Nishan Bhattarai, Ph.D.

Research Fellow, School for Environment and Sustainability
University of Michigan, Ann Arbor
3575 Dana Building, 440 Church St, Ann Arbor, MI 48103
Email: nbhattar@umich.edu/ Phone: 3345594041

ACADEMIC BACKGROUND

University of Michigan, **Ann Arbor, MI**
School for Environment and Sustainability
Postdoctoral Research Fellow, (Sep 2016 -)/Advisor: Dr. Meha Jain

Tufts University, Medford, MA
Center for International Environment and Resource Policy at The Fletcher School of Law & Diplomacy
Postdoctoral Research Fellow, 2015-2016/Advisor: Dr. Avery Cohn

SUNY College of Environmental Science & Forestry (SUNY-ESF), Syracuse, NY
Department of Environmental Resources Engineering
Ph.D. Environmental Resources Engineering, 2015/Advisor*:* Dr. Lindi J. Quackenbush

Auburn University, Auburn, AL
Department of Biosystems Engineering and School of Forestry and Wildlife Sciences
M.S. Forestry, 2010/Advisors: Dr. Mark Dougherty and Dr. Latif Kalin

Tribhuvan University, Nepal
B.S. Forestry, 2006

PAPERS IN PEER-REVIEWED JOURNALS

1. Jain M., Fishman, R., Mondal, P., Galford, G.L., **Bhattarai**, **N.**, Naeem, S. & DeFries, R.S. 201X. Groundwater depletion will reduce cropping intensity in India. *Proceedings of the National Academy of Sciences of the United States of America*: Under Review).
2. **Bhattarai, N.**, Mallick, K., Brunsell, N. A., Sun, G., & Jain, M.2017. Regional evapotranspiration from image-based implementation of the Surface Temperature Initiated Closure (STIC1.2) model and its validation across an aridity gradient in the conterminous United States, *Hydrology and Earth System Sciences (HESS) Discussions* (under review for *HESS*). [Link]
3. Niraula, R., Meixner, T., Dominguez, F., **Bhattarai, N.**, Rodell, M., Ajami, H., Gochis, D., Castro, C., 2017. How might recharge change under projected climate change in the western US? *Geophysical Research Letters* (In Press).
4. **Bhattarai, N.**, Wagle, P., Gowda, P., & Kakani, V. 2017. Utility of remote sensing-based surface energy balance models to track water stress in rain-fed switchgrass under dry and wet conditions. *ISPRS Journal of Photogrammetry and Remote Sensing*, 133: 128-141. [Link]
5. Richards, P., Cohn, A., Arima, E., VanWey, L., & **Bhattarai, N.** 2017. Enforcement evasion highlights need for better satellite monitoring for forest governance. *Conservation Letters,* 10:497-498. [Link]
6. **Bhattarai, N.**, Quackenbush, L.J., Im, Jungho, & Shaw, S.B., 2017. A new optimized algorithm for automating endmember pixel selection in the SEBAL and METRIC models. *Remote Sensing of Environment*, *196*: 178-192. [Link]
7. Wagle, P., **Bhattarai, N.***, Gowda, P., & Kakani, V. 2017. Performance of five surface energy balance models for estimating daily evapotranspiration in high biomass sorghum. *ISPRS Journal of Photogrammetry and Remote Sensing,* 128: 192-203. [Link]

8. Richards, P. Arima, E., VanWey, L., Cohn, A., & **Bhattarai, N.** 2017. Are Brazil's deforesters avoiding detection? *Conservation Letters*, 10:470-476. [Link]
9. **Bhattarai, N.**, Shaw, S. B., Quackenbush, L. J., Im, J., & Niraula, R. 2016. Evaluating five remote sensing-based single-source surface energy balance models for estimating daily evaporanspiration rates in a humid subtropical climate. *International Journal of Applied Earth Observation and Geoinformation* 49: 75-86 [Link]
10. **Bhattarai, N.**, Quackenbush, L.J., Dougherty, M., & Marzen, L. 2015. A simple Landsat–MODIS fusion approach for monitoring seasonal evapotranspiration at 30 m spatial resolution. *International Journal of Remote Sensing* 36: 115-143. [Link]
11. Shaw, SB., Marrs, J., **Bhattarai, N.**, & Quackenbush, L.J. 2014. Longitudinal study of the impacts of land cover change on hydrologic response in four mesoscale watersheds in New York State, USA. *Journal of Hydrology* 519: 12-22. [Link]
12. **Bhattarai, N.,** Dougherty, M., Marzen, L., & Kailn, L. 2012.Validation of evaporation estimates from a modified surface energy balance algorithm for land model in the south-eastern US. *Remote sensing letters* 3: 511-519. [Link]

Submission-ready drafts

13. Cohn, A., **Bhattarai, N.**, Duncan, J., & Jeffries, G., 201X. Dispersive heat is a large and unrecognized fraction of warming from tropical forest loss. *Environmental Research Letters* (soon to be submitted).
14. **Bhattarai, N.**, Wagle, P., Gowda, P., & Kakani, V. 201X. On the applicability of remote sensing based surface energy balance models for mapping switchgrass evapotranspiration under different moisture conditions. *GIScience & Remote Sensing* (soon to be submitted).

***** *indicates shared first authorships*

NON-REFERRED PUBLICATIONS/ABSTRACTS

1. **Bhattarai, N.** Jain, M., Mallick, K. 2017. An automated multi-model based evapotranspiration estimation framework for understanding crop-climate interactions in India. AGU Fall Meetings Abstracts, December 11-15, 2017, New Orleans, LA.
2. **Bhattarai, N.** and Jain, M. 2016. Understanding the climate-included variations in the seasonal water demands of irrigated crops in Northern India. AGU Fall Meetings Abstracts, December 11-16, 2016, San Francisco, CA.
3. **Bhattarai, N.** 2015. Single-source surface energy balance algorithms to estimate evapotranspiration from satellite-based remotely sensed data, Ph.D. Dissertation, SUNY-ESF.
4. **Bhattarai, N.,** Quackenbush L.J., Jungho, Im, and Shaw, S. B. Automation of Endmember Pixel Selection in SEBAL/METRIC Model. AGU Fall Meetings Abstracts, December 14-18, 2015, San Francisco, CA.
5. **Bhattarai, N.,** Quackenbush L.J., & Shaw, S. B. 2014. Comparison of four single-source surface energy balance-based models for estimating remotely sensed daily ET. Abstracts from the ASABE 2014 International Symposium on ET. April 7-11, 2014, Raleigh, NC.
6. **Bhattarai, N.** & Quackenbush, L.J. 2013. A data fusion approach for monitoring remotely sensed seasonal ET. AGU Fall Meetings Abstracts, December 9-13, 2013, San Francisco, CA.
7. **Bhattarai, N.,** Quackenbush, L.J., Calandra, L., Im, J., & Teale, S. 2012. An automated object-based approach to detect Sirex-infestation in pines. Proceedings of American Society for

Photogrammetry and Remote Sensing (ASPRS) 2012 Annual conference, March 19-23, Sacramento, CA.

8. **Bhattarai, N.,** Quackenbush, L.J., Calandra, L., Im, J., & Teale, S. 2011. Spectral analysis of Scotch pine infested by Sirex Noctillo. Proceedings of ASPRS 2011 Annual conference, May 1-5, 2011, Milwaukee, WI.
9. **Bhattarai, N.** 2010. Use of Remotely Sensed Data to Quantify Plant Water Use from Irrigated Lands in Wolf Bay Watershed Area, MS Thesis, Auburn University.

RESEARCH EXPERIENCE

Research Fellow, University of Michigan Ann Arbor	Sep 2016-
Research Affiliate, Tufts University, Medford, MA	Sep 2016- August 2017
Postdoctoral Research Fellow, Tufts University, Medford, MA	Aug 2015- Sep 2016
STEM Mentor, Research Foundation for the SUNY, Syracuse, NY	Jan 2015 – May 2015
Research Project Assistant, Research Foundation for the SUNY, Syracuse, NY	Sep – Dec 2014
Research/Field Tech, University of Illinois, Urbana-Champaign, IL	Jun – Aug 2014
Graduate Assistant, SUNY-ESF, Syracuse, NY	Aug 2011 – May 2014
Conservation Science Intern, World Wildlife Fund for Nature, Washington, DC	Jun – Aug 2013
Research Aide, Research Foundation for the SUNY, Syracuse, NY	May – Aug 2012
Research Project Assistant, Research Foundation for the SUNY, Syracuse, NY	Aug 2010 – Aug 2011
Research Assistant, Biosystems Engineering, Auburn University, AL	Aug 2008 – Aug 2010

TEACHING EXPERIENCE

Teaching Assistant

- Auburn University: Introduction to renewable resources (Fall 2009) – undergraduate course
- SUNY- ESF: GIS for engineers (Fall 2011, 2012, and 2013 graduate courses; conducted all GIS labs); Statics and Dynamics (Spring 2012 undergraduate course); Mechanics of Materials (Spring 2012, undergraduate course); Introduction to Engineering Design (springs of 2012, 2013, and 2014, undergraduate course)

STEM Mentor for elementary school kids in Syracuse, NY

- Taught science classes at two elementary schools (Spring 2015-three classes/week)

STUDENTS MENTORED

- John Marrs (Undergraduate, SUNY-ESF), Summer 2012: ArcGIS and Python
- Prakhyat Thapa (Undergraduate, SUNY-ESF), Summer 2012: ArcGIS and hydropower
- Andrew Sussman (Undergraduate, SUNY-ESF), Summer 2014: SapFlux Instrumentation and Weather station data collection
- STEM Mentor for elementary school kids (~60 total), Syracuse School District. Spring 2015
- Danielle Newport, Undergraduate opportunity research program (UROP), University of Michigan, Summer 2017: R
- Shon Harris, UROP, University of Michigan, Summer 2017: Google Earth Engine and R
- Julia Stuart, UROP, University of Michigan, Fall 2017: ArcGIS, Matlab, and Remote sensing

SELECTED TALKS

- An automated multi-model based evapotranspiration estimation framework for understanding crop-climate interactions in India. AGU Fall Meetings Abstracts, December 11-15, 2017, New Orleans, LA (Forthcoming)

- Understanding the climate-included variations in the seasonal water demands of irrigated crops in Northern India. AGU Fall Meetings Abstracts, December 11-16, 2016, San Francisco, CA.
- Introduction of automated calibration approaches to the surface energy balance-based ET algorithms, ASPRS Annual Conference, March 23-27, 2014, Louisville, KY.
- Comparison of four single-source surface energy balance-based models for estimating remotely sensed daily ET. ASABE 2014 International Symposium on ET. April 7-11, 2014, Raleigh, NC.
- Application of remote sensing and surface energy balance algorithms in estimating ET in the southeastern US. 24th ASPRS 2013 annual conference, March 24-28, 2013, Baltimore, MD.
- Using remote sensing and geospatial techniques in hydrological applications. NYGeoCon. NYGIS Association, November 12-13, 2013, Saratoga Springs, NY.
- Calibration of the InVEST water yield model- An automated approach, World Wildlife Fund-US, August 9, 2013, Washington, DC.
- A coupled multi-sensor fusion & surface energy balance algorithm approach to derive spatially-distributed seasonal ET.22nd GIS/SIG Annual Spatial/Digital Mapping Conference, April 16, 2013, Pittsford, NY.
- An automated object-based approach to detect Sirex-infestation in pines. 23rd ASPRS 2012 annual conference, March 19-23, 2012, Sacramento, CA.

AWARDS AND HONORS

Contributed proposals (In Review or Declined)

NASA. (**$6,998,836**). **Solicitation:** Earth Science Applications: Food Security and Agriculture: **Title:** Earth observations for food security and empowerment of small and marginal farmers. **PI:** Daniel Brown, **Co-Is:** Meha Jain, Preeti Rao, Manish Verma, **Nishan Bhattarai**, Joe Arvai, Kentaro Toyama, Period: 9/1/2017-8/31/2022. **My role:** Co-I. (*Declined*)

National Science Foundation. (**$2,491,746**). **Solicitation:** Innovations at the Nexus of Food, Energy, and Water Systems: **Title:** Water to increase energy or food access? Experimental and quasi-experimental evidence on trade-offs. **Co-PIs:** Meha Jain, Robyn Meeks, Period: 9/1/2017-8/31/2022; **My Role:** Senior Personnel**.** (*Declined*)

Granted Proposals

Raymond Von Dran Fund ($2,000). Micro-Hydro consultants, Raymond Von Dran Fund, Syracuse University, summer 2012. PIs: Nishan Bhattarai, John MacDonald, Prakhyat Thapa. Summer 2012
Research In Need Grant ($250), SUNY-ESF, Summer 2012
ConForM/Danida fellowship (~$250**).** Good governance in community forestry. PI: Nishan Bhattarai. 2005-2006.

Awards

- ERE Departmental Award for Academic Excellence (2014), SUNY-ESF, $1,000
- AGU Student travel award (2013), American Geophysical Union (AGU), $500
- CNY Graduate Student of the year (2013), ASPRS, $500
- Ta Liang Memorial Award (2013), ASPRS, $2,000
- ESF travel grants (2012-2013), SUNY-ESF, $500, $250

PROFESSIONAL SERVICES

Editorial

Editorial Board, *GIScience & Remote Sensing* (Publisher: Taylor & Francis), Starting January 2018

Peer reviewer

Remote Sensing of Environment, IEEE Transactions on Geosciences and Remote Sensing, International Journal of Remote Sensing, Hydrological Processes, Remote Sensing, IEEE-JSTARS, Stochastic Environmental Research & Risk Assessment, GIScience & Remote Sensing, PLoS ONE, Water, Transaction of ASABE, Science of the Total Environment, Applied Water Science, Sustainability, Sensors

Professional Memberships

American Geophysical Union (AGU), 2013-present
American Society for Photogrammetry and Remote Sensing (ASPRS), 2010-present
American Society of Agricultural and Biological Engineers (ASABE), 2013-2014
Nepalese Forester Association (NFA), 2007-present
Association of Nepalese Agricultural Professionals of America (NAPA), 2016-present

Judge/Volunteer

External project Advisor for International Initiate for Impact Evaluation (3ie)
Judge for outstanding student paper awards at the 2016 AGU fall meetings
Student assistant and /or volunteer for ASPRS 2012-2014 Annual Conferences
International Corps Member, EarthCorps, Seattle, WA (June-December 2007)

COMPUTER SKILLS

Programming Languages: Fluent in MATLAB and R; Advanced skills in High-Performance Computer (HPC) cluster systems and SSH Client; Good knowledge of Python, Google Earth Engine API, JavaScript; and basic knowledge of C/C++ and Visual Basic
GIS and Remote Sensing tools: Advanced skills in ArcGIS, QGIS, ENVI, and ERDAS IMAGINE
Other Software Packages: AutoCAD, HEC-HMS, SAS, SPSS, SigmaPlot, SQL Server, Photoshop, Office.