

Sagar Gautam

POSTDOC SCHOLAR · ENVIRONMENTAL ENGINEER

Sandia National Laboratory, Livermore and Joint BioEnergy Institute, Emeryville, CA USA

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Employment

Sandia National Laboratory (SNL) & Joint BioEnergy Institute (JBEI)

[Livermore & Emeryville, CA, USA](#)

POST-DOCTORAL RESEARCHER

Nov 2020-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)

Argonne National Laboratory (ANL) & Joint BioEnergy Institute (JBEI)

[Lemont, IL USA](#)

POST-DOCTORAL RESEARCHER

May 2019- Oct 2020

- Mission: Quantifying the environmental impacts of land use and climate change on soil and water system

Minnesota Pollution Control Agency (MPCA)

[St. Paul, MN USA](#)

RESEARCH SCIENTIST II

November 2018-April 2019

- Mission: Methodological advancement 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 projection

South Dakota State University (SDSU)

[Brookings, SD USA](#)

GRADUATE RESEARCH ASSISTANT

2014- 2015

- Mission: Field-scale hydrologic modeling; Soil and water 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 OF SCIENCE (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

[SNL, ANL & JBEI](#)

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 circum-polar region
- Assessing the soil carbon release under future warming in continental USA
- Representation of bioenergy crop in Earth system model

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

Large scale hydrologic modeling

MIZZOU, MO USA

SUPERVISORS: DR. CHRISTINE COSTELLO

2015 – 2018

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

Field scale hydrologic modeling

SDSU, SD USA

SUPERVISOR: DR. SANDEEP KUMAR

2014 – 2015

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

Peer review publications

First-author publications:

- 6 PROJECTED CHANGES IN CLIMATE CAN RELEASE FOUR PETA-GRAMS OF SOIL ORGANIC CARBON FROM US TOPSOIL BY THE END 21ST CENTURY. in prep.
Sagar Gautam, Umakant Mishra, & Corinne D Scown,
- 5 PROJECTION OF FUTURE DROUGHT AND EXTREME EVENTS OCCURRENCE IN GOODWATER CREEK EXPERIMENTAL WATERSHED, MIDWESTERN US minor revision (2020)
Sagar Gautam, Christine Costello, Claire Baffaut, Allen Thompson, & E. John Sadler Hydrological Sciences Journal
- 4 SORGHUM BIOMASS PRODUCTION IN THE CONTINENTAL UNITED STATES AND ITS POTENTIAL IMPACTS ON SOIL ORGANIC CARBON AND NITROUS OXIDE EMISSIONS 2020
Sagar Gautam, Umakant Mishra, Corinne D Scown, & Yao Zhang GCB Bioenergy
- 3 ASSESSING LONG-TERM HYDROLOGIC IMPACT OF CLIMATE CHANGE USING ENSEMBLE APPROACH AND COMPARISON WITH GLOBAL GRIDDED MODEL-A CASE STUDY ON GOODWATER CREEK EXPERIMENTAL WATERSHED 2018
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 EXPERIMENTAL WATERSHED IN OHIO. 2018
Sagar Gautam, Eric Gentil Mbonimpa, Sandeep Kumar, & James Bonta, J. Rangeland Ecology and Management
- 1 APEX MODEL SIMULATION OF CLIMATE CHANGE IMPACTS ON RUNOFF FROM A SMALL NO-TILL WATERSHED 2015
Sagar Gautam, Eric Gentil Mbonimpa, Sandeep Kumar, James Bonta, & Rattan Lal Journal of Soil Water 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 ORGANIC CARBON STOCKS IN DATA-LIMITED NORTHERN CIRCUMPOLAR REGION minor revision
Umakant Mishra, Sagar Gautam, William Riley, & Forrest M. Hoffman Frontier in Big Data
- 1 OMBINED PEST AND TRIAL-ERROR (CPTe) APPROACH TO IMPROVE APEX CALIBRATION. 2015
Mbonimpa, E. G., Gautam, S., Kumar, S., Lai, L., Bonta, J., & X. Wang Computers and Electronics in Agriculture

N-author publications:

- 4 MULTIFUNCTIONAL LANDSCAPE FOR DEDICATED BIOENERGY CROPS LEADS TO LOW-COST AND CARBON-NEGATIVE BIOFUELS In Prep.
Nawa Raj Baral, Shruti K. Mishra, Sagar Gautam, Umakant Mishra, & Corinne D. Scown
- 3 FRAMEWORK FOR USING DOWNSCALED CLIMATE MODEL PROJECTIONS IN ECOLOGICAL EXPERIMENTS TO QUANTIFY PLANT AND SOIL RESPONSES 2019
Rachel K. Owen, Elisabeth B. Webb, Keith W. Goyne, Bohumil M. Svoma, & Sagar Gautam Ecosphere

2	CLIMATE AND LAND USE EFFECT ON HYDROLOGIC PROCESSES IN A PRIMIRILY RAIN-FED, AGRICULTURAL WATERSHED <i>Quang A. Phung, Allen Thompson, Claire Baffaut, Christine Costello, E. John Sadler, Bohumil Svoma, Anthony Lupo, & Sagar Gautam</i>	2019 <i>Journal of American Water Resources Association</i>
1	LONG-TERM TILLAGE AND DRAINAGE INFLUENCES ON SOIL ORGANIC CARBON DYNAMICS, AGGREGATE STABILITY, AND CORN YIELD <i>Kumar, S., Nakajima, T., Mbonimpa, E. G., Gautam, S., Somireddy, U. R., Kadono, A., Lal, R., Chintala, R., Rafique, R., & Fausey, N.</i>	2014 <i>Soil Science and Plant Nutrition</i>

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	<i>San Francisco, USA</i>
2019	Joint Bioenergy Institute annual Meeting , Sagar Gautam, Umakant Mishra, and Corinne D Scown. Biomass sorghum production in the continental United States	<i>Monterey Bay, USA</i>
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	<i>Long Beach, CA USA</i>
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	<i>Spokane, WA USA</i>
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	<i>Phoenix, AZ USA</i>
2016	Mid-American Environmental Engineering Conference , Assessing long term hydrologic impact of climate change on an agricultural-dominated watershed using CMIP5 and SWAT model	<i>Edwardsville, IL USA</i>
2016	Employing model-based reasoning in socio-environmental synthesis (EMBeRS) PhD training Workshop	<i>El Paso, TX USA</i>
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	<i>West Lafayette, IN</i>
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	<i>Brookings, SD USA</i>

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)	<i>Columbia, MO USA</i>
Fall 2016	Soil Water Conservation Engineering (BE 4150) , Undergraduate course covering the principle soil water conservation (With Dr. Allen Thompson, University of Missouri)	<i>Columbia, MO USA</i>
Spring 2014	Environmental soil management (PS-362) , Undergraduate course covering the soil and water erosion (With Dr. Sandeep Kumar, South Dakota State University)	<i>Brookings, SD USA</i>
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)	<i>Brookings, SD USA</i>

Honors & Awards

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

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)