Stream Disconnect Monitor

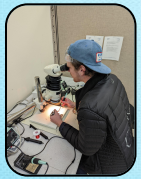
Sonoma State University — Department of Engineering Science, Electrical Engineering

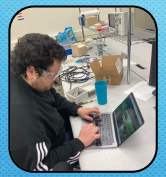
Team: James Lemos, Andres Luna, Jack Thornton

Advisors: Rob Rowlands, Neil Hancock

Introduction

- Monitoring **stream disconnects** has proven to be a useful tool when looking at water quality, levels, and potential drought patterns
- Existing solutions are **costly and inconvenient**, and require an active user when measuring these disconnects.
- Turbidity sensors are also costly, and even if they are unmanned, devices require a lot of **maintenance**.
- When collecting data over long periods of time, being able to access **recordings wirelessly** is ideal.





Objective

- Create a deployable module that can document conductivity to determine if disconnects exist.
- Log the tracked data to be sent to an online website through a LTE communications module.
- Have device contained in a water resistant enclosure to withstand California weather conditions.
- Design device so that data can be continuously recorded and displayed for a minimum of 2 years.

Mayfly Data Logger with LTE module

Sensor probe & IP65 encasing

Solution

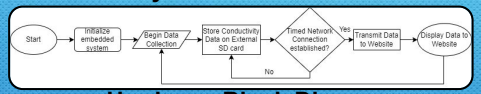
- Program the Mayfly Data logger to collect conductivity readings and store data onto SD card.
- Use the Xbee LTE CAT M1 wireless module to transfer the data from the SD card onto the website (monitormywatershed.org) wirelessly.
- Conductivity sensor probe is a simple and inexpensive extension cord.
- A PCB board was designed with built-in ESD protection to prevent damage from surges of current or lightning.

Tools and Software

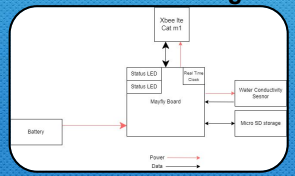
Monitor My Watershed · OSHPark · KiCad · KEYSIGHT · EnviroDIY

Potential Stream Bed

System Flowchart

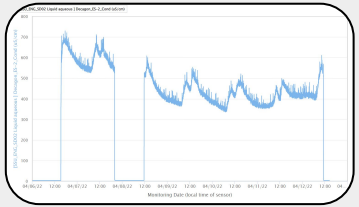


Hardware Block Diagram



Results

Deployed beta model of finished design



Displayed conductivity readings from monitormywatershed.org