

The Atmospheric Sciences and Global Change Division at Pacific Northwest National Laboratory (PNNL) is recruiting a research scientist and three postdoctoral scientists to conduct innovative research in climate modeling of the water cycle.

Resources:

Atmospheric Sciences and Global Change Division: <http://www.pnnl.gov/atmospheric/>
Department of Energy Water Cycle and Climate Extremes Modeling (WACCEM)
project: <https://climatemodeling.science.energy.gov/projects/water-cycle-and-climate-extremes-modeling>

Department of Energy Exascale Computing Project (ECP):
<https://www.hpcwire.com/2016/09/07/exascale-computing-project-awards-39-8m-22-projects/>

1. Research Scientist – Modeling Water Cycle and Climate Extremes

PNNL is recruiting a research scientist to advance modeling and understanding of water cycle and climate extremes, particularly related to convection, cloud, and precipitation and their interactions with the large-scale circulation. The successful candidate will conduct research to advance a non-hydrostatic global variable resolution modeling framework for multi-resolution simulations through development/evaluation of parameterizations and improvement/analysis of the physics-dynamics coupling in the modeling framework. The candidate will work with a team of PNNL scientists to design, perform, and analyze hierarchical modeling experiments to investigate how water cycle and climate extremes respond to warming in the future. Specific topics of climate extremes that expand and complement existing PNNL research in the Department of Energy funded WACCEM project include atmospheric rivers, temperature and precipitation extremes, and floods and droughts.

Qualifications: A Ph.D. degree in atmospheric sciences or related fields. Expertise in modeling or process understanding of cloud and convection or related processes such as boundary layer turbulence and land-atmosphere interactions as well as experience with high performance computing will be considered favorably during the evaluation.

Applications should include:

- Cover letter describing the applicant's research experience and interests.
- Curriculum vitae with a list of publications in refereed journals.
- Names and addresses of three references.

Interested candidates may send further inquiries to Ruby Leung (Ruby.Leung@pnnl.gov).

To apply, please visit <http://jobs.pnnl.gov> and search for job ID 305976.

2. Postdoctoral Scientist – Modeling Mesoscale Organized Convection and its Response to Global Warming

Mesoscale organized convection is a major cause of flooding in many regions worldwide. Representing organized convection has been one of the foremost challenges in climate modeling, which limits our ability to simulate the water cycle and its future changes. The selected candidate will work with a team of PNNL scientists on advancing modeling and understanding of mesoscale organized convection. In particular, the candidate will evaluate a non-hydrostatic global variable resolution modeling framework at spatial resolution ranging from about 4km to 50km for its ability to simulate organized convection and related processes. Combining with data analysis, the model will be used to study and contrast the different convection types and the role of land-atmosphere interactions on convection in the U.S. Great Plains and the Amazon. The model will also be used to investigate how the structure of mesoscale organized convection and the associated extreme precipitation may change in a warmer climate. These efforts are part of a larger project Department of Energy funded project (WACCCEM) aiming at understanding how large-scale circulation features modulate regional precipitation, what controls mesoscale organized convection and the associated precipitation, and the multiscale connections between atmospheric circulation and water cycle processes, all in the context of the changing climate. The position is for two years and renewable contingent upon performance.

Qualifications: A Ph.D. degree in atmospheric sciences or related fields. Expertise in using data and models to study convection or related processes such as clouds, boundary layer turbulence, and land-atmosphere interactions as well as experience with high performance computing will be considered favorably during the evaluation.

Applications should include:

- Cover letter describing the applicant's research experience and interests.
- Curriculum vitae with a list of publications in refereed journals.
- Names and addresses of three references.

Interested candidates may send further inquiries to Ruby Leung (Ruby.Leung@pnnl.gov).

To apply, please visit <http://jobs.pnnl.gov> and search for job ID 305988.

3. Postdoctoral Scientist – Advancing a Multiscale Modeling Framework (MMF)

PNNL is recruiting a postdoctoral scientist to improve modeling of water cycle processes using a multiscale modeling framework (MMF) that integrates a cloud-resolving model (CRM) into the U.S. Department of Energy Accelerated Climate Modeling for Energy (ACME) Earth System model. Research will be conducted to evaluate different MMF configurations with a two- or three-dimensional CRM embedded in an atmospheric model with grid resolution ranging from 100km to 25km. Research will also be conducted to evaluate several subgrid-scale parameterizations including subgrid momentum transport in the CRM, which have important effects on boundary layer clouds

and shallow convection, with subsequent impacts on deep convection and organized convection. Combining systematic evaluation of different CRM configurations embedded in the ACME high resolution atmosphere, and exploring physics representations including boundary layer turbulence and land-atmosphere interactions, the successful candidate will work with PNNL scientists and contribute to optimizing the MMF for ACME simulations of water cycle processes, as part of a Department of Energy funded Exascale Computing Project (ECP).

Qualifications: A Ph.D. degree in atmospheric sciences or related fields. Expertise in modeling cloud and boundary layer turbulence and experience in atmospheric modeling, particularly using MMF, and high performance computing will be considered favorably during the evaluation.

Applications should include:

- Cover letter describing the applicant's research experience and interests.
- Curriculum vitae with a list of publications in refereed journals.
- Names and addresses of three references.

Interested candidates may send further inquiries to Ruby Leung (Ruby.Leung@pnnl.gov).

To apply, please visit <http://jobs.pnnl.gov> and search for job ID 305989.

4. Postdoctoral Scientist – Modeling Regional Climate Change and Impacts

PNNL is recruiting a postdoctoral scientist to develop, evaluate, and analyze high-resolution climate scenarios using regional climate models and global variable resolution models for advancing understanding of regional climate change and facilitating modeling and analysis of climate change impacts. The successful candidate is also expected to conduct research to improve the methodology for developing high-resolution climate scenarios, and to develop diagnostics and metrics to understand, quantify, and compare model skills. Working with PNNL scientists, the candidate will contribute to the development of a hierarchical model evaluation framework for assessing climate simulations relevant to the energy-water-land nexus.

Qualifications: A Ph.D. degree in atmospheric sciences or related fields. Experience in climate modeling, dynamical downscaling, and analysis of observations and model outputs will be considered favorably during the evaluation.

Applications should include:

- Cover letter describing the applicant's research experience and interests.
- Curriculum vitae with a list of publications in refereed journals.
- Names and addresses of three references.

Interested candidates may send further inquiries to Ruby Leung
(Ruby.Leung@pnnl.gov).

To apply, please visit <http://jobs.pnnl.gov> and search for job ID 305987.