

**Application of the University of Massachusetts Boston
to become an Academic Partner in the
North Atlantic Coast Cooperative Ecosystems Studies Unit**

The University of Massachusetts Boston

The University of Massachusetts Boston is a comprehensive, doctoral-granting campus, one of five campuses of the University of Massachusetts. UMass Boston offers 81 undergraduate degree programs, 41 master's degree programs, 15 doctoral programs, and 13 undergraduate certificate programs through its seven colleges and Division of Corporate, Continuing, and Distance Education. Its academic departments and research centers and institutes contribute substantially to public policy discussion and formulation in such areas as economic development, environmental affairs, social well-being, and health care. The campus serves the most diverse student population in New England.

This proposal to join the North Atlantic Coast Cooperative Ecosystem Studies Unit (NAC-CESU) is a collaboration among faculty members and researchers from several academic departments and research centers within the university whose expertise and research interests align closely with the mission, strategic vision and priority direction of the NAC-CESU. These are:

Department of Anthropology
Andrew Fiske Memorial Center for Archaeological Research
Institute for New England Native American Studies
Environmental, Earth and Ocean Sciences Department
Urban Harbors Institute

The academic specialties and research interests of our collaborators bring natural science, social science, and public policy expertise to the study of the natural and cultural resources of the North Atlantic Coast's terrestrial, coastal, and marine environmental systems.

The University of Massachusetts Boston is located on Boston Harbor, approximately three miles south of downtown Boston. All of the UMass Boston departments and centers proposed to participate in the NAC-CESU are on the Boston campus. The address is 100 Morrissey Blvd., Boston 02125-3393.

Institutional and Departmental Mission and Goals

The mission and goals of the **University of Massachusetts Boston** are to provide challenging teaching, distinguished research, and extensive public service.

The university seeks to distinguish itself in four areas of inquiry: the physical environment; critical social and public policy issues; leadership in health, education, and human services; and high technology manpower needs. Extending the land grant tradition, UMass Boston forges linkages between research and service, forming partnerships with communities, the private sector, government, other colleges and universities, and other sectors of public education. The campus sponsors and supports cultural diversity by helping ethnic and international communities to articulate and celebrate their cultural values and identities, and by recognizing the contributions and achievements of members of these communities.

The **Anthropology Department** curriculum offers a theoretically informed, cultural, biological and historical viewpoint on human development and diversity. Among the department's faculty are archaeologists whose work focuses on the consequences of colonialism, identity politics, and

industrialization; and cultural anthropologists whose research spans historical and contemporary periods as they examine the impact of colonialism, migration, globalization, and tourism on nation states and on marginalized communities. At the undergraduate level, the Department prepares majors and other students to bring an anthropological perspective to whatever career path they may choose. At the graduate level, our program in the historical archaeology of the Americas trains M.A. candidates both for applied careers and for professional development at the doctoral level elsewhere. The Anthropology Department also maintains two research centers, the Andrew Fiske Memorial Center for Archaeological Research and the Center for Cultural and Environmental History. As integral parts of the Department, the “joint centers” conduct externally-sponsored research and public service activities that often involve both graduate and undergraduate students. The centers also play an important role in the educational mission of the Department, especially at the graduate level.

The **Fiske Center** supports a wide range of interdisciplinary archaeological research, applied public archaeology projects, and educational programs for undergraduate and graduate students. In general, the Fiske Center has a temporal focus on the archaeology of the last thousand years and a geographic emphasis on the archaeology of the Americas and the Atlantic World. The Center’s research has a theoretical focus on issues of colonization, urbanization, and industrialization, all key social and historical processes that have shaped the environments of the North Atlantic Coast. These issues are investigated through careful archaeological fieldwork and detailed laboratory analyses.

As part of a public university, the Fiske Center also has a strong commitment to local and regional archaeology. The Fiske Center undertakes selected public-oriented projects that promote the cultural heritage of the Commonwealth of Massachusetts and the broader New England Region. The Center carries out public service archaeology projects that are collaborative efforts with local governments, local historical societies, tribal nations, or other preservation organizations. These projects bring our staff’s expertise to bear on the preservation, interpretation, and management of significant sites and artifact collections.

The **Institute for New England Native American Studies** has been established in partnership with the Massachusetts Commission on Indian Affairs to (1) develop and share the Native perspective, (2) develop and engage in academic collaborations for the purpose of conducting research on issues vital to New England Native American communities; and, (3) broadly disseminate the research results in the form of policy analysis to enhance knowledge and encourage social and economic improvement.

To accomplish those broad objectives the Institute collaborates with all of the Tribes in the New England region and will position itself as a clearinghouse of resources that it encounters. For thousands of years Tribes of the First Light have lived in harmony with the natural resources along the coast and its estuaries. Since the imposition of colonialism they have been subjected to defense, industrial and development impacts on their ancestral lands. All of the Tribes of the region have expressed concern; some have made concerted efforts with regard to impacts on their cultural resources.

The **Environmental, Earth and Ocean Sciences Department (EEOS)** integrates the natural and social sciences to generate and apply new knowledge about the quality of our environment and the sustainable use of its resources. It focuses on promoting integrated science, planning, policy, and education for understanding earth-system processes and managing the impacts of urbanization on linked watershed and coastal marine systems. The department’s strong interdisciplinary makeup (natural and social sciences within the same department) and its focus on linked watershed-coastal systems are unique in the country.

Department facilities include the Applied Geographical Information Science (GIS) Center, the Center for Estuarine and Coastal Observation (CECO), the Trace Element Analysis Facility, and the Laboratory of Theoretical, Computational and Observational Oceanography. In addition, the Department houses specialized laboratories for earth, ocean and environmental sciences, including state-of-the-art facilities for GC/MS, CHN analysis, forensic environmental analysis, hydrogeology, coastal geology, environmental toxicology, stable isotope sample preparation, benthic ecology and zooplankton analysis, as well as inshore/near shore research vessels.

The **Urban Harbors Institute** (UHI) is a public policy and applied-science research center which focuses its expertise on solutions to problems of coastal and marine environments. The institute's mission is to increase understanding of the coastal environment, improve management practices, and promote informed decision making at the local, state and national levels. UHI employs a multidisciplinary approach in all its research and education projects, blending science, policy, and management. The Institute's expertise is in coastal and ocean policy, planning and management, environmental inventories and assessments, and sustainable development.

Nearly all of the research and public service projects conducted by UHI are done for and with federal, state and local government agencies, nonprofit organizations, or industry associations for the purpose of improving management of coastal and ocean areas.

Expertise the University of Massachusetts Boston can contribute to the NAC CESU consortium

Department of Anthropology

Research with Native American and immigrant communities in the region on issues of heritage, cultural resources management, tourism and the urban environment, and land preservation; historical and archaeological research on Native American reservation land as a cultural and natural resource site; analysis of regional tourism development and the role of urban and maritime history and heritage as part of it; archaeological, historical and ethnographic research on New England's coastal and island regions.

Andrew Fiske Memorial Center for Archaeological Research

Cultural Resource identification, evaluation, and management planning; archaeological overview and assessment reporting; terrestrial remote sensing for cultural resources; environmental archaeology analyses: palynology, paleoethnobotany, zooarchaeology; GIS.

Environmental, Earth and Ocean Sciences Department

Landscape reconstruction, marine & terrestrial geoarchaeology; environmental assessment, environmental risk, environmental policy & law; GIS, remote sensing, environmental modeling; marine processes, contaminant transport and tracing, geochemical fingerprinting; integration of science and policy.

Urban Harbors Institute

Natural resource planning and management; public policy, legal and regulatory analysis; socio-economic research and analysis; program and design and evaluation; GIS.

Individuals of UMass Boston who will be active in NAC CESU projects

Department of Anthropology

Amy Den Ouden, Associate Professor, specializes in Native North America with a focus on colonialism, indigenous land rights, Indian policy and the reservation system in southern New England, as well as contemporary issues concerned with sovereignty and federal acknowledgment.

Dr. Den Ouden's recent publications include her book *Beyond Conquest: Native Peoples and the Struggle for History in New England*.

Steve Mrozowski, Professor of Anthropology and director of the Center for Cultural and Environmental History and of The Andrew Fiske Memorial Center for Archaeological Research, specializes in social theory, historical archaeology, environmental and urban archaeology. He has directed field research throughout New England and in Virginia. He has edited or authored five books and published more than fifty essays dealing with issues in historical archaeology to the evolution of the urban landscape in New England, Virginia and Britain.

Stephen Silliman, Associate Professor and Graduate Program Director for the Historical Archaeology Graduate (M.A.) Program, specializes in issues of identity, labor, and postcolonialism; collaborative indigenous archaeology; and the impact of post-Columbian colonialism on Native Americans. He has conducted field research in Massachusetts, California, Oregon, Texas, and Japan, but his current geographic focus is on both southern New England and California. He works with the Eastern Pequot Tribal Nation in Connecticut on historic preservation and archaeological research, much of which is conducted as part of his annual summer field school. His publications include *Lost Laborers in Colonial California: Native Americans and the Archaeology of Rancho Petaluma* and *Historical Archaeology* (co-edited with Martin Hall).

Tim Sieber, Professor of Anthropology, specializes urban anthropology, applied anthropology, the cultural history of Amazonia, and immigrant and minority education. His research projects, publications, and consulting have centered on anthropological study of cities and on a variety of urban problems and issues, in the areas of education, child welfare, gentrification, community and urban development, environmental problems, multicultural relations, public culture and waterfront planning.

Andrew Fiske Memorial Center for Archaeological Research

David B. Landon is the Associate Director of the Andrew Fiske Memorial Center for Archaeological Research and an Adjunct Associate Professor in the Department of Anthropology. Landon's research interests are the archaeology of historic and industrial period sites, environmental archaeology, zooarchaeology, and archaeological science. Landon has published in more than a dozen journals including *Historical Archaeology*, *Journal of Archaeological Science*, *International Journal of Osteoarchaeology*, *IA: Journal of the Society for Industrial Archaeology*, and *Journal of Wildlife Management*. He has received over \$400,000 in funding for projects supported by the National Science Foundation, USDA Forest Service, National Park Service, Smithsonian, and other government and private sources.

John Steinberg has been a Senior Scientist at the Fiske Center since 2005. He has been directing the Skagafjördur Archaeological Settlement Survey (SASS) since 2000. SASS is a multi-year project in Northern Iceland to understand the formation of property rights during the Viking Age and after (AD 874-1700).

SASS is studying a series of farms to understand the variation in building construction and the economic potential. Buildings from the Viking Age in Iceland were constructed out of turf and are now buried in deep wind-blown deposits, thereby making them almost impossible to identify, except using remote sensing. His work examines the demographic changes that took place in Iceland from its Viking Age settlement, through its Norse chiefly organization, and into a medieval state system. He also teaches courses and advises students in the Historical Archaeology Graduate (M.A.) Program.

Heather Trigg is a Senior Scientist in the Andrew Fiske Memorial Center for Archaeological Research. Her research interests include the social and economic effects of colonization on both colonizers and indigenous peoples. She has worked extensively in the Southwest US on both pre-historic and historic sites and is currently working on historic sites in the Northeastern US. She has a technical specialty in paleoethnobotany; and in addition to materials in her research areas, she has identified plant remains from sites in Iran, Mongolia, and Germany.

Environmental, Earth and Ocean Sciences Department

Allen Gontz, Assistant Professor, possesses expertise in Quaternary geology, geophysics and landscape reconstructions. He is an active collaborator with the archaeological sciences to provide landscape-scale perspective to sites of interest. The integration of geology, geomorphology and geophysics is broadly applicable to any landscape and reconstructions can be developed at various spatial and temporal scales. Specific research included evolution of historic sites, coastline and shoreline reconstruction and non-invasive/non-destructive site assessment. He is also an expert in sedimentology and stratigraphy. He is a current collaborator with local, state and federal organizations.

Anamarija Frankic, Assistant Professor, possesses expertise in ecosystem indicators and integrated ecosystem socioeconomic management. She is a collaborator with the Massachusetts Office of Coastal Zone Management and the World Bank. Her broad array of globally-based projects will bring a uniquely global perspective and best management practices from other nations. Her expertise has been applied in projects ranging from ecosystem management to aquaculture in places including the North Sea, the Adriatic Sea and the Commonwealth of Massachusetts.

David Tenenbaum, Assistant Professor, has expertise in: 1) GIS science, including digital terrain analysis, code development and application customization, integration of remotely sensed data; 2) watershed hydrology, focusing on the spatial distribution of hydrological processes and hydroecological simulation, and 3) development of landscape representations for spatially-distributed models of ecosystem processes that emphasize scenario exploration; 4) hydrological modeling to support the development of instream flow needs standards; 5) remote sensing of vegetation properties for assessing surface moisture condition; and 6) assessment of drought conditions using indicators derived from moderate resolution imagery. His research areas and skills add significant strength to our team in GIS application and dynamics model development.

Ellen Douglas, Assistant Professor, has expertise in watershed-to-global hydrological processes and specializes on the impact of society on aspects of the hydrological cycle and quantifying non-sustainable water use. She is also active in monitoring the impacts of stream restoration, sediment transport and precipitation patterns in New England. In addition, she is an expert in applying statistical analysis and in developing and analyzing large data sets for the purpose of regional to global scale water resources investigations.

Wei Ding, Assistant Professor, has expertise in areas of interactive visualization modeling for large high-dimensional datasets, data mining feature-based hot spots using supervised clustering, regional co-location patterns for sets of continuous variables, and discovering controlling factors of geospatial variables. Especially, she has extended working experience to apply data mining technique for predicting the spatial and temporal distributions of environmental contaminants in ground water and soils and for assisting management decision making.

Urban Harbors Institute

Jack Wiggan, director, manages the Institute's interdisciplinary research, public service and educational initiatives which revolve around the development and implementation of coastal policy,

planning and management strategies at the national, state, and local levels of government. He is currently leading a team developing the planning framework for the Massachusetts ocean management plan; preparing harbor plans for Nantucket, Gloucester and New Bedford; and working with environmental justice communities on the impact of and responses to sea level rise as a consequence of climate change. He has prepared studies on incorporating renewable energy in the Boston Harbor Islands National Park Area, and prepared resource inventories and management plans for coastal watersheds, estuaries, and bays. He has taught planning courses in the EEOS Department at UMass Boston and Heritage Harbour Revitalization for the Cultural Resource Management Program, University of Victoria, British Columbia.

Dan Hellin, Research Associate, specializes in coastal management and marine ecology. His expertise is in harbor planning, coastal management, GIS, natural resource inventories, marine pollution reduction strategies, and marine-based recreation. Dan has expertise with GIS (ArcGIS 9.0 and ArcView 3.3) and in many software packages used for statistical analysis. Dan has conducted research on the impact of tourism and coastal development on coral reefs in Malaysia and numerous environmental impact assessments and ecological studies in Bermuda and the US. This work addressed recreational fishing, the ecological effects of sewage on coral reefs, the effects of thermal effluent on seagrass beds, the recovery of reefs after ship grounding events, and the ecological effectiveness of No-Take Zones within Marine Protected Areas.

Kristin Uiterwyk, Research Analyst, has conducted research and prepared studies on coastal hazards, public access, natural resource protection, shellfish management, open space planning, and harbor management. Kristin has expertise in environmental education, geographical information system (GIS) technology, data analysis, and survey research.

How UMass Boston will contribute to the NAC CESU Mission and Vision

The **Department of Anthropology** will provide a major contribution to UMass Boston's membership in the North Atlantic Coast CESU. The Department includes historical archaeologists and cultural anthropologists who have worked extensively with Native American and immigrant communities in the region on issues of heritage, tourism and the urban environment, cultural resource management, and land preservation. For instance, for the past six years, Professor Stephen Silliman's archaeological field school on the Eastern Pequot Tribal Nation's reservation in southeastern Connecticut has engaged undergraduate and graduate students in extensive research on the history of reservation land as a continuously significant cultural and natural resource site for Native American communities. Since 1984 Professor Timothy Sieber has studied Boston area regional tourism development and the role of urban and maritime history and heritage as part of it. The department also has a long history, spanning 35 years, of archaeological, historical and ethnographic research on New England's coastal and island regions, such as the Boston Harbor Islands, Nantucket, Cape Cod, and the Stellwagen Bank National Marine Sanctuary.

The **Fiske Center** will provide technical expertise and a practical emphasis on archaeological fieldwork and site sampling, material analysis and conservation, remote sensing, Geographic Information Systems (GIS) applications, paleoethnobotany, palynology, and zooarchaeology. This theoretical focus and methodological expertise, in combination with an experienced and accomplished staff, makes the Fiske Center a national leader in historical and environmental archaeology research. This expertise will contribute broadly to Cultural Resource Management and characterization of past anthropogenic environmental changes and land use practices. Fiske Center's CESU projects will include educational opportunities for graduate and undergraduate students, as well as an emphasis on public outreach.

The **Institute for New England Native American Studies** will provide an invaluable service for its constituents in terms of protecting cultural resources by identifying research and technical assistance opportunities through collaboration with the NAC-CESU partners.

The **Environmental, Earth and Ocean Sciences Department** is a unique department. Through its conception, EEOS is already a multidisciplinary and interdisciplinary entity with a focus on linked coastal and ocean watersheds. In addition to the staff listed above, additional expertise areas include aquatic/marine chemistry, coastal land use planning and law, GIS, environmental assessment, environmental risk, contamination transport fate and flow modeling. The EEOS department can bring this integrated perspective, usually not found in one location, to bear on issues facing the NPS with the ability to take projects from inception to scientific data acquisition/analysis to data synthesis and policy and risk assessment.

The **Urban Harbors Institute** will provide expertise on managing the impacts of urbanization on coastal land and water resources. The institute has conducted research on and prepared studies and plans for a number of the historic ports and harbors of New England that preserve and enhance the community's maritime heritage and natural resources while promoting contemporary development and uses. The institute has expertise in coastal sustainable development practices including renewable energy. We specialize in integrated science-based planning of coastal and ocean areas, designing and managing broad stakeholder and public involvement processes, and providing technical assistance and training in the above to government agencies and nonprofit organizations.

Who is the NAC CESU point of contact for your agency or University (include email, phone, fax, mailing address)?

The point of contact for the NAC CESU is:

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