



# Proposal Guidelines for Coral Reef and Reef-related Ocean Acidification Research off the southeast U.S. and Gulf of Mexico in 2008 and 2009

NOAA Undersea Research Center at the  
University of North Carolina Wilmington  
and  
NOAA Coral Reef Conservation Program



## Important Dates and Contacts

Inquiries related specifically to Opportunity #1 and *Aquarius Reef Base* should be directed to:

Ellen Prager, Chief Scientist of Aquarius Reef Base  
NOAA Undersea Research Center at UNCW  
PH: 305.451.0233, ext 206; FAX: 305.453.9719  
email: [pragere@earthlink.net](mailto:pragere@earthlink.net)

Inquiries related specifically to Opportunity #2 and ALL proposals should be directed to:

Thomas Potts, Associate Director  
NOAA Undersea Research Center at UNCW  
PH: 910.962.2442; FAX: 910.962.2444  
email: [pottst@uncw.edu](mailto:pottst@uncw.edu)

### Proposal deadlines:

- ▶ Proposals addressing Opportunity #1 must be received by the center no later than **March 3, 2008**.
- ▶ Proposals addressing Opportunity #2 must be received by the center no later than **March 10, 2008**.

**--Proposals received after the deadline will not be processed--**

### Proposal requirements:

- One signed original with requisite forms
- One hard copy with requisite forms
- Digital copy in MS Word AND Adobe PDF formats on CD (including forms)
- Formatted as described in the following pages
- All materials should be sent to Thomas Potts via address above

### Schedule of Events

RFP release date	December 14, 2007
Pre-proposal deadline	January 14, 2008
Invitation to submit full proposals	January 25, 2008
Proposal deadline: Opportunity #1	March 3, 2008
Proposal deadline: Opportunity #2	March 10, 2008
PI notification: Opportunity #1	May 2, 2008
PI subawards granted: Opportunity #1	May 5, 2008
PI notification: Opportunity #2	May 30, 2008
PI subawards granted: Opportunity #2	January 2009
Anticipated Aquarius mission date: Opportunity #1	October, 2008

## I. Funding Opportunity Description

**The NOAA Undersea Research Center at the University of North Carolina Wilmington (NURC/UNCW)** seeks proposals for undersea research projects to be conducted in 2008 and 2009 off the southeast U.S. from North Carolina to Texas. Projects are selected by peer review based on scientific merit, feasibility, and relevance to NOAA's mission and the topics outlined below. Proposals may be written for one year (opportunity 1) or two years (opportunity 2) of direct science support of \$75,000 per year and should contain an in situ field component. Undersea system and support vessel time is provided by the Center at no cost to the principal investigator.

This announcement is soliciting proposals for **TWO** specific funding opportunities. All proposals are strongly encouraged to involve industry, address how data will be disseminated to user communities (e.g., resource managers) and need to have broad scientific and societal impact.

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### **OPPORTUNITY #1: Ocean Acidification Research at Aquarius Reef Base (Key Largo, FL)**

Private foundation funds in the amount of \$75,000 for direct science support are available for a research mission focused on the impacts of ocean acidification on coral reefs at *Aquarius Reef Base* during **October 2008**. If additional funds are or become available projects may be extended to two years.

Systems Available: *Aquarius Reef Base assets (in October 2008)*

Proposal Focus: Coral reef ecosystems are among the most diverse and valuable ecosystems on Earth. Worldwide, coral reef ecosystems provide billions in annual goods and services. In the past few decades, competing demands on coral reef ecosystems and increasing threats from both natural and anthropogenic stressors (e.g., fishing, pollution, and climate change) have contributed to significant decline in coral reef ecosystem condition.

Climate change, in particular increases in temperature and carbon dioxide levels, threatens coral reef ecosystems through increased occurrence and severity of coral bleaching and disease events, sea level rise, and storm activity. Climate change may also reduce calcification rates in reef-building organisms by lowering the pH of seawater and reducing the availability of carbonate ions. Reduction in calcification rates directly affects the growth of individual corals and the reef's ability to maintain itself against forces that cause reef erosion, potentially compounding the 'drowning' of reefs caused by sea level rise.

Proposals are requested that specifically use *Aquarius Reef Base* assets to conduct a mission during October 2008 to address one or more of the following priorities for research on the impact of ocean acidification on coral reefs:

- Investigate how differing levels of atmospheric CO<sub>2</sub> will affect ocean pH, carbonate saturation state, and coral calcification and growth rates;
- Quantify the effects of temperature, pH, alkalinity, and aragonite saturation state on coral calcification, reproduction, and recruitment;
- Measure biogenic CaCO<sub>3</sub> production, seawater chemistry, CaCO<sub>3</sub> dissolution and accumulation, bioerosion, and export of CaCO<sub>3</sub> to improve the accounting of coral reef carbonate budgets, cycles, and predict how reef accretion may change in the future;
- Determine how variations in calcification rates affect associated organisms, food web dynamics, carbon and nutrient cycling, bioerosion, and ecosystem services;
- Determine the interactive effects of multiple variables that affect calcification and dissolution through experimental studies;
- Establish clear links between laboratory experiments and the natural environment, by combining laboratory experiments with field studies.

## OPPORTUNITY #2: NOAA Coral Reef Conservation Program (CRCP) Coral Research

This funding opportunity is for one to two year targeted research projects that address one or more of the following threats facing U.S. coral reefs in Florida (includes the Florida Keys, Southeast Florida, and the Eastern Gulf of Mexico) and the Flower Garden Banks: fishing, pollution, coastal uses (including invasive species), climate change, and extreme events.

*Systems available:* Scuba, Aquarius Reef Base assets (in 2009), Glider AUV

*Proposal Focus:* Specific research needs for this funding opportunity are detailed in the *NOAA Coral Reef Ecosystem Research Plan for FY 2007 to FY 2011*. Proposals must identify the specific research need that their project is addressing from one of the following:

- Jurisdiction-wide Research Needs
  - [www.coris.noaa.gov/activities/coral\\_research\\_plan/pdfs/jurisdiction\\_w\\_research.pdf](http://www.coris.noaa.gov/activities/coral_research_plan/pdfs/jurisdiction_w_research.pdf)
- Jurisdiction-specific Research Needs
  - Florida (includes the Florida Keys, Southeast Florida, and the Eastern Gulf of Mexico)  
[www.coris.noaa.gov/activities/coral\\_research\\_plan/pdfs/florida.pdf](http://www.coris.noaa.gov/activities/coral_research_plan/pdfs/florida.pdf)
  - Flower Garden Banks  
[www.coris.noaa.gov/activities/coral\\_research\\_plan/pdfs/flower\\_garden\\_banks.pdf](http://www.coris.noaa.gov/activities/coral_research_plan/pdfs/flower_garden_banks.pdf)

Proposals should be geared towards management-oriented research to: (1) develop a better understanding of the role of the threats listed above in coral reef ecosystem decline; (2) predict the impacts from and responses of reef communities to anthropogenic and natural stressors; and (3) design, test, and evaluate the effectiveness of specific reef management measures, including marine protected areas and habitat restoration techniques. Proposals should clearly demonstrate how the scientific information, tools, or other products from the project would enable resource managers to address threats to reefs and advance conservation of coral reef ecosystems.

### **Special Requirements for Opportunity #2 Only:**

- **Proposals submitted under the CRCP funding opportunity require 100% non-federal match.** Non-federal matching funds may be comprised of a variety of public and private sources and may include in-kind contributions and other non-cash support.
- **Eligibility.** Eligible applicants are U.S. institutions of higher education, not-for-profit institutions, and state, territory, and local governments. Proposals may include federal researchers as collaborators with a researcher who is affiliated with a U.S. institution, non-federal agency, or any other non-profit organization. Federal organizations may not charge federal salary, travel, or overhead, but other categories are appropriate.

## II. Description of available systems

### **Aquarius Reef Base**

The *Aquarius* undersea research station has evolved into *Aquarius Reef Base*, which is composed of the undersea lab, an ocean observing station with real-time access via the Internet, and a shore base. Together these assets provide a state-of-the-art saturation diving facility for coral reef science along with synchronous ocean observing, a test bed for technology development, and advanced communications that allow for telepresence research, education, and outreach.

Saturation diving is conducted from the *Aquarius* undersea laboratory, which is the only undersea laboratory specifically devoted to science operating in the world today. Four scientists and two staff technicians will live inside and work out of *Aquarius* for up to nine days. While saturation diving, a diver's tissues equilibrate with the surrounding depth with respect to inert gas (nitrogen) concentrations. The laboratory is located in 20 m of water, and aquanauts diving to a depth of 40 m achieve bottom times that are nearly 10 times longer than no-decompression scuba diving from the surface. *Aquarius* provides workspace, power, and data communications that support experimentation, observation, technology testing, and undersea access that could not be accomplished if supported solely from the surface.

During missions, the watch desk and support staff is based at the center's Key Largo facility, nine miles from the site. A life support buoy transmits real-time data from *Aquarius* and work sites to the shore-based watch desk, including:

- Status of generators and compressors;
- Life-support parameters inside *Aquarius*;
- Voice and video from *Aquarius* to shore;
- Science data from the seafloor and *Aquarius* to shore; and
- Ocean observations in real-time (salinity, temperature, oxygen, waves, currents, and various optical properties).

Dive tables and procedures developed in 1997 decrease decompression times for aquanaut rescues in the unlikely event that an emergency evacuation is necessary. Since surface support boats are not required to monitor aquanaut diving, staffing and weather conditions are less restrictive. Data from seafloor experiments can be transmitted in real-time, including voice and images, to anywhere in the world via the Internet. A cellular telephone also provides worldwide communication capability.

Staff-piloted, small boats are also available to enhance *Aquarius*-based research by providing the capability to conduct concurrent, independent, dive operations for a separate, surface-based research team. This is especially useful for projects requiring the assistance of scientific personnel beyond the four-scientist capacity of *Aquarius*, sampling from areas outside of the range of saturated aquanauts, and projects requiring outreach and education support from the surface.

Shore facilities, complete with sleeping, eating, and recreating areas, are available to house about 8 scientists and support personnel throughout the mission. A science laboratory and secure storage are also available on site.

**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).

**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, and fluorescence).

### III Proposal Format

It is extremely important that final proposals are complete and **adhere to a standard format**, including:

- Stapled in the upper left-hand corner, but otherwise unbound.
- Margins of 2.5 cm (1 in.).
- Three-hole punched for insertion into a binder.
- Clear and readily legible type (minimum of 12 pt font).
- **Original** printed one sided; **copy** may be printed two-sided.
- Use Metric System of weights and measures.
- **Proposal Text:** Brevity will assist reviewers and NURC staff in dealing effectively with proposals. Therefore, the proposal text may not exceed 15 pages.
  - **INCLUDED** in the 15-page limit: Visual materials, including charts, graphs, maps, photographs and other pictorial presentations.
  - **NOT INCLUDED** in the 15-page limit: Literature cited, subcontract description, biographical sketches and appendices.

Note: *A digital copy of the proposal text must accompany the hard copy on CD. Text must be saved in both of the following formats:*

- *MS Word (\*.doc)*
- *Adobe Acrobat (\*.pdf)*

*Please keep in mind that the digital copy may be sent to reviewers in lieu of a hard copy if so requested by reviewers.*

Proposals that are not consistent with these instructions may be returned without further consideration by NURC/UNCW. **Deviation from the prescribed guidelines must be obtained in writing from the center at least two weeks prior to the proposal deadline.**

#### Requisite Forms

1. Project certification form (with original signatures)
2. Project keyword(s) form
3. Proposal coversheet form
4. Proposal project summary form(s) (one required for each year of multi-year projects)
5. Subcontract request form
6. Current and pending support form(s)
7. Project participants and suggested reviewer form

## IV Proposal Content

The final proposal must include the following sections:

### 1. **Project Description**

#### ▶ **Table of Contents**

A table of contents with page numbers is an essential aid for the reviewers. Sections should match the sections in the proposal text.

#### ▶ **Situation and Need**

Briefly discuss notable gaps in knowledge or capabilities, review past and continuing significant work by yourself and others in the proposed area of interest (include reference citations) and its relationship to present state of knowledge in the field. Clearly state how this research relates to this RFP's priorities and, if appropriate, the need to use Aquarius Reef Base facilities.

For opportunity #2, identify the specific research need in the *NOAA Coral Reef Ecosystem Research Plan for FY 2007-2011* that this research is addressing from one of the following:

- Jurisdiction-wide Research Needs  
[www.coris.noaa.gov/activities/coral\\_research\\_plan/pdfs/jurisdiction\\_w\\_research.pdf](http://www.coris.noaa.gov/activities/coral_research_plan/pdfs/jurisdiction_w_research.pdf)
- Jurisdiction-specific Research Needs
  - o Florida (includes the Florida Keys, Southeast Florida, and the Eastern Gulf of Mexico)  
[www.coris.noaa.gov/activities/coral\\_research\\_plan/pdfs/florida.pdf](http://www.coris.noaa.gov/activities/coral_research_plan/pdfs/florida.pdf)
  - o Flower Garden Banks  
[www.coris.noaa.gov/activities/coral\\_research\\_plan/pdfs/flower\\_garden\\_banks.pdf](http://www.coris.noaa.gov/activities/coral_research_plan/pdfs/flower_garden_banks.pdf)

#### ▶ **Objective(s)**

Clearly state what is to be studied, measured, observed, assessed, modified, or developed and the anticipated results. For equipment development or modification, describe the proposed technical and operational characteristics of the device.

#### ▶ **Methods and Approach**

*Description of Major Tasks* -- Divide the proposed effort into a meaningful set of tasks that must be performed to accomplish the objectives and describe each task. Emphasize quantitative *in-situ* methodology to be used. State the tasks in the same order as the hypotheses they are designed to test. Experimental design must be described with statistical tests, if applicable, for hypotheses proposed.

*Proposed Dive Schedule* -- List approximate number of dives, related tasks to be accomplished and bottom time needed.

*Description of Facilities, Systems, and Equipment* -- Describe the equipment, systems (undersea and support vessels), and facilities --and how they will be used-- that the center must provide for achieving the proposed objectives.

*Description of Matching and Secondary Support* -- Describe required equipment and facilities that will be provided by other sources; if applicable, appendices should include letters from collaborators.

*Outreach & Education* -- While not a requirement, having an effective outreach and education component to the proposal will be looked upon favorably. Please outline your approach to outreach and education, how the research will be used, who the targeted audience is, and how they will be reached.

► **Program Management**

*Project Team* -- Describe the administrative responsibilities and authority of the team leader or principal investigator; describe the team composition (including names of key individuals) and their major task assignments; provide estimates of the time commitment (in hours, days, or FTEs) for each member.

► **Results from Prior NURP and CRCP Support**

If the principal investigator(s) has received NURP or CRCP funding in the past six years, information on the prior award is required:

1. Project title; NURP Center that funded project; amount and period of support; and summary of the results of the completed work.
2. List publications resulting from the NURP award.
3. Brief description of available data, samples, physical collections, new technology, and other products not described elsewhere.

Reviewers will consider the quality of the prior work described in this section of the proposal.

2. **Literature Cited:** Use of a specific format is not mandatory, but a bibliography of cited literature is required.

3. **Subcontract Description:** In addition to the subcontract request form, up to three pages of description and justification are required. The proposal may request funds under any of the categories listed as long as the item and amount are considered necessary to perform the proposed work and is not precluded by specific program guidelines or applicable cost principles.

4. **Biographical sketches and support personnel**

*Biographical Sketches* -- Maximum of **2 pages per PI**, written as curricula vitae. Emphasize experience using *Aquarius* if applicable and other undersea technologies. Include dive history, certifying organization, date certified and recent experience.

*Support Personnel* -- Information on exceptional qualifications that merit consideration in the evaluation of the proposal may also be included (no more than **one page per individual**) for postdoctoral associates, other professionals and students (research assistants) dedicated to the project.

5. **Appendices:** Special information and supplementary documentation

Except in the areas indicated below, special information and supplementary documentation should be included in the proposal as part of the 15-page project description. Information in the following areas may be included in appendices and **not** counted as part of the 15-page project text limitation:

- Letters of commitment for collaborative arrangements of significance to the proposal.
- Environmental impact statement for activities with potential impacts on the environment. Indicate the type and duration of such changes. Are any special permits required to undertake the proposed research? **If collecting is required, be as specific as possible regarding species, sizes and numbers required.**
- Appendices should describe, if applicable, any unusual circumstances that require special handling, such as proprietary or other privileged information in the proposal, matters affecting individual privacy, required intergovernmental review under E.O. 12372 for activities that directly affect state or local governments, or possible national security implications.
- Projects involving the following will require supplemental documentation:
  - ◇ Cooperation from other organizations -- If clearance or a permit from any government agency or other domestic or foreign government is required for program execution, please provide the name of the body, the method of obtaining the clearance or permit, and the time required.
  - ◇ Data or facility access -- If access is required to data or facilities held by another organization, please identify the data or facility, the nature and type of access required, the methods of obtaining such access, and the effect of being denied access.
  - ◇ Research in a location designated or eligible to be designated as a registered historical place.
  - ◇ Research involving field experiments with genetically engineered organisms.

- ◇ Research involving the use of human subjects, hazardous materials, vertebrate animals or endangered species requires a copy of an approved protocol or, in the case of hazardous materials, a copy of any required licenses or approvals.
- ◇ Projects that involve technology utilization/transfer activities require a management plan that should identify special reports or final product.

## V. Terms of Support

Proposals may be written for one year (opportunity 1) or two years (opportunity 2) of direct science support of \$75,000 per year and should contain an in situ field component. Undersea system and support vessel time is provided by the center at no cost to the principal investigator.

The types of items that can be included in subcontract requests include:

- Salaries and fringe for technicians, students and up to **3 months total for principal investigator(s)**
- Research supplies and specialized equipment needed at-sea
- Scientists' travel to and from the study area
- Laboratory processing and analysis of samples collected during the mission, including film processing
- Shipping costs for equipment/supplies
- Facilitation of education and outreach activities, such as development of lesson plans, professional development for teachers, accommodation of a teacher/educator-at-sea, participation in a media event or press conference to describe the expedition and its findings, at-sea media participation, and support for student tours of the research vessel and interaction with scientists in shipboard labs.
- Engineering support, such as design, materials and fabrication of research devices.

Other terms and conditions of center support include:

- Photography and videography equipment, supplies and services are the sole responsibility of the PI. Relevant costs should be included as part of the PI subcontract.
- Applicants that are Federal employees may not request funds for salary, travel, or overhead.
- Title to capital equipment (\$1000 or more, with a life expectancy of more than two years) purchased directly by the center remains with UNCW and is loaned to PIs. Title to capital equipment purchased via PI subcontract that costs from \$1,000 to \$4,999 remains with the PI's institution. Capital equipment costing \$5,000 or more will be owned by UNCW and disposition is variable.
- Foreign travel requires federal approval and more extensive description than domestic travel, including traveler(s) name(s), locations, approximate dates, justification for the travel, and a breakdown of estimated costs by daily per diem, transportation, and other costs.
- Subcontracts are cost-reimbursable agreements, thus, the center may be charged **overhead, up to 10 percent** of the total subcontract.
- **As a condition of the grant, acknowledgement must be made in all publications and media events as follows:**
  - For Opportunity #1: NOAA Undersea Research Center at the University of North Carolina Wilmington and Aquarius Reef Base **must be acknowledged.**
  - For Opportunity #2: NOAA Undersea Research Center at the UNCW and NOAA Coral Reef Conservation Program **must be acknowledged.**

**Please be sure your institutional representative understands these conditions before signing the certification page.**

## VI. Peer Review

All proposals are peer-reviewed by mail and panel reviewers. Proposals are evaluated on the basis of the following criteria:

- Scientific merit
- Relevance and importance of the proposed research to the stated RFP research objectives
- Operational feasibility of the proposed approach

Principal investigators are asked to submit the names and addresses of at least four qualified reviewers, without known conflicts of interest that might bias their reviews. They may also submit the names and addresses of persons that should not review the proposal. Principal investigator selections will be considered, but not automatically used for reviews.

In the event of a significant development that might materially affect the outcome of the review of a pending proposal, the proposer should contact the center to discuss the changed circumstances. The possibility of submitting the additional

information must not be used as a means of circumventing page limitations or stated deadlines, but is intended to provide an opportunity to communicate unexpected and significant breakthroughs or developments.

A panel will convene to review and rank proposals and all PIs will be notified with the results at a time listed on page 2. At that time, verbatim copies of mail reviews, excluding the names of the reviewers, and summaries of review panel deliberations will be mailed to the principal investigator. Proposers may also request and obtain any other releasable material in NURC/UNCW's file on their proposal. Everything in the file, except information that directly identifies either reviewers or other pending or declined proposals, is usually releasable.

Proposers are cautioned that only an appointed grants officer may make commitments or obligations on behalf of the government or authorize the expenditure of funds. No commitment on the part of the government to fund preparation of a proposal or to support research or education should be inferred from technical or budgetary discussions with NURC/UNCW. A principal investigator or institution that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NURC/UNCW Grants Officer does so at his or her own risk.

## **VII. Withdrawals**

A proposal may be withdrawn at any time before a final decision is made. Both the principal investigator and the authorized institutional representative must sign a request for withdrawal. NURC/UNCW does not normally return the copies of withdrawn proposals to the PI but does retain a file copy. Copies of reviews received by NURP before a proposal is withdrawn will be provided to the investigator.

## **VIII. Post-Mission Requirements**

Submission of a signed proposal to the center implies consent to meet post-mission requirements as follows:

- Three (3) types of reports are required from each principal investigator: 1) **Research Plan (i.e., cruise plan)** due 30 days prior to the start; 2) **Project Progress Report** due by December 31; and 3) **Final Project Report** due 90 days after the completion of the project. Guidelines for each report will be provided to investigators.
- Unless special circumstances prevent, all investigators are expected to **publish their results in refereed journals** within two years of their last mission. Future funding is contingent upon a successful publication record. Authors are expected to cite support from NOAA National Undersea Research Center at UNCW and Aquarius Reef Base (opportunity #1) and NOAA Undersea Research Center at UNCW and NOAA Coral Reef Conservation Program in all publications resulting wholly or partially from center sponsored activities.
  - **Appropriate acknowledgment** for opportunity #1 projects: "This research was funded ('in part' if appropriate) by a grant from Aquarius Reef Base owned by NOAA and operated by the University of North Carolina Wilmington."
  - **Appropriate acknowledgment** for opportunity #2 projects: "This research was funded ('in part' if appropriate) by a grant from the NOAA Undersea Research Center at the University of North Carolina Wilmington and the NOAA Coral Reef Conservation Program."
- PIs will have proprietary use of all data and research-specific images and video collected on their project for up to two years. Other images and video will be shared equally by the center and PI. The center may use images and video clips for internal purposes or release them to a broad-based worldwide audience through television, Internet video streaming and other multimedia platforms.
- An **official press release** on the overall program and specific projects may be prepared by NURC/UNCW to be used by all program participants for distribution to the news media. In a similar manner, official program photographs and movies may be developed. As news stories and releases evolve, it is **essential that proper credits and acknowledgments** be given to program participants and the center. Notification of any such interviews and releases should be provided to the center as soon as possible.