

YAO HU

Harker ISE Lab
Newark, DE 19716
Email: yaohu@udel.edu

Education

- 08/2010 – 02/2016 **University of Illinois**, Urbana-Champaign, Illinois, United States
Doctor of Philosophy in Civil and Environmental Engineering
Dissertation: *Agent-based models to couple natural and human systems for watershed management analysis*
- 10/2006 – 10/2008 **Hamburg University of Technology**, Hamburg, Germany
Master of Science, Environmental Engineering
Thesis: *Modeled water flow in the unsaturated zone with Richards Equation and Storage Model*
- 09/2002 – 06/2006 **Huazhong University of Science and Technology**, Wuhan, China
Bachelor of Engineering, Civil Engineering
Bachelor of Science, Computer Science and Technology

Appointments

- 03/2020 – Now
- **Assistant Professor**, Department of Geography & Spatial Sciences (Primary) and Department of Civil & Environmental Engineering, University of Delaware
 - **Director**, GIScience and Environmental Data Analytics Program, Department of Geography & Spatial Sciences
 - **Affiliated Faculty** with Engineering and Policy Program, Water Science and Policy Program, Data Science Institute and Artificial Intelligence Center of Excellence, University of Delaware

Research Interests

Water Intelligent System, Coupled Human and Water Systems (Socio-hydrology), Agent-based Modeling, Hydroinformatics, Hydrology and Water Resource Management, Data Science and Machine Learning, Environmental System Analysis and Optimization

Current grants and contracts

(Total Grants: >\$38.5M PI's Share: >\$3.4M)

1. National Science Foundation (NSF). CAREER: Advancing a Participatory Framework for Decentralized Stormwater Management, 09/2026 – 08/2031, Total: \$524,630, Yao Hu (PI).
2. DOD-Engineering Research and Development Center (ERDC). Integrated Modeling for Predictive Analysis of Coastal Terrains (IMPACTS), 10/2024 – 09/2028, Total: \$8M, Yao Hu (Co-PI).
3. National Science Foundation. SAI: Examining Long-Term "Success" of Green Stormwater Infrastructure, 09/2024 – 08/2027, Total: \$749,964, Yao Hu (Co-PI).
4. DOD-Engineering Research and Development Center (ERDC). Developing Engineering practices using Ecosystem Design Solutions for Future Army (DEEDS), 06/2022 – 01/2027, Total: \$10M, Yao Hu (Co-PI).

Past grants and contracts

1. Delaware Solid Waste Authority (DSWA). Interpretable, Reliable Model for Estimating Hydrogen Sulfide Emissions from Landfills, 12/2022 – 08/2023, Yao Hu (PI), \$40,000.
2. NOAA and University of Michigan. Workflow Demonstration: Daily Runoff Risk Prediction in the Great Lakes Region. 09/2022 – 8/2023, Yao Hu (PI), \$50,000.
3. NOAA and University of Michigan. Developing a Decision Support Tool for Agricultural Nutrient Application Timing using the National Weather Service National Water Model Framework. 06/2020 – 12/2021, Yao Hu (PI), \$90,000.
4. NSF. SAI-P: Optimizing Deployment of Green Stormwater Infrastructure for Maximum Benefit, 09/2022 – 09/2024, Total: \$123,556, Yao Hu (Co-PI).
5. NSF. EPSCoR RII Track 1: Water Security in Delaware's Changing Coastal Environment. 10/2018 – 08/2024, Total: \$19M, Yao Hu (Sub-PI), \$100,000.

Publication and Scholarly Presentations

(*: Corresponding author; Bold: Group members)

Full articles in peer-reviewed journals

1. **S. Xi** and **Y. Hu***. (2026). Street-to-Pipe Diagnosis of Compound Rain-Tailwater Flooding in a Coastal Combined Sewer System: Sewer Pre-Filling and Outfall Throttling. *Earth's Future*. – Recently accepted.
2. D. F. Levia*, R. Bergquist, A. Meydani, **Y. Hu**, D. M. Hannah (2024). Hydrological Extremes Heighten Vulnerability to Schistosomiasis. *Earth's Future*, 12(6), e2024EF004659.
3. **Y. Hu***, **C. Ghosh** and **S. Malakpour-Estalaki** (2023). A methodological framework for improving the performance of data-driven models, a case study for daily runoff prediction in the Maumee domain, U.S. *Geoscientific Model Development*, 16(7), 1925-1936.
4. C. M. Ford, **Y. Hu***, **C. Ghosh**, L. M. Fry, **S. Malakpour-Estalaki**, L. Mason, L. Fitzpatrick, A. Mazrooei and D. Goering (2022). Generalization of Runoff Risk Prediction at Field Scales to a Continental-Scale Region Using Cluster Analysis and Hybrid Modeling. *Geophysical Research Letters*, e2022GL100667.
5. V. Prigobbe*, C. Dawson, **Y. Hu**, H. O. Sharif and N. Tahvildari (2022). Editorial: Coastal flooding: modeling, monitoring, and protection systems. *Frontiers in Climate*, 200.
6. **Y. Hu***, L. Fitzpatrick, L. M. Fry, L. Mason, L. K. Read and D. Goering (2021). Edge-of-field Runoff Prediction by a Hybrid Modeling Approach Using Causal Inference. *Environmental Research Communications*.
7. **Y. Hu**, C.M. Long, Y.C. Wang, B. Kerkez and D. Scavia* (2019). Urban Total Phosphorus Loads to the St. Clair-Detroit River System. *Journal of Great Lakes Research*, 45(6), 1142-1149.
8. D. Scavia*, S.A. Bocaniov, A. Dagnew, **Y. Hu**, B. Kerkez, C.M. Long, R.L. Muenich, J. Read, L. Vaccaro, Y.C. Wang (2019). Detroit River Phosphorus Loads: Anatomy of a Binational Watershed. *Journal of Great Lakes Research*, 45(6), 1142-1149.
9. **Y. Hu**, D. Scavia and B. Kerkez* (2018). Are all data useful? Inferring causality to predict flows across sewer and drainage systems using Directed Information and Boosted Regression Trees. *Water Research*, 145, 697-706.
10. **Y. Hu*** and S. Beattie (2018). The Role of Heterogeneous Behavioral Factors in an Agent-based Model of Crop Choice and Groundwater Irrigation. *Journal of Water Resources Planning and Management*, 145(2), 04018100.
11. **Y. Hu***, C. J. Quinn, X. M. Cai and N. W. Garfinkle (2017). Combining human and machine intelligence to derive agents' behavioral rules for groundwater irrigation. *Advances in Water Resources*, 109, 29-40.
12. **Y. Hu***, X. M. Cai and B. DuPont (2015). Design of a web-based application of the coupled multi-agent system model and environmental model for watershed management analysis using Hadoop, *Environmental Modelling & Software*, doi:10.1016/j.envsoft.2015.04.011
13. **Y. Hu***, O. Garcia-Cabrejo, X.M. Cai, A. J. Valocchi and B. Dupont (2015). Global sensitivity analysis for large-

scale socio-hydrological models using Hadoop, *Environmental Modelling and Software*, doi:10.1016/j.envsoft.2015.08.015

14. **Y. Hu**, A. J. Valocchi*, S. A. Lindgren, E. A. Ramos and R. A. Byrd (2015). Groundwater Modeling with MODFLOW as a Web Application, *Groundwater*, doi:10.1111/gwat.12372