

Erin L. Towler, Ph.D.

National Center for Atmospheric Research
Capacity Center for Climate & Weather Extremes
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EDUCATION:

Ph.D. in Civil Engineering (Water Resources), University of Colorado at Boulder, 2010
Dissertation Title: Understanding and modeling the impacts of climate change on source water quality and utility planning
Advisors: Dr. Balaji Rajagopalan & Dr. R. Scott Summers

M.S. in Civil Engineering (Water Resources), University of Colorado at Boulder, 2006
Thesis title: Characterizing and incorporating uncertainty in water quality and treatment
Advisors: Dr. Balaji Rajagopalan & Dr. R. Scott Summers
Certification: *Graduate Teacher Program*, 2006

B.S. in Environmental Technology Systems, Cornell University, 2002
Magna Cum Laude

PROFESSIONAL EXPERIENCE:

2018-present *Project Scientist II:* Capacity Center for Climate & Weather Extremes, MMM, NCAR

- Plan, lead, and manage research to assess hydrologic availability and risks in the context of weather and climate variability.
- Develop and demonstrate frameworks and techniques to evaluate and enhance hydrologic forecasts, using both statistical and dynamical approaches, independently and in partnership with scientists and water planners.

2012-2018 *Project Scientist I:* Regional Climate Group, MMM, NCAR

- Performed statistical downscaling of global climate model projections to regional drought and worked with social scientist to increase the usability of drought information.
- Incorporated recurring weather pattern projections into statistical extreme-value analysis to predict precipitation extremes in the US Southwest.

2010-2012 *Postdoctoral PACE Fellow:* UCAR Visiting Scientists Program, NCAR and US Geological Survey, Bozeman, MT

- Assessed hydrologic risks to terrestrial and aquatic ecosystems from climate variability and change in collaboration with scientists from NCAR and the USGS Northern Rocky Mountain Science Center (Bozeman, MT).
- Communicated and transferred research findings to advance the incorporation of climate predictions into ecological applications and adaptation, specifically for environmental flows and forest management.

2008-2010 *Graduate Research Assistant:* Research Applications Laboratory, NCAR

- Developed lake water temperature module for the Water Evaluation and Planning (WEAP) model.

2007-2010 *Research Assistant (Doctoral):* University of Colorado at Boulder

2005-2006 *Research Assistant (Masters):* University of Colorado at Boulder

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2004-2005 *Teaching Assistant:* University of Colorado at Boulder

2002-2004 *Project Engineer and Analyst:* Aquacraft, Inc., Water Engineering and Management, Boulder, CO

FUNDED RESEARCH GRANTS

2020-2023 “Characterizing the predictability and sensitivity of streamflow to monsoon season precipitation.” Principal investigator (PI); funded by U.S. Bureau of Reclamation, [\$180,000 to NCAR].

2020-2022 “Characterizing monsoon precipitation patterns and predictability in Arizona.” PI; funded by U.S. Bureau of Reclamation, [\$90,000 to NCAR].

2019-2020 “Generating and evaluating temperature-conditioned Colorado River Basin streamflow ensembles.” PI; funded by the Central Arizona Water Conservation District, Denver Water, California’s Six Agency Committee, and Southern Nevada Water Authority. [\$100,000 to NCAR].

2017-2019 “Detecting, Interpreting, and Modeling Hydrologic Extremes to Support Flexible Water Management and Planning.” PI; funded by the US Bureau of Reclamation. [\$120,000 to NCAR].

2014- 2019 “Collaborative Research: EaSM3 Integration of Decision-Making with Predictive Capacity for Decadal Climate Impacts.” Co-PI; funded by NSF. [\$1,185,000 to NCAR]

PUBLICATIONS:

Refereed Articles

Towler E, Foks SS, Dugger AL, Dickinson JE, Essaid HI, Gochis D, Viger RJ, and Zhang Y (2023), Benchmarking high-resolution hydrologic model performance of long-term retrospective streamflow simulations in the contiguous United States, *Hydrol. Earth Syst. Sci.*, 27, 1809-1825, <https://doi.org/10.5194/hess-27-1809-2023>.

Towler E, Woodson D, Baker S, Ge M, Prairie J, Rajagopalan B, Shanahan S, Smith R (2022), Incorporating mid-term temperature predictions into streamflow forecasts and operational reservoir projections in the Colorado River Basin, *Journal of Water Resources Planning and Management (ASCE)*, 148(4), doi: 10.1061/(ASCE)WR.1943-5452.0001534.

Prein A, **Towler E**, Ge M, Llewellyn D, Baker S, Tighi S, Barrett L (2022). Sub-seasonal predictability of North American Monsoon precipitation. *Geophysical Research Letters*, 49(9), <https://doi.org/10.1029/2021GL095602>. Press release: <https://news.ucar.edu/132841/new-method-can-predict-summer-rainfall-southwest-months-advance>

Bruyère CL, Buckley B, Jaye AB, Done, JM, Leplastrier M, Aldridge J, Chan P, **Towler E**, Ge M (2022), Using large climate model ensembles to assess historical and future tropical cyclone

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activity along the Australian east coast, *Weather and Climate Extremes*, <https://doi.org/10.1016/j.wace.2022.100507>

Woodson D, Rajagopalan B, Baker S, Smith R, Prairie J, **Towler E**, Ge M, Zagona E (2021), Stochastic decadal projections of Colorado River streamflow and reservoir pool elevations conditioned on temperature projections, *Water Resources Research*, <https://doi.org/10.1029/2021WR030936>.

Done JM, Ge M, Lazrus H, Morss R, **Towler E**, Tye, M, Das T, Munévar A, Hewitt J, Hoeting J, Schafer C, Czajkowski J, Van Zant AB (2021), A prototype research framework to understand and create useable predictive climate information on decadal timescales. *One Earth*, 4(9), <https://doi.org/10.1016/j.oneear.2021.08.013>.

Towler E, McCreight J (2021), A wavelet-based approach to streamflow event identification and timing error benchmarking. *HESS*, 25, 2599–2615, <https://doi.org/10.5194/hess-25-2599-2021>.

Towler E, Yates D (2021), Incorporating near-term temperature predictions for water resources planning. *Journal of Applied Meteorology and Climatology*, DOI: 10.1175/JAMC-D-20-0134.1, p 171-183.

Towler E, Llewellyn D, Prein A, Gilleland E (2020), Extreme-value analysis for the characterization of extremes in water resources: A generalized workflow and case study on New Mexico monsoon precipitation. *Weather and Climate Extremes*, doi: 10.1016/j.wace.2020.100260.

Towler E, Lazrus H, PaiMazumder D (2019), Characterizing the potential for drought action from combined hydrological and societal perspectives, *Hydrology and Earth System Sciences*, 23, 1469-1482, <https://doi.org/10.5194/hess-23-1469-2019>.

Pournasiri Poshtiri M, Pal I, Lall U, Naveau P, **Towler E** (2019), Variability patterns of the annual frequency and timing of low streamflow days across the USA and their linkage to regional and large-scale climate. *Hydrological Processes*, doi: 10.1002/hyp.13422.

Clemins PJ, Bucini G, Winter JM, Beckage B, **Towler E**, Betts A, Cummings R, Queiroz HC (2019), An analog approach for weather estimation using climate projections and reanalysis data, *Journal of Applied Meteorology and Climatology (AMS)*, doi: 10.1175/JAMC-D-18-0255.1.

Pournasiri Poshtiri M, **Towler E**, Pal, I (2018), Characterizing and understanding the variability of streamflow drought indicators within the United States. *Hydrologic Sciences Journal*, doi: [10.1080/02626667.2018.1534240](https://doi.org/10.1080/02626667.2018.1534240).

Hewitt J, Hoeting JA, Done JM, **Towler E** (2018), Remote effects spatial process models for modeling teleconnections. *Environmetrics*, doi:[10.1002/env.2523](https://doi.org/10.1002/env.2523). *2018 Wiley-TIES Best Environmetrics Paper Award.

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Towler E, PaiMazumder D, Done J (2018), Towards the Application of Decadal Climate Predictions. *Journal of Applied Meteorology and Climatology (AMS)*, DOI: 10.1175/JAMC-D-17-0113.1.

Towler E, Lazrus H (2016), Increasing the usability of drought information for risk management in the Arbuckle Simpson Aquifer, Oklahoma, *Clim Risk Manage*, doi:10.1016/j.crm.2016.06.003.

Towler E, PaiMazumder D, Holland G (2016), A framework for investigating large-scale patterns as an alternative to precipitation for downscaling to local drought, *Climate Dynamics*, doi:10.1007/s00382-016-3116-5.

Done JM, PaiMazumder D, **Towler E**, Kishtawal CM (2016), Estimating impacts of North Atlantic tropical cyclones using an index of damage potential, *Climatic Change* doi: 10.1007/s10584-015-1513-0.

Murphy DJ, Wyborn C, Yung L, Cleveland C, Eby L, Dobrowski S, **Towler E**, and Williams DR (2016). Engaging Communities and Climate Change with Multi-scale Iterative Scenario-building in the Western US. *Human Organization*, 75 (1).

Pal I, **Towler E**, and Livneh B (2015), How can we better understand low river flows as climate changes?, *Eos*, 96, doi:10.1029/2015EO033875.

Towler E, Roberts M, Rajagopalan B, Sojda R (2013), Incorporating probabilistic seasonal climate forecasts into river management using a risk-based framework, *Water Resour Res*, 49: 4997–5008, doi:10.1002/wrcr.20378.

Towler E, Rajagopalan B, Yates D, Rodriguez A, Summers RS (2013), An integrated approach to simulate stream water quality for municipal supply under changing climate, *J Environ Eng*, 139(12): 1432-1440, doi: 10.1061/(ASCE)EE.1943-7870.0000766.

Towler E, Saab V, Sojda R, Dickinson K, Bruyère C, Newlon KR (2012), A risk-based approach to evaluating wildlife demographics for management in a changing climate: A case study of the Lewis's Woodpecker, *Environ Manage*, 50(6): 1152-1163, doi:10.1007/s00267-012-9953-z.

Bruyere CL, Holland GJ, **Towler E** (2012), Investigating the use of a Genesis Potential Index for tropical cyclones in the North Atlantic Basin, *J Climate*, 25(24): 8611-8626, doi:10.1175/JCLI-D-11-00619.1.

Towler E, Raucher B, Rajagopalan B, Rodriguez A, Yates D, Summers RS (2012), Incorporating climate uncertainty in a cost assessment for a new municipal source water, *J. Water Res Pl-ASCE*, 138:396-402, doi:10.1061/(ASCE)WR.1943-5452.0000150.

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Towler E, Rajagopalan B, Gilleland E, Summers RS, Yates D, Katz RW (2010), Modeling hydrologic and water quality extremes in a changing climate: A statistical approach based on extreme value theory, *Water Resour Res*, 46, W11504, doi:10.1029/2009WR008876.

Towler E, Rajagopalan B, Summers RS, Yates D (2010), An approach for probabilistic forecasting of seasonal turbidity threshold exceedance, *Water Resour Res*, 46, W06511, doi:10.1029/2009WR007834.

Towler E, Rajagopalan B, Summers RS (2009), Using parametric and nonparametric methods to model total organic carbon, alkalinity, and pH after conventional surface water treatment, *Environ Eng Sci*, 26(8):1299-1308.

Towler E, Rajagopalan B, Seidel C, Summers RS (2009), Simulating ensembles of source water quality using a k-nearest neighbor resampling approach, *Environ Sci Technol*, 43(5): 1407-1411.

Mayer PW, Bennett R, DeOreo W, **Towler E** (2006), Third-party billing of multifamily customers presents new challenge to water providers, *J Am Water Works Ass*, 98(8):74.*
* *AWWA Water Conservation Division Best Paper Award, 2006.*

Non-refereed Articles

Towler E (2022) Characterizing monsoon precipitation patterns and predictability in Arizona (Final Report), prepared for the US Bureau of Reclamation Lower Colorado Basin Region.

Towler E, Llewellyn D, Prein A. (2019) Detecting, Interpreting, and Modeling Hydrologic Extremes to Support Flexible Water Management and Planning (Final Report), U.S. Bureau of Reclamation Research and Development Office Science and Technology Program (ST-2019-1782-01).

Towler E, Llewellyn D, Barrett L, Young R (2019), Extremes of Opportunity? A generalized approach to identify intersections between changing hydrology and water management. Proceedings of the Federal Interagency Sedimentation and Hydrologic Modeling Conference (SEDHYD), Reno, NV,
https://www.sedhyd.org/2019/openconf/modules/request.php?module=oc_program&action=view.php&id=160&file=1/160.pdf

Morss RE, Done JM, Lazrus H, **Towler E**, Tye MR (2018), Assessing and Communicating Uncertainty in Decadal Climate Predictions: Connecting Predictive Capacity to Stakeholder Needs, *US CLIVAR Variations*, vol 16. No 3. Summer 2018.

Pournasiri Poshtiri M, **Towler E**, Llewellyn D, Prein AF (2018), Extremes of Opportunity: Examining Recent Trends in Warm Season Extreme Precipitation for New Mexico River Basins, *86th Western Snow Conference*, Albuquerque, NM,
<https://westernsnowconference.org/files/PDFs/2018Poshtiri.pdf>.

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Hewitt J, Hoeting JA, Done JM, **Towler E** (2017) A Geostatistical Approach to Modeling Teleconnections. American Statistical Association's Section on Statistics and the Environment.

Pournasiri Poshtiri M, **Towler E**, Pal I (2017), Streamflow Drought Indicators for the Conterminous United States, *NCAR Technical Note* TN-541+STR, NCAR, 33 pp. (DOI: 10.5065/D65D8QJH).

Towler E, Lazrus H, PaiMazumder D (2017). Characterizing drought risks and implications for water management under climate change. *NCAR Technical Note* NCAR/TN-533+STR, 25 pp, doi:10.5065/D6HD7T3N.

Products

Towler E, Foks SS, Dickinson JE, Dugger AL, Essaid HI, Gochis D, Hodson TO, and Zhang Y (2022), Daily streamflow performance benchmark defined by the standard statistical suite (v1.0) for the National Water Model Retrospective (v2.1) at benchmark streamflow locations: U.S. Geological Survey data release, <https://doi.org/10.5066/P9QT1KV7>

Towler E, Foks SS, Dugger AL, Dickinson JE, Essaid HI, and Hodson TO (2022), Daily streamflow performance benchmark defined by the standard statistical suite (v1.0) for the National Hydrologic Model application of the Precipitation-Runoff Modeling System (v1 byObs Muskingum) at benchmark streamflow locations: U.S. Geological Survey data release, <https://doi.org/10.5066/P9DKA9KQ>

Foks, S.S., **Towler, E.**, Hodson, T.O., Bock, A.R., Dickinson, J.E., Dugger, A.L., Dunne, K.A., Essaid, H.I., Miles, K.A., Over, T.M., Penn, C.A., Russell, A.M., Saxe, S.W., and Simeone, C.E., 2022, Streamflow benchmark locations for conterminous United States, version 1.0 (cobalt gages): U.S. Geological Survey data release, <https://doi.org/10.5066/P972P42Z>

SELECT ORAL PRESENTATIONS:

Towler E, Baker S, Barrett L, Ge M, Prein A, Llewellyn D, Tighi S (2023), An Experimental Monsoon Forecast for Water Management, AMS Annual Meeting, Denver, CO, Jan 10, 2023.

Towler E, (2022), WeighESP: An Experimental Streamflow Forecast using Decadal Temperature Predictions for the CRB: Review & Next Steps, Colorado River Climate and Hydrology Work Group Meeting (Virtual presentation to Salt Lake City, Utah), November 16, 2022, (**Invited**).

Towler E, (2022), An Experimental Monsoon Forecast for Water Management, Colorado River Climate and Hydrology Work Group Meeting (Virtual presentation to Salt Lake City, Utah), November 16, 2022. (**Invited**).

Towler E, Llewellyn, D, Prein AF, Mander N, Baker S, Barrett L, (2022), An Experimental Monsoon Forecast for Water Management, Bureau of Reclamation Water Operations and Planning Seminar (Virtual), November 10, 2022. (**Invited**).

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Towler E, (2021) “WeighESP: An Experimental Streamflow Forecast using Decadal Temperature Predictions for the Colorado River Basin.” 2021 Virtual Upper Colorado River Basin Water Forum, hosted by Colorado Mesa University, November 4, 2021 (**Invited**).

Towler E. “Incorporating Decadal Temperature Predictions into Streamflow Forecasts and Operational Reservoir Projections in the Colorado River Basin.” Hydrology Water Resources Seminar, Department of Civil, Environmental, and Architectural Engineering, CU Boulder, - Sep 22, 2021. (**Invited**).

Towler E, McCreight J, Dugger A, Gochis D, Mahoney K, Joe Mills TJ (2018) Probabilistic Verification of the National Water Model. AMS Annual Meeting, Austin, TX, January 11, 2018.

Towler E, Llewellyn D, Prein A, Pinson A, Young R, Barrett L (2017) Detecting, Interpreting, and Modeling Hydrologic Extremes to Support Flexible Water Management and Planning. USGS Upper Rio Grande Basin Focus Area Study Project Forum, Remote presentation to Albuquerque, NM, December 4, 2017 (**Invited**).

Towler E (2017) Towards the Application of Decadal Climate Predictions in Water Management. US CLIVAR (Climate Variability and Predictability Program) Summit, Predictability, Predictions, and Applications Interface Panel, Remote presentation to Baltimore, MD, August 9, 2017, (**Invited**).

Towler E PaiMazumder D, Done J, Yates D (2017) Towards the Application of Decadal Climate Predictions. Southern Nevada Water Authority: Colorado River Hydrology Research Symposium, Las Vegas, NV, May 23, 2017 (**Invited**).

Towler E (2017). Incorporating decadal climate predictions into water management. American Water Resources Association – Colorado Section, Annual Symposium, Evergreen, CO. April 28, 2017 (**Invited**).

Towler E (2017). Incorporating decadal climate predictions into water management. Front Range Water Utility Climate Change quarterly meeting, NCAR, Boulder, CO. Feb 6, 2017 (**Invited**).

Towler E (2017) Incorporating decadal predictions into water management decisions. University of Colorado Boulder Spring 2017: Hydrologic Sciences and Water Resources Engineering Seminar Series. University of Colorado Boulder, Boulder, CO. January 25, 2017 (**Invited**).

Towler E (2017). Incorporating decadal climate predictions into water management. Remote presentation to research team at University of Montana, Missoula, January 26, 2017 (**Invited**).

Towler E, Lazrus H, PaiMazumder D (2014) Interdisciplinary approach to drought risks in the context of social conflict and climate change. Society for Risk Analysis Annual Meeting 2014, Denver, CO, December 8, 2014.

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Towler E (2013) Incorporating climate forecasts into aquatic management using a risk-based framework. Water Resources Seminar, University of Colorado, Boulder, CO, Jan. 23, 2013. (**Invited**).

Towler E (2012) Evaluating and managing extreme hydrologic risk in natural and human systems. *Workshop on Statistical Applications to Climate Extremes*, Zurich Development Center, Zurich, Switzerland, Oct. 29, 2012.

SELECT POSTER PRESENTATIONS:

Towler E, Foks S, Dugger AL, Dickinson J, Essaid H, Gochis D, Zhang Y, (2022), “Evaluating and Benchmarking Continental-Scale Hydrologic Performance for a Long-Term Retrospective”, AGU Chapman Conference on Water Availability, Golden, CO, Sep 12-16, 2022. (Poster).

Towler E, Woodson D, Baker S, Ge M, Prairie J, Rajagopalan B, Shanahan S, Smith R, (2022) “Incorporating Multi-Year Temperature Predictions into Streamflow Forecasts and Operational Reservoir Projections in the Colorado River Basin.” US CLIVAR hosted Societally-Relevant Multi-Year Climate Predictions Workshop, Boulder, CO, March 28-30, 2022, [Poster].

Towler E, Foks S, Cabell R, Dickinson J, Dudley RW, Dugger AL, Essaid H, Gochis D, Hodgkins GA, Hodson TO, FitzGerald K, Levin S, Over TM, Penn CA, Rafieeinassab A, Russell A, Sampson KM, Saxe S, Simeone C, Viger RJ (2021) “A Framework for the Systematic Evaluation and Benchmarking of Hydrologic Model Performance.” AGU Fall Meeting, New Orleans, LA, Dec 16, 2021, [Virtual Poster].

Towler E, Done J, Touma DE, Ge M, Swain DL, Brunner MI, Bukowski J, (2021) “Exploring the Predictability of Connected Extremes.” AGU Fall Meeting, New Orleans, LA, Dec 17, 2021, [Virtual Poster].

Towler E, Done JM, Touma D, Ge M, Swain DL, Brunner MI, Bukowski J. “Investigating the Predictability of Connected Precipitation Extremes.” World Climate Research Programme (WCRP) Workshop on Extremes in Climate Prediction Ensembles (ExCPEs), hosted by APCC Korea, Oct. 25 – 27, 2021 (Virtual Poster).

Towler E, Baker S, Ge M, Prairie J, Rajagopalan B, Shanahan S, Smith R, Woodson D, (2020) Harnessing Mid-Term Temperature Skill to Improve Streamflow Management in the Colorado River Basin (Virtual AGU poster Dec 9, 2020, **Invited**).

Woodson D, Rajagopalan B, **Towler E**, Ge M, Zagana E, Baker S, Smith R, Prairie, J, (2020) Midterm Projections of Colorado River Streamflow and Water Resources Operations Conditioned on Temperature Projections. (Virtual AGU poster Dec 9, 2020).

Feng X, **Towler E**, Liu Y, RafieeiNasab A, Cosgrove B, Fitzgerald K, Read L, Wu W, Gochis D, Dugger A, Flowers T, McDaniel R. Impact of Calibration Objective Function on the Performance of National Water Model. (Virtual AGU poster Dec 11, 2020).

- *Erin Towler's CV*

Towler E, PaiMazumder D, Done J (2018) Towards the Application of Decadal Climate Predictions in Water Management. AMS Annual Meeting, January 10, 2018. Austin, TX.

Towler E and Lazrus H. (2016) Increasing the usability of drought information for risk management. 41st Annual Natural Hazards Research and Applications Workshop. July 10-13 in Broomfield, Colorado.

Towler E, PaiMazumder D, Done J, Yates D (2016) Incorporating decadal predictions into water management decisions. AGU Fall Meeting, San Francisco, CA. Dec 13, 2016.

Towler E, Lazrus H, PaiMazumder D (2015) “Interdisciplinary approach to drought risks in the context of water management conflict under climate change.” North Central Climate Science Center Open Science Conference, Colorado State University, Fort Collins, CO, May 21, 2015.

Towler E, Lazrus H, PaiMazumder D (2014) “Avoiding Drought Risks and Potential Water Management Conflict Under Climate Change.” AGU Fall Meeting, San Francisco, CA, December 18, 2014.

Towler E, PaiMazumder D, Holland G (2014), “Improving future predictions of drought: A new hybrid statistical-dynamical downscaling approach.” *National Science Foundation EaSM Investigator Meeting*, Washington, DC, January 2014. [Poster].

Towler E, Lazrus H, PaiMazumder D (2012), “Risky business: Incorporating decadal predictions into decision-making.” *AGU Fall Meeting*, San Francisco, CA, Dec. 3, 2012, (Invited).

HONORS AND AWARDS:

NCAR's 15 years of Service Honoree, 2022

Outstanding Reviewer for ASCE Journal of Water Resources Planning & Management, 2012.

Postdocs Applying Climate Expertise (PACE) Fellowship Award, 2010-2012

Environmental Protection Agency STAR Fellowship Award, 2009-2010

National Water Resources Institute Fellowship Award, 2007-2009

Dean's Outstanding Merit Fellowship Award, University of Colorado at Boulder, 2007

SERVICE AND TRAINING:

Service and Contributions – External

2021-present U.S. CLIVAR Predictability, Predictions, and Applications Interface (PPAI)
Panel member

2019-present PhD Mentor for David Woodson (Civil Engineering, Water Resources,
University of Colorado Boulder)

2013–2017 PhD Dissertation Committee & Chair for Maryam Pournasiri Poshtiri
(Civil Engineering, University of Colorado Denver)

2012–present Member: American Geophysical Union; Earth Science Women's Network

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2020- present Member: Mountain West Climate Services Partnership
2011 DISCCRS VI Symposia Scholar
2004 Licensure: Enrolled as an Engineer-Intern in Colorado

Service and Contributions – Internal

2022-present Engagement and Training Committee, MMM, NCAR
2022-present NCAR Scientist Assembly (NSA) Executive Committee, MMM Representative
2012-2019 Instructor for Climate and Weather Extremes Tutorial, MMM, NCAR
2015-2018 UCAR ECSA (Early Career Scientists Assembly) steering committee
2015-2018 UCAR Oversight Committee for the Postdocs Applying Climate Expertise (PACE) Fellowship Program
2015-2018 Mentor for NCAR's Undergraduate Leadership Workshop, SOARS Academy

Training

- Earth Science Women's Network (ESWN) "Leadership Workshop", Nov 4-6, 2019
- UCAR's "Difficult Conversations and Bystander Intervention" training session, Jan 3, 2019 (4 hour in-person training)
- UCAR's "Neurodiversity 101: Thinking Different, Working Together" webinar with Devon Price, Ph.D., May 5, 2022 (1.5 hour Webcast)
- UCAR's "More than the sum of its parts: intersectionality and identity in the workplace" with disability rights and inclusion activist Imani Barbarin (1 hour Webcast).