POSITION ANNOUNCEMENT:

GEORGE MELENDEZ WRIGHT INITIATIVE FOR YOUNG LEADERS IN CLIMATE CHANGE

The National Park Service (NPS) is pleased to announce the *George Melendez Wright Initiative for Young Leaders in Climate Change* (YLCC) to provide a pathway for exemplary students in higher education (graduate students and advanced undergraduate students) to apply their skills and ideas to park-based challenges and solutions. The Initiative offers 12-week paid internships which allow students to gain valuable work experience, explore career options, and develop leadership skills through mentorship and guidance while helping to advance the NPS response to climate change. Successful students may be eligible for non-competitive hire into federal positions for which they qualify following completion of all academic requirements.

Develop Coastal Vulnerability Information in Order to Improve Resilience to Climate Change Impacts

Boston Harbor Islands National Recreation Area,
Boston, Massachusetts

This project will provide an intern the opportunity to play a critical role in the most important climate change adaptation project in the park by studying the impacts of accelerating sea-level rise and the effects on the Harbor Island shorelines. Working closely with a team of coastal geologists and park managers, the intern will collect, organize and present multiple data sets examining coastal features and processes as well as important park resources and facilities. This data will provide baseline information that will be used to populate models that will be developed as part of a multi-year project.

PROJECT DESCRIPTION

The larger project is intended to improve the resilience to loss or damage of the Boston Harbor Islands' most important resources and facilities by developing a locally–scaled dynamic coastal inundation model for all Boston Harbor Island shorelines. The model will incorporate coastal morphology, nearshore bathymetry, shoreline substrate types (e.g. rock, seawall, riprap, glacial till, sand, marsh mud, etc…), wave energy and boat wake patterns, and the local hydro- and sediment dynamics in order to predict areas of likely loss or gain of land, conversion of habitat types, and threshold crossings (e.g. overtopping of seawalls, inundation of inland resources, etc.). The resulting GIS map layers will illustrate zones of relative vulnerability, overlaid on the location and elevation of all of the parks fundamental resources, and visitor facilities. The results of this work will allow NPS to work with other managers in the Boston Harbor Islands Partnership to develop specific climate change adaptation initiatives aimed at preserving the most important and most vulnerable resources.

The 2015 internship will focus on collecting detailed data for input to the model, and compiling these data into a database and GIS that can be used by park managers and partnering researchers at Boston University and Northeastern University.

Likely tasks could include the following (the final intern work plan to be determined in collaboration among park lead, researchers, and selected candidate):

- Collect and collate park bathymetry, LiDAR and elevation data (including newly released 30-m resolution Shuttle Radar Topography Mission data) and help produce an updated Digital Elevation Model (DEM).
- Using the DEM, assess and classify areas that are low-lying where marshes could expand versus steeper gradients where marsh extension would be obstructed.
- Use GIS to collate existing park resource and facility spatial data, and identify data gaps.
- Create a draft database that cross-compares known positions of park resources and facilities with the new DEM to pilot the vulnerability assessment.
- Re-assess the condition of coastal structures and compared to 2006-2007 assessment (recorded in the BU-NEU Boat Wake Project GIS - PMIS 69944).
- Begin ground-truthing resource and facility spatial data using RTK-GPS system.
- Digitize existing data on sediment release from drumlin sources (Hapke 2010) and include within the project GIS.

Products

- An updated Digital Elevation Model for park.
- GIS data and maps of coastal slope, classified according to areas of vulnerability.
- A pilot GIS database of the (horizontal and) vertical position of key park infrastructure, natural and cultural resources in the Park, ground-truthed using RTK-GIS.
- GIS data and maps of bluff erosion at specific locations and associated sediment release rates.
- GIS data and maps of areas of potential marsh expansion.

QUALIFICATIONS

Substantial coursework and experience working with GIS, including ArcGIS software. Specific skills and experience will ideally include:
- Maintaining GIS files and databases; editing GIS data.
- Inputting spatial and non-spatial digital data and performing procedures to ensure the data contain limited error.
- Performing edits of digital maps in a GIS; changing/manipulating map legends, scale bars and other map elements as needed.
- Preparing and maintaining metadata that explain and document the nature, contents, and evaluation of information source of the GIS data base and GPS files.
- Collecting field data using accepted field mapping techniques (e.g. GPS, RTK-GPS).
- Managing data downloads and data correction from GPS units.
- Plotting data to meet user requirements for various kinds of displays, and making plots to check and verify data and the results of map file construction. Selecting plot contents, scales, colors, shading, lines, fonts and text.

LEADERSHIP DEVELOPMENT

The intern will have an opportunity to work closely both with an NPS supervisor (Stewardship Program Director Marc Albert) and a team of highly regarded coastal geologist technical advisors from Boston

University (Dr. Duncan FitzGerald and Dr. Zoe Hughes) and Northeastern University (Dr. Peter Rosen). This internship would provide baseline information for the most important and far–reaching park planning effort in the coming decades, and there will be an opportunity at the end of the internship for the intern to present their work to the Boston Harbor Islands Partnership (BHIP). The managers in the BHIP need to understand and be engaged with this effort to predict changes to coastal areas in response to sea-level rise (SLR) and associated coastal inundation, and then to determine management actions to adapt to the changes.

DATES OF POSITION

1 June 2015 to 31 August 2015. However, the project could run any time April - November 2015.

COMPENSATION

This initiative supports one student at $14 / hour for 12 weeks, or 480 hours.

HOUSING

There are many options for summer rentals (e.g. shared student apartments) in the Boston Area that are in close proximity to the MBTA subway system. Park offices and boat departure points are very close to numerous subway stations. Summer housing is also available at Boston University; rates, dining, and availability can be found at: http://www.bu.edu/housing/summer/rates2014/.

WORK ENVIRONMENT

The internship will include office work at park offices in downtown Boston, field work on multiple Boston Harbor Islands, and visits to geologist advisor labs and offices at Boston University. The intern will be part of a small Stewardship Program staff of approximately five who work together, along with dozens of community volunteers and research partners, on science and resource management projects throughout the lands and waters of the Boston Harbor Islands. The NPS office includes shared work space with about a dozen interpretive park rangers and visitor service assistants from the Harbor Islands, and the building is shared by many other NPS park and program staff from around the NPS Northeast Region. During the summer the waters and islands in Boston Harbor range from very busy to quiet; often boat rides and work sites will be shared with staff or visitors, but solitary field work on more isolated islands and shoreline areas will also be part of the experience.

CONTACT INFORMATION

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