Request for Proposals
Applied Ecophysiology of *Hemigrapsus oregonensis*: Linking Mechanisms to Management in a Changing Coastal Environment

Issued by: International Society of Crustacean Ecophysiology
Letter of Intent Submission Deadline: April 14, 4:30pm (AA); April 15, 4:30pm (AB)
Funding Period: Spring Quarter 2025

Overview

The International Society for Crustacean Ecophysiology invites proposals for applied research using the native hairy shore crab (*Hemigrapsus oregonensis*) as a model organism to understand how physiological responses to environmental stressors scale up to influence ecological interactions, species resilience, and resource management. This opportunity supports projects that bridge ecophysiology and ecosystem dynamics to inform real-world responses to climate change, species invasions, and shifting fisheries.

As a widespread estuarine crab with broad physiological tolerance, *H. oregonensis* offers a tractable model for investigating how individual- and population-level stress responses can affect community structure, species performance, and ecosystem services.

Research Priorities

We seek proposals integrating experimental approaches to examine how physiological mechanisms underlie ecological outcomes relevant to coastal management. Proposals should address one or more of the following categories:

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1. Climate Change and Crab Fisheries

Core Questions:

- How do environmental stressors (e.g., heatwaves, hypoxia, acidification) affect the physiological performance, survival, and reproductive output of *H. oregonensis*?

- What are the implications of these changes for species occupying similar ecological niches, including commercially important crab species?

Priority Areas:

- Applied physiology studies linking stress thresholds (e.g., critical thermal maxima, metabolic limits) to species distributions or abundance trends.

- Comparisons between *H. oregonensis* and managed crab species to inform fishery risk assessments or adaptive harvest strategies.

- Development of bioindicators or early warning tools for environmental tipping points.

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2. Invasive Species and Competitive Tolerance

Core Questions:

- How do physiological tolerances of *H. oregonensis* compare to invasive competitors under projected climate scenarios?

- Can physiological plasticity or limits predict shifts in species dominance?

Priority Areas:

- Head-to-head stress trials between *H. oregonensis* and known invasive species (e.g., *Carcinus maenas*) tolerances under thermal, salinity, pH gradients, or other environmental factors..

- Application of tolerance data to predict invasion success or community restructuring under environmental change.

- Trait-based risk assessments linking physiological traits to invasion potential.

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3. Applied Stress Physiology of Marine Invertebrates

Core Questions:

- What mechanisms allow *H. oregonensis* to survive and function in fluctuating and stressful coastal environments?

- How can these insights be applied to other vulnerable or economically important species?

Priority Areas:

- Metabolic, immune, or behavioral responses to acute and chronic stress (e.g., oxidative damage, osmoregulatory shifts).
- Comparative physiology across taxa to identify conserved vs. unique stress response strategies.
- Application of lab results to field settings or restoration scenarios (e.g., habitat refugia, shellfish mariculture design).

Eligibility

This opportunity is open to researchers from universities, non-profits, tribal organizations, government labs, and other institutions engaged in coastal or estuarine research. Collaborative and interdisciplinary projects are strongly encouraged, particularly those that link physiology with ecology, fisheries science, or management.

Proposal Requirements

Proposals must include:

- Project Title and Summary (max 300 words)
- Research Objectives and Background
- Methodology, including stressor types and physiological metrics
- Relevance to real-world ecological or management outcomes
- Timeline and Milestones
- Experimental Design and Justification

Review Criteria

Proposals will be evaluated based on:

- Scientific and technical merit
- Strength of applied ecophysiological approach
- Relevance to priority themes
- Feasibility and clarity of methods
- Broader impacts and potential to inform policy or practice

Submission Instructions

Letters of intent must be submitted by the previously mentioned deadline. Proposal presentations created by applicants will take place April 21, 1:30pm-4:20pm (AA) and April 22, 1:30pm-4:20pm (AB). Panel members will decide whether or not proposals are accepted and provide feedback on how experiments should be conducted to receive approval.

We look forward to supporting research that advances the predictive and applied power of ecophysiology in coastal systems under rapid environmental change!