ANUPAL BARUAH
NORTH EASTERN SPACE APPLICATION CENTER
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Research Gate link: https://www.researchgate.net/profile/Anupal-Baruah

Research Interests

- Hydrodynamic modeling (1D and 2D)
- Environmental fluid mechanics
- Ecology, Ecohydrology and Ecohydraulics
- River hydraulics and sediment transport
- Hydrological modeling ,CFD
- Weather Forecasting modeling
- Drainage and waste water modeling

Education

PhD **Indian Institute of Technology, Guwahati, Department of Civil Engineering**

2016-2022

- Dissertation: Hydrodynamic modeling of vegetated alluvial channel and its application in aquatic ecology
- Supervised by: Prof. Arup Kr Sarma
- CGPA(Coursework):9/10

M.E **Guwahati University**

2015

- Discipline: Watershed management and flood control
- Thesis: A laboratory study on the performance of submerged vanes as sediment management device
- Supervised by: Dr. Utpal Kr Misra
- Grade: First Class

B.E **Nagpur University**

2011

- Grade: First Class

RESEARCH & TEACHING EXPERIENCE

Nov,2021- Research Scientist, North Eastern space application Center, Department of Space, Umiam, Meghalaya,

- Project: Flood level early warning system
- PI: Dr. Diganta Baraman, Scientist-F
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July, 2016- Dec,2016 Junior Research Fellow

- Project: Mathematical modeling of the Brahmaputra River and its impact on climate change
- Funding Agency: Brahmaputra Board, Govt. of India
- PI: Dr.Arup Kr Sarma

May, 2015 -June 2016	Assistant professor, Assam downtown University, Guwahati
July, 2014 -April 2015	Teaching Assistant, Assam downtown University, Guwahati
May, 2013 -June 2014	Guest Faculty, Sankardev institute of Engineering and Management, Guwahati

INDUSTRIAL EXPERIENCE

Nov 2011 – April 2012	Site Engineer, Gammon India Limited

SCHOLARSHIP

Jan 2017- Nov 2021	Ministry of Human Resource Development (MHRD),Government of India(GoI) fellowship for PhD program.

MEDIA HIGHLIGHTS OF THE RESEARCH WORK

31 Jul,2021	"https://economictimes.indiatimes.com/news/india/iit-guwahati-to-collaborate-with-brahmaputraboard-to-restore river banks/article show/84906866 .cms? frm=mailtofriend&intenttarget=no" **Economic Times**
29 Dec, 2018	IIT-Guwahati's Mathematical Modelling on Brahmaputra" **The sentinel**

PUBLICATIONS

Journal Articles:

J1 Baruah A, Sarma A K, Hinge G "Hydrological-hydrodynamic nexus for evaluation of fish habitat suitability in the Bhogdoi River, India" Journal of Hydrologic Engineering, American Society of Civil Engineers, 26(11), 4021032. https://doi.org/10.1061/(ASCE)HE.1943-5584.0002127 I.F:2.064

J2 Baruah A, Sarma A K "A fully coupled two-dimensional flow – vegetation routing model in open channel flow" Environmental Fluid Mechanics, Springer, http://link.springer.com/article/10.1007/s10652-021-09810- , IF-2.551

J3 Devi D, Baruah A, Sarma A K " Characterization of dam-impacted food hydrograph and its
degree of severity as a potential hazard" Natural hazards, Springer, https://doi.org/10.1007/s11069-022-05253-7 , IF -3.102

J4 Kalita B, Baruah A, Handique A, Sarma A K "A semi-coupled model for determining the distribution of two-dimensional coherent structures in open channel fow" Environmental Fluid Mechanics, Springer, https://doi.org/10.1007/s10652-022-

09847-4 , IF-2.551

J5 Baruah A, , Sarma A K, Hing G, "A semi coupled shallow water model for vertical velocity distribution in an open channel with submerged flexible vegetation" Journal Of Irrigation and Drainage Engineering, ASCE, (ACCEPTED) ,IF: 1.34

J6 Baruah Aand Sarma A K, "A simple and efficient two-dimensional hydrodynamic model for unsteady flow simulation in undulating bathymetry" Progress in Computational fluid dynamics, Inderscience Publication, Vol. 21, No. 6, 2021, DOI:10.1504/PCFD.2021.119256 , IF 1.048,

J7 Baruah A & Sarma, A. K (2020), "A quasi three dimensional hydrodynamic model for velocity distribution in open channel" ISH Journal of Hydraulic Engineering, https://doi.org/10.1080/09715010.2020.18576,

J8 Baruah A & Sarma, A. K (2020)," Ecological flow assessment using hydrological and hydrodynamic routing model in Bhogdoi river, India," Modeling Earth Systems and Environment, Springer, https://doi.org/10.1007/s40808-020-00982-9,

J9 Baruah A, Handique A, Sarma A K(2021), "A coupled approach to investigate the entropy parameter dynamics in open channel flow with submerged flexible vegetation" Modeling Earth Systems and Environment, https://doi.org/10.1007/s40808-021-01307-0

J10 Sharma A, Baruah A, Mangukiya N, Hinge G, Bharali B "Evaluation of Gangetic dolphin habitat suitability under hydroclimatic changes using a coupled hydrological-hydrodynamic approach", Ecological Informatics, Elsevier https://doi.org/10.1016/j.ecoinf.2022.101639

J11 Baruah A, Sarma A K "Performance of conservative and non-conservative shallow ater model in wavy river bed" (Accepted), Int J Of Hyd. Science and Technology, Inderscience Publication

J12 Baruah A, Barman D, B M Arjun, Chyne B, Kurbah S, Aggarwal SHiv P, "Habitat Response of adult fish species under the influence of ecological flow and hydrodynamic regime in perennial river system" Ecohydrology, Willy online (Under review)

J13 Handique A, Baruah A, Sarma A K, Bhattacharjya, Rajib Kumar "A dip-corrected discharge estimation method for large braided river system: A case study in Brahmaputra River, Assam" Flow Measurement and Instrumentation, Elsevier (Under review)

J14 Hinge G , Bharali B, Baruah A , Sharma A "Integrated Groundwater Quality Analysis using Water Quality Index, GIS and Multivariate Technique: A Case Study of Guwahati City " Environmental Earth Sciences, Springer (Under review)

CONFERENCES [10]

C1 Biswadip Bharali, Anupal Baruah "A Study on Muskingham Equation Using Conventional Method and MATLAB Software for River Routing; Assam Water conference-2015,Department of water resource ,Govt of Assam,2015

C2 Arup Kr Sarma, Anupal Baruah, "A robust numerical scheme for simulation of transcritical flow in a braided river" International conference in recent advancement in fluid and thermal science(I-craft), BITS PILANI,DUBAI.

C3 Anupal Baruah , “A laboratory study on the performance of submerged vanes in river training work; International Seminar on Infrastructure Development, Civil Engineering Department, Jorhat Engineering College,(21-22 Dec) 2018.

C4 Anupal Baruah, Dhruba J Sarmah, & Arup Kr Sarma, “A Geo-spatial and hydrodynamic analysis on the influence of flow diverting structures in a natural channel: A case study on Brahmaputra River near Majuli;” Geo-spatial application for Natural resources management, (July 9-10, 2020) NIRDPR-NERC, Guwahati

C5 Anupal Baruah, Priyam Deka, Ranjit Deka, Arup Kr Sarma “A 2D hydrodynamic model study in Brahmaputra River for implementation of bank protection work at Nimatighat”, SWARM-2020

C6 Gaurav Talukdar, Anupal Baruah , Arup Kr sarma“2D hydrodynamic model for evaluating impact of possible river front activities in an urbanized bank of Brahmaputra River” SWARM-2020

C7 D i p s i k h a Devi, Anupal Baruah, and Arup Kr Sarma, “Characterizing Dam Induced Flood at Downstream of a Hydel Project,” EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-8757, https://doi.org/10.5194/egusphereegu21-8757, 2021.

C8 Anupal Baruah, Dhruba Jyoti Sarma, Arup Kumar Sarma, “An Ecohydrological and Geospatial assessment for urban river system : A case study in the Bhogdoi River, India”HYDRO-2021

C9 Ashutosh Sharma, Gilbert Hinge, Anupal Baruah, Biswadip Bhirali, “Assessing influence of climate change on favorable conditions for aquatic species using an integrated hydrological and hydrodynamic approach: A case study in the Kulsi River, India” AGU Fall Meeting 2021

C10 Dr. Diganta Barman, Anupal Baruah,Dr. Arjun B M, Dr. S P Aggarwal “A fuzzy multi-criteria decision tree model for flood hazard assessment in the Dhemaji district of the state of Assam in India” EGU General Assembly 2022

Book Chapter[5]

B1 Anupal Baruah, Dhruba J Sarmah, & Arup Kr Sarma ,”A Geo-spatial and hydrodynamic analysis on the influence of flow diverting structures in a natural channel: A case study on Brahmaputra River near Majuli;” Geo-spatial application for Natural resources management, ISBN-978-81-8730-584-4

B2 Anupal Baruah, Rishob Borua, “An experimental study on the soil charecteristics and infiltration rate on Horton’s decay constant” https://link.springer.com/bookseries/6689 , https://link.springer.com/chapter/10.1007/978-3-030-81358-

1_15#:~:text=DOI%3A%2010.1007/978%2D3%2D030%2D81358%2D1_15

B3 Arup Kr Sarma, Anupal Baruah, "A robust numerical scheme for simulation of transcritical flow in a braided river , IOP Conf. Series: Journal of Physics: Conf. Series 1276 (2019) 012035 IOP Publishing, doi:10.1088/1742-6596/1276/1/012035

B4 Baruah, A., Deka, P., Deka, R., Sarma, A.K. (2023). A 2D Hydrodynamic Model Study in Brahmaputra River for Implementation of Bank Protection Work at Nimatighat. In: Bhattacharjya, R.K., Talukdar, B., Katsifarakis, K.L. (eds) Sustainable Water Resources Management. Advances in Sustainability Science and Technology. Springer, Singapore
https://doi.org/10.1007/978-981-16-7535-5_12

B5 Talukdar, G., Baruah, A., Sarma, A.K. (2023). 2D Hydrodynamic Model for Evaluating Impact of Possible Riverfront Activities in an Urbanized Bank of Brahmaputra River. In: Bhattacharjya, R.K., Talukdar, B., Katsifarakis, K.L. (eds) Sustainable Water Resources Management. Advances in Sustainability Science and Technology. Springer, Singapore
https://doi.org/10.1007/978-981-16-7535-5_12V

WORKSHOP

- Advances in integrated water resource management,16-18 Dec,2019,IIT GUWAHATI
- River research to evolve sustainable projects for people with eco-friendly climate resilient technology,15-16 Nov, 2019, IIT GUWAHATI

SKILLS

Programming	MATLAB, Python
Hydrodynamic Modeling	HEC –RAS 1D and 2D,MIKE21
Hydrological Modeling	HEC HMS
Remote Sensing, GIS	Arc GIS, SAR analysis
Weather Forecasting	WRF
River Survey/Filed Experience	Working experience in bathymetric survey, velocity measurements (current meter, ADCP) and sediment collection in Brahmaputra River

OTHER ACHIVEMENTS

- Diploma in AUTO-CAD from CADD center
- Certificate course on STADD PRO.
- Online certificate course on 'Flood modeling using HEC RAS
- Online certificate course on 'HEC RAS and Arc-GIS for hydrologic engineering
- One month internship in DHI on waste water modeling (MIKE-URBAN+)

FINDINGS RECEIVED DURING PHD

- Numerical modeling study near the Majuli Island, Jorhat, Assam (Funded by the Brahmaputra Board, Govt of India)

- Numerical modeling study near the Umananda Island, Guwahati, Assam (Funded by PWD, Assam)

- Numerical modeling in Tiding River, Arunachal Pradesh (Funded under the project: Mathematical Model Study for Protection Work for Safety of existing 400ft Tidding BSB Over Tidding River on Tezu- Hayuliang Road, in Lohit District of Arunachal Pradesh).

CONSULTANCY WORK/PROJECTS

- Mathematical Model study of River Brahmaputra with Emphasis on Climate Change"; Principal Investigator: Prof Arup Kr Sarma.

- Mathematical Model study for the Proposed Bridge over the Brahmaputra at Majuli"; Principal Investigator: Prof R K .Bhattacharjya.

- Protection of Brahmaputra River front from Bharalumukh to Sukleswar temple"; Principal Consultant:Prof Arup Kr Sarma.

- Mathematical Model study for the proposed bridge over the Subansiri at Khabalu ;Principal Investigator: Prof R K .Bhattacharjya

- Flood of North Lakhimpur vis-a-vis Ranganadi Hydropower Project, Principal Investigator: Prof Arup Kr Sarma. (https://www.google.com/search?q=RANGA+NADI+HYDEL+PROJECT+iit+GUWAHATI&oq=RANGA+NADI+HYDEL+PROJECT+iit+GUWAHATI+&aqs=chrome..69i57j33i10i160.8775j0j7&sourceid=chrome&ie=UTF-8)

EXTRA CURICCULAR ACTIVITIES

- Represent the departmental and inter hostel badminton meet at IIT-Guwahati

REFEREE

Dr. Arup Kumar Sarma	Professor	IIT Guwahati	M Block, Department of Civil Engineering, IIT Guwahati, 781039, India	aks@iitg.ac.in	91-361-258- 2409 (O)
Dr. D Nagesh Kumar	Professor	Indian Institute of Science, Bangalore	Department of Civil Engineering Indian Institute of Science Bangalore 560 012, India	nagesh@iisc.ac.in	91 80 2293 2666 (O)
Dr. Shinji Fukuda	Associate Professor	Tokyo University of Agriculture and Technology	Tokyo University of Agriculture and Technology Address: 3-5-8 Saiwai-cho, Fuchu, Tokyo 183-8509, Japan Building 3, Room 311	shinji-f@cc.tuat.ac.jp	+81-42-367-5604