

# Arghajeet Saha

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## PRINCIPAL INTERESTS

Watershed Management, Hydrology, Water Quality, Sustainability, Food-Energy-Water Nexus, Nutrient Management, Climate Change Effects, Environmental Impact Assessment, Ecohydrology, and Remote Sensing Applications in Hydro-informatics.

## ACADEMIC BACKGROUND

[STEPS Postdoctoral Scholar](#) November, 2023 - ongoing  
[Department of Biological and Agricultural Engineering](#),  
University of Arkansas, Fayetteville, United States  
Advisor: [Dr. Rebecca Muenich](#)

[STEPS Postdoctoral Scholar](#) June, 2022 - October, 2023  
[School of Sustainable Engineering and the Built Environment \(SSEBE\)](#),  
Arizona State University, Tempe, United States  
Advisor: [Dr. Rebecca Muenich](#)

Ph.D. in Agricultural and Biological Engineering August, 2017 - June, 2022  
[The Pennsylvania State University](#), University Park, United States  
**GPA = 3.74/4**

- *Dissertation title: Nutrient Management and Control Strategies in the Susquehanna River Basin towards meeting Chesapeake Bay TMDL Goals*  
Advisor: [Dr. Cibin Raj](#)  
Thesis: <https://etda.libraries.psu.edu/catalog/22367axs1296>

MS in Water Engineering and Management August, 2015 - June, 2017  
[Indian Institute of Technology \(IIT\) Kharagpur](#), India  
**GPA = 8.26/10**

- *Dissertation title: Impact of climate and land-use land-cover change on the Kangsabati river flow using SWAT and its feedback to the regional climate system*  
Advisor: [Dr. Bhabagrahi Sahoo](#)

BS in Agricultural Engineering August, 2011 - July, 2015  
[Assam University](#), India  
**GPA = 8.06/10**

## ORAL

(International: 5, National: 2, Regional: 4)

## CONFERENCE

## CONTRIBUTIONS

1. **Saha, A.**, Lee, S.A., McLaurin, R., Fajardo, H., Liu, T., Amavisca, A., Morrison, E. S., Nelson, N., Obenour, D., Muenich, R.L. (2022). Can Multiple Stable Isotopes Improve Mass Flow Diagram Validation for Small Watersheds? In American Geophysical Union [AGU] Fall Meeting Abstracts (Vol. 2022, pp. GC22J-0706), Chicago, December.
2. **Saha, A.**, Muenich, R.L. (2022). Animal Feeding Operations in the United States: Improvements Seen with Parcel Data, *Sustainable Phosphorus Summit, Raleigh, NC*, November. Details: <https://steps-center.org/p-week/sps-abstracts/sfeastorfamine>
3. **Saha, A.**, Cibin, R., Saha, G., Spiegel, S., and Kleinman, P. (2021). Evaluation of Water Quality Benefits of Manureshed Based Manure Management in the Susquehanna

River Basin, American Society of Agricultural and Biological Engineers [ASABE] International Annual Conference (virtual), July.

4. **Saha, A.**, Cibin, R. (2020). Potential Environmental Benefits Evaluation of Manure and Nutrient Placement Strategies considering Optimal Weather Condition, ASABE International Annual Conference (virtual), July.
5. **Saha, A.**, Cibin, R. (2020). Water Quality Benefits of Weather Forecasting Based Strategical Manure Application Timing in the Susquehanna River Basin, Chesapeake Community Research and Modeling Symposium [CCMP] (virtual), June.
6. Cibin, R., **Saha, A.**, Saha, G., Spiegel, S., and Kleinman, P. (2020). Water Quality Outcomes of Implementing the Manureshed Concept in Susquehanna River Basin, 2020 ASA-CSSA-SSSA International Annual Meeting (virtual), November.
7. **Saha, A.** (2020). Comprehensive Development of an Ecohydrological model for Susquehanna River Basin in an Agro-ecosystem Framework, CCMP (virtual), June.
8. **Saha, A.**, Cibin, R. (2020). Quantifying Water Quality Benefits of Weather Forecasting Based Manure Application Timing Strategies in the Susquehanna River Basin, Northeast Agricultural and Biological Engineering Conference [NABEC], (virtual), July.
9. **Saha, A.**, Cibin, R. (2019). Computationally Efficient Calibration Strategies for Complex Large-Scale SWAT Applications, Soil and Water Assessment Tool International Conference, Vienna, Austria, July.
10. **Saha, A.**, Cibin, R. (2018). Identifying Nutrient Loading Hotspots in Susquehanna River Basin Using SWAT, CCMP, Annapolis, MD, USA, June.
11. **Saha, A.**, Sahoo, B., Tiwari, M. (2017). Impact of RCM (CORDEX) Climate Change Scenario on the Stream Flow Generation Potential of Kangsabati River Basin, International Symposium on Water Urbanism and Infrastructure Development in Eco-Sensitive Zones, jointly organized by IIT Kharagpur, Columbia University (USA) and IISC Bangalore, Kolkata, West Bengal, India, January.

**POSTER  
CONFERENCE  
CONTRIBUTIONS**

**(Regional: 2)**

1. Lisenbee, W.A., **Saha, A.**, Mohammadpour, P., Cibin, R., Kaye, J., Grady, C., and I. Chaubey. (2021). Water Quality of Circular Agricultural Systems in the Chesapeake Bay Watershed. Lancaster-Lebanon Watershed Forum and Science Symposium, Elizabethtown, PA, November.
2. **Saha, A.**, Chen, Y., Cibin, R., and Ambrose, K. (2018). Estimation of Slow-Release Fertilizer Impacts through Development of Computational Algorithm for a Watershed Model, NABEC, Morgantown, WV, USA, July.

**RESEARCH  
PUBLICATIONS**

**(2 peer-reviewed, 2 in press, 1 submitted, 4 in preparation)**

1. **Saha, A.**, Saha, G., Cibin, R., Spiegel, S., Kleinman, P.J.A., Veith, T.L., White, C.M., Drohan, P.J., Tsegaye, T. (2022). Evaluating water quality benefits of manureshed management in the Susquehanna River Basin. *Journal of Environmental Quality*, 52(2), 328-340. <https://doi.org/10.1002/jeq2.20429>
2. **Saha, A.**, Saha, G., Cibin, R., Veith, T.L., White, C.M., Drohan, P.J. (2023). Water quality benefits of weather-based manure application timing and manure placement strategies. *Journal of Environmental Management*, 333, 117386. <https://doi.org/10.1016/j.jenvman.2023.117386>

3. Lisenbee, W., **Saha, A.**, Mohammadpur, P., Cibin, R., Grady, C., Kaye, J., Chaubey, I. (2023). Water Quality Impacts of Recycling Nutrients Using Organic Fertilizers in Circular Agricultural Scenarios (In Press - Agricultural Systems). Preprint: <https://dx.doi.org/10.2139/ssrn.4214469>
4. Ruffato, K., **Saha, A.**, Muenich, R.L., Cusick, R.D. (2023). Phosphorus Trading Market Potential in Midwestern Watersheds Incorporating Animal Feeding Operations (In Press - Environmental Science & Technology).
5. Tang, Q., **Saha, A.**, Ogboi, C., Nelson, N., Duckworth, O., Muenich, R.L., Obenour, D. (2023). Is Legacy Phosphorus Useful in Predicting Total Phosphorus Variability at the National Scale? (Submitted).
6. **Saha, A.**, Muenich, R.L. (2023). A Novel Approach to Improving Machine Learning-Based Identification of Animal Feeding Operations on a Parcel-Scale Using Bright and Dark Spot Analysis (In Preparation).
7. **Saha, A.**, Muenich, R.L., Islam, M. (2023). Development of an Urban Watershed Modeling Framework for Arid Regions Using SWAT (In Preparation).
8. Islam, M., **Saha, A.**, Muenich, R.L., Westerhoff, P. (2023). Unlocking the Potential of Wastewater Treatment Plants for Phosphorus Recovery: Identifying Optimal Locations for Technology Implementation and Fertilizer Production (In Preparation).
9. **Saha, A.**, Drohan, P.J., Cibin, R. (2023). Comparison between Hydrological Trends in a Mid-Atlantic Watershed under a Ecohydrological Modeling Framework Using SSURGO Soil Classification and Taxonomy Based Soil Classification. (In Preparation).

**BOOK  
CHAPTER**

Elser, J., Baker, J., Boyer, T., Grieger, K., Liu, T., Muenich, R., Rittmann, B., **Saha, A.** (2023). [Creating an alternative future for Earth's phosphorus cycle in the Anthropocene via eco-prospecting, eco-mining, and eco-refining.](#) *In Treatise on Geochemistry.* (In Press).

**REVIEWER  
SERVICE**

**Journal of Hydrology, Environmental Monitoring and Assessment, Journal of Environmental Quality, Journal of the ASABE, and Agricultural Systems** (ORCID: <https://orcid.org/0000-0002-3983-3005>).

**INVITED  
TALKS**

**Tackling water quantity and quality problems through combining hydrologic modeling and machine learning approaches : Newer approaches in large scale hydrological calibration, optimized nutrient management, and non-point source identification.** University of Arkansas. April, 2023.

**ADDITIONAL  
PROJECTS**

1. Sustainability assessment and effectiveness of rural water treatment systems and review analysis of ceramic and SODIS filter in rural households across the world, *under the supervision of Dr. M.K. Tiwari*, School of Water Resources, IIT Kharagpur (2016).
2. Flood vulnerability assessment by remote sensing and GIS based applications in West Bengal: A review, *in collaboration with Sai Praneeth* (Postdoctoral Scholar, Wayne State University) (2016).
3. Environmental impact assessment of a 1600 MW thermal power plant project in Karimnagar district of Telangana, *in collaboration with Sai Praneeth* (2016).

## TEACHING ENGAGEMENT

1. BE 487: Watershed Modeling for Water Quality Design, Spring (2020). Main Course Supervisor: Dr. Cibin Raj.
2. Graduate level lecture on High Performance Computing, Fall (2019) (later included as part of the graduate-level course, ABE 587: Computational Ecohydrology).
3. BE 307: Principles of Soil and Water Engineering, Spring (2018). Main Course Supervisor: Dr. Cibin Raj.

## MENTORING DUTIES

During PhD: Mentored **2** undergraduate students (Fall 2018, Spring 2019, Summer 2019) in setting up a yearlong greenhouse experiment involving Slow-Release Fertilizers. Mentoring also involved guiding them in water quality testing at the Land and Water Research Laboratory at Pennsylvania State University.

1. Laura Lutes (BS Ag and Bio Engg, Penn State; 2015-19).
2. Peter Savchik (BS Ag and Bio Engg, Penn State; 2015-20).

I have also mentored **1** PhD student at Pennsylvania State University.

Post PhD: Mentored a diverse cohort of **14** engineering undergraduates as part of the NSF-REU program at STEPS for 10 weeks. Additionally, I have mentored **3** graduate (MS) students in SSEBE during their research internships: **2** in Spring 2023 and **1** in Summer 2023. In my current position, I am also mentoring **1** PhD student. Additionally, I have voluntarily undertaken other mentorship duties outside of my official obligations.

## FELLOWSHIP AND AWARDS

1. Energy and Environmental Sustainability Laboratories (EESL) grant, Pennsylvania State University (Fall 2018 – Spring 2019): \$ 2500 (US dollars).
2. Was awarded 3rd Prize at the Campus and Community Expo by Sustainability Institute at Pennsylvania State University for Walnut Springs Wetland Evaluation (Spring 2019).
3. FEGR Fellowship for Doctoral studies at Department of Agricultural and Biological Engineering, Pennsylvania State University (Fall 2017 – Fall 2018): \$ 3000 (US dollars).
4. Awarded Graduate Aptitude Test in Engineering (GATE) Fellowship, Ministry of Human Resource Development, Government of India (2015 – 2017).

## SKILLS

*Code Creation:*

1. Developed an algorithm that searches and imputes missing values in precipitation datasets across a large watershed using inverse distance weighing (IDW) interpolation from nearest rain gauges.
2. Developed an algorithm for estimating nutrient release by Slow Release Fertilizers for the SWAT model. The algorithm is currently in a testing stage with field data.

*Developed Database:* Developed a new soil database considering soil taxonomy and at the same resolution of SSURGO.

*Operating System:* Windows, Linux.

*Programming:* Python (including ArcPy library), MATLAB, High Performance Computing, Visual Basic (.NET), Fortran, R basics, C basics, LaTeX, SQL.

*Applications/Softwares:* SWAT, ArcGIS, ArcGIS Pro, MS Access and other MS Office suite softwares, Google Earth, Erdas Imagine, VIC, SWMM, EPANET, HEC-HMS, Water GEMS, DYNA-CLUE, MIKE 11, WRF.

*Languages:* English (proficient), Hindi (proficient), Bengali (proficient), Assamese (elementary), French (elementary).

**CONVENING  
DUTIES**

1. **Beyond the BMP: Strategies and Solutions to Advance Agricultural Conservation** (ASABE, 2023 - Session 142).
2. **Convergent Research to Manage Human Interactions With the Phosphorus Cycle** (Upcoming AGU, 2023 - Session 192629).

**LEADERSHIP  
POSITIONS  
AND  
MEMBERSHIP**

1. Member of American Society of Agricultural and Biological Engineers (ASABE).
2. Member of American Geophysical Union (AGU).
3. College of Agricultural Sciences delegate to the Graduate and Professional Student Association (2019-21).
4. Graduate Chair of the Programming committee at the Graduate and Professional Student Association (2019-20).
5. Vice-President of the Agricultural and Biological Engineering Graduate Student Association (2018-20).
6. Campus representative to the Graduate Council from Graduate and Professional Student Association (2019-21).
7. Campus representative to the Graduate Student and Faculty Issues board (2019-20).
8. Board member of Advocacy and Diversity Committee at Graduate and Professional Student Association (2020-21).
9. Graduate representative of Stewarding Our Planet's Resources strategic planning steering committee at Pennsylvania State University (2019-21).

**SCI-COMM  
DUTIES**

STEPS Podcast working group (October, 2022 - ongoing) - [PhosForUs](#).

**PRESS  
AND MEDIA  
COVERAGE**

1. Mulhollem, J. (2023, March 22). 'Manureshed' management in Susquehanna River basin key to Chesapeake Bay cleanup. Penn State University.  
<https://www.psu.edu/news/research/story/manureshed-management-susquehanna-river-basin-key-chesapeake-bay-cleanup/>
2. Mulhollem, J. (2023, April 25). 'Manureshed' management in Susquehanna River basin key for water quality of Chesapeake Bay. Outdoor News.  
<https://www.outdoornews.com/2023/04/25/manureshed-management-in-susquehanna-river-basin-key-for-water-quality-of-chesapeake-bay>