

Proposal Name 7247 39 Coastal Hydrology Agriculture and Water Resilience Specialist

Project Summary This position will focus broadly on integrated water resources management and hydrologic processes in coastal areas, many that are severely water limited, including applied research for sustainable water resources management for communities, ecosystems, and high-value agriculture. The position will address unique and critical needs for coastal regions, including groundwater overdraft, saltwater intrusion, nutrient loading, land use and regional economic development, freshwater fisheries, and maritime elements of coastal agriculture, and will support efforts to meet requirements of California's Sustainable Groundwater Management Act. The Specialist will advance water education by training the next generation of leaders to understand and formulate responses to changing interactions between water supplies and societies, and collaborate and communicate with federal, state, and regional agencies, NGOs, and the public. The primary office for the Specialist will be at the UC MBEST campus in Marina.

About the Position Proposal Development

What is your title / representation to submit this proposal? Campus Leadership

Please indicate the groups that co-developed the proposal. Group type(s): for Advisor proposals - Regional Team number (1-5), REC System, Program Team(s); for Specialist proposals - which Program Team(s) the initial idea came from.

About the Proposed Position

What is the proposed headquarters? For Advisor proposals, enter UCCE county office. For Specialist proposals, enter campus acronym and name of department or center. UCSC Department of Earth and Planetary Sciences; Center for Agroecology

For Advisor proposals only: Enter the names of the county(ies) that the proposed position covers. For Specialist proposals, enter "Statewide". Statewide

Contacts

Name	Position	Affiliation
Brent Hales	Principal Investigator	Vice President-ANR

2023 UC ANR Cooperative Extension Position Template (Specialist)

Developed and proposed by: UCSC Dept. of Earth and Planetary Sciences (Andrew Fisher), Center for Agroecology (Stacy Philpott, Darryl Wong), MBEST (Lawrence Samuels), UCSB Bren School for the Environment (Kelly Caylor, Scott Jasechko), UC ANR Hansen REC (Annemiek Schilder), with support from the UC ANR California Institute for Water Resources (Erik Porse).

Position Title: UCCE Specialist in Coastal Hydrology, Agriculture, and Water Resilience

Position: This position will focus broadly on integrated water resources management and hydrologic processes in coastal areas, many that are severely water limited, including applied research for sustainable water resources management for communities, ecosystems, and high-value agriculture. The position will address unique and critical needs for coastal regions, including groundwater overdraft, saltwater intrusion, nutrient loading, land use and regional economic development, freshwater fisheries, and maritime elements of coastal agriculture, and will support efforts to meet requirements of California's Sustainable Groundwater Management Act. The Specialist will advance water education by training the next generation of leaders to understand and formulate responses to changing interactions between water supplies and societies, and collaborate and communicate with federal, state, and regional agencies, NGOs, and the public. The primary office for the Specialist will be at the UC MBEST campus in Marina.

Candidates must have a PhD in water resources or related field, a demonstrated publication record, a portfolio of work demonstrating experience in water resources research, and a record of or interest in public and stakeholder engagement and collaboration. The CE specialist is academically and administratively responsible to the ANR Vice President with input from the Chair of Earth and Planetary Sciences. UC ANR will oversee the merit and promotion process. The Specialist will lead and contribute to proposals and research projects, engage with the AES faculty and other faculty and researchers at UCSC, interact with students, deliver occasional lectures, and perform other academic functions as appropriate. The Specialist will engage with several UCSC units and off-campus collaborators, including other ANR experts in water, agriculture, and related fields.

Justification: Needs: Water is a major concern for California agriculture, and is strongly reflected in several challenge areas identified as high priorities for the ANR Strategic Visioning 2040 (e.g., water supply insecurity, persistent and increasing droughts, water use inefficiencies, water pollution and quality, a lack of infrastructure to collect, store, and convey water, as well as inequitable access to clean, safe, affordable drinking water). Water conditions and processes in coastal basins are fundamentally different from those of inland basins (lacking snowpack and major rivers and reservoirs), and thus require specific and focused research leading to practical solutions for long-term challenges. Coastal agricultural areas provide critical hydrologic services to important agricultural, municipal, economic, and environmental systems. Moreover, coastal

areas generally use a greater fraction of groundwater to satisfy water use needs that are important for industries, cities, and responding to fires. The region thus provides unique opportunities for research and provides insight into what a future California may face due to climate change, shifts in land use, and increasing water demand. Outcomes/Impact: This position will work to protect and enhance California's natural and agricultural resources through innovative research and extension activities related to improved water quality, water-use efficiency, and water-supply security, and ultimately increased ecological sustainability of agricultural landscapes in the Central Coast of California. The incumbent will work in collaboration with government agencies, non-profit and community organizations, commodity boards of regionally-important crops, and water policy organizations at all levels (local, national and global) to strengthen California's position as leader in research and education in water sustainability.

Extension: Outreach methods will include in-person and virtual meetings, educational venues, use of contemporary electronic tools such as social media, online learning formats, blogs, and standard media outlets. Extensive collaboration with other researchers, inside and outside of UC ANR and UCSC is expected. The anticipated nature of these activities include, but are not limited to, raising awareness and briefing, supporting agencies to develop and implement documented goals and requirements for water management (e.g., Groundwater Sustainability Plans, Water Use Efficiency Plans, Capital Investment and Master Plans), shaping water planning processes by hosting workshops with government agencies and nonprofit organizations (e.g., evaluating implementation of Integrated Watershed Management Plans), informing legislators and the public via high-profile media interactions. The Specialist will serve as a resource and collaborator for UCCE Advisors, county agricultural commissioners, pest control associations, government scientists, and regulatory personnel, translating applied research into local and state policies for water sustainability.

Research: The Specialist will conduct solutions-oriented, transdisciplinary research on a range of coastal water and agricultural management topics related to climate adaptation, drought management, groundwater sustainability and governance, links between water supply and quality, hydrologic system services and processes in coastal basins, corporate water stewardship, water policy, water diplomacy, the food-water-energy nexus. The Specialist will focus on unique water challenges in coastal areas that primarily depend on groundwater and have limited access to water resources from snow pack, major rivers, and large-scale water conveyance. Methods may include field and controlled plot studies, comparisons between systems across the central coast and elsewhere in California and the western U.S., development of instruments and use of drones and remote sensing data to assess water use and related processes, laboratory tests, and modeling of linked systems. The Specialist will build expertise in coastal hydrology issues unique to a wide variety of soil conditions found on the Central Coast. The Specialist may also examine soil management, and limiting erosion into adjacent waterways, estuaries, and the Monterey Bay National Marine Sanctuary. The Specialist will publish in leading journals for their field and discipline (e.g., *Journal of Water Resources Planning and Management*, *Water*

Resources Research, Water Policy, Environmental Science and Technology, Environmental Management) and in extension and outreach publications such as *California Agriculture*.

UC ANR Network: The Specialist will be a key part of building the new AES at UCSC, and in will develop collaborations with UC ANR Extension Specialists and Advisors across the Central Coast region and throughout California. The Specialist will develop strong ties to ANR Program Teams (e.g., Water Resources). At UCSC, the Specialist will interact with Earth and Planetary Sciences, Environmental Studies, and Microbiology and Environmental Toxicology Departments, and the Center for Agroecology. Beyond UCSC, the Specialist will engage with faculty and staff at the Hansen REC and the UCSB Bren School for the Environment. The Specialist will also have an opportunity to work with UC ANR's California Institute for Water Resources to build programs in coastal water and environmental management currently underserved in UC ANR. The Specialist will participate in UC and UC ANR leadership activities, through committees, task forces and other formal and informal structures.

Network External to UC ANR: The Specialist will interact with individuals at government agencies (e.g., California Department of Water Resources; State Water Resources Control Board; U.S. Geological Survey; Coastal Commission, state and federal elected officials), non-profit organizations (e.g., The Nature Conservancy; Public Policy Institute of California; Environmental Defense Fund), foundations and land trusts (e.g., Elkhorn Slough Foundation, Santa Cruz Land Trust), institutions of higher education (California State University Monterey Bay / Channel Islands, Hartnell College), and agricultural groups and farm bureaus. This will help to push knowledge, technology, and discoveries across the region, allow inter-comparison of work in different settings, and provide the basis for robust professional development.

Support: The Specialist will be provided office space at the MBEST Center and in Earth and Planetary Sciences on the main UCSC campus. Earth and Planetary Sciences will provide lab space as needed, depending on the specific research and extension activities. The Specialist will have access to the UCSC Farm, MBEST, Hansen REC, and other active farms for research trials and studies. Earth and Planetary Sciences and other UCSC Departments can provide access to a wide range of state-of-the art instrumentation and field and lab equipment, including: nutrient analyzers, chromatographs, spectrophotometers, mass spectrometers, microscopes, field vehicles and tools, and a high-performance computing network. UCSC is highly collegial, with considerable shared equipment and interdisciplinary collaboration within and across programs.

Other support: The Specialist will seek research funding from NSF, USGS, USDA, CDFR, WSARE and other federal and state funding sources. The Specialist will compete for grants in these programs, with or without on- and off-colleagues as appropriate. The Specialist will also be expected to compete for research funds available from UC ANR.

Headquarters and Coverage Area: This position will be based at UCSC, within Earth and Planetary Sciences, with an office at MBEST and access to experimental field sites on the

MBEST property. The programmatic coverage area is expected to be Coastal agricultural areas of California, with a specific regional focus on the Central Coast Region (Santa Cruz, San Benito, Monterey, San Luis Obispo, Santa Barbara and Ventura counties).