Pramod Adhikari, Ph.D.

Postdoctoral Researcher | Atmospheric & Climate Science
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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 physics-based dynamical downscaling using WRF and WRF-Chem simulations for regional climate at fine spatial (~1km) and temporal scales (~5 minutes to climate scale).

Climate Data Analysis
Observational (station and satellite), 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-Wyoming supercomputer)
Extensive experience with supercomputing environments, including parallel processing, PBS job scripting, and data workflow optimization.

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. **Adhikari, P.,** Geerts, B., Rahimi-Esfarjani, S., Xue, L., Rasmussen, K., Dudhia, J., (2026), RM1.3: A 1.33 km Long-term Climate Reanalysis over the Rocky Mountain Region. *Geoscientific Model Development* (in preparation)
2. Geerts, B. and **Adhikari, P.**, (2026) 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).
3. Smith K., Geerts, B., Adhikari, P., Day K., Rahimi S., Shuman B., Xue L., and Schneider T. (2026) Evaluation of CONUS404 cold-season precipitation and snowpack over the mountainous western United States. *Journal of Hydrometeorology* (under review)
4. Day K., Smith K., Geerts, B., Adhikari, P., Rahimi S. (2026) Uncertainties in Snow Measurements over Mountains in the Interior Western US through a geographical analysis (in preparation)
5. **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* https://doi.org/10.1029/2025GL116113
6. 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* https://doi.org/10.1029/2024JD042405
7. **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
8. **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
9. **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
10. **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
11. **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**
   University of Wyoming | *January 2023- present*
   - Run high spatial and temporal resolution **(70+ years at 1.3 km) mesoscale models (WRF)**, manage computational workflows, and process and manage large-scale climate datasets (~1PB).
   - 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 performance assessments of downscaled GCMs to establish reliability for local and regional climate impact studies.
   - Assess and project **probabilities of extreme events** (using Generalized Extreme Value distribution) under various **global warming levels** using ensembles of dynamically downscaled CMIP6 data (25 members at 9 km resolution).
   - Contribute modeling and analyses to decision-support tools, including the **WyACT Climate Portal (wyadapt.org)** and the contributing author to **Snake River Headwaters Futures Assessment** (*in preparation*), informing water resource and adaptation planning.
   - **Mentor undergraduate and graduate students**, guiding them in climate data analysis, modeling workflows, and research methodologies.

2. **Postdoctoral Researcher**
   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 an 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
   - Analyze the data from various sources, e.g., Satellite (e.g., MODIS, CALIPSO, GPM), stations (weather and meteorological stations, AERONET stations), reanalysis (ERA-Interim, ERA5), etc.

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 the 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) Long-term hydroclimate modeling at 1.33 km resolution over the Rocky Mountains: development and initial results from RM1.3, AGU Fall meeting, 2025.
2. **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.
3. **Adhikari, P.,** et al., (2024) Changes in wet and dry extremes in a dynamically downscaled datasets, American Geophysical Union Fall Meeting, 2024.
4. 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
5. **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.
6. **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.
7. **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.
8. **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.

CERTIFICATIONS

1. *Neural Networks and Deep Learning* | June 2025
   - An online non-credit course authorized by DeepLearning.AI and offered through Coursera
2. *Google Advanced Data Analytics* | March *2024*
   - An online non-credit course authorized Google and offered through Coursera

OUTREACH

1. Journal Reviewer: Urban Science- MDPI, Atmospheric Research – Science Direct (Elsevier)
2. Participated in the AGU Science Policy Workshop and Congressional Visit Day (GeoCVD-2025), advocating for sustained federal support of geoscience research and science funding
3. 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)
4. 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

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

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