Marine Fluorometer to Quantify Biomass
Sponsor: Catalina Sea Ranch
Mentors: Reginald Olson & Anthony White
Michael Austin, Lindsay Bastin, Brandon Clark, & Vincent Messina

Optical Filtering
- Narrow Band Pass Essential for Accuracy
- Minimize Impact of Ambient Light

Signal Processing & Communication
- Kinetis IDE/mBED
- K64 Freedom Board
- Digital Communications
- CAN bus

Sea-Worthy Housing
- Waterproof
- Manufacturable
- More cost effective
- Optimized for speciation
- New optics orientation

Amplifier Circuit
- Circuit Modeling and Analysis
- Prototyping
- PCB software
- Printing the Circuit Board
- Soldering Components

Optimize the Farming of a Sustainable Protein

Broader Impacts
Economy
- A new industry and opportunity for United States
- U.S. seafood trade in an $11.2 billion deficit annually
- 91% of seafood consumed by the U.S is imported
- Aquaculture is growing by 6% per year

Environment
- Analyze Impact of Mussels on Environment
- Targeting Zero-Impact Protein source

Information
- Contribute to CSR’s Internet of Things™
- Determine Optimal Depth for Mussel Lines in Real Time

Room to Grow
- Power
- Calibration
- Cabling & Device Array
- Communication to NOMAD

Biology:
Fluorescence Excitation and Correlation to Biomass
- Linear Correlation Between Fluorescence Detected and Chlorophyll
- Linear Correlation Between Chlorophyll and Biomass

Technology:
Printed Circuit Board
- Conductive Tracks Connect Electrical Components
- Widely Used in the Industry
- Saves Manufacturing Time
- Cuts Cost

Glossary
Aquaculture - raising aquatic plants or animals for food
CAN bus - communication network which allows multicontrollers to communicate without a host computer
NOMAD - CSR’s smart-buoy for collecting real-time data
Printed Circuit Board (PCB) - circuit board with pre-determined conductor paths for connecting electrical components

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