

SCUP

Louis Hand, Geneva Casalegno,
Zoe Lee, Caleb Callaway

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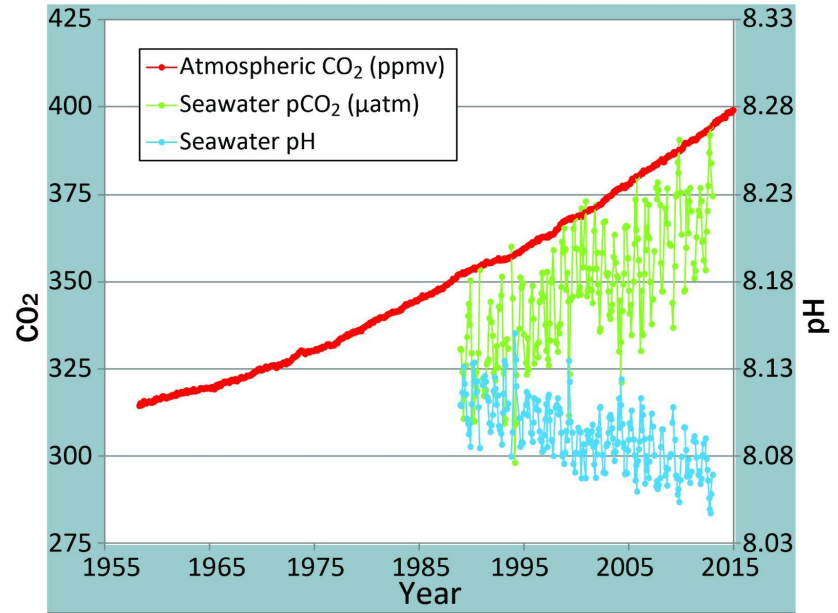
The Issue

**More CO₂ in the Air =
More CO₂ in the Ocean =
Lower pH of Ocean Water**

- Environmental threats to RI shellfishing
 - Ocean acidification
 - River runoff pollution
- Disconnect between growing wind sector and local communities and a need for support of renewable energy

“We import 225 times as much [blue mussels] as we are producing, and U.S. consumption is growing. Increasing national production would help our food security and lessen the seafood trade deficit.”

—Gary Wikfors, Shellfish Scientist and Director of the Milford Laboratory



Data taken from Hawaiian Ocean measurements

Our Solution

Our proposal is to combine offshore aquaculture with offshore wind turbine developments to create a more resilient environment to sustain shellfish farming and fishing.

- Partnership system
 - Shellfish Harvesters and Wind Farms
 - Take advantage of offshore aquaculture benefits
 - More resilient to ocean acidification in deeper waters
 - More nutrient flow
- Site design and layout
 - Customize our aquaculture layout to meet the needs of local interested parties
 - Work with wind farm company to meet their design needs



Our Solution

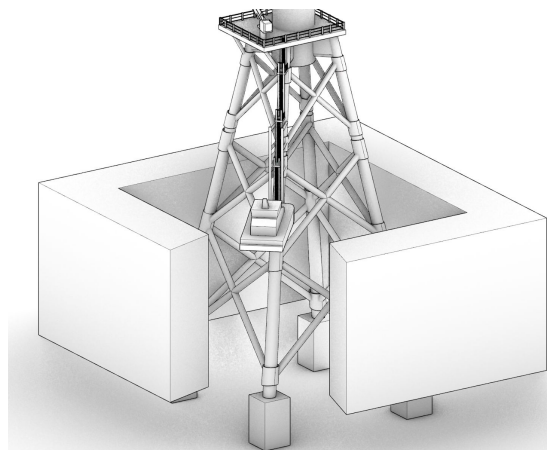
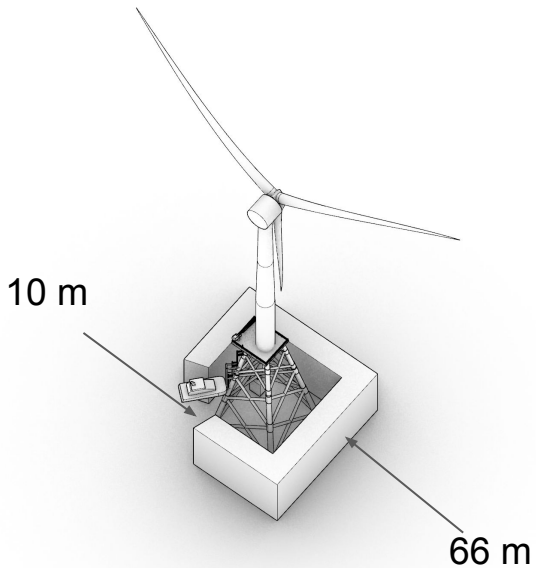
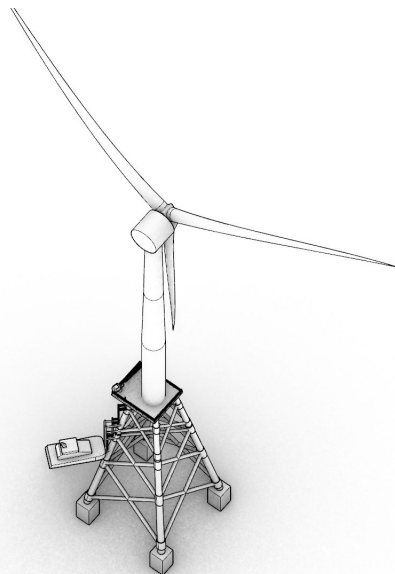


Technical

- Offshore shellfish farming is done locally and AMC, Matunuck Oysters, and Everything Seaweed are interested in our system
- Wind farm and aquaculture cooperation demonstrated in Europe
- Orsted and other wind companies highly value community relations, seen in Vineyard Wind's compensation to fishermen of \$37.7 million

Our Solution

TOTAL OCEAN SURFACE
AREA PER TURBINE ~
16,500 m²



Potential Space Layout:
80% Mussels = 5,971 lbs/week
20% Seaweed = 6,982 lbs/week
**Total Annual Revenue =
\$2,000,000**

Market

Customers- Growing market for seafood. Medical applications research of ocean species.

North American seafood growth US\$ 29,629. 37 million by 2027 from US \$ 22,526. 38 million in 2019

-ReportLinker

Systems approach unique to our group. Adaptable and scalable. Projected **\$2,000,000 annually** from the Block Island Wind Farm.

Competition

-Our turbine based offshore aquaculture system does not have any competitors in the US. There will be partnerships formed to help facilitate the technology and harvest.

Protecting our idea

We have begun communication with a patent lawyer, and are interested in protecting the ownership of our designs.

Our team

SCUP was started by Zoe Lee RISD 2023, Louis Hand 2022, Caleb Callaway 2023 and Geneva Casalegno MIT 2021.

We are applying to a Collaborative Study Program as a team in the fall at Rhode Island School of Design with Lucy Spelman, one of 200 board-certified zoological medicine specialists in the world and former head of the Smithsonian Zoo. We are looking to ingrain our education with business practice and progress our research to future commercialization.

<https://www.risd.edu/academics/history-philosophy-and-social-sciences/faculty/lucy-selman>

Drives

We are driven by the strive for sustainability. We want to make a positive impact on our food systems that can help nourish communities and drive connections.

Accomplishments

Timeline:

- People's Choice Award at the SeaAhead BlueGreen Innovation Challenge

June 17th

- Rhode Island SeaAhead BlueGreen Innovation Challenge First Place
\$10,000

June 17th

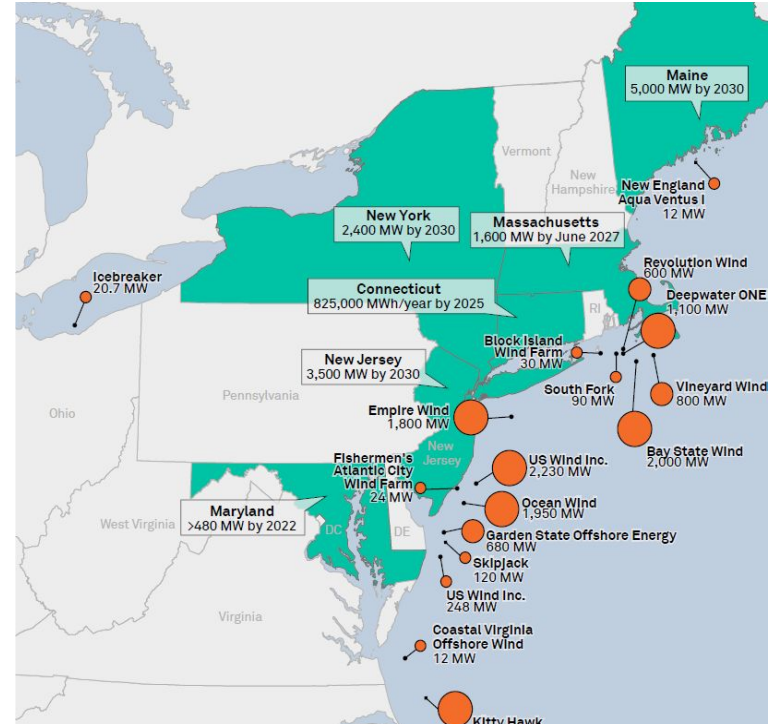
Impact

We would measure our impact by measuring our yearly yield

- What metric would you use to measure that impact? (e.g. tons of carbon dioxide avoided, sq. m of kelp forest saved, tons of plastic avoided)
- Based on your metric, when your innovation has reached its market potential and is operating profitably at scale, what could your annual impact be? Be numerical & show your assumptions

The Future Roadmap

- Pursuing further grants
- Startup funds → Self sustaining business model
- (Expected \$2 million revenue annually)
- Easily expandable to new developments
- Our Role and Service:
 - Plans for site layout and devices
 - Components for farming
 - Service of administration and organization, coordinating collaboration of all parties



Why pick us?

Mentorship and funding will help us create a viable business model. We hope to accomplish a new

Assumptions and Obstacles

- Participation
 - Buy-in effort from harvesters and wind farms
- Permitting
 - Legal and private authorization
 - Environmental safety
- Production
 - Installing equipment
 - Site follows estimates for yield and market values
- Costs
 - Initial Setup Costs \$230,000
 - Operation Costs \$70,000- \$100,000/ year
 - Operations take minimum 2 years to produce a harvestable product



Signs of Success



- Economic
 - Harvest revenue on par with estimates
 - Resilience to changes on specific farming sites
 - Participation/public support for new wind energy development
- Ecologic
 - Preservation of Biodiversity
 - Increased fish populations near aquaculture systems
 - Healthy shellfish/seaweed
 - Improved water quality (monitor nitrogen and toxin levels)
- Equity
 - Current users of the ocean space are able to continue using the space without disturbance or negative impacts



THANK YOU!

