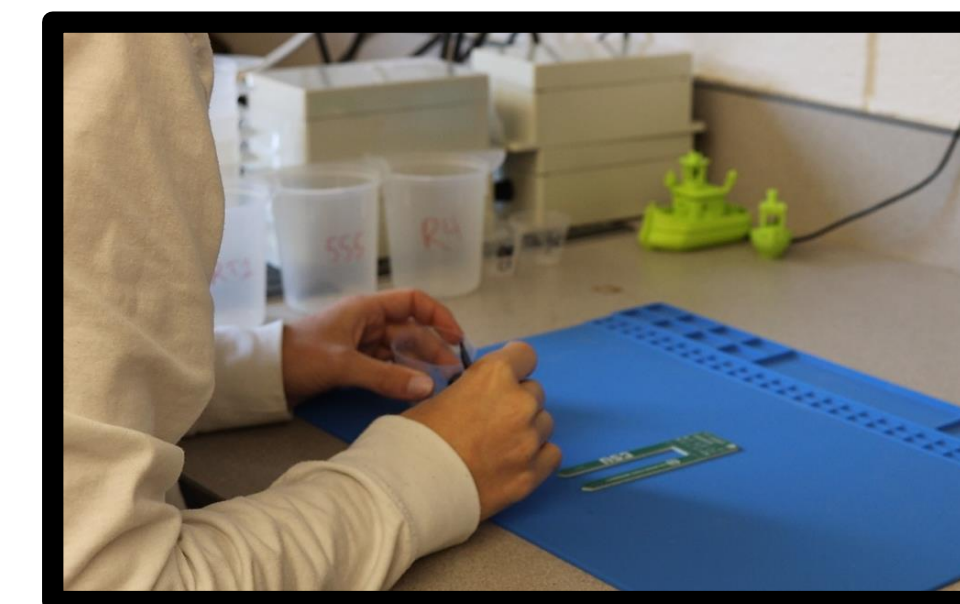
Through this internship with AWQP I learned not only about water quality, but also many other extremely useful skills. At the beginning of my internship, I learned how to solder parts onto a PCB board, take soil fertility samples, install flumes, and much more. By the end of my internship, I was assembling low-cost soil moisture sensors as well as low-cost water samplers from scratch.

Lastly, an important thing I learned while doing this internship is that agriculture has a place for everyone and everything and therefore you can have a big impact on peoples lives. Educating producers about this technology has the potential to create lasting beneficial impacts on the way we practice agriculture and therefore beneficial impacts on our environment.

SOIL MOISTURE SENSORS

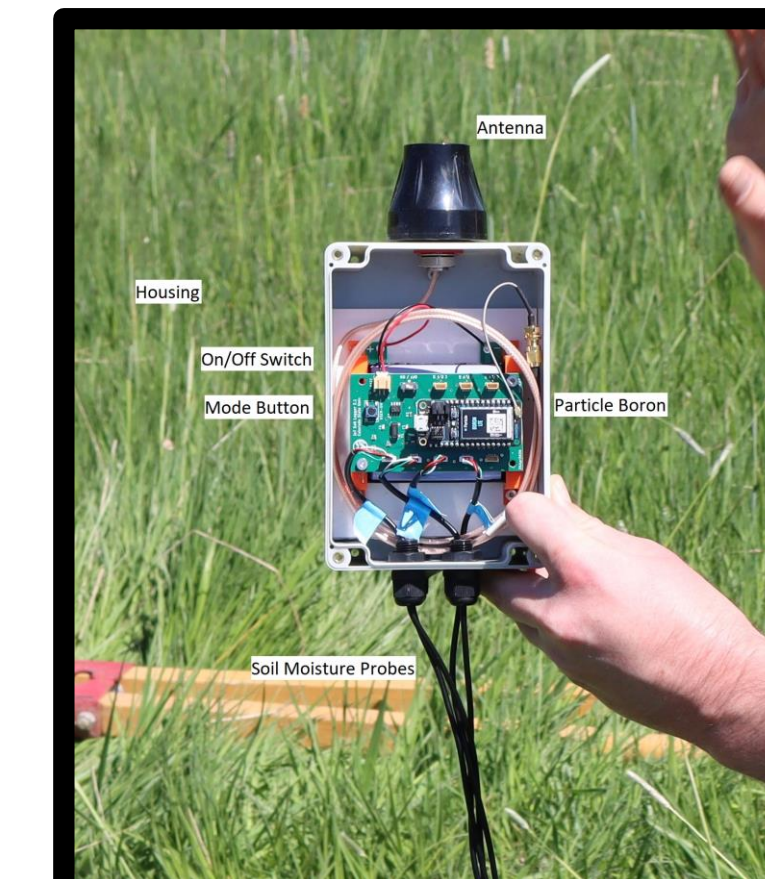
1. Soil Moisture Sensor

- Parts were soldered onto PCB board
- Board was placed in 3D printed housing



2. Soil Moisture Station

- Uploaded code to Particle Boron and placed onto board
- 5 sensors connected to one board
- Placed in moisture proof box



3. Installation

- Sensors placed at 3, 6, 12, and 18 inches in undisturbed soil



OUTREACH

- Presented soil moisture sensors to producers and other researchers



- Filmed and edited outreach video to go on website
- Video overview of why and how to build low-cost soil moisture sensors

Scan QR to View Video

RESULTS

- Data collected at Legacy Ranch in Steamboat Springs, CO
- Sensors successfully collected real time data
- Data displayed on live internet dashboard (Figure 1)
 - The higher the value displayed, the lower the soil moisture

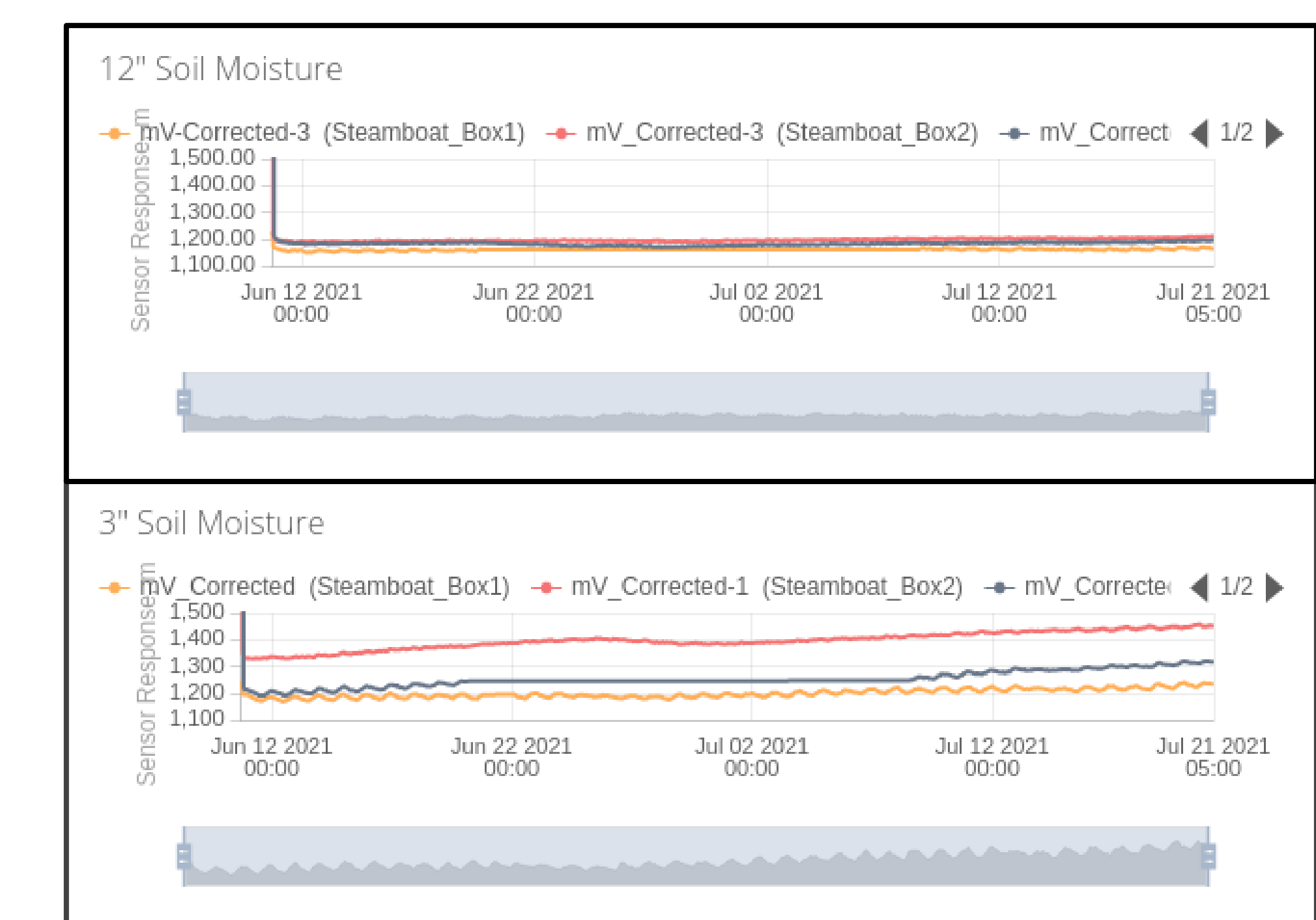


Figure 1. Example of soil moisture data displayed on live internet dashboard