Jason Ray, Alexias Thao, Jolee Thirtyacre  
Affiliated Organizations: Thomas Quinn, Chelsea Wood Lab, José Guzmán Lab, PhD  
Affiliated Institutions: University of Washington, University of Washington, University of Washington

April 14th, 2025

**To:**  Program Officers: José Guzmán, PhD and Zach Bengtsson  
 Funding Organization: International Society of Crustacean Ecophysiology  
 Program Title: *Applied Ecophysiology of Hemigrapsus oregonensis*

**Subject:** Letter of Intent to Submit a Proposal – *Applied Ecophysiology of Hemigrapsus oregonensis*

Dear Dr. Guzmán and Mr. Bengtsson,

I am writing to formally express my intent to submit a proposal in response to the RFP titled *“Applied Ecophysiology of Hemigrapsus oregonensis: Linking Mechanisms to Management in a Changing Coastal Environment.”*

Our proposed project, tentatively titled **"Water Temperature and Ibuprofen ecophysiological effects on *Hemigrapsus oregonensis*"**, will address the following thematic area(s) of the RFP:

● Climate Change - Exposure to Increasing Temperature:

* Understanding how heat environmental stress affects the physiological performance of *H. oregonensis* by looking at respiration/oxidation and glucose responses.
* Crabs exposed to high and ambient temperature treatments based on literature reviews and temperatures relevant to their native waters.

● Applied Stress Physiology of Marine Invertebrates - Pharmaceutical Stress (Ibuprofen)

* Understanding how the physiology of *H. oregonensis* is affected by fluctuating levels of pharmaceuticals in their environment.
* Two treatment groups experiencing Ibuprofen concentrations (dose 1) at the levels in the environment, and (dose 2) at a higher level than present in the environment currently. These doses will be determined by literature review.

Methods will include four treatment groups including: (1) high temperature, dose 1 (environmental dose); (2) ambient temperature, dose 1; (3) high temperature, dose 2 (higher than environmental); and (4) ambient temperature, dose 2. With two control groups: (1) high temperature, no drug; (2) ambient temperature, no drug. We will be examining the changes in haemolymph glucose levels, respiration rates, and haemolymph osmolality to look at the physiological impact of these stressors. These assays were chosen based on previous studies that have shown to be affected by different levels of NSAIDs (ibuprofen and others such as diclofenac) and temperature stressors.

This project will investigate physiological changes of *H. oregonensis* under different levels of Ibuprofen concentrations and temperature stress. Implications for this study aims to look at crab physiology as water temperatures continue to increase with climate change, along with understanding the impact of increasing pharmaceutical-contaminated runoff on organisms in the intertidal zone.

The anticipated Principal Investigators will be Drs. Thomas Quinn, Chelsea Wood, and José Guzmán. Our research approach emphasizes ecologically meaningful physiological endpoints with direct application to coastal resource management and climate adaptation.

We appreciate this opportunity to contribute to applied coastal science and would be happy to provide any additional information if needed prior to full proposal submission.

Sincerely,  
 Jason Ray, Alexias Thao, and Jolee Thirtyacre