

Appendix A.1: 2006-2007 University Research Grant Proposal Cover Sheet

Faculty Rank:	Assistant Professor				
Last Name:	Grace				
First Name:	Sean				
Department:	Biology				
Funding Request:	\$3,819				
Is this a Partnership Application?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Is this a Continuation Project?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
University:	Southern Connecticut State University				
E-mail:	graces2@southernct.edu	Phone:	(203)-392-6216		
Campus Address	217 Jennings Hall, New Haven, CT 06515				

Please mark one research category that best fits this project:

- Fine Arts and Humanities Social Sciences, Business and Education
 Life and Physical Sciences, Mathematics, Computer Science, Engineering and Technology

If this is a partnership application, list name, rank and department of co-proposers:

Name _____ Rank _____ Department _____

Name _____ Rank _____ Department _____

Project Title: A Survey of the Shallow-Water Subtidal Scleractinian Corals in Long Island Sound

ABSTRACT (Limit: 100 words)

Shallow subtidal communities in Long Island Sound are exposed to physical and biological factors that affect species distribution, abundance, and ecology. One conspicuous member of this community is the temperate scleractinian coral, *Astrangia poculata*. Though the basic biology of this species has been documented in Narragansett Bay, little information on this coral's ecology in Long Island Sound exists. This study will be the first to examine this organism's distribution, abundance, and interactions with other organisms in the Long Island Sound. Results will provide valuable information on factors (salinity, temperature, turbidity, and competition) that influence this coral's basic biology and ecology.

IRB/IACUC Statement

(If "yes" to either question please see section 5 of "Proposals", p. 3.)

YES NO

 Does your research involve human beings as research subjects?

 Does your research involve vertebrate animals?

Sign-Off Statement (To be signed individually by every faculty applicant; –please use separate sheets as needed)

I hereby acknowledge my understanding that the lack of compliance with the format and terms required in the University Research Grant Guidelines – 2006-07 may result in the proposal being disqualified without review.

Signature of Permanent, Full-Time Faculty

Date

Signature of Permanent, Full-Time Faculty

Date

Signature of Permanent, Full-Time Faculty

Date

Appendix A.2: REPORT ON PREVIOUS CSU/AAUP-FUNDED RESEARCH

Proposals for continuation of work that was funded by this program in previous years should provide a summary of accomplishments in this appendix (not to exceed 300 words). If you received a grant in the 2004-2005 year, please refer to the activities as an interim report. Please include compelling evidence of the impact of the research conducted, such as: publications in peer reviewed journals, securing of external funding for the expansion/continuation of the work, presentations at professional conferences, performances or exhibits, book publications, etc.

-Not Applicable- This is my first submission of a CSU/AAUP-Funded Research Proposal with this focus and is not a continuation of any previous effort.

Appendix A.3: BUDGET AND BUDGET JUSTIFICATION FORM

Budget Item	Amount (Whole Dollars)	Brief Justification
Faculty Stipend	2,500	Salary
Support Services *	0	
Supplies and Equipment	1319	Equipment for field work
Travel	0	
Total	3,819	N/A

* For definition see Section 9.4 of the CSU-AAUP Contract, 2002-2006

2) Proposal Narrative:

1) Significance:

The temperate scleractinian (hard) coral *Astrangia poculata* inhabits an exceptionally dynamic environment (Szmant-Froelich 1980). It is found typically in the shallow subtidal regions of the east coast from Cape Cod south through the northern most reef tracts of Florida and throughout the Gulf of Mexico (Cummings 1983). This coral thus has a large geographic distribution and can inhabit waters whose physical parameters (i.e. salinity, temperature, turbidity) vary widely. The basic biology of this coral has been documented in Narragansett Bay (Grace 2004), however, little information on coral populations in Long Island sound exist. In addition, studies examining natural populations of this coral *in situ* are few.

The Long Island Sound represents a unique habitat for this coral, in that constant freshwater input would seem to put this coral at a disadvantage. This input results in salinity changes and increased sedimentation (particles suspended into the water column) which could interfere with coral feeding (tentacular) by smothering the coral. In addition to constant changes in salinity and increased sedimentation, temperature also plays a positive role in coral growth and survival. Jacques and Pilson (1983) found, for Narragansett Bay corals, that coral growth was equal to that of tropical corals when exposed to increased temperatures. Given the higher water temperature in Long Island Sound, in comparison to Narragansett Bay, it is hypothesized that coral growth in Long Island Sound is greater, and subsequently, that local corals are larger. I propose to examine the distribution and abundance of *Astrangia poculata* communities in Long Island Sound.

Literature Cited:

Cummings, C. E. 1983. The biology of *Astrangia poculata*. University of Rhode Island, Ph.D. dissertation. Pp. 149.

Grace, S.P. 2004. Macroalgal-Coral interactions in Narragansett Bay. University of Rhode Island, Ph.D. dissertation. Pp. 275.

Jacques, T.G. and M.E.Q. Pilson. 1980. Experimental ecology of the temperate scleractinian coral *Astrangia poculata*. I. Partition of respiration, photosynthesis and calcification between host and symbiont. *Marine Biology* 60:167-178.

Szmant-Froelich, A. 1980. The coral that lives in the Narragansett Bay. *Maritimes* 24:1-3.

2) Work Plan: I will provide the objective and corresponding work plan for completion.

a) objective one:

What is the distribution of *Astrangia poculata* at 20 sites in Long Island Sound? 20 sites in Long Island Sound will be determined via rocky and hard bottom presence. To determine the basic

distribution of this coral in Long Island Sound, within each site, at 5-7 meters depth, a 30 meter transect line will be laid out along the substrate (maintaining the 5-7 m depth profile). At 10 random intervals along this transect line, a 0.25m² quadrat will be laid on the substrate and each coral colony counted. In addition to counting, 5 quadrats will be photographed utilizing an underwater camera with housing.

b) objective two:

What are the physical factors associated with each site? Salinity, turbidity, and temperature will be examined at each of the 20 sites. This information will be used to examine how these factors may influence the growth of the corals present. The XplorerTM (PASCO Inc.) datalogger will be used *in situ* to collect and store all the physical measurement information. This data will also be used to examine any and all differences between sites, utilizing a 1-factor analysis of variance, where the factor will be site, and the dependent variables, salinity, turbidity and temperature.

c) objective three:

How do the corals at each site differ morphologically? To characterize the range of morphologies associated with this coral, 25 corals will be collected from each site and three morphological traits will be measured to the nearest 1.0 mm with Vernier calipers: total height, polyp diameter, total width. The buoyant weight will also be determined by weighing the corals to the nearest 0.01 g in water. This will provide valuable information on the morphological diversity of corals that live in Long Island Sound.

3) Outcomes and reporting:

The significant outcome of this research will include a publication submitted to the Journal of Experimental Marine Biology and Ecology. In addition, the results of this research will be presented in part at two scientific conferences, the Benthic Ecology Meeting, and the CSU-Research symposium. Also, results from this study will be used to aide in generating a

larger grant proposal to the National Undersea Research Center at UCONN's Avery Point Campus.

4) Budget Proposal and Justification:

Item 1. Salary. \$2,500.00

I am requesting salary because this field work is time consuming and intensive.

Item 2: Wetsuits. \$400.00

I am requesting monies to purchase two wetsuits to use *in situ*. Given the nature of the habitat, two would be needed.

Item 3: XPlorer TM datalogger \$519.00

I am requesting monies to purchase this interface box that allows for the collection and storage of field data. I currently have all the necessary probes for salinity, temperature, and turbidity.

Item 4: SCUBA Fill cards \$200.00

I am requesting enough SCUBA tank fill cards to allow for 60 fills on an 80 cubic inch SCUBA cylinder

Item 5: SCUBA 80 cubic inch Aluminum tank \$200.00

I am requesting monies to purchase a new SCUBA tank. I currently have one, but could utilize two for this study.

Total Budget: \$3,819.00