Dr. Subhasis Ghosh

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Education

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

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

Master of Science (M.S.) in Geography — 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 — Summer **2018**
Visva-Bharati University, India

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

Work Experience

Assistant Professor of Physical Geography (Tenure-Track) — Aug **2025 - Present**
Department of Chemistry and Geosciences, Jacksonville State University, USA

Graduate Teaching Assistant — Jan **2024** – July **2025**
Department of Geosciences, Auburn University, USA

Graduate Research Assistant (NASA-IDS) — Aug **2021** – July **2025**
Department of Geosciences, Auburn University, USA

Project Scientist / Junior Research Fellow — Mar **2021** – July **2021**
West Bengal State Council of Science and Technology, India

GIS Analyst — Sept **2019** – Oct **2019**
Prayukti Systems Pvt. Ltd., India

Appointments

Chair - Regional Development and Planning Specialty Group, American Association of Geographers (AAG). — Mar **2026** – **Present**

Vice Chair - Regional Development and Planning Specialty Group, American Association of Geographers (AAG). Mar **2025** – **Present**

Member of Undergraduate Curriculum Committee – Dept. of Chemistry & Geosciences, Jacksonville State University, Alabama Oct **2025** - **Present**

Director of Outreach and Engagement - Regional Development and Planning Specialty Group, American Association of Geographers (AAG). Mar **2024** – Mar **2025**

Professional License

Remote Pilot (Part 107) License Spring **2024**
Federal Aviation Administration, Department of Transportation (Does not expire)
Category: UAV-Small

Skills

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.

Teaching Experience

GIS 5540 - Geospatial Programming (graduate level, instructor): This course explores the use of scripting languages, such as Python and R, to create applications that perform fundamental spatial statistical analysis, such as geoprocessing, spatial autocorrelation, database management, spatial regression, and map creation. Students will explore data analysis and data modeling. Students demonstrate knowledge of programming concepts and approaches and develop solutions to problems by automating geoprocessing tasks.

GY 250 - Physical Geography: Atmospheric Patterns and Processes (undergraduate level, instructor): Study of the function and distribution of the interrelated processes that shape Earth's weather and the classification and distribution of Earth's climates.

GY 252 – Physical Geography Lab I (undergraduate level, instructor): Experiments focus on weather, energy and moisture budgets, and climatic classifications. One 2-hour lab per week.

GY 251 - Physical Geography II: Landscape Patterns and Processes (undergraduate level, instructor): Study of Earth's soils, biomes and physiographic regions with emphasis on the processes that formed them and their global patterns.

GIS 5220 & GIS 420 - Web-based GIS: Technologies and Applications (graduate & undergraduate level, instructor): This course introduces students to the growing field of web-based GIS. The course focuses on the design, development, and implementation of web mapping applications, allowing students to apply techniques in real-world applications. Students taking this course will be required to develop a web GIS application.

GEOG 5880/6880 - Advanced Geographic Information Systems (graduate & undergraduate level, TA): Advanced concepts and techniques used in the collection and analysis of data for evaluating spatial patterns and processes.

GEOG 6850 - Drones and Geospatial Applications (graduate & undergraduate level, TA): This course introduces the concepts of drone data collection, processing, and analysis, and focuses on how these high-resolution datasets can be used in a multitude of geospatial (including GIS and remote sensing) applications. This class has both in-class and field components.

GEOG 6700/5700 - Quantitative Methods & Spatial Analysis (graduate & undergraduate, TA): Applications of quantitative methods and spatial statistics to environmental, urban, and economic systems and implementations of these techniques in GIS and statistical software.

SCMH 1010 - Concepts of Science (undergraduate level, TA): An interdisciplinary course that presents major scientific concepts in physical and biological sciences.

GEOG 1010 - Global Geography (undergraduate level, TA): Spatial and locational context for analyzing change in the contemporary world, including elements of both physical and cultural environments.

Students Supervised

Student Name	Degree and School	Role
Dinesh Lamichhane	MS in Geographic Information Science and Technology, Jacksonville State University	Thesis Committee Member

Invited Talks/Guest Lectures

- *Introduction to GeoAI* – Guest lecture for the 'Quantitative Methods and Spatial Analysis' class at Auburn University, USA on 4th November 2024.

Research Activities

Please visit Google Scholar page for updated citation matrices. (Total citations – 84, as of 14th March 2026)

Doctoral Dissertation

Ghosh, Subhasis (2025). Impacts of Urban Agglomerations on Weather Dynamics: A Multifaceted Initiative for Better Understanding, Global Urban Monitoring, and Improved Urban-Rainfall Forecasting'. https://etd.auburn.edu//handle/10415/9825

Master's Thesis (MA)

Ghosh, S. (2018). Gully erosion and it's impact on regional development: A case study of bolpur-sriniketan lateritic patch. doi:10.13140/RG.2.2.31405.14567

Selected 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

Publications in Progress

6. **Ghosh, S.**, Singh, M., Kamath, H., Saxena, S., SB, V., Mitra, C., Sudharsan, N., Rao, S., Dashtian, H., Magruder, L., Shepherd, M., & Niyogi, D. (2026). NDUI+: A fused DMSP-VIIRS based multidecadal, high-resolution global normalized difference urban index (NDUI) dataset. Manuscript under review with IOPScience Machine Learning: Earth. Pre-print available at https://doi.org/10.48550/arXiv.2306.02794 (M. Singh and S. Ghosh are designated as co-first authors).

7. Bandopadhyay, S., Dey, S., Grover, L., **Ghosh, S.**, Das, B. (2026), Earth Observation Technologies for agricultural risk management in fragmented croplands of India. Manuscript accepted for publication in Discover Applied Sciences, Springer.

8. **Ghosh, S.**, Mitra, C., Singh, M., Shepherd, M. (2026), Assessing the Importance of Up-To-Date Urban Representation in the WRF Model for Better Extreme Rainfall Predictions – A Case Study. Manuscript under review with Nature Cities.

Global Urban Footprints 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: DOI: 10.5281/zenodo.10799651

Selected Conference Proceedings

1. **Subhasis Ghosh** et. al. (2025), 'Introducing NDUI+: A fused DMSP-VIIRS based multidecadal, high-resolution global normalized difference urban index (NDUI) dataset'. Paper presented at AAG Annual Conference, 24th March – 28th March 2025, Detroit, MI, USA.
2. **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*, 28th Aug – 1st Sept. 2023, UNSW, Sydney, Australia.
3. **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*, 23rd – 27th March 2023, Denver, CO, USA.
4. 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, 27th 29th January 2023, Hyderabad, India.
5. **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, 19th – 22nd November 2022, Atlanta, GA, USA.
6. **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 1st International Electronic Conference on Forest*, MDPI, 15th-30th November 2020, View at: https://sciforum.net/paper/view/7956
7. **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 *4th West Bengal Science & Technology Congress (Southern Region) 2019*, Haringhata, West Bengal, India, 23rd-24th December 2019, Published at Abstract Volume, p- 120. View at: https://tinyurl.com/2srf92m2
8. **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 *3rd West Bengal Science & Technology Congress (Southern Region) 2018*, Kolkata, West Bengal, India, 18th-19th December 2018, Published at Abstract Volume, p-117. View at: https://tinyurl.com/2uv782m5

Research Grants

Year	Description	Investigator(s)	Funding Agency	Amount
2023	Climate Adaptation Scientists of Tomorrow (CAST) Research Mini-Grant	**Subhasis Ghosh**	United States Geological Survey (USGS), USA	$2000
2025	Partnering with Anniston Waterworks to Identify Pipeline Leaks Using Thermal Drone Technology	Sean Chenoweth, **Subhasis Ghosh**, Saeideh Gharehchahi	Anniston Water Works & Sewer Board, Anniston, AL, USA	$62670 approx. (funding for 1 graduate student, purchased a thermal UAV)

2025	Flood Hazard and Sediment Transport Modelling For Assessing Roadway Vulnerability: A Study of Emerald Mountain Expressway on Tallapoosa River in Alabama	Saeideh Gharehchahi, **Subhasis Ghosh**, Ross Martin	Jacksonville State University, AL, USA	$10570 (partially funded- $2570)

Major Scholarships/Fellowships Awarded

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

Related Training/Workshops

- Grant Proposal Writing Workshop sponsored by National Science Foundation (NSF) (16th Sept 2024).
- Best Practices for Research Excellence Workshop organized by Auburn University (9th Sept 2024)
- Weather Research & Forecasting (WRF) Tutorial (mesoscale weather modeling) at National Center for Atmospheric Research (NCAR), Boulder, CO, USA (17th July – 21st July 2023).
- Responsible Conduct of Research for Physical Science (Record ID 47998085), CITI Program, 3rd April 2022 (Valid till 2nd 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 (7th Sept – 9th 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).

Services

Peer-Review 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 Spece 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, 2 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 17th-19th, 2023, Wuhan, China.

Editorial Services

- 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).

Student Leadership Roles

- **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)

Outreach Activities

- Helped organizing '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

2025 "JSU adopts new AI policy for all classes" – published in The Chanticleer, Oct 10, 2025 (link)

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)

Professional Memberships

- American Association of Geographers (AAG) (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) (Since 2022)
- Geography Student Organization, Auburn University (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)