Proposal for the City University of New York (CUNY) to Become a Partner in the North Atlantic Coast Cooperative Ecosystem Studies Unit (NAC CESU)

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Overview of the City University of New York

The City University of New York (CUNY) is the nation's leading urban public university serving more than 400,000 students at 19 colleges in New York City. CUNY has many levels of organization. One CUNY hub for advanced research and education is The Graduate Center, its doctorate-granting institution founded in 1961. In this nationally unique consortium of 1,700 faculty members, a core faculty of 125 Graduate Center appointments is supplemented by over 1,500 additional faculty members drawn from throughout CUNY's ten senior colleges and New York City's leading cultural and scientific institutions. With 4,000 doctoral students, they pursue a shared enterprise of expanding the boundaries of knowledge.

In this consortial model, faculty and students conduct research at The Graduate Center, the senior colleges, and participating institutions such as the American Museum of Natural History and the New York Botanical Gardens. CUNY also is home to both university-wide institutes and college-based centers of specialization.

The most relevant components of CUNY and associated personnel to NAC CESU include the following:

Queens College

Dr. John Waldman recently joined the Biology Department and is also on the Graduate Faculty of the School of Earth and Environmental Sciences. Long-term research interests include the ecology and evolution of fishes, the biology and management of diadromous

fishes, marine conservation, and estuarine biology (particularly of the Hudson River estuary). Research underway includes stock structure of Atlantic cod and Atlantic sturgeon. His current graduate students are working on the wintering biology of striped bass in the Thames River, clam shrimp demographics, the history, status and trends of oysters in New York Harbor, cormorant food habits and breeding locations in New York Harbor, and the population genetics of diamondback terrapins. Dr. Waldman has received inquiries about working with the Jamaica Bay Unit of the National Parks Service in NAC CESU-related projects.

The School of Earth and Environmental Sciences at Queens College has numerous faculty working on North Atlantic coastal issues. Dr. Nicholas Coch is an established expert on sedimentology, coastal processes, and history and effects of hurricanes of the New York region. Dr. George Hendrey works on broad-scale environmental issues such as acid rain. Among his regional studies, Dr. Stephen Pekar uses a new integrated approach to determine climate variability and environmental changes of the Hudson River region by estimating paleosalinity changes in the estuary for the past 7,000 years. He is also studying the depositional history of the inner shelf off of New Jersey and Long island. Dr. Cecilia McHugh is also working in the Hudson River focusing on a bottom mapping project of the Hudson. Both Dr. McHugh and Dr. Pekar are also studying changes in the sedimentary deposition of the outer shelf of the New York Bight. Dr. Yan Zheng's research is focused on the biogeochemical cycles of elements in the environment that occur on a range of time scales. Dr. Timothy Eaton is conducting research on the hydrology of a semi-connected urban estuary, the Flushing Meadow lakes. Among the interests of Dr. Karen Kohlfield is the role of marine biogeochemistry in controlling atmospheric CO2 across glacial-interglacial climate cycles. She and Dr. McHugh also teach an on-the-water field course on Long Island Sound. Dr. Gillian Stewart is a biogeochemist with interest in the interactions between organisms and elemental cycling, particularly in the ocean.

Hunter College

Hunter College's CARSI Lab (Center for the Analysis and Research of Spatial Information) is a state-of-the-art facility for geographical information analysis, with an emphasis on the urban environment of New York City. Within the Department of Geography, Dr. Frank Buonaiuto studies coastal processes, numerical modeling of waves, tides and sediment transport; Dr. Allan Frei works on river flow changes in New England; Dr. Randye Rutberg focuses on radiogenic isotopic tools for paleoceanography; Dr. Haydee Salmun investigates turbulent mixing processes in boundary layers in atmospheric, estuarine and coastal areas; and Dr. Karl Szekielda studies the biogeochemistry of rivers and coastal regions.

City College

City College is home to NOAA-CREST (Cooperative Remote Sensing Science and Technology Center). NOAA-CREST uses remote sensing for a variety of goals, including methods capable of monitoring the diverse conditions of coastal and inland

waters for coastal water management. Dr. Pengfei Zheng of the Department of Earth and Atmospheric Science of City College currently is researching concentrations of chlordane in sediments from Long Island Sound. In the College's Biology Department, Dr. John Lee is a marine microbial ecologist working mainly on symbiosis in giant foraminifera and microbial and protistological problems related to mariculture; he also works with salt marsh protozoa.

College of Staten Island

The laboratory of the Biology Department's Dr. William Wallace focuses on linking chemical and physiological interactions within metal-contaminated aquatic ecosystems to alterations at several levels of biological organization. Current activities are aimed at understanding patterns in metal accumulation and toxicity in aquatic invertebrates inhabiting the waterways surrounding Staten Island. His colleague, Dr. Richard Veit, studies coastal seabirds, including urban gull and heron populations. Dr. Tom Koutavas is a recent addition to the faculty at Staten Island, who is using isotopic and trace element data to constrain paleoceanographic changes during the past 10,000 years.

Brooklyn College

Dr. David Franz of the Biology Department has long conducted research on the invertebrates of Jamaica Bay and the surrounding region. The College's Earth and Environmental Sciences Department also contains the Environmental Sciences Laboratory, which is equipped with state-of-the-art instrumentation for the analysis of inorganic particulates.

Kingsborough Community College

Kingsborough Community College is located on the south shore of Brooklyn. It is home to several CUNY research and education vessels ranging from 20 to 47 feet in length.

CIRCE (CUNY Institute for Research on the City Environment)

The Institute, initiated in 2005, includes Hunter College, Queens College, City College and the Office of Academic Affairs. Its mission includes educating the citizens of New York City, the 450,000 students at CUNY, the K-12 public school population about the environment and sustainable development; promoting environmental research; and generating knowledge through such innovative educational opportunities as the course The Nature of New York: Its Natural History and Environment, developed through a collaboration between CUNY's School of Professional Studies and Nurturing New York's Nature.

AREAC (Aquatic Research and Environmental Assessment Center)

AREAC is an aquatic culture and research facility at Brooklyn College. Recent research topics have included captive breeding of horseshoe crab and examination of environmental effects on winter flounder declines in Jamaica Bay. AREAC also

cooperates with Urban Divers to conduct environmental monitoring of Brooklyn's Gowanus Canal and Erie Basin.

Governors Island Initiative

Governors Island, located in the heart of New York Harbor, is in the planning stages of being developed as the "next great public space for New York." A major stipulation in this development includes a significant portion of the island to be devoted for educational purposes. A leading proposal in the educational arena is for a project entitled *Harbor 360*, which would focus on the urban marine environment. As currently envisioned, it would be anchored by a scale model of the lower Hudson River estuary. This public attraction would include educational and research facilities, such as real-time and static displays of harbor phenomena, aquaria, lecture halls, and field-trip venues such as a seining beach and vessels for education and research. CUNY is currently a full partner in this effort and if this initiative is included in the final master plan, CUNY would be allocated space for research and educational programs, including a facility for storing and analyzing cores, and docking facilities for research vessels. The focus of the CUNY effort would be on urban coastal physical processes, but with support for other marine- and estuarine-related endeavors.

Contribution to the NAC CESU Vision and Mission

The NAC CESU's vision and mission is a laudable blend of excellence, utility, and efficiency: Federal land management, environmental, and research agencies, along with the nation's universities, share several science-based goals, including high-quality science, usable knowledge for resource managers, responsive technical assistance, continuing education, and cost-effective research programs. Because of its sheer size, CUNY does not have a well-known and centralized coastal marine laboratory. However, the sum of its relevant parts is impressive. This expertise and these facilities already generate exciting, cutting-edge research. However, in any program there is always benefit to collaboration with other institutions; we believe the unique expertise and facilities of CUNY would augment the already strong federation of NAC CESU members.

Moreover, CUNY would bring a distinctive urban element to the consortium. CUNY is the government-funded higher education institution of the largest urban region in the country and many of its faculty conduct research within this domain. Also, 72% of CUNY students are non-white. Thus, some components of CUNY qualify for funding available through various minority-based programs. For example, four colleges within the university qualify as Historically Black institutions. Minority status has allowed City College and Hunter College to qualify to each become a Research Center in Minority Institutions (RCMI) site and to obtain generous RCMI funding. Many of the colleges also have graduate students supported by the Minority Access to Research Careers (MARC) Program.

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