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Shuhui Wang

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Education

Master of Science in Soil and Water Conservation Engineering, *Beijing Forestry University* 06/2022
Thesis: *Research on Non-point Source Pollution and Watershed Management 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 Engineering, *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 — 06/2022
Beijing Forestry University *Beijing, Chongqing and Hubei, China*

- **Developing watershed management strategies to reduce non-point source pollution**
  - Conceptualized the research and developed the theoretical framework
  - Designed 60 Best Management Practice (BMP) scenarios and developed a database for watershed management
  - Developed a simulation-based optimization framework to search cost-effective watershed management strategies
  - Compared the performance of several advanced MOEAs applied to a real-world multi-objective watershed management problem
  - Delivered a presentation on non-point source pollution studies and watershed management to international graduate students (2022-5-16)
  - First-authored the research manuscript, which was published [DOI]
- **Assessment of influencing factors on non-point source pollution critical source areas**
  - Conceptualized the research and developed the theoretical framework
  - Collected spatial and attribute data of the study watershed (runoff, soil property, land use, meteorological data, etc.), applied a semi-distributed model (AnnAGNPS) to identify the critical source areas
  - Applied machine learning technique to identify the dominant influencing factors of critical source areas, explored the non-linear relationships and potential thresholds that may cause great changes in pollution losses
  - Filtered a set of suitable BMPs to reduce non-point source pollution for decision makers
  - First-authored the research manuscript, which was published [DOI]
- **Research on quantifying the effectiveness of vegetated buffer stripes**
  - Assembled experiment apparatus, cultivated vegetation and collected water samples, measured water quality in the laboratory
  - Quantified the reduction rate of vegetated buffers on sediment, total nitrogen and total phosphorus, identified the optimal width and vegetation type of buffer stripes in the Three Gorges Reservoir Region
  - Co-authored the research manuscript, which was published [DOI]
  - Co-designed a technique for constructing vegetated buffer stripes in sloping areas, which was published as a patent [Link]
- **Analysis of Runoff and Sediment variations in the Three Gorges Reservoir Region**
  - Conceptualized the research and developed the theoretical framework
  - Analyzed long-term (2002-2017) runoff and sediment loads changes in the Three Gorges Reservoir Region using Mann-Kendall test and Double Cumulative Curve
  - Quantified the impact of human activity and climate change on runoff and sediment
  - First-authored the research manuscript, which was published [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. This study focuses on developing an efficient and effective software to filter practical BMPs to reduce non-point source pollution and calculate their construction costs for decision makers
- Made presentations on remote sensing and hydrological water quality modeling
- Prepared and revised the application materials, made the presentation for final defense
- Co-developed the BMPs selection system software, which was registered and licensed [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 soil erosion in sloping areas
- Drafted and revised the application materials, delivered a presentation and raised funds (5k RMB) for the project
- Designed experiments, assembled experimental setups (cultivated grass on a soil-bed experimental flume), collected sediment samples and measured sediment loads
- Wrote the experimental reports, drafted research manuscripts, 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 (Centrifugation, Titration, etc.)
Communication	English (Duolingo 135), Mandarin (Linguistic background), Cantonese (Intermediate)

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Awards and Honors

First Class Scholarships, *Beijing Forestry University* 2019 — 2021
MS Admission without Entrance Exam, *Beijing Forestry University* 2018
Liang Xi Scholarships, *Beijing Forestry University* 2016 — 2018
Liang Xi Academic Class Student, *Beijing Forestry University* 2015

References

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