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Shuhui Wang

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Academic Homepage
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Education

PhD Student in Earth and Environmental Sciences, *The University of British Columbia, Canada* 09/2023 -
Thesis Topic: *Hydrological Responses to Wildfire at the Watershed Scale in British Columbia, Canada*
Supervisor: Dr. Xiaohua (Adam) Wei

MSc in Soil and Water Conservation Engineering, *Beijing Forestry University, China* 09/2019 - 06/2022
Thesis: *Research on Non-point Source Pollution and Watershed Management in a Typical Agricultural Watershed in the Three Gorges Reservoir Region*
Supervisors: Dr. Yujie Wang and Dr. Yunqi Wang

BSc in Soil and Water Conservation Engineering, *Beijing Forestry University, China* 09/2015 - 06/2019
Thesis: *Research on the Runoff and Sediment Discharge Characteristics of the Yangtze River in the Three Gorges Reservoir Region*
Supervisors: Dr. Yujie Wang and Dr. Yunqi Wang

Research Experience

Full-time Student Researcher / National Key R & D Program of China 11/2018 - 06/2022

Beijing Forestry University *Beijing, Chongqing and Hubei, China*

- **Developing cost-effective watershed management strategies to reduce non-point source pollution**
  - Conceived and crafted the research project, established the theoretical framework
  - Designed 60 Best Management Practice scenarios for watershed management
  - Established a simulation-based optimization framework to develop robust and cost-effective watershed management strategies
  - Optimized the framework through performance comparisons and sensitivity analysis of advanced evolutionary algorithms in a real-world multi-objective watershed management problem
  - Provided practical, optimized and cost-effective watershed management strategies to decision makers
  - Drafted, edited and first-authored the research article [DOI]
- **Assessing the influencing factors on non-point source pollution critical source areas in an agricultural watershed**
  - Conceptualized the research project and developed the theoretical framework
  - Established a comprehensive database for the study watershed (watershed properties, field management records, long-term climate data, etc.), and identified the critical source areas within the watershed with semi-distributed hydrological model (AnnAGNPS)
  - Quantified the contribution of each environmental & anthropogenic factor to critical source areas, explored the non-linear relationships and potential thresholds that could cause great changes in pollution losses with machine learning techniques
  - Drafted, edited and first-authored the research article [DOI]
- **Research on quantifying the effectiveness of vegetated buffer stripes on non-point source pollution**
  - Assembled experiment apparatus, cultivated vegetation buffer, collected water samples and measured water quality indicators (sediment, TN, TP) in the laboratory
  - Quantified the reduction rates of vegetated buffers on sediment, TN and TP, identified the optimal buffer width and vegetation type for the Three Gorges Reservoir Region
  - Co-authored the research article [DOI] and co-patented an innovative technique for constructing efficient vegetated buffer stripes in sloping areas [Link]
- **Analysis of Runoff and Sediment variations in the Three Gorges Reservoir Region**
  - Developed the research framework and methodology
  - Conducted statistical analysis of long-term (2002-2017) runoff and sediment load variations in the Three Gorges Reservoir Region using Mann-Kendall test, Double Cumulative Curve methods, Sen's slope, etc.
  - Quantified the impact of human activity and climate change on runoff and sediment
  - Drafted, edited and first-authored the research article [DOI]

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Teaching Experience

Graduate Assistant/ Innovation and Entrepreneurship Training Program for College Student 06/2020 - 08/2021
Beijing Forestry University *Beijing and Chongqing, China*

- Supervised 6 undergraduate students on their research project. The study aims to develop an efficient software for filtering practical BMP to control non-point source pollution while calculating associated construction costs.
- Delivered presentations on the topics of remote sensing and hydrological & water quality modeling in watersheds
- Prepared and revised application materials for the program, and delivered the presentation for the final defense
- Developed, registered and licensed BMP database and BMP selection system software [Link]

Leadership Experience

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

- Conceptualized the research and developed the theoretical framework
- Designed the research project. This study focuses on exploring the effectiveness of different vegetation patterns on reducing soil erosion in sloping areas
- Drafted and revised the application materials, delivered the presentation to raise funds (5,000 RMB) for the project
- Designed experiments, assembled experimental setups (cultivated grass patterns on soil-bed experimental flume), collected sediment samples and measured sediment loads
- Wrote the experimental reports, drafted a research manuscript, and made the final defense

Publication

Journal Articles

Wang S., Wang Y*., Wang Y., Wang Z., 2022. Comparison of multi-objective evolutionary algorithms applied to watershed management problem. *Journal of Environmental Management* 324, 116255 [DOI]

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* 141, 109084 [DOI]

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].

Wang Z., Wang Y*., Ding X., Wang Y., Yan Z., **Wang S.**, 2022. Evaluation of net anthropogenic nitrogen inputs in the Three Gorges Reservoir Area. *Ecological Indicators* 139, 108922 [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 Non-point Source Pollution Control in the Three Gorges Reservoir Area." CN Software Copyright 2021SR215280 [Certification]

Fu J., Wang Y., Wang Z., **Wang S.**, 2020. "The Construction Method of Vegetated Buffer Stripes for Optimized Flow Routing." CN Patent 110731238 A [Link]

Skills

Languages and Tools	R, Python, LaTeX, HTML
Data Visualization	ArcGIS, AutoCAD, Photoshop, Illustrator
Technical Models	SWAT, AnnAGNPS, RUSLE, WEPP, SPAW
Laboratory Skills	Experimental Design, Laboratory Techniques
Communication	English (Fluent), Mandarin (Native), Cantonese (Elementary)

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Awards and Honors

International Four-Year Doctoral Partial Tuition Award, *The University of British Columbia*	2023
UBC Okanagan Graduate Research Scholarships, *The University of British Columbia*	2023
China Scholarship Council (CSC) Scholarship	2023
First Class Scholarships, *Beijing Forestry University*	2019 —2022
Admission to the Graduate Program without Examination*, *Beijing Forestry University*	2018
Liang Xi Scholarships, *Beijing Forestry University*	2015 — 2018
Liang Xi Academic Class Student, *Beijing Forestry University*	2015

References

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* Granted to students with exceptional academic performance