SUSHANT MEHAN, Ph.D.
Assistant Professor and SDSU Extension Water Resource Engineer Specialist
Agricultural and Biosystems Engineering Department, South Dakota State University,
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LinkedIn | Google Scholar Profile | ResearchGate | HydroSolveSM Lab

EDUCATION

Purdue University, West Lafayette, Indiana, USA Aug 2018
Ph.D., Agricultural and Biological Engineering
Dissertation Title: Impact of Changing Climate on Water Resources in the Western Lake Erie Basin Using SWAT (Read here)

Punjab Agricultural University, Ludhiana, India Aug 2014
Master of Technology (Agricultural Engineering)
Thesis Title: Studies on the Effect of Colored Mulches on Yield and Quality of Bell Pepper (*Capsicum annuum* L.) (Read here)

Punjab Agricultural University, Ludhiana, India Jul 2011
Bachelor of Technology (Agricultural Engineering)

RESEARCH INTERESTS

- Watershed Hydrology and Water Resources Management: Focus on modeling and managing water flow, quality, and availability in agricultural and natural landscapes, emphasizing sustainability under changing climatic conditions.
- Nutrient Fate and Transport: Investigate the movement and transformation of nutrients in agricultural watersheds, aiming to enhance water quality through best management practices.
- Hydro-Informatics and Geospatial Statistics: Apply advanced computational techniques and statistical models to analyze hydrologic data, improve predictions, and support decision-making in water resources management.
- Digital Water and Cybersecurity: Explore the intersection of water resource management and digital technologies, including developing secure digital platforms for hydrologic modeling and water quality assessment.
- Integrated and Interdisciplinary Hydrological Sciences: Promote collaboration across disciplines to address complex water resource challenges, integrating process-based modeling with machine learning to develop comprehensive, user-friendly tools.

PROFESSIONAL EXPERIENCE

Aug 2023 - Present	Assistant Professor and SDSU Extension Water Resource Engineer Specialist, Brookings, SD
Jan 2023 – Aug 2023	Postdoctoral Fellow, Colorado State University, Fort Collins, CO - PI (Dr. Kyle R. Mankin)
Mar 2022 – Jan 2023	Postdoctoral Research Associate, University of Wisconsin, Madison, WI - PI (Dr. Margaret M. Kalcic)
Jun 2020 – Feb 2022	Postdoctoral Scholar, Ohio State University, Columbus, OH - PI (Dr. Margaret M. Kalcic)
Oct 2018 – May 2020	Agricultural Engineer, Formation Environmental LLC, Sacramento, CA
Jan 2016 – Aug 2018	Graduate Research Assistant, Purdue University, West Lafayette, IN
Jan 2015 – Dec 2016	Graduate Research Assistant, South Dakota State University, Brookings, SD
Jan 2012 – May 2012	Lecturer, Northwest Institute of Engineering and Technology, Punjab, India

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SNAPSHOT OF IMPACT

- Number of Data Science Workshops (Python, R) facilitated /online courses developed 9/2
- Peer-Reviewed Work (Journal Articles/Book Chapters) 22/5
- Number of U.S. Patents Issued 2
- Amount in Dollars ($) funded in grants as Primary Applicant/Co-PI > $3M
- Review Services (Number of Journal Articles/Grant Proposals) >170/6
- Number of students formally mentored for research projects 7
- Number of years of industrial experience 2
- Number of conference presentations/poster (as a Primary author/Co-author) > 65
- Number of popular articles/datasets 12/4

RESEARCH EXPERIENCE

Assistant Professor and Extension Water Resource Engineer Specialist Aug 2023 - Present
Agricultural and Biosystems Engineering Department
South Dakota State University, Brookings, SD

- Advance understanding and management of water resources in the water-limited Great Plains and Midwest region
- Assess the environmental and economic benefits of Seasonal Riparian Area Management initiatives in agricultural watershed
- Enhance the representation of physical processes using hydrologic models to facilitate continuous monitoring and measurement across the agricultural landscape
- Integrate process-based modeling and machine learning to create user-friendly tools that enable a comprehensive understanding and prediction of the diverse factors influencing agronomic operations, crop yield, water usage, and profitability

Postdoctoral Fellow Jan 2023 - Aug 2023
USDA-ARS Water Management and Systems Research, Fort Collins, CO
PI – Dr. Kyle Mankin

- Conducted comprehensive review, synthesis, and interpretation of various gridded climate datasets for their application in hydrologic modeling and analysis.
- Assisted and coordinated the work of other students and staff conducting geospatial analyses.
- Assessed and led geospatial analysis and modeling towards understanding and evaluating genetic x environment x management x socioeconomics (GxExMxS) interactions on crop yields, economics, and sustainability in dryland agroecosystems.

Postdoctoral Research Associate Mar 2022 - Jan 2023
Department of Biological Systems Engineering, University of Wisconsin,
Madison, WI
PI – Dr. Margaret M. Kalcic

- Improved model simulations of freezing-thawing cycles in snow-dominated watersheds to quantify management-practice effectiveness in protecting water quality
- Enhanced the effectiveness of water-quality models to simulate the fate and transport of phosphorus on and below the soil surface in a tile-drained dominated agricultural watershed
- Quantified and assessed the simulation of the control drainage management practice to improve water-quality issues using the edge-of-field monitoring sites data and hydrologic modeling
- Assessed the soil health and its impact on water quality management using hydrologic modeling and field experiments

Postdoctoral Scholar Jun 2020 - Feb 2022
Department of Food, Agricultural, and Biological Engineering, Ohio State
University, Columbus, OH
PI – Dr. Margaret M. Kalcic

- Improved simulations of in-stream biogeochemical processes to quantify nutrient fate and transport for watershed management using hydrologic modeling and in-field observations

- Evaluated drainage water-management practices using hydrologic modeling and in-situ observations to manage water resources
- Assisted with quantification of soil health practice effects on soil properties and nutrient loss in a watershed-scale hydrologic model
- Planned and managed the observed and modeled data repository for the lab

Agricultural Engineer/Hydrologist Oct 2018 - May 2020
Formation Environmental LLC, Sacramento, California

- Improved crop-growth simulation models for 40 different crops using process-based computer models for California's Central Valley to quantify nitrate leaching loads
- Tested heat-storage components in the existing SEBAL (Surface Energy Balance) CalETa (California Actual Evapotranspiration) mapping program for the state of California to improve the simulation of evapotranspiration
- Applied statistics and data visualization for environmental mapping and design of different ecological/ meteorological variables
- Collaborated on an Industry-University model assessment study to quantify nitrate leaching in tomato-grown fields using the modeling and in-situ measurements

Graduate Research Assistant Jan 2016 - Aug 2017
Department of Agricultural and Biological Engineering, Purdue University,
West Lafayette, Indiana

- Performed univariate and multivariate analysis to compare synthetic climate values with climate data for the
  Western Lake Erie Basin
- Analyzed long-term climate data simulated by stochastic weather generators to quantify their effectiveness in simulating climate for use in hydrologic models
- Evaluated different methods of bias correction for GCM (General Circulation Model) outputs to create a reliable future climate database
- Quantified nutrient transport in an agricultural tile-drained watershed for assessment of the climate-changing impact on water resources
- Applied remote sensing and data science to study the spatial and temporal extent of algae in Lake Erie

Graduate Research Assistant Jan 2015 - Dec 2015
Department of Plant Science, South Dakota State University, Brookings, SD

- Quantified different types of droughts over long-term climate change for water-resource management planning using a process-based hydrologic model
- Assisted in radio-isotope study to quantify surface/groundwater interactions
- Applied remote sensing and GIS to estimate rainfall distributions over space using different spatial interpolation techniques

University Fellow Jul 2012 - Jul 2014
College of Agricultural Engineering and Technology, Punjab Agricultural
University, Ludhiana, India

- Conducted field-scale experiment evaluating the impact of different colored biodegradable plastic mulches on plant microclimate
- Performed on-field and in-lab experiments to measure different physical and chemical properties of the product along with the end-season crop yields
- Applied the application of passive spectroradiometer to quantify the change in the plant light environment

Graduate Engineer Trainee Jul 2011 – Dec 2011
John Deere Pune Works (JDPW) Pvt. Ltd, Pune, India

- Learned and applied KAIZEN and SIX SIGMA applications in the off-road vehicles' manufacturing units, including John Deere Pune Works Pvt. Ltd, India
- Participated and contributed to identifying and implementing new and innovative ideas to

reduce the time and increase the efficiency of a manufacturing line and supply chain
- Designed and conducted a farmer's survey for prototype development

Bharti Field Fresh Undergraduate Scholar Jul 2007 – Jul 2011
College of Agricultural Engineering and Technology, Punjab
Agricultural University, Ludhiana, India
- Modified atmosphere packaging on minimally processed baby corn
- Analyzed the annual land-use change in the Moga District using Remote Sensing and GIS

TEACHING/MENTORING/ADVISING EXPERIENCE

Agricultural and Biosystems Engineering Department, South Dakota State University, Brookings, SD
- Guest Lecture: AST 426 Fall 2024
  (Number of Students: 54)
- Co-Teaching: ABE 790 Seminar Spring 2024
  (Number of Students: 15)
- Guest Lecture: ABE 434 Natural Resources Engineering Fall 2023, 2024
  (Number of Students: 30)
- Guest Lecture: AST 333 Soil and Water Mechanics Fall 2023
  (Number of Students: 15)

Department of Food, Agricultural, and Biological Engineering, Ohio State University, Columbus, Ohio
- Technical advisor on a senior design project Aug 2021 – Feb 2022
  Stormwater Treatment for Algal Bloom Reduction
- Co-technical advisor on a senior design project Aug 2020 – May 2021
  Rush Run Soil – Bioengineered Stream Restoration
- Co-advised and mentored Ph.D. students

NSF-MSGI Summer Internship
- Mentor to National Science Foundation Mathematical Sciences Graduate Intern from the Department of Mathematics and Statistics, College of Arts and Sciences, Washington State University, Pullman, WA, (Dr. Priyanka Rao) with Dr. Devendra M. Amatya, Research Hydrologist, USDA Forest Service, Santee Experimental Forest, Center for Forest Watershed Research, Coredesville, SC Summer 2021
- Mentor to National Science Foundation Mathematical Sciences Graduate Intern from the Department of Statistics, University of Connecticut, Storrs, CT, (Mr. Alokesh Manna) with Dr. Devendra M. Amatya, Research Hydrologist, USDA Forest Service, Santee Experimental Forest, Center for Forest Watershed Research, Coredesville, SC Summer 2023

Formation Environmental LLC, Sacramento, California
- Advised Postdoctoral Scholar at the University of California, Davis, to quantify impacts of land use and climate change on crop water use using hydrologic modeling
- Guest Lecture: ABT 182 / HYD 182 Environmental Analysis using GIS Winter 2020
  (Number of Students: 30)
- Guest Lecture: HYD 110 Irrigation Systems and Water Management Spring 2019
  (Number of Students: 10)

Department of Agricultural and Biological Engineering (ABE), Purdue University, West Lafayette, Indiana

- Facilitator of the Workshop on R for Beginners: I & II (Number of Students: 40) — Fall 2017/Spring 2018
- Guest Lecture: ABE 52700 Computer Models in Environmental and Natural Resources Engineering (Number of Students: 15) — Spring 2018
- Co-Advised/Mentored Summer Undergraduate Research Fellows (11-week program in the Summer of every year) — Summer 2017

Department of Plant Science, South Dakota State University, Brookings, SD

- Created and facilitated lab modules: PS 723-L Hydrologic Modeling (Number of Students: 15) — Fall 2015

Punjab Agricultural University, Ludhiana, Punjab, India

- Semester Long: Tutored SWE 304 Irrigation Engineering (Number of Students: 5) — Fall 2014

North-West Institute of Engineering & Technology (NWIET), Dhudike, Moga, Punjab, India

- Semester Long: Lectured PE/DE -2.1 Industrial Engineering (Number of Students: > 40) — Spring 2011

Teaching Experience at Professional Conferences

At the American Society of Agricultural and Biological Engineering (ASABE) Annual International Meeting (AIM) (Workshop Facilitator / Instructor)

- Graduate Student Presentation Workshop (Number of Students: 100) — Jul 2024
- Data Analytics Using Python In Agricultural And Biological Engineering (Number of Students: 15) — Jul 2024
- Nexus of R and Data in Agricultural and Biological Engineering (Number of Students: 11) — July 2023
- Advanced Data Analytics for Water Resources Management using R (Number of Students: 11) — July 2022
- Agricultural and Biological Engineering Data Handling Using R (Number of Students: 40) — July 2021
- Agricultural and Biological Engineering Data Handling Using R (Number of Students: 80) — July 2020
- Data Analytics using Python in Agricultural and Biological Engineering (Number of Students: 41) — July 2019
- Introduction to Data Science in Agriculture with Python (Number of Students: 30) — July 2018

At the South Dakota Student Water Conference (Workshop Facilitator / Instructor)

- Advanced Data Analytics for Natural Resources Management using R (Number of Students: 35) — Oct 2023

At the ASA, CSSA, SSSA International Annual Meeting (Workshop Facilitator / Instructor)

- Advanced Data Analytics for Natural Resources Management using R (Number of Students: 60) — Oct 2023

ASSIGNED SERVICE (Extension and Outreach Efforts)

- Leading Water Program in South Dakota (Project Title: Bridging Community insights and solutions in Water Resources Management: A Pathway to Water Resources Program in South Dakota) — Since Fall 2024
- Member, Planning Committee for the first Ag Cybersecurity Symposium in South Dakota (Combined efforts of South Dakota State University and Dakota State University) — Since Spring 2024
- Member, Planning Committee for the Annual Drainage Research Forum organized by Chris Hay, Iowa Soybean Association; Matt Helmers, Iowa State University; Sushant Mehan, South Dakota State University; Lindsay Pease, University of Minnesota and Gary Sands, University of Minnesota on September 5, 2024 in Ames, IA. — 2024
- Co-led the Water Quality training during the Concentrated Animal Feeding Operations (CAFOs) on June 26, 2024, at the Crossroads Convention Center in Huron — 2024
- Attending and responding to calls from SD State Local Civilians on questions related to Water Quality and Quantity — Since Fall 2023

INSTITUTIONAL SERVICE

South Dakota State University, Brookings, South Dakota

- Leading Faculty Retreat Discussion on Departmental Research and Outreach Activities — Fall 2024
- Reestablishing SD ASABE Section — Fall 2024
- Planning Committee Chair, 2024 South Dakota Student Water Conference — Fall 2024
- Planning Committee Co-Lead, 2024 ASABE North Central Regional Section Meeting at SDSU after more than 25 years of inactivity — Spring 2024
- Planning Committee Member, First Ever Ag Cybersecurity Symposium in SD — Since Spring 2024
- Vice-Chair & Faculty Member Representative, University Committee for Research, Scholarship, and Creative Activity (RSCA) — Fall 2023 – Fall 2026
- Member of the Awards Committee of the Agricultural and Biosystems Engineering Department. — Since Fall 2023
- Member, Search Committee for SD Water Research Institute Director — Spring 2024 – Fall 2024
- Member, SDSU ABE Recruitment and Retention Planning Committee — Since Fall 2024
- Serving as Co-Advisor to SDSU Indian Student Association — Since Fall 2024

University of Wisconsin-Madison, Madison, Wisconsin

- Communication Director, University of Wisconsin-Madison Postdoctoral Association (UWPA), 2022 — Spring 2022- Fall 2022
- Organizing Committee Member - University of Wisconsin-Madison Postdoctoral Association (UWPA) Annual Research Symposium, 2022 — Fall 2022
- Advising graduate students' leadership in planning different events and developing departmental graduate student organization — Spring 2022- Fall 2022

Ohio State University, Columbus, Ohio

- Only Postdoc representatives from all agricultural disciplines on Commercialization Training Module for Postdoc - A pilot program to promote entrepreneurship opportunities among academic scientists — 2020-2021

- Member of the Organizing Committee of The Annual Postdoc and Ph.D. Career Expo — 2020-2021

Purdue University, West Lafayette, Indiana

- ABE-GSA (Agricultural and Biological Engineering - Graduate Student Association)
  - President — 2017-2018
  - Professional Development Chair — 2016-2017
- Graduate Student Ambassador from Agricltural and Biological Engineering on a College of Agriculture Graduate Student Advisory Board May 2016-Apr, 2017 — May 2016- Apr 2017
- Executive Member - Purdue Climate Change Research Center (PCCRC) Post-Doc, Graduate Students Group (2016-2018) — 2016-2018
- Alpha Epsilon (AE) Honors Society, Purdue University Chapter — 2017-2018
  - Member at Large (MAL); Professional Development Community

ACADEMIC SERVICE

- Associate Editor: Natural Resources & Environmental Systems (NRES), ASABE Journals
- Topic Editor for a special collection on "Climate change impacts on agriculture and natural resources along with adaptation options with a focus on extreme events" in Frontiers in Environmental Science. For more details, click here.
- Guest Associate Editor for "Digital Water: Computing Tools, Technologies, and Trends" in the 2024 issues of the Journal of the ASABE and Applied Engineering in Agriculture. For more details, click here
- Special Issue Editor for "Precision Management of Water Resources under Changing Climate and Weather Dynamics: Data, Simulation, Modeling, and Sustainability" in Sustainability (MDPI) For more details, click here
- Reviewer Board: Sustainability, Water, Climate, Remote Sensing, Agronomy
- Proposal Reviewer: USDA – NIFA, 2022; 2023, 2024
- Proposal Reviewer: National Science Foundation, 2023, 2024
- Proposal Reviewer: Nazarbayev University Research Proposal Reviewer, 2018; 2019.
- Peer Reviewer for the following Journals: *Science Bulletin, Irrigation and Drainage, Journal of Natural Resources and Agricultural Ecosystems, Water Research, Journal of Hydrology, Journal of Soil and Water Conservation (JSWC), Journal of Environment Quality(JEQ), Natural Hazards (NHAZ), Science of the Total Environment (STOTEN), Ecology and Evolution, Journal of the American Water Resources Association (JAWRA), Journal of Water and Climate Change (JWC), Earth's Future, Agricultural Water Management (AGWAT), ISPRS International Journal of Geoinformation, Journal of the ASABE (old name: Transactions of the ASABE), CATENA, Applied Engineering in Agriculture, Big Earth Data, Journal of Applied Meteorology and Climatology (JAMC), Sustainability, Agriculture, Water, Climate, Precision Farming, Remote Sensing, Journal of Plant and Agricultural Research.*

STUDENT COMPETITION SERVICE (Served as a Judge)

- Jacksrabbit BEST Robotics — 2023 & 2024
- ASABE North Central Regional Meeting — 2024
- South Dakota Student Water Conference (Oral and Poster Presentations) — 2023
- Diversity Poster Contest organized by the ACS DEI Committee at the 2023 ASA-CSSA-SSSA Annual Meeting. — 2023
- 3MT Thesis Competition at Graduate Student Industrial Symposium (GRIS) organized by Graduate Student Association, Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, IN. — 2022
- NCEES Land Surveying Special Award: Ohio Region Future City Competition organized by Future City Ohio Board. — 2022

- 35th Annual Edward F. Hayes Graduate Research Forum. 2021
- The Ohio Academy of Science State Science Day organized by The Ohio State Chapter of Sigma Xi. 2021
- Spellman HV (Heating Ventilation) Clean Tech Competition – International Sustainability Innovation Competition. 2021; 2022
- ABE 205: Computations for Engineering Systems (Sophomore Course) Final Project at Purdue University, West Lafayette, IN (Course Offered Fall 2021) 2021
- UCD Ag/Env Sciences (FFS) Field Day - AgriScience Fair 2019
- Lafayette Regional Science and Engineering Fair, Undergraduate Research and Poster Symposium at Purdue University, Senior Capstone Project, and Big Ten Poster Competition. 2016; 2017; 2018
- Visual Presentation Contest ASA-CSSA-SSSA Tri Society Annual Meeting. 2016; 2017
- The Lafayette Regional Science and Engineering Fair 2016; 2017; 2018
- UC Davis Field Day: AgriScience Fair 2020
- Undergraduate Research and Poster Symposium at Purdue University 2016
- Undergraduate Capstone Project 2016; 2017; 2018

LEADERSHIP AND SERVICE AT THE PROFESSIONAL SOCIETIES

American Society of Agricultural and Biological Engineers (ASABE) Click here and learn more about ASABE

- Co-led revisions on "X526.5 Soil and Water Terminology." With Dr. Derek Heeren 2023-2024
- Vice Chair NRES-21 (Hydrology) 2024-2025
- Secretary NRES-21 (Hydrology) 2023-2024
- Member, NRES-02 (NRES Steering Committee) Since 2024
- Member, NRES-05 Publications Review Since 2022
- Member, NRES-06 Paper Awards Since 2022
- Vice Chair NRES-07 (Nomenclature) 2023-2024
- Chair, Young Professional Community (YPC) 2022-2024
- Vice Chair, Young Professional Community (YPC) 2021-2022
- Publications Council Rep, Young Professional Community (YPC) 2019-2021
- Members-at-large, Young Professional Community (YPC) 2017; 2018; 2019
- Chair, P-120 Student Organizations 2024-2026
- Vice Chair, P-120 Student Organizations 2023-2024
- Chair, P-121 G.B. Gunlogson Student Environ Design Competition 2022-2023
- Vice Chair, P-121 G.B. Gunlogson Student Environ Design Competition 2021-2022
- Competition Coordinator, P-121 G.B. Gunlogson Student Environ Design Competition Since 2019
- Member, E-2050 Global Engagement Since 2023
- Member, E-20 Finance Committee 2023-2024
- Member, E-05 Marketing and External Communications Since 2023
- Member, Circular Bioeconomy Systems Institute (CBSI) Since 2023
- Member of EOPD 204 Engineering & Technology Accreditation Since 2024
- Member and Vice Chair of P-515 Teaching and Learning Resources Committee Since 2024
- Member of M-135 - Pharos of Alexandria Award Selection Committee Since 2024
- Member, P-122 Boyd-Scott Graduate Research Award Since 2022

- Public Relations Officer: CA/NV ASABE Section 2021-2022
- Awards Chair: CA/NV ASABE Section 2020-2021
- Executive Member: CA/NV ASABE Section, 2019-2020 2019-2020
- Session Chair and Moderator: Next-Gen Agroecosystems Modeling: Integrating AI/ML and Process-based models Jul 2024
- Session Chair and Moderator: Advances in Agro-Ecosystems Modeling and Data Analytics Jul 2023
- Session Chair and Moderator: Advances in Hydrologic Modeling of Agroecosystems of various Complexities-HYBRID Jul 2022
- Session Chair and Moderator: Data and Water Management: Volume, Velocity, and Variety Jul 2022
- Session Chair and Moderator: Hydrologic and Climate Data: Challenges and Opportunities Jul 2018; 2019; 2020; 2021
- Adjudicator at ASABE Fountain Wars Design Competition and Open Format ASABE Annual International Meeting 2017; 2018; 2019
- Adjudicator at ASABE Adams and Foundation Engineering Scholarship Since 2017
- Adjudicator at ASABE John C. Nye Graduate Fellowship Since 2020

Association of Agricultural, Biological, and Food Engineers of Indian Origin (AABFEIO)

- President 2020-2021
- Vice President 2019-2020
- Secretary 2018-2019

American Geophysical Union (AGU)

- Primary Convenor for the "H129-I. The Food-Water-Ecosystem Nexus: Nonpoint Source Pollution Dynamics, Impacts, and Management in Groundwater and the Vadose Zone Systems" session at AGU Fall Meeting 2024. 2024
- Primary Convenor for the session "IN31E - Empowering Earth Science Data Use and Hydrologic Advancements: Showcasing Innovative Tools and Technologies for Broad User Communities Poster" at AGU Fall Meeting 2023 2023
- Primary Convenor and Chair for the session "INV43A - Advancements in Hydrologic Tools and Technologies: A Forum for Demonstration and Discussion I" at AGU Fall Meeting 2023 2023
- Primary Convenor for the session "Hydroinformatics and Data Science: Pathways to Support Reproducible Watershed Modeling" at AGU Fall Meeting 2022 2022
- Lead (Section Champion): AGU The ICON Special Collection specific to hydrology 2021-2022
- AGU Hydrology Section Coordinator for Outstanding Student Presentation Awards (OSPA) Since 2024
- Member of AGU Digital User Group Since 2021
- Member of AGU Water Quality Technical Committee Since 2022

Soil Science Society of America (SSSA)

- Member, ACS Visual Presentation Contest Committee 2016-2017
- Member, America-New Zealand Soil Science Professional Exchange Award Committee 2023
- Chair, America-New Zealand Soil Science Professional Exchange Award Committee 2024
- Member, Soil Science Industry and Professional Leadership Award Committee 2024-2025

FUNDING (Research and Extension)

- PD. SDSU Extension Seed Grant. Bridging Community insights and solutions in Water Resources Management: A Pathway to Water Resources Program in South Dakota. **$99, 514 Awarded** 2024
- PD. United States Geological Survey (USGS) 104 (b). Integrated Remote Sensing and Water Quality Analysis for Spatiotemporal Assessment of Surface Water Quality in Eastern South Dakota. **$15,000 Awarded** 2024
- Co-PD. United States Geological Survey (USGS) 104 (b). Development of a non-contact, AI-driven method for rapid assessment of surface water quality based on imagery and smells. **$12,372 Awarded** 2024
- PD. East Dakota Water Development District. Assessing the Environmental and Economic Efficacy of the SRAM Program in the Big Sioux River Watershed. **$120,553 Awarded.** 2024
- Co-PD. 2024 South Dakota Nutrient Research and Education Council. Utilization of Laser-Induced Graphene-Based Sensor for Soil NPK Measurements and Development of Nutrients Maps - **$63,412 Awarded.** 2024
- PD – USDA ARS (Agricultural Research Service) Non-Assistance Cooperative Agreement - **$60,475. Awarded** (Geospatial Analysis and Modeling of Agrohydrological Variability in the Water-limited Great Plains.) . #58-3012-3-019/Amendment01. **$30,000 (Awarded)** 2023
- Co-PD - USDA NIFA (National Institute of Food and Agriculture) BNRE (OSU (Ohio State University)) - **$750,000. Awarded (**Advancing knowledge and prediction of phosphorus dynamics in tile-drained landscapes) 2021
- Co-PD - USDA NIFA BNRE area of the Foundational and Applied Science (University of Wisconsin-Madison and OSU) - **$750,000. Awarded (**A multi-scale and regional approach to cold season hydrology and nutrient dynamics in agroecosystems for water quality protection) 2021
- Co-PI - Ohio Department of Higher Education Harmful Algal Bloom Research Initiative – Approx. **$300,000. Awarded** (Evaluating field-and watershed-scale water quality benefits of H2Ohio conservation practices in the Maumee River watershed) 2021
- Co-PI - Ohio Lake Erie Commission – Approx. **$250,000. Awarded** (Evaluating field-and watershed-scale water quality benefits of H2Ohio conservation practices in the Maumee River watershed using watershed modeling) 2021
- Fall Meeting General Student Travel Grant: (Adviser: Dr. Margaret W. Gitau). **$500. Awarded.** 2018
- Blosser Environmental Travel Grant: (Adviser: Dr. Margaret W. Gitau). **$1500. Awarded.** 2018
- Purdue Climate Change Research Center Spring Student Travel Grant: 2018

(Adviser: Dr. Margaret W. Gitau). **$1000. Awarded.**

- Purdue Graduate Student Government (PGSG) Student Travel Grant: 2017
  (Adviser: Dr. Margaret W. Gitau). **$250. Awarded.**

- Purdue Climate Change Research Center Spring Student Travel Grant: 2017
  (Adviser: Dr. Margaret W. Gitau), $**1100. Awarded.**

PUBLICATIONS *(*Graduate Student, ** Temporary student help, ┼ Serving on committee)*
Peer-Reviewed Published Journal Articles

1. Mankin, K. R., **Mehan, S.**, Green, T. R., and Barnard, D. M. (2024). Review of Gridded Climate Products and Their Use in Hydrological Analyses Reveals Overlaps, Gaps, and Need for More Objective Approach to Model Forcings. Accepted for publication in *Hydrol. Earth Syst. Sci. Discuss*. [preprint], https://doi.org/10.5194/hess-2024-58

2. Lamichhane, M.*, Chapagain, A.R., **Mehan, S.**, Ames, D.P., Kafle, S. (2024). Integrating solar-induced chlorophyll fluorescence with traditional remote sensing and environmental variables for enhanced rice yield prediction in Nepal using machine learning. In press in *Remote Sensing Applications: Society and Environment*. https://doi.org/10.1016/j.rsase.2024.101371. (https://www.sciencedirect.com/science/article/pii/S2352938524002350)

3. Amatya, D. M., Williams, T. M., Skaggs, R., Wayne; N., Jami E., and **Mehan, S.** (2024). Silvicultural Practices and Water Table Dynamics of Coastal Forested Wetlands in a Changing Climate. In press in the *Journal of Natural Resources and Agricultural Ecosystems*. doi: 10.13031/jnrae.15933

4. Sharma, A., **Mehan, S**., McDaniel, R., Arnold, J. Trooien, T., Sammons, N., and Amegbletor, L. (2024). Assessing SWAT+ Performance in Simulating Drainage Water Management and Parameter Transferability for Watershed-Scale Applications. *Journal of Hydrology*, *637*, https://doi.org/10.1016/j.jhydrol.2024.131338. (https://www.sciencedirect.com/science/article/pii/S0022169424007339)

5. Lamichhane, M.*, Phuyal, S., Mahato, R., Shrestha, A., Pudasaini, U., Lama, S.D., Chapagain, A.R., **Mehan, S.** and Neupane, D. (2024). Assessing Climate Change Impacts on Streamflow and Baseflow in the Karnali River Basin, Nepal: A CMIP6 Multi-Model Ensemble Approach Using SWAT and Web-Based Hydrograph Analysis Tool. *Sustainability*, 16(8), p.3262. https://doi.org/10.3390/su16083262

6. Sharma, Y., Sidana, B. K., Kumar, S., Kaur, S., Sekhon, M. K., Mahal, A. K., and **Mehan, S.** (2023). Pre and Post Water Level Behaviour in Punjab: Impact Analysis with DiD Approach. *Sustainability*, 15(3), 2426. https://doi.org/10.3390/su15032426

7. Hoffman, I.R., Miller, K., Paul, G., Yimam, Y., **Mehan, S.**, Dickey, J., Harter, T., and Kisekka, I. (2022). Modeling water and nitrogen dynamics from processing tomatoes under different management scenarios in the San Joaquin Valley of California. *Journal of Hydrology: Regional Studies*, 43, https://doi.org/10.1016/j.ejrh.2022.101195

8. Kushwaha, N. L., Elbeltagi, A., **Mehan, S.**, Malik, A., and Yousuf, A. (2022). Comparative study on morphometric analysis and RUSLE-based approaches for micro-watershed prioritization using remote sensing and GIS. *Arabian Journal of Geosciences*, 15(7), 1-18. https://doi.org/10.1007/s12517-022-09837-2

9. Acharya, B., Ahmmed, B., Chen, Y., Davison, J., Haygood, L., Hensley, R., Kumar, R., Lerback, J., Liu, H., **Mehan, S.**, Mehana, M., Patil, S., Persaud, B., Sullivan, P., and URycki D. (2022). Hydrological Perspectives on Integrated, Coordinated, Open, Networked (ICON) Science. *Earth and Space Science Open Archive (ESSOAr)*. https://doi.org/10.1029/2022EA002320

10. Evenson, G., Osterholz, W. R., Shedekar, V. S., King, K., **Mehan, S.**, and Kalcic, M. (2022). Representing soil health practice effects on soil properties and nutrient loss in a watershed-scale hydrologic model. *Journal of Environmental Quality*. https://doi.org/10.1002/jeq2.20338

11. Kumar, M., Dogra, R., Narang, M., Singh, M., and **Mehan, S.** (2021). Development and Evaluation of Direct Paddy Seeder in Puddled Field. *Sustainability*, 13(5), 2745. https://doi.org/10.3390/su13052745

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23. **Mehan, S.**, Kannan, N., Neupane, R.P., McDaniel, R., and Kumar, S. (2016). Climate change impacts on the hydrological processes of a small agricultural watershed. *Climate*, 4(4), 56. https://doi.org/10.3390/cli4040056

24. **Mehan, S.**, Kaur, P., and Singh, M. (2014). Studies on effect of storage on quality of minimally processed baby corn. *Journal of Food Processing & Technology*, 5(11). 388 https://doi: :10.4172/2157-7110.1000388

Preprint

1. Manna, A., **Mehan, S.**, and Amatya, D. M. (2024). Development of a Statistical Predictive Model for Daily Water Table Depth and Important Variables Selection for Inference. arXiv preprint arXiv:2410.01001.https://doi.org/10.48550/arXiv.2410.01001

Book Chapters

1. **Mehan, S.**, Lamichhane, M.*, and Jha, A. (2024). Shift in Streamflow in Headwater Catchments: Causes and Impacts. Accepted for publication in *Navigating the Nexus: Hydrology, Agriculture, Pollution, and Climate Change* (Springer Nature)

2. **Mehan, S.** and Eslamian, S. (2023). Movement of Water in Soil. In Eslamian, S., and Eslamian, F. (Eds.). (2023). *Handbook of Irrigation Hydrology and Management: Irrigation Fundamentals (1st ed.)*, pp. 39-67, CRC Press. https://doi.org/10.1201/9780429290114

3. **Mehan, S.** (2020). Transformation of pedagogical skills for 21st century. In George, A. *Education For Future – An Archive of Humanities, Science and Technology for Sustainable Development*, pp. 135-139, Media House Publications, Delhi.

4. Srinivasulu, A., Femeena, P., **Mehan, S.,** and Raj, C. (2019). Environmental Impacts of Bioenergy Crop Production and Benefits of Multifunctional Bioenergy Systems. *Bioenergy with Carbon Capture and Storage*, pp. 195-217, Academic Press.

5. **Mehan, S.,** and Singh, K.G. (2015). Use of Mulches in Soil Moisture Conservation: A Review. *Best Management Practices for Drip Irrigated Crops*, pp. 283 - 293, Apple Academic Press. International Standard Book Number-13: 978-1-4987-1482-2

Popular/Extension articles

1. **Mehan, S.**, Nafchi, A.M., Yang, X., Vandermark, L., Brennan, J., & Sellars, S. (2024). *Ag Cybersecurity and Social Engineering 101*. https://extension.sdstate.edu/ag-cybersecurity-and-social-engineering-101

2. **Mehan, S.**, Nafchi, A.M., Yang, X., Sellars, S., Vandermark, V., & Brennan, J. (2024). *What should you do before or after any cyber security breaches?* https://extension.sdstate.edu/what-should-you-do-or-after-any-cyber-security-breaches

3. **Mehan, S.**, & Buterbaugh, R. (2024). *Educating about flooding and associated activities*. South Dakota State University Extension. https://extension.sdstate.edu/educating-about-flooding-and-associated-activities

4. **Mehan, S.**, & Buterbaugh, R. (2024). *Understanding Flood Hazards in the United States.* South Dakota State University Extension. https://extension.sdstate.edu/understanding-flood-hazards-united-states

5. **Mehan, S.**, & Buterbaugh, R. (2024). *Flood Preparedness*. South Dakota State University Extension. https://extension.sdstate.edu/flood-preparedness

6. **Mehan, S.**, & Buterbaugh, R. (2024). *Global and U.S. Perspectives on Flooding.* South Dakota State University Extension https://extension.sdstate.edu/global-and-us-perspectives-flooding

7. **Mehan, S.**, & Buterbaugh, R. (2024). *Restoring and Sampling Private Wells in South Dakota.* South Dakota State University Extension. https://extension.sdstate.edu/restoring-and-sampling-private-wells-south-dakota

8. **Mehan, S.**, & Buterbaugh, R. (2024). *Where do floodwaters go and what do they leave behind?* South Dakota State University Extension. https://extension.sdstate.edu/where-do-floodwaters-go-and-what-do-they-leave-behind

9. Yang, X., Nafchi, A.M. & **Mehan, S.** (2024). *Where could cyberattacks occur in a precision agriculture system? An outlook on the system breakup.* South Dakota State University Extension. https://extension.sdstate.edu/where-could-cyberattacks-occur-precision-agriculture-system-outlook-system-breakup

10. Brennan, J., Vandermark, L., Sellars, S., **Mehan, S.**, Nafchi, A.M., & Yang, X. (2024). *The Growing Threat of Cyber Attacks in Agriculture*. South Dakota State University Extension. https://extension.sdstate.edu/growing-threat-cyber-attacks-agriculture

11. Klopp, H., Bly, A., Nunes, V.L.N., **Mehan. S.** (2024). *Carbon to Nitrogen Ratio of Healthy Soils.* South Dakota State University Extension. https://extension.sdstate.edu/carbon-nitrogen-ratio-healthy-soils

12. Nafchi, A. M., Smart, A., Yang, X., **Mehan, S.**, & Brennan, J. (2024). *Cybersecurity vulnerabilities in precision agriculture* (Extension fact sheet P-00303). South Dakota State University Extension. https://extension.sdstate.edu/sites/default/files/2024-07/P-00303.pdf

Published Codes and Cited Datasets

1. DiSera, L., Eva, E., Foroutan E., Igwe, K., Lamichhane, M.*, **Mehan, S.**, Wasik, A. (2024, October 23). GeoAI Applications to Predict Field Scale Actual Evapotranspiration. https://platform.i-guide.io/notebooks/adcb35f0-a54e-4ec4-ac77-deb5dd0a86ad

2. **Mehan, S.**, and Gitau, M. (2019). Climate Time Series Analysis using R [Data set]. Purdue University Research Repository. https://doi.org/10.4231/R77H1GTX (1897 views; 494 Downloads; 2 Citations as of 08/2024)

3. **Mehan, S.**, and Gitau, M. (2019). Climate Projections for the Western Lake Erie Basin for medium and high emission scenarios for hydrologic modeling assessment studies (Indiana, Ohio, and Michigan) [Data set]. Purdue University Research Repository. https://doi.org/10.4231/R7C53J3W (883 Views; 175 Downloads; 2 Citations as of 08/2024)

4. **Mehan, S.**, and Gitau, M. (2019). Climate Projection Data for 21st Century for the Western Lake Erie Basin (Indiana, Ohio, and Michigan) [Data set]. Purdue University Research Repository. https://doi.org/10.4231/R7GX48SF (842 Views; 181 Downloads; 2 Citations as of 08/2024)

5. **Mehan, S.**, and Gitau, M.W. (2019). Spatial-Temporal Climate Projection Data for 21st Century for the Western Lake Erie Basin (WLEB) for Hydrologic Studies [Data set]. Purdue University Research Repository. https://doi.org/10.4231/R73R0R42 (836 Views; 191 Downloads; 2 Citations as of 08/2024)

Conference Proceedings Paper

1. Gitau. M.W. and **Mehan, S.** (2019). Impacts of Changing Precipitation Patterns on Hydrology and Pollutant Transport in a Subsurface-Drained Watershed. *11th World Congress on Water Resources and Environment (EWRA 2019): Managing Water Resources for a Sustainable Future*." Madrid, Spain, June 25-29. http://ewra.net/pages/EWRA2019_Proceedings.pdf pp 43-44.

Invited Talks

1. **Mehan, S.** (2024). What 100 Years of Climate Data Means for Water Resource Practitioners. A webinar organized by Iowa Learning Farms. September 4, 2024. Virtual.

2. **Mehan, S.** (2024). Cultural Diversity in ASABE: International Perspectives-RAP. A Panel discussion was organized at the Annual International Meeting organized by the American Society of Agricultural and Biological Engineers, Anaheim, CA. July 29, 2024. In-Person.

3. **Mehan, S.** (2024). Land and Water Management to cope up with Climate Change conditions. ICAR - Central Institute of Agricultural Engineering, Bhopal (MP)-462038. January 5, 2024. Virtual.

4. **Mehan, S.** (2023). Rationale behind standards: Why is it important to Young Professionals. ASABE YPC Webinar Series. Virtual Panel Discussion with Jean Walsh, Standards Administrator and Special Projects at ASABE HQ. October 17, 2023. Virtual

5. **Mehan, S.** (2023). Modeling the Hydrologic Nexus: Advancements, Adaptability, and Interdisciplinarity in the Age of Precision Agriculture and Climate Extremes. Eastern South Dakota Water Conference, October 11, 2023. In-Person.

6. **Mehan, S.** (2023). Connecting Water, Carbon and Climate: Fields to Algorithm. Carbon Climate Collaborative Network Webinar Series organized by the Society of Young Agriculture and Hydrologist Scholars in India (SYAHI). September 23, 2023. Virtual.

7. **Mehan, S.** (2023). Email, Curriculum Vitae and Cover letter for academic positions in the USA. All India Agricultural Scientists Association (AIASA) Webinar Series. July 03, 2023. Virtual.

8. **Mehan, S.** (2023). Get Involved with ASABE YPC. Southeastern ASABE Regional Rally, March 25, 2023, and Midwestern Regional Rally, March 24, 2023. Virtual.

9. **Mehan, S.** (2023). The State of Programing Language, R, in Water Resources Research. The inaugural seminar is in a seminar series organized by the ASABE NRES-21 (Hydrology) committee in 2023. February 3, 2023. Virtual.

10. **Mehan, S.** (2022). Workshop on Soil and Water Assessment Tool (SWAT). organized by Society of Young Agriculture and Hydologist scholars in India (SYAHI) and Motilal Nehru College, University of Delhi. August 6 &7, 2022. Virtual.

11. **Mehan, S.** (2022). Adaptation vs. Adoption: Face of Agricultural and Biological Engineering and SARS CoV-2. Joint Special Session organized by three international communities within ASABE: Association of Overseas Chinese Agricultural, Biological & Food Engineers (AOCABFE), African Network Group of ASABE (ANGASABE), and Association of Agricultural, Biological, and Food Engineers of Indian Origin (AABFEIO) at Annual International Meeting organized by American Society of Agricultural and Biological Engineers

at Houston Texas from July 17 - 22, 2022. In-Person.

12. **Mehan, S.** (2021). Data and Humans: A perspective of an Agrineer. The seminar series was organized by the University of Florida Biocomplexity group. January 19, 2021. Virtual.

13. **Mehan, S.** (2020). Obtaining a Postdoc Position. A panel workshop sponsored by the Graduate Education Office of the College of Engineering at Purdue University. November 17, 2020. Virtual.

14. **Mehan, S.** (2020). Role of science in the post-COVID-19 era. A two-day International Symposium at Gujranwala Guru Nanak Khalsa College, Ludhiana, Punjab, India. May 29, 2020. Virtual

15. **Mehan, S.** (2017). The Grad School vs. Industry. The Purdue Chapter of the Society of Women Engineers organized a group panel session. September 10, 2017. In-Person.

16. **Mehan, S.** (2017). Indian Water Resources under the Face of Climate Change: Issues and Remedial Measures. Indian Institute of Technology, Delhi, India. November 22, 2017. In-Person.

17. **Mehan, S.** (2017). Implications of Changing Climatic Conditions on Indian Water Resources: Future Potential in Water Resource Research. Water Technology Center, Indian Council of Agricultural Research, Delhi, India. November 23, 2017. In-Person.

18. **Mehan, S.** (2017). Keys to Higher Education Overseas. National Institute of Food Technology Entrepreneurship and Management, Sonipat, Haryana, India. November 21, 2017. In-Person.

Conference presentations (Grad Students, ** Temporary student help, ┼Serving on committee)*

1. **Mehan, S.** (2024, December 9-13). Bridging the data gap using AI/ML approaches for enhanced water quality analysis [Abstract]. In *2024 American Geophysical Union Fall Meeting*, Washington, DC, United States.

2. Lamichhane, M.*, **Mehan, S.**, and Mankin, K. (2024, December 9-13). Physics Informed Neural Network for Estimating Root Zone Soil Moisture in Semi-Arid Agricultural Fields in Akron, CO [Abstract]. In 2024 *American Geophysical Union Fall Meeting*, Washington, DC, United States.

3. Scheibe, T.D., Gary, S., Goldman, A.E., Forbes, B.K., Garayburu-Caruso, V.A., Rexer, E., Malhotra, A., Tylor, M. Torreira, A.V., Waterman, B.R., **Mehan, S.**, Sampson, C., Bruen, M.P., Gonzales, B.I., McKever, S., Renteria, L., Laan, M, Delgado, D., Stegen, J. (2024, December 9-13). Monthly Model-Experiment Cycles Guided by AI and ICON Science to Understand River Sediment Respiration at the Continental Scale [Invited Abstract]. In 2024 *American Geophysical Union Fall Meeting*, Washington, DC, United States.

4. **Mehan, S.**, and Lamichhane, M.* (2024, November 10-13). Application of remote sensing and machine learning approaches in predicting surface soil moisture (SSM) at a field scale [Abstract]. In *2024 ASA, CSSA, SSSA Annual Meeting*, San Antonio, TX, United States.https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/158548

5. DiSera, L., Eva, E., Foroutan E., Igwe, K., Lamichhane, M.*, **Mehan, S.**, Wasik, A. (2024, October 23). GeoAI Applications to Predict Field Scale Actual Evapotranspiration. [Abstract]. In NSF I-GUIDE Virtual Consulting Office. (Online Webinar). https://i-guide.io/i-guide-vco/geoai-applications-to-predict-field-scale-actual-evapotranspiration/

6. Adebayo, K.*, and **Mehan, S.** (2024, October 15). Climate dynamics of the Great Plains of the United States (1924-2023) [Abstract]. In *South Dakota Student Water Conference*, Brookings, SD, United States.

7. Manna, A., Amatya, D.M., and **Mehan, S.** (2024, October 16). Development of a Statistical Model for Daily Water Table Depth and Important Variables Selection for Inference. In SC Water Resources Conference, Clemson, SC, United States.

8. Maher, K.**, and **Mehan, S.** (2024, October 15). Water Quality Analysis of Skunk Creek Using Basic Imputation Methods [Abstract]. In *South Dakota Student Water Conference*, Brookings, SD, United States.

9. Movaghatian, A.*, **Mehan, S.,** McMaine, J.T., Kulkarni, P., Aydogdu, M. (2024, October 15). Assessment of the Impact of Swine Manure on Wind Erosion Potential Using RCBD Plot Scale Study in Eastern SD [Abstract]. In *South Dakota Student Water Conference*, Brookings, SD, United States.

10. Ram, T.*, Niroula, A., Alam, J., and **Mehan, S.** (2024, October 15). Water balance of Tamor River Basin using SWAT [Abstract]. In *South Dakota Student Water Conference*, Brookings, SD, United States.

11. Eva, H.S.**, **Mehan, S.,** Bergstrom, J., Dalton, J., Schlecter, P., Kolb, K. (2024, October 15). Bridging Community Insights and Solutions in Water Resource Management: A Pathway to Water Resources Program in South Dakota [Abstract]. In *South Dakota Student Water Conference*, Brookings, SD, United States.

12. Lamichhane, M.* and **Mehan, S.**, (2024, October 15). Machine Learning Models to Predict Surface Soil Moisture Using Multimodal Remote Sensing Data Fusion in Diverse Crop Fields in Semi-Arid Regions [Abstract]. In *South Dakota Student Water Conference*, Brookings, SD, United States.

13. Sahraei, M.†, Hentegs, M., McMaine, J.T., Trooien, T., **Mehan, S.**, Osterloh, K., Moradi, H.R. (2024, October 15). Evaluating Nitrate and Dissolved Reactive Phosphorus Concentrations in Subsurface Drainage and Contributing Factors in Eastern South Dakota [Abstract]. In South Dakota Student Water Conference, Brookings, SD, United States.

14. Lamichhane, M.*, **Mehan, S.**, and Mankin, K. (2024, July 28 - August 1). Comparison of hybrid machine learning models with classical machine learning models to predict actual evapotranspiration in semi-arid region [Abstract ID: 2400756]. In *ASABE Annual International Meeting*, Anaheim, CA, United States.

15. **Mehan, S.**, Sharma, A., McDaniel, R., Arnold, J. G., Trooien, T., Sammons, N., and Amegbletor, L. (2024, July 28-31). Evaluating the performance of SWAT+ for simulating drainage water management (DWM) and model parameter transferability spatially in Eastern SD [Abstract ID: 2401216]. In *ASABE Annual International Meeting*, Anaheim, CA, United States.

16. Sahraei, M.†, Hentegs, M., McMaine, J., Trooien, T., **Mehan, S.**, Osterloh, K., and Moradi, H. (2024, July 28-31). Management practices and field characteristics that drive nutrient loss in tile drainage in eastern South Dakota [Abstract ID: 2400904]. In *ASABE Annual International Meeting*, Anaheim, CA, United States

17. Adebayo, K.*, **Mehan, S.** , and Mankin, K.(2024, July 28-August 1). Analyzing climate change trends in the Great Plains of the United States (1900-2022) [Abstract ID: 2400792]. In *ASABE Annual International Meeting*, Anaheim, CA, United States.

18. Bruen, M., Forbes, B., Gary, S.F., Goldman, A.E., Malhotra, A., **Mehan, S.**, Pelly, A.C., Sampson, C., Scheibe, T.D., Stegen, J., Taylor, M.S., Waterman, B. (2024, May 30) [Abstract]. In *HydroML Symposium*, Richland, WA, United States.

19. Lamichhane, M.*, **Mehan, S.**, Mankin, K., and Maitinyazi, M. (2024, April 18). Machine learning models to predict actual evapotranspiration in semi-arid region. In *2024 Western South Dakota Hydrology Conference*, Rapid City, SD, United States.

20. Adebayo, K.*, and **Mehan, S.** (2024, April 18). Comprehensive analysis of drought dynamics in South Dakota using the aridity index and standardized precipitation evapotranspiration index. In *2024 Western South Dakota Hydrology Conference*, Rapid City, SD, United States.

21. Lamichhane, M.*, **Mehan, S.**, and Mankin, K. (2024, April 11-12). Actual evapotranspiration prediction based on harmonized Landsat sentinel indices with a few weather variables using machine learning algorithms in semi-arid regions. In *2024 ASABE North Central Regional Meeting*, Brookings, SD, United States.

22. Adebayo, K.*, **Mehan, S.**, and Mankin, K. (2024, April 11-12). A comparative analysis of change point detection methods for hydrologic data. In *2024 ASABE North Central Regional Meeting*, Brookings, SD, United States.

23. Lamichhane, M.*, **Mehan, S.**, and Maimaitijian, M. (2024, April 4). Soil moisture prediction using multimodal remote sensing data fusion and machine learning algorithms in diverse crop fields. Poster session presented at the *55th Geography Conference*, Brookings, SD, United States.

24. **Mehan, S.** (2024, April 3-5). Effectiveness of SWAT simulating drainage water management using edge-of-field data in OH. In *Annual Meeting for the Conservation Drainage Network and NCERA-217: Drainage Design and Management Practices to Improve Water Quality*, Westerville, OH, United States.

25. Muehlman, J., Prasad, L., Thompson, A., **Mehan, S.**, Osterholz, W., King, K., Arriaga, F., and Kalcic, M. (2024, April 25-26). Improving the representation of cold season hydrology in SWAT. In *WI AWRA 2024 Annual Meeting*, Appleton, WI, United States.

26. Lamichhane, M.*, and **Mehan, S.** (2023, October 10). Enhancing evapotranspiration (ETa) estimation through machine learning driven satellite image fusion. In *2023 South Dakota Student Water Conference*, Brookings, SD, United States.

27. Lamichhane, M.*, **Mehan, S.**, and Maimaitijian, M. (2023, November 15). Machine learning models to predict actual evapotranspiration (ET_a) based on harmonized Landsat Sentinel (HLS) and climate variables in semi-arid regions. Poster session presented at *EROS Center Fall Poster Session*, Sioux Falls, SD, United States

28. **Mehan, S.**, and Amatya, D. (2023, December 11-15). Development of an open-source forest fire prediction tool using machine learning algorithms. In *American Geophysical Union Fall Meeting*, San Francisco, CA, United States.

29. **Mehan, S.**, Mankin, K., Barnard, D., and Green, T. (2023, July 9-12). GeoSpatial hydrometeorological data in the contiguous U.S.: Sources, characteristics, accessibility, and applicability – A review and synthesis. In *ASABE Annual International Meeting*, Omaha, NE, United States.

30. Mankin, K., Wells, R., Edmunds, D., McMaster, G., Green, T., Kipka, H., **Mehan, S.**, Fox, F., Wagner, L., and Barnard, D. (2023, July 9-12). Crop phenology modeling and calibration using UPGM for corn, sorghum, wheat, sunflower, and dry bean. In *ASABE Annual International Meeting*, Omaha, NE, United States.

31. Kalcic, M., **Mehan, S.**, Prasad, L. R., and Thompson, A. M. (2023, March 16-17). Improving watershed model (SWAT) simulation of wintertime nutrient transport. In *46th Annual Meeting of*

the American Water Resources Association-Wisconsin Section, Wisconsin Dells, WI, United States.

32. **Mehan, S.**, Prasad, L. R., Kalcic, M., and Thompson, A. M. (2022, December 12-16). Improving SWAT simulation of frozen hydrology in cold-region agricultural watersheds. In *American Geophysical Union Fall Meeting*, Chicago, IL, United States.

33. **Mehan, S.**, Kujawa, H., Murumkar, A., Shedekar, V., Kalcic, M., and King, K. (2022, July 17-21). Using Soil and Water Assessment Tool (SWAT) for simulating drainage water management: Lessons learned. In *ASABE Annual International Meeting*, Houston, TX, United States.

34. **Mehan, S.**, Rao, P. D., and Amatya, D. M. (2022, July 17-21). Wildfire prediction modeling using fine resolution meteorological data. In *ASABE Annual International Meeting*, Houston, TX, United States.

35. Murumkar, A., Martin, J., Kalcic, M., King, K., Shedekar, V., **Mehan, S.**, and Kujawa, H. (2022, July 17-21). Simulating the watershed scale water quality impacts of drainage water management in the western Lake Erie basin, USA. In *ASABE Annual International Meeting*, Houston, TX, United States.

36. **Mehan, S.**, Kalcic, M., and Hood, J. M. (2021, December 13-17). Improving and testing in-stream phosphorus cycling in SWAT+. In *American Geophysical Union Fall Meeting*, New Orleans, LA, United States. https://doi.org/10.1002/essoar.10509563.1

37. **Mehan, S.,** King, K., Kujawa, H., Shedekar, V., Murumkar, A., and Kalcic, M. M. (2021, July 12-16). Evaluating the effectiveness of SWAT (Soil and Water Assessment Tool) in simulating the impact of drainage water management (DWM) system on water quality. In *ASABE Annual International Meeting*, Virtual Meeting.

38. **Mehan, S.**, and Amatya, D. M. (2021, April 1). Data-driven decision-making matrices assessing fire risk in woody ecosystem: A preliminary feasibility study. In *Santee Experimental Forest Research Forum 2021*, Virtual Meeting.

39. **Mehan, S.**, Kalcic, M., and Hood, J. M. (2020, December 1-17). Review of water quality models simulating in-stream nutrient dynamics. In *American Geophysical Union Fall Meeting*, Virtual Meeting. https://doi.org/10.1002/essoar.10510722.1

40. **Mehan, S.**, Amatya, D. M., and Aggarwal, R. (2020, July 12-15). Meteorological data challenges and opportunities in designing matrices relating climatology impacting changes in woodland ecosystems. In *ASABE Annual International Meeting*, Virtual Meeting.

41. Paul, G., Dickey, J., Miller, K., **Mehan, S.**, Hartz, T., Schmid, A., and Kellar, C. (2019, November 10-13). Declining groundwater quality and quantity in Central Valley California – Assessing impact of crop management practices. In *ASA-CSSA-SSSA International Annual Meeting*, San Antonio, TX, United States.

42. Miller, K., Dickey, J., Paul, G., **Mehan, S.**, Kellar, C., Yimam, Y. T., Cassman, K., Harter, T. K., and Ikemeya, D. (2019, October 28-30). Site-specific management effects on nitrate leaching. In *FREP/WPHA Nutrient Management Conference*, Fresno, CA, United States.

43. Miller, K., Dickey, J., Paul, G., **Mehan, S.**, Kellar, C., Yimam, Y. T., Cassman, K., Harter, T. K., Ikemeya, D., Geiseller, D., Cahn, M., and Schmid, A. (2019, October 28-30). Tools for site-specific crop management to maximize recovery of applied nitrogen fertilizer. In *FREP/WPHA Nutrient Management Conference*, Fresno, CA, United States.

44. Hoffman, I. R., **Mehan, S.**, Miller, K., Paul, G., Dickey, J., Hartz, T., Harter, T. K., and Kisekka, I. (2019, October 28-30). A multi-scale modeling assessment of nitrogen leaching from Central Valley irrigated processing tomatoes. In *FREP/WPHA Nutrient Management Conference*, Fresno, CA, United States.

45. **Mehan, S**., Miller, K., Paul, G., Yimam, Y. T., Dickey, J., Schmid, A., Hartz, T. K., Schmid, B., and Roberson, M. (2019, December 9-13). Quantification of nitrate budget from irrigated lands in Central Valley of California using SWAT. In *American Geophysical Union Fall Meeting*, San Francisco, CA, United States.

46. **Mehan, S.**, Paul, G., Yimam, Y. T., Dickey, J., Schmid, A., Hartz, T. K., and Schmid, B. (2019, July 7-11). Quantification of nitrate leaching from almond fields in Central Valley of California using SWAT. In *ASABE Annual International Meeting*, Boston, MA, United States.

47. **Mehan, S.**, Yimam, Y., Paul, G., Hartz, T., Dickey, J., Cassman, K., and South San Joaquin Valley Management Practices Evaluation Program Team Members. (2018, October 23-24). Quantifying nitrate leaching from Central Valley irrigated lands using the Soil and Water Assessment Tool (SWAT). In *FREP/WPHA Conference*, Seaside, CA, United States.

48. Gitau, M. W., **Mehan, S.**, Sekaluvu, L., Kiggundu, N., Moriasi, D., and Mishili, F. (2018, October 3-6). Water resources modeling in East Africa: Access and suitability of rainfall data. In *Global Water Security Conference for Agriculture and Water Resources*, Hyderabad, India.

49. **Mehan, S.**, Gitau, M. W., and Flanagan, D. C. (2018, October 3-6). Impact of changing climate on surface flow and nutrients in an agricultural dominated tile drained watershed for sustainable water resources. In *Global Water Security Conference for Agriculture and Water Resources*, Hyderabad, India.

50. **Mehan, S.**, and Gitau, M. W. (2018, July 29-August 1). Bias-corrected climate data for Western Lake Erie Basin (WLEB): Implications for hydrologic and water quality modeling for 21st century using SWAT. In *ASABE Annual International Meeting*, Detroit, MI, United States.

51. **Mehan, S.**, Gitau, M. W., and Flanagan, D. C. (2018, June 27-29). Assessment of changing climatic conditions on nutrients fate and transport in tile drained watershed for sustained water quality. In *39th Annual Indiana Water Resources Association (IWRA) Symposium*, Bloomington, IN, United States.

52. **Mehan, S.**, and Gitau, M. W. (2018, February 8). Estimation and correction of bias of long-term simulated climate data from global circulation models (GCMs)-II. In The 5th Annual ABE-GSA Industrial Research Symposium, West Lafayette, IN, United States.

53. **Mehan, S.**, and Gitau, M. W. (2017, December 11-15). Estimation and correction of bias of long-term simulated climate data from global circulation models (GCMs). In *American Geophysical Union Fall Meeting*, New Orleans, LA, United States.

54. **Mehan, S.**, Guo, T., Gitau, M. W., and Flanagan, D. C. (2017, July 16-19). Weather generator performance in representing statistical characteristics of observed data. In *ASABE Annual International Meeting*, Spokane, WA, United States.

55. **Mehan, S.**, Guo, T., Gitau, M. W., Wallace, C., and Flanagan, D. C. (2017, July 16-19). Hydrologic model performance as related to different realizations of the climate generator simulated weather data. In *ASABE Annual International Meeting*, Spokane, WA, United States.

56. Gitau, M. W., **Mehan, S.**, and Guo, T. (2017, July 5-9). Weather generator utilization in climate impact studies: Implications for water resources modelling. In *10th World Congress on Water Resources and Environment*, Athens, Greece.

57. **Mehan, S.**, and Gitau, M. W. (2017, June 28-30). Quantification of bias from global circulation model outputs and its correction. In *38th Annual Indiana Water Resources Association (IWRA) Symposium*, Turkey Run State Park, IN, United States.

58. **Mehan, S.**, and Gitau, M. W. (2017, February 16). Extent of uncertainty in statistically downscaled climate data. In *The 4th Annual ABE-GSA Industrial Research Symposium*, West Lafayette, IN, United States.

59. **Mehan, S.**, Guo, T., Gitau, M. W., and Flanagan, D. C. (2016, October 25). Performance capability of different weather generators in simulating long-term climate data in the Great Lakes region. In *University and Industrial Consortium at Dows Agro Science*, Indianapolis, IN, United States.

60. **Mehan, S.**, Guo, T., Gitau, M. W., and Flanagan, D. C. (2016, July 17-20). Comparison of stochastic weather generators for long-term climate data simulation in Great Lakes region. In *ASABE Annual International Meeting*, Orlando, FL, United States.

61. **Mehan, S.**, Guo, T., Gitau, M. W., and Flanagan, D. C. (2016, June 8-10). Effectiveness of stochastic weather generators in simulating long-term climate data. In *37th Annual Indiana Water Resources Association Symposium*, Angola, IN, United States.

62. **Mehan, S.**, Singh, K. G., and Sharda, R. (2016, February 18). Effect of colored mulches in mitigating climate change impacts on growth of capsicum under field conditions. In *The 3rd Annual ABE-GSA Industrial Research Symposium*, West Lafayette, IN, United States.

63. **Mehan, S.**, Neupane, R. P., and Kumar, S. (2015, November 15-18). SWAT model calibration, validation and parameter sensitivity analysis using SWAT-CUP. In *ASA-CSSA-SSSA International Annual Meeting*, Minneapolis, MN, United States.

64. **Mehan, S.**, Neupane, R. P., and Kumar, S. (2015, October 14-16). Projecting climate change impacts on surface hydrology of a small agriculture-dominated watershed. In *International Soil and Water Assessment Tool Conference*, West Lafayette, IN, United States.

65. **Mehan, S.**, Kumar, S., and Lin, Y. (2015, November 18). Application of GIS in analyzing rainfall distribution spatially in Skunk Creek watershed. In *USGS EROS-SDSU Student Led Posters*, Garretson, SD, United States.

66. **Kumar, S.**, Mehan, S., Neupane, R. P., Mbonimpa, E., Kjaersgaard, J., Jequet, J., Bly, A., Miller, M., and Smalley, S. (2015, July 27-28). Integrated plan for drought preparedness and mitigation, and water conservation at the watershed scale. In *NIWQP and AFRI PD Meeting Program*, North Carolina, United States.

67. **Mehan, S.**, Singh, K. G., and Sharda, R. (2017). Impact of colored plastic mulches on plant light environment, soil temperature, and yield of bell pepper under field conditions. *Agricultural Mechanization in Asia, Africa and Latin America, 48*(1), 2014-83.

68. **Mehan, S.**, and Singh, K. G. (2013). Use of colored mulches in sustaining Indian agricultural production. In *National Seminar on Advances in Protected Cultivation Technical Session: Protected Infrastructures and Allied Issues* (p. 138). New Delhi, India.

PATENTS ISSUED

SOY-BASED FILTRATION SYSTEM

Smith, A., Huang, A., **Mehan, S.**, and Saadat, S. (2024). Soy based filtration system (U.S. Patent No. 12,090,431). U.S. Patent and Trademark Office. https://patentimages.storage.googleapis.com/4a/d6/4d/e912f0d70a8d30/US12090431.pdf

Smith, A., Huang, A., **Mehan, S.**, and Saadat, S. (2023). Soy based filtration system (U.S. Patent No. 11,691,099). U.S. Patent and Trademark Office. https://patentimages.storage.googleapis.com/9f/7d/64/24c9a39b98213c/US11691099.pdf

PROFESSIONAL SOCIETY AFFILIATIONS

- American Society of Agricultural and Biological Engineers (ASABE) — Since 2015
- American Geophysical Union (AGU) — Since 2017
- Soil Science Society of America (SSSA) — Since 2015
- Tau Beta Pi (TBP), The Engineering Honor Society — Since 2017
- Alpha Epsilon (AE) Honors Society, Purdue University Agricultural and Biological Engineering Chapter — Since 2017
- National Association County Agricultural Agents (NACAA) — Since 2023
- South Dakota Association of Agricultural Extension Professionals (SDAAEP) — Since 2023
- Indian Society of Agricultural — Since 2024

HONORS AND AWARDS

- NSF-I GUIDE ((Institute for Geospatial Understanding through an Integrative Discovery Environment) Team Lead — 2024
- HydroLearn Faculty Fellow by Consortium of Universities for the Advancements of Hydrologic Science, Inc. (CUAHSI) — 2024
- ASABE Presidential Citation — 2024
- ASABE Education Aids Blue Ribbon — 2024
- SD Discovery Center Science Communication Fellow — 2024
- Trailblazers in Engineering (TBE) Fellow — 2023
- ASABE Outstanding Reviewer (NRES-Natural Resources & Environmental Systems) — 2020 and 2023
- Early Career Engineer of the Year from the Association of Agricultural, Biological, and Food Engineers of Indian Origin (AABFEIO) — 2022
- Ohio State Post-Doctoral Association Professional Development Award — 2020
- "Highest Likes and Most Watched Video" Winner at ASABE Inspired Video Challenge — 2020
- Top Reviewers in Environment and Ecology (Global Peer Review Awards powered by Publons) — 2019
- Top Reviewers in cross-field (Global Peer Review Awards powered by Publons) — 2019
- Outstanding ABE Ph.D. Student: Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, IN — 2018
- ASABE New Faces: Professional — 2018
- Special Mention Graduate Ag Research Spotlight — 2018
- First Place in Poster Competition, Second Place in Oral Presentation, Second Place in Pitch Your Thesis Competition at 5th ABE GSA Research and Industrial Symposium, Purdue University, West Lafayette, IN — 2018
- Bilsland Dissertation Fellowship, College of Engineering, Purdue University, West Lafayette, Indiana 47907 — 2017-2018
- Indiana Soybean Innovation Competition (Winner of student competition): Team competition- The final product is filed for International Patent — 2017
- Indian Council of Agricultural Research International Fellowship — 2014
- University Fellow, Punjab Agricultural University, Ludhiana, Punjab, India — 2012-to-2014
- Outstanding Best Student at Undergraduate Level, Punjab Agricultural University, Ludhiana, Punjab, India — 2011

- Nominee of Indira Gandhi National Service Scheme (NSS) National Award 2011
- Dr. Dalip Singh Deep Memorial State Award 2010
- College Merit for Literary Events 2010
- Outstanding Student Indian Society of Technical Education (ISTE) 2010
- Best Speaker of the University (Punjab Agricultural University) 2008 and 2011
- Best Debater of the University (Punjab Agricultural University) 2007-to-2011
- Swami Vivekananda Youth Award 2010
- Ajit Matto Award for Outstanding Academic Performance 2010

AWARDS and HONORS by Lab Members

Manoj Lamichhane, PhD Student (2nd Year)

- Outstanding Oral Presentation at 2024 ASABE North Central Regional Section Meeting, Brookings, SD. (April 11-12, 2024) 2024
- NSF-I GUIDE ((Institute for Geospatial Understanding through an Integrative Discovery Environment) Team Lead 2024
- 2024 ASABE Annual International Meeting Travel Grant sponsored by Agricultural and Biosystems Engineering Department at South Dakota State University, Brookings, SD 2024

Kayode Adebayo, PhD Student (1st Year)

- 3rd position in the student poster competition at the Western Hydrology Conference, South Dakota, April 18, 2024 2024

LIST OF REFERENCES

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