Guotao Cui

(+1) 307-761-2629 | cuigt@mail.sysu.edu.cn | guotaocui.gitlab.io | Google Scholar | gt_cui

Professional Profile

Feb 2023–Present	**Associate Professor**, School of Geography and Planning, Sun Yat-sen University, Guangdong, China.
Oct 2022–Feb 2023	**Assistant Project Scientist**, Sierra Nevada Research Institute, University of California, Merced, CA, USA.
Oct 2018–Oct 2022	**Postdoctoral Scholar**, Sierra Nevada Research Institute, University of California, Merced, CA, USA. Mentor: Roger C. Bales
Apr 2018–Oct 2018	**Postdoctoral Fellow**, Athabasca River Basin Research Institute, Athabasca University, Alberta, Canada. Mentor: Junye Wang

Education

2014–2017	Ph.D. in Civil Engineering, **University of Wyoming**, WY, USA → Major in Water Resources & Hydrology → Advisor: Jianting (Julian) Zhu
2010–2013	M.S. in Hydrology & Water Resources, **Zhengzhou University**, Henan, China → Advisor: Qiting Zuo
2006–2010	B.S. in Water Conservancy & Hydropower Engineering, **Zhengzhou University**, Henan, China

Refereed Journal Publications

1. **Cui, G.**, M. Anderson, and R. Bales, Mapping of snow water equivalent by a deep-learning model assimilating snow observations, *Journal of Hydrology*, doi:10.1016/j.jhydrol.2022.128835.
2. **Cui, G.**, R. Rice, M. Anderson, F. Avanzi, P. Hartsough, W. Guo, M. Conklin, and R. Bales, Precipitation estimates and orographic gradients using snow, temperature, and humidity measurements from a wireless-sensor network, *Water Resources Research*, 58, e2021WR029954, doi:10.1029/2021WR029954.
3. Guo, W., M. Safeeq, H. Liu, X. Wu, **G. Cui**, Ma, Q., M. Goulden, M. Lindeskog, and R. Bales (2022). Mechanisms controlling carbon sinks in semi-arid mountain ecosystems. *Global Biogeochemical Cycles*, 36, e2021GB007186 doi:10.1029/2021GB007186
4. **Cui, G.**, Q. Ma, and R. Bales (2022), Assessing multi-year-drought vulnerability in dense Mediterranean-climate forests using water-balance-based indicators, *Journal of Hydrology*, *606*, 127431 doi:10.1016/j.jhydrol.2022.127431.
5. Zuo, Q., X. D, **G. Cui**, and W. Zhang (2022), Yellow River Basin Management under Pressure. The Present State, Restoration and Protection: Lessons from a Special Issue, *Water*, 14*(19)*, 3127, doi:10.3390/w14193127.
6. Zuo, Q., J. Guo, J. Ma, **G. Cui**, R. Yang, and L. Yu (2021), Assessment of regional-scale water resources carrying capacity based on fuzzy multiple attribute decision-making and scenario simulation, *Ecological Indicators*, *130*, 108034, doi:10.1016/j.ecolind.2021.108034.
7. **Cui, G.**, R. Bales, R. Rice, M. Anderson,F. Avanzi, P. Hartsough, and M. Conklin (2020), Detecting rain-snow-transition elevations in mountain basins using wireless-sensor networks, *Journal of Hydrometeorology*, *21*(9), 2061–2081, doi:10.1175/JHM-D-20-0028.1.
8. **Cui, G.**, and J. Wang (2019), Improving the DNDC biogeochemistry model to simulate soil temperature and emissions of nitrous oxide and carbon dioxide in cold regions, *Science of The Total Environment*, 687, 61-70, doi:10.1016/j.scitotenv.2019.06.054.
9. **Cui, G.**, and J. Zhu (2018), Prediction of unsaturated flow and water backfill during infiltration, *Journal of Hydrology*, 557, 509–521, doi:10.1016/j.jhydrol.2017.12.050.

10. **Cui, G.**, and J. Zhu (2018), Infiltration model based on traveling characteristics of wetting front, *Soil Science Society of America Journal*, doi:10.2136/sssaj2017.08.0303.

11. **Cui, G.**, and J. Zhu (2017), Infiltration model in sloping layered soils and guidelines for model parameter estimation, *Hydrological Sciences Journal*, *62*(13), 2222-2237, doi:10.1080/02626667.2017.1371848.

12. **Cui, G.**, and J. Zhu (2018), Modeling infiltration and runoff with surface crust under unsteady rainfalls, *Journal of Hydrologic Engineering*, doi:10.1061/(ASCE)HE.1943-5584.0001672.

13. Cheng, Y., **G. Cui**, and J. Zhu (2017), Using time compression approximation to determine actual infiltration rate from variable rainfall events, *Hydrology Research*, doi:10.2166/nh.2017.062.

14. Zuo, Q., and **G. Cui** (2013), International viewpoint and news: Chemical leaks contaminate Chinese river: Viewing environmental emergency response of China, *Environmental Earth Sciences*, *69*(8), 2801–2803, doi:10.1007/s12665-013-2331-1.

15. Li, D., Q. Zuo, and **G. Cui** (2013), Disposal of chemical contaminants into groundwater: viewing hidden environmental pollution in China, *Environmental Earth Sciences*, *70*(4), 1933–1935, doi:10.1007/s12665-013-2463-3.

16. Zuo, Q., R. Jin, J. Ma, and **G. Cui** (2014), China pursues a strict water resources management system, *Environmental Earth Sciences*, *72*(6), 2219–2222, doi:10.1007/s12665-014-3369-4.

17. Zuo, Q., H. Zhao, C. Mao, J. Ma, and **G. Cui** (2015), Quantitative analysis of human-water relationships and harmony-based regulation in the Tarim river basin, *Journal of Hydrologic Engineering*, *20*(8), 05014030, doi:10.1061/(ASCE)HE.1943-5584.0001118.

18. Zuo, Q., R. Jin, J. Ma, and **G. Cui** (2015), Description and application of a mathematical method for the analysis of harmony, *The Scientific World Journal*, doi:10.1155/2015/831396.

Conference Proceedings

19. **Cui, G.**, and R. Bales (2021), Deep-learning-based snowpack mapping and forecasting with ground observations: A case study using a wireless-sensor network in the American River basin, *88th Annual Western Snow Conference* .

20. **Cui, G.**, R. Bales, M. Conklin, R. Rice, F. Avanzi, and P. Hartsough (2019), Rain-snow transition elevation from wireless sensor network in American and Feather River basins, *87th Annual Western Snow Conference* .

Books

21. Zuo, Q., X. Ding, **G. Cui**, W. Zhang (2022), ellow River Basin Management under Pressure: Present State, Restoration and Protection. *MDPI, Basel* doi:10.3390/books978-3-0365-5669-7.

Other Publications

22. Bales, R., **G. Cui**, R. Rice, X. Meng, Z. Zhang, P. Hartsough, S. Glaser and M. Conklin (2020), Snow depth, air temperature, humidity, soil moisture and temperature, and solar radiation data from the basin-scale wireless-sensor network in American River Hydrologic Observatory (ARHO), V2, UC Merced, Dataset, https://doi.org/10.6071/M39Q2V.

23. Zuo, Q., and **G. Cui** (2020), Quantitative evaluation of human activities affecting an interconnected river system network, *Acta Geographica Sinica*, *7*, 1483-1493. https://doi.org/110.11821/dlxb202007011.

24. **Cui, G.**, and Q. Zuo (2012), Analysis and quantitative evaluation of human activities affecting river system network interconnected relationship, *Journal of Water Resources Research*, *1*, 326–333.

25. **Cui, G.**, and Q. Zuo (2012), Relationship between interconnected river system network and the strictest water resources management system, *South-to-North Water Transfers and Water Science & Technology*, *2*, 129–132.

26. **Cui, G.**, Q. Zuo, Z. Li, and M. Dou (2012), Analysis of function and adaptability for interconnected river system network, *Water Resources and Power*, *2*, 1–5.

27. **Cui, G.**, Q. Zuo, and M. Dou (2011), Development evolution and influences of the interconnected river system network at home and abroad, *South-to-North Water Transfers and Water Science & Technology*, *4*, 73–76.

28. **Cui, G.**, and Q. Zuo (2011), Research status and prospect of ecological regulation, *South-to-North Water Transfers and Water Science & Technology*, *6*, 90–97.

29. Zuo, Q., and **G. Cui** (2012), Study on theoretical system and framework of interconnected river system network, *Water Resources and Power*, *1*, 1–5.

30. Dou M., **G. Cui**, Q. Zuo, C. Wang, C. Mao, and Y. Xu (2011), Character analysis of interconnected river system network, *China Water Resources*, *16*, 17–19.

31. Zuo, Q., and **G. Cui** (2012), Improvement of management and protection system in water function zones, *China Water Resources News*, March 15, 2012. (Newspaper)

32. Hu, Y., and **G. Cui** (2012), Discussions on strategic direction of water conservancy development in Heilongjiang province, *Heilongjiang Science and Technology of Water Conservancy*, *12*, 207–210.

33. Zuo, Q., B. Zhang, Z. Wang, F. Guan, and **G. Cui** (2011), Revelation and discussion on water science research from the "2011 No.1 document by the central committee of the CPC", *South-to-North Water Transfers and Water Science & Technology*, *5*, 68–73.

Manuscripts in progress

1. **Cui, G.**, M. Anderson, and R. Bales, Data for water-resources decision making in mountain headwater basins: challenges, opportunities, and research needs.

2. **Cui, G.**, and R. Bales, MODIS-based modeling of forest evapotranspiration supported by root-zone water storage in California's Sierra Nevada.

Presentations

1. **Cui, G.**, M. Anderson, and R. Bales, Precipitation and Snowpack Information for Decision Making from Basin-Scale Wireless-Sensor Networks, *103rd American Meteorological Society (AMS) Annual Meeting*, Paper 412757, Denver, CO, USA, Jan. 8-12, 2023.

2. Bales, R., M. Conklin, M. Goulden, B. Egoh, S. Khan, W. Guo, H. Guo, **G. Cui**, M. CHUNG, and M. Eriksson, Warming, wildfire, water, and the survival of mountain forests in the western US, *Geological Society of America (GSA) Connects 2022 Meeting*, v. 54, no. 5, https://doi.org/10.1130/abs/2022AM-379358, Denver, CO, USA, Oct. 12, 2022.

3. **Cui, G.**, R. Rice, M. Anderson, M. Conklin, and R. Bales, Ground-based sensor networks provide precipitation amounts and partitioning for near-real-time decision making in California's Sierra Nevada, *AGU Frontiers in Hydrology*, Abstract 407, San Juan, PR, USA, Jun. 19–24, 2022. *(Oral)*

4. **Cui, G.**, Q. Ma, and R. Bales, Hydrologic vulnerability of dense mixed-conifer forests in California's Sierra Nevada to multi-year droughts, *AGU Frontiers in Hydrology*, Abstract 413, San Juan, PR, USA, Jun. 19–24, 2022. *(poster)*

5. **Cui, G.**, and R. Bales, Snowpack mapping and forecasting by blending deep-learning estimates with ground observations in the Northern Sierra Nevada, *American Geophysical Union (AGU) Fall Meeting*, Abstract C35G-0947, New Orleans, LA, USA, Dec. 13–17, 2021. *(poster)*

6. **Cui, G.** and R. Bales, Deep-learning-based snowpack mapping and forecasting with ground observations: A case study using a wireless-sensor network in the American River basin, *88th Annual Western Snow Conference* , virtual format, Apr. 12-15, 2021. *(Oral)*

7. **Cui, G.**, R. Bales, and Q. Ma, Water-stress patterns of giant-sequoia groves during multi-year droughts, *American Geophysical Union (AGU) Fall Meeting*, Abstract B082-0013, San Francisco, CA, USA, Dec. 1–17, 2020. *(poster)*

8. **Cui, G.** and R. Bales, Water-Stress Vulnerability of Giant Sequoia Groves During Extended Droughts, *2020 Yosemite Hydroclimate Meeting*, virtual format, Oct. 15–16, 2020. *(Oral)*

9. **Cui, G.**, R. Bales, R. Rice, M. Anderson,F. Avanzi, P. Hartsough, and M. Conklin, MDetecting rain-snow transition elevations in mountain basins using wireless-sensor network, *2020 California Extreme Precipitation Symposium: Connecting Rain-on-Snow Events, Atmospheric Rivers, and Floods*, Davis, CA, USA, Jun 30, 2020. *(Invited talk)*

10. **Cui, G.**, R. Bales, M. Conklin, R. Rice, F. Avanzi, P. Hartsough, and W. Guo, Mountain Precipitation Patterns in Mixed Rain-Snow Areas from a Distributed Wireless-Sensor Network and a Random Forest Model, *American Geophysical Union (AGU) Fall Meeting*, Abstract C41B-01, San Francisco, CA, USA, Dec. 9–13, 2019. *(Oral)*

11. Guo, W., S. Khan, R. Bales, **G. Cui**, Q. Ma, Simulating water-carbon interactions in a Mediterranean mountain ecosystem using a dynamic global vegetation model, *American Geophysical Union (AGU) Fall Meeting*, Abstract B21G-2410, San Francisco, CA, USA, Dec. 9–13, 2019. *(Poster)*

12. **Cui, G.**, R. Bales, M. Conklin, R. Rice, F. Avanzi, P. Hartsough, and W. Guo, Estimating precipitation in a mountainous region from a wireless-sensor network, *Southern Sierra Critical Zone Observatory 2019 Annual Meeting*, Merced, CA, USA, Aug. 22, 2019. *(Poster)*

13. **Cui, G.**, R. Bales, M. Conklin, R. Rice, F. Avanzi, and P. Hartsough, Rain-snow transition elevation from wireless sensor network in American and Feather River basins , *87th Annual Western Snow Conference* , Reno, Nevada, USA, Apr. 15-18, 2019. *(Poster)*

14. **Cui, G.**, and J. Zhu, A smple and accurate rate-driven infiltration model, *American Geophysical Union (AGU) Fall Meeting*, Abstract H33D-1704, New Orleans, LA, USA, Dec. 11–15, 2017. *(Poster)*
15. **Cui, G.**, and J. Zhu, Dynamic modeling of infiltration in unsaturated layered soils, *American Geophysical Union (AGU) Fall Meeting*, Abstract H21C-1410, San Francisco, CA, USA, Dec. 12–16, 2016. *(Poster)*
16. **Cui, G.**, and J. Zhu, Effective Green-Ampt parameters of sloping layered soils, *American Geophysical Union (AGU) Fall Meeting*, Abstract H23B-1583, San Francisco, CA, USA, Dec. 14–18, 2015. *(Poster)*
17. **Cui, G.**, and J. Zhu, Effective hydraulic parameters for sloping heterogeneous soil formations, *Soil Science Society of America (SSSA) Annual Meeting*, Abstract 321-9, Minneapolis, MN, USA, Nov. 15–18, 2015. *(Poster)*
18. **Cui, G.**, and Q. Zuo, Analysis and quantitative evaluation of human activities affecting river system network interconnected relationship, *The 10th China Water Forum*, Wuhan, China, Aug. 24–26, 2012. *(Oral)*
19. **Cui, G.**, and J. Zhu, Infiltration model in layered soils: Application of steady-state modeling, *Civil Engineering Seminar at University of Wyoming*, Laramie, WY, USA, Mar. 9, 2017. *(Oral)*

Grants

1. Defining the rain-snow transition zone in the Northern Sierra Nevada , WaterSMART: Applied Science Grants, U.S. Bureau of Reclamation & California Department of Water Resources. (PI: Bales, R.; Lead author: **Cui, G.**). (*2020-2023*, Project DashBoard website)

Teaching & Advising

1. Academic advising, Individual Research (CE299) at the University of California, Berkeley. (Teacher: Bales, R.; *Sept.–Dec. 2020*)
2. Teaching assistant, Fluid Dynamics (ES2330) at the University of Wyoming. (Teacher: Zhu, J.; *Sept.–Dec. 2015*)
3. Teaching assistant, Water Resources at Zhengzhou University. (Teacher: Zuo, Q.; *Apr. 2012*)

Honours & Awards

- Wyoming Engineering Initiative Doctoral Fellowship, WY, USA 2014-2017
- Summer Ph.D. Augmentation, University of Wyoming, WY, USA 2017
- "Zhang Guangdou Funding" Scholarship for Highly Promising Students, Tsinghua University Education Foundation, China 2013
- Outstanding Graduate Award of Henan Province, Department of Education of Henan Province, China 2013
- National Graduate Scholarship, Ministry of Education of China, China 2012
- Outstanding Graduate Research Award, Zhengzhou University, China 2012
- Outstanding Youth Paper Award of China Water Forum, China Society of Natural Resources, China 2012
- Undergraduate Scholarship, Zhengzhou University, China 2007

Professional Service

- *Professional Affiliations:* American Geophysical Union (AGU), American Meteorological Society (AMS)
- *Reviewer Board:* Water.
- *Guest Editor:* Water — Yellow River Basin Management under Pressure: Present State, Restoration and Protection
  Frontiers in Marine Science — Flow, Mass Transport and Ecological Process in Land-Freshwater-Marine Ecosystems on Earth
- *Peer Reviewer:* PNAS Nexus, Geophysical Research Letters, Water Resources Research, Journal of Hydrology, Journal of Hydrometeorology, Soil Science Society of America Journal, Agricultural and Forest Meteorology, Journal of Hydrologic Engineering, Environmental Pollution, Environmental Earth Sciences, Water, Geosciences, Entropy, Atmosphere, Environmental Science and Pollution Research, Mathematics, Frontiers in Water.

Programming/Modeling Skills

- *Programming Languages:* Python, C++, GNU/Linux Bash, Fortran, Matlab, LaTeX, JavaScript.
- *Skills:* HYDRUS, DNDC, Google Earth Engine, SWAT, LPJ-GUESS, MODFLOW, ArcGIS, TensorFlow, Git, HPC platform, OpenMP.