



Department of Organismic and Evolutionary Biology
HARVARD UNIVERSITY
26 Oxford Street
Cambridge, Massachusetts 02138

February 20, 2013

Dr. Judith Swift
Director, The Coastal Institute
University of Rhode Island
215 South Ferry Rd.
Narragansett, RI 02882

Re: Desire to enroll in the CESU as a new partner institution/organization

Dear Dr. Swift:

I write to request membership in the North Atlantic Coast Cooperative Ecosystem Studies Unit (NAC CESU) on behalf of the Department of Organismic and Evolutionary Biology (OEB) at Harvard University and our allied institutions, including but not limited to, the Museum of Comparative Zoology (MCZ), Harvard University Herbaria (HUH), the Arnold Arboretum (AA) and Harvard Forest (HF). The administrative office of OEB and the allied institutions mentioned above is located at 26 Oxford Street, Cambridge, MA 02138. Additional centers of environmental research at Harvard include the Harvard Center for the Environment (HUCE), the Department of Earth and Planetary Sciences (EPS) and the Center for Geographic Analysis (CGA). Other Departments with emphases of relevance to the funding opportunities via CESU are History and Anthropology. If the CESU is approved, I therefore expect there will be much additional interest at Harvard.

The Office of Sponsored Programs (OSP) mediates outside funding for research at Harvard University and has agreed to be the administrative lead, and to accept the 17.5% indirect cost rate on any projects initiated under the CESU agreement. Technical representatives, at least initially, will be the directors of the allied institutions (Dr. Donald Pfister and Dr. Charles Davis (OEB/HUH), Dr. James Hanken (OEB/MCZ), Dr. David Foster (OEB/HF), and Dr. William (Ned) Friedman (OEB/AA)), and Dr. Brian Farrell (OEB/MCZ).

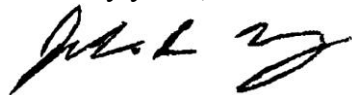
We collectively offer expertise in ecology and evolution (OEB), managed ecosystems (HF), and living collections (AA), as well as taxonomic expertise and natural history collections (HUH and MCZ) that total some 30 million specimens. We also offer expertise in vegetation mapping (EPS

and OEB). We can contribute the intellectual assets of students and faculty, as well as expertise in documenting biodiversity and ecosystem distributions.

Some recent activities relevant to CESU goals (and supported in part by NPS) include the 6-year inventory of invertebrates in the Boston Harbor Islands National Park directed by Professor Brian D. Farrell. This All Taxa Biotic Inventory (ATBI) recorded and identified nearly 2000 species of arthropods from this New England coastal area and provides high-resolution images of these species online that are of use for identification. Nearly all included species are widespread throughout this CESU area and therefore this one resource provides information not otherwise readily available for identifying arthropods in the region. The inventory produced three senior theses and multiple research papers as well.

Please find below some of the websites of the Harvard departments and institutions concerned.

Sincerely yours,



John Wakeley
Professor of Biology
Chair, Department of Organismic and Evolutionary Biology

<http://www.oeb.harvard.edu/>
<http://www.mcz.harvard.edu/>
<http://www.huh.harvard.edu/>
<http://www.arboretum.harvard.edu/>
<http://harvardforest.fas.harvard.edu/>
<http://environment.harvard.edu/>
<http://www.eps.harvard.edu/icb/icb.do>
<http://www.gis.harvard.edu/icb/icb.do>
<http://www.fas.harvard.edu/~anthro/>
<http://history.fas.harvard.edu/>

2. Institutional Statement of Agreement

Harvard University has read the CESU agreement and agrees to support the CESU mission and goals and fulfill the roles and responsibilities of a nonfederal partner, as described in the CESU agreement to the extent such activities are and remain consistent with Harvard's institutional policies.



Webb Brightwell
Grants and Contracts Officer
Office for Sponsored Programs

Harvard University

3. Description of the institution/organization, its mission, and the primary focus of collaborative activities to be supported through the CESU in the context of the CESU mission.

We collectively offer expertise in ecology and evolution (OEB), managed ecosystems (HF), and living collections (AA), as well as taxonomic expertise and natural history collections (HUH and MCZ) that total some 30 million specimens. We also offer expertise in vegetation mapping and landscape structure analysis (EPS and OEB). We can contribute the intellectual assets of students and faculty. Faculty and graduate students perform research on issues relevant to the mission of the NAC-CESU, including interdisciplinary research on climate change, habitat loss and landscape ecology, and organismal and genetic biodiversity. Undergraduate students at Harvard also become contributing members of research labs, assisting faculty and graduate students in lab and field activities, as well as conducting their own research for honors theses. We hope to collaborate further on projects documenting biological and habitat diversity, exotic species establishment, and selection and monitoring of indicator species in coastal parks and refuges. Many research labs are enthusiastic about collaborating with non-academic partners to conduct research, train professionals, and provide internships for students. The physical locations of the Harvard campuses and arboretum in Cambridge and Boston give students and faculty ready access to coastal federal lands; Boston Harbor Islands national park area can be reached in less than an hour, and several more national parks, seashores, and wildlife refuges are within a few hours drive.

4. Description or list of the primary programs, departments, or other institutional divisions of relevance to federal land management, environmental, and research agencies that will likely be engaged in CESU activities. Include website addresses for further information, as appropriate.

The Department of Organismic and Evolutionary Biology (OEB) at Harvard University and our allied institutions will be the primary department engaged in CESU activities at the outset of this proposed partnership. OEB's allied institutions include the Museum of Comparative Zoology (MCZ), Harvard University Herbaria (HUH), the Arnold Arboretum (AA) and Harvard Forest (HF).

The President and Fellows of Harvard College (i.e. the institution) would be signing the agreement, thereby allowing other departments, schools, and programs within Harvard University to engage in CESU activities. Other departments, programs, and groups within the University with aligned activities include, but are not limited to: the Harvard Center for the Environment (HUCE), the Department of Earth and Planetary Sciences (EPS) and the Center for Geographic Analysis (CGA), History, and Anthropology.

Selected Websites:

OEB	http://www.oeb.harvard.edu/
MCZ	http://www.mcz.harvard.edu/
HUH	http://www.huh.harvard.edu/
AA	http://arboretum.harvard.edu/

HF <http://harvardforest.fas.harvard.edu/>
HUCE <http://environment.harvard.edu/>
EPS <http://eps.harvard.edu/>
CGA <http://www.gis.harvard.edu/>
History <http://history.fas.harvard.edu/>
Anthropology <http://www.fas.harvard.edu/~anthro/>

5. A list of and brief description of the staff or faculty with expertise in disciplines and subject areas of relevance to federal land management, environmental, and research agencies (selected faculty of many)

Brian D. Farrell

Professor of Biology

Curator of Entomology in the Museum of Comparative Zoology

Much of the work of the Farrell lab tests hypotheses concerning the influence of spatial and temporal variation in the availability of habitats or other resources on speciation and the rate of evolution of interspecific interactions. Their data are largely phylogenetic, based on variation in DNA sequences and morphological characters, and their studies vary in focus from principally ecological dimensions of resource use to emphasis on biogeographic or paleontological dimensions. Their general goal is to understand the interplay of adaptation and historical contingency in ecological and taxonomic diversification, as well as the marks of evolutionary history on community structure. The context of nearly all of their studies is the interaction between insects and plants, ecological associates whose diversity and abundance make them the principal denizens of the terrestrial earth.

Donald H. Pfister

Asa Gray Professor of Systematic Botany

Curator of the Farlow Library and Herbarium

Dean of Harvard Summer School

Co-director, Harvard University Herbaria

Dr. Pfister's research centers on the biology and systematics of fungi, particularly members of the fungus classes Pezizomycetes and the Leotiomycetes, both belonging to ascomycete groups. Using molecular, life history and morphological methods the Pfister lab strives to understand relationships within these groups and to uncover their diversity. In addition, Dr. Pfister studies the history of collections and collectors.

Charles Davis

Professor

Curator of Vascular Plants

Co-director, Harvard University Herbaria

The Davis lab's research on plant diversity integrates the disciplines of systematics, paleobiology, evolution, ecology, and molecular biology. One major theme that unites these

disciplines is phylogenetic theory, which they apply to reconstruct the history of plant diversity through evolutionary time. Biogeography, biome evolution, plant-insect interactions, and horizontal gene transfer are some of the focal points of our work in this area. The lab's recent projects have sought to understand the origins of intercontinental disjunctions, the age of modern tropical rain forest, the maintenance of morphological stasis in the tree of life, and mechanisms for horizontal gene transfer. This research combines fieldwork with specimen-based studies in the herbarium and molecular approaches in the lab. Broader interests of the Davis lab also include monographic and floristic study.

James Hanken

Alexander Agassiz Professor of Zoology,
Curator in Herpetology, and Director, Museum of Comparative Zoology
Professor of Biology, Department of Organismic and Evolutionary Biology

Dr. Hanken studies the evolution of morphology, developmental biology, and systematics. Most work by his group focuses on amphibians but otherwise addresses a wide range of topics, taxa, and methodologies. The latter range from laboratory-based molecular analyses to extensive field surveys. Current subjects include the evolution of craniofacial patterning in vertebrates; the developmental basis of life-history evolution; systematics, taxonomy and evolution of African frogs and neotropical and Asian salamanders; and amphibian declines and conservation. Active field programs are maintained in Mexico, China and Africa. Dr. Hanken's group also are very active in the Encyclopedia of Life, and especially EOL's Learning and Education group, which is based at MCZ.

David R. Foster

Director of the Harvard Forest
Senior Lecturer on Biology

Dr. Foster is the Principal Investigator for the Harvard Forest Long Term Ecological Research program, sponsored by the National Science Foundation and involving more than 100 scientists and students investigating the dynamics of New England landscape as a consequence of climate change, human activity, and natural disturbance. Dr. Foster's interests focus on understanding the changes in forest ecosystems that result from human and natural disturbance and applying these results to the conservation and management of natural and cultural landscapes.

William (Ned) Friedman

Arnold Professor of Organismic and Evolutionary Biology
Director of the Arnold Arboretum of Harvard University

Dr. Friedman's research program focuses on the organismic interfaces between developmental, phylogenetic and evolutionary biology. Within the past fifteen years, remarkable advances in the study of the phylogenetic relationships of plants have provided the raw materials for critical studies of character evolution. Armed with hypotheses of relationships among organisms, Dr. Friedman seeks to explore how patterns of morphology, anatomy and cell biology have evolved through the modification of developmental processes. His work is primarily focused on the origin and subsequent diversification of flowering plants, Darwin's "abominable mystery."

6. Description of student demographics and the institution's status as a minority-serving institution

The Office of the Provost at Harvard University maintains detailed demographic information for both enrollment and degrees conferred. This publically available information can be found at:

Enrollment:

http://www.provost.harvard.edu/institutional_research/harvard_fact_book_2012_enrollment.pdf

Degrees Conferred:

http://www.provost.harvard.edu/institutional_research/harvard_fact_book_2012_completions.pdf

The University has several programs aimed at minority recruitment and retention. Programs that directly benefit the Department of Organismic and Evolutionary Biology at Harvard (the primary department for this CESU application) and the Faculty of Arts and Sciences at Harvard are:

Undergraduate Minority Recruitment Program (UMRP)

http://www.admissions.college.harvard.edu/apply/hrp/minority_recruitment/index.html

Graduate School of Arts and Sciences Diversity and Minority Affairs

http://www.gsas.harvard.edu/prospective_students/diversity_at_gsas.php

Diversity in Life Sciences

<http://www.fas.harvard.edu/~lifesci/diversity/>

7. Description or list of facilities, equipment, centers, or institutes that would provide support to the research, technical assistance, or educational activities of relevance to federal land management, environmental, and research agencies that will be engaged in CESU activities.

A number of Harvard facilities would provide outstanding research support to the NAC-CESU. The animal and plant natural history collections at the MCZ and HUH total 30 million specimens, and include representative specimens of much of the New England fauna and flora. In addition, state-of-the-art molecular analysis, microscopy, and digital imaging labs are associated with the collections. Arnold Arboretum, in addition to a living collection of ~15,000 plants, supports research with microscopy and molecular labs, greenhouses, growth chambers, and a weather station. Harvard Forest is an ecological research station of 3,000 acres in Petersham, MA; it is also a part of the national network of Long Term Ecological Research (LTER) sites. Resources at the research forest include a library, museum, meteorological station, permanent forest plots established for the LTER program, and canopy web-cams that contribute to the National Phenology Network. The Center for Geographic Analysis (CGA) supports research and teaching of all disciplines across the University with emerging geospatial technologies. The Harvard University Center for the Environment (HUCE) promotes collaborative research and education about the environment and its interactions with human society by bringing together students and researchers from many disciplines, including chemistry, earth and planetary sciences, engineering and applied sciences, biology, public health,

government, business, and economics. The Harvard University library system is unsurpassed among academic libraries and includes the Cabot Science Library, the Ernst Mayr Library at the MCZ, the Botany Library at the HUH, and many others. The online Harvard Library portal provides access to collections and digital resources. Science education is the focus of the Harvard Life Sciences Outreach Program, which uses university resources to support local high school biology education and teachers.

8. Description or list of past research, technical assistance, and educational services supported through federal financial assistance awards that are of relevance to federal land management, environmental, and research agencies that will be engaged in CESU activities.

Some recent activities relevant to CESU goals (and supported in part by NPS) include the 6-year inventory of invertebrates in the Boston Harbor Islands National Park directed by Professor Brian D. Farrell. This All Taxa Biotic Inventory (ATBI) recorded and identified nearly 2000 species of arthropods from this New England coastal area and provides high-resolution images of these species online that are of use for identification. Nearly all included species are widespread throughout this CESU area and therefore this one resource provides information not otherwise readily available for identifying arthropods in the region. The inventory produced three senior theses and multiple research papers as well. More recently, Professor Farrell has received funding from NPS to assist in developing a nationwide Taxonomists-in-Parks program; to support ongoing biodiversity discovery efforts at Boston Harbor Islands npa, Acadia NP, and George Washington Birthplace NM; and to collaborate with the Encyclopedia of Life to develop biodiversity-focused educational tools.

9. Description or list of current formal agreements and informal relationships with federal agencies that are of relevance to federal land management, environmental, and research agencies that will be engaged in CESU activities.

From 2005 to 2013, Harvard University has collaborated with Boston Harbor Islands national park, Boston Harbor Island Alliance, the park's non-profit partner, and George Washington Birthplace National Monument to conduct insect biodiversity-focused research in island and coastal parks. We are also collaborating with Acadia National Park to create outreach materials related to ongoing biodiversity research.

10. CESU overhead recovery cap, and Harvard's willingness to accept the 17.5% rate.

The Office of Sponsored Programs (OSP) mediates outside funding for research at Harvard University and has agreed to be the administrative lead, and to accept the 17.5% indirect cost rate on any projects initiated under the CESU agreement. The 17.5% overhead rate is less than the federally negotiated rate for each school within the University. Overhead recovery at Harvard University offsets the **administration** costs, including department, school, and central administration, and **facilities** costs, including building and equipment depreciation, interest, operations and maintenance, and library costs incurred by maintaining a research program at the institution.

11. Harvard University's technical representative to serve on the CESU steering committee, participate in CESU annual/semi-annual partner meetings, and facilitate internal and external communication, promotion, and response to CESU correspondence and administrative actions (e.g., announcements, new member applications, processing agreements/amendments, five-year reviews).

Dr. Brian D. Farrell

Title: Professor of Biology
Curator of Entomology in the Museum of Comparative Zoology
Address: Museum of Comparative Zoology
26 Oxford Street, 409 MCZ
Cambridge, MA 02138-2029
Phone: 617-496-1057
Fax: 617-496-8308
Email: bfarrell@oeb.harvard.edu

12. Agreement to relay agency-specific research, technical assistance, and educational needs and associated funding opportunities to other institutional/organizational members (e.g., faculty, students).

The Department of Organismic and Evolutionary Biology (OEB) at Harvard (the primary department for this CESU application) with the technical representative proposed for this submission will relay, to the best of our ability, agency-specific research, technical assistance, and educational needs and associated funding opportunities to other departments, faculty, students, and schools within the University where appropriate. OEB will work with the FAS Office of Research Development to broadcast opportunities within the University, in order to best target and reach the most appropriate departments and individuals.

13. Signature (or endorsement) from an appropriate official, with authority to commit institutional resources in a binding multi-year federal cooperative and joint venture agreement



Webb Brightwell
Grants and Contracts Officer
Office for Sponsored Programs
Harvard University

14. Letter(s) of support from one or more CESU federal agency partners sponsoring the new partner's application, including a description of successful past collaborative work supported through federal financial assistance awards.

Please see attached letter from Charles T. Roman, Ph.D., Research Coordinator, North Atlantic Coast CESU and Coastal Ecologist, Northeast Region.