GMU-US Geological Survey's National Climate Adaptation Science Center (NCASC) Fellowship Program

Program Overview

The department of Environmental Science and Policy offers undergraduate fellowships in the Fish and Wildlife Adaptation Program with the US Geological Survey's National Climate Adaptation Science Center (NCASC). In this program, fellows learn to develop policy-informing products to manage the impacts of climate change on fish and/or wildlife resources. This program provides fellows with the opportunity to acquire professional experience outside of academia, while simultaneously advancing in their degree program.

The fellowship lasts a calendar year (comprising the spring, summer, and fall semesters semesters). During the spring and fall semesters, fellows collaborate with mentors at NCASC' headquarters in Reston, VA for 10-18 hours per week. During this time, fellows focus on the background of current issues of climate change and fish and/or wildlife resources, and learn the process by which policy-informing tools are produced at NCASC. During the summer semester, fellows work at NCASC' headquarters full-time (40 hours/week) to produce part or an entire policy-informing tool themselves. Issues focus on understanding climate change impacts to fish and wildlife. The fellowship program also includes environmental and climate policy data analytic workshops to provide students with hands-on experiences in data analysis tools, such as R or ArcGIS, etc. Each fellow will work on one project (below), working directly with the project Principal Investigator (PI) at NCASC.

Projects

Currently, NCASC is offering the following opportunities starting in the spring 2023 semester:

1. National Synthesis of Species Responses to Climate Change (Range Shifts)

Climate change represents one of the foremost drivers of ecological change, yet its documented impacts on biodiversity remain uncertain and complex. Although there have been many published studies on species shifting their geographic ranges in response to climate change, it is still challenging to identify the specific mechanisms and conditions that facilitate range shifts in some species and not in others. In addition, it can be difficult to disentangle climate-induced range shifts from other environmental changes which can also result in range shifts (such as changes to land use or habitat).

This fellowship will involve collecting and analyzing documented effects of climate change on fish and wildlife, with an emphasis on range shifts. As part of an effort to

assess the body of evidence about range shifts in response to climate change, this project will involve working with USGS staff to review peer-reviewed articles on species' range shift in response to climate change; articulate and assess hypotheses related to climate change-related range shifts in terrestrial, freshwater, and marine ecosystems; and depending on interest and project progress, participate in a journal publication process.

This project will require strong skills in statistical analysis; experience reading and interpreting scientific publications; data management; and the ability to work independently.

2. Aquatic Conservation Communications

This internship will focus on developing communication products (e.g., social media posts, website content, blog series, newsletters) in support of NCASC-facilitated aquatic conservation projects and groups, including the <u>American Fisheries Society Climate</u> <u>Change Committee</u>, the <u>international 'InFish' network</u>, and the <u>International Union for</u> <u>Conservation of Nature (IUCN) Freshwater Fish Specialist Group</u>. The intern will learn about current issues in aquatic conservation and expand his/her/their professional network through interactions with global colleagues.

3. Inland Fisheries and Climate Data Informatics

This internship will focus on supporting NCASC databases related to climate change and inland fish including the <u>Fish and Climate Change Database (FiCli)</u> and the <u>U.S. Inland</u> <u>Creel and Angler Survey Catalog (CreelCat)</u>. The intern will learn about systematic literature review approaches and tools and may have an opportunity to contribute to scientific publications.

4. Ungulates and Climate Change

Climate change is an important driver of ungulate (hoofed mammal) life-histories, population dynamics, and migratory behaviors. Changes in temperature and precipitation, and resulting shifts in plant phenology, winter severity, drought conditions, and other stressors have the potential to directly or indirectly affect ungulates. However, the ways in which ungulates are affected by changes in climate can vary by species and geography.

A database cataloguing the literature on how climate variability and change affects ungulates in North America was recently completed. This fellowship will involve using this database to segment out a portion of articles based on a particular topic, to be determined in collaboration with the supervisor (e.g., how climate affects ungulate migration, how climate affects caribou, how climate affects ungulates in the western U.S.), and conducting a synthesis of the evidence on that topic. The student will revisit the relevant articles to pull and code additional information on climate impacts, run basic summary statistics, and draft a manuscript summarizing the evidence on the selected topic.

This project will require experience reading and interpreting scientific publications, data entry and organization skills, strong writing skills, and the ability to work independently.

5. Wildlife Responses to a Changing Climate

This internship will focus on synthesizing responses of wildlife populations to a changing climate. Duties may include database searches of the scientific literature, compiling information from published studies, analysis of data, and writing up results in preparation for publication. There may also be opportunities to develop science communication products that can be used for engaging natural resource practitioners.

Compensation

- Undergraduate fellows are provided with a \$7,500 stipend per year
- Optionally, this fellowship can be applied to one or two 1-3 credit EVPP 494

Eligibility

- Active undergraduate student in either the Environmental Science or Environmental and Sustainability Studies program.
- Students may be asked work at the USGS office in Reston, VA for multiple days a week during the spring and fall semesters, and potentially up to five days during the summer semester.

Application materials:

- Letter of interest
- Current resume
- (Un)official transcripts

Application Submissions and Contact

• Dr. Younsung Kim via <u>ykih@gmu.edu</u>

Application Deadline:

• January 22, 2023 (Sunday), 11:59 pm (EST)