Homework 2: Research Topic Quad Chart

Overview

For this assignment, you team will create a quad chart explaining your proposed research topic that you will explore during the semester. Be sure to come up with a unique topic that is exciting and can sustain your group for the entire semester!

It is okay if your team does not come up with a research topic. In that event, you will be asked to research the relationship between a surfer's motion and the wave characteristics using three unique non-dimensional parameters.

You may use the example below ***as a reference***

Requirements

The chart must conform to the following format:

Introduction Introduce your team members and team name. Describe your topic and goals.	**Required Sensors and Measured Variables** Describe what sensors you think you would need and what data you would use from them.
Motivations Describe your team's motivation for choosing this research topic	**Contributions to Society** Describe how exploring the research question benefits society

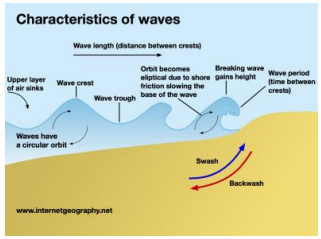
Grading

This assignment will use a pass-forgive scheme. You must convince the instructor that your research topic is worthy using this quad chart. If you fail to do so, or do not submit a quad chart, the grade will be forgiven and your team will be tasked with researching the default prompt.

How Can We Relate Surfer Motion and Wave Characteristics Using Non-Dimensional Parameters?

By: Braidan Duffy

Goal: Measure wave characteristics and surfer motions simultaneously to establish a relationship between them.



Required Sensors and Variables Measured

- Thetis instrumentation package (shown left)
- Lowell MAT-1 datalogger (shown below)
- HOBO water level gauge

- Surfer orientation
- Surfer acceleration/velocity/position
- Surfer direction and speed
- Wave height
- Wave period
- Wave direction

Motivations

- Fosters understanding of the relationships between variables in a dynamic environment
- Not well understood or studied
- Want to understand how we can improve a surfer's ability to choose when to go surfing and when not

Contributions to Society

- Contributes research to the coastal engineering and coastal dynamics fields on people's interactions with waves in the surf zone
- Allows us to understand the complex dynamics between floating bodies and waves in the surf zone
- We can extrapolate and predict surfer motions based on measured or predicted wave characteristics
- We can develop algorithms in the future to better score the "surfability" of given conditions