Shuhui Wang

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Education

Master of Science in Soil and Water Conservation, *Beijing Forestry University* Expected 06/2022
Thesis: *Research on Non-point Source Pollution and Best Management Practices planning in a Typical Agricultural Watershed in the Three Gorges Reservoir Region*
Advisors: Dr. Yujie Wang and Dr. Yunqi Wang

Bachelor of Science in Soil and Water Conservation, *Beijing Forestry University* 06/2019
Thesis: *Research on the Characteristics of Runoff and Sediment Discharge of the Yangtze River in the Three Gorges Reservoir Region*
Advisors: Dr. Yujie Wang and Dr. Yunqi Wang

Research Experience

Full-time Student Researcher / National Key R & D Program of China 11/2018 — 03/2022
Beijing Forestry University *Beijing, Chongqing and Hubei, China*

- **Watershed Planning for Non-point Source Pollution Control**
  - Designed 60 Best Management Practice (BMPs) scenarios for non-point source pollution control, and developed a BMPs database comprising the ecological effectiveness and costs
  - Built multi-objective evolutionary algorithms (NSGA-II, NSGA-III, MOEA/D) to find the optimal watershed planning and compared the performance of three algorithms in multi-objectives watershed planning problem. The average cost of proposed watershed planning is nearly 50% that of unoptimized planning for the same ecological objective
  - Authored the research manuscript, which has been submitted to the journal (under review)
  - Delivered presentations on the comprehensive strategy on non-point source pollution research and control system to graduate students
- **Assessment of influencing factors on non-point source pollution critical source areas**
  - Collected spatial and attribute data (runoff, soil property, land use, meteorological, etc.), develop a semi-distributed model (AnnAGNPS) for the study watershed and identified the critical source areas of non-point source pollution
  - Applied machine learning method (Boosted Regression Tree Model) to identify the dominant influencing factors on critical source areas as well as the non-linear relationships and thresholds associated with the non-point pollution loads variations that watershed managers should be aware of
  - Adopted clustering analysis for critical source areas further classification and proposed suitable BMPs scenarios for decision makers
  - Authored the research manuscript, which has been submitted to the journal (under review)
- **Experimental Research on the Ecological Effectiveness of Vegetation Stripe**
  - Assembled experiment apparatus and cultivated vegetation stripe at the experimental site, collected water samples and measured water quality indicators
  - Quantified the reduction rate of vegetation stripe on sediment, total nitrogen and total phosphorus, identified the optimal stripe width and vegetation type for non-point source pollution control in Three Gorges Reservoir Region
  - Co-authored the research manuscript, which has been published [DOI]
  - Co-designed a vegetation stripe construction method, which is particularly beneficial for non-point source pollution control in sloping areas. This method has been published as a patent [Link]
- **Analysis of Runoff and Sediment loads variations in the Three Gorges Reservoir Region**
  - Collected runoff and sediment data of the Yangtze River in the Three Gorges Reservoir Region (2002-2017), applied Mann-Kendall test and Double Cumulative Curve to analyze the trend and mutation points of the runoff and sediment loads
  - Quantified the average contribution rates of human activity and climate change on Runoff and Sediment loads after the establishment of Three Gorges Reservoir, which further validated the ecological impact of the Three Gorges Dam
  - Authored, revised the research manuscript, which has been published [DOI]

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Teaching Experience

Teaching assistant/ Innovation and Entrepreneurship Training Program for College Student 06/2020 — 08/2021
Beijing Forestry University *Beijing and Chongqing, China*

- Advised 6 undergraduate student in their research program. The research focuses on helping decision makers decide which BMPs scenario meets the ecological objective
- Presented two short teaching sessions and made a tutorial to introduce the basic functionalities of the AnnAGNPS model, and how to use it to develop management practices for the study watershed
- Helped to prepare and revise application materials and presentations for the final defense
- Supervised an undergraduate student in developing a best management practices selection system and obtained the software copyright [Link]

Leadership Experience

Team Leader / Innovation and Entrepreneurship Training Program for College Student 06/2017 — 10/2018
Beijing Forestry University *Beijing, China*

- Designed the research program. The research focuses on analyzing the soil erosion resistance characteristics of different vegetation pattern in slopping area
- Drafted and revised the application materials, delivered a presentation and raised funding (5k yuan) for the research project
- Assembled experiment apparatus, organized experiments, collected sediment samples, and measured sediment loads during every experiment
- Wrote a comprehensive experimental report, drafted a research manuscript, delivered a presentation on the experimental results of the research to faculty advisors

Publication

Journal Articles

Wang S., Wang Y*., Wang Y., Wang Z., 2022. Performance comparison of Multi-objective Evolutionary Algorithms Applied to BMPs Planning Problem. *Journal of Environmental Management*. (Under Review)

Wang S., Wang Y*., Wang Y., Wang Z., 2022. Assessment of Influencing Factors on Non-point Source Pollution Critical Source Areas in An Agricultural Watershed. *Ecological Indicators*. (Under Review)

Wang Z., Wang Y*., Ding X., Wang Y., Yan Z., **Wang S.**, 2022. Evaluation of net anthropogenic nitrogen inputs (NANI) in the Three Gorges Reservoir Area. *Ecological Indicators*. (Under Review)

Wang S., Su B., Wang Y*., Wang Y., Zhu J., Fu J., 2021. Change analysis of runoff and sediment in the Three Gorges Reservoir Region in recent 16 years. *Science of Soil and Water Conservation* 19, 69-78 (in Chinese with English abstract) [DOI].

Fu J., Wang Y*., Wang Y., Wang C., **Wang S.**, Wang Z., 2020. Effect of herbal buffer on pollutant reduction under different inflow conditions. *Journal of Soil and Water Conservation* 34, 129-134 (in Chinese with English abstract) [DOI].

Patent and Software Copyright

Wang Y., Wang Z., **Wang S.**, Cui W., 2021. "Best Management Practices (BMPs) Selection System v1.0 for Agricultural Surface Pollution Technologies in Watersheds in the Three Gorges Reservoir Area." CN Software Copyright 2021SR215280 [Certificate File]

Fu J., Wang Y., Wang Z., **Wang S.**, 2020. "Vegetation Buffer Belt and Construction Method for Optimized Water Flow Path," CN Patent 110731238 A [Link]

Skills

Languages and Tools	R, Python, LaTeX
Data Visualization Tools	AutoCAD, ArcGIS, Illustrator, Photoshop
Technical Models	SWAT, AnnAGNPS, WEPP, SPAW
Communication	English (fluent), Chinese, Cantonese (oral comprehension)

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Awards and Honors

First Class Scholarship, *Beijing Forestry University* 2019 — 2021
Postgraduate admission without entrance examination, *Beijing Forestry University* 2018
Liang Xi Scholarship, *Beijing Forestry University* 2016 — 2018
Liang Xi Academic Class Student, *Beijing Forestry University* 2015

References

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