Overall Summary:

These last two weeks we have been meeting with our advisor and designing different PCBs to be used for testing. We have started breaking into smaller groups and working on different parts of our sensor array. We created three PCB designs with a combination of different components such as a Bluetooth chip, microcontroller, and temperature/accelerometer sensors. These boards have been reviewed and sent out to be printed. In addition, we also made a large purchase of hardware components mentioned above that will be soldered on the PCBs.

Individual Contributions:

These are the descriptions for individual contributions for the two weeks of this reporting period: 2/2-2/16

Anastasia Golter: I worked with Nick and Emily to finish up our two prototype PCB boards with the temperature and accelerometer sensors and bluetooth chip. We met as a team to discuss more details concerning our project and how to order parts. I also worked on finishing up the team website, so it can be turned in. Finally, I have been researching different sensors that we could use for our project as well as different methods for waterproofing. Weekly: 7.5 Total: 23

Nicholas Stasi: I worked on making two prototype boards with Emily and Chloe. One of the boards was for our microcontroller, and the other was a board for two of our sensors we will be interfacing with so we can test them on a breadboard. I met with my team to discuss parts we need to order to start testing. I also have been looking online for different parts we could possibly use and have been researching the I2C communication protocol. As a team, we have continued discussing high level design, specifically, how we will be communicating with different systems wirelessly. Weekly: 7 Total: 23

Emily Kinne: I worked with Chloe and Nick to design two different PCB prototypes. We used Eagle CAD to develop our boards one was for the bluetooth controller and the other included both the accelerometer and temperature sensors. These have been sent to get printed and will be used for future testing. I also met with the team to talk about supplies we need purchased and I started to research some existing technologies that are related to our project that we can include in our design document. Weekly: 6 Total: 21

Zachary DeMaris: I researched the different libraries Arduino offers for communicating with I2C devices. I spent time researching various chlorophyll sensors, requested price quotes for different sensors, and explored the possibility of using a Raspberry Pi instead of an Arduino. I worked with one of our clients Chris, to get two Arduino boards to start testing I2C code. In addition, I finished up our first parts order with temperature and gyro sensors, as well as cellular shield field for Arduino devices. I also researched cellular technologies for our project, specifically 2G GSM chips vs 4G LTE chips. Finally, I wrote some I2C test code for communicating between two Arduino devices to solve some of the I2C issues before we receive the actual sensors. Weekly: 6 Total: 21

Jack Seiter: I researched getting information off of the sensor platform and to a remote server. I've requested buying parts for that goal for the arduino through a cellular system. Additionally I started writing the code for the server the sensor platforms will eventually serve the data to. Proper abstractions have been written for it for storage of reports, receiving of the reports, ect. Finally I wrote a protocol that looks like Go-Back-N ARQ but is adapted to

the frames/reports being passed. Weekly: 2 Total: 16

Andrew Koenen: I created two PCB designs, one to hold the bluetooth chip and all of the inputs, and another for the sensor array mounting the temperature and accelerometer components into a modular design. I verified these designs with Vishal and sent them to be printed. I also did some research into I2C busses to see how we will add multiple sensors. I talked with one of the clients, Chris, and asked about some of the current design choices as well as some technical aspects of the communication protocols we were using. Lastly, I worked on researching some cellular technology with Zach and worked with Vishal to get a better understanding of how to flash the code to the Bluetooth memory using their current setup. Weekly: 6.5 Total: 24

Pending Issues:

We have done some research on different types of sensors and have created another list that needs to be purchased. Our main issue is waiting on the hardware. The PCBs could take up to two weeks to be printed and delivered.

Plans:

For these next few weeks as we are waiting for our PCBs we are going to focus on research and familiarizing ourselves with all aspects of our project. As we prepare our design document we need to have information about different types of systems that already exist and how we are going to create something novel that has not been done before. We will prepare a comprehensive set of information for people who may want to know about our project and be able to explain why we made those decisions. We will further grock the code for the Bluetooth microcontroller system so we can prepare our designs based on previous work. Arduino components should come in before the next biweekly report, so we plan on testing sensors and communications with Arduinos.