

# Bibi S. Naz

Post-Doctoral Research Associate  
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Google Scholar citations: <http://scholar.google.com/citations?user=OGmkAUwAAAAJ&hl=en>

## **RESEARCH EXPERIENCE:**

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**Post-Doctoral Research Associate**, Oak Ridge National Lab  
Oak Ridge, TN, USA 4/2013 - present  
Research topics: “**Climate Change Impact Assessment on Hydropower Generations**”  
“**Towards the Development of an Integrated Energy-Water Risk Assessment Tool for Probable Maximum Precipitation and Flood**”

**Post-Doctoral Research Associate**, Department of Civil and Environmental Engineering, University of Washington, Seattle, WA, USA 5/2011 – 3/2013  
Advisor: Dennis P. Lettenmaier  
Research topic: “**Predicting the Effect of Mountain Glacier Recession on Water Resources**”

**Graduate Research Assistant**, Department of Agronomy, Purdue University.  
Purdue University, West Lafayette, IN, USA 8/2006 - 5/2011  
Advisor: **Laura C. Bowling**  
Research topic: “**Hydrologic sensitivity of the Upper Indus River to glacier changes in the Western Karakoram Himalaya.**”

**Graduate Research Assistant**, Department of Agronomy  
Purdue University, West Lafayette, IN, USA 8/2004 - 7/2006  
Advisor: **Laura C. Bowling**  
Research topic: “**Hydrologic impact of subsurface drainage of agricultural fields.**”

**Geographic Information System (GIS) Analyst**  
Forest Management Center, Peshawar, Pakistan 04/1999 - 04/2002

## **TEACHING AND MENTORING EXPERIENCE**

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**Purdue University**, West Lafayette, IN, USA 01/2010 - 05/2010  
**Graduate Teaching Assistant**, Department of Agronomy.

**University of Peshawar**, Peshawar, Pakistan 04/2002 - 01/2004  
**Lecturer of remote sensing and GIS**, Department of Environmental Sciences.

### **Mentoring:**

- Served on research committee of graduate students at University of Peshawar, 2002-2004
- Served as a mentor to an undergraduate student under Summer Undergraduate Research Fellowship (SURF) program at Purdue University during summer, 2008.
- Provide mentoring to graduate students at University of Washington, 2011-2013
- Provide mentoring to post-master and summer intern under HERE program at ORNL during summer, 2014.

### **EDUCATION**

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- 2006-2011            **Purdue University**, Department of Agronomy, West Lafayette, Indiana  
Doctorate of Philosophy. Environmental Soils and Landscape processes
- 2004-2006            **Purdue University**, Department of Agronomy, West Lafayette, Indiana  
M.S. in Environmental Soils and Landscape processes
- 1996-1998            **University of Peshawar**, Computer Science Department, Peshawar, Pakistan  
M.Sc. in Computer Science
- 1994-1996            **University of Peshawar**, Peshawar, Pakistan  
B.Sc. in Mathematics /Computer Science

### **PUBLICATIONS**

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#### **Published in peer review journals:**

- 2014            Zhang, S., Gao, H., **Naz, B. S.** (2014), **Monitoring Reservoir Storage in South Asia from Multi-satellite Remote Sensing**, Water Resource Research., DOI: 10.1002/2014WR015829 (Accepted).
- 2014            **Naz, B. S.**, C. D. Frans, G. K.C. Clarke, P. Burns, D. P. Lettenmaier (2014) **Modeling the effect of glacier recession on streamflow response using coupled glacio-hydrological model** (2014), Hydrol. Earth Syst. Sci., 18, 787-802, 2014, doi:10.5194/hess-18-787-2014.
- 2014            Oubeidillah, A. A., Kao, S.-C., Ashfaq, M., **Naz, B. S.**, and Tootle, G.: **A large-scale, high-resolution hydrological model parameter dataset for climate change impact assessment for the conterminous United States**, Hydrol. Earth Syst. Sci. Hydrol. Earth Syst. Sci., 18, 67–84, 2014, doi:10.5194/hess-18-67-2014
- 2013            Cherkauer K.A., Bowling L.C., and **Naz B. S.**, **Watershed Hydrology in Periglacial Environments**. In: John F. Shroder (ed.) Treatise on Geomorphology, Volume 8, pp. 151-172. San Diego: Academic Press.

- 2009 Naz, B.S., S. Ale, L.C. Bowling, **Detecting subsurface drainage systems and estimating drain spacing in intensively-managed agricultural landscapes.** *Agricultural Water Management*, 96 (4), 627-637.
- 2008 Naz, B.S., L.C. Bowling, **Automated identification of tile lines from remotely sensed data.** *Trans. ASABE*, 51(6): 1937-1950.

**Conference proceedings/ Book Chapters:**

- 2007 Ale, S., B. S. Naz and L. Bowling, 2007. **Mapping of tile drains in the Hoagland watershed for simulating the effects of drainage water management.** *ASABE Annual Meeting Paper No. 072144. St. Joseph, MI: ASABE*
- 2004 Naz, B. S., **Effectiveness of Policies for the Reduction of Flood Hazard in Pakistan: A Case Study of Nala leh, Rawalpindi City, Pakistan.** In: *Applied Research Grants for Disaster Reduction - A Compendium of Project Reports.* Hazard Management Unit, the World Bank.

**In revisions /Submitted/In preparation:**

- 2014 Khan, A., B. S. Naz, L. C. Bowling (2014) **Separated snow-glacier inventory and Equilibrium Line Altitudes in the Hindukush Karakoram Himalayas, Upper Indus Basin,** *Journal of Hydrology* (in 1st revision for moderate review comments).
- 2014 Frans C., Istanbuluoglu E., Lettenmaier D. P., Naz, B. S., Clarke G., Condom T., Burns P., Nolin A. (2014), **Hydrologic response to historical and future glacier recession in the Cordillera Real, Bolivia,** *Water Resource Research* (Submitted)
- 2014 Naz, B. S., S. -C Kao, M. Ashfaq, R. Mei, D. Ratogi and L. C. Bowling, (2014) **Historical and future hydrologic change in the Conterminous United States** (In preparation).
- 2014 Naz, B. S., S. -C Kao, S. Gangrade, M. Ashfaq, R Mei, and D. Ratogi (2014) **Climate change impacts on reservoir inflow in the United States** (In preparations).

**CONFERENCE PRESENTATIONS**

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- 2014 Naz, B. S., S. C. Kao, M. Ashfaq, and R. Mei., **Projecting the potential impacts of climate change on water resources for the Conterminous United States through high resolution hydro-meteorological simulation.** 94th American Meteorological Society Annual Meeting 2014, Feb 2 – 6, Atlanta, GA.

- 2014 Kao, S.-C., D. Rastogi, **B. S. Naz**, M. Ashfaq, B. L. Preston, E. D. Kabela, Rui Mei and N. Singh (2013), **Towards the Development of an Integrated Energy-Water Risk Assessment Tool for Probable Maximum Precipitation and Flood**, World Environmental & Water Resources Congress 2014, June 1–5, Portland, OR.
- 2014 Frans, C., Istanbuluoglu, E., Lettenmaier, D.P., **Naz, B. S.**, Clarke, G., and Nolin, A. (2014, January). **Evaluating the influence of glacier recession on watershed hydrology through coupled modeling of glacier and hydrologic processes**. United States Geologic Survey Washington Water Science Center, Tacoma, WA, USA.
- 2013 Kao, S.; **Naz, B. S.**; Ashfaq, M.; Mei, R. **Refining the Resolution of Future Energy-Water Projection through High Performance Computing**. American Geophysical Union, Fall Meeting 2013, abstract #GC23C-0940.
- 2013 Frans, C. D.; Istanbuluoglu, E.; **Naz, B. S.** ; Lettenmaier, D. P.; Condom, T.; Clarke, G. K.; Burns, P. J.; Nolin, A. W. **Historical and future hydrologic response to glacier recession in the Cordillera Real, Bolivia**, American Geophysical Union, Fall Meeting 2013, abstract #GC21E-05
- 2013 Zhang, S.; Gao, H.; **Naz, B. S.**, **Monitoring Reservoir Storage in South Asia from Satellite Remote Sensing**, American Geophysical Union, Fall Meeting 2013, abstract #GC21B-0833
- 2013 Frans, C., Istanbuluoglu, E., **Naz, B. S.**, Lettenmaier, D.P., Condom, T., and Clarke, G. (2013, September). **21st Century glacier recession and water resources of La Paz, Bolivia**. University of Washington / University of British Columbia Water Symposium, Vancouver, BC, CA.
- 2012 **Naz, B.S.**, C. D. Frans, P. Burns, L. Cuo, K. Duan, G. K.C. Clarke, A. W. Nolin, Erkan Istanbuluoglu, and D. P. Lettenmaier. **Streamflow response of partially glacierized river basins to glacier recession using a coupled glacio-hydrological model**. American Geophysical Union (AGU) fall meeting, Dec 3-7, San Francisco CA.
- 2012 Frans, C., **Naz, B. S.**, Istanbuluoglu, E., and Lettenmaier D.P. (2012, September). **Integrating a dynamic glacier model within a distributed hydrology model: model development and applications**. Oral presentation at the 2012 University of Washington / University of British Columbia Water Symposium, Seattle, WA, USA.
- 2011 **Naz, S. B.**, C. D. Frans, G. K.C. Clarke, P. Burns, A. W. Nolin, E. Istanbuluoglu, D. P. Lettenmaier. **Application of spatially distributed coupled glacio-hydrological model to predict the effect of glacier recession on the flow of the Upper Bow River, Alberta, Canada**. American Geophysical Union, Fall Meeting 2011, abstract #C53D-0712

- 2011 Naz, B. S., L. C. Bowling, M. Ashfaq, and N. S. Diffenbaugh., **Implications of glacier change to Upper Indus River streamflow**. 91<sup>st</sup> American Meteorological Society Annula Meeting 2011, Jan 22 – 27, Seattle, Washington.
- 2010 Naz, B. S., Bowling, L. C.; Crawford, M. M., **Quantification of glacier elevation changes using ICESat and SRTM elevation data in the Upper Indus Basin**. American Geophysical Union, Fall Meeting 2010, abstract#C43F-05
- 2010 Bowling, L. C., **B. S. Naz**, M. Ashfaq, N. S. Diffenbaugh, **Effect of climate change on water resources of the Upper Indus River**. American Geophysical Union, Fall Meeting 2010, abstract #H31F-1073
- 2010 Naz, B.S., L.C. Bowling, M. Ashfaq, N.S. Diffenbaugh, **Influence of recent glacier changes in the Karakoram Himalaya region on the streamflow variability of the Upper Indus River**, International Glaciological Society International Symposium on Earth's Disappearing Ice: Drivers, Responses and Impacts, Columbus, OH, Abstract 59A068
- 2010 Naz, B.S., L.C. Bowling, N.S. Diffenbaugh, M. Ashfaq, **Recent glacier changes in the Karakoram Himalaya and streamflow variability in the Upper Indus**, Steve Burges retirement symposium on Hydrology in the 21st Century: Links to the past, and a vision for the future. March 24-26, 2010.
- 2009 Naz, B.S., L.C. Bowling, N.S. Diffenbaugh, P. Owens, M. Ashfaq and S. Shafiq-ur-Rehman, 2009. **Hydrological sensitivity of the Upper Indus River to Glacier Changes in the Karakorm Himalya Region**, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract C31C-0455.
- 2008 Naz, B. S., Bowling, L. C. and Crawford, M. M., **Quantification of Glacier Changes Using ICESat Elevation Data and the SRTM Digital Elevation Model in the Western Karakoram Himalaya Region**. American Geophysical Union, Fall Meeting 2008, abstract #C23A-0592
- 2006 Naz, B. S, L. C. Bowling, C. J. Johannsen and K. A. Cherkauer, **Automated identification of subsurface drainage systems of agricultural fields using image processing techniques**, 27th Annual Symposium, IWRA Purdue University, West Lafayette, IN, June 21-23.
- 2006 Naz, B. S, L. C. Bowling, E. J. Kladviko and K. A. Cherkauer, **Evaluation of Distributed Hydrology-Soil-Vegetation Model (DHSVM) for simulating tile drained landscapes**, ASA-CSSA-SSSA International Meeting, Indianapolis, IN, November 12- 16, Abstract 725.
- 2005 Naz, B. S, C. J. Johannsen and L.C. Bowling, **Hydrologic Impact of Subsurface Drainage of Agricultural Fields**. Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract H41D-0447

## **TEACHING INTERESTS (list of courses that I am prepared to teach)**

### **Undergraduate Level:**

- Hydrologic Modeling
- Watershed Hydrology
- GIS and Remote Sensing
- Irrigation and Drainage Systems
- Water Resources Management

### **Graduate Level:**

- Advanced Topics in Hydrology
- Cold Regions Hydrology
- Climate Change and Hydrologic Extremes
- Application of Remote Sensing and GIS in Land and Water Resources Management
- Water Resources in Changing Environment

## **RESEARCH INTERESTS AND SKILLS**

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### **Interests:**

- Large scale hydrologic modeling
- Analysis of extreme events including droughts and floods and its effects on hydropower generation
- Global food and water security
- Climate change effects on cold region hydrology
- Energy and infrastructure demands in changing climate
- Application of remote sensing data and land surface models to understand hydrologic changes
- Ecological implications of natural and anthropogenic alterations of water quality and quantity in rivers

### **Skills:**

- **Remote Sensing:** ENVI, ERDAS-Imagine, GRASS-GIS
- **GIS:** ArcGIS 9.0, ArcView 3.x, Arc Info, MapServer, GRASS-GIS
- **Computer Models:** Distributed Hydrology-Soil-Vegetation Model (DHSVM), Variable Infiltration Capacity (VIC) Model, SWAT Model, VIC-RBM (Stream temperature model)
- **Programming Languages:** C & C++, FORTRAN, Python, Awk, C-Shell programming, NCL, IDL, Visual Basic
- **Application Tools:** Microsoft Office, Matlab, GMT, R

## **HONORS AND AWARDS**

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| 2011 | Bilsland Dissertation Fellowship, Purdue University.  |
| 2010 | Purdue Climate Change Research Center (PCCRC) Fellowship.   |
| 2008 | Incentive Grant for Proposal Writing, Purdue University (\$500).  |
| 2007 | Incentive Grant for Proposal Writing, Purdue University. (\$500).   |
| 2003 | Applied Research Grant for Disaster Risk Reduction. ProVention Consortium (World Bank and Partners) (\$5000). |

## **PROFESSIONAL AFFILIATIONS / SERVICES**

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- American Geophysical Union
- American Water Resource Association
- International Association of Hydrological Sciences (IAHS)
- American Meteorological Society
- Reviewer for Journal of Geophysical Research, Hydrological Sciences Journal, The International Journal of River Basin Management and British Journal of Environment and Climate Change
- Served as a judge for student posters at Hydrology Session of AGU 2012.

## **APPEARANCE IN MEDIA**

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- “Researchers prepare for future climate with help of America's fastest scientific supercomputer”, <http://climatechangescience.ornl.gov/content/researchers-prepare-future-climate-help-americas-fastest-scientific-supercomputer>, 2014
- “A recent, pioneering study based on satellite imagery – conducted by Bibi S Naz and colleagues at Purdue University in Indiana – suggests snowfall amounts and the extent of perennial snow cover have increased in the past couple of decades at high elevations in the Central Karakoram.” Chinadialogue, <https://www.chinadialogue.net/article/show/single/en/3480-Understanding-glacier-changes-2-> January 2<sup>nd</sup>, 2010

## **MISCELLANEOUS**

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- Participated in Wabash Stream Sampling Blitz 2010 to collect water samples and measured stream temperature and turbidity on-site.
- Served as a mentor to an undergraduate student under Summer Undergraduate Research Fellowship (SURF) program at Purdue University during summer, 2008.
- Participated in one week training on Achieving Creativity in Technical Writing, at Human resource Development Institute (HRDI), Islamabad, Pakistan. May, 2001.
- Participated in one week introductory Management Course for Junior Executives at Pakistan Institute of Management, Karachi, Pakistan. October, 2000.
- Participated in one month training on GIS at Pakistan Forest Institute, Peshawar, Pakistan. April-May 1999.