Buoy and Sensor Team

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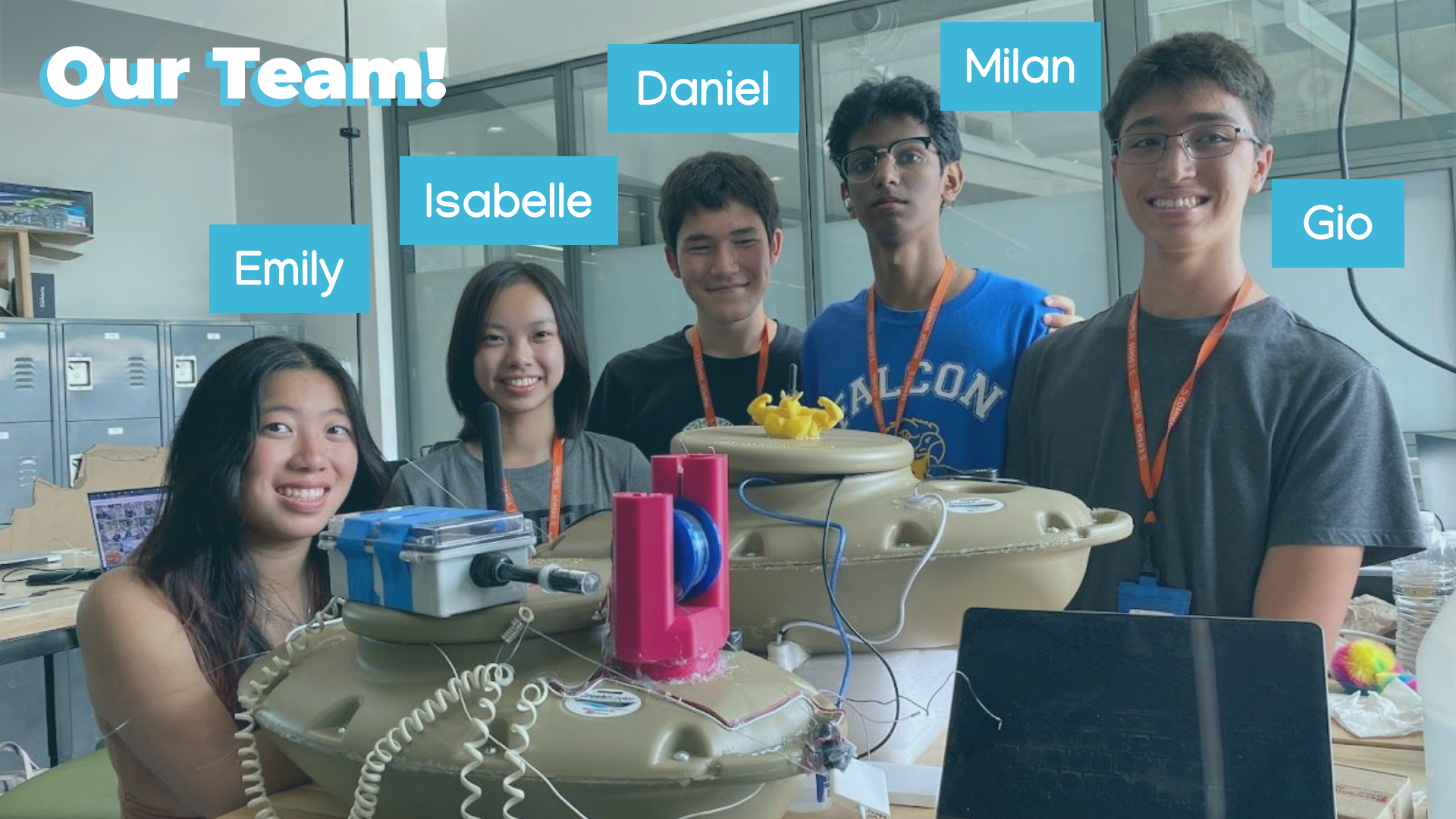
Our Team!



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Why do we need to survey the ocean?

Having extensive data on the oceans is crucial in planning conservation efforts and studying the effectiveness of past conservation efforts. This essential information is extremely costly to find so we plan to create a cheaper autonomous buoy that can constantly gather information on the changing ocean.

01: Introduction

To achieve our goal of surveying both the lake surface and underwater, we employed the use of buoys and a capsule.

Constraints

Time:

- Only 3 weeks – had to limit the amount of modules we created
- Limited time to troubleshoot integration issues

Budget:

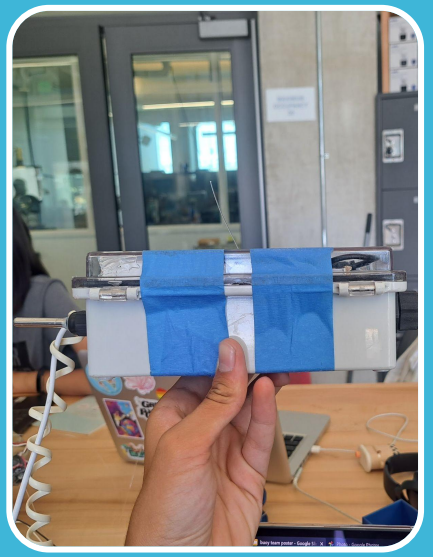
- Had to use relatively cheap sensors – fairly accurate but not precise readings
- Limits on what online stores we could buy things from

Our Products

Buoy #1

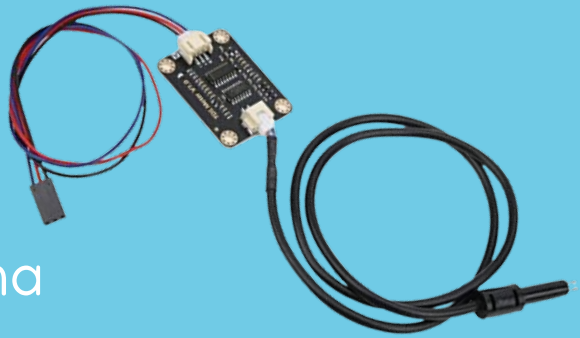
Buoy #2

Capsule



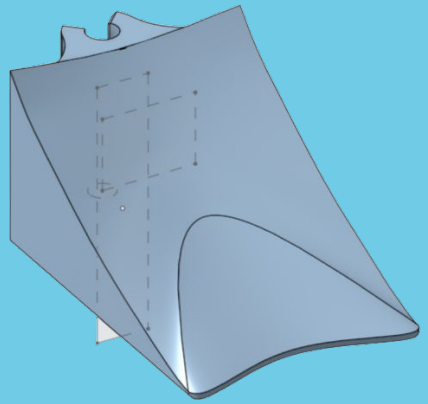
Challenges

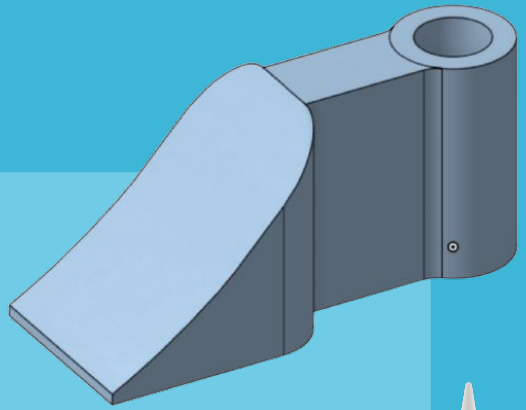
- Sensors
- Wiring
- Mounting the LoRa Antenna
- Waterproofing

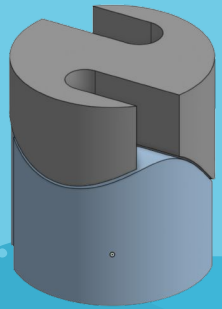


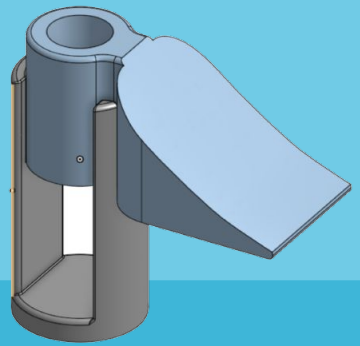
Solutions

- Sensor holders
- Buff pikachu
- Use of adhesives
- Redoing caulking



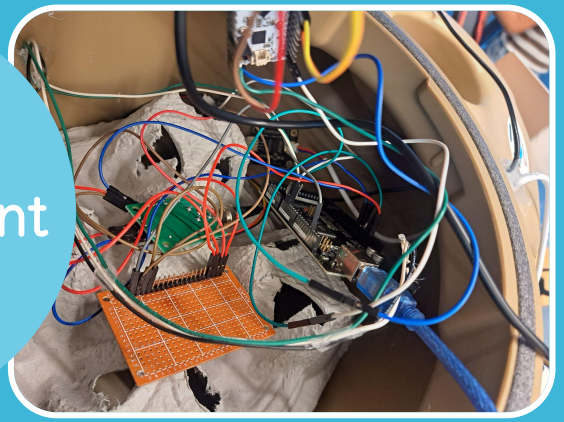






Future Plans

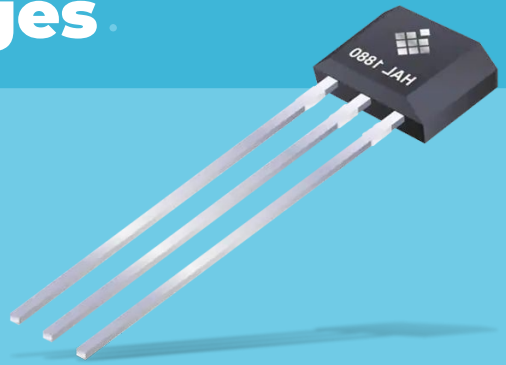
Cable management



Reduce possible failure points

Challenges

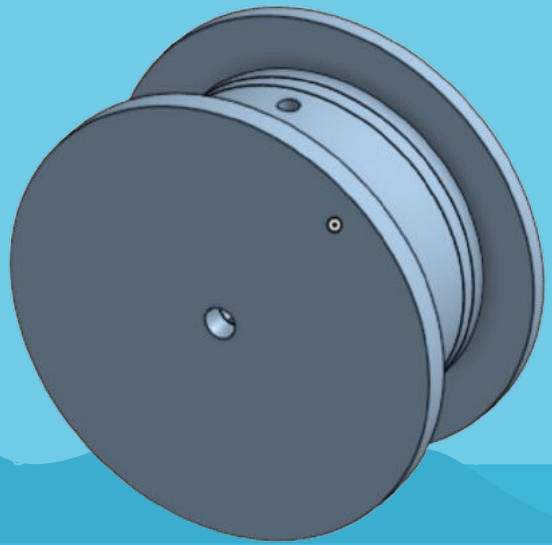
- Winch
- Motor
- Coding / communication
- Encoders

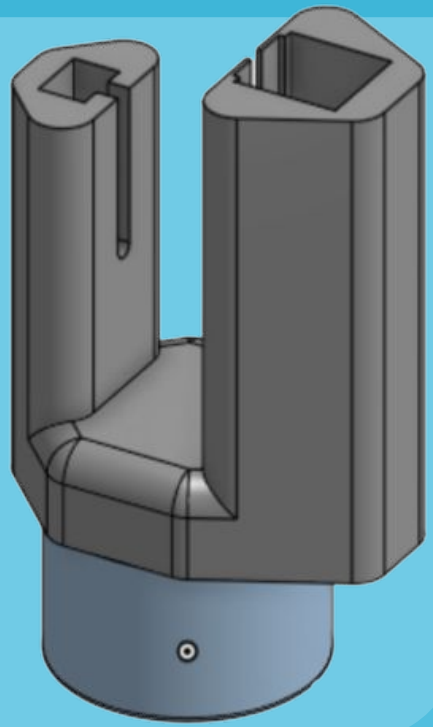


03: Capsule Buoy

Solutions

- Rapid 3d printing and testing
- Fishing line
- Troubleshooting





Future Plans

Improve communication

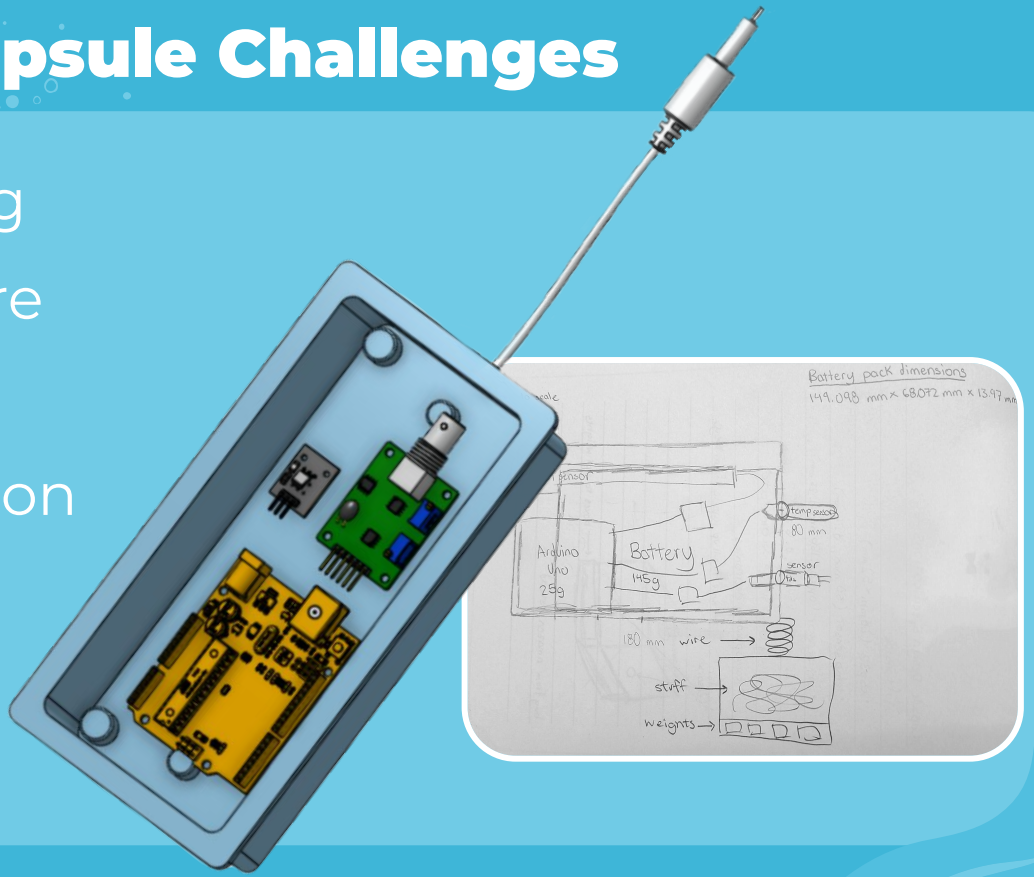
Increase motor torque

Cable Management

Redo parts to fit design changes

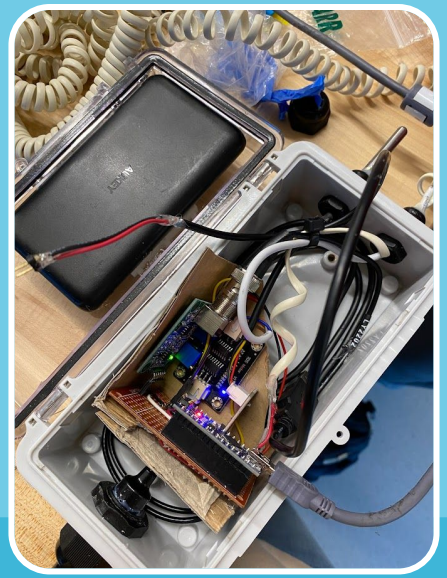
Capsule Challenges

- Waterproofing
- Water pressure
- Wiring
- Communication
- Weight
- Powering



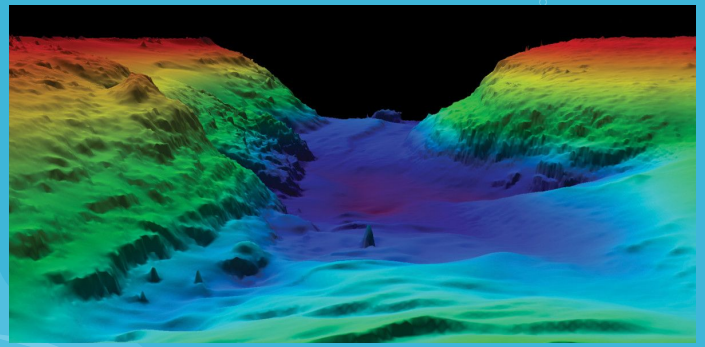
Capsule Solutions

- Watertight box
- Cable grommets + adhesives
- Telephone wire
- Internal battery
- External weights



Capsule Future Plans

- Better Weighting
- Ultrasonic sensor
- Map lake floor (Sonar/Lidar)



Conclusion

Relatively successful

- Collect & Transmit Measurements
- Winch issues with capsule buoy
  - Fixed ^

What Next?

- Application in larger oceanic environments
- More compact design than buoy