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# **AASERT SUPPLEMENT TO VIBRATIONAL SENSING IN MARINE INVERTEBRATES**

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## **LONG-TERM GOALS**

My long-term goal is to understand important interactions among organisms, particles (including sediments), solutes and moving fluids. The reason for this goal is to be able to solve interesting forward and inverse problems dealing with marine biota.

## **OBJECTIVES**

My current objectives under this supplement are to investigate the phenomenon of emergence from the benthos.

## **APPROACH**

The supplement is enabling Ms. Kelly Kringel to work with Van Holliday's TAPS-4 (Tracor Acoustic Profiler) data collected during the ORCAS experiment. This device used four frequencies and range gating to generate vertical profiles of backscatter in 2-min, 0.5-m bins. The AASERT grant enabled her to revisit the ORCAS site in summer of 1997 to test hypotheses about the identities of animals constituting the emergence phenomenon documented by TAPS-4 at ORCAS but seen almost everywhere in the littoral that data allow a look (e.g. Jumars et al. 1996). This phenomenon is better known from tropical reef habitats and fresh water, but only because of higher-intensity sampling and observation there. TAPS-4 operated at multiple frequencies, but the frequency that showed the phenomenon most clearly in our case was 265 kHz.

## **WORK COMPLETED**

The grant began in June 1997. A time-series analysis of the TAPS-4 data is nearing completion. Emergence traps and zooplankton nets were deployed at the ORCAS site in summer of 1997 to test hypotheses about the identity and vertical extent of emerging organisms.

## **RESULTS**

Time-series analysis of the TAPS-4 results showed clear daily periodicity in the water depth from which peak backscatter occurs. Emergence happened shortly after dark and re-entry happened shortly before first light. The new trap and net data confirmed our suspicions that the scatterers responsible are mysid shrimp comprising several species but dominated strongly by one.

## **IMPACT**

It is premature to expect impact, as we have not had time to present the results at meetings or to publish.

## **TRANSITIONS**

For similar reasons there are no documented transitions, although we can already suggest that acoustic search near the seabed in the littoral zone will be most difficult at dawn and dusk and easiest (least volume reverberation from animals) during daylight.

## **RELATED PROJECTS**

This AASERT is tied directly to the parent grant by the same name. It is in collaboration with Van Holliday of Tracor Applied Science.

## **REFERENCES**

Jumars, P.A., D.R. Jackson, T.F. Gross and C. Sherwood. 1996. Acoustic remote sensing of benthic activity: A statistical approach. *Limnol. Oceanogr.* 41: 1220-1241.

Further information, graphics and links to related work will be made available at the following url as the work progresses:

<<http://www.ocean.washington.edu/people/faculty/jumars/jumars.html>>