

## **Subhasis Giri, Ph.D.**

Post-Doctoral Research Associate (Area: Hydrology/Water Resources Engineering)

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### **Education**

2013 Ph.D. Bio-systems Engineering	Michigan State University
2008 M.S. Biological and Agricultural Engineering	Texas A&M University
2005 B.S. Agricultural Engineering	Orissa University of Agriculture and Technology

**PhD Dissertation:** Assessing Best Management Practices (BMPs) and implementation strategies to improve water quality.

**MS Thesis:** Vegetative covers for sediment control and phosphorus sequestration from dairy waste application fields.

### **Professional Experience**

07/2016-Present	Post-doctoral Research Associate, Center for Remote Sensing and Spatial Analysis, School of Environmental and Biological Sciences, Rutgers University,
01/2016-05/2016	Adjunct Professor, Department of Chemistry and Environmental Science, New Jersey Institute of Technology
05/2014-06/2016	Post-doctoral Research Fellow, Department of Chemistry and Environmental Science, New Jersey Institute of Technology
09/2013- 04/2014	Professional Aide / Postdoctoral Research, Department of Bio-systems and Agricultural Engineering, Michigan State University
09/2010-08/2013	Graduate Research Assistant, Department of Bio-systems and Agricultural Engineering, Michigan State University
07/2009-08/2010	Research/Teaching Assistant, Department of Biological and Agricultural Engineering, Texas A&M University
11/2008-06/2009	Staff Engineer, BPC Group Inc, Orlando, FL
09/2006-08/2008	Graduate Research Assistant, Department of Biological and Agricultural Engineering, Texas A&M University
01/2006-06/2006	Research Assistant, Department of Agricultural and Food Engineering, Indian Institute of technology, Kharagpur, India

## Grants

### *Funded Proposal*

1. *Title:* Targeted Implementation of Agricultural Conservation Practices and Green Stormwater Infrastructure in the Upper Salem River Watershed. *Principal Investigators:* PI- **Subhasis Giri**, Co-PI- Christopher C Obropta. \$20,000, United States Geological Survey (through New Jersey Water Resources Research Institute).
2. *Title:* Developing a Watershed Restoration Plan for Southern Barnegat Bay-Little Egg Harbor Tributaries. *Principal Investigators:* PI- Richard G. Lathrop, Co-PIs- Zeyuan Qiu, Dibyendu Sarkar, **Subhasis Giri**, Lisa M. Auermuller. \$775,000, New Jersey Department of Environmental Protection.

### *Pending Proposal*

1. *Title:* Development of a decision support tool for managing natural resources in a changing environment. *Principal Investigators:* PI- David L. Tulloch, Co-PIs- Richard G. Lathrop, Paul. D. Gottlieb, **Subhasis Giri**, Nazia N. Arbab. \$493,021, USDA-NIFA-AFRI.

## Publications

### *Refereed Journal Articles:*

22. **Giri, S.**, Zhang, Z., Krasnuk, D., Lathrop, R.G., 2019. Evaluating the impact of land uses on stream integrity using machine learning algorithms. *Science of The Total Environment* 696,133858.
21. **Giri, S.**, Arbab, N.N., Lathrop, R.G., 2019. Assessing the potential impacts of climate and land use change on water fluxes and sediment transport in a loosely coupled system. *Journal of Hydrology* 577, 123955.
20. Qiu, Z., Kennen, J.G., **Giri, S.**, Walter, T., Kang, Y., Zhang, Z., 2019. Reassessing the relationship between landscape alteration and aquatic ecosystem degradation from a hydrologically sensitive area prospective. *Science of The Total Environment* 650, 2850-2862.
19. Hamaamin, Y.A., Nejadhashemi, A.P., Zhang, Z., **Giri, S.**, Adhikari, U., Herman, M.R., 2019. Evaluation of neuro-fuzzy and Bayesian techniques in estimating sediment loads. *Sustainable Water Resources Management* 5, 639-654.
18. **Giri, S.**, Arbab, N.N., Lathrop, R.G., 2018. Water security assessment of current and future scenarios through an integrated modeling framework in the Neshanic River Watershed. *Journal of Hydrology* 563, 1025-1041.
17. **Giri, S.**, Qiu, Z., Zhang, Z., 2018. Assessing the impacts of land use on downstream water quality using a hydrologically sensitive area concept. *Journal of Environmental Management* 213, 309-319.
16. Qiu, Z., **Giri, S.**, Wang, L., Luo, B., 2018. SWAT modeling of fecal indicator bacteria fate and transport in a suburban watershed with mixed land uses. *Proceedings of the International Academy of Ecology and Environmental Sciences* 8, 28-46.

15. **Giri, S.**, Qiu, Z., Zhang, Z., 2017. A novel technique for establishing soil topographic index threshold in defining hydrologically sensitive areas in landscapes. *Journal of Environmental Management* 200, 391-399.
14. Qiu, Z., Pennock, A., **Giri, S.**, Trnka, C., Du, X., Wang, H., 2017. Assessing Soil Moisture Pattern Using a Soil Topographic Index in a Humid Region. *Water Resources Management* 31, 2243-2255.
13. **Giri, S.**, Qiu, Z., 2016. Understanding the relationship of land uses and water quality in Twenty First Century: A review. *Journal of Environmental Management* 173, 41-48.
12. Wu, Y., **Giri, S.**, Qiu, Z., 2016. Understanding the Spatial Distribution of Hydrologic Sensitive Areas in the Landscape Using Soil Topographic Index Approach. *International Soil and Water Conservation Research* 4, 278-283.
11. **Giri, S.**, Qiu, Z., Prato, T., Luo, B., 2016. An integrated approach for targeting critical source areas to control nonpoint source pollution in watersheds. *Water Resources Management*. 30,5087-5100.
10. **Giri, S.**, Nejadhashemi, A.P., Woznicki, S.A., 2016. Regulators' and stakeholders' perspectives in a framework for bioenergy. *Land Use Policy* 59, 143-153.
9. Hamaamin, Y.A., Nejadhashemi, A.P., Zhang, Z., **Giri, S.**, Woznicki, S.A., 2016. Bayesian regression and neuro-fuzzy methods reliability assessment for estimating streamflow. *Water* 8(7),287, doi:10.3390/w8070287.
8. **Giri, S.**, Nejadhashemi, A.P., Zhang, Z., Woznicki, S.A., 2015. Integrating statistical and hydrological models to identify implementation sites for agricultural conservation practices. *Environmental Modelling & Software* 1-14.
7. Martinez-Martinez, E., Nejadhashemi, A.P., Woznicki, S.A., Adhikari, U., **Giri, S.**, 2015. Assessing the significance of wetland restoration scenarios on sediment mitigation plan. *Ecological Engineering* 77, 103-113.
6. **Giri, S.**, Nejadhashemi, A.P., Woznicki, S.A., Zhang, Z., 2014. Analysis of best management practice effectiveness and spatio-temporal variability based on different targeting strategies. *Hydrological Processes*, 28, 431-445.
5. **Giri, S.**, Nejadhashemi, A.P., 2014. Application of analytical hierarchy process for effective selection of agricultural best management practices. *Journal of Environmental Management*, 132, 165-177.
4. Mutenyo, I., Nejadhashemi, A.P., Woznicki, S.A., **Giri, S.**, 2013. Evaluation of SWAT performance on a mountainous watershed in tropical Africa. *Hydrology Current Research* S14, 10.4172/2157-7587.
3. Sommerlot, A.R., Nejadhashemi, A.P., Woznicki, S.A., **Giri, S.**, Prohaska, M.D., 2013. Evaluating the capabilities of watershed-scale models in estimating sediment yield at field-scale. *Journal of Environmental Management*, 127,228-236.
2. **Giri, S.**, Nejadhashemi, A.P., Woznicki, S.A., 2012. Evaluation of targeting methods for implementation of best management practices in the Saginaw River Watershed. *Journal of Environmental Management*, 103, 24-40.
1. **Giri, S.**, Mukhtar, S., Wittie, R., 2010. Vegetative covers for sediment control and phosphorus sequestration from dairy waste application fields. *Transactions of the ASABE*, 53(3), 803-811.

*Refereed Journal Articles in Review:*

- 1.. **Giri, S.**, Lathrop, R.G.,Obropta, C.C., 2019. Climate change vulnerability assessment and adaptation strategies through best management practices. *Journal of Hydrology*.

2. Giri, S., 2019. Concept of Water Quality, Status, Recent Developments, Barriers and Opportunities. *Journal of Hydrology*.

#### *Technical Report:*

1. **Giri, S.**, D. Krasnuk, R. Lathrop, S. Malone, J. Herb. 2016. State of Raritan Report Volume 1, Available at: <http://raritan.rutgers.edu/wp-content/uploads/2017/01/SOR-Final-2017-01-30.pdf>.

#### **Research Interest**

Water security assessment using innovative blue and green water footprint concept coupling with land use change and climate interaction, development of crop water footprint framework, potential effect of climate and land use changes on water flux and pollution transport in a Coupled Natural and Human System, Climate vulnerability assessment and adaptation strategies through best management practices, conversion of land use due to surrounding land uses and locational variable using Agent-based Probabilistic Model, assessing the relationship between land uses and stream integrity leveraging GIS and machine learning algorithms in water resources, managing hydro-ecological hotspots in the landscapes based on innovative variable source area hydrology concept for achieving long term sustainability in water resources, assessing wetland restoration strategies on streamflow and sediment mitigation plan, stream flow and sediment estimation using soft computing techniques such as artificial neuro-fuzzy inference system and Bayesian regression, estimation of streamflow in mountainous watershed, fate and transport of fecal coliform and E.coli on watershed, pollution transport from field scale through edge of the stream to watershed outlet, identifying best location in watershed using spatial targeting techniques to implement conservation practices, evaluating spatiotemporal variability of best management practices(BMPs) effectiveness, and selection of effective BMPs using analytical hierarchical process, Field scale BMP evaluation, change in land use/cover using geo-spatial technique, land use and hydro-ecological hotspots management using geographical information systems(GIS) and biophysical modeling, evaluation of effectiveness of low impact developments(LIDs) (specially, green infrastructures) on watershed scale, evaluation of bioenergy crop expansion on water quality and ecosystems.

#### **Teaching Experience**

- **Guest Lecture:** “*Advanced Remote Sensing*”, Spring 2018: Undergraduate and Graduate students at School of Environmental and Biological Sciences, Rutgers University, New Brunswick, NJ.
- **Co-Instructor:** “*Advanced Environmental Geomatics*”, Spring 2017: Undergraduate and Graduate students at School of Environmental and Biological Sciences, Rutgers University, New Brunswick, NJ.
- **Guest Lecture:** “*Introduction to Aerial Photograph*” Fall-2016, 2017, & 2018: Undergraduate students at School of Environmental and Biological Sciences, Rutgers University, New Brunswick, NJ.

- **Adjunct Professor:** “*Environmental Policy and Science*”: Spring 2016: Undergraduate students at Department of Chemistry and Environmental Science, New Jersey Institute of Technology, Newark, NJ.
  - ❖ Designed course material for all classes throughout the semester
  - ❖ Homework formulation and evaluation
  - ❖ Preparation of question for exams and their evaluation
  - ❖ Use of online “Moodle” system for easy access of materials to students
  - ❖ Preparation of videos related to study topics for better understanding of concept as well as more engagement of students
- **Teaching Assistant:** “*BAEN 340: Fluid Mechanics*”: Spring 2010: Undergraduate students at Department of Biological and Agricultural Engineering, Texas A&M University, College Station, TX.
  - ❖ Helping students in their home works and doubts
  - ❖ Grading of home works
  - ❖ Occasional teaching while absence of Professor
- **Teaching Assistant:** “*BE 481: Water Resources System Analysis*”: Spring 2012: Undergraduate students at Biosystems Engineering, Michigan State University, East Lansing.
  - ❖ Helping students in their watershed modeling Lab and home works
  - ❖ Grading of home works
  - ❖ Occasional teaching while absence of Professor

### **Teaching Interests**

Principle of Environmental Hydrology, Soil and Water Conservation Engineering, Water Quality Engineering, Fluid Mechanics, Urban Stormwater Management, Ecological Engineering

### **Mentoring**

- Michael Prohaska , BS, Civil Engineering, Michigan State University
- Carole Trnka, BS, Chemistry and Environmental Science, New Jersey Institute of Technology
- Andrew Pennock, BS, Mechanical Engineering, New Jersey Institute of Technology
- Daryl Krasnuk, BS, Environmental Planning and Geomatics, Rutgers University

### **Honors and Awards**

2013 Outstanding International Student (Merle and Katherine Esmay Scholarship), Department of Biosystems and Agricultural Engineering, Michigan State University, East Lansing, MI

### **Service**

A. *Committee Member:*

1. Hydrology Group: Natural Resources & Environmental Systems(NRES-21), ASABE
2. Erosion Control Group: Natural Resources & Environmental Systems(NRES-22), ASABE
3. ASABE Standard Committee(NRES-03)
4. Moderators:
  - ❖ *In Water Security Assessment in River Basin and Complexity and Dynamics in Coupled Natural and Human Systems* Session in 2018 ASABE International Conference, Detroit.
  - ❖ *Hydrologic and Climate Data: Challenges and Opportunities* session 2019 ASABE International Conference, Boston.

*B. Peer Review Service:*

Current Climate Change, Environmental Modeling and Assessment, Environment, Development and Sustainability, Environmental Technology, International Journal of Agricultural and Biological Engineering, International Journal of Environmental Research and Public Health, International Journal of River Basin management, Journal of Environmental Management, Journal of Civil and Environmental Engineering, Journal of Hydrology, Journal of Soil and Water Conservation, Land Degradation & Development, Scientific Reports, Stochastic Environmental Research and Risk Assessment, Sustainability, Theoretical and Applied Climatology, Transaction of the ASABE, and Water.

*C. Judging Poster Competition:*

1. Served as a Judge for Natural Resources & Environmental Systems student poster competition at 2019 ASABE International Conference, Boston.
2. Served as a Judge for Summer Undergraduate Research Forum poster competition, MSU, East Lansing, July 2012
3. Served as a Judge for Graduate Research Forum poster competition, MSU, East Lansing, October 2013.

**Professional Affiliation**

- Member, American Society of Agricultural and Biological Engineer
- Member, Soil and Water Conservation Society

**Professional Activities**

*Invited Talks/Presentations and Conference proceedings:*

1. Giri, S., N. N. Arbab., R. Lathrop. (2019). Assessing the potential impacts of climate and land use change on water fluxes and sediment transport in a Coupled Natural and Human Systems. Annual ASABE International Conference, Boston, Massachusetts. July, 2019.

2. Giri, S., R. Lathrop. (2019). Climate Change versus Critical Source Area and Pollution Export: An Adaptation Strategies through Conservation Practices. Annual ASABE International Conference, Boston, Massachusetts. July, 2019.
3. Giri, S., N. N. Arbab., R. Lathrop. (2019). Assessing the potential impacts of climate and land use change on water fluxes and sediment transport in a Coupled Natural and Human Systems. 11<sup>th</sup> Annual Sustainable Raritan River Conference, Rutgers University. New Brunswick, NJ. June, 2019.
4. Giri, S., N. N. Arbab., R. Lathrop. (2018). Assessing the potential impacts of climate and land use change on water fluxes and sediment transport in a Coupled Natural and Human Systems. Rutgers Climate Symposium, New Brunswick, New Jersey. November, 2018
5. Giri, S., N. N. Arbab., R. Lathrop. (2018). Water security assessment of current and future through an integrated modeling framework. Annual ASABE International Conference, Detroit, Michigan. July, 2018.
6. Giri, S., N. N. Arbab., R. Lathrop. (2018). Water security assessment of current and future through an integrated modeling framework. 10<sup>th</sup> Annual Sustainable Raritan River Conference, Rutgers University. New Brunswick, NJ. June, 2018.
7. Giri, S., R. Lathrop., D. Krasnuk. (2018). Evaluating the impact of land uses on stream integrity using machine learning algorithms. 10<sup>th</sup> Annual Sustainable Raritan River Conference, Rutgers University. New Brunswick, NJ. June, 2018.
8. Giri, S., Z. Qiu. (2018). Assessing the impact of land use on down stream water quality using a hydrologically sensitive area. 10<sup>th</sup> Annual Sustainable Raritan River Conference, Rutgers University. New Brunswick, NJ. June, 2018.
9. Giri, S., N. N. Arbab., R. Lathrop. (2017). Water security assessment through an integrated modeling framework. 2017 Rutgers Center for Resilient Landscape Fall Symposium, Rutgers University, New Brunswick, New Jersey. September, 2017.
10. Giri, S., R.Lathrop., D. Krasnuk. (2017). Assessing land use intensity on stream health using macro-invertebrates. 2017 ASABE Annual International Meeting, Spokane, Washington. July, 2017.
11. Giri, S., R.Lathrop., D. Krasnuk. (2017). Assessing land use intensity on stream health using macro-invertebrates. 9<sup>th</sup> Annual Sustainable Raritan River Conference, Rutgers University. New Brunswick, NJ.
12. Giri, S. (2016). Sustainable Raritan River. Seminar at Department of Ecology, Evolution, and Natural resources, Rutgers University.
13. Giri, S., Z.Qiu. (2015). Managing critical source areas for enhancing ecosystems services in agricultural landscapes. USDA-NIFA AFRI and NIWQP Project Director meeting, Greensboro, North Carolina.
14. Giri, S. 2014. Assessing best management practice and implementation strategies to improve water quality, Seminar at Department of Chemistry and Environmental Science, New Jersey Institute of Technology, NJ.

15. Giri, S., A.P. Nejadhashemi, S.A.Woznicki, Z.Zhang. (2013). Analysis of best management practice effectiveness and spatiotemporal variability based on different targeting strategies. ASABE Annual International Meeting, Kansas City, Missouri. July, 2013.
16. Giri, S., A.P. Nejadhashemi, S.A.Woznicki, Z.Zhang. (2012). Analysis of best management practice effectiveness and spatiotemporal variability based on different targeting strategies. Michigan State University Engineering Graduate Research Symposium, East Lansing, Michigan, October 2012.
17. Giri, S., A.P. Nejadhashemi, S.A.Woznicki. (2011). Identification of the high priority areas for Best Management Practices (BMPs) in the Saginaw Bay Watershed to maximize pollution reduction. ASABE Annual International Meeting, Louisville, Kentucky. August 2011.
18. Giri, S., S. Mukhtar, and R. Wittie. (2008). Vegetative covers to control sediment and phosphorus (P) in runoff from dairy waste application fields (WAFs). ASABE Annual International Meeting, Providence, Rhode Island, July 2008.
19. Giri, S., S. Mukhtar, and R. Wittie. (2008). Vegetative covers for sediment control and phosphorus sequestration in run-off from dairy waste application fields. Student Research Poster Competition, Texas A&M AgriLIFE Conference, January 2008.
20. Giri, S., S. Mukhtar, and R. Wittie. (2007). Efficacy of different plant cover in reduction of phosphorus (P) from dairy waste application fields. National Conference on Agriculture and the Environment, Monterey, California, November 2007.
21. Giri, S., S. Mukhtar, and R. Wittie. (2007). Efficacy of vegetative filter strips in reducing phosphorus (P) in runoff from dairy waste application fields. 15th National Non-Point Source (NPS) monitoring workshop, Austin, Texas, August 2007.

### **Computational and Analysis Skill**

Soil and Water Assessment Tool (SWAT), Field SWAT, High Impact Targeting (HIT), Revised Universal Soil Loss Equation Version 2 (RUSLE 2), Hydrologic Engineering Center-River Analysis System (HEC-RAS), Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), Interconnected Channel and Pond Routing Model (ICPR), Urban Hydrology for Small Watersheds (Technical Release-55), Topographic Index, Soil Topographic Index, Hydrologic Sensitive Area locator Tool, Linear Mixed Modeling, Agent-based Modeling (ABM), Multiple Regression, Machine Learning algorithms (Random Forests and Boosted Regression Trees), Proficiency in R, Python Scripting, Geospatial Analysis in Arc GIS environment, and Statistical Package for Social Sciences (SPSS)