Nishan Kumar Biswas
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Area of Interest

- Hydrometeorological application of satellite remote sensing
- Numerical weather prediction and extreme event forecasting
- Cloud computing, big data visualization and application development

Experience

Associate Scientist (February 2021 - Present)
Landslide Hazard Group, Hydrological Sciences Laboratory
NASA Goddard Space Flight Center (https://science.gsfc.nasa.gov/sed/bio/nishankumar.biswas)

- Lead developer of Google Cloud Platform based Landslide Hazard Assessment model for Situational Awareness (LHASA) for the Lower Mekong Region of South-East Asia.
- Leading activities to migrate landslide hazard monitoring system to the advanced computational IT infrastructure (i.e. Google Earth Engine, Google Cloud Platform)

Graduate Research Assistant (December 2015 - February 2021)
Department of Civil Engineering (SASWE Research Group), University of Washington

- A Global Reservoir Assessment Tool (RAT) was developed to monitor the operating pattern of 1600 reservoirs solely based on satellite observations, which showed an accuracy of more than 75%.
- A Dynamic River Width based Altimeter Height Visualizer was developed to generate near-real-time river stages of 210 virtual stations over South and South-East Asia. News link of JPL, NASA
- A skillful and computationally efficient flash flood forecasting system developed for the northeastern region of Bangladesh which has been used operationally to minimize flood risk and damage.
- World's first operational transboundary reservoir monitoring system was developed for Mekong and Red River Basins to monitor upstream dams using EO data with a promising accuracy. EOS news link
- A web analytics based real-time correction system was implemented for satellite based precipitation over the South and South-East Asia river basins which showed a significant improvement in prediction.
- A scalable and operational web interface South Asian Surface Water Modelling System was developed which connects complex back-end models with user-friendly front-end. Earth Sciences News of NASA

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

- An interactive web based dynamic framework LIS-ATLAS was developed to visualize Land Information System (LIS) Model outputs and quantitative evaluations of model predictions.

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

- A vertically integrated and automated system were designed, developed and implemented for an operational flood prediction and inundation mapping for 160 million people of Bangladesh.
- More than 6 hydrological-hydrodynamic models were developed, calibrated and validated using state of the art tools and software for river stage and flow prediction and water resources management.

Education

PhD in Civil and Environmental Engineering (June 2017 – February 2021)
University of Washington, Seattle, WA, USA
Thesis: Mainstreaming multi-mission satellite observations in advancing operational water management

MSc in Civil and Environmental Engineering (January 2016 – June 2017)
University of Washington, Seattle, WA, USA

BSc in Water Resources Engineering (January 2008 – February 2013)
Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Awards and Honors

- NASA Certificate of Appreciation (2020), SWOT Early Adopter Virtual Hackathon
- Appreciation Award (2020) for flash flood forecasting, Bangladesh Water Development Board
- Public Messaging and Engagement Award (2019), UW Student Film Contest 2019
- Co-organizer of Engineering Discovery Days (2016-2018), University of Washington
- Ivanhoe Fellowship (2015), University of Washington
- Engineers Stipend (2011), Bangladesh University of Engineering and Technology
- Higher Secondary School Examination Scholarship (2007), Government of Bangladesh

Selected peer reviewed publications

1. **Biswas, N.K.,** & Hossain, F. (2021). A Multi-decadal Analysis of Reservoir Storage Change in Developing Regions. Journal of Hydrometeorology. https://doi.org/10.1175/JHM-D-21-0053.1
2. **Biswas, N. K.,** Hossain, F., Bonnema, M., Lee, H., & Chishtie, F. (2021). Towards a global Reservoir Assessment Tool for predicting hydrologic impacts and operating patterns of existing and planned reservoirs. Environmental Modelling & Software, 140, 105043. doi: 10.1016/j.envsoft.2021.105043.
3. **Biswas, N. K.**, Hossain, F., Bonnema, M., Aminul Haque, A. M., Biswas, R. K., Bhuyan, A., & Hossain, A. (2020). A computationally efficient flash flood early warning system for a mountainous and transboundary river basin in Bangladesh. Journal of Hydroinformatics, 22(6), 1672-1692. doi: 10.2166/hydro.2020.202
4. **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
5. 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
6. **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 (Citations: 95)
ResearchGate Profile: https://www.researchgate.net/profile/Nishan-Kumar-Biswas (RG Score:19.5)

Computing Skills

Cloud computing and programming: Google Cloud & Earth Engine, Python, C#, MATLAB, Bash
Hydrological Modelling: VIC Hydrological Model, MIKE by DHI, HEC-RAS, HEC-HMS, CCHE 2D
GIS Analysis and Database: ArcGIS, QGIS, GDAL, ENVI, Microsoft SQL Server Express, SQLite
Drafting and Documentation: AutoCAD 2D & 3D Modelling, Microsoft Office
Web and Visualization: HTML, CSS, JavaScript, WordPress, D3.js, Leaflet.js, Highcharts.js

Conferences and Workshops

- Hacker and helper of SWOT Virtual Early Adopter Hackathon (2021), organized by NASA and the University of Washington to build deeper engagement with SWOT Early Adopters.
- Invited speaker on Data Science and Cloud Computing application in Remote Sensing (2020), Sensing River 2020 Workshop organized at University of Washington.
- Presenter and hacker of SWOT Virtual Early Adopter Hackathon (2020), organized by NASA and the University of Washington to build deeper engagement with SWOT Early Adopters.
- Summer school participant (2019) on using Satellite Observations to Advance Climate Models, organized by Center for Climate Sciences, Jet Propulsion Lab, NASA.
- Posters presented in American Geophysics Union Fall Meetings (2018, 2020, 2021)
- Poster presented in Fifth AMS Symposium on the Joint Center for Satellite Data Assimilation, American Meteorological Society Meeting, 2017.

Trainings

Trainings as the lead:

- Spent 14 days at Hanoi, Vietnam for the technical training workshop (July 1st 2018 to July 14th 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, 2016, 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:
  - National University of Civil Engineering (NUCE), Vietnam (March - April 2016)
  - Department of Hydrology and Meteorology (DHM), Nepal (April - May 2016)
  - Pakistan Council of Research in Water Resources (PCRWR), Pakistan (May 2017)
  - National Center for Water Resources Planning and Investigation (NAWAPI), Vietnam (Oct - Nov 2016)
  - Asian Disaster Preparedness Center (ADPC)
  - Bangladesh Water Development Board, Bangladesh
- 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# 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

- Reviewer of MDPI Remote Sensing, MDPI Sustainability, and IEEE Transactions on Geoscience and Remote Sensing
- Guest Editor of special issue "Artificial Intelligence and Statistical Techniques to Advance Weather Forecasting and Impact Modeling"
- Associate Member, American Society of Civil Engineers (ASCE)
- Student Member, American Geophysical Union (AGU)
- Student Member, American Meteorological Society (AMS)