

The NOAA Undersea Research Center at the University of North Carolina Wilmington seeks proposals for undersea research projects to be conducted in 2006 and 2007 off the southeast U.S. from North Carolina to Texas. Projects are selected by peer review based on scientific merit and relevance to the program's mission. Proposals may be written for one or two years of direct science support of \$35,000 per year. Undersea system and support vessel time is provided by the center at no cost to the principal investigator. Awards from previous years averaged \$25,000 per year and are partly determined by NOAA funding to the center and partly by peer review rankings.

This announcement is soliciting proposals for FOUR specific funding opportunities. The following general themes are identified as priority items, but other projects will be considered based on submission of pre-proposal review. All proposals are strongly encouraged to involve industry and need to have broad societal impact through education and outreach programs.

OPPORTUNITY #1: NOAA Coral Reef Conservation Program (NCRCP). Funds for two-year projects (with one-year projects preferred) beginning in 2006 that address the priority research needs for the southeast U.S. and Gulf of Mexico. There is a 100 percent non-federal match required for NCRCP projects.

Systems available: Scuba, saturation diving

NOAA and regional priorities:

- Define the role of keystone species within coral communities and determine how they sustain such roles through studies of their trophic and behavioral webs, physiological metrics in comparison to other guild members (including reproductive physiology), recruitment dynamics, and population dynamics.
- Assess the baseline microbial communities of keystone species in the region.
- Study life histories of economically important marine organisms associated with coral ecosystems and identify indicators of community change and recovery.
- Conduct research to better understand the threats faced by shallow coral reefs, including, but not limited to, coral bleaching, coral diseases, land-based pollution, and invasive species; assess the impact of these stressors on coral reef ecosystems; evaluate management effectiveness.
- Conduct epizootiological studies to determine the relationships between coral disease, coral health and changing environmental conditions.
- Determine the effects of environmental and climatic factors on infectivity and susceptibility.
- Develop restoration methods of damaged coral reefs.
- Develop models to accurately predict the effects of environmental changes (including natural events) on habitats of interest and marine managed areas.

OPPORTUNITY #2: NURP core projects. Funds for one- or two-year projects beginning in 2006 focusing on NOAA/NURP research priorities off the southeast region:

Systems available: Scuba, glider, saturation diving

NOAA and regional priorities:

- Corals (see Coral Reef Conservation Program opportunity)
- Fisheries:
 - Determine how spatial and temporal patterns of diversity are regulated and relate spatial patterns to phenotypic and genetic variation in key taxa in critical habitats and marine managed areas.
 - Conduct research to better understand how ecosystems function, including interrelationships between environments, populations, species, and individual organisms to predict how such systems will react to anthropogenic change and natural events.
 - Use advanced underwater technology to develop improved techniques for stock assessment of fish populations, and to determine the effectiveness of stock enhancement efforts.
 - Develop improved methods/models to assess the abundance and condition of fishery populations or affected ecosystems, and the effectiveness of stock or habitat enhancements.
 - Identify, characterize, and understand essential fish habitat to determine requirements for healthy fish populations and assess the effectiveness of management strategies for conserving fish stocks.
 - Conduct research on life histories of commercially or ecologically important fish and invertebrate stocks.

- Assess the influence of trophic interactions and oceanographic conditions on recruitment success and abundance of fish populations.
- Ecosystems:
 - Characterize, assess, and analyze the spread of alien and invasive species.
 - Collect, analyze, and archive marine samples for biomedical and commercial applications.
 - Assess function and effectiveness of marine managed areas including Marine Protected Areas, Habitat Areas of Particular Concern, National Marine Sanctuaries (Flower Garden Banks, Florida Keys and Gray's Reef), and National Parks

OPPORTUNITY #3: Ocean mapping initiative using the new NURP AUV (30 days of survey time available). One-year projects beginning in 2006 or 2007

Undersea System: Explorer AUV

NOAA and regional priorities:

- Provide detailed habitat maps and characterizations of significant ecosystems, such as managed areas, resilient, and less resilient ecosystems
- Provide maps to facilitate exploration and research of shelf and slope areas of ecological and economic importance.

OPPORTUNITY #4: 2007 Deep Submergence Facility. One-year projects beginning in 2007.

Undersea Systems: DSV Alvin, ROV Jason II (<http://www.whoi.edu>)

NOAA and regional priorities:

- Conduct studies to increase the understanding of deep-sea corals, and how communities of corals may function as habitat for fish and invertebrates.
- Develop models to predict the succession of cold seep communities as a response to changes in chemical flux.
- Seek out, recover, and culture novel organisms from unique, extreme environments, such as cold seeps, for the purpose of identifying unique bioactive compounds with commercial potential.
- Evaluate, model, and predict the effects of anthropogenic stressors and/or environmental changes to cold seep ecosystems, and estimate rates of impact recovery.
- Investigate the relationships between seep geochemistry and the associated seep communities.
- Understand the role that methane hydrate degassing plays in the carbon cycle.

Descriptions of available systems:

Note: Due to funding limitations, the center is not soliciting proposals that require submersibles or remotely operated vehicles with the exception of Deep Submergence vehicles identified in opportunity #4 listed above.

- **Non-Saturation Diving:** Personnel and equipment support for ambient air or nitrox scuba diving. Use of nitrox can increase the bottom time by as much as 200 percent over the course of a 12-hour dive day.
- **Technical Diving:** Technical diving involves the use of techniques and equipment to enable divers to safely conduct scientific research to depths of 300 fsw. Technical diving supported by the center includes air and nitrox decompression diving and mixed gas decompression diving using alternative inert gas (AIG). Personnel must be certified for decompression diving using air, nitrox, or AIG.
- **Saturation Diving from the Aquarius Undersea Laboratory:** Aquarius is the most sophisticated undersea laboratory operational in the world today. Aquarius is located at Conch Reef, 5 nm off Key Largo in the Florida Keys. Saturation missions of 7-14 days are typically supported.
- **Glider AUV:** Long-duration shelf deployments (<200m). The vehicle will be deployed from small vessels of opportunity to perform wide-area coastal ocean surveys lasting up to 30 days. The vehicle may survey in a yo-yo fashion through the water column or horizontally across programmed transects while recording CTD and limited oceanographic data, e.g., turbidity, oxygen, fluorescence.
- **Ocean mapping AUV** (2200m depth rated): Surveys are generally 10 days in length and cover up to 18 km² per day. The AUV is 4.9 meters long, 0.69 meters in diameter, 940 kg weight in air, and operated from vessels of opportunity of sufficient size and with appropriate handling equipment. Standard payloads include: Simrad EM-2000 multi-beam echosounder (MBES), SeaBird FastCat 49 CTD, and navigation and communications system that enable it to perform seafloor mapping at much higher resolution than possible from surface ships in deep water. Other optional payloads provided by the investigator are possible.

Preliminary proposals are **required and must be submitted by email by July 1, 2005**. Pre-proposals should be <3 pages and give a summary of the proposed research, describe research goals and facilities/equipment requirements, outline time or logistic constraints, give area of operations including depths, and estimate the level of support required. This will ensure that appropriate research guidelines are addressed, and permit operations staff to evaluate feasibility.

Proposal guidelines contain a full description of center facilities and systems, proposal conditions and format, and required forms. Guidelines will be available online at <http://www.uncwil.edu/nurc> by April 29, 2005

Proposal deadline: Proposals must be received by the center no later than **August 19, 2005**.

For further information:

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