Sagar **Gautam**

POSTDOC SCHOLAR · ENVIRONMENTAL ENGINEER

Argonne National Laboratory, Lemont, IL USA

☎ 605-592-6831 | ✉ sgautam@anl.gov | 🐦 @zzautam

Employment

Argonne National Laboratory (ANL)
Lemont, IL USA

POST-DOCTORAL RESEARCHER
May 2019-Present

- Mission: Quantifying the environmental impacts of land use and climate change on soil and water system using simulation models (Process models, machine learning models and earth system models)

Minnesota Pollution Control Agency (MPCA)
St. Paul, MN USA

RESEARCH SCIENTIST II
November 2018-April 2019

- Mission: Research to improve the methodology on implementation of Lake and River Eutrophication Standards to prevent the eutrophication of the lake and river located in the State of Minnesota

University of Missouri-Columbia (MIZZOU)
Columbia, MO USA

GRADUATE RESEARCH ASSISTANT
2015- 2018

- Mission: Hydrologic Modeling, GCM Downscaling and Bias-correction and, Future drought

South Dakota State University (SDSU)
Brookings, SD USA

GRADUATE RESEARCH ASSISTANT
2014- 2015

- Mission: Field-scale Hydrologic Modeling and Water and soil sampling and its lab analysis

Education

University of Missouri-Columbia
Columbia, MO USA

DOCTOR OF PHILOSOPHY (BIO-ENVIRONMENTAL ENGINEERING)
2015– 2018

- Dissertation title: Assessing climate change impact on hydrology and extreme occurrence at a watershed scale using simulation models
- Dr. Christine Costello, Dr. Allen Thompson, Dr. Claire Baffaut and Dr. E. J Sadler

South Dakota State University
Brookings, SD USA

MASTER DEGREE IN SOIL PHYSICS
2013 – 2014

- Thesis title: Runoff simulation using APEX from long-term no-till and grazed pasture watersheds
- Dr. Sandeep Kumar, Dr. Jim Bonta, Dr. Sharon K. Papiernik and Dr. Rattan lal

Research

Quantifying the environmental impacts of land use and climate change on soil and water
ANL, IL USA

SUPERVISOR: DR. UMAKANT MISHRA
Apr. 2018 – Present

- Quantifying the environmental impacts of biomass removal using field observations and agro-ecosystem model (DAYCENT)
- Application of machine learning models to predict spatial heterogeneity of surface soil organic carbon stocks in data-limited northern circumpolar region
- Assessing the soil carbon release under future warming in continental USA
- Representation of bioenergy crop in earth system model (E3SM)

Implementation of Clean Water Act
MPCA, MN USA

SUPERVISOR: STEVEN WEISS
Nov. 2018. – Mar. 2019

- Analysis of state wide (state of Minnesota) water quantity and quality datasets and implementation of simulation models to ensure the compliance of industrial, municipal and domestic facilities with Clean Water Act
- Research to improve the methodology on implementation of lake and river eutrophication standards to prevent the eutrophication of the lake and river located in the state of Minnesota

Large scale hydrologic modeling
MIZZOU, MO USA

SUPERVISORS: DR. CHRISTINE COSTELLO
2015 – 2018

- Hydrologic modeling (both field and watershed scale)
- GCM downscaling and bias-correction (focus on statistical downscaling)
- Drought analysis (meteorological, hydrological and agricultural droughts)

Field scale hydrologic modeling

Supervisor: Dr. Sandeep Kumar

- Field scale hydrologic modeling
- Calibration and uncertainty analysis
- Water and soil sampling and its lab analysis

Peer review publications

First-author publications:

6   Soil carbon release under future warming in continental US.   *in prep.*
    Sagar Gautam, Umakant Mishra, & Corinne D Scown,

5   Impact of climate change on Drought Occurrence in the Agricultural Watershed Located in   *in prep.*
    Northeast Missouri.
    Sagar Gautam, Christine Costello, Claire Baffaut, Allen Thompson, & Bohumil M Svoma

4   Sorghum biomass production in the continental United States and its potential impacts on soil   *2020*
    organic carbon and nitrous oxide emissions
    Sagar Gautam, Umakant Mishra, Corinne D Scown, & Yao Zhang   *under review*

3   Assessing Long-term Hydrologic Impact of Climate Change using Ensemble Approach and   *2018*
    Comparison with Global Gridded Model-A Case Study on Goodwater Creek Experimental Watershed
    Sagar Gautam, Christine Costello, Claire Baffaut, Allen Thompson, Bohumil M Svoma, Quang A Phung & Edward J Sadler   *Water*

2   Simulating Runoff from Small Grazed Pasture Watersheds Located at North Appalachian   *2018*
    Experimental Watershed in Ohio.
                                                                                                                  Rangeland Ecology and
    Sagar Gautam, Eric Gentil Mbonimpa, Sandeep Kumar, & James Bonta, J.   *Management*

1   APEX model simulation of climate change impacts on runoff from a small no-till watershed   *2015*
                                                                                                                  Journal of Soil Water
    Sagar Gautam, Eric Gentil Mbonimpa, Sandeep Kumar, James Bonta, & Rattan Lal   *Conservation*

Second-author publications:

3   Payment for soil carbon sequestration may encourage biomass production and bioeconomy   *2020*
    Shruti Mishra, Sagar Gautam, & Umakant Mishra   *under review*

2   Ensemble machine learning approach improves predicted spatial heterogeneity of surface soil   *2020*
    organic carbon stocks in data-limited northern circumpolar region
    Umakant Mishra, Sagar Gautam, William Riley, & Forrest M. Hoffman   *under review*

1   ombined PEST and Trial-Error (CPTE) Approach to Improve APEX Calibration.   *2015*
                                                                                                                  Computers and Electronics in
    Mbonimpa, E. G., Gautam, S., Kumar, S., Lai, L., Bonta, J., & X. Wang   *Agriculture*

N-author publications:

3   Framework for using downscaled climate model projections in ecological experiments to quantify   *2019*
    plant and soil responses
    Rachel K. Owen, Elisabeth B. Webb, Keith W. Goyne, Bohumil M. Svoma, & Sagar Gautam   *Ecosphere*

2   Climate and Land Use Effect on Hydrologic Processess in a Primirily Rain-fed, Agricultural   *2019*
    Watershed
    Quang A. Phung, Allen Thompson, Claire Baffaut, Christine Costello, E. John Sadler, Bohumil Svoma, Anthony Lupo, &   *Journal of American Water*
    Sagar Gautam   *Resources Association*

1   Long-term Tillage and Drainage Influences on Soil Organic Carbon Dynamics, Aggregate Stability,   *2014*
    and Corn Yield
                                                                                                                  Soil Science and Plant Nutrition
    Kumar, S., Nakajima, T., Mbonimpa, E. G., Gautam, S., Somireddy, U. R., Kadono, A., Lal, R., Chintala, R., Rafique, R., &
    Fausey, N.

Seminars & Conference Talks

2019	**American Geophysical Union fall meeting**, Sagar Gautam, Umakant Mishra, Corinne D Scown, Yao Zhang. Suitability analysis for biomass sorghum production in the continental United States	*San Francisco, USA*
2019	**Joint Bioenergy Institute annual Meeting**, Sagar Gautam, Umakant Mishra, and Corinne D Scown. Biomass sorghum production in the continental United States	*Monterey Bay, USA*
2017	**American Society of Agricultural and Biological Engineers Annual International Meeting**, Sagar Gautam, Christine Costello, Claire Baffaut, Allen Thompson, Bohumil M. Svoma and John Sadler. Evaluation of climate variability impact on drought occurrence in an agricultural watershed	*Spokane, WA USA*
2016	**International Symposium on Sustainable System and Technology**, Sagar Gautam, Christine Costello, Claire Baffaut, and Bohumil M. Svoma. Assessing long term hydrologic impact of climate change on an agricultural-dominated watershed using CMIP5 and SWAT model	*Phoenix, AZ USA*
2016	**Mid-American Environmental Engineering Conference**, Assessing long term hydrologic impact of climate change on an agricultural-dominated watershed using CMIP5 and SWAT model	*Edwardsville, IL USA*
2016	**Employing model-based reasoning in socio-environmental synthesis (EMBeRS) PhD training Workshop**	*El Paso, TX USA*
2015	**International SWAT Conference**, Sagar Gautam, Christine Costello, Claire Baffaut, Quang A. Phung ,and Bohumil M.Svoma. Climate model biases and statistical downscaling for application in hydrologic model	*West Lafayette, IN*
2018	**ASA-CSSA-SSSA. International Annual Meeting**, Sagar Gautam, Sandeep Kumar, Eric Gentil Mbonimpa, James Bonta, Rattan Lal, Jeppe H Kjaersgaard, Sharon K. Papiernik and Jimmy R. Williams, Simulating Runoff from Small Grazed Pasture Watersheds Located at North Appalachian Experimental Watershed	*Long Beach, CA USA*
2013	**Eastern South Dakota Water Conference**, Sagar Gautam, Sandeep Kumar, Eric Gentil Mbonimpa and James Bonta. APEX Model to Assess No-Till Management Effects on Runoff and Nutrient Losses from a Small Agricultural Watershed in Ohio	*Brookings, SD USA*

Teaching Experience

Spring 2017	**Water Management Theory (BE 8250),** Graduate course covering unsaturated flow (With Dr. Allen Thompson and Dr. Stephen Anderson, University of Missouri)	*Columbia, MO USA*
Fall 2016	**Soil Water Conservation Engineering (BE 4150) ,** Undergraduate course covering the principle soil water conservation (With Dr. Allen Thompson, University of Missouri)	*Columbia, MO USA*
Spring 2014	**Environmental soil management (PS-362),** Undergraduate course covering the soil and water erosion (With Dr. Sandeep Kumar, South Dakota State University)	*Brookings, SD USA*
Spring 2014	**Introduction to soil (PS-213),** Undergraduate course covering introduction to soil physical and chemical properties (With Dr. Sandeep Kumar, South Dakota State University)	*Brookings, SD USA*

Honors & Awards

2016	**National Science Foundation travel grant for attending Symposium on Sustainable System and Technology**	*Phoenix, AZ*
2016	**Third place in student poster competition in International Symposium on Sustainable System and Technology**	*Phoenix, AZ*
2016	**Travel grant for attending the National Science Foundation-funded Employing Model-based Reasoning in Socio-Environmental synthesis (EMBeRS) PhD Training Workshop**	*El Paso, TX USA*
2013	**Finalist in sigma XI graduate student research award ,** SDSU Sigma Xi Chapter	*Brookings, SD USA*

Skills

Programming	Python, R, TEX, Matlab, HPC
Data analysis	ArcGIS,Mathematica, AutoCAD
Environmental models	Hydrologic models (GMS, SWAT, APEX, HEC-RAS, HSPF, MODFLOW), DNDC, DAYCENT, CropSyst, Environmental Regulatory Compliance)

References

- **Dr. Christine Costello** Penn State University, University Park, PA, chriscostello@psu.edu
- **Dr. Sandeep Kumar** South Dakota State University, Brookings, SD, sandeep.kumar@sdstate.edu
- **Dr. Umakant Mishra** Argonne National Laboratory, Lemont, IL, umishra@anl.gov