

Post-Doctoral Researcher  
Hurrell and Rasmussen Research Teams  
Department of Atmospheric Science  
Colorado State University

**Work unit description:**

The Department of Atmospheric Science is a large academic and research department in the Walter J. Scott College of Engineering at Colorado State University. We currently have twenty-three faculty members, eighty graduate students, over seventy full-time researchers and postdoctoral fellows, and an outstanding and dedicated support staff, that comprise one of the most research-active units at the university. The department conducts more than \$14M in externally sponsored research each year and is nationally ranked near the top of its field.

The [Hurrell Research Group](#) and the [Rasmussen Research Group](#) are comprised of highly motivated researchers passionate about mesoscale meteorology, climate variability and change, research questions at the weather-climate interface, and the data analysis tools used to understand them. Areas of active research include cloud and mesoscale processes, high-resolution regional climate modeling, earth system predictability, climate dynamics, climate change and sustainability, and climate intervention.

**Position summary:**

The postdoctoral scientist will be working with the Hurrell and Rasmussen research teams to conduct independent and collaborative research in the exciting and new interdisciplinary area of how climate variability and change influence mesoscale weather systems, including proposed climate intervention strategies. This will include observational analyses and modeling studies assessing the future risk of extreme weather events, and how these events might be impacted by proposed climate intervention strategies. The postdoctoral scientist will also interact with and support graduate students and early career researchers, especially from the Hurrell and Rasmussen groups, but also other research groups across the Atmospheric Science Department. The position will help define the research and development direction of the Hurrell and Rasmussen research groups in the area of climate-mesoscale interactions, as well as participate in opportunities to apply atmospheric expertise to research efforts in other disciplines across and beyond the CSU campus.

Expected results for this position will be new insights into processes that determine how weather systems are affected by climate variability and climate change, and how climate change signals might be modified by climate intervention, in addition to producing new publications and research methods.

This position will report directly to Prof. James Hurrell and Prof. Kristen Rasmussen and will be a part of a vibrant community of researchers both within the Hurrell and Rasmussen Groups, the Atmospheric Science Department, Colorado State University, and other funded collaborators.

## **Essential job duties:**

### 1. Research and analysis:

This position will be responsible for the following duties as part of the research and analysis function:

- Serve as a prominent researcher within the Hurrell and Rasmussen groups by conducting ongoing, substantive scientific research on the understanding of how climate variability and change impact mesoscale weather systems, and publish results in leading journals.
- Provide skill in assessing the potential impacts of climate intervention on climate, mesoscale weather systems, and their interactions.
- Generate statistics and complex calculations of weather and climate diagnostics to determine underlying processes.
- Provide skill in the analysis of large observational and model data sets.
- Develop solutions to complex problems, understand the results and recommend research strategies.
- Solve research questions by incorporating relevant new ideas, techniques and developments.
- Provide skill running and analyzing model simulations, especially with the Weather Research Forecasting (WRF) model.
- Apply automated algorithm to identify specific mesoscale storm modes in WRF simulations and connect to large-scale climate processes.
- Interact with graduate students, and support the research of those in the Hurrell and Rasmussen groups.

The postdoctoral scientist must have a record of conducting high-quality independent and collaborative research in mesoscale meteorology, with a basic knowledge of the physical processes and mechanisms of the dynamically coupled climate system. As such, this position will develop and evaluate data sets and combine observational and model data in empirical and diagnostic studies of how climate processes affect mesoscale weather systems. Experience in running and analyzing weather models is required; in particular, the WRF. The postdoctoral scientist must also have a desire to work with graduate students in a team setting. This will include mentoring, as appropriate, and help in processing and analyzing weather and climate data.

Percentage of time:

- Conduct original and collaborative research – 65%
- Interact with and support graduate students – 10%
- Set up and run model experiments – 5%

## 2. Publication/Presentation of research results:

The postdoctoral scientist position will be expected to communicate the results of personal and group scientific research at national and international scientific meetings, at university seminars, in the refereed literature, and contribute to the preparation of proposals and project reports. The individual, hired into this position, will also attend and participate in departmental seminars, as well as other workshops and conferences. Finally, this position will review proposals and research papers for agencies and journals.

- Publication and presentation of results – 10%
- Support new research proposals and project reports – 2%
- Review proposals and papers – 3%

## 3. Career preparation and advancement

The postdoctoral researcher will have the opportunity to actively develop and plan for their career, via additional service and mentoring opportunities. Professional development opportunities will be provided to the postdoctoral researcher by Profs. Hurrell and Rasmussen at their group meetings and individually based on their career plans and goals.

- Career planning and development – 5%

### **Decision making responsibilities:**

The postdoctoral research scientist must have independent decision making and problem-solving skills. These include the ability to:

- Develop solutions to complex problems in the evaluation of model and observational data sets.
- Understand results and recommend research strategies.
- Solve research questions by incorporating relevant new ideas, techniques and developments.
- Develop, monitor and coordinate progress of research projects, and provide scientific and technical guidance.
- Identify potential problems, issues and conflicts, and participate in their resolution.
- Select research results for publication and presentation at national and international conferences and workshops.
- Help develop appropriate mechanisms for disseminating research results to the broader community, possibly including the press as well.
- Mentor and advise graduate students working in weather and climate dynamics.

### **Number of employees that this position will supervise:**

This position will not directly supervise other CSU employees, but will mentor graduate students and possibly summer interns.

**Required job qualifications:**

- Ph.D. in atmospheric, climate, or Earth system science.
- Experience as an independent research scientist in mesoscale meteorology, with knowledge of the climate system and climate processes.
- Demonstrated experience working with large, scientific computer programs including weather models.
- Demonstrated experience in analyzing complex data sets.
- Demonstrated experience analyzing weather events, perhaps including extreme weather and compound events.
- Demonstrated experience writing and publishing scientific results.
- Strong oral and written communication skills.
- Publication record commensurate with experience.

**Preferred qualifications:**

- Prior research experience using the Weather Research and Forecasting (WRF) model.
- Research experience analyzing climate model output.
- Experience with research in solar climate intervention.

**Justification of need:**

Prof. Hurrell and Prof. Rasmussen are seeking an individual who has well established research credentials in mesoscale meteorology, and who has demonstrated experience with the tools, data sets and methods necessary to examine how climate processes affect weather systems. They are seeking an individual who not only has a record of pursuing individual research, but one that values collaboration, works well in a group setting, and desires to mentor and help advise graduate students.

**Classification title:**

Postdoctoral Fellow

**Desired start date:**

June 2023 or earlier

To apply to this position electronically, please visit: <https://jobs.colostate.edu/postings/108142>

Colorado State University is an EO/EA/AA employer and conducts background checks on all final candidates.