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**NRAC FULL PROPOSAL REVIEW FORM**

Project Code/Title: 23-08: Developing structural engineering guidelines for open ocean aquaculture installations.

Date Due: December 9, 2022.

[NOTE: This reviewer does not feel very well qualified to evaluate this proposal based on his expertise or lack thereof related to engineering. Nonetheless, there seem to be some significant flaws evident beyond the specific nature of the proposed work.]

1. **Science, Technology, and/or Extension Program Design (technical merit of all aspects of the project, 30%):**

This reviewer is not comfortable evaluating the merits of the technological approaches used or the mathematical modeling proposed as those are beyond his realm of expertise. That being said, this reviewer has some significant concerns about some elements of the proposed project framework. Firstly, Tasks 1 and 3 do not seem like meaningful research objectives… conducting a literature review should be part of the prep work for a proposal, and data mining wave data etc., from NOAA is not the generation of new information. Similarly, site selection (Task 4) is something that could have been done as part of the development of this proposed research. This information feels somewhat ambiguous as it currently presented.

Additionally, there are insufficient details provided on some elements of the methods and experimental design (e.g., The spatial resolution of the samples will be selected such that it is sufficient to provide the required geotechnical data to evaluate the anchoring system performance).

This reviewer is also concerned that the modeling efforts appear to be based on data derived from a single operation. While this reviewer is not an engineer or a modeling, having an n of 1 seems to be troubling to put it mildly. Why is a greater diversity of operations not identified *a priori* and evaluating to generate more data in the field as part of the proposed research?

*Poor 18*

1. **Industry Relevance and Probability of Success (30%):**

The proposed work aims to generate validated numerical model techniques that will be used in the process to perform engineering calculations for the extreme and operational conditions. Safety factors will be developed by comparing probability density function estimates of loads and tension response. Cyclical loads, wear and replacement periods of mussel farm components will also be investigated. The optimization of these parameters will lead to lower capital, operational and replacement costs and help to avoid structural failures, consequent loss, accidents, and damage to the aquaculture industry

While understanding the performance of aquaculture gear is important from a permitting perspective, this reviewer feels that the PI oversold its importance to the growth of the industry more broadly. Furthermore, it seems unlikely that data from a single source could be used to expedite the permitting process in a broad sense within a coastal environment which is certainly variable based on bathymetry, bottom type, prevailing wind direction etc.

The information dissemination plan is somewhat limited and vague and the data management plan is very brief.

Fair 21

1. **Integration with Extension (20%):** Does this work identify the key stakeholders? Stakeholders include those individuals (industries and agencies) not directly involved in the project. Is the extension plan appropriately designed to reach the targeted stakeholders? How will the results of this work address the needs of key stakeholders? Will this project extend our knowledge to all stakeholders? Are the expected outputs, outcomes, and impacts clearly described? Is the budget appropriate for effective integration?

The project team has engaged four farmers as part of an advisory team and funded members of the project to review and evaluate the work. That being said, based on the milestone table, interaction with industry seems to be limited to a 2-month window in year 1.

*Fair 14*

***4.* Capacity (10%):** Is (are) the principal investigator(s) and specified members of the research (extension) team qualified to conduct the research (program)? Is there industry representation as part of the team? Have the investigators clearly articulated they have adequate facilities and equipment to complete the project. Is the overall budget appropriate given the scope of the project? Is there a reasonable chance the project will be completed on-time?

The PI and Co-PI are well qualified and the project includes a number of unfunded participants with relevant skills and experiences. Four farms are engaged to serve on the advisory panel (and provided letters of support/commitment) and are getting compensated, but this reviewer would like to see more replication at the level of farms for engineering performance to be thoroughly evaluated. Unclear how all of the proposed modeling work can be completed based on a single operation.

In terms of the budget, it is not clear what the students will be doing for 12 months of the year.

*Fair 7*

***5.* Accountability (10%):** Does the investigator and her/his team have a successful track record of previous NRAC funding being adopted by the industry? Have they leveraged NRAC funding for additional resources to solve bigger problems that can be funded by NRAC alone? Is there evidence that the investigator(s) has (have) an established record indicating a high probability of success on the proposed work? Does the PI(s) have an established record of completing projects on-time meeting the objectives laid out in previous projects? Can this project integrate or be leveraged with funding from other work of the investigator(s)? Does the investigator(s) have a track record that suggests this project will be a good investment for NRAC resources?

No information is provided for previous NRAC funding as part of this submission, although the project team have clearly secured and completed projects funded by other sources..

*Good 8*

***6.* Total score: 68**

**Rating Fair**

**Final Recommendation: Do Not Fund**