Post-Doctoral Positions
Available at the Center for Western Weather and Water Extremes (CW3E)
Part of UC San Diego's Scripps Institution of Oceanography

Location: La Jolla, CA.
Deadline: Positions are available immediately. Applications will be considered until positions are filled. Preference will be given to applications received by 1 September 2017.
Number of new positions available: 4

The Center for Western Weather and Water Extremes, (CW3E; cw3e.ucsd.edu) is a research and applications center established in 2013 at Scripps Institution of Oceanography by its Director, Dr. F. Martin Ralph. CW3E focuses on the physical understanding, observations, weather predictions, seasonal outlooks and climate projections of extreme weather and water events to support effective policies and practices to improve resilience in the Western U.S. Funding for this set of Postdoctoral positions is in place from several federal, state and local agencies, with a major emphasis on the unique science and applications needs associated with water supply and flood risk in the Western United States. CW3E carries out its goals with a diverse network of research and operational partners at more than ten other institutions across the U.S. Individuals will be joining a group of several existing Postdoctoral scholars and graduate students, and a number of experienced faculty, researchers and staff at Scripps who are involved with CW3E.

Per normal Postdoctoral appointment policies, all positions are envisioned as being initially for 1-year, with extension possible contingent upon performance and availability of funding. The University of California, San Diego is an AA/EOE.

Interested individuals are encouraged to submit their resumes and a 1-page statement of relevant personal interests, goals, range of potential start dates and at minimum two references. These should be sent to the person listed below as the "position coordinator" for the position you are interested in.

Applicants should have 0-2 years of Postdoctoral experience, or be nearing completion of their Ph.D. (estimated within 3 months), and be self-motivated and hard-working. Good written and verbal communication skills, including the ability to produce scientific publications and presentations and meet project milestones are required. Strong analytical backgrounds with a Ph.D. in atmospheric science, meteorology, atmospheric chemistry, climate science, hydrology or environmental engineering is preferred. Programming experience working in a Unix environment with experience in scripting languages such as Python, Perl, R and Matlab along with true programming language experience in C and Fortran is highly desired. Experience with using high performance computing is also desired. Successful applicants should be comfortable independently working with large code libraries and producing novel visualizations.

Position 1: Hydrometeorological Advancements for Management Decision Support
CW3E position coordinator – Dr. Brian Henn; bhenn@ucsd.edu

CW3E seeks a Postdoctoral researcher to design and contribute to efforts that lead toward improved operational application of distributed hydrologic and hydrometeorological sciences. The position would work on research that improves hydrologic model performance associated with extreme events. Anticipated methodologies include data assimilation (DA) techniques that leverage in-situ soil moisture observations and remotely sensed observations, improving hydrologic model parameterization and determining the most appropriate unbiased atmospheric forcing's for hydrologic model applications from NWP output. Additionally the candidate would develop guidelines for parsimonious application of hydrologic models in time and space and evaluation processes and metrics for hydrologic model simulations and forecasts that isolate areas of potential improvement. The research would support the development, by the candidate, of a prototype decision support system that combines a variety of observed and forecast information to aid in operational decision making. Through the research the candidate would continually develop and support a connection between CW3E and California-Nevada River Forecast Center operational forecasts systems. The candidate should have experience with hydrological model development, calibration, application, and verification. Additional experience in developing observed datasets for forcing hydrologic models and operating hydrologic and hydraulic models in a forecasting mode using NWPs or other sources is also desired.

Position 2: Aerosols Influence on Winter Precipitation
CW3E position coordinator – Dr. Amato Evan; aevan@ucsd.edu

CW3E seeks a Postdoctoral researcher to investigate the manner by which aerosols influence wintertime precipitation in the western US, with a focus on ice nuclei from marine and terrestrial sources, using high-resolution numerical modeling. The goal of this work is to improve basic understanding of aerosol-cloud interactions and their affect upon precipitation from atmospheric rivers to improve forecasts of precipitation from such events. In order to address the scientific needs of the project the postdoctoral scholar will be expected to design, implement and validate aerosol emission, transport, removal, cloud condensation and ice nuclei activation models within West-WRF, which is a version of the Weather Research and Forecast Model (WRF) that has been developed at CW3E to improve the accuracy of forecasting extreme precipitation events and as a testbed for understanding the physical processes that drive extremes in weather. These activities will be conducted in collaboration with a team of students, faculty and scientists at CW3E. The successful candidate will have the opportunity to present at conferences and will be expected to publish major results in peer-reviewed journals as first author.

Position 3: Terrestrial Water Storage
CW3E position coordinator – Dr. Julie Kalansky; jkalansky@ucsd.edu

We seek a postdoctoral researcher to investigate variability in regional terrestrial water storage, in the form of ground water and surface water including snowpack, as revealed by a growing archive of GPS near surface crustal displacements that are collected throughout California and across the United States. The GPS-inferred water storage contains variability over a range of time scales, and should relate to extreme events from synoptic scale storm activity as well as longer-term interannual variation such as produced by persistent wet and dry spells. Regionally, the high density of the GPS network may afford resolution at 10's of km scales and thus provide new insight into catchment water balances. This investigation will require synthesis and comparison with other observational data along with model simulated hydrological variability. The post-doc will use the new GPS data system for information about snow pack and ground water and relate these to weather and climate events. As part of the project, the post-doc may develop online tools for tracking this information for decision support. Support for this position will come from CW3E, in partnering with CNAP (cnap.ucsd.edu) and the Institute of Geophysics and Planetary Physics (igpp.ucsd.edu). The post-doc should be familiar with climate and hydrological phenomena in western North America.

Position 4: Mesoscale Dynamics and Predictability of ARs
CW3E position coordinator – Dr. Jason Cordeira; jcordeira@ucsd.edu

The position will explore the mesoscale dynamics and predictability of ARs affecting the western U.S. coast. The research will use a variety of observational and modeling-based tools and analysis techniques to diagnose the multiscale processes associated with persistent AR conditions culminating in extreme precipitation. The candidate should have experience forecasting extreme events from an operational or modeling perspective, and the ability to conduct in depth case studies and verification analyses. The position will involve participation in an atmospheric river airborne reconnaissance project "AR Recon" effort that is aimed at improving the 1-to-3-day skill of AR landfall forecasts. For example, the incumbent will develop methods to utilize targeting observations in order to improve prediction of mesoscale frontal waves that are key to determining position and duration errors associated with landfalling ARs. The project involves active collaboration with NCEP (GFS) and the Navy (COAMPS) to identify, analyze, and diagnose dynamical processes associated with skillful AR landfall and precipitation characteristics. The candidate should have strong knowledge of mesoscale and synoptic-scale atmospheric dynamics and forecasting techniques, including but not limited to frontal circulations, jet streaks, cyclone kinematics, multiscale precipitation processes, data assimilation, and mesoscale modeling.