

Dr. NABANITA BORAH

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BORN

28th June 1983

PERMANENT ADDRESS

Dipota
Tezpur
Sonitpur, Assam
PIN 784001
India

SUMMARY

Working for the upliftment of the society was my dream for a long time. During my school days I worked to create environmental awareness among the citizens of my home town, Tezpur, Assam, India. I was involved in an NGO at that time. Then I tried to help the local underprivileged kids in getting their education. I found myself thoroughly enjoying interacting with the common people, explaining science stories to them.

I did my masters in Physics and PhD in Meteorology. My PhD thesis draws inspiration from the intent to help the Indian agrarian community by providing a reliable forecast of the rainy/dry spells 15-20 days in advance. During my PhD I was involved in issuing weather forecast every 5th day for the two monsoon seasons 2013 and 2014. These forecasts were conveyed to the farmers by the India Meteorological Department and it was a huge success.

The nature of my PhD research intensified my interests in communicating the meteorological scientific outputs with the common people, especially the people in developing countries, like India. Weather and Climate awareness is relatively poor in developing countries. Two major concerns of relevance are, lack of climate scientists to translate the scientific outputs to an easily understandable form and poor mechanism to efficiently communicate the translated content to the common public.

To gather experience in translating the scientific outputs to an easily understandable form, I started working with Dr. John Cook, Research assistant professor at the Center for Climate

Change Communication, George Mason University, USA on a misinformation-based learning project targeted to school children. My role in the project was to provide the climate science contents and to develop the lesson plans to be communicated with the teachers. This project aims on neutralizing the misinformation about climate change using the misconception-based learning.

Currently, I am leading a project on how to communicate climate change information using traditional folk theaters among the rural people of Assam, India.

I am intellectually and physically quite capable of handling any responsibilities at a professional level. I also have developed the necessary traits of percept and organizational ability to work in a group in a co-operative fashion during my PhD, which I feel is mandatory in any field of work.

EDUCATION

Ph.D.	Atmospheric & Space Sciences	University of Pune, India	October, 2015	
<p>Ph.D. Thesis: Extended Range Prediction of Indian Summer Monsoon: Development of A Non-Linear Technique and Bias Correction of Dynamical Model Forecast</p> <p>Advisor: Dr. Atul Kumar Sahai and Prof. Bhupendra Nath Goswami</p>				
M.Sc.	Physics	Gauhati University, India	Class-I	2004-2006
<p>M.Sc. Dissertation: Deep Inelastic Neutrino-Nucleon Collision And Structure Functions</p> <p>Advisor: Prof. Dilip Kumar Choudhuri</p>				
B.Sc.	Physics (Mathematics, Chemistry)	Darrang College, India	Class-I with Distinction	2001-2004

EMPLOYMENT & ASSOCIATIONS

Sep-2019 - till date	Adjunct Faculty National Institute for Advanced Studies Bengaluru, India
Apr-2017 - till date	Research Affiliate Center for Climate Change Communication George Mason University, Fairfax, USA
Sep-2016 to Sep-2017	Post-Doctoral Research Associate The Center for Ocean-Land-Atmosphere Studies George Mason University, Fairfax, USA
Aug-2015 to Mar- 2016	Extended Senior Research Fellow Indian Institute of Tropical Meteorology Pune, India
Jul-2011 to July-2015	Senior Research Fellow Indian Institute of Tropical Meteorology Pune, India
Jul-2009 to Jul-2011	Junior Research Fellow Indian Institute of Tropical Meteorology Pune, India
Feb-2008 to Jun-2009	Project Assistant Indian Institute of Tropical Meteorology Pune, India

SCIENTIFIC RESEARCH INTEREST

- Climate change communication
- Translation of Indian summer monsoon predictions to the Indian agrarian society
- Indian summer monsoon and its variability
- Prediction of Indian summer monsoon rainfall

Ph.D. RESEARCH SUMMARY

The goal of my PhD research was to develop a non-linear pattern recognition technique called Self-Organizing Map (SOM) based prediction system and a multi-model ensemble forecasting system for the probabilistic extended range prediction of Indian summer monsoon 3-4 pentads

in advance. Method had been developed to bias-correct and downscale the CFSv2 model generated extended range forecast of Indian summer monsoon rainfall.

SKILLS

- Ability to be a part of an intense operational campaign.
- Ability to handle huge amount of data.
- Ability to work in a team.
- FORTRAN
- GrADS, NCL, Xmgrace
- Experience of working in HPC.
- Latex.

LANGUAGE FLUENCY

- English
- Hindi
- Assamese
- Bengali

VOLUNTEER EXPERIENCE

- Running a project ‘আধান’ (*Aadhan*) with the goal to empower the under-privileged students of my home land, Assam, India.
- Motivating and mentoring young students.
 - Mentoring students in Assam, India at different educational level, via, frequent one-to-one telephonic conversations to help them with their career goals and confidence building.
 - Motivational chat

- Working for a non-profit organization Xomidhan whose main motto is to provide free online career counseling to the students of Assam, India.
- Associated with an initiative called ‘Mentors for life’.
- Done a successful crowd funding (through www.milaap.com) to help one of my critically ill friend for her treatment in Assam, India.
- Arranging help for economically challenged potential students

OTHER INTERESTS*

- Recitation
- Playing Djembe
- Bridal Make up
- Cooking
- Interior Decoration
- Acting/Performing arts
 - a) Played the role of Maryam in the short film ‘*Left to the air*’ (Lungspo Khen), by Syed Maisam Ali Shah, Film and Television Institute of India, Pune, India
<https://www.youtube.com/watch?v=zDF6Nk-bIx8>
 - b) Costume designer in the short film ‘*Sand-dune and lullaby*’ by Mukul Haloi, Film and Television Institute of India, Pune, India
 - c) Direction assistant in the short film ‘*Days of Autumn*’ (শৰতৰ আবেলিবোৰ), by Mukul Haloi, Film and Television Institute of India, Pune, India

*No Professional Training taken

AWARDS and ACHIEVEMENTS

- Nov 2014 Grant: International Travel Support: Science and Engineering Research Board, DST, Govt. of India
- Eligibility for Lectureship (National Eligibility Test), June 2011, Council of Scientific & Industrial Research, India.
- Best Poster Presentation Award in the IITM Golden Jubilee International Conference (OCHAMP), 21-25 February, 2011, by Indian Institute of Tropical Meteorology.

- Participated in the ‘Visiting Students’ Research Program (VSRP)’ in Tata Institute of Fundamental Research, 2005; *Report: Energy Threshold and Trigger Rates for HAGAR; Guide: Dr. V. R. Chitnis and Prof. B. S. Acharya*
- Participated in the ‘CSIR Programme on Youth for Leadership in Science’ organized in Regional Research Lab, Jorhat, Assam, 1999
- State rank 5th in MSc under Gauhati University, 2006
- State rank 5th in BSc under Gauhati University (Best Science graduate of Darrang College), 2004
- State rank 13th in High School Leaving Certificate (HSLC), 1999
- District rank 4th in Middle School Scholarship Exam, 1995
- District rank 1st in Lower Primary Scholarship Exam, 1991

PROJECTS

1. *Communicating Climate Change through Traditional Folk Theater*: This project aims to communicate climate change with the non-experts using traditional folk theater. The initial study had been carried out at Barpeta, Assam during February-March, 2019.

FILMS

2. *A Bridge Over The River*, a science communication docu-film that chronicles how traditional folk theater was used to communicate climate change to 5 Ojapali (one of the oldest folk theater in Assam, India) performers and 20 high school students in Amrikhowa, Barpeta of Assam, India, **N. Borah** (writer, director, producer), 2019.

(<https://youtu.be/y3dN4ynXpeI>)

1. *Climate Change Communication through Ojapali*, an experimental short video about using a participatory Traditional Folk Theater (TFT) to communicate climate change in Assam, **N. Borah** (concept & presentation), 2018.

(<https://youtu.be/OoDbC0q2BW4>)

PUBLICATIONS

19. *Folk-art meeting science! A better way to communicate climate change? (under preparation).*
18. *Gender perspectives on water, drought and Climate change, (under preparation).*
17. *Drought and Climate change: How students think about water resources (under preparation).*
16. *Turning Misinformation about Climate Change into an Educational Opportunity, Cook J., M. McCone, N. Borah, B. Hoge, R. Anderson (under preparation).*
15. *Potential predictability of wet/dry spells transitions during extreme monsoon years: optimism for dynamical extended range prediction (2016), Sahai A. K., S. Sharmila, R. Chattopadhyay, S. Abhilash, S. Joseph, N. Borah, B.N. Goswami, D.S. Pai; A.K. Srivastava, Nat Hazards, DOI:10.1007/s11069-017-2895-2.*
14. *Extremes in June rainfall during Indian summer monsoons of 2013 and 2014: Observational Analysis and Extended range prediction (2016), Joseph S., A. K. Sahai, R. Chattopadhyay, S. Sharmila, S. Abhilash, M. Rajeevan, R. Mandal, A. Dey, N. Borah and R. Phani, QJRMS, DOI: 10.1002/qj.2730.*
13. *A bias-correction and downscaling technique for operational extended range forecasts based on Self Organizing Map, Sahai A. K., N. Borah, R. Chattopadhyay, S. Joseph and S. Abhilash (2016), Climate Dynamics, doi:10.1007/s00382-016-3214-4.*
12. *Better spread-error relationship in a multimodel ensemble prediction system (2015), Abhilash S., A.K. Sahai, N. Borah, S. Joseph, R. Chattopadhyay, S. Sharmila, M. Rajeevan, B. E. Mapes, A. Kumar, Bulletin of the American Meteorological Society, 96, 1228-1229*
11. *Real-time performance of a multi-model ensemble based extended range forecast system in predicting the 2014 monsoon season based on NCEP-CFSv2 (2015), Sahai, A. K., R. Chattopadhyay, S. Joseph, R. Mandal, A. Dey, S. Abhilash, R. P. M. Krishna, and N. Borah, Current Science, 109, November 2015, 1802-1813*
10. *Development and evaluation of an objective criterion for predicting Indian summer monsoon onset in a coupled model framework (2014), Susmitha Joseph; A. K. Sahai,*

Ph.D.; S Abhilash; Rajib Chattopadhyay; **N Borah**; Brian Mapes; M Rajeevan; Arun Kumar, Journal of Climate, doi: <http://dx.doi.org/10.1175/JCLI-D-14-00842.1>.

9. *Improved Spread-Error Relationship and Probabilistic Prediction from CFS based Grand Ensemble Prediction System* (2014), S. Abhilash, A. K. Sahai, **N. Borah**, S. Joseph, R. Chattopadhyay, S. Sharmila, M. Rajeevan, B. Mapes and A. Kumar, Journal of Applied Meteorology and Climatology, doi: <http://dx.doi.org/10.1175/JAMC-D-14-0200.1>.
8. *An Assessment of Real Time Extended Range Forecast of 2013 Indian 1 Summer Monsoon* (2014), **N. Borah**, A. K. Sahai, S. Abhilash, R. Chattopadhyay, S. Joseph, S. Sur and A. Kumar, International Journal of Climatology, DOI: 10.1002/joc.4178.
7. *North Indian Heavy Rainfall Event during June 2013: Diagnostics and Extended Range Prediction* (2014), Susmitha Joseph, A.K. Sahai, S. Sharmila, S. Abhilash, **N. Borah**, P. A. Pillai, R. Chattopadhyay, M. Rajeevan, Arun Kumar, (2014), Climate Dynamics, DOI:10.1007/s00382-014-2291-5.
6. *High-resolution operational monsoon forecasts: an objective assessment* (2014) Sahai A.K., Abhilash S., Chattopadhyay R., **N. Borah**, Joseph S., Sharmila S, Rajeevan M, Climate Dynamics, DOI:10.1007/s00382-014-2210-9, 1-12.
5. *A new method to compute the Principal Component Time Series of Self Organizing Maps: An application to Monsoon Intraseasonal Oscillations* (2014) Sahai A.K., Chattopadhyay R., Joseph S., **N. Borah**, Goswami B.N., International Journal of Climatology, DOI:10.1002/joc.3885, 2925–2939.
4. *Does bias correction in the forecasted SST improves the extended range prediction skill of active-break spells of Indian summer monsoon rainfall?* (2014), Abhilash. S, A. K. Sahai, **N. Borah**, R. Chattopadhyay, S. Joseph, S. Sharmila, S. De and B. N. Goswami, Atmospheric Science Letters, doi:10.1002/jgrd.50688.
3. *Prediction and Monitoring of Monsoon Intraseasonal Oscillations over Indian Monsoon Region in an Ensemble Prediction System using CFSv2* (2014), Abhilash S., A. K. Sahai, **N. Borah**, R. Chattopadhyay, S. Joseph, S. Sharmila, S. De, B. N. Goswami, Climate Dynamic, DOI: 10.1007/s00382-013-2045-9.
2. *A Self-Organizing Map Based Ensemble Forecasting System for Extended Range Prediction of Active/Break Cycles of Indian Summer Monsoon* (2013), **N. Borah**, A. K. Sahai, R. Chattopadhyay, S. Joseph, Abhilash S. and B. N. Goswami, Journal of Geophysical Research – Atmospheres, doi:10.1002/jgrd.50688.

1. *Simulation and extended range prediction of monsoon intraseasonal oscillations in NCEP CFS/GFS version 2 framework* (2013), Sahai, A. K., S. Sharmila, S. Abhilash, R. Chattopadhyay, **N. Borah**, R. P. M. Krishna, S. Joseph, M. Roxy, S. De, S. Pattnaik and P. A. Pillai, *Current Science (Special Section: Atmosphere and Ocean Science)*, 104, 10

REPORTS

1. *Development of Extended Range Prediction System Using CFSv2 and Its verification* (2013), **N. Borah**, S. Abhilash, S. Joseph, R. Chattopadhyay, S. Sharmila and A. K. Sahai, IITM Research Report, RR-130.
2. *Extended Range Prediction of Uttarakhand Heavy Rainfall Event by an Ensemble Prediction System based on CFSv2* (2013), Susmitha Joseph, A.K. Sahai, S. Sharmila, S. Abhilash, **N. Borah**, P.A. Pillai, R. Chattopadhyay, Arun Kumar, IITM RR-131, ISSN 0252-1075, ESSO/IITM/SERP/SR/03(2013)/180.

PARTICIPATION IN TRAINING, WORKSHOP/CONFERENCE

- “EGU 2019”, 7-12 April 2018 at Vienna, Austria. Oral: “Bridging the gap: Experts to non-experts”.
- “2018 AGU FALL meeting”, 10-14 December 2018 at Washington D.C., USA. Poster: “Communicating Climate Change through Traditional Folk Theater”.
- Training program on "Science Communication", 09-13 July 2018 at CSIR-NISCAIR, Vigyan Suchna Bhawan, New Delhi, India.
- “EGU 2018”, 8-13 April 2018 at Vienna, Austria. Oral: “Turning Misinformation into Educational Opportunities”.
- “AMS 2018”, 7-11 January 2018 at Austin, USA. Oral: “Turning Misinformation into Climate Change Education”.
- “2017 AGU FALL meeting”, 11-15 December 2017 at New Orleans, USA. Oral: “Turning Misinformation into Climate Change Education”.
- “Arthur M. Sackler Colloquia: The Science of Science Communication III: Inspiring Novel Collaborations and Building Capacity”, 16-17 November 2017 at Washington, District of Columbia, USA.
- “2014 AGU FALL meeting”, 15–19 December, 2013 at San Francisco, USA. Poster: “An Assessment of Real Time Extended Range Forecast of 2013 Indian Summer Monsoon”.

- “6th International Forecast Verification Workshop”, 17-19 March, 2014, New Delhi Poster presentation: Prediction and Monitoring of Monsoon Intraseasonal Oscillations using a CFSv2 based Ensemble Prediction System and Its Verification.
- “2013 AGU FALL meeting”, 9–13 December, 2013 at San Francisco, USA. eposter: Prediction and Monitoring of Monsoon Intraseasonal Oscillations over Indian Monsoon Region in an Ensemble Prediction System using CFSv2.
- “ANNUAL MONSOON-2012 WORKSHOP” on 19th and 20th February, 2013 at IITM, Pune. Poster presentation: Probabilistic Prediction of Intraseasonal Oscillations of Indian Summer Monsoon Rainfall in Extended-range Scale Using a Self-Organizing Map Based Ensemble Forecasting Technique.
- “ESSO-IITM-ICTP Targeted Training Activity (TTA)”, 14-25 January 2013, at IITM, Pune on "Intraseasonal Monsoon Predictability and Prediction".
- OCHAMP, 21-25 February 2012, Indian Institute of Tropical Meteorology, Pune, India
- Workshop on Monsoon Variability, 17-19 August 2011, CAOS, IISc, India

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