# Web Application for Aqualab Sensor Monitoring and Analysis - Milestone 4

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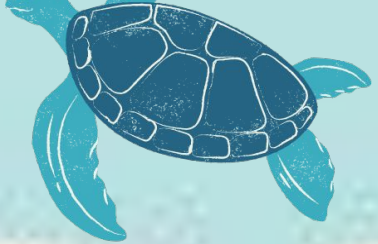
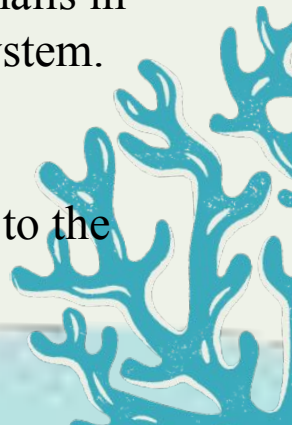
# Milestone 4 Overview:



- Implement, test, and demo **Interface between Frontend, Backend, and Database**
  - All elements communicate effectively

- Implement, test, and demo **User Notifications**
  - A notification is displayed on the control computer's screen when data is out of bounds.
  - Google disabled the API system we were going to use to send these emails in January 2025, which means we will be using a different SMTP mail system.

- Implement, test, and demo **Water Sensor Implementation**
  - System is able to connect the water sensor, read the values, store them to the database.



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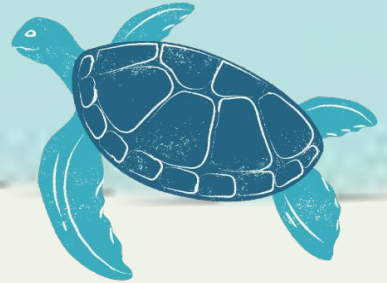
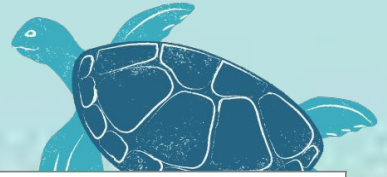


- Implement, test, and demo **UI tweaks/improvements**
  - Tweaks and improvements have been made to the GUI to ensure it is completely functional, user-friendly, and intuitive.

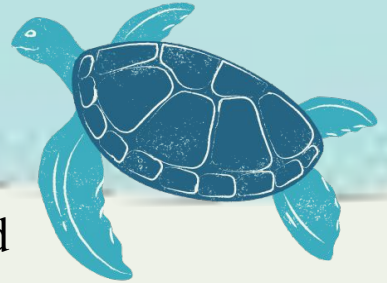
- Implement, test, and demo additions to **Analysis Tool**
  - Functional and works as intended. Users can access all data and filter via time and sensor/measurement.

# Milestone 4 Progress Matrix:



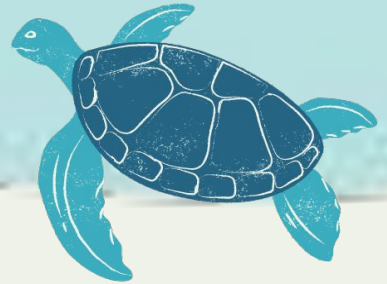
| Task | Completion | Greg | Haley | Ruth | To do |
|---|---|---|---|---|---|
| Implement, test, and demo **Interface between Frontend, Backend, and Database** | 90% | 30% | 70% | 0% | User configuration and role options need to be added to the backend. |
| Implement, test, and demo **Water Sensor Implementation** | 90% | 10% | 90% | 0% | Test further with possible new water sensors. |
| Implement, test, and demo **UI tweaks/improvements** | 95% | 0% | 0% | 100% | Demo UI further in testing to ensure client satisfaction. |
| Implement, test, and demo **Analysis Tool** | 85% | 0% | 90% | 10% | Test further with different data loads and csv file downloads. |
| Implement, test, and demo **User Notifications** | 40% | 90% | 10% | 0% | SMTP Server needs to be set up and implement text notifications. |

# Frontend, Backend, and Database:



- Program allows simultaneous execution of the Frontend and Backend
- Backend stores readouts from the sensors in the database
- Frontend reads from the database to send data to users
- Frontend submits changes to configuration to the database
- Backend reads configuration changes from the database and implements them
- Frontend and Backend communicate effectively using websockets to display real time data on the home page and tank tabs

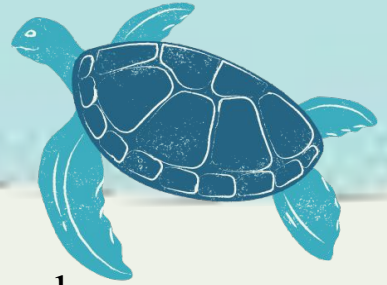
# Notifications:



- Thanks Google
- Implementation of Google SSO is beyond the scope of this project, so we will be using a different SMTP mail system
- The software can display notifications on the system computer, but cannot currently send email.

> Starting January 2025, less secure apps, third-party apps, or devices that have you sign in with only your username and password will no longer be supported for Google Workspace accounts. For exact dates, visit Google Workspace Updates . To continue to use a specific app with your Google Account, you'll need to use a more secure type of access that doesn't share password data. Learn how to use Sign in with Google.

# Water Sensor:



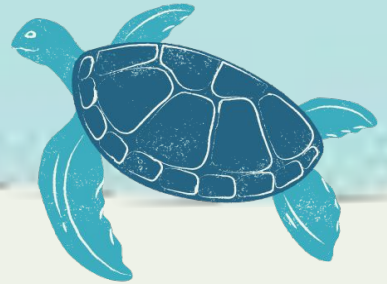
**Current Progress:**

- Water sensor class and main program working as intended - Able to read, parse, and store data accurately
- Sensors situation is ever changing - We are simulating data from with an arduino and test sensor class to makeshift data
- Data can be accurately read, process, stored, and displayed

**Looking Forward:**

- Continue to simulate data flow with arduinos - use virtual serial port tools
- Ensure easy scalability/connectivity for any sensor they choose

# Analysis Tool:



**Current Progress:** Working as intended!

- All data comes through on first page load
- Filters entered are sent to the backend
- Backend filters database to find desired sensors/times and sends data to frontend to display
- All filtering functional

**Additions Left:**

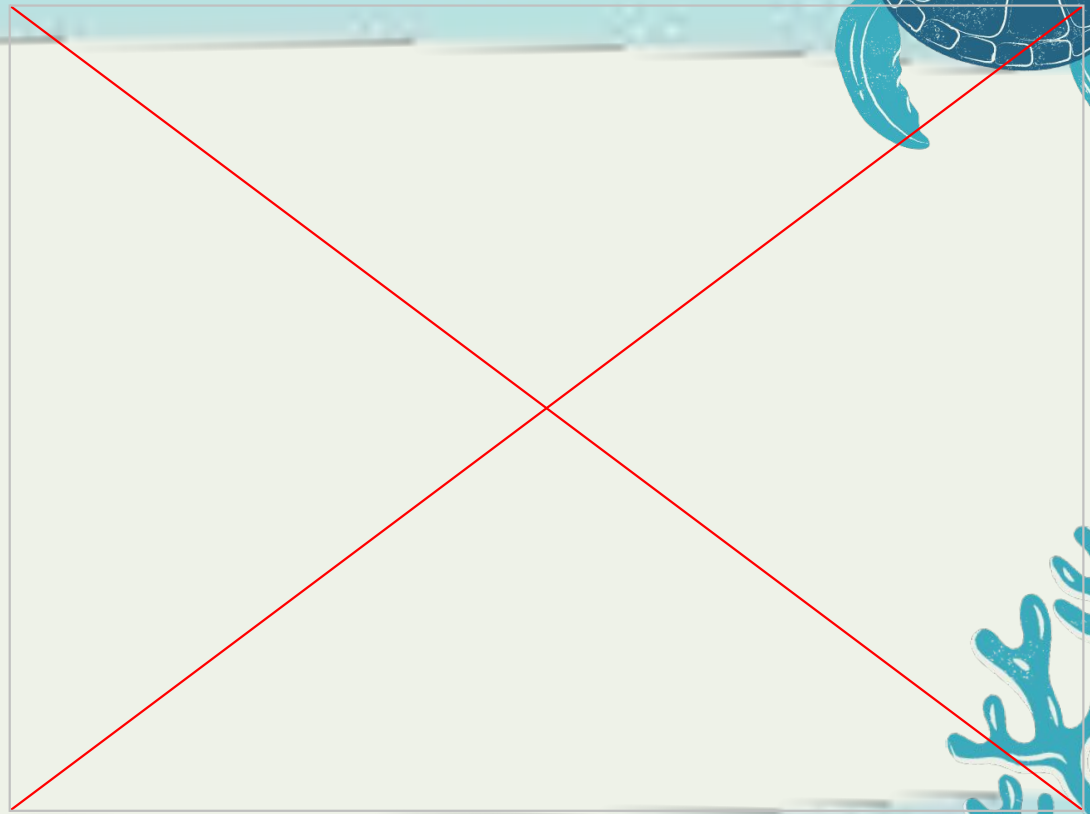
- Time filtering edits (choose last hour, 24 hours, etc. or another way)
- Downloading data to csv file
- Calculated relationships is coming

# UI Improvements:

- Not too many visible changes at the moment
  - **Cleaned Unused Elements in CSS** – Many JSX/HTML elements are added but never styled in CSS.
  - **Fixed Overpowering Styles** – A single CSS file or rule is overriding other styles, causing inconsistencies.
- More consistency in the layouts of each page
- Going to demo to client for any other tweaks or requests

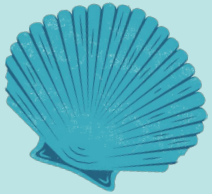
# Demo Time

One Moment Please
(grabbing flash drive)



# Milestone 5:

| Task | Greg | Haley | Ruth |
|---|---|---|---|
| Implement, test, and demo **all sensor implementations** | 0% | 80% | 20% |
| Implement, test, and demo **program recovery after shutdown** | 50% | 50% | 0% |
| Implement, test, and demo **backing up data/disk space management** | 80% | 20% | 0% |
| Implement, test, and demo **user notifications** | 100% | 0% | 0% |
| Conduct evaluation and analyze results | 33% | 33% | 33% |
| Create poster for Senior Design Showcase | 0% | 0% | 100% |



# Questions?