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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 database comprising the ecological effectiveness and costs of each BMPs scenario
  - Built multi-objective evolutionary algorithms (MOEAs: NSGA-II, NSGA-III, MOEA/D) to find the watershed planning with optimal ecological-economical effectiveness, compared the performance of MOEAs in multi-objectives watershed planning problem. For the same ecological objective, the watershed plans proposed in this study cost roughly 50% those un-optimized plans
  - Authored the research manuscript, which has been submitted to the journal (under review)
  - Delivered presentations on non-point source pollution study and watershed planning 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 data, etc.), developed a semi-distributed model (AnnAGNPS) for the study watershed and identified the critical source areas of non-point source pollution
  - Applied statistical machine learning method (Boosted Regression Tree) to identify the dominant influencing factors of critical source areas as well as the non-linear relationships and thresholds associated with the non-point pollution loads that watershed managers should be aware of
  - Adopted cluster 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 Vegetated Buffer Stripes**
  - Assembled experiment apparatus, cultivated vegetation and collected water samples in the field experiments, measured water quality indicators in the laboratory
  - Quantified the reduction rate of vegetated buffer stripes on sediment, total nitrogen and total phosphorus, identified the optimal stripe width and vegetation type for non-point source pollution control in the Three Gorges Reservoir Region
  - Co-authored the research manuscript, which has been published [DOI]
  - Co-designed a construction method of vegetated buffer stripes, 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 trends and mutation points of long-term runoff and sediment loads
  - Quantified the average contribution rates of human activity and climate factors on runoff and sediment loads variation, which further validated the ecological impact of the construction of 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 students on their research project. This study focuses on developing an efficient and simple tool for identifying potentially useful BMPs for non-point source pollution control to provide data support for decision makers
- Presented two short teaching sessions and made a tutorial on the basic functionalities of the AnnAGNPS model, and how to use it to evaluate the ecological effectiveness of management practices
- Helped to prepare and revise application materials and presentations for the final defense
- Supervised an undergraduate student and co-developed the BMPs 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*

- Designed the research project. The study focuses on analyzing the soil erosion resistance characteristics of different vegetation pattern in sloping areas
- Drafted and revised the application materials, delivered a presentation and raised funding (5k yuan) for the research project
- Organized experiments, assembled experiment apparatus, 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 study to 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 Non-point Source Pollution Control in the Three Gorges Reservoir Area." CN Software Copyright 2021SR215280 [Certificate File]

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
Data Visualization Tools	AutoCAD, ArcGIS, Illustrator, Photoshop
Technical Models	SWAT, AnnAGNPS, RUSLE, WEPP, SPAW
Laboratory Skills	Experimental Design, Basic Laboratory Techniques (centrifugation, titration, etc.)
Communication	English (IELTs 6.5), Chinese, Cantonese (basic)

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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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