

# SUBHASIS GHOSH

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## Education

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**Doctor of Philosophy (Ph.D.) in Earth System Science** Expected in Spring 2025  
Auburn University, USA

**Master of Science (M.S.) in Geography and Environmental Studies** Fall 2023  
Auburn University, USA  
*(Please note that my degree was conferred with the title MS in Geography. However, the degree has since been renamed by the issuing institution to MS in Geography and Environmental Studies with no change in curriculum)*

**Post-Graduate Diploma (PG Diploma) in Urban Planning and Development** Spring 2020  
Indira Gandhi National Open University, India

**Post-Graduate Diploma (PG Diploma) in Geoinformatics** Spring 2019  
Maulana Abul Kalam Azad University of Technology (Formerly known as WBUT), India

**Master of Arts (M.A.) in Geography (Specialization in Applied Geomorphology)** Summer 2018  
Visva-Bharati University, India

**Bachelor of Arts (B.A. Honors) in Geography** Summer 2016  
Visva-Bharati University, India

## Professional Certificates and License

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**Graduate Certificate in Geographic Information System Science** Spring 2024  
Auburn University

**Remote Pilot (Part 107) License** Spring 2024  
Federal Aviation Administration, Dept. of Transportation  
Category: UAV-Small

**Certificate in GIS and Thematic Cartography** Summer 2018  
National Atlas and Thematic Mapping Organization, Govt. of India

## Appointments/Work Experience

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**Jan 2024 – Present** **Graduate Teaching Assistant**  
Department of Geosciences, Auburn University, USA  
Courses Taught: Advanced GIS (GEOG 6880/5880), Drones and Geospatial Applications (GEOG 6850/5850), Quantitative Methods and Spatial Analysis (GEOG 6700/5700), Concepts of Science (SCMH 1010), Global Geography (online course) (GEOG 1010).

- Gained experience working with a classroom of 20-25 students, including both undergraduate and graduate levels.
- Delivered lab lectures, in-class and one-on-one GIS course material and project advising, assisted with grading lab assignments, and provided constructive feedback to students.

**Aug 2021 – Present** **Graduate Research Assistant - NASA-IDS Project**  
Department of Geosciences, Auburn University, USA

- Worked in the areas of urban expansion and its impacts on regional weather and climate.
- Used Python and Google Earth Engine for processing satellite imageries and geospatial datasets. Worked with various geospatial models and WRF (Weather Research & Forecasting) simulations to assess atmospheric effects and environmental implications of cities.

**Oct 2023 – Present**

**Graduate Research Assistant – USGS Project**

Department of Geosciences, Auburn University, USA

- In this project, I transformed remote sensing images into visually appealing art pieces, akin to the 'Earth as Art' images created by USGS using digital image processing techniques and contributed to developing a Virtual Reality (VR) based immersive learning experience to promote interest in Earth science and STEM disciplines.

**Mar 2021 – Jul 2021**

**Junior Research Fellow / Project Scientist**

West Bengal State Council of Science and Technology, India

- Involved in creating (and updating) a space-based information support system for decentralized planning in collaboration with the Indian Space Research Organization (ISRO).

**Sept 2019 – Oct 2019**

**GIS Analyst**

Prayukti Systems Pvt. Ltd., India

## **Research**

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Please visit [Google Scholar page](#) for updated citation matrices. (Total citations - 51 as of 17<sup>th</sup> October 2024)

### **Peer-Reviewed Publications**

1. Das, R. D., Bandopadhyay, S., **Ghosh, S.**, Das, M., Chowdhury, M., Cotrina-Sanchez, A., Kumar, C., & Mitra, C. (2023). Have COVID lockdowns really improved global air quality? –Hierarchical observations from the perspective of urban agglomerations using atmospheric reanalysis data. *Physics and Chemistry of the Earth, Parts A/B/C*, 132, 103452. <https://doi.org/10.1016/j.pce.2023.103452>
2. Bandopadhyay, S., Das, B., Sánchez, A. C., Banerjee, S. P., Banerjee, B. P., & **Ghosh, S.** (2023). Canopy Scale High-Resolution Forest Biophysical Parameter (LAI, fAPAR, and fCover) Retrieval Through Machine Learning and Cloud Computation Approach. In IEEE (Ed.), 2023 International Conference on Machine Intelligence for GeoAnalytics and Remote Sensing (MIGARS) (pp. 1-4). Hyderabad, India. doi: <https://doi.org/10.1109/MIGARS57353.2023.10064558>
3. Cotrina Sánchez, A., Rojas Briceño, N. B., Bandopadhyay, S., **Ghosh, S.**, Torres Guzmán, C., Oliva, M., Guzman, B. K., & Salas López, R. (2021). Biogeographic Distribution of *Cedrela* spp. Genus in Peru Using MaxEnt Modeling: A Conservation and Restoration Approach. *Diversity*, 13(6), 261. <https://doi.org/10.3390/d13060261>
4. **Ghosh, S.**, Bandopadhyay, S., & Sánchez, D. A. Cotrina. (2021). Long-Term Sensitivity Analysis of Palmer Drought Severity Index (PDSI) through Uncertainty and Error Estimation from Plant Productivity and Biophysical Parameters. *Environ. Sci. Proc.*, 3(1), 57. <https://doi.org/10.3390/IECF2020-07956>
5. Jha, V. C., & **Ghosh, S.** (2020). Environmental Risk Assessment: A Geomorphic Investigation over the Bolpur-Santiniketan-Illambazar Lateritic Patch of Birbhum District, West Bengal, India. *National Geographical Journal of India*, 66(2), 94-110. <https://doi.org/10.48008/ngji.1733>

### **Other Publications**

6. Singh, M., **Ghosh, S.**, Kamath, H., Vaisakh, S. B., Mitra, C., Saxena, S., Rao, S., Shepherd, M., & Niyogi, D. (2023). Long-term normalized difference urban index (NDUI) data time series for urban studies. arXiv, Cornell University Press. <https://doi.org/10.48550/arXiv.2306.02794>. (Pre-print).

### **Global Dataset Creation (Open Access)**

Description: The NDUI+ dataset is a global, high-resolution (30-meter) remotely sensed urban dataset, covering the period from 1999 to the present. It solves key challenges in remote sensing, including gaps in resolution, coverage, and the continuity of urban data. This comprehensive dataset is valuable for a wide range of applications, such as urban growth analysis, microclimatic variability studies, and assessments of economic impacts, among others.

Data Repository Link: [10.5281/zenodo.10799651](https://doi.org/10.5281/zenodo.10799651)

### **Articles in Progress**

7. Singh, M., **Ghosh, S.**, Kamath, H., Vaisakh, S. B., Mitra, C., Saxena, S., Rao, S., Shepherd, M., & Niyogi, D. (2024). 'NDUI+: A fused DMSP-VIIRS based multidecadal, high-resolution global normalized difference urban index (NDUI) dataset'. (**S. Ghosh and M. Singh are co-first authors**, Manuscript under review with *Cities*, Nature).
8. Bandopadhyay, S., Dey, S., Grover, L., **Ghosh, S.**, & Das, B., (2024). 'Sensing The Dynamics of Small Landholding in India through Earth Observation: A Comprehensive Review'. (Manuscript under review with *Environmental Monitoring and Assessment*, Springer Nature).

9. **Ghosh, S.** (2024). ‘A Comprehensive Review of Remote Sensing and Its Paradigm Shifts Over Time’. (Manuscript under review with *GeoJournal*, Springer Nature).
10. **Ghosh, S.,** & Mitra C. (2024). ‘Understanding the relationship between the levels of urban development and extreme rainfall occurrences through Weather Research & Forecasting Modelling’. (Manuscript under preparation).
11. **Ghosh, S.,** Dasgupta, S., Tasneem, SN., & Mitra C. (2024). ‘The Changing Trend of Global Urban Agglomerations – A comprehensive review’. (Manuscript under preparation).
12. Bandopadhyay, S., **Ghosh, S.,** Pal, L., & Das., B. (2024). ‘Development of FuzzyGPP (GF Index) to estimate plant productivity under data constrain situation: A simple fuzzy simulation approach’. (Manuscript under preparation).
13. **Ghosh., S.** (2024). ‘What is Urban and What is Not? Present and Future Role of Geoinformation Technologies in Defining Urban Boundaries for Improved Governance and Municipal Service Distribution in Rapidly Urbanizing Regions’. (Manuscript under preparation).

### **M.A. Thesis**

Gully Erosion and its Impact on Regional Development - A Case Study of Bolpur-Sriniketan Lateritic Patch.

### **M.S. Capstone Project**

Revolutionizing Urban Studies: Harnessing Deep Learning to Extend Long-Term Normalized Difference Urban Index (NDUI) Data Time Series.

### **Selected Conference Proceedings**

1. **Subhasis Ghosh,** Chandana Mitra (2023), ‘Need for Investigating the Impacts of Urbanization on Micro-Hydroclimatology: Urban Agglomerations vs Individual Cities’, Poster presented at *ICUC 11: 11th International Conference on Urban Climate*, 28<sup>th</sup> Aug – 1<sup>st</sup> Sept. 2023, UNSW, Sydney, Australia.
2. **Subhasis Ghosh,** Chandana Mitra (2023), ‘Urban Climate Archipelagoes and their impacts on global climatology: An Emerging Matter of Concern’, Paper presented at *AAG Annual Meeting 2023*, 23<sup>rd</sup> – 27<sup>th</sup> March 2023, Denver, CO, USA.
3. Subhajit Bandopadhyay, Barnali Das, Alexander Cotrina Sánchez, Sankar Prasad Banerjee, Bikram P. Banerjee and **Subhasis Ghosh** (2023), ‘Canopy Scale High-Resolution Forest Biophysical Parameter (LAI, fAPAR, and fCover) Retrieval Through Machine Learning and Cloud Computation Approach’, Presented at *IEEE MIGARS2023*, 27<sup>th</sup> 29<sup>th</sup> January 2023, Hyderabad, India.
4. **Subhasis Ghosh,** Chandana Mitra, Sukanya Dasgupta (2022), ‘Long Term Ozone Health Analysis of Atlanta Urban Agglomeration of United States Using Machine Learning and Cloud Computing Techniques’, Presented at *Annual Meeting of the SouthEastern Division of American Association of Geographers (SEDAAG) 2022*, 19<sup>th</sup> – 22<sup>nd</sup> November 2022, Atlanta, GA, USA.
5. **Subhasis Ghosh,** Subhajit Bandopadhyay, Dany A. Cotrina Sánchez (2020), ‘Long-term Sensitivity Analysis of Palmer Drought Severity Index (PDSI) Through Uncertainty and Error Estimation from Plant Productivity and Biophysical Parameters’, Presented at *The 1<sup>st</sup> International Electronic Conference on Forest*, MDPI, 15<sup>th</sup>-30<sup>th</sup> November 2020, View at: <https://sciforum.net/paper/view/7956>
6. **Subhasis Ghosh** and A.R Ghosh (2019), ‘Identification of an Emergency Ambulance Route for Festival Seasons of Bolpur-Santiniketan- A GIS Based Approach’, Oral Presentation at *4<sup>th</sup> West Bengal Science & Technology Congress (Southern Region) 2019*, Haringhata, West Bengal, India, 23<sup>rd</sup>-24<sup>th</sup> December 2019, Published at Abstract Volume, p- 120. View at: <https://tinyurl.com/2srf92m2>
7. **Subhasis Ghosh** and VC Jha (2018), ‘Impact of Lateritic Terrain on Regional Development- A Case Study of Bolpur-Santiniketan Lateritic Patch, Birbhum District, West Bengal’, Oral Presentation at *3<sup>rd</sup> West Bengal Science & Technology Congress (Southern Region) 2018*, Kolkata, West Bengal, India, 18<sup>th</sup>-19<sup>th</sup> December 2018, Published at Abstract Volume, p- 117. View at: <https://tinyurl.com/2uv782m5>

### **Research Grants Awarded**

<b>Year</b>	<b>Title</b>	<b>Author (PI)</b>	<b>Funding Agency</b>	<b>Amount</b>
<b>2023</b>	Climate Adaptation Scientists of Tomorrow (CAST) Research Mini-Grant	Subhasis Ghosh	United States Geological Survey (USGS), USA	\$2000

## Major Scholarships and Fellowships Awarded

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Year	Title	Funding Agency	Amount
2023	Graduate Student Council (GSC) Travel Fellowship	Auburn University Graduate Student Council, USA	\$500
2023	Geosciences Advisory Board (GAB) Travel Grant	Auburn University, Geosciences Department, USA	\$250
2022	Geosciences Advisory Board (GAB) Travel Grant	Auburn University, Geosciences Department, USA	\$250
2021	Research Assistantship through NASA Interdisciplinary Studies (IDS) (Grant No. NNH19ZDA001N-IDS, PI-Dr. Marshall Shepherd, CO-PI- Dr. Chandana Mitra)	NASA, USA	\$188,000 (approx.)
2017	Swami Vivekananda Merit-Cum-Means Scholarship	Dept. of Higher Education, Govt. of West Bengal, India	INR 24000
2016	Swami Vivekananda Merit-Cum-Means Scholarship	Dept. of Higher Education, Govt. of West Bengal, India	INR 24000

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## Skills

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**Programming:** Python, R, Java, NCL

### **Geospatial Software Proficiency**

GIS Analysis, Image Processing, and Mapping: ArcGIS Pro, ERDAS Imagine, QGIS, Google Earth Engine.  
Specialized Numerical Modelling: Weather Research & Forecasting (WRF), Community Earth System Model (CESM).  
Unmanned Aerial Vehicle (UAV) data collection and Processing: Drone2Map, Pix4Dmapper.  
Statistical Analysis: SPSS, R-Studio.

### **Related Coursework**

Remote Sensing & Image Interpretation, Advanced GIS, GIS Programming, Drones and Geospatial Applications, Spatial Database Analysis and Modelling, Natural Hazard Risk and Resilience, Climatology, Human-Environment Interactions, Land-Climate Interactions, Quantitative Methods and Spatial Analysis, Urban Geography and Sustainability.

### **Related Training/Workshops**

- Grant Proposal Writing Workshop sponsored by National Science Foundation (NSF) (16<sup>th</sup> Sept 2024).
- Best Practices for Research Excellence Workshop organized by Auburn University (9<sup>th</sup> Sept 2024)
- Weather Research & Forecasting (WRF) Tutorial (mesoscale weather modeling) at National Center for Atmospheric Research (NCAR), Boulder, CO, USA (17<sup>th</sup> July – 21<sup>st</sup> July 2023).
- Responsible Conduct of Research for Physical Science (Record ID 47998085), CITI Program, 3<sup>rd</sup> April 2022 (Valid till 2<sup>nd</sup> April 2027).
- Summer School (e-School) on Climate Science & Policy, Indian Institute of Technology (IIT), Bombay, India (17 Aug-28 Aug 2020).
- Summer School (e-School) on Urban Sustainability, DLGS, Germany (7<sup>th</sup> Sept – 9<sup>th</sup> Sept 2020).
- NASA Applied Remote Sensing Training (ARSET) Program on Understanding Phenology with Remote Sensing (2020).
- NASA Applied Remote Sensing Training (ARSET) Program on Using Earth Observations to Monitor Water Budgets for River Basin Management (2020).
- 80-hours training workshop in English Communication and Basic Corporate Etiquette, jointly organized by TATA Consultancy Services & Visva-Bharati University. (2015).

## Services

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### **Peer-Review/Editorial Services**

- Peer Reviewer – *Scientific Reports*, Nature. 1 review ([visit journal](#))
- Peer Reviewer - *Heliyon*, Cell Press. 2 reviews ([visit journal](#))
- Peer Reviewer – *Results in Earth Sciences*, Elsevier. 3 reviews ([visit journal](#))
- Peer Reviewer - *Advances in Space Research*, Elsevier. 2 reviews ([visit journal](#))
- Peer Reviewer – *Environmental Monitoring and Assessment*, Springer Nature. 1 review ([visit journal](#))

- Peer Reviewer – *Journal of the Indian Society of Remote Sensing*, Springer Nature, 1 review ([Visit journal](#))
- Grant Reviewer - Undergraduate Research Fellowship-2024, College of Sciences and Mathematics, Auburn University.
- Reviewer - The 7th International Conference on Computer Science and Application Engineering, Oct 17<sup>th</sup>-19<sup>th</sup>, 2023, Wuhan, China.
- Guest Editorial Assistant (Chief Editor's nominee) of the *Indian Cartographer* - Journal of the Indian National Cartographic Association (INCA), India, ISSN 0972-8392 (2020).
- Editorial team member (technical) of the *Indian Cartographer* - Journal of the Indian National Cartographic Association (INCA), India, ISSN 0972-8392, Vol-36, Special Issue - Cartography and Climate Change (2016).

## **Leadership Roles**

- **Director of Outreach and Engagement** - Regional Development and Planning specialty group of the American Association of Geographers (AAG). (2024 - present)
- **Graduate Students Advisory Board Member** - Dept. of Geosciences, AU (2024 - present)
- **Geosciences Senator** - Auburn University Graduate Student Council (2023-2024)
- **Vice President of Special Projects** - Indian Students Association, Auburn University, USA (2022-2023)
- **Student Representative** - Regional Development and Planning specialty group of the American Association of Geographers (AAG). (2023-2024)
- **Secretary** - Geography Student Organization at Auburn University, AL (2022-2023)
- **Media and Publicity Officer** - Indian Student Association, Auburn University, USA (2021-2022)

## **Community Service, Extra-Curriculars, and Outreach Activities**

### **Service to School and Academia**

- Paper session organizer on 'Urban, Climate, and Sustainability' at AAG (American Association of Geographers) Annual Meeting, Denver, CO, USA. (2023)
- Judge: Auburn Research Student Symposium, Auburn University, AL, USA (2022)
- Student volunteer in organizing INCA (Indian National Cartographic Association) International Conference (2016)
- Sportsman-
  - Volleyball: Played for Visva-Bharati University, India in Zonal Inter-University Volleyball Championship (2013-2014)
  - Basketball: Runners-up in Intra-University Basketball Tournament (2010-2011)
  - Discus Throw and Javelin Throw: Won medals (gold-1, silver-2, Bronze-1) in high school level athletic meets (2010, 2012)

### **Service to Community**

- Served as a voluntary academic tutor to provide free tuition to the unprivileged school kids of my locality coming from economically humble families. (2016-2018)

### **Outreach Activities**

- Helped organize 'GIS Day' events in collaboration with Auburn city administration to promote GIS Science public awareness (2023)
- Judge: Greater East Alabama Regional Science and Engineering Fair (GEARSEF) (2022)
- Judge: 'Special Awards' and 'Marketing Presentation' categories of South's Best Championship – 2021 (Demo Daze Best Robotics) organized by Auburn University, USA (2021)
- Member of state representatives to attend special national integration and leadership camp at Lakshadweep Islands, India from West Bengal State (2014)
- Participated in Snorkeling Experience program (Discover the Underwater World) organized by PADI (Professional Association of Diving Instructors) (2014)

## **Other Achievements and Honors**

- 2023** Received Auburn University Involvement Award for 'Excellence in Communications and Marketing in recognition of the innovative publicity and communication efforts for the Indian Students Association (ISA) in Auburn University, AL, USA.
- 2013** Secured all-India (national) Rank-2 in Visva-Bharati University Common Admission Test (VBCAT) to study B.A.(Honours) in Geography.
- 2018** Secured all-India (national) Rank-4 in the entrance examination of Post-Graduate Diploma (Geoinformatics) program organized by the Dept. of Higher Education, Science & Technology and Biotechnology, Govt. of West Bengal, India.

**2018** Certificate of Appreciation received for outstanding contribution to the welfare project - 'environmental protection and awareness for the people of Bolpur', India, from 50 Bengal Bn.NCC, India.

## **News Feature/Media Interaction**

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**2023** "Auburn doctoral student challenges perceptions of COVID-lockdowns' impact on air quality with international team of researchers through NASA project" – published in COSAM Today news, Oct 24, 2023 ([link](#))

## **Affiliations**

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- American Association of Geographers (AAG) ([www.aag.org](http://www.aag.org)) (Since 2021)
- Regional Development and Planning specialty group of the American Association of Geographers. (Since 2023)
- South Eastern Division of the American Association of Geographers ([sedaag.org](http://sedaag.org)) (Since 2022)
- Geography Student Organization, Auburn University ([auburn.campuslabs.com/engage/organization/gso](http://auburn.campuslabs.com/engage/organization/gso)) (Since 2021)
- The International Society for Photogrammetry and Remote Sensing Student Consortium (ISPRS SC), (<https://sc.isprs.org>) (Since 2020)
- International Water Resources Association (<https://www.iwra.org>) (Since 2020)

## **References**

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Available Upon Request.

# Curriculum Vitae