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## **Small-Scale Bio-Optical Distributions in the Upper Ocean (AASERT)**

Timothy J. Cowles

College of Oceanic and Atmospheric Sciences

104 Oceanography Admin Bldg

Oregon State University

Corvallis, OR 97331-5503

Office: (541) 737-3966 FAX: (541) 737-2064 email: [cowles@oce.orst.edu](mailto:cowles@oce.orst.edu)

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### **LONG-TERM GOALS**

Our long-term goal is to quantify the interactions between small-scale biological and physical processes within the upper ocean. This project addresses that goal by providing support for a graduate student to assist in field work, sample analysis, and data processing and analysis within the parent project "Assessing The Role Of Small-Scale Bio-Optical And Bio-Acoustical Distributions In Upper Ocean Biological And Optical Processes."

### **OBJECTIVES**

Our objective is to train graduate students to think critically about scientific questions, and to develop the skills to address well-formed questions with the appropriate analytical tools. This ASSERT project permits Ms. Lisa Eisner, a graduate student in Biological Oceanography, to work with newly-developed, state-of-the-art bio-optical instrumentation, and provides the opportunity for her to participate in the growth of an important new research area within biological oceanography.

### **APPROACH**

Ms. Eisner is working with bio-optical data obtained from a time-series of high-resolution vertical profiles (2-3 cm vertical resolution) in East Sound, Orcas Island, WA. Ms. Eisner is examining, using data analysis software, patterns of occurrence of thin planktonic layers in association with distinct physical properties. In addition, she is using experimental procedures to evaluate the physiological response of phytoplankton found in small-scale distributions.

### **WORK COMPLETED**

Ms. Eisner is taking graduate coursework in oceanography and gaining familiarity with our large data sets of high-resolution profiles of physical and bio-optical properties. She has participated in two cruises off the Oregon coast that focussed on the linkages between small-scale bio-optical processes and physical processes. In addition, she participated in the 1998 Thin Layers experiment in East Sound, Orcas Island, WA. She has gained valuable experience with the high-resolution

profiling system. She is investigating approaches for inverting spectral absorption and fluorescence data into taxonomic categories.

## **RESULTS**

Ms. Eisner's 1998 experiments and subsequent data analysis will be shown in a presentation at the 1999 Aquatic Sciences meeting in Sante Fe, NM. Her analyses are in progress at this time.

## **IMPACT/APPLICATION**

The AASERT funding provides the opportunity to train graduate students in the use of newly developed instrumentation, and the application of that technology to pressing scientific questions.

## **TRANSITIONS**

Not applicable at this time.

## **RELATED PROJECTS**

This AASERT proposal is linked to the field efforts of the following ONR Principal Investigators:

Dr. J. Ronald Zaneveld, Oregon State University  
Dr. Percy Donaghay, University of Rhode Island  
Dr. Jan Rines, University of Rhode Island  
Dr. Dian Gifford, University of Rhode Island  
Dr. Alice Alldredge, UC Santa Barbara  
Dr. Sally MacIntyre, UC Santa Barbara  
Dr. Mary Jane Perry, University of Washington  
Dr. Van Holliday, Tracor Systems