

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.

Integrating Future Hydrologic Models into Transportation Management in North Cascades National Park

North Cascades National Park Service Complex
Sedro-Woolley, WA

INTERNSHIP PROJECT BACKGROUND

Climate models project average warming in the Pacific Northwest of 2.1 °C by the 2040s and 3.8 °C by the 2080s. Warmer temperatures will influence precipitation patterns in the northern Cascades by shifting many watersheds from snow to rain dominated systems. These shifts will result in more autumn/winter floods, higher peak flows, and lower summer flows. Culverts that convey streamflows under roads or trails will be at an increased risk of inundation and failure as flood extremes increase with climate change. Culvert performance affects park ecosystems (stream function, aquatic organism passage) and transportation by park visitors and park staff.

The North Cascadia Adaptation Partnership (NCAP) is a multi-agency, science-management partnership that was established to increase awareness of climate changes, assess resource vulnerabilities, and identify climate adaptation management strategies. During the NCAP access workshop, undersized culverts were identified as a vulnerable component of trail and road system infrastructures. Adaptation strategies for transportation infrastructure included replacement of undersized culverts with those capable of accommodating larger peak flows and aquatic organism passage. Two obstacles to the implementation of this strategy were identified: 1) the lack of a spatially-based, comprehensive culvert inventory and 2) lack of a geospatial database on future hydrologic stream flows.

INTERNSHIP PROJECT DESCRIPTION

Over the last year, we have worked with hydrologists at the University of Washington to improve our adaptive management of roads and trails infrastructure through science. Currently, North Cascades National Park Service Complex (NOCA) has a partial inventory of culverts, but spatial information is generally limited to wheel miles in FMSS (Facility Management Software System), which cannot be

accurately converted into a GIS layer (due to topography). FMSS inventories do not include some attributes that are needed to calculate culvert capacity or to document presence of aquatic organisms.

To remedy these problems, we worked with Dr. Erkan Istanbuluoglu and doctoral candidate Ronda Strauch to design a geospatial data base to project future streamflows, a new culvert inventory data sheet, and a new App to facilitate collection of culvert data. The YLCC Intern will “field test” these products (both field and office tools), revise them as needed, and train park staff on their use. We would also like to test the culvert inventory as a volunteer project.

The intern will work with NOCA’s Science Advisor who will assist in coordination of activities with other divisions and University of Washington. Specific tasks are:

- Become familiar with field collection app, ArcGIS database & excel spreadsheet
- Field- and office-test tools with NPS staff
- Identify any bugs with applications and needed revisions
- Write a user manual for new tools
- Explore methods to overlay fish distribution and landform GIS layers with hydrologic projections to prioritize culvert replacement
- Locate existing culvert data and upload into data base
- Field test culvert App with volunteers and evaluate if this is a viable VIP or Citizen Science project
- Work with maintenance FMSS Specialist to identify route to integrate this tool with FMSS

QUALIFICATIONS

The ideal candidate will be a current or prospective graduate student with an undergraduate degree in natural resources, geography, hydrology, civil engineering, or related field; a strong background through coursework or applied project experience in ArcGIS and database management. Specific GIS skills will ideally include: maintaining GIS files and databases, inputting spatial and non-spatial data, geospatial analysis, and developing maps from data. Ideally the Intern would have experience with Collector for ArcGIS and would be skilled in developing or revising apps and transferring data collected on apps into a GIS database. The Intern will need skills in writing and verbal communication to train others in use of the tools.

LEADERSHIP DEVELOPMENT

The Intern will work with park staff from the natural resources and maintenance staffs as well as the UW researchers. The Intern will be the park lead on testing and refining the tools that researchers have developed from downscaled climate models for use in park management of roads. In this project, she/he will have direct contact with both science and applications and learn to how to connect research and site-based management. The Intern will interface with park staff from different disciplines (fish, geology, maintenance, GIS) and different organizational levels (field technicians to park Superintendent and Division Chiefs) and gain experience in presenting program overviews to audiences with different interests and applications. The Intern will also test the field tool with park staff and volunteers to evaluate the use of this tool with volunteers.

DATES OF POSITION

The dates for the internship are flexible. Ideally the intern will work 480 hours between June 13 and Sept 2, but beginning and ending dates are flexible.

COMPENSATION

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

HOUSING

Housing is available in Marblemount in shared bunkhouse housing. Cell phones only work in some locations, wireless communication is spotty, but the scenery and recreational opportunities are unsurpassed. Marblemount is approximately 45 miles east of Interstate 5 on State Route 20 (North Cascades Scenic Highway); Newhalem is 60 miles east of I-5. Both communities are small (<350 residents) and facilities are limited (a small grocery store, gas stations, churches, community center, and a post office). About 18 miles down valley of Marblemount, the larger town of Concrete provides a larger grocery store, medical office, and specialty stores such as those selling hardware goods. Many people shop in the larger towns of Burlington, Sedro-Woolley and Mount Vernon, about an hour drive away. Closest metropolitan area is Seattle, Washington (100 miles).

The intern could also find housing independently in Sedro-Woolley or in Bellingham which is a college town about 25 miles from park headquarters.

WORK ENVIRONMENT

Office space is located in park headquarters in Sedro-Woolley which is a 45 minute commute from Marblemount. The Intern will need a personal car to travel to the office and for groceries which are also in Sedro-Woolley. Once the Intern is familiar with their work responsibilities, it may be possible to schedule some office work at Marblemount, but most specialists work at Sedro-Woolley.

The project will require some field work and a government vehicle will be furnished for this. Field work will take place in mountainous areas with steep terrain and often at high-elevations. Field work may take place in cool or wet weather and will require backcountry camping.

CONTACT INFORMATION

Park Service Supervisor:
Regina M. Rochefort, Ph.D.
regina_rochefort@nps.gov
360-854-7202