YI YU

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EDUCATION

The Australian National University, Canberra, Australia 07/2021 – Present

Doctor of Philosophy

- Project title: From point-to-pixel: understanding spatiotemporal scaling to improve soil moisture modelling capability through the utilisation of satellite observations

The Australian National University, Canberra, Australia 07/2018 – 08/2020

Master of Environment (Advanced)

- GPA: 6.56/7.00 (First Class Honours Equivalent); Activity: ANU Student Research Conference

Southwest University, Chongqing, China 09/2014 – 06/2018

Bachelor of Land Resource Management

- Activity: Summer Program of Environmental Science (University of British Columbia, 2017)

EXPERIENCES

ANU Institute for Water Futures Canberra, Australia 01/2021 – Present

Research Officer Supervisor: Dr. Luigi Renzullo

Project: Data Assimilation into the AWRA-CMS for improved operational and forecast modelling

- Processing continent-scale geospatial data acquired from NASA, USGS and CSIRO. Establishing ensemble machine learning models by using packages from Python (e.g. sklearn and PyTorch) and R (e.g. randomForest). Familiar with essential Linux commands and utilising programming modules from Gadi (a supercomputer located in the ANU campus) to complete research tasks.
- Undertaking testing and statistical analysis as required and preparing and disseminating relevant analysis reports to internal and external stakeholders, including external funding agencies.
- Participating in workshops and professional networks across campus to develop a broad base of industry knowledge, and providing input to improve the area's research practices and processes.

PUBLICATIONS

- **Yu, Y.**, Renzullo, L.J. and Tian, S., 2021. Continental scale downscaling of AWRA-L analysed soil moisture using random forest regression, *24th International Congress on Modelling and Simulation, Sydney, Australia.*
- **Yu, Y.**, Xu, T. and Wang, T., 2020. Outmigration Drives Cropland Decline and Woodland Increase in Rural Regions of Southwest China, *Land, 9*(11), p.443.
- Wang, T., Yan, J., Cheng, X. and **Yu, Y**., 2020. Irrigation Influencing Farmers' Perceptions of Temperature and Precipitation: A Comparative Study of Two Regions of the Tibetan Plateau, *Sustainability, 12*(19), p.8164.

DESCRIPTIONS OF MOST SIGNIFICANT PUBLICATIONS

[1] Continental scale downscaling of AWRA-L analysed soil moisture using random forest regression

- As a first step towards high-resolution daily Australia-wide soil moisture (SM) estimation, a downscaling framework was developed to generate monthly SM with 500-m spatial resolution using analysed SM from the Australian Water Resource Assessment Landscape (AWRA-L) model and multisource geospatial predictors (including topographic data, soil texture and MODIS retrievals) in a random forest (RF) regression.

- The downscaled SM showed greatly enhanced spatial details at the local scale while maintaining same performance with AWRA-L analysis in the validations against in-situ data.
- This study explored the potential of ML approach for the SM downscaling applications at a continental scale. It could be a promising direction to exploit the modelling capability of integrating multisource geospatial data including satellite retrievals, land surface models (LSM) and interpolated ground observation data.

[2] Outmigration Drives Cropland Decline and Woodland Increase in Rural Regions of Southwest China

- Used a case study in southwest China to investigate how regional land use patterns have been changed in the context of rural outmigration and assessed the resulting dynamics on local society, agriculture, and the ecological environment. Data from multiple sources (e.g. climatic datasets, statistics and NDVI) were utilised to conduct a comprehensive assessment.
- The results implied that vegetation improvement can occur in the context of depopulation and farmland reduction, which didn't significantly threaten local agriculture. It could be a good choice to allow those high-slope and biophysically poor farmlands to undergo natural ecological evolution rather than cultivation.
- This study provided new insights and more realistic scenarios for rural development. The findings are expected to provide a better understanding to enable sustainable land use management in southwest China.

[3] Irrigation Influencing Farmers' Perceptions of Temperature and Precipitation - A Comparative Study of Two Regions of the Tibetan Plateau

- Compared farmers' perceptions of temperature and precipitation change with meteorological data in two regions of the Tibetan Plateau and analysed how irrigation affects farmers' perceptions. Data were obtained from local meteorological stations and household questionnaires (N = 1005)
- This study found that farmers' perception of temperature change was consistent with meteorological data, but there was an obvious difference in precipitation perception between the two regions. The results also showed that irrigation facilities played a mediating role on precipitation perception and farmers having access to irrigation facilities were more likely to perceive increased precipitation.
- Provided suggestions to farmers and local governments that meteorological data and farmers' perceptions should be integrated when developing policies, and the consequences of climate change should be publicised to improve farmers' abilities of risk perception

★ Honours & Awards

- ANU University Research Scholarship
- CSIRO-ANU Digital Agriculture PhD Supplementary Scholarship
- ANU Unilodge Senior Resident Scholarship 2020
- MaxDream Achiever Scholarship 2020

i Skills & Certificates

- **Programming Languages**: R Programming (Expert); Python (Proficient); Shell Scripting
- **Software Packages**: ArcGIS; EndNote; Google Earth Engine; LaTeX

References

- References available on request.