Announcing an opportunity to participate in a new
Departmental Research Initiative (DRI)
supported by the Office of Naval Research (ONR), entitled

Critical Benthic Environmental Processes and Modeling at SAX04 (aka Ripples DRI)

A four year, $5M (total), multi-disciplinary research program starting in Fiscal Year 2004

Planning letters briefly describing research to be proposed under this DRI should be submitted to the Science Program Officer leading this program **by 1 November 2003**.

The DRI goal is to develop predictive understanding of small-scale ripple morphology and its temporal evolution, including genesis, evolution, and decay, in sandy environments across the inner shelf.

Detailed below are the scope and objectives of the DRI, a general approach proposed to achieve these objectives, and the process and timetable of application for research support under the DRI.

SCOPE AND OBJECTIVES OF THE DRI

The Ripples DRI, formally entitled *Critical Benthic Environmental Processes and Modeling at SAX04*, is being developed and will be administered by a partnership among three programs in ONR: Coastal Geosciences, Ocean Optics and Biology, and Ocean Acoustics.

Recent ONR Ocean Acoustics program observations at SAX99 (Thorsos et al., 2001; Richardson et al. 2001) reveal that small-scale seafloor geometry in sandy environments, in particular, ripples, significantly affects subseafloor penetration of acoustic energy that might be usefully exploited for detection of buried targets. Acousticians desire the ability to predict seafloor geometry, for example, the existence or absence of ripples, their height, spacing, and orientation, and the temporal and spatial variability of seafloor geometry. Such predictive capabilities are only partially developed: fundamental understanding of the turbulent, granular-fluid flows that characterize sediment transport processes that both generate and modify seafloor geometry on the inner shelf requires additional research. The Ripples DRI is motivated by such basic research needs and its scope is limited to basic research. It is expected that the results of the Ripples DRI will have substantial application, but such applications will not be addressed within the scope of this DRI.

The main objectives of the DRI are to:

- Measure and model ripple morphology and its gradients on scales ranging up to kilometers
- Understand the response of ripples to changes in wave and wave-current forcing
- Measure and model rates of biological degradation (or production) of seafloor geometry
- Measure and model effects of a distribution of grain-scale properties (e.g., size, density, cohesion) on ripple morphology
- Understand the role of ripples in generating surface and subsurface sedimentary structures

To achieve these objectives a wide range of research programs need to be supported and integrated. These research programs individually and collectively should be designed to answer important questions posed to directly address the above objectives. An integral element of the overall research effort is expeditious collaboration between field and modeling efforts. A detailed data-sharing policy to ensure efficient, two-way dissemination of information between DRI participants will be generated at the first DRI planning meeting, before final proposals are submitted.

RESEARCH APPROACH

Researchers in the scientific community are expected to generate the research plan to achieve the DRI objectives, subject only to some logistical constraints. DRI field researchers are expected to participate in the main SAX04 field experiment, which will start 1 September 2004 and conclude 15 November 2004. The timing and location of the SAX04 experiment, offshore either Fort Walton Beach or Panama City, Florida, are driven primarily by Ocean Acoustics program needs. SAX04 plans include an extensive array of acoustical apparatus to be deployed from a moored ship, the R/V Seward Johnson. Both the moored ship and a second vessel will be available to DRI participants, subject to some space limitations. The SAX04 field design will be very similar to the design in SAX99 (Fig.4 in Thorsos et al., 2001), with an additional 50-m-long rail system for SAS experiments that will be oriented both parallel to and perpendicular to ripple crests during SAX04. DRI research during SAX04 may encompass a larger area, start earlier, and end later than SAX04; the balance between mutually beneficial colocation and unacceptable perturbation will be addressed in planning meetings.

Following the SAX04 field experiment, DRI researchers will have the opportunity to select one or more additional sites consonant with research needs for future field experimentation. A candidate timetable for field research under the DRI might consist of a field season (SAX04) starting in late FY04, a year for analysis of field observations in FY05, a second field season in FY06, and a year for analysis of the second season's field observations in FY07. Because the DRI research overlaps substantially with that of the core CG program, there is strong likelihood that additional funding for DRI-related research will be available after the DRI formally concludes.

This DRI is a four-year program with a total budget of approximately $5M. Available funds are nominally $1.5M for FY04, $1M for FY05, $1.5M for FY06, and $1M for FY07. Both teams and individuals may submit planning letters to be considered for field, laboratory, and computational studies. In developing research plans and operating budgets potential participants must consider the program's budget limitations and recognize that many researchers must be supported to accomplish the program's objectives.

APPLICATION FOR RESEARCH SUPPORT & TIMETABLE

Researchers wishing to apply for research support under the DRI should submit a short (less than 4 pages) planning letter by email 321_CG_TeamLeader@onr.navy.mil **by 1 November 2003**. Planning letters should be sent as an email attachment in the form of a Word document file or PDF file.

The planning letter should include:
1) investigator's names, institutions, phone numbers, and email addresses;
2) a concise description of the goals of the research you wish to propose;
3) the technical approach;
4) an estimate of funds required by year;
5) a short CV for each principal investigator.

After careful review of the planning letters, an ONR Program Officer will respond to indicate whether or not submission of a full proposal is encouraged. This announcement is intended to solicit a broad response from the research community. Criteria used in evaluating both planning letters and proposals will be:

- technical merit and innovation;
- programmatic compatibility and Naval relevance;
- qualifications of the PI(s);
- synergy of the team for the proposed effort (team proposals);

- reasonable and manageable cost

Projected timetable for requesting research support and evaluation of requests by ONR follows:
1 November 2003: planning letters due
15 December 2003: recommendations on planning letters announced
1 February 2004: formal proposals due to ONR
Early February 2004: organizational workshop; possible proposal revisions due
Mid February 2004: final funding decisions made
1 March 2004: projects begin
1 September 2004: SAX04 begins

Questions on the DRI or proposal process should be first directed to the ONR Program Officer associated with the DRI: 321_CG_Teamleader@onr.navy.mil; phone 703-696-1206. Email is preferred.

REFERENCES

Thorsos, E.I. et al., 2001, An overview of SAX99: acoustic measurements: IEEE Journal of Oceanic Engineering, vol. 26, no. 1, p. 1-25.

Richardson, M.D. et al., 2001, Overview of SAX99: environmental considerations: IEEE Journal of Oceanic Engineering, vol. 26, no. 1, p. 26-53.

http://www.apl.washington.edu/programs/SAX99/