Nirajan Dhakal, Ph.D.

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Environmental and Health Sciences Program
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RESEARCH INTERESTS

- Water Resources Engineering
- Hydrological and Hydraulic Analysis and Modeling
- Hydroclimatology
- Sustainable Water Resources Management
- Geographic Information System (GIS) and Remote Sensing
- Risk analysis and Decision Making

TEACHING INTERESTS

- Hydraulics
- Hydrology
- GIS and Remote Sensing in Water Resources
- Sustainable Water Resources Management

EDUCATION

- Ph.D. in Civil Engineering *Auburn University*, Auburn, AL May 2012
- Master of Civil Engineering, *Auburn University*, Auburn, AL May 2010
- *Concentration: Water Resources, Hydraulics and Hydrology*
- Bachelor of Civil Engineering, *Tribhuvan University*, Nepal Feb 2007

RESEARCH EXPERIENCE

Northeast Climate Science Center (NECSC) Post-Doctoral Fellow, University of Massachusetts
Nov 2014 – July 2015

- Performed research on the impacts of climate change on water resources in the Northeast USA including impacts on natural and manmade systems

Post-Doctoral Fellow, *Sustainability Solutions Initiative,* University of Maine Sept 2012 – Nov 2014

- Studied about the climate change and vulnerability of infrastructures to extreme weather
- Developed an innovative methodology to analyze change in extreme precipitation, and its impacts on community resilience

Graduate Research Assistant, *Auburn University,* Auburn, AL Jan 2008 – May 2012

- Extraction of literature based runoff coefficients for 90 watersheds in Texas using land-use data from NLCD 1992 and 2001
- Extraction of volumetric and rate-based runoff coefficients for 90 watersheds in Texas using 1600 rainfall-runoff data
- Development of the Modified Rational Unit Hydrograph model using the high level programming language FORTRAN 90
- Runoff simulation of 1600 rainfall-runoff events using the Modified Rational Unit Hydrograph model

RESEARCH GRANT

NOAA-SARP grant (Dhakal, Co-PI) US $230,000 *"From data-poor to data-rich: Using smartphone applications to increase the adaptive capacity of communities to prepare for extreme storms in a changing climate",* 2013-2015, (Not funded).

TEACHING EXPERIENCE

Spelman College

Assistant Professor, Environmental and Health Sciences Program Aug 2015 – Present

- ES312 Water Resources and Management
- ES312 L Water Resources and Management – Lab
- ES211 Introduction to Environmental Sciences
- ES211L Introduction to Environmental Sciences – Lab

University of Maine

Instructor, Department of Civil and Environmental Engineering Sept 2013 – May 2014

- CIE 456 Groundwater Hydrology and Hydraulics (Spring 2014)
- CIE 351 Hydraulics Lab (Fall 2013)

Auburn University

Teaching Assistant Jan 2008 – May 2012

- Gave lectures to more than 55 students for *Common Lab Hydraulics class*
- Led students in Hydraulics Laboratory to perform the lab experiments like *Laminar and Turbulent Conduit Flow, Sluice Gate and Linear Momentum, Detention Reservoir Hydraulics, Surface Water Profiles for Gradually Varied Flow etc*
- CIVL 3110 Hydraulics
  - Graded assignments, quizzes and exams and assisted students during office hours
- CIVL 6110 Open Channel Hydraulics (Spring 2010)

- Graded assignments, quizzes and exams

Guest Lecturer

- CIVL 6970 Civil Engineering Special Topics - Hydrologic Analysis and Modeling (Fall 2008)
  - Topic: Urban Hydrology

COMPUTER SKILLS

- ***Modeling Software:*** HEC-HMS, HEC-RAS, WinStorm, BASINS, PONDPACK, WinTR-55, PRMS
- ***Visualization and Design:*** ArcGIS, AutoCAD, ERDAS IMAGINE, SAP 2000
- ***Programming***: FORTRAN, Visual Basic, MATLAB, SAS, R, NCL
- ***Microsoft Series***: MS Office package, LaTeX

LICENSES

Engineer-In-Training (EIT): #06355 (New Hampshire)

AWARDS

- "**The College Fellowship Scholarship**" during the 4-year study of Bachelor's Degree in Civil Engineering
- **Graduate Teaching Assistanceship (GTA)** awarded by the Department of Civil Engineering, Auburn University on 01/2008
- **Graduate Research Assistanceship (GRA)** awarded by the Department of Civil Engineering, Auburn University on 01/2008
- **Departmental Scholarship for the year 2011**, Department of Civil Engineering, Auburn University
- **Sustainability Solutions Initiative (SSI) Post-Doctoral Fellowship**, University of Maine on 09/2012
- **Northeast Climate Science Center (NECSC) Post-Doctoral Fellowship,** University of Massachusetts on 11/2014

AFFILIATIONS

- American Society of Civil Engineers (ASCE), Member
- American Geophysical Union (AGU), Member
- American Water Resources Association (AWRA), Member
- American Meteorological Society (AMS), Member
- International Association of Hydrological Sciences (IAHS), Member
- Nepal Engineers' Association (NEA), Member

PEER-REVIEWED PUBLICATIONS

- Nirajan Dhakal*, Xing Fang, Theodore G. Cleveland, David B. Thompson, William H. Asquith, and Luke J. Marzen, 2012. "Estimation of Volumetric Runoff Coefficients for Texas Watersheds Using Land-Use and Rainfall-Runoff Data." *ASCE Journal of Irrigation and Drainage Engineering, 138(1):43-54.*

- Nirajan Dhakal*, Xing Fang, William H. Asquith, Theodore G. Cleveland, and David B. Thompson, 2013. "Return Period Adjustments for Runoff Coefficients Based on Analysis in Texas Watersheds." *ASCE Journal of Irrigation and Drainage Engineering, 139(6): 476-482.*

- Nirajan Dhakal*, Xing Fang, William H. Asquith, Theodore G. Cleveland, and David B. Thompson, 2013. "Rate-based Estimation of the Runoff Coefficients for Selected Watersheds in Texas." *ASCE Journal of Hydrologic Engineering, 18(12):1571-1580.*

- Nirajan Dhakal*, Xing Fang, David B. Thompson, and Theodore G. Cleveland, 2014. "Modified Rational Unit Hydrograph Method and Applications." *Water Management Proceedings of the Institution of Civil Engineers, DOI: 10.1680/wama.13.00032.*

- Nirajan Dhakal*, Shaleen Jain, Alexander Gray, Michael Dandy, and Esperanza Stancioff, 2015. "Nonstationarity in seasonality of extreme precipitation: A nonparametric circular statistical approach and its application." *Water Resources Research, DOI: 10.1002/2014WR016399.*

- Nirajan Dhakal* and Shaleen Jain, 2015. "Extreme daily precipitation in a changing climate in the eastern United States: Contribution of North Atlantic tropical cyclones." (To be submitted to *Water Resources Research*).

JOURNAL PUBLICATIONS IN PREPARATION

- Nirajan Dhakal* and Shaleen Jain, 2015. "On Transient Nature of the Seasonality of Extreme Precipitation in Eastern United States."

- Nirajan Dhakal* and Richard N. Palmer, 2015. "Trends in the timing of highflows and lowflows in the Northeast United States based on circular statistical approach."

- Nirajan Dhakal* and Richard N. Palmer, 2015. "Annual floods in a changing climate: Mixed extreme hydro meteorological distribution."

NON-PEER REVIEWED PUBLICATIONS

- Nirajan Dhakal, 2012. Development of Guidance for Runoff Coefficient Selection and Modified Rational Unit Hydrograph Method for Hydrologic Design, *PhD Dissertation, Auburn University*, USA.

CONFERENCE PROCEEDINGS

- Nirajan Dhakal*, Xing Fang, Theodore G. Cleveland, David B. Thompson, and Luke J. Marzen, 2010. "Estimation of Rational Runoff Coefficients for Texas Watersheds." Proceeding (CD-ROM) for 2010 World Environmental and Water Resources Congress, Providence, Rhode Island, May 16-21, 2010.

- Nirajan Dhakal*, Xing Fang, Theodore G. Cleveland, and David B. Thompson, 2011. "Revisiting Modified Rational Method." Proceeding (CD-ROM) for 2011 World Environmental and Water Resources Congress, Palm Springs, CA, May 22-26, 2011.

POSTER PRESENTATIONS

- Nirajan Dhakal* and Shaleen Jain, 2013. "Changing statistics of extreme rainfall: New analysis and estimation considerations for infrastructure design." AGU Chapman Conference on Coastal Processes and Environments Under Sea-Level Rise and Changing Climate: Science to Inform Management, Galveston, Texas, USA, April 14 - 19, 2013.

- Nirajan Dhakal* and Shaleen Jain, 2013. "Impact of a single unusually large rainfall event on the level of risk used for infrastructure design." AGU Fall Meeting, San Francisco, CA, December 9 – 13, 2013.

- Nirajan Dhakal* and Shaleen Jain, 2014. "Detection of nonstationarity in seasonality of extreme precipitation using a new statistical approach." AGU Fall Meeting, San Francisco, CA, December 15 – 19, 2014.

PRESENTATION IN SCIENTIFIC MEETINGS

- Nirajan Dhakal* and Shaleen Jain, 2014. "A New Approach for Seasonality Characterization of Extreme Rainfall." AMS 94th Annual Meeting, Atlanta, Georgia, February 2-6.

MEDIA PRESENTATION

- "*Culvert Operations*." Maine Public Broadcasting Network (MPBN), Bangor, Maine. 9 October 2013. Television.

OTHER ATTENDED CONFERENCES

- Ecosystems, Economy and Society: how large-scale restoration can stimulate sustainable development, May 29-30, 2014, Washington, D.C., USA.

SERVICES

Reviewer

- ASCE Journal of Hydrologic Engineering
- Journal of Hydrology- Elsevier
- Journal of the American Water Resources Association
- Hydrological Sciences Journal
- Stochastic Environmental Research and Risk Assessment
- Journal of Sustainable Watershed Science and Management
- Outstanding Student Paper Award (OSPA) Judge at AGU Fall Meeting, 2013

Advisor

- Environmental Task Force, Spelman College (August 2015 -)

Undergraduate student mentoring, University of Maine

- Michael Dandy (Fall 2012; Spring 2013)
  - *Research Topic*: Extreme rainfall in a changing climate: Developing new methodologies to inform infrastructure design

Off-Campus

- State Coordinator for Maine, Blood Donors of America

RELEVANT GRADUATE COURSES

- Open Channel Flow
- Groundwater Hydraulics
- Hydrologic Analysis and Modeling
- Numerical Methods in Hydrology and Hydraulics
- Advanced Numerical Analysis
- Geographic Information Systems
- Surface Water Quality Modeling
- SAS Programming
- Experimental Statistics
- Aerial Photo and Remote Sensing
- Multipurpose Environmental Analysis System

HIGHLIGHTS OF QUALIFICATIONS

- Strong background in hydrological analysis and modeling
- Worked as a Post-Doctoral Fellow for the Sustainability Solutions Initiative at University of Maine; helped communities better understand and prepare for the potential local impacts of climate change
- Experience in teaching and working with a large number of students; gave lectures to more than 55 students for Common Lab Hydraulics class from Jan 2008 – May 2012
- Extensive computer programming experience (FORTRAN, Visual Basic, R)
- Familiar with different hydrologic models and visualization and design softwares including ArcGIS, AutoCAD, HEC-HMS, ERDAS IMAGINE, BASINS
- Demonstrated written and verbal communication skill