

Pramod Adhikari, Ph.D.

Postdoctoral Researcher | Atmospheric & Climate Science
Department of Atmospheric Science, University of Wyoming

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🌐 <https://pramodadhikari.github.io/>

EDUCATION

Ph.D. (Atmospheric Science) University of Nevada, Reno, USA 2018-2022

- Dissertation: “*Aerosol-cloud-precipitation interaction based on remote sensing and cloud-resolving modeling over the Central Himalayas*”
- Advisor: Dr. John F. Mejia, Associate Research Professor

MS (Atmospheric Science) University of Nevada, Reno, USA 2015-2017

- MS Thesis: “*Assessment of wind regime and sediment transport activity at Oceano Dunes, California*”

MSc. (Physics) Central Department of Physics, Tribhuvan University, Nepal 2011-2015

- MSc. Thesis: “*Numerical reconstruction of early monsoon weather situation over Arun valley of eastern Nepal Himalaya*”

BSc. (Physics) St. Xavier’s College, Tribhuvan University, Nepal 2007-2010

KEY SKILLS

Regional Climate Modeling

WRF & WRF-Chem

Expertise in configuring, modifying, and executing WRF and WRF-Chem simulations for regional climate and air quality applications at fine spatial (~1km) and temporal scales (~15 minutes).

Climate Data Analysis

Observational, Reanalysis, CMIP6, LENS2

Proficient in collecting, processing, and analyzing regional and global climate model large datasets, with a focus on hydroclimate extremes and climate change impacts across mountainous terrains.

Gridded Data Processing (NetCDF, HDF, GRIB, tiff)

xarray, numpy, scipy, pandas, matplotlib

Skilled in handling and visualizing large-scale spatial and temporal datasets using Python-based tools to generate diagnostics and publication-quality figures.

High-Performance Computing

Derecho, Casper (NCAR)

Extensive experience with supercomputing environments, including parallel processing, PBS job scripting, and data workflow optimization on NCAR systems.

Scientific Programming

Python, R, FORTRAN

Strong programming background for data analysis, modeling, and workflow automation. Daily user of Jupyter Notebooks and well-versed in modular, reproducible code design.

Linux/Unix Environments

Shell Scripting & System Tools

Proficient in Linux-based computing including shell scripting, software environment management, and system-level troubleshooting for research workflows.

Collaborative Research

Team-Oriented Research

Experienced in managing and contributing to interdisciplinary projects with scalable and reproducible workflows, resulting in peer-reviewed publications.

PUBLICATIONS

1. Geerts, B. and **Adhikari, P.**, (2025) Comment on “Great Expectations: A Review of the Colorado River Basin 2 Pilot Project—The Nation’s Most Expensive Randomized Orographic 3 Cloud-Seeding Experiment”. *Weather, Climate and Society by AMS* (Under Review).
2. **Adhikari, P.**, Geerts, B., Rahimi-Esfarjani, S., Shuman, B. N., Smith, K., and Day, K. (2025). Global Warming Induced Changes in Extreme Precipitation in the Western United States: Projections from Dynamically Downscaled CMIP6 GCMs. *Geophysical Research Letters* (Accepted)
3. Chang, C., Mejia J. F., Henao J. J., and **Adhikari P.**, (2025) Impacts of Wildfire Smoke on Stratocumulus Clouds and Their Diurnal Cycle Using WRF-Chem Modeling, *Journal of Geophysical Research: Atmospheres* (under review)
4. Smith K., Geerts, B., Adhikari, P., Day K., Rahimi S., Shuman B., and Schneider T. (2025) Evaluation of CONUS404 cold-season precipitation and snowpack over the mountainous western United States (in preparation)
5. Day K., Smith K., Geerts, B., Adhikari, P., Rahimi S. (2025) Uncertainties in Snow Measurements over Mountains in the Interior Western US through a geographical analysis (in preparation)
6. **Adhikari, P.**, Geerts, B., Tessendorf S., Xue, L., and Schneider, T. L. (2025). Climatology of cold season supercooled liquid water and glaciogenic cloud seeding potential in the western United States, according to a 4 km resolution climate reconstruction. *Journal of Applied Meteorology and Climatology*. <https://doi.org/10.1175/JAMC-D-24-0246.1>
7. **Adhikari, P.**, Geerts, B., Rahimi-Esfarjani, S., Smith, K., Shuman, B. N., & Schneider, T. L. (2024). Evaluation of the mountain hydroclimate across the western United States in dynamically downscaled climate models. *Journal of Hydrometeorology*, 25(12), 1877-1894. <https://doi.org/10.1175/JHM-D-24-0063.1>
8. **Adhikari, P.**, Mejia, J. F. (2023). Aerosol–precipitation elevation dependence over the central Himalayas using cloud-resolving WRF-Chem numerical modeling. *Atmospheric Chemistry and Physics*, 23, 1019-1042. <https://doi.org/10.5194/acp-23-1019-2023>
9. **Adhikari, P.**, & Mejia, J. F. (2022). Impact of transported dust aerosols on precipitation over the Nepal Himalayas using convection-permitting WRF-Chem simulation. *Atmospheric Environment: X*, 100179. <https://doi.org/10.1016/j.aeaoa.2022.100179>
10. **Adhikari, P.**, Mejia, J. F. (2021). Influence of aerosols on clouds, precipitation and freezing level height over the foothills of the Himalayas during the Indian summer monsoon. *Climate Dynamics* 57, 395–413. <https://doi.org/10.1007/s00382-021-05710-2>

PROFESSIONAL EXPERIENCE

1. **Postdoctoral Researcher**, *Supervised by Dr. Bart Geerts*
Project: Wyoming Anticipating Climate Transitions (WyACT)
University of Wyoming | *January 2023- present*
 - Utilize high-resolution regional climate models to **dynamically downscale global climate simulations**, enhancing predictive understanding of climate change impacts on water availability and human-environment systems in the Interior Western U.S.

- Conduct **retrospective evaluations of downscaled GCMs** at 9 km resolution to assess performance and applicability for regional and local climate impact studies.
 - Collaborate with **NCAR scientists** to implement **fine-scale (~1 km) simulations**, manage computational workflows, and process large-scale climate datasets.
 - Assess and project **probabilities of extreme events** (using Generalized Extreme Value distribution) under various **global warming levels (GWLs)** using dynamically downscaled CMIP6 data.
 - Contribute to **public-facing climate data portal** (<https://wyadapt.org/>) to disseminate regional climate projections, focusing on precipitation shifts, water availability, and extreme weather events.
 - Contribute to the **Snake River Headwaters Futures Assessment** by modeling and analyzing **future local-scale climate scenarios** and their implications for water resource planning.
 - **Mentor undergraduate and graduate students**, guiding them in climate data analysis, modeling workflows, and research methodologies.
2. **Postdoctoral Researcher, Supervised by Dr. Nancy Chanover**
New Mexico State University | *August 2022- January 2023*
 - NASA's Planetary Data System: The Planetary Atmospheres Node at the Department of Astronomy
 - Work as part of a team of scientists developing a planetary data system-equivalent archive of atmospheric modeling output through a Atmospheric Modeling Annex.
 3. **Graduate Research Assistant (PhD), Desert Research Institute, Reno | 2018- 2022**
 - Handle and analyze long-term and large gridded datasets from satellite and reanalysis product
 - Lead the project and apply for the funding and computational resources
 - Design model experiments and run cloud-resolving WRF-Chem simulations in a high-performance computing environment
 - Prepared various anthropogenic, biogenic, fire emission, and initial/boundary condition datasets to be used for WRF-Chem
 - Analyze data from the simulation, compile results and prepare a manuscript for publications
 4. **Graduate Teaching Assistant, University of Nevada, Reno | 2018-2022**
 - Teach physics laboratory and recitations for undergraduate students majoring in physical sciences, engineers, and non-physical sciences
 - Design syllabus, deliver lectures, conduct a discussion on physics problems, and run lab assignments
 - Ensure a positive learning environment as reflected in course evaluation
 5. **Graduate Research Assistant (M.S.), Desert Research Institute, Reno | 2015-2017**
 - Compiled, validated, and analyzed multi-year datasets to identify the sand transport events over the Oceano Dunes, California
 - Analyzed long-term wind speed data to infer the sand transport potential

CONFERENCE PROCEEDINGS

1. **Adhikari, P., et al., (2025)** Predicting weather extremes and water resources in the climate transition: a focus on the Western United States American Meteorological Society Annual Meeting, 2025.
2. **Adhikari, P., et al., (2024)** Changes in wet and dry extremes in a dynamically downscaled datasets, American Geophysical Union Fall Meeting, 2024.

- Geerts, B., Albeke, S., Rahimi, S., Shuman, B., Adhikari, P., Williams D., Knapp, C., Bukovsky, M. (2023) Communicating quantitative climate change information to stakeholders and the public: opportunities and challenges of a regional web portal: a case study for Wyoming, AGU Fall Meeting Abstracts
- Adhikari, P.**, et al., (2023) Elevation-dependence evaluation of historical bias-corrected dynamically downscaled GCMs across the western U.S., American Geophysical Union Fall Meeting, 2023.
- Adhikari, P.**, Mejia, J. F. (2022). Impact of dust aerosols on the convective system using cloud-resolving WRF-Chem simulation over the Nepal Himalayas, American Meteorological Society Annual Meeting, 2022.
- Adhikari, P.**, Mejia, J. F. (2020). Impact of transported dust aerosols on precipitation over the central Himalayas using convection permitting WRF-Chem Simulation, American Geophysical Union Fall Meeting.
- Adhikari, P.**, Mejia, J. F. (2019). Influence of aerosols on precipitation and vertical temperature distribution over the foothills of Himalayas during the Indian summer monsoon, AGU Fall Meeting: San Francisco, CA, December 9-13, 2019.

MEDIA COVERAGE

- The Kathmandu Post, **Kathmandu, Nepal**, May 10th, 2021: Air pollution not only impacts health, but can also trigger floods and landslides, study finds (<https://kathmandupost.com/climate-environment/2021/05/09/air-pollution-not-only-impacts-health-but-can-also-trigger-floods-and-landslides-study-finds>)
- Air Quality News, **United Kingdom**, May 10th, 2021: Air pollution could trigger flooding, study suggests (<https://airqualitynews.com/2021/05/10/air-pollution-could-trigger-flooding-study-suggests/>)

HONORS AND AWARDS

- Colin Warden Memorial Endowment*, **Outstanding graduate student researcher**, Desert Research Institute, Reno, Nevada 2021
- Graduate Student Association travel award*, University of Nevada, Reno 2018/2019/2022
- Charles Francis Cutts scholarship award*, University of Nevada, Reno 2017-2018
- International graduate student scholarship award*, University of Nevada, Reno 2016-2017
- M.Sc. Fellowship*, Central Department of Physics, Tribhuvan University, Nepal 2011-2013

JOURNAL REVIEWER

- Urban Science- MDPI, Atmospheric Research – Science Direct (Elsevier)

FUNDING

- Computational allocation in NCAR-Wyoming Supercomputing Center (Derecho and Cheyenne)
- Institute Project Assignment fund by Desert Research Institute

TRAINING AND WORKSHOPS

- Introduction to the Community WRF-Hydro Modeling System: Interactive Hands-on Tutorial (February 2022)
- Teaching with Technology Course (January-May 2019)

- NCAR Command Language (NCL) and Visualization and Analysis Platform (VAPOR) workshop, (July 2018)
- NASA ARSET applied remote sensing webinar training on “Overview of the Global Disaster Alert and Coordination System” (February 2017)

Field Measurement

- Measurement of threshold shear stress and transport conditions at White Sand Dunes, New Mexico (March 6-11, 2017)
- Wind energy assessment around Kathmandu Valley, Nepal, using SODAR (April to June 2014)

PROFESSIONAL ASSOCIATIONS

- Member, American Geophysical Union
- Member, American Meteorological Society