Ning Liu

Curriculum Vitae

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Work Experience

2017.11 - **Post Doctoral Research Fellow**.
School of Veterinary and Life Sciences, Murdoch University, Western Australia, Australia

2017.2 – 2017.11 **Research assistant**.
School of Veterinary and Life Sciences, Murdoch University, Western Australia, Australia

Education

2014-2017 **PhD**, *Environmental Science*.
Murdoch University, Western Australia, Australia

2010-2013 **MSc**, *Ecology*.
Chinese Academy of Forestry, Beijing, China

2006-2010 **BSc**, *Forestry*.
Shandong Agricultural University, Tai'an, China

Research Interests

1. GIS and remote sensing
2. Ecohydrological modelling
3. Agricultural science
4. Climate change and global biogeochemical cycles
5. Machine learning and big data computing

Research skills

Modelling	WaSSI-C (Mastery), ANUSPLINE (Proficiency), SWAT (Proficiency), Biome-BGC (Familiarity)
Software	ArcGIS (Proficiency), QGIS (Proficiency), ENVI (Proficiency), Latex (Proficiency), Leximancer (Proficiency), SAS (Familiarity), SPSS (Familiarity)
Programming	R (Mastery), FORTRAN (Mastery), Python (Proficiency), IDL (Proficiency), HTML (Familiarity)
Big data	Cloud Computing (Nectar and GEE) (Proficiency), High Performance Computing (Magnus) (Proficiency)

Publications

Published papers

1. **Liu, N.,** Shaikh, M. A., Kala, J., Harper, R. J., Dell, B., Liu, S., & Sun, G. (2018). Parallelization of a distributed ecohydrological model. ***Environmental Modelling & Software***, 101, 51-63. (IF = 4.4)
2. **Liu, N.**, Harper, R., Handcock R., Evans B., Sochacki, S., Dell, B., & Liu, S. (2017). Seasonal timing for estimating carbon mitigation in revegetation of abandoned agricultural land with high spatial resolution remote sensing. ***Remote Sensing***, 9, 545. doi:10.3390/rs9060545. (IF = 3.244)
3. **Liu, N.**, Harper, R., Dell, B., Liu, S., & Yu, Z. (2017). Vegetation dynamics and rainfall sensitivity for different vegetation types of the Australian continent in the dry period 2002 - 2010. ***Ecohydrology***. http://doi.org/10.1002/ECO.1811. (IF = 2.852; Cited by 1)
4. Zhang, M., **Liu, N**., Harper, R., Li, Q., Liu, K., Wei, X., & Liu, S. (2016). A global review on hydrological responses to forest change across multiple spatial scales: importance of scale, climate, forest type and hydrological regime. Journal of Hydrology, 546, 44-59. http://doi.org/10.1016/j.jhydrol.2016.12.040. (IF = 3.483; Cited by 3)
5. Sun, P., **Liu, N.**, Liu, S., & Sun, G. (2016). Trade-offs between water yield and carbon sequestration for sub-alpine catchments in western Sichuan, China. ***Chinese Journal of Plant Ecology***, 40(10), 1037-1048. http://doi.org/10.17521/cjpe.2016.0020 (in Chinese with English Abstract).
6. **Liu, N**., Sun, P., Liu, S., & Sun, G. (2013). Coupling simulation of water-carbon processes for catchment: calibration and validation of the WaSSI-C model. ***Chinese Journal of Plant Ecology***, 37(6), 492-502. (in Chinese with English Abstract).
7. **Liu, N**., Sun, P., & Liu, S. (2012). Research advances in simulating land water-carbon coupling. ***Chinese Journal of Applied Ecology***, 23(11), 3187-3196. (in Chinese with English Abstract)
8. **Liu, N**., Sun, P., Liu, S., & Sun G. (2012). Determination of spatial scale of response unit for the WaSSI-C eco-hydrological model: a case study on the upper Zagunao River watershed of China. ***Chinese Journal of Plant Ecology***, 37(2), 132-141. http://doi.org/10.3724/SP.J.1258.2013.00014 (in Chinese with English Abstract)
9. Sun, P., Yu, Z., Liu, S., Wei, X., Wang, J., Zegre, N., & **Liu, N**. (2012). Climate change, growing season water deficit and vegetation activity along the north-south transect of

eastern China from 1982 through 2006. ***Hydrology and Earth System Sciences***, 16(10), 3835-3850. http://doi.org/10.5194/hess-16-3835-2012. (IF = 4.437; Cited by 10)

Papers under review

10. **Liu, N.**, Harper, R., Liu, S., & Dell, B. (2018). Water use efficiency responses of Australia's forest ecosystems to drought. ***Forest Ecology and Managenent***
11. **Liu, N.**, Harper, R., Liu, S., Dell, B., & Sun, G. (2018). Projecting water yield and ecosystem productivity to climate change across Australia's hydrologic reference stations. **Climatic Change**.
12. **Liu, N.**, Sun, P., Liu, S., Harper, R., Dell, B. (2018). Spatial and temporal variations of water and carbon processes of Minjiang watershed from 2002 to 2014 in the southwest of China. ***Ecological Research***

Presentations at conferences

1. **Liu, N.**, *et al*. New applications of UAV technology in agriculture: estimating carbon sequestration and water repellency. **UAS4RS 2017 (Unmanned Aircraft Systems for Remote Sensing) Conference**. 24 - 25 May 2017. Tasmania, Australia
2. **Liu, N.**, *et al*. Responses of Water and Vegetation to Climate Changes in South-Western Australia. **IUFRO Regional Congress for Asia and Oceania 2016**. 24-27 October 2016. Beijing, China
3. **Liu, N.**, *et al*. Water use efficiency responses of Australia's forest ecosystems to drought. **IUFRO Regional Congress for Asia and Oceania 2016**. 24-27 October 2016. Beijing, China
4. **Liu, N.**, *et al*. Vegetation dynamics and rainfall sensitivity of the Australia continent. **International Conference on Forests and Water in a Changing Environment 2015**. 6-9 July 2015. Kelowna, British Columbia, Canada

Research experience

2014–2017 **PhD**, *Environmental Science, School of Veterinary and Life Sciences, Murdoch University*, Perth, Australia.

Thesis project: **Effects of climate change on forest water and carbon balance in Australia and China**

- Studied relationship between vegetation indices (NDVI & LAI) and water inputs (rainfall & soil moisture) for different vegetation types in Australia continent;
- Revised WaSSI-C model for simulating carbon and water processes
  - Developed theory of WaSSI-C model with latest result from global Eddy Flux;
  - Revised WaSSI-C model from monthly and catchment scale to daily and gridded scale model (dWaSSI-C);
  - Parallelized dWaSSI-C to suit HPC simulation;

- Built a R package of dWaSSI-C;

- Reviewed hydrological responses to forest change across multiple spatial scales
- Conducted carbon estimation in revegetation of abandoned agricultural land with high spatial resolution remote sensing.
- Studied water use efficiency responses of Australia's forest ecosystems to drought.
- Analyzed responses of water and vegetation to climate changes at catchment scale in Australia
- Predicted responses of water and carbon to climate changes scenarios in the future

2010–2013 **MSc**, Institute of Forest Ecology, Environment and Protection, Chinese Academy *of Forestry*, Beijing, China.

Thesis project: **Simulation and coupling water and carbon processes for subalpine forest ecosystems in Southwest of Sichuan Province**

- Identified the best hydrology response unit (HRU) scale for WaSSI-C model;
- Evaluated the applicability and improvements of WaSSI-C in the southwest of China:
- Developed several data processing and displaying programs as well as calibration and validation modules for WaSSI-C model.
- Assessed the spatial and temporal patterns of water and carbon interactions in southwest of China, and quantified the exchange between water and carbon of subalpine forest ecosystem under climate change.

Awards, Prizes and Scholarships

2017	The 12th International Congress of Ecology Conference's Travel Award ($1000)
2015	Murdoch University's Conference Travel Award ($2500)
2014	Murdoch University PhD Scholarship ($87,500)
2013	National Scholarship, China ($4000)
2013	Outstanding Graduate in Beijing
2013	Outstanding Graduate Student of Chinese Academy of Forestry
2010	Outstanding Graduate of Shandong Province
2019	Outstanding Student Research Training Project of Shandong Agricultural University
2006-2010	Excellent Student Scholarship (6 times)

Other Academic Activities

2018 Attended “Climate and Water Summer Institute Symposium” of OZEWEX at Australian National University, Canberra

2016 Presented knowledge about "Theory of remote sensing and big data processing" to students visiting Murdoch University from Northwest Agriculture and Forestry University

2016 Presented examples of big data processing to high school students in "Big Data Crunch: SciTech Planetarium" in Perth, Western Australia

2013 Participated in the Student Research Training (SRT) Project in Shandong Agricultural University, China

2013 Worked as a volunteer for the international symposium "International Conference on Response of Forests and Adaptation Management to Climate Change" hosted by IUFRO, China

2013 Attended the certificated training course "Development and Application of Water Cycle Model - SWAT"

2013 Attended the certificated training course "Applied Engineer of Water Numerical Simulation and Calculation Technology"

2013 Attended the certificated training course "USCCC about Carbon Flux"

References

Prof. Shirong Liu

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Prof. Richard Harper

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Tel.: +61 8 9360 2191
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