

# Guo Yu, Ph.D., P.E.

Assistant Research Professor, Hydrometeorology  
Desert Research Institute, Reno, Nevada

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## Research Interests

I am interested in understanding the role of precipitation and its interaction with watershed properties to produce floods, and in developing hydrologic and statistical modeling approaches to solve challenges in flood hazard and risk estimation.

## Education

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|--|-------------|
| University of Wisconsin-Madison, Wisconsin, U.S.   | 2017 – 2021 |
| Ph.D., Civil and Environmental Engineering<br><u>Minor:</u> Atmospheric and Oceanic Sciences<br><u>Dissertation:</u> Process-based Understanding and Prediction of Riverine Flood Hazard |             |
| University of Nice Sophia Antipolis, Nice, France  | 2011 – 2013 |
| M.S., Hydro-Informatics and Water Management<br><u>Dissertation:</u> Development of a Web-Based Rapid Flood Inundation Modelling System  |             |
| Tianjin Chengjian University, Tianjin, China   | 2007 – 2011 |
| B.E., Water Supply and Drainage Engineering  |             |

## Research and Professional Employment

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|---|----------------|
| Desert Research Institute, Las Vegas, Nevada, U.S.  | 2021 – Present |
| <ul style="list-style-type: none"><li>Assistant Research Professor, Hydrometeorology (2023 – Present)</li><li>Postdoctoral Fellow (2021 – 2023)</li></ul> |                |
| Argonne National Laboratory, Illinois, U.S.   | 2020 – 2021    |
| <ul style="list-style-type: none"><li>Graduate Research Aide</li></ul>  |                |
| University of Wisconsin-Madison, Wisconsin, U.S.  | 2017 – 2021    |
| <ul style="list-style-type: none"><li>Research and Teaching Assistant</li></ul>   |                |
| DHI Water & Environment, Shanghai, China  | 2014 – 2017    |
| <ul style="list-style-type: none"><li>Water Resources Engineer and Team Leader</li></ul>  |                |

## Teaching and Mentoring Experience

Mentored 5 undergraduate students during the Nevada Research Immersion Internship, 2023: Chad Ceredon, Jade Mueller, Karla Avila, Ernesto Ibanez, and Hunter Berke.

Teaching Assistant for CEE-311: Hydro-science, University of Wisconsin-Madison, Spring, 2019.

Instructor for MIKE FLOOD modelling software, DHI China, 2014-2017.

## Funded Research Proposals

*A Storyline Approach to Assess the 1997 New Year's Flood in Western Nevada*, USGS National Institutes for Water Resources (NIWR 104b). PI (no other investigators). Award Term: 2023–2025. Total Award: \$113,758.

*Understanding Urban Flood Risks Beyond FEMA Flood Maps*, Desert Research Institute. PI (no other investigators). Award Term: 2023–2024. Total Award: \$77,434.

*Process-based Understanding of Rainfall and Flood Frequencies in Arid Region Under Current and Future Climate Condition*, Desert Research Institute. PI (no other investigators). Award Term: 2021–2023. Total Award: \$217,872.

## Peer-Reviewed Publications

1. **Yu, G.**, Liu, T., McGuire, L.A., Wright, D. B., Hatchett, B. J., Miller, J. J., et al. (2023). Process-based quantification of the role of wildfire in shaping flood frequency. *Water Resources Research*, 59(12), e2023WR035013. <https://doi.org/10.1029/2023WR035013>.
2. **Yu, G.**, Feng, Y., Wang, J., & Wright, D. B. (2023). Performance of Fire Danger Indices and Their Utility in Predicting Future Wildfire Danger Over the Conterminous United States. *Earth's Future*, 11(11), e2023EF003823. <https://doi.org/10.1029/2023EF003823>.
3. **Yu, G.**, Hatchett, B. J., Miller, J. J., Berli, M., Wright, D. B., & Mejia, J. F. (2023). Seasonal Storm Characteristics Govern Urban Flash Floods: Insights from the Arid Las Vegas Wash Watershed. *Journal of Hydrometeorology*, 24(11), 2105–2123. <https://doi.org/10.1175/JHM-D-23-0002.1>.
4. Li, C., **Yu, G.**, Wang, J., & Horton, D. E. (2023). Toward improved regional hydrological model performance using state-of-the-science data-informed soil parameters. *Water Resources Research*, 59, e2023WR034431. <https://doi.org/10.1029/2023WR034431>.
5. **Yu, G.**, Miller, J. J., Hatchett, B. J., Berli, M., Wright, D. B., McDougall, C., & Zhu, Z. (2023). The Nonstationary Flood Hydrology of an Urbanizing Arid Watershed. *Journal of Hydrometeorology*, 24(1), 87–104. <https://doi.org/10.1175/JHM-D-22-0117.1>.
6. **Yu, G.**, Wright, D. B., & Davenport, F. V. (2022). Diverse Physical Processes Drive Upper-Tail Flood Quantiles in the US Mountain West. *Geophysical Research Letters*, 49(10), e2022GL098855. <https://doi.org/10.1029/2022GL098855>.
7. **Yu, G.**, Wright, D. B., & Holman, K. D. (2021). Connecting Hydrometeorological Processes to Low-Probability Floods in the Mountainous Colorado Front Range. *Water Resources Research*, 57(4). <https://doi.org/10.1029/2021WR029768>.
8. **Yu, G.**, Wright, D. B., & Li, Z. (2020). The Upper Tail of Precipitation in Convection-Permitting Regional Climate Models and Their Utility in Nonstationary Rainfall and Flood Frequency Analysis. *Earth's Future*, 8(10). <https://doi.org/10.1029/2020EF001613>.
9. Wright, D. B., **Yu, G.**, & England, J. F. (2020). Six decades of rainfall and flood frequency analysis using stochastic storm transposition: Review, progress, and prospects. *Journal of Hydrology*, 585, 124816. <https://doi.org/10.1016/j.jhydrol.2020.124816>.
10. **Yu, G.**, Wright, D. B., Zhu, Z., Smith, C., & Holman, K. D. (2019). Process-based flood frequency analysis in an agricultural watershed exhibiting nonstationary flood seasonality. *Hydrology and Earth*

System Sciences, 23(5), 2225–2243. <https://doi.org/10.5194/hess-23-2225-2019>.

11. Zhu, Z., Chen, Z., Chen, X., & Yu, G. (2019). An assessment of the hydrologic effectiveness of low impact development (LID) practices for managing runoff with different objectives. *Journal of Environmental Management*, 231, 504–514. <https://doi.org/10.1016/j.jenvman.2018.10.046>.
12. Zhu, Z., Wright, D. B., & Yu, G. (2018). The Impact of Rainfall Space-Time Structure in Flood Frequency Analysis. *Water Resources Research*, 54(11), 8983–8998. <https://doi.org/10.1029/2018WR023550>.
13. Yan, J., Jin, J., Chen, F., Yu, G., Yin, H., & Wang, W. (2018). Urban flash flood forecast using support vector machine and numerical simulation. *Journal of Hydroinformatics*, 20(1), 221–231. <https://doi.org/10.2166/hydro.2017.175>.
14. Ren, X., Yu, D., Ruan, Y., & Yu, G. (2015). Modeling of Municipal Drainage and Urban Channel Flooding in Coastal City in the South of China. *Journal of Risk Analysis and Crisis Response*, 5(2), 74. <https://doi.org/10.2991/jrarc.2015.5.2.1>.

## Technical Reports

Yu, G., Miller, J.J., Sueki, S. (2022). *Wildfire Impacts on Annual Flood Peaks Across the Western United States*. Division of Hydrologic Sciences, Desert Research Institute (41291), Las Vegas, NV.

Holman, K.D., D.B. Wright, Yu, G. (2020). *Stochastic Storm Transposition for Physically-Based Rainfall and Flood Frequency Analyses*, Science and Technology Program Research and Development Office, U.S. Bureau of Reclamation, Denver, CO.

## Conference Presentations

Yu, G., Miller, J. J. (May 2023). *The Nonstationary Flood Hydrology for the Las Vegas Wash Watershed*, EWRI Congress 2023, Henderson NV, May 22, 2023.

Yu, G., Miller, J. J., Sueki, S. *Wildfire Impacts on Annual Flood Peaks Across the Western United States*, Federal Interagency Conferences on Sedimentation and Hydrologic Modeling, St. Louis, MI, May 10, 2023.

(INVITED) Yu, G., Wright, D. B. and Holman, K. *Flood Frequency Analysis using Stochastic Storm Transposition and WRF-Hydro: An Application of Risk-Informed Dam Safety Analysis*, Charleston, SC, April 20, 2023.

Yu, G., Wright, D. B., Davenport, F. *Diverse Physical Processes Drive Upper-Tail Flood Quantiles*, AGU Fall Meeting, Chicago IL, December 21, 2022.

Yu, G., Berli, M., Hatchett, B. J., Miller, J. J. *How Has the Flood Recipe for the Las Vegas Wash Watershed Changed?*, AGU Fall Meeting, Chicago IL, December 20, 2022.

Yu, G., Wright, D. B. and Holman, K. D. (VIRTUAL): *Connecting Hydrometeorological Processes to Low-Probability Floods in the Mountainous Colorado Front Range*, AGU Fall Meeting, December 13, 2021.

Wright, D.B., G. Yu, K. Holman, *Estimating Flood Frequency using Stochastic Storm Transposition, Gridded Precipitation Data, and Physics-based Modeling*, Probabilistic Flood Hazard Assessment Research Workshop, February 23, 2021.

Wright, D.B., G. Yu, Z. Li, K. Holman, *Using New Observational and Modeling Platforms to Estimate*

*Rainfall and Flood Frequencies in a Changing World*, AMS Annual Meeting, January 11, 2021 (Virtual).

**Yu, G.**, Wright, D. B. and Holman, K. D.: *Understanding the Flood Hydrometeorology in a Mountainous Watershed in the Colorado Front Range*, Webinar hosted by Water Resources Engineering and Management Group at Bureau of Reclamation, Denver, CO, August 13, 2020.

**Yu, G.**, Wright, D. B. and Holman, K. D.: *The Upper Tail of Precipitation in Convection-Permitting Regional Climate Models and Their Utility in Nonstationary Flood Frequency Analysis*, American Geophysical Union Fall Meeting, San Francisco, CA, December 8, 2019.

**(INVITED)** Wright, D. B., **Yu, G.** and Holman, K. D.: *Modeling Rainfall and Flood Frequency using Stochastic Storm Transposition and Precipitation Remote Sensing*, AGU Fall Meeting, Washington, DC, December 13, 2018.

**Yu, G.**, Wright, D. B. and Holman, K. D.: *Bottom-up Flood Frequency Analysis using Stochastic Storm Transposition and WRF-Hydro in the context of nonstationarity*, AGU Fall Meeting, Washington, DC, December 12, 2018.

**Yu, G.**, Wright, D. B., Holman, K. D. and Zhu Z.: *Nonstationary Flood Frequency Analysis using Stochastic Storm Transposition and Hydrologic Modeling: A Case Study for Turkey River, Iowa*, EWRI Congress, Minneapolis, MN, June 5, 2018.

**Yu, G.** and Wright, D. B.: *Application of Stochastic Storm Transposition and Hydrologic Modelling to Flood Frequency Analysis: A Case Study for Turkey River, Iowa*, Wisconsin section of the American Water Resources Association Annual Meeting, Appleton, WI, March 8, 2018.

Wright, D. B., **Yu, G.** and Holman, K. D.: *A Web-based Stochastic Storm Transposition Toolkit for Physically-based Rainfall and Flood Hazard Analysis*, AMS Annual Meeting, January 8, 2018.

Smith, C., **Yu, G.** and Wright, D. B.: *What Is Driving the Observed Changes in Flooding in the Turkey River in Iowa*, AGU Fall Meeting, New Orleans, LA, December 14, 2017.

Wright, D. B., **Yu, G.** and Holman, K. D.: *RainyDay: An Online, Open-Source Tool for Remote Sensing-based Rainfall and Flood Frequency Analysis*, AGU Fall Meeting, New Orleans, LA, December 13, 2017.

## Training Workshops

- Post-Wildfire Debris Flow Modeling Applications With HEC-HMS & HEC-RAS, U.S. Army Corps of Engineers, Las Vegas, NV, April 24-27, 2023.
- Recent Developments in Risk-Informed Approaches and Probable Maximum Precipitation, U.S. Society on Dams, Charleston, SC, April 20, 2023.
- The Science and Practice of Operational Ensemble Hydrological Prediction, the National Center for Atmospheric Research, Boulder, CO, May 21-23, 2019.
- The Community WRF-Hydro Modeling System, the National Center for Atmospheric Research, Boulder, CO, June 5-8, 2018.

## Media Contributions

"Climate change will increase wildfire risk and lengthen fire seasons, study confirms", PreventionWeb, United Nations Office for Disaster Risk Reduction, December 7, 2023.  
<https://www.preventionweb.net/news/climate-change-will-increase-wildfire-risk-and-lengthen-fire-seasons-study-confirms>.

"Summer monsoons get the hype, but Las Vegas researcher warns of winter storms' perils", Las Vegas Sun, February 7, 2023. <https://lasvegassun.com/news/2023/feb/07/summer-monsoons-get-the-hype-but-las-vegas-research/>.

"Las Vegas valley flood patterns are changing, new study shows," KLAS 8 News Now, January 18, 2023. <https://www.8newsnow.com/news/local-news/las-vegas-valley-flood-patterns-are-changing-new-study-shows/>.

"Scientists discover uncertainties in flood risk estimates," Research News, National Science Foundation, July 5, 2022. <https://beta.nsf.gov/news/scientists-discover-uncertainties-flood-risk-estimates>.

## Honors

- Licensed Professional Engineer in the State of Nevada (Credential ID: 031496).
- Science and Technology Project of the Year, U.S. Bureau of Reclamation, 2020: "Development of a Web-based Stochastic Storm Transposition Toolkit for Physically-based Rainfall and Flood Hazard Analysis".
- James Villemonte Excellence in Research Award, University of Wisconsin-Madison, 2020
- First place award, Reid Bryson Scholarship, Center for Climatic Research, University of Wisconsin-Madison, 2020
- Outstanding Student Presentation Award, American Geological Union Fall Meeting, 2019
- Third place award, "Three Minute Thesis" contest, Wisconsin Institute for Discovery, 2017

## Professional Skills and Services

- Modelling Software: WRF-Hydro, Noah-MP, SWMM, HEC-HMS, HEC-RAS, MIKE URBAN, MIKE FLOOD, Advanced Weather Generator (AWE-GEN), QGIS, ArcGIS.
- Programming: R, Python, Matlab, JavaScript, Unix/Linux, High Performance Computing (Slurm), High Throughput Computing (e.g., Open Science Grid).
- Membership: American Geological Union, American Society of Civil Engineers.
- Reviewer for more than 10 different journals, such as Water Resources Research, Hydrology and Earth System Sciences, and Geophysical Research Letter.