2018 Internship Program Description

Software and Web Development Intern

Organization: Henry's Fork Foundation

Location: Ashton, Idaho

Job Type: Internship (Summer 2018)

Duration: June 15 through August 23 (10 weeks)

Job Summary: The Henry's Fork Foundation (HFF) is currently accepting applications from undergraduate students with strong computer programming skills who are interested in working in the research and restoration 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 regular 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 improve the speed, efficiency, and functionality of our scientific website and equip four of our already existing water-quality monitoring sites with hardware and software that 1) control automated transmission and processing of the data and 2) make that data publicly available via said website.

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 aesthetics 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 including 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. In 2017, we installed the hardware at one of the 11 sites. During 2018, the intern will have two main tasks: 1) with respect to the website, improve existing background data handling and interface design with the goal of creating a faster, more responsive, and more satisfying user experience and 2) help outfit four more field sites with the remote-transmission hardware/software. In particular, the website improvements will require the intern to identify areas of slow and inefficient handling of data in the background of our existing R Shiny web application.

This internship will also provide a unique opportunity for the student to work closely with HFF's science staff, including Dr. Rob Van Kirk and Melissa Muradian. 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. Melissa Muradian holds a M.S. in Quantitative Ecology and Resource Management and brings a unique set of quantitative, programming, and creative skills to her position as director of HFF's water-quality program, a position she has held since July of 2015. 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 Real-time Data Network:** Continue work begun by the 2016 and 2017 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, programming data-logger and modem functions, and improving functionality and speed of the existing website.
2. **Outreach:** Assist in preparation of scientific outreach products, including presentations, reports, papers, blogs, and social-media posts.
3. **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 15-16. 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.

4. ***Outreach/ Education:*** HFF has a youth education program that works to engage youth in 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."
5. ***Field Work:*** Although primary duties of the modeling intern will be to work on the automated water-quality monitoring network and website, a portion of the intern's time during the summer will be devoted to field work. In 2018, this work could include monitoring of fish passage facilities, collecting water-quality samples, maintaining the continuous-recording water-quality instruments, and installing fences that keep livestock away from streambanks.

Qualifications: We are seeking a motivated student with intermediate-to-advanced skills in programming in one or more widely used programming languages, software development, and website design, 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. However, the full chain of information flow from field instrument to web site also requires programming in HTML, CSS, and proprietary software that controls the data-transmission hardware. Experience with Program R and the Shiny package as well as electrical engineering skills/experience are desirable.

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 underrepresented 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.

For specific 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

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

Henry's Fork Foundation YouTube: https://www.youtube.com/user/HFfoundation

Henry's Fork Foundation Facebook: facebook.com/HenrysFork