Overview – In 2021 a multi-university and agency research award from NIFA AFRI was funded to UC Davis as the lead institution for an integrative research, education, and extension project that is aimed at alleviating groundwater overdraft and water quality deterioration in major aquifer systems in the southwestern US and advancing socioecological and technological innovations. The successful candidate in this postdoctoral opportunity will bring strong coding and analysis capacities to bear in supplementing all aspects of this project through developing downscaled climate datasets and climate exposure analyses with a focus on select specialty crops, irrigation management, and groundwater recharge applications.

The Challenge – Agriculture in California and across the southwestern US (SW) is an important industry, producing high-value perennial fruit and nut crops as well as vegetables, grains, forages, and fibers. At the same time, climate change is projected to stress the region’s water resources. From multi-year droughts to increased heat stress, climate change will increase water demands; simultaneously, more extreme precipitation events, decreased mountain snowpack, and a changed hydrograph will challenge water supply infrastructure. During times of surface water scarcity, irrigated agriculture leans heavily on groundwater resources. While groundwater provides a stopgap during short-term drought conditions, an over-reliance on this resource has resulted in groundwater overdraft and subsequent land subsidence in recent decades. To address water supply and quality issues, many states in the SW passed legislation that will have a significant impact on the sustainability of irrigated agriculture. For example, California’s Sustainable Groundwater Management Act (SGMA) requires water users to bring their basins into long-term balance and mitigate the impacts of excessive pumping. Practices such as agricultural managed aquifer recharge (AgMAR) and water demand reduction can be used as means to address groundwater sustainability, but integrated decision support tools are needed to better inform climate smart farm management and sustainable practice implementation in irrigated agriculture.

Position Summary - The USDA California Climate Hub and the Department of Land, Air and Water Resources at UC Davis have an opening for a Postdoctoral Fellow in downscaled climate dataset development and curation for hydrologic and cropping modeling, and agronomic metrics and agricultural vulnerability analysis with a focus on agricultural water resources. The successful candidate will work with a diverse team of researchers at USDA Climate Hubs, Agricultural Research Service, UC Davis, UC Berkeley, UC Merced, Stanford, CSU Fresno, University of Arizona, and New Mexico State University. The candidate will be hired by UC Davis Department of Land, Air and Water Resources but is expected to participate as a staff member of the USDA Climate Hub network and interact and participate with others in the Climate Hub network.

As part of the effort develop sustainable irrigated agricultural systems in the SW, the postdoc will identify climate metrics critical to irrigated agricultural production and groundwater recharge in the region and conduct downscaled climate exposure analyses with select metrics
under future climate scenarios. Drawing on exposure analyses, the postdoc will quantify the climatic vulnerability of economically-important SW crops that have high irrigation demands and/or high AgMAR potential. The postdoc will also engage with stakeholders to ensure that these evaluations are highly relevant for the communities they will serve.

The ideal candidate will possess demonstrated capacity in coding (e.g., R, Python, Matlab) and statistical modeling and the ability to integrate climate, hydrologic, and plant data to make sense of complex whole-system challenges across space and time. The successful candidate will hold a Ph.D. and have relevant expertise in a disciplinary background such as agricultural science, climate science, environmental science, hydrology, soil science, agricultural and biological engineering, spatial analysis, statistical modeling, and/or closely-related disciplines. Interdisciplinary or transdisciplinary experience is a plus. In addition, the successful candidate is expected to possess excellent written and oral communication skills, professional and interpersonal skills, and the capacity to meaningfully contribute as a part of a large interdisciplinary team. The postdoc will work with a diverse team of scientists across multiple agencies, organizations, and disciplinary backgrounds, including Dr. Steven Ostoja, director at the USDA California Climate Hub; Dr. Lauren Parker, coordinator and fellow at the USDA California Climate Hub; Dr. Isaya Kisekka, Associate Professor of Agricultural Water Management and Irrigation Engineering at UC Davis; Dr. Scott Bradford, research leader for the USDA-ARS Sustainable Agricultural Water Systems Research Unit; Dr. Emile Elias, research hydrologist and director at the USDA Southwest Climate Hub; and others.

Qualifications

● Ph.D. in agricultural science, climate science, environmental science, hydrology, soil science, agricultural and biological engineering or closely-related field.
● Proven experience in coding and/or statistical modeling, ideally with agricultural, hydrological, and/or climate-science applications.
● Experience with conducting agricultural, hydrological, and/or climate-related research as demonstrated through scientific publications.
● Excellent written and oral communication skills.
● Ability to work both independently and as part of a diverse, interdisciplinary team.

Additional Valued Skills

● An understanding of agricultural water resources management and climate change impacts to agricultural water demand and hydrology in the western US.
● Familiarity with federal and state water policy and management frameworks.
● Experience with or enthusiasm for engaging with stakeholders to identify and understand needs, resource gaps, and barriers to adopting climate-smart management practices.
● Knowledge of or experience with qualitative or mixed-methods analyses.
● The capacity to balance multiple projects and adapt to changing priorities.

Salary and Benefits:

● Salary starts at $54,540, but is commensurate with experience
● Information on postdoctoral benefits can be found at: https://hr.ucdavis.edu/employees/benefits/post-doc-scholars
Start date: Preferred start date is **Spring 2022**

**Application must include the following:**

- A cover letter introducing yourself (e.g. experience, potential research interests, and general career goals), delineate all technical skills you have that are relevant to this position.
- Either a Curriculum Vitae or Resume are acceptable, listing all technical skills.
- Copies of transcripts (unofficial acceptable)
- A list of publications and presentations – including one first authored peer review paper as a writing example.
- Contact information for three professional references whom we can contact regarding your application.

Send your completed application package as a **single PDF** to steven.ostoja@usda.gov AND leparker@ucdavis.edu with *Climate Vulnerability and AgMAR Postdoc* in the subject line by **March 4th** to receive full consideration.