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Area of Interest

- Hydrometeorological application of satellite remote sensing
- Numerical weather prediction and extreme event forecasting
- Cloud computing, system automation and application development

Education

PhD in Civil and Environmental Engineering (Jun 2017 – Present**)**
Hydrology and Hydrodynamics Track
Department of Civil and Environmental Engineering
University of Washington, Seattle, Washington
Thesis Title: Mainstreaming multi-mission satellite observations in advancing operational water management

Masters in Civil and Environmental Engineering (Jan 2016 - Jun 2017)
Hydrology and Hydrodynamics Track
Department of Civil and Environmental Engineering
University of Washington, Seattle, Washington
Thesis Title: Development of Web Analytical Scalable Tools for Water Management based on Satellite-based Earth Observations

Bachelor of Science in Water Resources Engineering (Jan 2008 – Feb 2013)
Department of Water Resources Engineering
Bangladesh University of Engineering and Technology (BUET) Thesis Title: Study on Revetment at Teesta River.
Statistical Characterization of Teesta River Discharge and Water Level using analytical and graphical frequency analysis, Design of a typical revetment along Teesta River for the purpose of stability check of existing revetment.

Experience

Graduate Research Assistant (December 2015 - Present)
SASWE Research Group (www.saswe.net)
Department of Civil and Environmental Engineering
University of Washington, Seattle, Washington

- *Developer of Global Reservoir Assessment Tool (RAT), a global and freely accessible system to monitor the operating pattern of current and planned reservoirs and their impact on water availability.*
- *Cloud Computing-Google Earth Engine based Dynamic Width based Altimeter Height Visualizer to visualize river water levels from Jason 3* 2015-Present) *altimeter observations, related news covered by NASA JPL.*
- *Developed a skillful and computationally efficient flashflood and early warning system for the People's Republic of Bangladesh (Ministry of Water Resources - Bangladesh Water Development Board) which is expected to have a positive impact on the food security of Bangladesh by minimizing flashflood damage.*

- *Developer of Advanced Weather, Climate and Satellite based Water Forecasting System, which is world's first operational transboundary reservoir monitoring system based on earth observations.*
- *Web analytics based real-time correction system for satellite based GPM (IMERG) precipitation correction and streamflow correction.*
- *Core developer of Build-it-Yourself operational and fully automated web interface South Asian Surface Water Modelling System connected with complex back-end models and codes with user-friendly front-end GUI, related news from Earth Sciences Division, NASA.*
- *An end-to-end automated 8-day lead time inundation forecast system development based on altimetry based forecasting techniques, Hydrodynamic Model (MIKE 11) and GDAL, which rendered through smartphones.*

Summer School Participant (Summer 2019)
JPL Center for Climate Sciences, JPL, NASA

- *Using Satellite Observations to Advance Climate Models, Organized by the NASA JPL Center for Climate Sciences & the Keck Institute for Space Studies, Keck Center, Caltech, Pasadena19-23 August 2019*

Student Intern (June 2017- September 2017)
Hydrological Sciences Laboratory, Goddard Space Flight Center
National Aeronautics and Space Administration (NASA)

- *Development of an interactive web based dynamic framework LIS-ATLAS to visualize Land Information System (LIS) Model and LVT outputs and quantitative evaluations for different spatial and temporal configurations under the FEWS-NET project.*

Junior Engineer (July 2013 – December 2015)
Flood Management Division
Institute of Water Modelling (IWM), Dhaka, Bangladesh

- *Different types of software, scripts and tool development, development and simulation of rainfall-runoff models, Hydrodynamic models using state of the art tools and software, end to end complete automated system development which ingests satellite based and in-situ measurements and though using rainfall-runoff models, hydrodynamic models, inundation mapping, optimizations, flood forecast inundation maps and hydrographs preparation, and dissemination though different mode of communication.*

Undergraduate Internship (June 2017-September 2017)
Flood Management Division
Institute of Water Modelling (IWM), Dhaka, Bangladesh

- *Rainfall-Runoff Model development of flash flood prone northeast watershed of Bangladesh using DHI-MIKE11 Model. Worked there as a requirement of fulfillment of B.Sc. in Engineering Degree.*

Selected peer reviewed publications

1. **Biswas, N.K.**, Hossain, F., Bonnema, M., Lee, H., Chishtie, F. (2020). A Global Reservoir Assessment Tool for Predicting Hydrologic Impact and Operating Pattern of Existing and Planned Reservoirs, *Environmental Modeling and Software* (In revision).

2. **Biswas, N. K.**, Hossain, F., Bonnema, M., Aminul, A., Biswas, R. K., Buiyan, A., & Hossain, A. (2019). A computationally efficient flashflood early warning system for a mountainous and transboundary river basin in Bangladesh, Journal of Hydroinformatics (accepted)
3. **Biswas, N. K.,** Hossain, F., Bonnema, M., Okeowo, M. A., & Lee, H. (2019). An altimeter height extraction technique for dynamically changing rivers of South and South-East Asia. Remote Sensing of Environment, 221, 24-37. doi:10.1016/j.rse.2018.10.033
4. Hossain, F., **Biswas, N. K.**, Ashraf, M., & Bhatti, A. (2017). Growing More with Less Using Cell Phones and Satellite Data. Eos. doi:10.1029/2017eo075143
5. **Biswas, N. K.**, & Hossain, F. (2017). A scalable open-source web-analytic framework to improve satellite-based operational water management in developing countries. Journal of Hydroinformatics, 20(1), 49-68. doi:10.2166/hydro.2017.073

Google scholar link: https://scholar.google.com/citations?user=e0y35q0AAAAJ&hl=en

Computing Skills

Numerical Modelling: Variable Infiltration Capacity Model (VIC), MIKE 11 (Rainfall-Runoff, Basin & Hydrodynamic), HEC-RAS, HEC-HMS, CCHE 2D, Water-CAD, Storm-CAD
Programming language: Python, C#, MATLAB, Bash Scripting
Cloud Computing: Google Earth Engine (GEE)
Operating Platform: Windows, Linux (Ubuntu)
Drafting and Documentation: AutoCAD 2D & 3D Modelling , Microsoft Office
GIS Analysis: ArcGIS, QGIS, GDAL
Database Management: Microsoft SQL Server Express, SQLite 3
Web and Content Management: HTML, JavaScript, Wordpress, Joomla, Highcharts.js, Leaflet.js, D3.js

Awards and Honors

Ivanhoe Fellowship (2015), University of Washington
Engineers Stipend (2011), Bangladesh University of Engineering and Technology
Board Scholarship in Higher Secondary School Examination

Trainings

Trainings as the lead:

- Presenter, Hacker and Helper of SWOT Virtual Early Adopter Hackathon-2020 organized by NASA and the University of Washington to build deeper engagement with SWOT Early Adopters, who comprise SWOT's active user community
- Spent 14 days at Hanoi, Vietnam for the technical training workshop (July 1 2018 to July 14 2018) to mainstream decision support system for Vietnam on USAID Evidence to Action project for "Application of Satellite Gravimetry, Satellite Altimetry, and VIC Hydrological Model for Water Resource Management in Vietnam"
- Led a workshop entitled “Supporting Water Management in the Lower Mekong with Satellites” from 5-7th October, Hanoi, Vietnam supported by SERVIR-Mekong, funded by USAID in partnership with NASA, joined forces with USAID’s Partnerships for Enhanced Engagement in Research (PEER) with participants from various agencies in Vietnam, Cambodia, Lao PDR, Myanmar, and Thailand
- Online IT training on how to build and maintain web-portals such as South Asian Surface Water Modelling System (http://depts.washington.edu/saswe) using non-proprietary (free)

software to Pakistan Council for Research in Water Resources, Pakistan and Department of Hydrology and Meteorology, Nepal by University of Washington

- Training at University of Washington, Seattle on development of Variable Infiltration Capacity (VIC) Model and Satellite Altimeter to person/group from:
  - ✓ Pakistan Council of Research in Water Resources (PCRWR), Pakistan (May 2015
  - ✓ National University of Civil Engineering (NUCE), Vietnam (March - April 2016)
  - ✓ Department of Hydrology and Meteorology (DHM), Nepal (April - May 2016)
  - ✓ National Center for Water Resources Planning and Investigation (NAWAPI), Vietnam (Oct - Nov 2016)
- Online IT training on how to build and maintain web-portals such as South Asian Surface Water Modelling System (http://depts.washington.edu/saswe) using non-proprietary (free) software to Pakistan Council for Research in Water Resources, Pakistan and Department of Hydrology and Meteorology, Nepal by University of Washington

Trainings as a participant:

- Training on User Interface Development using C# Programming and SQL Server Database Management by Institute of Water Modelling
- Training on Environmental Impact Assessment & Environment Management Plan by the Department of Civil Engineering, BUET
- Training on MIKE 11: Flood Mapping and Data Assimilation from the Academy by DHI, Delft Hydraulic Institute, Denmark.
- Training on MIKE 11(HD & NAM) by Institute of Water Modelling
- Training on Basic Arc-GIS by Institute of Water Modelling
- Orientation Training of Junior Engineers by Institute of Water Modelling

Outreach Activities

- Public Messaging and Engagement Award, UW Student Film Contest 2019
- Co-organizer of research group booth, Engineering Discovery Days 2016-2018 by University of Washington

Affiliations

Student Member, American Society of Civil Engineers (ASCE)
Student Member, American Geophysical Union (AGU)
Student Member, American Meteorological Society (AMS)

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