United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

JUN 5 1998

Kenneth R. Hinga
Assistant Dean
Graduate School of Oceanography
South Ferry Road
University of Rhode Island
Narragansett, Rhode Island 02882

Dear Dr. Hinga:

As you know, the Department of the Interior and several other federal agencies are establishing a network of Cooperative Ecosystem Studies Units (CESUs). On 15 May 1998, the CESU Implementation Working Group evaluated the revised proposal submitted by the University of Rhode Island and its partners.

The group unanimously recommended that a decision on establishing a CESU at the University of Rhode Island be postponed to allow time for the CESU Implementation Working Group to a) hold additional discussions with university officials, b) make an additional site visit (if necessary), and c) review a second revised proposal.

I have been informed that representatives of the Working Group have already held additional discussions with university officials and that the Chair of the CESU Implementation Working Group has received a revised addendum (dated 28 May 1998). This addendum will be shared as soon as possible with the rest of the CESU Implementation Working Group. The members of the Working Group will be polled by phone and will make a formal recommendation to me no later than 15 July 1998.

The Department of the Interior and its CESU partner agencies are enthusiastic about the establishment of a CESU at the University of Rhode Island. Such a CESU would have extraordinary potential to contribute to the founding of the CESU network. The Working Group looks forward to reviewing your revised addendum, and I look forward to their recommendation.

Sincerely,

Mark Schaefer
Deputy Assistant Secretary
for Water and Science

UNIVERSITY OF
RHODE ISLAND

May 28, 1998

Dr. Gary E. Machlis
Chair, CESU Working Group
National Park Service
Main Interior Building (3127)
1849 C Street, NW
Washington, DC 20240

Dear Dr Machlis:

We are pleased to submit a revised addendum to our proposal for establishment of a Cooperative Ecosystem Studies Unit at the University of Rhode Island. We recently had a discussion about our proposal with Mary Foley and Charles Roman and they indicated that the CESU Working Group remains concerned about several issues.

We specifically discussed issues related to indirect costs and we have prepared the following statement acknowledging our acceptance of the 15% negotiated rate. This replaces our earlier statement on indirect costs that was submitted on 14 May 1998 as an Addendum to our proposal. We also include a statement regarding our partnership with the University of Maryland Eastern Shore and promising interactions with other Historically Black Colleges and Universities.

Indirect Costs

A *15%* indirect cost rate will be applied to CESU projects related to research, technical assistance and professional training. This represents a substantial waiver from the standard rate of 49.2% designated our cognizant federal. In return for a reduced negotiated indirect cost rate, CESU scientists resident at the University will provide valuable services to the University, including support and mentoring of graduate students, teaching, collaboration with university faculty, staff and students on CESU projects, participation in academic departmental activities, and active involvement in the overall intellectual atmosphere of the university.

A CESU Managers Committee will prepare and adopt a role and mission statement that defines the focus of the North Atlantic coastal zone CESU and identifies research, technical assistance, professional training and other services that the CESU may provide. The Managers Committee will be a cooperative group, with representatives from the federal partners, URI, and partner universities. CESU projects will adhere to the guidelines set-forth in the role and mission statement. CESU projects will be reviewed by and approved by the CESU Managers Committee.

CESU projects, as with all projects that are executed through a federal-university cooperative agreement, must demonstrate substantial involvement by the federal government. Substantial involvement may include participation of federal scientists or managers as principal investigators with University personnel. As principal investigator, the federal scientist(s) will be involved in all

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Narragansett Bay Campus
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aspects of the project including proposal preparation, data collection and analysis, report preparation, and planning and execution of training or educational efforts.

Substantial involvement may also include substantial use of federal facilities (e.g., laboratories) and/or equipment (e g., boats and operators) that are necessary for execution of the project Federal technicians, managers, or supervisors may also provide substantial participation in data collection, analysis, and interpretation of research findings, especially ensuring that scientifically-based recommendations are appropriate to the agency's research, planning and resource management goals. Federal personnel may be necessary and active participants in the planning and execution of training or workshop programs to insure that the natural resource management needs of the partner agency are satisfied.

For projects without substantial federal involvement, a grant or contract, and not a cooperative agreement, would be the most appropriate mechanism for obligation of federal funds.

URI will not charge indirect costs on funds 'passed through' to a partner university, such as the University of Maryland Eastern Shore (UMES). UMES, and other university partners that may become associated with the North Atlantic coast CESU at URI, will apply a 15% indirect cost rate in accordance with the CESU role and mission statement, Managers Committee review and approval, and demonstration of substantial federal involvement.

University Partnerships

UMES, a designated Historically Black College or University (HBCU), will serve as our initial university partner. It is expected that UMES faculty, staff and students will be fully involved in the conduct of research, technical assistance and professional training missions of the North Atlantic coast CESU. Collaboration among federal scientists and managers, and URI and UMES researchers and students on individual projects will be encouraged. UMES programs in biology, chemistry, environmental science, and in particular, MS and Ph.D. degree programs in marine-estuarine-environmental sciences and toxicology, will be especially relevant to addressing issues associated with the CESU. UMES also offers the opportunity to interact with USGS-BRD scientists associated with the Maryland Cooperative Fish and Wildlife Research Unit.

In addition to UMES, plan to network with additional HBCUs under the CESU, thus expanding opportunities for minority students. For example, Clarke Atlanta University has a particularly strong program in salt marsh research, with a focus on air-sea gas exchange. This and related topics would be of relevance to CESU projects addressing estuarine nutrient dynamics, climate change, and other issues. With several minority partners, each with different areas of expertise, the concept of host and partner universities building a strong and comprehensive technical expertise will be realized. URI has had cooperative programs with Clarke Atlanta in the past and discussions are presently ongoing regarding formal involvement with the CESU. In addition to UMES, it is expected that as the CESU program grows, additional university partnerships will be established as specific needs become evident.

URI has enjoyed a long and productive relationship with the Department of the Interior through our National Park Service and USGS cooperative programs. The North Atlantic coast CESU will be a nice complement to these existing programs. We look forward to establishment of a CESU at URI and to increased opportunities for collaboration among URI, UMES, and federal partner researchers and resource managers.

I hope this letter addresses the concerns of the CESU Working Group. Please call if we can provide clarification or additional information.

Sincerely,

Kenneth R Hinga for Leinen

Margaret Leinen
Vice Provost for Marine Programs
mleinen@gsosun 1.gso.uri.edu
(401) 874-6222

cc: Thomas Rockett
Kenneth Hinga
Mary Foley
Charles Roman

Proposal to Establish a

Cooperative Ecosystem Studies Unit at the University of Rhode Island

with a Focus on the North Atlantic Coast

Submitted by:

Dr. Margaret S. Leinen _____
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January 30, 1998

1. EXECUTIVE SUMMARY

The University of Rhode Island (URI) proposes to establish a Cooperative Ecosystem Study Unit for the North Atlantic Coast pilot biogeographic area. The CESU will primarily make use of the extremely broad base of programs and expertise at URI relevant to coastal land management. Existing partnerships with non-university organizations will be of benefit to the CESU. As future projects develop, URI will enter into new partnerships as needed to fulfill the needs of the CESU.

Marine and environmental studies are one of the four focus areas for URI. There are faculty in at least 11 academic departments which have expertise relevant to management of coastal lands. There are also numerous non-academic organizations within URI which conduct activities directly relevant to land management. In addition, URI has existing partnerships with federal agencies which are useful to the mission of the North Atlantic Coast CESU.

CESU scientists will be expected to have full participation in URI academic, research, and outreach programs. CESU scientists will have equal access to URI facilities and support as do URI faculty members.

This proposal is being submitted by Dr. Margaret Leinen, Vice Provost for Marine and Environmental Programs, Dean of the Graduate School of Oceanography, and interim Dean of the College of Resource Development. The Assistant Dean of the Graduate School of Oceanography, Dr. Kenneth Hinga, will serve as contact person for this proposal. He may be reached at:

Kenneth R. Hinga
Graduate School of Oceanography
University of Rhode Island
Narragansett, RI 02882

Telephone: 401-874-6888 FAX: 401-874-6889 khinga@gsosun1.gso.uri.edu

Formal agreements and other official paperwork between the university and agencies and other external organizations are executed by the URI Research Office. The contact person is:

Angelo Mendillo
The Research Office, Sponsored Projects Review
70 Lower College Road
Kingston, RI 02881

Telephone: 401-874-5138 FAX: 401-874-4272 sponproj@uriacc.uri.edu

2. INTRODUCTION

The University of Rhode Island (URI) proposes to serve as the host Cooperative Ecosystem Studies Unit (CESU) for the North Atlantic Coast pilot biogeographic area. The proposed CESU at URI, in collaboration with cooperating agencies and colleagues at other universities, is qualified to address the many issues that confront federal land management, environmental and research agencies throughout the developed northeastern US coastal zone. Coastal watersheds —including terrestrial, freshwater, estuarine and nearshore ecosystems — are faced with increasingly complex and challenging issues. Management issues — such as nutrient enrichment of estuaries, resource consumption (e.g., groundwater withdrawal, forestry, fisheries and aquaculture), hydrologic alterations, exotic species expansion, habitat restoration, and alteration of shoreline geomorphic processes — are all in response to the intense pressure from expanding urban centers and recreational demands within the coastal zone. This proposal will demonstrate that URI has a long-standing commitment to conducting multidisciplinary studies of coastal ecosystem structure, function and process. Moreover, based on existing partnerships with numerous federal agencies, it will be demonstrated that URI's coastal programs have successfully engaged in cooperative research efforts that provide mutual benefits to agency natural resource protection and management goals and to University graduate education and research missions.

URI is one of the nation's premier academic institutions for the study of coastal ecosystems and associated watersheds. At URI, there are more than 200 faculty and 40 departments and programs that work in the field of marine, coastal and environmental research, teaching, or service. At the graduate level, over 350 students are studying in coastal/marine related programs. The National Park Service recognized the University's broad qualifications and located its coastal Cooperative Park Studies Unit at URI in 1989. The Unit is now affiliated with the USGS-Biological Resources Division (BRD). In 1996, the National Park Service entered into a cooperative venture designating URI as a Field Technical Support Center for Geographical Information Systems (GIS). NOAA honored URI as a Center of Excellence in marine programs and established a Cooperative Marine Education and Research (CMER) program at URI. The US Environmental Protection Agency's Atlantic Ecology Division (a National Health and Environmental Effects Research Lab) and a NOAA-National Marine Fisheries Lab are co-located on the URI Narragansett Bay Campus. The mix of University programs, federal cooperative partnerships, and major federal laboratories contributes to a diverse and enriched community all focused on coastal zone ecosystems.

This proposal will highlight URI's diverse coastal programs that focus on research, education, resource management, and policy. The Graduate School of Oceanography, the largest coastal/marine-focused graduate school in the US, is home to a cadre of estuarine/marine researchers with expertise in biological, geological, physical and biogeochemical processes. The Departments of Ocean

Engineering, Civil and Environmental Engineering, Biological Sciences, Geology, Natural Resources Science, Environmental and Resource Economics, Community Planning, Marine Affairs, and others, represent a collective expertise in estuarine circulation modeling, non-point and point pollutant tracking, ground and surface water hydrology, coastal and freshwater fisheries, water quality monitoring and assessment, limnology, wetlands and aquatic ecology, watershed management, coastal geomorphology, wildlife biology, forestry, aquaculture, and land use planning -- all topics of interest to land management agencies that may become associated with a North Atlantic coast CESU. Three Centers at URI — the Coastal Resources Center, Environmental Data Center and the Center for Vector-borne Disease — deserve special mention, each representing disciplines of importance to the CESU network, namely, natural resource management and planning, GIS and spatial data analysis, and ecology of ticks, Lyme Disease and mosquitoes.

Perhaps the most exciting initiative at URI with immediate relevance to the CESU is the recent dedication of the Coastal Institute. The Institute is charged with providing new opportunities to solve coastal zone problems by integrating coastal science disciplines and social sciences. The USGS-BRD is a federal partner in the Institute (with EPA and NOAA). The existing USGS-BRD Cooperative Park Studies Unit is headquartered within the new Coastal Institute building, and it is proposed that the CESU will be an integral partner in this collaborative effort to address the challenges confronting coastal ecosystems.

To complement the broad representation of coastal disciplines at URI, there is often collaboration with professional colleagues from the northeast and elsewhere throughout the world. This proposal names URI as the host CESU university, but does not identify specific partner universities or organizations; however, we acknowledge and support the concept of partnering in order to strengthen the capabilities of the CESU. This proposal will demonstrate that our faculty serve as co-investigators with scientists from other universities, agencies and organizations and maintain a broad multidisciplinary professional network. This collaboration is often facilitated through formal agreements.

This proposal will demonstrate that URI is especially qualified and well poised to host a North Atlantic Coast CESU;

- USGS-BRD and NPS personnel are currently on campus and fully integrated into the university community
- the diversity of coast-related expertise and exceptional facilities at URI, coupled with a central location within the North Atlantic, make it a logical location to focus coastal ecosystem studies
- existing partnerships between the university and federal agencies will provide opportunities for networking with the CESU program.

3. UNIVERSITY ROLE AND MISSION STATEMENT

The CESU would be hosted by The University of Rhode Island. URI is a public state-supported land grant institution with a tradition of public service through research, teaching, and outreach. The university has an enrollment of about 10,250 undergraduate and 3,125 graduate students. The masters degree is offered in 48 areas of study and the doctorate in 31 areas. Research awards to URI exceeded $43,000,000 in Fiscal year 1997. Excerpts from URI's Mission Statement expands on the University's scope of endeavors. These excerpts are somewhat generic to all major universities; however, they do point to URIs focus on natural resources and marine disciplines, commitment to maintaining a culturally and intellectually diverse atmosphere, and a goal to be actively involved in addressing problems of national/international importance.

> "The University of Rhode Island is the principal public research and graduate institution in the State of Rhode Island with responsibilities for expanding knowledge, for transmitting it, and for fostering its application. Its status as a land grant, sea grant, and urban grant institution highlights its traditions of natural resource, marine, and urban-related research.
>
> "With undergraduate and graduate programs in the liberal arts and sciences and focus programs in the areas of marine and environmental studies; health; children, families, and communities; and enterprise and advanced technology, the University strives to meet the rapidly changing needs of the State, the country, and the world.
>
> "The University seeks talented undergraduate and graduate students, faculty, and staff from a wide array of cultural, economic, and ethnic backgrounds who collaborate in an intellectual and social community of mutual respect to learn, to be enriched, and to produce significant research and scholarly and creative works.
>
> "To fulfill its special obligations to the State of Rhode Island, the University cooperates in offering programs with other Rhode Island institutions of higher education, public and private. It is committed, through cooperative governance, to an ongoing evaluation of programs, priorities, and processes in order to improve existing programs and to anticipate changing needs and new challenges. Aspiring to have a quality and extent of influence beyond the state, with breadth of vision and boldness of approach the University of Rhode Island strives for excellence for Rhode Island and for the country."

To emphasize to URI's commitment to the study of coastal ecosystems, the University President recently reinforced that Marine and Environmental programs is one of four focus areas for enhanced investment in research and graduate education. The ability to attract and hire new faculty and support graduate students is a direct outcome of these focus areas.

4. DESCRIPTION OF COOPERATORS

Many organizations within the University and existing partnerships between the University and other organizations conduct activities relevant to land management. The list will begin with academic departments, follow with other organizations within URI, then list partnerships with external organizations.

Graduate School of Oceanography (GSO)

"The Graduate School of Oceanography of the University of Rhode Island is dedicated to excellence in marine related scientific research, education, and public service. Its goal is to be the premier academic marine research institution in the world. While the ultimate purpose of the research program is to make significant contributions to the understanding of global earth systems, the intent of the academic component is to educate marine scientists to conduct fundamental research to meet the needs of Rhode Island, the nation, and the world. The institution's public service responsibility is to be a resource for the state and its citizens on marine matters" (Statement from a GSO planning document, *A Starry for the Future.*). GSO conducts approximately $23 million of federally sponsored research and training activities per year.

Faculty and Marine Research Scientists

GSO has 52 Faculty and Marine Research Scientists (Ph.D. researchers with principal investigator status). Faculty and Marine Scientists with interests complimentary with the proposed CESU include:

Jeremy S. Collie	quantitative marine ecology
Edward G. Durbin	marine planktonic food chains, zooplankton, and fish ecology
Paul E. Hargraves	phytoplankton systematics, morphology, and biogeography
Scott W. Nixon	estuarine and wetland ecosystems
Candace A. Oviatt	coastal and estuarine marine ecology
Theodore J. Smayda	phytoplankton ecology and physiology
David C. Smith	marine microbial ecology, food web dynamics
Jennifer Specker	fish endocrinology, adaptation and development
Elijah Swift	marine phytoplankton, oceanic bioluminescence
James A. Yoder	biological oceanography, remote sensing
Percy Donaghay	zooplankton physiology and population dynamics in changing environments.
Aimee A. Keller	trophic interactions, fisheries biology.
Robert D. Kenney	distributional biology, behavior of mammals
Grace Klein-MacPhee	early life history of fishes

Barbara L. Nowicki	carbon, nitrogen, and phosphorus cycling in coastal waters
Petra M. Stegman	dynamics of biological and physical interactions
Barbara K. Sullivan	predator-prey interactions of medusae and ctenophores.
Dana R. Kester	physical chemistry of seawater
Michael E.Q. Pilson	chemistry of seawater, experimental biogeochemistry and ecology
James G. Quinn	marine organic chemistry
Kenneth R. Hinga	fates and effects of chemicals in the marine environment
Kenneth Rahn	atmospheric process, atmospheric transport of pollutants
Christopher Kincaid	geophysical fluid dynamics, marine geophysics, coastal circulation modelling
John King	paleomagnetism, rock magnetism, palynology, trace-metal contaminants
Peter Cornillon	remote sensing oceanography, marine data access
Tetsu Hara	surface waves, air-sea interaction
David L. Hebert	small-scale mixing processes

Facilities

The Graduate School of Oceanography has a 165 acre campus adjacent to Narragansett Bay. The campus comprises 18 office and laboratory buildings totaling 250,000 square feet of space. Seawater facilities include a research aquarium, and two marine enclosure, or mesocosm, facilities (the Marine Ecosystems Research Laboratory and the Seagrass Mesocosm Facility). Laboratories throughout the campus house extensive analytical instrumentation and computational facilities. The USGS-BRD and NOAA cooperative programs are headquartered at GSO.

College of Resource Development

The College of Resource Development is dedicated to the study of the biology of living organisms, their environments, and the social instruments that guide stewardship over the physical and biological resources of the planet. The College traces its roots to the original Land Grant School of Agriculture and Mechanical Arts and to the Rhode Island Agricultural Experiment Station from which the University evolved. This lineage is distinguished by a fundamental commitment to providing a liberal and practical education to all citizens and to extending the benefits of science to society. Today, the College encompasses a spectrum of traditional and modern disciplines in agriculture, biology, environmental design and ecosystem management, food sciences, geology, marine sciences, resource conservation, and related social sciences.

The College faculty have traditional tri-part land grant appointments, with duties related to teaching, research, and outreach. Compared to many modern land grant Colleges of Agriculture and Natural Resources, the College is more strongly focused on coastal ecology (including agricultural, forest, and estuarine ecosystems, all of which are heavily influenced by adjacent human residential and industrial systems) and coastal land use and resource conservation issues, without neglecting traditional needs of agricultural and rural constituents.

As is true with GSO (above), the College has a long record of collaborative interactions with state and federal research and regulatory agencies on matters pertaining to coastal ecosystem management. Through the Agricultural Experiment Station Regional Research mechanism, and in response to many competitive grants initiatives (e.g., the Sustainable Agricultural Research and Extension program), College faculty also have a long history of cooperative projects within the Northeast region and nationally. College faculty have also participated in several international projects, through the Coastal Resources Center at GSO, and in response to USDA (e.g., OICD) and other international research initiatives (e.g., CGIAR).

The 70 faculty in the College are organized into seven academic departments, with research and outreach frequently spanning more than one department. Examples of faculty expertise relevant to the CESU are grouped here by department.

Community Planning and Area Development (7 faculty)

Howard Foster	Rural economic development policy

Fisheries, Animal, and Veterinary Science (8 faculty)

Terry Bradley	Fish physiology
Marta Gomez, Richard Wolke	Fish and Shellfish Pathology
Mike Rice, Joe DeAlteris	Aquaculture, fish technology
Conrad Recksiek	Fish Stock Enhancement, Environmental Restoration
Richard Rhodes, Murn Nippo	Animal ecology and stress physiology
Ulysses Whitworth	Zoonotic Lyme Disease, veterninary medicine

Food Science (10 faculty)

Richard Traxler, Tony Fischl, Garth Rand, Chong Lee, Spiros Constantides	Biotechnologies for food product development, microbial transformations of organic compounds, biotechnologies for bioremediation

Geology (5 faculty)

John Boothroyd	Coastal and near-off-shore geology of biological substraits
Anne Veeger	Surface and groundwater hydrology

Natural Resources Science (13 faculty)

Peter August	Population and community dynamics of patchy forest habitats; geographic information systems; ecology of bats
Jose Amador	Soil physics and microbiology, C&N biomineralization
Jana Compton, Mark Stoltz	Long-term dynamics of C, N, & P cycling in New England Forests
Peter Paton	Ecology of amphibians in woodland vernal pools; ornithology
Thomas Husband	Population genetics of rabbits, tropical mammalian ecology, woodland ecology of birds and mammals
Francis Golet	Wetlands classification and ecology; bird ecology
Arthur Gold, William Wright	Landscape level soil and water dynamics of coastal watersheds

Plant Sciences (18 faculty)

Joel Chandlee	Plant Responses to stresses; plant genetics
Richard Casagrande, Steve Alm	Insect and plant biological control; nematology
Roger LeBrun	Insect physiology and ecology
Patrick Logan	Aquatic Entomology; systems science
Thomas Mather	Vector borne diseases
Richard Hull, Noel Jackson, Bridget Ruemmele	Integrated turfgrass management
Brian Maynard	Horticulture, use of plants in bioremediation
Michael Sullivan	Agronomy, soil conservation

Environmental and Natural Resource Economics (8 faculty)

Thomas Grigalunas, James Opaluch	Valuation methods for coastal area management; bioremediation economics
Tim Tyrrell	Impacts of community tourism
Stephen Swallow	Economics of Rural & Coastal Forest Ecosystem management
Dennis Wichelns	Public values and Rural land use policies
Jim Anderson, John Gates, Cathy Wessels	Private strategies, public policies, food system performance

Facilities

The College of Resource Development is located on the main campus of the University of Rhode Island in Kingston. Facilities relevant to the CESU include

the Rhode Island Environmental Data Center (a Geographic Information Systems laboratory), state-of-the art computer teaching facilities, and fully networked and modern computer facilities in all faculty and staff offices. To support work on insect ecology, the College has the Center for Vector Borne Disease laboratories, and the Insect Quarantine and Rearing laboratory (a University facility that has recently won praise from USDA-APHIS for several of its design features), aquatic insect ecology and insect physiology, as well as full greenhouse and farm field facilities. Wildlife ecology, ornithology, wetlands ecology, water resources, and soil science each have one to several laboratories, all with contemporary instrumentation.

The College is also the administrative home of the Rhode Island Agricultural Experiment Station. The Station supports three farms in immediate proximity to the campus: The Plains Roads farms emphasize turf grass ecology (including relevant studies in nitrogen runoff, etc.), field crop ecology and agronomy. East Farm is devoted to orchards, vineyards, and extensive ornamental horticultural plantings, and has capabilities for research in use of plants for restoration ecology. Aquacultural systems and fish and shellfish pathology and physiology are also centered at East Farm. Peckham Farm has 120 acres available, and is home of the Animal Science program, featuring sheep and goats used in on-going reproductive physiology and stress management studies. The Station also supports the Electron Microscope Facility, a University-wide laboratory with TEM, STEM, and light microscopy, with veteran technical staff experienced in environmentally related research.

College of Engineering

The Department of Ocean Engineering offers graduate and undergraduate degrees with specializations in: coastal and nearshore processes, coastal and offshore structures, ocean instrumentation and seafloor mapping, underwater acoustics and data analysis, marine hydrodynamics and water wave hydrodynamics, and marine geomechanics. Faculty with the Department of Civil and Environmental Engineering include expertise in groundwater hydrology, pollutant tracking, and landfill mitigation. Faculty with interests complimentary with the proposed CESU include:

Malcolm Spaulding	numerical modeling of nearshore processes, pollutant transport and fate and effects
Armand Silva	marine geotechnology
Frank White	pollutant transport dynamics
Raymond Wright	water resources and water quality control
Stephan Grilli	coastal engineering, pours media flows
Sau-lon James Hu	dynamics of waves and structures, marine structural design
James Miller	acoustic tomography in shallow waters
Daniel Urish	groundwater hydrology

Facilities

Ocean Engineering facilities include a 30 meter long tow tank, an acoustic test tank, computational facilities, a geotechnology laboratory, and a 80-foot coastal research vessel.

College of Arts & Sciences

Two academic departments, Marine Affairs and Biological Sciences are most relevant to the CESU mission. The Department of Marine Affairs focus is on management, policy, and legal aspects of coastal/ocean space and its uses. The Department offers graduate and undergraduate degrees with specializations in: coastal zone management, marine transportation and port planning, fisheries law and management, international marine policy and law. Faculty with interests complimentary with the proposed CESU include:

Dennis Nixon	coastal zone law, marine pollution law
Richard Burroughs	marine environmental policy
Timothy Hennessey	the role of science in marine policy
Bruce Marti	economic geography, port planning and development
Neils West	environmental impact assessment, coastal demographics, marine recreation and tourism
William Fordon	environmental law and planning, environmental impact assessment
Gerald Krausse	tourism, marine park management
Christopher Dyer	fisheries management, coastal disasters and hazards

The Department of Biological Sciences combines the disciplines of zoology and botany. The Department offers training in basic biology. Students are able to focus on the study of animals (zoology) or plants (botany). Specializations include ecology and evolutionary biology, cell and developmental biology, physiology, and molecular biology. Faculty with interests complimentary with the proposed CESU include:

Marilyn Harlin	seagrass ecology, coastal algae
Richard Koske	coastal vegetation, mycology
Keith Killingbeck	physiology ecology, nutrient cycling
Robert Shoop	herpetology, marine reptiles
Frank Heppner	avian flocking
Stanley Cobb	marine ecology, behavior
Robert Bullock	marine invertebrates (mollusks)
Saran Twombly	freshwater ecology, invertebrates

URI's Coastal Institute
The Coastal Institute is an organization with multi-department participation as well as participation with State of Rhode Island agencies, representatives of local EPA and NOAA laboratories, the USGS-BRD Cooperative Unit (see below), and other organizations. The scope of the Coastal institute includes both basic and applied science and includes both the natural and social sciences as well as engineering. The scope includes research and extension and out-reach activities. The geographic range of the Coastal Institute extends inland to conclude activities within a watershed that directly effect coastal issues and seaward to the edge of the continental shelf or the Exclusive Economic Zone. The Coastal Institute has a Director, Fellows, an Executive Board, and an Advisory Council.

Rhode Island Sea Grant
The Rhode Island Sea Grant Program is a NOAA partnership of academia, government, and industry focusing on coastal and marine Resources, it operates through a university-based network to meet environmental and economic needs. Sea Grant conducts research, education, and outreach to use and conserve coastal and marine resources for a sustainable economy and environment.

The National Sea Grant Depository
The National Sea Grant Depository is the sole archive and central server for the entire collection of documents generated throughout the history of the National Sea Grant Program. This extensive collection provides a valuable research of information relevant to land management in the coastal zone. The Depository provides access to this rich collection to people throughout the world from all levels of expertise and interest.

URI Coastal Resources Center (CRC)
CRC is dedicated to developing strategies, systems, and institutions for the effective management of coastal environments. The Coastal Resources Center's field programs include work with US and foreign partners on all stages of coastal management. Field programs include work in: Kenya, Zanzibar, Tanzania, Ecuador, Indonesia, Jamaica, Mexico, Philippines, Sri Lanka, Thailand, and the United States. Domestic programs include Hazard Mitigation (hurricanes, fire, and flooding), Governance Workshops, Marina Guidelines, Public Access, and Community Planning. International programs include: a Coral Reef Initiative, Coastal Management, U.N. Advisory Role, Estuary Training, and Coastal News Publications. CRC's programs are primarily supported through cooperative agreements, grants, and contracts. CRC has a staff of 45 persons including in-country staff.

URI Office of Marine Programs
The Office of Marine Programs (OMP) is responsible for education, outreach, and publications activities for the marine and environmental programs of the University. The OMP sponsors programs in teacher training for K-12 education and provides educational programs for the public.

URI/NOAA Cooperative Marine Education and Research Program (CMER)
The CMER program, established in 1989, is to foster enhanced interactions between all elements of NOAA and URI with emphasis on projects of mutual interest to URI and the Northeast Region of NOAA's National Marine Fisheries Service. CMER provides an Adjunct Faculty in Residence on URI's Bay Campus who participates fully in research and education activities of URI. CMER sponsors many research programs at URI, primarily in fisheries management.

U.S. Geological Survey, Biological Resources Division, Cooperative National Park Studies Unit (CPSU) at URI
The CPSU at URI, established in 1989, conducts scientific research on coastal National Parks, and other Department of Interior coastal landscapes, with the objective of applying research findings to the protection of natural resources, mitigation of resource impacts, and development of effective natural resource management policies. The CPSU has three Adjunct Faculty in Residence at URI who participate fully in the research and education activities of URI.

EPA/Northeast Environmental Research Training Program
This URI/EPA partnership is to support the training of post-doctoral, pre-doctoral, and undergraduate scientists through research training opportunities with EPA Atlantic Ecology Division scientists and to increase the effectiveness and numbers of future independent scientists who will conduct environmental and ecological research.

A Coastal Information and Data Resource
URI and the Coastal Services Center of NOAA have formed a partnership with the objective of working jointly to create new tools and in general facilitate access, by scientists, planners, educators, and policy makers to coastal data and information, primarily through modern electronic communications technology. URI participants in the project include the Pell Marine Science Library, the National Sea Grant Depository, and developers of the Distributed Ocean Data System software.

URI/Mystic Marinelife Aquarium Memorandum of Understanding
This MOU formalizes the long history of mutual interests, cooperative programs, and beneficial interactions between URI and Mystic Aquarium in the areas of marine education, research, and public service.

Other Partners Throughout the Northeast
This proposal is not specifically naming institutions or organizations to serve as partners in this CESU endeavor. The research capabilities and facilities at URI enable the conduct of broad, multidisciplinary ecosystem-level research. However when additional expertise is required, URI researchers have frequently collaborated with colleagues from other institutions and organizations. A partial listing of collaborations over the last few years includes:

SUNY-Syracuse
Rutgers University

Cape Cod Commission
Cornell University
Woods Hole Oceanographic Institution
Connecticut College
Rhode Island Natural History Survey
Providence College
Massachusetts Audubon Society
University of Maine
University of Connecticut

As the CESU develops, the URI host university will look forward to interacting with colleagues, and establishing formal partnerships, as will be necessary to accomplish the CESU research mission with excellence.

Overhead Rate, Administrative/Clerical Support, Office Space, Faculty Appointment

It is proposed that the CESU will reside within and be associated with the URI Coastal Institute. Indirect costs (overhead) for establishing the CESU shall be 15% of total direct costs (all expenses except permanent equipment and student tuition). This represents a substantial waiver of over 34% of the standard rate designated by the cognizant federal agency, Office of Naval Research (49.2%).

In return for the modest 15% overhead, and in addition to routine physical plant support (e.g., lights, heat, cooling, etc.), URI will provide the following;

- Clerical/secretarial support for CESU scientists duty-stationed full-time at URI. This is the same amount of support provided to faculty and to our USGS-BRD and NOAA cooperators in the department in which they are housed. For example, clerical support for GSO faculty is at 20% of a full time clerical person.
- complete grant accounting for URI research projects
- offices for each CESU scientist duty-stationed at URI
- graduate students associated with a CESU scientist will be provided with office space
- Dedicated laboratory space may be provided to CESU scientists depending upon the needs of their research programs and availability. In addition, CESU scientists will be allowed full access to and use of laboratory facilities and equipment of collaborating co-investigators. Our CPSU scientists resident at URI have found this arrangement to be more than satisfactory.

To transfer or subcontract CESU funds to partner universities or organizations, 15% will be charged on only the first $25,000 of such agreements.

It is the goal of the university to have CESU scientists fully integrated into the intellectual atmosphere of the university, serving as major professor for students, serving on student graduate committees, participating in departmental meetings, teaching courses, offering guest lectures, etc. Our resident USGS-BRD and NOAA

cooperative scientists serve these roles and we look forward to similar involvement by CESU scientists. Adjunct Professor appointments to the appropriate departments must be awarded by the faculty and will be based on professional accomplishments. The University will encourage CESU scientists to be placed in departments where they will bring additional skills and areas of expertise to the departments.

5. SPECIFIC BENEFITS OF PROPOSED CESU

A CESU at URI will be instrumental in assessing the status of coastal ecosystems, detecting changes in ecosystem structure and function that are attributed to both natural and human-induced factors, and developing ecosystem-level models aimed at predicting changes. The ability to anticipate ecosystem impacts, thus enabling proactive initiation of management practices will greatly benefit natural resource managers and environmental regulators.

Breadth of Available Services -- As reviewed in item #4 of this proposal, URI clearly has a diverse faculty and research staff able to address issues of relevance to coastal land managers. Regarding facilities, URI is well-equipped to support major coastal ecosystem studies. All of our facilities are available for use by the USGS-BRD, NPS and NOAA scientists that are presently on campus by cooperative agreement and these services will be available to our CESU cooperators. Some examples of the facilities, educational, technical assistance and training programs, and public outreach programs that are available at URI follow.

- The Environmental Data Center is a state-of-the-art ArcInfo-based GIS lab. At present, it serves as the NPS Field Technical Support Center with the mission of supporting spatial data collection, management, and analysis for National parks in the northeast. It is also headquarters of RIGIS, the Rhode Island statewide GIS database.
- The Marine Ecosystems Research Lab at GSO is a center for marine and freshwater water chemistry analysis, estuarine habitat analysis, and manipulative ecosystem-level experiments.
- The 46,000-volume Pell Marine Sciences Library has a coastal/marine focus. It houses the National Sea Grant Depository, has electronic literature search capabilities, an interlibrary loan program, etc.
- The Coastal Resources Center, with a US staff of over 25 and 10 international staff, addresses issues and holds training workshops for resource managers pertaining to coastal ecosystem management & planning, hazard mitigation, governance, public access, volunteer environmental monitoring, etc. CRC provides an unsurpassed opportunity to follow the ramifications of coastal management practices so that information can be fed back into the decision making processes.
- The Office of Marine Programs is responsible for education, outreach and publication of marine/coastal and environmental activities. USGS-BRD

scientists at URI have participated in public education/outreach programs sponsored by the Office of Marine Programs.

- URI Cooperative Extension and the Office of University Outreach — under the Vice-Provost for Graduate Education, Research, and Outreach — support a number of collaborations linking the University to Federal and State agencies, and to local township governing bodies (the Rhode Island equivalent to county governments). These partnerships focus on regional planning, water quality, resource conservation, aquaculture, agriculture and soil conservation, pollution reduction, and various youth-oriented educational agendas, many of the latter with environmental themes.
- The Coastal Institute, dedicated in 1996, contains offices of the USGS-BRD scientists at URI, but more importantly, contains exceptional laboratory and conference facilities. The National Park Service recently used the conference facility for training.

Responsiveness to Federal Agency Needs -- Perhaps the most effective way to demonstrate URI's ability to deliver the kinds of research that are most relevant to land management and regulatory agencies is to highlight some of the research projects conducted through the NPS and USGS-BRD cooperative programs at URI. The diversity of coastal ecosystem types studied and the variety of issues addressed is noted.

ECOSYSTEM COMPONENT Management Issue	SHORT TITLE
ESTUARINE	
Nutrient Enrichment	-- Response of primary producers to nutrients
Habitat Restoration	--Vegetative & nekton baseline of salt marshes
Aquaculture	-- Ecological effects of shellfish aquaculture
Contaminants	-- Organic contaminants in shellfish
FRESHWATER WETLAND	
Hydrologic Alteration	-- Groundwater withdrawal impacts on ecology
Nutrient Enrichment	-- Macrophyte composition and monitoring
BARRIER ISLAND/COASTAL	
Shoreline Dynamics	-- Geomorphic analysis of storm breaches
Sea Level Rise	-- Response of salt marshes to accelerated rates
TERRESTRIAL	
Vector-borne Disease	-- Tick ecology and Lyme Disease
Habitat Assessment	-- Vegetation mapping at Minute Man NHP
Biodiversity	-- Assess declines in neotropical migrants

Foster Multi-disciplinary and Multi-agency Research -- Ecosystem-level research can not be effectively conducted without embracing a multi-disciplinary approach. In coastal ecosystems the interactions of biotic components with atmospheric, hydrologic, biogeochemical, geomorphic and other processes are extensive. As an example, the RI Sea Grant Program is associated with research within a Narragansett Bay watershed (the Greenwich Bay initiative). Teams of investigators from URI, NOAA, EPA, Natural Resources Conservation Service, RI Dept. of Environmental Management and three local towns are engaged in multidisciplinary studies to detect nutrient sources to the estuary, evaluate habitat responses, and model ecosystem restoration/management alternatives. Disciplines involved include, surface and groundwater hydrology, water chemistry, salt marsh and seagrass ecology, non-point source modeling, estuarine circulation modeling, community planning, GIS, and others. This represents just one example of many where URI researchers are collaborating with numerous agencies to address ecosystem-level coastal issues from a multidisciplinary perspective.

Diversity of Scientific Workforce -- The University of Rhode Island is an equal opportunity employer with a demonstrated commitment to enhancing access to and hiring of a diverse workforce. The College of Resource Development, for example, has recently graduated Dr. Oscar LiBurd, with a Ph.D. in Entomology, and is supporting the Ph.D. program of Angelia Browdy in Food Science. Both of these students were actively recruited from historically black colleges of agriculture. Examples of recent hires with Hispanic or Afro-American heritage include soil microbiologist Dr. Jose Amador, shellfish pathologist and geneticist Dr. Marta Gozez-Chiarri, and veterinarian Dr. Ulysses Whitworth. In US oceanogaraphy schools, there has historically been a very low minority participation. GSO has one of the very best records in minority participation in US oceanographic schools. In the last three years, GSO has graduated two Ph.D. and one M.S. minority students. One of the Ph.D. students was supported, in part, through the Federal Cooperative Education Program, and upon graduation was permanently placed with the National Park Service. GSO presently has six minority students enrolled, three being supported on minority-specific fellowships.

6. DOCUMENTATION AND LETTERS OF INTEREST/COMMITMENT

As previously stated, this proposal does not specifically identify partner universities or organizations. However, we are committed to the concept of partnering and look forward to interacting with our colleagues from other universities and organizations as specific needs arise.