

Christopher L. Hancock, PhD (he/him) | Curriculum Vitae

Postdoctoral Scholar, Rice University

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Research Interests

I am a climate and data scientist using information from observational networks, paleoclimate archives, and climate model simulations to reconstruct and project the impacts of global climate change on regional hydroclimate variability. To do this, I develop and manage large datasets and utilize analytical techniques such as timeseries analysis, geospatial statistics, and data assimilation. These results provide insight into modern climate dynamics and the impacts of current climate change on the global hydrological cycle.

Education

Northern Arizona University — PhD Earth Science & Environmental Sustainability 2020 – 2024

Dissertation: *Reconstructing past climate change since the Last Glacial Maximum using paleoclimate proxies, model simulations and data assimilation*

Advisor: Dr. Nick McKay

University of Denver — MA Geography 2018 – 2020

Thesis: *Spatial and temporal controls on streamflow variability in the San Juan Mountains, CO*

Advisor: Dr. J. Michael Daniels

George Washington University — BS Geological Sciences 2010 – 2014

Minors in Geography and Geographical Information Science

Advisor: Dr. Richard Tollo

Professional Experience

Postdoctoral Researcher — Rice University Sep. 2024 – present

The Climate & Water Lab (Advisor: Dr. Sylvia Dee), Houston, AZ

Research Assistant — Northern Arizona University Aug. 2020 – Aug. 2024

PaleoDynamics Lab (Advisor: Dr. Nick McKay), Flagstaff, AZ

Raw Water Operations Intern — Denver Water May 2019 – Aug. 2019

Water Resources Strategy Section, Denver, CO

Support Technician II — Michael Baker International Jan. 2015 – July 2018

National Flood Insurance Program Contract (FEMA), Alexandria, VA

University Research Aide — George Washington University Mar. 2014 – Aug. 2014

Geology Department (Advisor: Dr. Richard Tollo), Washington, DC

Student Trainee — U.S. Geological Survey June 2013 – Aug. 2013

Appalachian Blue Ridge Project, Reston, VA

Teaching Experience (Instructor of Record)

Northern Arizona University ENV 115 – Climate Change

Summer 2022

Teaching Experience (Teaching Assistant)

Northern Arizona University	GLG 112L – Geological Disasters Lab	Spring 2022
	ENV 490C – Senior Seminar in Environmental Sciences	Spring 2022
	ENV 259L – Geomorphology Lab	Fall 2021
	ENV 181 – Environmental Sustainability	Fall 2021
University of Denver	GEOG 1201, 1202, 1203 – Environmental Systems Lab	Fall 2019, Winter 2020, Spring 2020, Summer 2020
George Washington University	GLG 1002 – Historical Geology Lab	Spring 2014
	GLG 1005 – Environmental Geology Lab	Fall 2013

Publications (In Review)

- Hancock, C. L.**, Dee S. G., Haider, M. R., Murphy, K., Doss-Gollin, J., Lehner, F., Muñoz, S. E. (in review). Robust 21st century hydrological trends in the Mississippi River basin from CMIP6: west-gets-drier, east-gets-wetter, *Journal of Climate*.
- Hancock, C. L.**, McKay, N. P., Erb, M. P., Kaufman, D. S., Thomas, E. K. (in review). Arctic warming during the past century was more widespread than the largest millennial-scale events following the Last Glacial Maximum, *PNAS*.
- Murphy, K., Dee, S. G., **Hancock, C. L.**, Emilia, P., Doss-Gollin, J., Wallace, E., Muñoz, S. E. (in review). Bermuda High and Great Plains low-level jet drive interannual changes in Mississippi River basin hydroclimate from Last Millennium to 2100, *JGR: Atmospheres*.
- Mark, S. Z., Gaglioti, B. G., Thomas, E. K., Mann, D. H., Otiniano, G. A., **Hancock, C. L.**, McKay, N. P. (in review). Evidence from the last deglaciation reveals constraints on the permafrost-carbon feedback, *Nature Communications*.

Publications (Peer Reviewed)

- Hancock, C. L.**, Erb, M. P., McKay, N. P., Dee, S. G., and Ivanovic, R. F. (2023). A global Data Assimilation of Moisture Patterns from 21 000–0 BP (DAMP-21ka) using lake level proxy records, *Climate of the Past*, 20, 2663–2684. <https://doi.org/10.5194/cp-20-2663-2024>
- McKay, N. P., Kaufman, D. K., Arcusa, S., Kolus, H., Edge, D., Erb, M. P., **Hancock, C. L.**, Routson, C. R., Żarczyński, M., Marshall, L. P., Roberts, G., Telles, F. (2024). The 4.2 ka event is not remarkable in the context of Holocene climate variability. *Nature Communications*, 15, 6555. <https://doi.org/10.1038/s41467-024-50886-w>
- Hancock, C. L.**, McKay, N. P., Erb, M. P., Kaufman, D. S., Routson, C. R., Ivanovic, R. F., Gregoire, L. J., and Valdes, P. (2023). Global synthesis of regional Holocene hydroclimate variability using proxy and model data. *Paleoceanography and Paleoclimatology*, 38, e2022PA004597. <https://doi.org/10.1029/2022PA004597>
- Erb, M. P., McKay, N. P., Steiger, N., Dee, S., **Hancock, C.**, Ivanovic, R. F., Gregoire, L. J., and Valdes, P. (2022). Reconstructing Holocene temperatures in time and space using paleoclimate data assimilation. *Climate of the Past*, 18, 2599–2629. <https://doi.org/10.5194/cp-18-2599-2022>

Conference & Workshop Presentations (First Author Only)

- 2025 - Hancock, C. L., Dee S. G., Haider, M. R., Murphy, K., Doss-Gollin, J., Lehner, F., Muñoz, S. E., “Robust 21st century hydrological trends in the Mississippi River basin from CMIP6: west-gets-drier, east-gets-wetter” American Geophysical Union (AGU) annual meeting, New Orleans, LA.

- Hancock, C. L., McKay, N. P., Erb, M. P., Kaufman, D. S., Thomas, E. K., “Arctic warming during the past century was more widespread than the largest millennial-scale events following the Last Glacial Maximum” American Geophysical Union (AGU) annual meeting, New Orleans, LA.
- Hancock, C. L., “Uncertainties among CMIP6 models for 21st century hydroclimate changes in the Mississippi River basin” Texas Climate Conference, Houston, TX.
- 2024 - Hancock, C. L. and McKay, N. P., “PAGES Databases: Creation and Analysis” 2k Network workshop: Global-scale hydroclimate synthesis of the Common Era, Nottingham, UK.
- 2023 - Hancock, C., Erb, M.P., McKay, N., “DAMP-21ka: Data Assimilation of Moisture Patterns (21 ka - present) using lake-level proxy records” American Geophysical Union (AGU) annual meeting, San Francisco, CA.
- Hancock, C., “Analyzing & compositing proxy data” Data Assimilation Workshop, Flagstaff, AZ.
- Hancock, C., “Present upcoming Holocene hydroclimate proxy database & reconstruction”, PAGES 2k Phase 4 Workshop, Potsdam, Germany. (invited seminar)
- 2022 - Hancock, C., McKay, N., Erb, M.P., Gregoire, L.J., Ivanovic, R.F., Valdes, P.J., “Global synthesis of regional Holocene hydroclimate variability using proxy and model data” American Geophysical Union (AGU) annual meeting, Chicago IL.
- Hancock, C., “Analyzing & compositing proxy data” Data Assimilation Workshop, Flagstaff, AZ.
- 2021 - Hancock, C., McKay, N., Erb, M.P., Gregoire, L.J., Ivanovic, R.F., Valdes, P.J., “Holocene Hydroclimate: Multi Millennial-Scale Trends in Proxies and Models” American Geophysical Union (AGU) annual meeting, New Orleans LA.
- Hancock, C. “Hydroclimate of the San Juan Mountains, Colorado” Association of American Geographers (AAG) annual meeting, Seattle WA.
- 2019 - Hancock, C. “Hydroclimate of the San Juan Mountains, Colorado” Association of American Geographers (AAG) annual meeting, Washington DC.

Funding, Grants, & Awards

2023 - ARCS Scholar Award	\$8,500
- Tom and Rose Bedwell Earth Physics Research Award	\$1,550
2022 - Tom and Rose Bedwell Earth Physics Research Award	\$1,000
- Rod Parnell Fund for Water Resources Research Support	\$500
2021 - Pioneer Natural Resources Research Award	\$1,800
- Tom and Rose Bedwell Earth Physics Research Award	\$1,600
- EarthCube Early Career Travel Grant	\$1,500
2019 - Laurance C. Herold Fund	\$850

Service

Departmental Committees: 2023 – 2024 PhD Student Representative — Northern Arizona University
 2022 – 2024 D&I Committee Member — Northern Arizona University
 2019 – 2020 Graduate Student Representative — University of Denver

Journal Reviewer: 2025 - Climate of the Past; Geophysical Research Letters;
 npj Climate and Atmospheric Sciences; Scientific Data
 2024 - Earth System Science Data; Nature Communications;
 Paleoceanography and Paleoclimatology

Advised Students: Undergraduate - Evan Gebhart (2025)

Outreach

ARCS Awards Dinner (Phoenix, AZ) — Achievement Rewards for College Scientists Foundation	4/21/2023
Be in the Know: Water and Future Development in Arizona Event (Payson, AZ) — Arizona Association for Economic Development	11/16/2022

Technical Skills

Python, R, ArcGIS Pro, QGIS, SQL, GitHub, & Adobe Illustrator