A healthy lobster fishery is critical to the economy and culture of coastal New England. A new type of shell disease has contributed to an enormous decline in southern New England lobsters with a severe effect on the fishery. Despite the fact that lobster shell disease has been observed throughout the New England region, and at low levels throughout the Gulf of Maine, little is known about this new disease. Establishment of a long-term research and outreach partnership between state and federal fisheries managers, researchers and the lobster industry will aid in the determination of the causes of shell disease, the linkages between stressed environments, lobster health, and population-level effects, and will inform efforts to minimize the impact on the lobster ecology, the fishery, and the region.

Request for Research Proposals

The New England Lobster Disease Research Initiative

Issued May 17, 2006

Full Proposal Submission Deadline:
4:00 PM Wednesday June 28, 2006

Rhode Island Sea Grant College Program
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http://seagrant.gso.uri.edu/fisheries/lobster_initiative/index.html

Background

In 1996, lobstermen and scientists began to recognize and monitor a new form of shell disease occurring on lobsters in the Southern New England area of the Northeast United States. By 1999 the disease was seen to be affecting over 30% of legal and sub-legal lobsters of inshore areas. This shell disease has a different origin and appearance from previously described "impoundment disease" and "burnt spot shell disease." Impoundment shell disease lesions are bilaterally symmetrical and are centered around setal cores; burnt spot disease appears as individual blackened lesions on the body and is often used as an environmental health indicator. In contrast, this disease—epizootic shell disease—is characterized by moderate to deep erosions in the carapace that progress vertically, leaving behind a pillar formation of chitin crystalline lattice. Epizootic shell disease has never before been documented to occur in the wild lobster population at these prevalence levels, duration, and/or severity. A detailed review of shell disease in New England lobsters has recently been completed (http://seagrant.gso.uri.edu/fisheries/lobster_initiative/index.html) and should be consulted for more detailed background on the etiology of this disease.

Research on lobster health is paramount to understanding the causes and consequences of this and other diseases affecting lobster stocks. Several lobster diseases have been discovered that have occurred concurrently with the outbreak of the lobster epizootic shell disease in Southern New England. In 1997, a *Vibrio fluvialis*-like organism was implicated as the etiological agent for the "limp lobster" syndrome found in Maine. The extreme lobster mortality event that occurred in Long Island Sound in 1999 brought to the forefront the link between stressed environments, lobster health, and population-level effects. Also from Long Island Sound, calcinosis—a non-infectious fatal disease of lobsters—was determined to be caused by anomalously high bottom water temperatures during the spring and summer of 2002, causing changes in the acid-base status and calcium metabolism of the lobster, resulting in calcium deposits in the gills and antennal glands.

The provision of funding dedicated to lobster health is the backbone for understanding the effects of this and other diseases on both the resource and the fishery. This new initiative will direct approximately $1.9 million for innovative research program to study the causes and consequences of lobster shell disease.

Request For Research Proposals

This is a call for one or two year research proposals to be funded through the New England Lobster Disease Research Initiative. Proposals concerned primarily with monitoring, outreach and/or education will not be considered in this competition. This research program will be competitive and is open to universities, state, regional and/or local agencies, non-governmental organizations and privately owned/operated entities around the world. Each proposal will receive extensive external scientific peer review, with guidance on final funding decisions made by an external, ad hoc scientific review panel.

Competition Timeline

The deadline for submission of proposals to this research competition is 4:00 PM (EDT) Wednesday, June 28, 2006. Other important deadlines for this research competition are listed at the end of this RfP.

This call is issued on the 17th of May 2006.

There is no pre-proposal phase for this RfP.

All proposals will be submitted electronically through the Rhode Island Sea Grant College Program "Webnibus" portal (http://seagrantadm.gso.uri.edu/webnibus/logn/logn_login.php). Further detail on accessing and using Webnibus are contained later in this RfP.

Electronic copies of this RfP are available at the Rhode Island Sea Grant College Program web site (http://seagrant.gso.uri.edu/fisheries/lobster_initiative/index.html).

Applicants will be notified of the outcomes of the selection process via email on or before the 13th of October 2006, with official notification of acceptance or rejection following, both by email and post.

Anticipated start date of project is 02 January 2007.

All funded investigators shall submit an annual progress report and documentation of impacts during the project period.

Award Process

Funds are available on a competitive basis. Research projects will be funded for up to two years. Funding for each proposal will not exceed $150,000.00 per year. Continuation of multi-year funding will be contingent upon performance and demonstration of significant progress in the first year.

The New England Lobster Disease Research Initiative intends to fund science which best targets the research priorities described below. Each proposal will be reviewed by at least three external peer reviewers selected carefully to match proposal content with reviewer expertise. A panel of experts will be convened to review the full proposals and their peer reviews. While the Rhode Island Sea Grant Director and New England Lobster Disease Research Initiative Chairperson will participate in the deliberations of the proposal review panel, panel members are solely responsible for ranking the proposals. Based on these external evaluations, selected applicants may be asked to modify objectives, work plans or budgets subsequent to the decisions of the review panel.

Proposal Review Criteria/Research Priorities

The success of shell disease depends upon at least four factors: the nature of the pathogen, the tissue attacked, the ability of the immune system to deal with the infection, and the response by the tissue and immune system to stress imposed by changing or degrading environment. Understanding the dynamics of the disease in the environment and the effect of the disease on local populations is crucial to managing the fishery in the context of shell disease. Knowledge

areas important to understanding the disease are listed below. This list is not complete; rather, it identifies some of the most important and tractable scientific questions:

I. *The nature of the pathogen*
- a. Microbiology:
  - -Identify the primary species responsible;
  - -Fulfill Koch's postulates;
  - -Compare to other crustacean shell disease.
- b. Biofilm on the lobster exoskeleton:
  - -The nature of the microbial communities;
  - -The dynamics of microbial communities;
  - -What are the reservoirs in the environment.

2. *The nature of the tissue*
- a. Exoskeleton:
  - -Exoskeleton development as related to shell disease;
  - -Presence and/or role of immune factors;
  - -Variation in Exoskeleton with diet, location, season etc.?
  - -Lab model of cuticle development would be very useful;
  - -Do lesioned and unlesioned areas of cuticle differ?
  - -Does nutrition play a role in susceptibility?

3. *The ability of the immune system to deal with infection*
- a. Response of the innate immune system to bacterial challenges at the exoskeleton:
  - -Description;
  - -Variation (by gender, age, individual…);
  - -Role of hemolymph factors? Of hemocytes?
  - -Can individuals different in immune response be characterized genetically?

4. *The role of environmental stress*
- a. Changes in the susceptibility or severity of the infection under environmental stress:
  - -Temperature;
  - -Hypoxia;
  - -Nutrition (bait consumption?);
  - -Handling (repeated capture in traps);
  - -Pollutants (anthropogenic substances);
  - -Stress and the Crustacean Hyperglycemic Hormone (CHH).
- b. Changes in cuticle development under stress (see stressors above).

5. *The dynamics of the disease in the environment and effect on local populations*
- a. Epidemiology:
  - -Description of the geographic and temporal patterns of disease distribution;
  - -Incidence;
  - -Severity;
  - -Demography of infected individuals;
  - -Growth rate and mortality rate of diseased individuals?
  - -Rate of egg loss by infected berried females.
- b. Management:
  - -Shell disease effect on population fecundity?
  - -Behavioral changes in shell diseased individuals;

-Catchability;
-Migrations;
-Aggressiveness;
-How do the lehal and sublethal effects of the disease affect stock assessment models?

Other Considerations

Key considerations for proposal evaluation are:

Rationale and relationship to Lobster Disease Research Initiative priorities
Scientific merit
Qualifications of investigators
User relationships
Budget justification

The criteria employed in the evaluation of proposals shall include, but not be limited to, the following:

1. The scientific or technical merits of the research proposed.
2. The extent to which the proposed research addresses the needs and priorities stated in the Request for Proposals and the priorities stated under "Proposal Review Criteria/Research Priorities" (pg 4).
3. The demonstrated competencies of the individuals proposing the activity to conduct the proposed project in a timely fashion to a satisfactory conclusion. Included in this evaluation are the adequacy of research facilities and instrumentation to conduct the research, experience and past performance of the principal investigator and key personnel, their familiarity with the area of the proposed study, and their publication record.
4. The budget and how realistic and reasonable it is for accomplishing the proposed tasks, and the inclusion of appropriate match.

Proposal Format

1. Title Page

Research proposals must be cleared through the principal investigator's institution to ensure conformity with local and state administrative procedures. One copy of the proposal must be signed by the principal investigator(s), an official authorized to commit the institution, and the business officer(s) authorized to commit the cosponsoring organization(s). Proposing institutions may have additional signature requirements. Proposals are incomplete if endorsement signatures are omitted.

2. Abstract

The proposals must contain a 200-word maximum, abstract of the proposed research. The abstract must include a statement of the research objectives, scientific methods to be used, and the significance of the proposed research to the investigation into the causes of the mass mortality of lobsters or the increase in the incidence of shell disease syndrome identified in the Request for Proposals.

3. Project Description (to include objectives and methods)

The main body of the proposal should be a detailed statement of the work to be undertaken. Brevity will assist reviewers in dealing effectively with proposals. Therefore, the Project Description may not exceed 12 pages. Tables and visual materials, including figures, charts, graphs, maps, photographs and other pictorial presentations are included in the 12-page limitation. The description should introduce the research setting and environment. It should include a brief review of pertinent literature and the pertinent current state of knowledge on the subject, and describe the research problem in relation to lobster mortality issues and the priorities identified previously in this RfP.

Objectives: This section should discuss the overall study objectives, the specific research objectives and the relationship to lobster mortality research objectives and priorities. This section should also present the primary hypothesis upon which the project is focused, as well as any additional hypotheses and predictions that will be addressed by the proposed research.

Methods: This section should state the method(s) to be used to test the hypotheses and accomplish the specific research objectives including a systematic discussion of what, when, where and how the data are to be collected, analyzed, and reported. Field and laboratory methods should be valid and reliable scientifically and accompanied by a statistically sound sampling scheme. Methods should be well documented and described in sufficient detail to enable other scientists to evaluate their appropriateness and their possible impact on the environment. Methods chosen should be justified and compared with other methods employed for similar work. Analytical methods and statistical tests applied to the data should be documented, thus providing a rationale for choosing one set of methods over alternatives. Quality control measures also should be documented (e.g., statistical confidence levels, standards of reference, performance requirements and internal evaluation criteria). The proposal should indicate by way of discussion how data are to be synthesized, interpreted, and integrated into final work products.

4. Products

This section should describe the products of the project (e.g., final report, maps, location and media for data storage, computer programs, web sites, methods of retrieval at later dates, etc.).

5. Project Significance

This section should discuss how the proposed research effort will enhance or contribute to the research priorities stated in the request for proposals.

6. Schedule/Milestones

A schedule is required in the proposal. This schedule should show, in table form, anticipated dates for completing field work and data collection, data analysis, annual reporting and other related activities. Use "Month 1, Month 2," rather than June, July, etc. in preparing these charts, but if there are sampling periods, seasonal or academic year restrictions that are critical to the conduct of the project, these dates and time frames should be should also be noted as actual dates/months.

7. Literature Cited

This section should provide complete references for current literature, research, and other appropriate published and unpublished documents cited in the text of the proposal. Reference lists do not count against the 12-page proposal text limit.

8. Biographical Sketches
A curriculum vitae of each senior scientist or researcher and a list of each investigator's publications during the past five years, including those in press, should be included. There is a 2-page maximum for the CV of each investigator. Biographical sketches do not count against the 12-page proposal text limit.

9. Budget and Budget Justification
Each proposal must contain a budget for each year of support requested and a cumulative budget for the full term of requested support. A clear delineation of the use of these funds must be provided in the budget justification. The proposal may request funds under any of the categories listed so long as the item is considered necessary for the research. Budget and justification do not count against the 12-page proposal text limit.

Matching funds are not required for this RfP. However, partner contributions are encouraged and will be viewed favorably.

10. Current and Pending Support
Applicants must provide information on all current and pending support for ongoing projects and proposals, including subsequent funding in the case of continuing grants. All current project support from all sources (e.g., Federal, State, or local government agencies, private foundations, industrial or other commercial organizations) must be listed. The list must include the proposed project and all other research requiring a part or portion of time of the principal investigator and other senior personnel, even if they receive no salary support from the project(s). The number of person-months or percentage of effort to be devoted to the projects must be stated regardless of source of support. Similar information must be provided for all proposals that are being considered by or will be submitted soon to other possible sponsors. These pages do not count against the 12-page proposal text limit.

If the submitted proposal has been funded previously by a source other than the sponsors of this RfP, the information requested in the paragraph above should be furnished for the immediately antecedent funding period. If this proposal is being submitted to other possible sponsors, all of them must be listed. Attachment V gives the format for reporting all current and pending support for ongoing research projects, as well as proposals for same, including each subsequent funding request in the case of continuing grants.

11. Facilities
The proposal should describe available facilities and major items of equipment to be used in the research. Proposals requesting equipment should describe comparable equipment that is already at the proposing institution and explain why it cannot be used. The degree of utilization also should be discussed. These pages do not count against the 12-page proposal text limit.

Proposal Submittal

For this research competition a web-based proposal submission and review system called **Webnibus** will serve as the sole portal for full proposal development, submittal, and review. **An account MUST be created** (Use the “sign up now” link at the “log-in” web page) by the PI before a proposal can be developed in **Webnibus**.

To create a **Webnibus** account, please go to:

http://seagrantadm.gso.uri.edu/webnibus/logn/logn_login.php

Upon creation of a user account, the full proposal can be entered into **Webnibus**. All information entered will be accessible for change throughout proposal development process.

IMPORTANT WEBNIBUS NOTES:

- Enter a start date of 01/02/2007
- Enter an end date of 01/02/2008 for 1-year proposals
- Enter an end date of 01/02/2009 for 2-year proposals
- **Click the "Submit Preliminary Proposal" button** [even though you have not submitted any information at this point] **and "agree" to submit the proposal**.

After the above steps are completed, your proposal will be moved to "Full" status within a 48-hour period and you can then begin the proposal development process in Webnibus. Please send an email message to Alan Desbonnet (aland@gso.uri.edu) acknowledging proposal submittal, and/or if your proposal is not elevated to "Full" status within a 48-hour period.

When using **Webnibus**, **PLEASE DO NOT USE THE BACK ARROW IN YOUR BROWSER** to return to previous screens. Information that you have entered may be lost by using the back arrow. Please use the menus on the side of the page, or at the top of the active page, to move around your proposal or to other portions of the **Webnibus** system. **Webnibus** will automatically save, or prompt the user to save, as needed. Also be sure to **LOGOUT** when leaving the **Webnibus** program. **Failure to log out of your proposal development session could allow other users to access and/or modify your proposal**.

Please read all instructions and help screens that "pop up" during your use of **Webnibus** as they contain pertinent information that will help you successfully complete pre- and full proposals. Please access the help menu on the left side of the page as needed. Please use the "Print Preview" function for ensuring the best results when printing a copy of the proposal.

Webnibus has dedicated screens for project budgets. Please use the biosketch function to submit information from investigator CV's. Once a PI has created a proposal in **Webnibus**, they can add co-PI's and give them permission to edit the proposal on **Webnibus** directly. All co-PI's who wish to work on **Webnibus** will need to create their own user accounts.

Proposals must be submitted via the Webnibus online system by 4:00 PM, Wednesday the 28th of June. The electronic portal will close at that time and will not accept further submissions.

If you are unable to access Webnibus, or experience any difficulties, please contact Alan Desbonnet (874-6813; aland@gso.uri.edu).

INCOMPLETE, WITHDRAWAL, REJECTION

Proposals that do not follow the prescribed format or are incomplete will be ineligible for consideration.

An applicant may withdraw a proposal at any time before a final decision is made.

An applicant whose invited proposal has been rejected may request and will receive the reasons for the action, together with verbatim copies of peer reviews, although not the names of the peer reviewers.

Other Special Federal Requirements

1. Federal Policies and Procedures - Recipients and subrecipients are subject to all Federal laws and Federal and Department of Commerce (DOC) policies, regulations, and procedures applicable to Federal financial assistance awards.

2. Delinquent Federal Debts - No award of Federal funds shall be made to an applicant who has an outstanding delinquent Federal debt until either:

(A) The delinquent account is paid in full,
(B) A negotiated repayment schedule is established and at least one payment is received, or
(C) Other arrangements satisfactory to DOC are made.

3. Name Check Review - All non-profit and for-profit applicants are subject to a name check review process. Name checks are intended to reveal if any key individuals associated with the applicant have been convicted of or are presently facing criminal charges such as fraud, theft, perjury, or other matters which significantly reflect on the applicant's management honesty or financial integrity.

4. False Statements - A false statement on an application is grounds for denial or termination of funds and grounds for possible punishment by a fine or imprisonment as provided in 18 U.S.C. 1001.

5. Intergovernmental Review - Applications for support from the National Sea Grant College Program are not subject to Executive Order 12372, "Intergovernmental Review of Federal Programs".

6. Pursuant to Executive Orders 12876, 12900, and 13021, the Department of Commerce, National Oceanic and Atmospheric Administration (DOC/NOAA) is strongly committed to broadening the participation of Historically Black Colleges and Universities (HBCU), Hispanic Serving Institutions (HSI), and Tribal Colleges and Universities (TCU) in its educational and research programs. The DOC/NOAA vision, mission, and goals are to achieve full participation by Minority Serving Institutions (MSI) in order to advance the development of human potential, to strengthen the nation's capacity to provide high-quality education, and to increase opportunities for MSIs to participate in and benefit from Federal Financial Assistance programs. DOC/NOAA encourages all applicants to include meaningful participation of MSIs. Institutions eligible to be considered HBCU/MSIs are listed at the following Internet website: http://www.ed.gov/offices/OCR/99minin.html
ATTACHMENT I

New England Lobster Disease Research Initiative
Request for Proposal Timeline

May 17, 2006	RFP released
June 28, 2006	Full proposal deadline (4:00 PM EDT)
Late Sept/Early Oct 2006	Review Panel Meeting for Proposal Selection
13 October, 2006	Successful PIs notified and contract processes initiated
January 2, 2007	Estimated date for funds to become available