

Ze JIANG

Water Research Center, University of New South Wales (UNSW), Sydney, Australia
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EDUCATION

University of New South Wales, Australia
2018 – 2021

Ph.D. in Water Resources Engineering

Supervisor: Prof. Ashish Sharma, A/Prof. Fiona Johnson

Thesis: *Implications of spectral transformations in hydro-climatology*

Partnership of five European Universities

Newcastle University (UK)
University of Nice-Sophia Antipolis (France)
Brandenburg University of Technology (Germany)
Technical University of Catalonia (Spain)
Warsaw University of Technology (Poland)

Erasmus Mundus Joint M.Sc. Degree: Hydro-Informatics and Water Management - EuroAqua

Supervisor: Prof. Frank Molkenhain, Prof. Heiko Sieker

Thesis: *Development and application of time-area function model based on QGIS environment*

2013 – 2015

Hohai University, Nanjing, China

2008 – 2012

B.Eng. in Environmental Engineering

GPA: 4.62/5.0, *Awarded the Most Outstanding Graduate*

RESEARCH INTEREST

- Hydro-climatological modeling and forecasting (e.g., Wavelet System Prediction)
- Postprocessing techniques for correcting bias in numerical weather predictions
- Climate change impact on the water cycle (e.g., floods and droughts)
- Hydrology/Hydraulics and water quality modeling
- Hydro-Informatics and water management

PROFESSIONAL EXPERIENCE

University of New South Wales (UNSW), Sydney, Australia (Jun. 2021 – Present) **Postdoctoral Research Associate**

- The development of Wavelet System Prediction (WASP) for characterizing hydroclimate system
- Hydro-climatological forecasting using CMIP decadal prediction and ACCESS seasonal forecasts
- Interannual rainfall forecasting with CMIP6 decadal projections over Australia
- Bias characterisation and correction in Numerical Weather Prediction (NWP) models

Helmholtz-Centre German Research Centre GFZ, Potsdam, Germany (May 2023 – Jul. 2023) **Visiting Research Scientist**

- Climate-informed flood estimation under a changing climate

Tropical Marine Science Institute (TMSI), National University of Singapore, Singapore (Nov. 2015 – Feb. 2018) **Research Engineer**

- DSSAT crop modeling of future rice yield in Vietnam under climate change, Singapore-MIT Alliance project.
- Development of index-based drought insurance for sovereign disaster risk transfer, World Bank project.
- Impact of climate change on inland and coastal flooding in Singapore, Public Utilities Board (PUB) project.
- Effectiveness of ABC Waters design features in residential developments, PUB-TMSI-Monash University project.

AWARDS & HONORS

- 2023 Helmholtz Visiting Researcher Grant by Helmholtz Association of German Research Centers
- 2021 Postdoctoral Writing Fellowship funded by UNSW
- 2018 University International Postgraduate Award (UIPA) funded by UNSW
- 2013 Erasmus Mundus Scholarship Award by European Union
- 2010 National Undergraduate Mathematical Contest in Modeling (Provincial Award)

PUBLICATIONS

1. Wu, Y., Li, Y., **Jiang, Z.**, Xu, Z., Yang, M., Ding, J., & Zhang, C. (2023). Machine Learning Prediction of Phosphate Adsorption on Six Different Metal-Containing Adsorbents. *ACS ES&T Engineering*. doi:10.1021/acsestengg.3c00001
2. **Jiang, Z.**, Johnson, F., & Sharma, A. (2023). Do derived drought indices better characterize future drought change? *Earth's Future*, 11(7), e2022EF003350.
3. **Jiang, Z.**, & Johnson, F. (2023). A new method for postprocessing numerical weather predictions using quantile mapping in the frequency domain. *Monthly Weather Review*, 151(8), 1909-1925.
4. Kusumastuti, C., **Jiang, Z.**, Mehrotra R., & Sharma, A. (2022). Correcting systematic bias in climate model simulations in the time-frequency domain. *Geophysical Research Letters*, 49(19), e2022GL100550.
5. Lang, Y.*, **Jiang, Z.***, & Wu, X. (2022). Investigating the linkage between extreme rainstorms and concurrent synoptic features: A case study in Henan, central China. *Water*, 14(7), 1065.

6. **Jiang, Z.**, Sharma, A., & Johnson, F. (2021). Variable transformations in the spectral domain – Implications for hydrologic forecasting. *Journal of Hydrology*, 603, 126816.
7. Kusumastuti, C., **Jiang, Z.**, Mehrotra R., & Sharma, A. (2021). A signal processing approach to correct systematic bias in trend and variability in climate model simulations. *Geophysical Research Letters*, 48(13), e2021GL092953.
8. **Jiang, Z.**, Rashid, M. M., Johnson, F., & Sharma, A. (2020). A wavelet-based tool to modulate variance in predictors: An application to predicting drought anomalies. *Environmental Modelling & Software*, 135, 104907.
9. Hohl, R., **Jiang, Z.**, Vu, T. M., Raghavan, S. V., & Liong, S.-Y. (2020). Using a regional climate model to develop index-based drought insurance for sovereign disaster risk transfer. *Agricultural Finance Review*, 81(1), 151-168.
10. **Jiang, Z.**, Sharma, A., & Johnson, F. (2020). Refining predictor spectral representation using wavelet theory for improved natural system modeling. *Water Resources Research*, 56(3), e2019WR026962.
11. **Jiang, Z.**, Sharma, A., & Johnson, F. (2019). Assessing the sensitivity of hydro-climatological change detection methods to model uncertainty and bias. *Advances in Water Resources*, 134, 103430.
12. **Jiang, Z.**, Raghavan, S. V., Hur, J., Sun, Y., Liong, S.-Y., Nguyen, V. Q., & Van Pham Dang, T. (2019). Future changes in rice yields over the Mekong River Delta due to climate change - Alarming or alerting? *Theoretical and Applied Climatology*, 137(1), 545-555.

TALKS

1. **Jiang, Z.**, Choudhury, D., and Sharma, A.: Unlocking the Future of Rainfall: Enhancing Interannual Forecasts with Spectral Transformations of CMIP Decadal Predictions, *Asia Oceania Geosciences Society (AOGS) 2023*, Oral presentation, Singapore, 31 July-04 August 2023, HS10-A010.
2. **Jiang, Z.**, Kibria, G., and Sharma, A.: Enhancing water supply management through improved rainfall anomaly forecasting over medium to long term, *International Union of Geodesy and Geophysics (IUGG) 2023*, Oral presentation, Berlin, Germany, 12 July 2023, IUGG23-4782.
3. Johnson, F. and **Jiang, Z.** (2023). Wavelet-based post-processing of NWP precipitation forecasts, *EGU General Assembly 2023*, PICO presentation, Vienna, Austria, 28 April 2023.
4. **Jiang, Z.**, Choudhury, D., and Sharma, A. (2023). Could the 2019-20 Australia bushfires or 2020-22 floods be predicted using CMIP decadal prediction? *EGU General Assembly 2023*, Oral presentation, Vienna, Austria, 24 April 2023.
5. **Jiang, Z.**, Sharma, A., & Johnson F. (2022). Hydrologic forecasting over long lead times: A wavelet-based variance transformation approach, *Asia Oceania Geosciences Society (AOGS) 2022*, Oral presentation, Online, Singapore, 5 August 2022.
6. **Jiang, Z.**, & Johnson, F. (2022). Applications of the Wavelet-based Method for Postprocessing Rainfall Forecasts – Implications for Urban Flood Forecasting, *Asia Oceania Geosciences Society (AOGS) 2022*, Oral presentation, Online, 2 August 2022.
7. **Jiang, Z.**, Sharma, A., & Johnson, F. (2021). Advanced wavelet-based variance transformation algorithms for ENSO forecasting over long lead times, 24th International Congress on Modelling and Simulation (*MODSIM 2021*), Oral presentation, Online, Sydney, Australia, 8 December 2021.
8. **Jiang, Z.**, Sharma, A., & Johnson, F. (2020). Hydro-climatological forecasting: A view from the spectral domain. *AGU Fall Meeting 2020*, Oral presentation, Online, San Francisco, CA, USA, 15 December 2020.
9. **Jiang, Z.**, Sharma, A., & Johnson, F. (2019). A wavelet-based method to analyse sustained hydrological anomalies under climate change, 23rd International Congress on Modelling and Simulation (*MODSIM 2019*), Oral presentation, Canberra, Australia, 6 December 2019.
10. **Jiang, Z.**, Sharma, A., & Johnson, F. (2019). Drought prediction for improved water resource management: A wavelet-based system prediction approach, *STAHY 2019*, Oral presentation, Nanjing, Jiangsu, China, 20 October 2019.
11. **Jiang, Z.**, Sharma, A., & Johnson, F. (2018). Assessing the impact of systematic biases in detection of hydrologic change across Australia, *STAHY 2018*, Oral presentation, Adelaide, South Australia, Australia, 18 September 2018.
12. **Jiang, Z.**, Raghavan, S. V., Hur, J., Sun, Y., & Liong, S.-Y. (2017). Impacts of Climate Change on Rice Crop Yields in Vietnam, *Asia Oceania Geosciences Society (AOGS) 2017*, Oral presentation, Singapore, 11 August 2017.

BOOK CHAPTERS

1. Raghavan, S. V., **Jiang, Z.**, Hur, J., Liu, J., Nguyen, N. S., & Liong, S.-Y. (2019). ASEAN Food Security under the 2 C-4 C Global Warming Climate Change Scenarios. In V. Anbumozhi, M. Breiling, & V. Reddy (Eds.), *Towards a Resilient ASEAN: Disasters, Climate Change, and Food Security: Supporting ASEAN Resilience* (Vol. 1, pp. 37-52). Jakarta, Indonesia: Economic Research Institute for ASEAN and East Asia.
2. Kim, D., Sun, Y., Wendi, D., **Jiang, Z.**, Liong, S.-Y., & Gourbesville, P. (2018). Flood modelling framework for Kuching City, Malaysia: overcoming the lack of data. In *Advances in Hydroinformatics* (pp. 559-568): Springer, Singapore.

SERVICE & LEADERSHIP

- Contribute to First Order Draft of IPCC 6th Assessment Report (FOD-WGII-AR6) as a group reviewer
- Contribute to Second Order Draft of IPCC 6th Assessment Report (SOD-WGI-AR6) as a group reviewer
- Topic Coordinator for a Special Issue of *Frontiers in Marine Science*
- Reviewer Editor: *Frontiers in Water* (Sections: Water and Climate; Water and Hydrocomplexity)
- Reviewer for Scholarly Journals: *Journal of Hydrology*; *Weather and Climate Extremes*; *Journal of Applied Meteorology and Climatology*; *International Journal of River Basin Management*; *Frontiers in Water*; *Water*; *Sustainability*; *International Journal of Environmental Research and Public Health*

MEMBERSHIP

- American Geophysical Union (AGU)
- European Geosciences Union (EGU)
- Asia Oceania Geosciences Society (AOGS)
- International Commission of Statistical Hydrology (ICSH-IAHS)
- Modeling and Simulation Society of Australia and New Zealand (MSSANZ)

TEACHING & ADVISING EXPERIENCE

- 2021-2023 Assistant to my advisor for: One Ph.D. student's research, two master students' thesis, and two undergraduate students' Final Year thesis
- 2021-2022 Assistant to assignment: Catchment and Water Resources Modelling (Prof. Ashish Sharma, UNSW)
- 2018-2019 Teaching Assistant & Grader: Fundamentals of Water Engineering (Prof. Ashish Sharma, UNSW)
- 2019 Teaching Assistant: Water Resources Engineering (A/Prof. Fiona Johnson, UNSW)

SKILLS

- Language: Mandarin (Native), English (Fluent), German (Basic), French (Basic).
- Strong interpersonal skills with a good sense of teamwork.
- Programming Skills: R, C/C++, and Python in both Unix and Windows systems.
- Rich experience in modeling and GIS, using MIKE, SWMM, DSSAT, and QGIS.