Water Weather Station

Client: Erik Fretheim

492 Team: Emma Geary, Garrett King, Kaitlyn Rice

Project Description

The WWXS will offer a unique way of keeping students engaged beyond the end of their camp. The buoy will allow for physical interaction with a device that creates useful data. With a higher level of user interaction Users will be more likely to retain the skills they have learned at the Sea Discovery Camp.

Cybersecurity student Ian Burnett, 10 from Dupont, brings up a water sample with the help of SEA Discovery Center assistant Sam Larson, center. *Larry Steagall / Kitsap Sun*

This is you!

- Work as an instructor at the Sea Discovery Center
- Manage a group of Middle School aged students
- Love water and computers (especially in tandem)
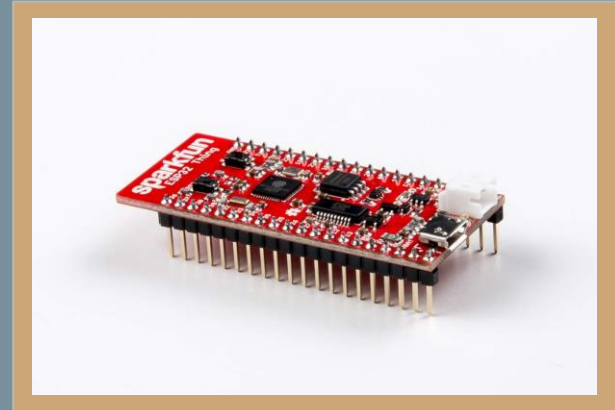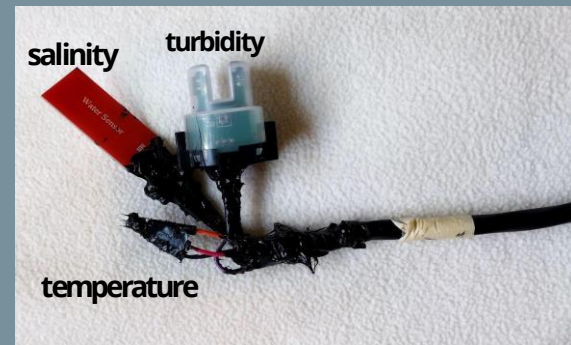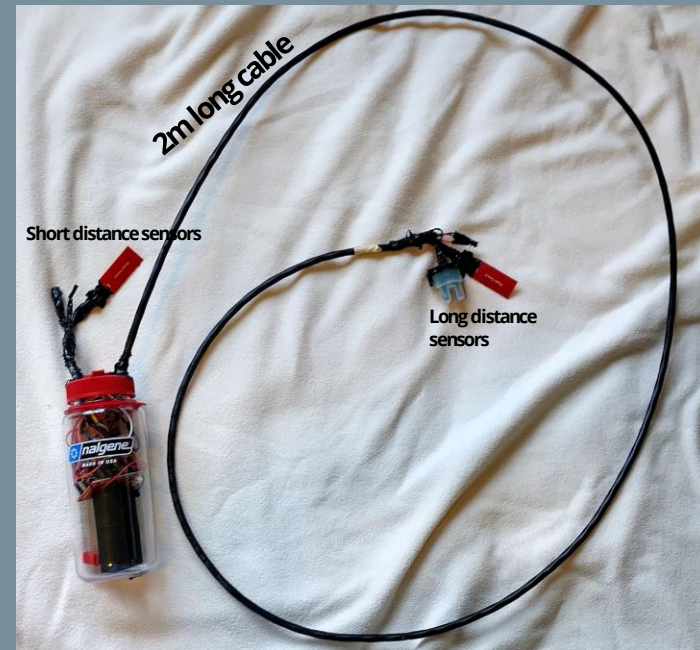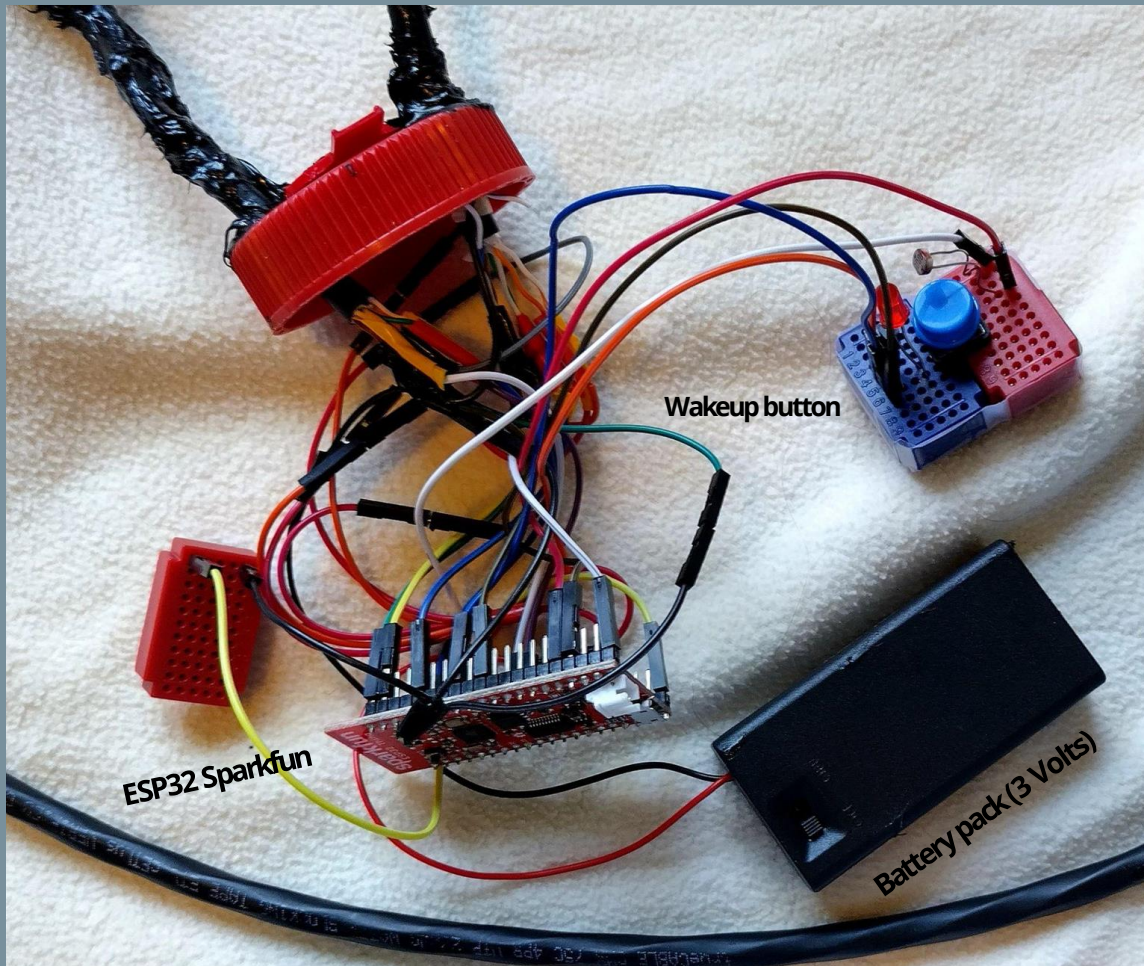
But first, what is going on?

Buoy

Emma Geary

Buoy Details

- Collects and stores sensor data
  - Turbidity, insolation, salinity, temperature
- Updates
  - App connectivity, battery life

Wakeup button

ESP32 Sparkfun

Battery pack (3 Volts)

2m long cable

Short distance sensors

Long distance sensors

salinity

turbidity

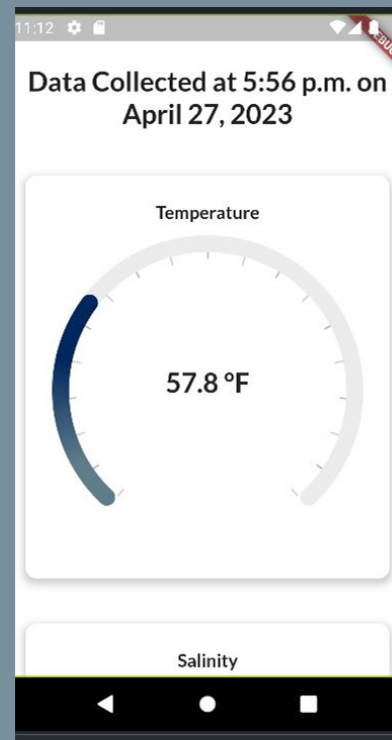temperature

App

Garrett King

Updates:

Web API

- Functional sending of data from the app

  to the web server

UI upgrades

- Date collected
- Small style changes to data display screen

App Screens

Web API
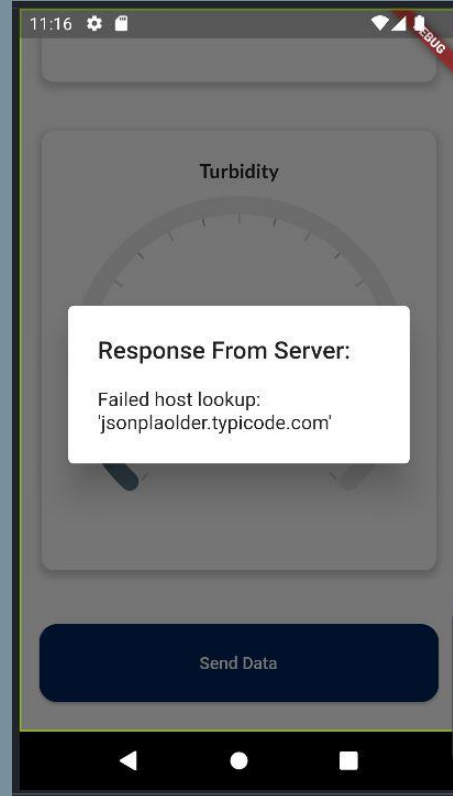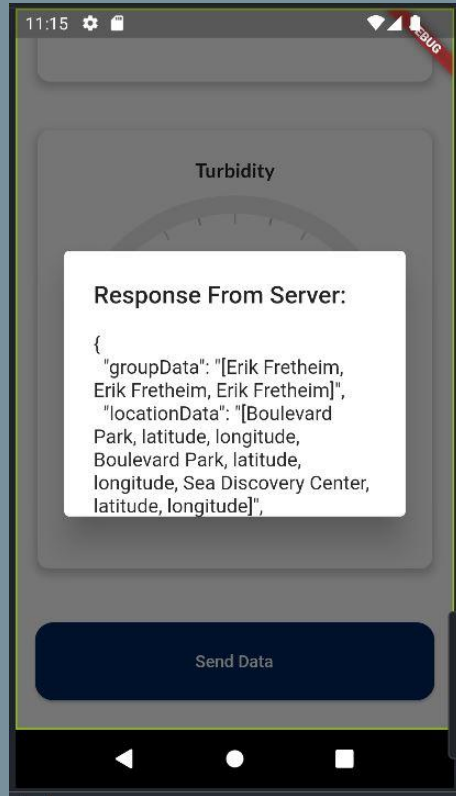
Updates:

- Connected Website and App
- Technical Info: Website receives data as an array of arrays
- Displays real-time data in a table with associated graphs as representation

Buoy Name	Last Data Submitted	Group
proto		default
salish		group1

Active Buoys

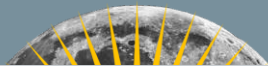| Location Name	Location ID	Latitude	Longitude	Timestamp	Surface Temperature	Shallow Temperature	Depth Temperature	Surface Insolation	Shallow Salinity	Depth Turbidity
Boulevard Park 1	1	48.73343624214479	-122.50343444257562	2023-05-04T20:49:49.395Z	16.642019135008645	0.31100685029580877	0.3804657042108208	0.2905545352938006	0.5334864744980545	0.069689899303 19425
Boulevard Park 1	1	48.73343624214479	-122.50343444257562	2023-05-05T20:49:49.395Z	51.39667927913545	0.18538720045055967	0.8124528063921208	0.3673017976167685	0.9881396449108655	0.8110420923501709
Boulevard Park 1	1	48.73343624214479	-122.50343444257562	2023-05-06T20:49:49.395Z	78.71986375417201	0.9171257457162367	0.3332909611330175	0.19641199169132406	0.5257155286833559	0.2439065584525797
Boulevard Park 1	1	48.73343624214479	-122.50343444257562	2023-05-07T20:49:49.395Z	49.150408382619126	0.9837954206970456	0.8560640592636548	0.16069393348972616	0.9378320746580169	0.25329272456813645
Boulevard Park 1	1	48.73343624214479	-122.50343444257562	2023-05-08T20:49:49.395Z	25.427268208391652	0.4355752634423833	0.688412907004279	0.5910903916782975	0.857047444760024	0.051478007153136884
Boulevard Park 1	1	48.73343624214479	-122.50343444257562	2023-05-09T20:49:49.395Z	24.873668082566164	0.6264131553545105	0.9788985122216727	0.4631538708086209	0.7452646456476435	0.5955797148386619
Old Main	2	48.73751	-122.48429	2023-05-06T20:49:49.395Z	86.84973403489407	0.08494301752952405	0.8743947954499067	0.3747485996238702	0.9041902305381433	0.5560435374468293
Old Main	2	48.73751	-122.48429	2023-05-07T20:49:49.395Z	51.006648832679645	0.489081604854529	0.8515002889222956	0.15515007613525156	0.5252338812310111	0.6262846014505898
Old Main	2	48.73751	-122.48429	2023-05-08T20:49:49.395Z	51.90687167020036	0.6821409345922178	0.3788202876899289	0.3868623113901677	0.16800818448633237	0.030107949830981973
Old Main	2	48.73751	-122.48429	2023-05-	90.5380547294	0.82415483617	0.19208401396	0.57903378656	0.612756721270	0.10043656564

Real-time Buoy Data

Old Main	2	48.73751	-122.48429	2023-05-07T20:49:49.3957Z	51.006648832679645	0.489081604854529	0.8515002889222956	0.15515007613525156	0.5252338812310111	0.6262846014505898
Old Main	2	48.73751	-122.48429	2023-05-08T20:49:49.3957Z	51.90687167020036	0.6821409345922178	0.3788202876899289	0.3868623113901677	0.16800818448633237	0.030107949830981973
Old Main	2	48.73751	-122.48429	2023-05-09T20:49:49.3957Z	90.53805472945908	0.824154836179977373	0.19208401396848052	0.5790337865653077	0.6127567212700875	0.10043656564426828
Old Main	2	48.73751	-122.48429	2023-05-10T20:49:49.3957Z	56.91204933125616	0.5085516210018819	0.653364782824887	0.36303041358791455	0.9242603936042721	0.17243527213605092
Old Main	2	48.73751	-122.48429	2023-05-12T20:49:49.3957Z	10.79229790608398	0.41177866866176505	0.9843812617724867	0.6817323681943328	0.07189675013317665	0.12086481396283388

Scatter Chart

Surface Temperature

Boulevard Park 1 x   Old Main x

Surface Temperature Data

- Boulev...
- Old Main

Surface Temp in Fahrenheit

100
80
60
40
20
0

May 5, 2023   May 7, 2023   May 9, 2023   May 11, 2023   May 13, 2023

Time

Data Displayed in Graphical Format

Current State v. Future Goals

- Buoy > App > Website connection is working
- Buoy battery life has increased
- All current sensors returning correct values
- App correctly displays data + beautified

- Reorganize buoy
- Add more sensors (i.e. oxygen)
- Allow multiple users to access a single buoy + added security
- Site beautification