

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.

Ecotonal Monitoring of the Marching Mangrove Front

South Florida / Caribbean Network
Palmetto Bay, FL

INTERNSHIP PROJECT BACKGROUND

Climate change is expected to have an acute impact on South Florida in the form of sea level rise. The Intergovernmental Panel on Climate Change (2007) estimates that global sea level will rise 0.2-0.6 meters by the year 2100. When changing glacial dynamics are added to these conservative estimates, sea level rise is predicted to be 0.8-2.0 meters by the end of the century (Pfeffer et al. 2008). This has the potential to cause immense changes in the vegetation within the two-thirds of Everglades National Park that has an elevation lower than 1 m. Increases in relative sea level are associated with mangrove inland expansion. Modeling of Everglades National Park suggests that even a small rise in sea level (15 cm) could cause upslope expansion of mangroves and loss of adjacent marshes and hammocks (Doyle et al. 2003). Given the potential for future sea level rise and reduced freshwater flows, there is significant concern about the movement of mangrove communities in South Florida.

Tracking the position of mangrove-marsh ecotones can indicate the long-term trajectory of Everglades National Park's wetlands. The transition from mangrove to freshwater marshes can be effectively monitored using a combination of aerial photography and on-the-ground data collection.

The specific objectives of the Mangrove-Marsh Ecotone Monitoring Protocol at Everglades National Park are: 1) delineating the current mangrove-marsh ecotonal boundary, 2) determining the spatial and temporal movement of the mangrove-marsh ecotonal boundary, and 3) collecting vegetation data to document what species are contributing to changes in the ecotone. This monitoring will occur using both remotely sensed imagery and field data collection.

The movement or lack of movement of the mangrove-marsh ecotonal boundary will help resource management staff understand the local-scale impacts of relative sea level rise on the hundreds of miles

of mangrove-marsh ecotones within Everglades National Park. Excessively high rates of movement of the mangrove-marsh ecotone may impact long-term park planning (e.g. whether to replace or move inland old park structures, where restoration efforts should be focused, and whether rare plant species need to be moved inland).

INTERNSHIP PROJECT DESCRIPTION

The intern will be part of a team of professional scientists that comprise the South Florida/ Caribbean Inventory and Monitoring Network (SFCN). The intern will be directly supervised by the SFCN Quantitative Ecologist who will oversee the entire project, will collaborate with the SFCN data manager for guidance on GIS skill development and GIS product evaluation, and will collaborate with the SFCN botanist for implementing the digitizing and doing field ground truthing work. The intern will undergo training as needed to become proficient at basic ARCmap geographic information system (GIS) functions such as feature creation, editing polygons, and the use of a spatially enabled personal geodatabase. The intern will then use these skills to digitize areas of the mangrove-marsh ecotone in Everglades National Park. A subset of these areas will also be digitized by a second person to evaluate training procedures and finally as a quality-control check. The intern will use the differences between the two digitizers and between the digitized line and field data points to estimate the accuracy of the lines, help write a standard operating procedure for performing the quality control check, and report the results. The intern will develop basic skills utilizing GPS data collection (Trimble) and will assist the SFCN botanist with field verification of the digitized ecotone line, entering data into a geodatabase, performing QA/QC checks, and summarizing the results. The intern will experience field work utilizing a helicopter or airboat to access remote sites.

The products will include a baseline data set of digitized mangrove-marsh ecotonal location lines for sections of Everglades National Park coupled with field vegetation data from ground-truthing locations, and housed in a spatially enabled personal geodatabase using ARCMAP (GIS) and Microsoft Access. In addition, the intern will help draft the standard operating procedure for conducting a QA/QC test of a subset of the ecotone lines and how to analyze the results. The intern will also create a summary of the differences between the digitized lines and ground-truthed locations and the relative accuracy of the digitized lines in different areas of the park that can be included in the project's data summary report.

QUALIFICATIONS

The ideal candidate will be a upper level undergraduate or a current or prospective graduate student and should have education in one of the following: biology, basic ecology, vegetation science, geography, zoology, wildlife, and an interest in climate change. Strong computer skills and proficiency in Microsoft Access and ArcMAP (or ArcGIS) are required. The ideal candidate should like working on substantial projects that involve many hours in front of a computer. Knowledge and experience with basic outdoor skills such as hiking over rocky or marshy terrain is preferred. Intern must be able to swim. Intern must be able to write well, be detail-oriented, be able to work well with a team, and be

able to complete tasks in a timely and professional manner. Intern must be have a personal vehicle as there is a 40 minute drive between park housing and the SFCN office.

LEADERSHIP DEVELOPMENT

The intern will be part of a team of professional scientists that comprise the South Florida/ Caribbean Inventory and Monitoring Network (SFCN) and will work closely with the SFCN Quantitative Ecologist, Botanist, and Data Manager. The intern will gain valuable practical skills applying technologies such as ARCMAP, MS Access, Trimble GPS units, and statistical analysis to a practical real-world problem. The intern will be developing written products as well as making verbal progress reports and will be part of the collaboration, consultation, and creative problem-solving that occurs when implementing a new protocol and determining where sources of variation can creep in and how to either minimize it through training or estimate it so change can be better evaluated in the future. Finally, the intern will also experience being part of a diverse program monitoring a range of indicators from vegetation to birds to coral in some of our nation's largest national parks. In addition to the intern's own project, there may be opportunities to assist with other monitoring efforts.

DATES OF POSITION

Start date is somewhat flexible and could be anywhere from May 1 – June 15 with earlier start dates preferred. Ending dates would depend on start date and would presumably end in August – September after the completion of 480 hours. Start dates before May 1 are possible.

COMPENSATION

This initiative supports one student at \$15/hour for 12 weeks, or 480 hours.

HOUSING

Park housing is available at Pine Island in Everglades National Park; this is a substantial distance from the SFCN office (26 miles one way- 40 min drive time - a personal vehicle is necessary). The housing is group housing, with up to 6 housemates. There are 3 rooms, so each room has 2 roommates. There is a shared kitchen. Interns will need to provide their own food and linens. Cleaning is responsibility of everyone and it is expected that shared living space and personnel spaces will be kept in a clean and orderly manner.

The nearest cities where one can buy groceries from the Pine Island housing are Florida City and Homestead which are approximate 20 minutes drive away. Both cities have a large spanish-speaking population and residents primarily either work in the agricultural industry in the surrounding area or commute to the larger Miami metropolitan area to work. Opportunities for grocery and other shopping also exist near the SFCN office in Palmetto Bay, FL.

WORK ENVIRONMENT

The majority of the work is office work. Shared office space, computers (with the most recent version of ArcMap), and web access will be provided at the SFCN office. The student will be required to acquire a Department of Interior Personal Identity Verification Credential in order to utilize and access park service computers. As the project progresses, a good amount of field work is anticipated at very remote locations within Everglades National Park. Helicopter, airboat, or walking will be used to access the sites. Interns must be able to swim. Interns will need to pass training in AT-100 - basic aviation safety training and A312 - water ditching and survival. Florida is hot, extremely humid, and buggy in the summer months and there are frequent thunderstorms. Keen appreciation of the weather, and working in hot and humid environments is a must. Hurricanes are always a possibility in South Florida. Frost is not an issue but exposure to torrential downpours can and will chill one to the bone.

CONTACT INFORMATION

Park Service Supervisor:

Dr. Andrea Atkinson

Andrea_Atkinson@nps.gov

Work: 305-252-0347, Direct: 786-249-0052, Cell: 786-512-5979

Project Advisor:

Brooke Shamblin

Brooke_Shamblin@nps.gov,

Work: 305-252-0347, Direct: 786-249-0062