2019 Internship Program Description

Water Quality Instrumentation Intern

Organization: Henry's Fork Foundation

Location: Ashton, Idaho

Job Type: Paid internship through the Bill Lane Center for the American West at Stanford University

Duration: June 14, 2019 through August 22, 2019 (10 weeks)

Job Summary: The Henry's Fork Foundation (HFF) is currently accepting applications from Stanford University undergraduate students with computer programming skills who are interested in working in the science and technology program of a non-profit watershed conservation organization in the Greater Yellowstone region. The selected intern will participate in all sectors of non-profit work but will primarily continue work done by HFF staff and previous Stanford interns that incorporates cutting-edge technologies into our water-quality research and data collection. These technologies will ultimately improve existing resource management as well as public engagement with science and stewardship. Specifically, the intern will work with HFF's science and technology team to equip seven of our existing water-quality monitoring stations with hardware and software that control automated transmission and processing of the data and make it available on a web site. The intern will also collect water samples and assist with field surveys of recreational river use.

Additional Opportunities: HFF has year-round need for research assistants with strong computer science, quantitative, and communications skills. Over the years, numerous summer interns have continued working for HFF throughout the winter in various capacities, both as hourly-wage technicians and as external consultants under project-specific contracts with HFF. Most often, these interns were recent graduates who took a year away from school before starting graduate studies, and they worked

for HFF during that year. We encourage applications from students who are considering such a career path and who could bring strong scientific skills to the organization throughout the year.

Organization Overview: The Henry's Fork Foundation is a non-profit organization that works to conserve, protect, and preserve the unique fisheries, wildlife, and water resources of the Henry's Fork Watershed. HFF uses a collaborative, science-based approach to achieve its mission and works closely with water users, hydroelectric power companies, government agencies, and other nonprofit groups.

Project Description: HFF maintains a network of 11 water-quality monitoring instruments called "sondes" that record parameters such as dissolved oxygen, temperature, and turbidity every 15 minutes. The 2016 and 2017 Bill Lane Center interns designed and developed the hardware and software systems necessary to transmit data automatically from these sondes via cell modem to a central server, from which the data are uploaded and made available to the public on a website. One of the sondes was outfitted with the transmission equipment in 2017. The 2018 Stanford intern outfitted two more sondes, as well as a weather station that the intern assembled and installed at the HFF campus. The 2019 intern will install the required hardware and software at 7 sites, maintain existing hardware at 3 sites, and collect water samples for laboratory analysis to complement sonde data. In rotation with the other interns, the Bill Lane Center intern will also spend roughly one-half day each week collecting data on recreational river use.

This internship will also provide a unique opportunity for the student to work closely with HFF's science and technology team, led by Dr. Rob Van Kirk. Dr. Van Kirk has over 20 years of experience in research and management of fisheries and water resources on the Henry's Fork and throughout the Intermountain West. In addition to his position as HFF's Senior Scientist, Dr. Van Kirk is Professor Emeritus of Mathematics and Statistics at Humboldt State University. The intern will receive supervision and training in field and laboratory work from other HFF staff, including Melissa Muradian, who directed HFF's water quality program from 2015 to 2018, before relocating to Colorado with her family. Ms. Muradian holds a M.S. in Quantitative Ecology and Resource Management and brought a unique set of quantitative, programming, and creative skills to the development of instrumentation, data processing, and data management protocols. Close interaction with HFF science staff will allow the intern to learn about the role of nonprofit organizations in conducting high-level science and monitoring that is used to inform management and conservation of aquatic resources.

Specific activities and projects include, but are not limited to:

1. ***Water Quality Instrumentation:*** Continue work begun by the 2016, 2017 and 2018 Bill Lane Center interns to implement remote data transmission from water-quality instruments in the field to a server, from which it is made available on a devoted data website. This includes installing hardware in the field and programming data-logger and modem functions. The intern will install equipment at seven locations and maintain existing equipment at three other sites.
2. ***Water Quality Sampling.*** Collect and process water samples from the Henry's Fork River.
3. ***Outreach:*** Assist in preparation of scientific outreach products, including presentations, reports, papers, blogs, and social-media posts.
4. ***Summer Seminar Series:*** Participate in HFF's weekly summer seminar series, at which HFF staff, invited guests, and the interns themselves present a variety of information relevant to

HFF's conservation work. All interns are required to attend seminar, ask questions of speakers, and give a 20-minute presentation on their own work with HFF.

5. ***Henry's Fork Day:*** All interns are required to participate in "Henry's Fork Days", our main member outreach and fundraising event, on Friday and Saturday, June 21-22. Interns will help with set-up and event duties, alongside the entire HFF staff. At this event, interns will also be recognized to our membership for their internship.
6. ***Outreach/ Education:*** HFF has a youth education program that works to engage youth with their watershed and the work we do to protect it. Interns will assist, as needed, with our youth fly-fishing program "Youth on the Fly."
7. ***Additional Field Work:*** Although the Bill Lane Center intern will work primarily in the water quality program, a portion of the intern's time during the summer will be devoted to field work on other projects. In 2019, this work could include monitoring of fish passage facilities, installing fences that keep livestock away from streambanks, and collecting data on recreational river use. The recreational use survey may require occasional work on evenings and weekends.

Qualifications: We are seeking a motivated student with experience with one or more widely used programming languages and who is comfortable working outdoors, in and near water. The HFF science and technology team uses the R statistical programming language for all data processing, analysis, and modeling applications, familiarity with R is desired. In addition, skills and experience with hand and power tools, electrical wiring and circuitry, and basic construction will be useful. The successful applicant will also need to have good communication skills, be comfortable working independently and with others, have good time management skills, be physically able to work outside and on the river, and be flexible with assignments. Applicants must also be able to swim and have a valid driver's license.

Logistics: The selected intern will receive a 10-week stipend directly from the Bill Lane Center at Stanford University, through a fund established specifically to support this internship with HFF. The intern is responsible for travel to and from HFF's campus in Ashton. HFF will provide dormitory-style housing at its campus at no cost to the intern. HFF will also provide company vehicles for work-related travel, but the intern is responsible for local transportation during off-work hours.

Our Commitment to Diversity and Inclusion: The Henry's Fork Foundation values a diverse workforce of people from all backgrounds and is committed to increasing the number of traditionally under-represented groups in the environmental and natural-resources professions. Our internship program provides a unique opportunity for students from around the country to bring a diversity of ideas and experiences to our small community and to each other, thereby enriching the experience and effectiveness of the entire HFF team. We are committed to respecting this diversity of ideas and backgrounds. We strongly encourage applications from members of underrepresented groups in the natural-resource professions, including women and minorities.

Applications for this internship must be submitted to the Bill Lane Center at Stanford University

For more information on this internship, contact Dr. Rob Van Kirk at rob@henrysfork.org

To learn more about the HFF and the work we do, please explore the following links.

Henry's Fork Foundation website: henrysfork.org and HFF Blog: http://henrysfork.org/blog