Magnetic Field Replication:
How Do Skates Respond to Offshore Wind Turbines?

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Objectives and Background

As offshore wind turbines harvest electricity, species such as skates, which use magnetic fields for navigation, may become disoriented.

A set of experiments is being conducted with three modes: north, south, and control, to observe how the skates respond to various magnetic fields and determine the effects of offshore wind farms.

Components

- Circuit Board: Arduino Mega 2560
- Arduino IDE (Integrated Development Environment) software
- Power Source: AC and DC power supply
- Housing: Designed using Inventor, laser cut clear acrylic
- Code in C++ and C
- Species: Big Skate (*Beringraja binoculata*)

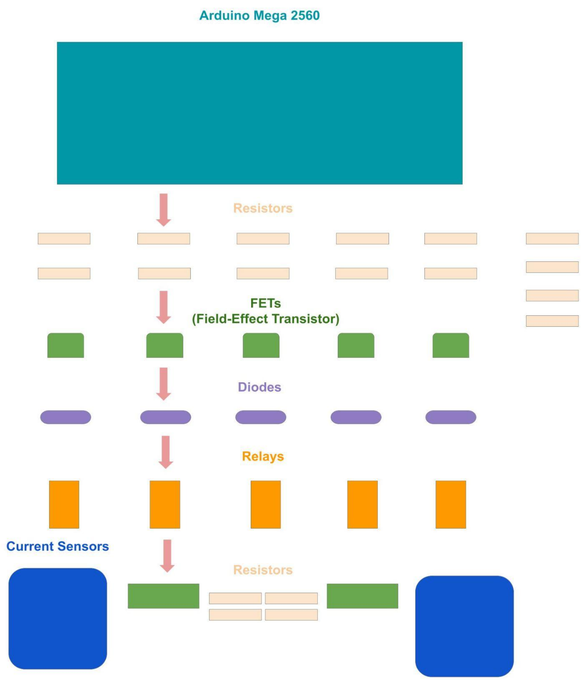
Design

An Arduino Mega is used in conjunction with code sequences to create three current modes for the experiments. A skate will be subjected to the varying magnetic fields to observe their responses during ten minute increments. The purpose of this master control system is to reduce potential error, increasing coherence amongst the experiments.

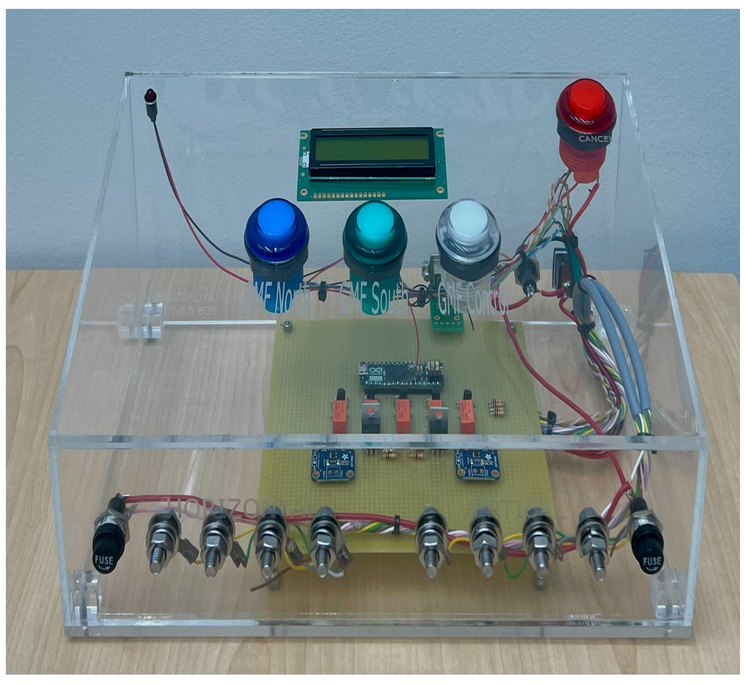
Further Work

- Finish code
- Complete wiring circuitry
- Experiments!

Breakdown of circuitry



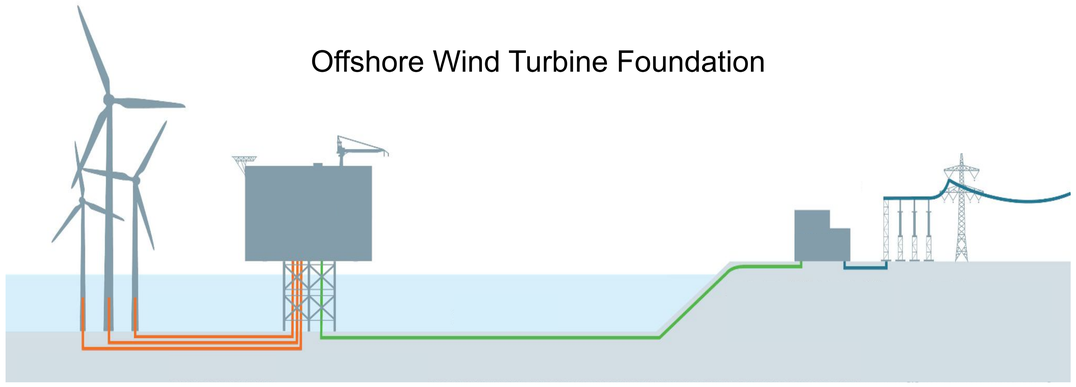
Master Control System



Power Supplies

Coils

Offshore Wind Turbine Foundation



Oregon State University Hatfield

Oregon State University Marine Studies Initiative

iLab AT HATFIELD

Special thanks to Bob Davidson, electrical wizard

Photos by Josie Bacholl