



Shannon Point Marine Center
Western Washington University

COSEE-PP PRIME
SUMMER INTERNSHIP

**Promoting Research Investigations in the Marine Environment
for Community College Students
Shannon Point Marine Center**

Sponsored by



COSEE Pacific Partnerships is sponsoring two summer internships for community college students at the Shannon Point Marine Center (SPMC) located in Anacortes, WA through the Promoting Research Investigations in the Marine Environment (PRIME) Program. The internships will introduce students to the research environment at a marine laboratory and provide training in research techniques. The program will run from June 21-August 13, 2010. Interns will receive a \$2,000 stipend and housing on-site will be provided. Additional information about COSEE Pacific Partnerships can be accessed at <http://www.coseepacificpartnerships.org> and about SPMC at www.wvu.edu/~sPMC.

Students may participate in one of the following two projects in 2010, both of which will be under the supervision of Dr. Stephen Sulkin, Shannon Point Marine Center Director

The relationship between nutritional status at hatching and the value of ingesting microalgae in larval crabs

Larval crabs must feed soon after hatching to sustain their normal development. While they will ingest single-celled algae (phytoplankton), such prey is not sufficient to support development. However, it is possible that feeding on phytoplankton immediately after hatching may sustain larvae until they encounter a more suitable prey field, consisting of small zooplankton. Laboratory studies on this possibility have been inconsistent and it may be that the nutritional value of ingesting phytoplankton upon hatching depends on the nutritional status of the larvae; that is, do they hatch with sufficient nutrient reserves left over from the pre-hatching brooding period to render feeding on algae unnecessary. Preliminary studies by a COSEE PRIME intern in 2009 suggested this possibility. To examine this rigorously, the experiment must define nutritional status at hatching and relate it to the capacity of algae to provide some measurable

outcome related to development. Larvae of the commensal pea crab provides a system that can be manipulated to study this phenomenon. Pea crabs live in the shells of bivalves and other invertebrates and depend upon the capacity of their hosts to provide them food. Variation in that capacity can influence the energy that the female crab can contribute to the eggs she produces and thus there may be variation in the nutritional status of the larvae at hatching. Such variation among broods can be documented by measuring how long the larvae can survive under starvation conditions. The delay in mortality when the larvae are fed various phytoplankton can then be compared to starvation condition survival and the relationship between the two documented. The study will contribute to a better understanding of the feeding ecology of larval crabs, an important factor in determining their role in population and community ecology.

Manipulating the nutritional value to larval crabs of rotifer prey

Larval crabs must feed on small zooplankton to develop normally. A small invertebrate, the rotifer, has been shown to be an excellent prey, but its nutritional value varies depending upon its own diet. This phenomenon provides the opportunity to study various nutritional requirements of larval crabs if the nutritional value of the rotifer can be predictably manipulated. For example, preliminary studies have shown that algae high in certain fatty acids produce a more nutritious rotifer than do algae low in fatty acids. Furthermore, rotifers will ingest certain strains of toxic algae but not other, closely related strains. The purpose of this study will be to manipulate the diets of the rotifer by feeding them various algae in defined combinations, determine if the rotifer selectively ingests them, and assess the nutritional value of the rotifer prey to larval crabs. The study will also create cultures of rotifers raised on single algal species and create crab larval diets consisting of combinations of these different rotifers. The study will provide new tools for the rigorous investigation of nutritional requirements in larval crabs.

Requirements: One year of science coursework at a community college

To Apply: Please submit the following materials by **April 19, 2010:**

- 1) Your name and contact information (including e-mail address if available);
- 2) A copy of your transcripts (informal copy acceptable)
- 3) A letter of recommendation from a faculty member
- 4) One-page essay detailing your interests in marine science and outreach and why you are applying for this opportunity;
- 5) List in order of preference the project for which you would like to be considered

Mail To: COSEE Summer Internship, Shannon Point Marine Center, 1900 Shannon Point Road
Anacortes, WA 98221

Or email to: spmc@wwu.edu