



Dr. Avit K. Bhowmik

Assistant Professor, Karlstad University, Sweden

Born on 27 September, 1986

key achievements

contact

Risk and Environmental Studies
Department of Environmental and
Life Sciences
Karlstad University
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SE 651 88 Karlstad, Sweden

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Fax: +46 (0)54 700 10 44

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Web: <http://avitbhowmik.ml/>

research areas

Sustainability transformation
Climate
Risk Assessment
Environmental epidemiology
Remote Sensing
Geostatistics
GIS

technical skills

Programing & Modelling

R, C++, Python, Netlogo and
Unix Shell*

Databases

SQL and PostgreSQL

Geoinformatics

GRASS GIS, Quantum GIS,
ArcGIS, GeoMS, and ERDAS
IMAGINE

Communication and Presentation

HTML, CSS, Markdown and \LaTeX

languages

Bangla: mother tongue
English: level C2
German: level B2
Swedish: level A1
Portuguese: level A1

2018 - 2019

Exponential Climate Action Roadmap

Have been leading the modelling exercises to lay out the first exponential pathways for climate action to halve greenhouse gas emission every decade from 2020 through 2050, the first output report from which was the highlight of Global Climate Action Summit, held in San Francisco, September 2018, and an update was released during the UN Climate Action Summit 2019.

2018

The World in 2050

Contributed to shape the narrative and pathways for achieving the Sustainable Development Goals of the "Agenda 2030" in collaboration with a consortium of international scientists and policy makers, hosted in International Institute of Applied System Analysis (IIASA), the first output report of which was presented in United Nations High Level Political Forum, July 2018.

2017

European Research Council (ERC) Advanced Grant

Co-applicant and contributed with drafting, reviewing and geospatial research expertise to a successful ERC Advanced grant proposal, i.e. "Earth Resilience in the Anthropocene (ERA)" (2,500,000 euro), Principal Investigator: Prof. Dr. Johan Rockström.

2016

Arctic Science Ministerial Report

Provided expert opinion for spatiotemporal variability modelling of climate and resilience in the Arctic, which shaped the policy framework of the "U.S.-Canada Joint Statement on Climate, Energy, and Arctic Leadership" in the first White House Arctic Science Ministerial Meeting on September 28, 2016.

2015

Novel Algorithm: ATRIC

Developed the first open-source geospatial algorithm for automated stream threshold selection and riparian corridor delineation, which is currently being used by the "Amazon Conservation Team" in Columbia to assess deforestation impacts on the Amazon river. See [here](#) for details.

education

09/2011–12/2015

Doctor of Natural Sciences

University of Koblenz-Landau, Germany

Quantitative Landscape Ecology, Institute for Environmental Sciences
Dissertation: *Human and Ecological Impacts of Freshwater Degradation on Large Scales. Development and Integration of Spatial Models with Ecological Models for Spatial-ecological Analyses* (supervisor: Prof. Dr. Ralf B. Schäfer)
Specialization: Spatial Statistics, Freshwater Eco(toxico)logy, Climate
Grade: 1.0 (top ranked) on a scale of 1.0 - 3.0 (1.0 best and 3.0 sufficient)

09/2010–03/2012

Master of Science in Geospatial Technologies

Erasmus Mundus, European Commission

Partners: 1. School of Statistics and Information Management, New University of Lisbon, Portugal, 2. Institute for Geoinformatics (ifgi), University of Münster, Germany and 3. Department of Computer Languages and Systems, University of Jaume I, Spain

(Levels: A1/2: Basic user - B1/2: Independent user - C1/2: Proficient user, according to Common European Framework of Reference for Languages)

Dissertation: *Evaluation of Spatial Interpolation Techniques for Mapping Climate Variables with low sample density. A case study using a new gridded dataset of Bangladesh* (supervisor: Prof. Dr. Ana Cristina Costa)
 Major: Geostatistics, Geographic Information Science (GIS), Climate
 Grade: 18 (top ranked) on a scale of 1 - 20 (20 best and 1 worst)

12/2004–10/2009 **Bachelor of Science** in Urban & Regional Planning Bangladesh University of Engineering & Technology
 Department of Urban & Regional Planning
 Dissertation: *Relocation of the Hazaribagh Tannery: Myth or Reality?* (supervisor: Prof. Dr. Md. Shakil Akther)
 Major: GIS, Environmental and Ecological Planning
 Grade: 3.79 on a scale of 0-4.0 (4.0 best and 0 worst)

professional appointments

03/2019–present **Assistant Professor** Karlstad University, Sweden
 Risk and Environmental Studies, Department of Environmental and Life Sciences

01/2018–02/2019 **Postdoctoral Researcher & Liaison** Royal Swedish Academy of Sciences
 Future Earth
 1. Exponential Climate Action project: Backcasting modelling of climate action strategies to achieve Paris Agreement following the Carbon Law
 2. The World in 2050 project: Geospatial modelling and spatiotemporal analyses of drivers and processes underlying Sustainable Development Goals
 3. Secretariat Liaison: Global Research Projects: (i) Analysis, Integration and Modelling of the Earth System (AIMES) and (ii) Integrated History and Future of People On Earth (IHOPE), and Knowledge Action Networks: (i) Decarbonization and (ii) Sustainable Development Goals

01/2018–02/2019 **Guest Researcher** Stockholm University, Sweden
 Stockholm Resilience Centre (Planetary Boundaries)

01/2016–12/2017 **Postdoctoral Researcher** Stockholm University, Sweden
 Stockholm Resilience Centre (Planetary Boundaries)
 Cross-scale dynamics and spatial resilience patterns in social-ecological domains (led by Prof. Dr. Johan Rockström)

01/2016–03/2018 **Guest Lecturer** University of Koblenz-Landau, Germany
 Courses: 1. GIS Application, 2. GIS Projects for Advanced, 3. Introduction to open-source software and R for spatial ecotoxicological analyses, and 4. Spatial(-Temporal) Interpolation with R

11/2015–12/2015 **Research Assistant** University of Koblenz-Landau, Germany
 Quantitative Landscape Ecology, Institute for Environmental Sciences
 Project - AufLand: Understanding effects of land use on the energy transfer across the freshwater-land interface

04/2012–07/2012 **Research Assistant** University of Münster, Germany
 Institute for Geoinformatics (ifgi)
 Development of online demonstrators and web tools for core concepts of spatial information

- 03/2008–10/2010 **Project Assistant** Technical University of Dortmund, Germany
The Struggle for Urban Livelihoods and the Quest for a Functional City Reconciling Informal and Statutory Planning Institutions in Dhaka, Bangladesh, supported by the German Research Foundation (DFG) and conducted by the Department of Urban and Regional Planning, Faculty of Spatial Planning
 Preparation of Geographic Information Systems (GIS) databases, analyses and processing of empirical data, conduction of empirical field investigation, i.e. key informant interviews, group discussion, household interviews and exercise of Venn-diagrams and observations
- 10/2009–08/2010 **Assistant Town Planner** Concorde Land Development Limited, Dhaka, Bangladesh
 Preparation of GIS databases, land use and subdivision plans

research visits

- 03/2018–04/2018 **Research Stay** International Institute for Applied Systems Analysis (IIASA)
 Energy Program
 Regional disparities among the trade-offs and co-benefits in the underlying processes of Sustainable Development Goals

publications

bibliographic metrics

h-index: 12

i10-index: 15

388 citations since 2012

source: google scholar

working papers

- Internalising knowledge about climate change is crucial for the transformation of air travel behaviour
 L. Jacobson, J. Åkerman, M. Guisti, and A. K. Bhowmik
 under review (2019). 2019
- Powers of 10: A framework to optimise implementation of climate action strategies from individual to global scales
 A.K. Bhowmik, M. McCaffrey, C. Frischmann, O. Gaffney, and A. Ruskey
 under review (2018). 2018. DOI: [10.31223/osf.io/feaq5](https://doi.org/10.31223/osf.io/feaq5)
- Social tipping elements instrumental for decarbonization by 2050
 I. Otto, A. K. Bhowmik, J. Donges, R. Cremades, W. Lucht, M. McCaffrey, H. J. Schellnhuber, and J. Rockström
 under review (2018). 2018
- What drives mangrove degradation?: Empirical evidence and ecosystem challenges
 R. Padmanaban, A. K. Bhowmik, P. Cabral, and R. Mahalingam
 under review (2018). 2018

peer reviewed journal articles

- Matching scope, purpose and uses of planetary boundaries science
 A. S. Downing, A. K. Bhowmik, D. Collste, S. Cornell, J. Donges, I. Fetzer, T. Häyhä, J. Hinton, S. Lade, and W. M. Mooij
 Environmental Research Letters (2019). 2019. DOI: <https://doi.org/10.1088/1748-9326/ab22c9>
- Satellite Image Fusion to Detect Changing Surface Permeability and Emerging Urban Heat Islands in a Fast-Growing City
 R. Padmanaban, A. K. Bhowmik, and P. Cabral
 PLOS ONE 14.1 (2019) e0208949. 2019. DOI: <https://doi.org/10.1371/journal.pone.0208949>

Persistent Organic Pollutant emission via dust fallout throughout Pakistan: Fingerprinting of recent inputs, regional cycling and their implication for human health risks

M. Sohail, J. Podgorski, A.K. Bhowmik, A. Mahmood, N. Ali, H. Bokhari, T. Sabo-Attwood, H. Shen, and S.A.M.A.S Eqani

Science of the Total Environment 618 (2018) pp. 829–837. 2018. DOI: <https://doi.org/10.1016/j.scitotenv.2017.08.224>

Comparison of spatial interpolation techniques to generate high-resolution climate surfaces for Nigeria

Aisha Olushola Arowolo, Avit Kumar Bhowmik, Wei Qi, and Xiangzheng Deng

International Journal of Climatology (Jan. 2017). 2017. DOI: [10.1002/joc.4990](https://doi.org/10.1002/joc.4990)

Modelling Urban Sprawl Using Remotely Sensed Data: A Case Study of Chennai City, Tamilnadu

Rajchandar Padmanaban, Avit K. Bhowmik, Pedro Cabral, Alexander Zamyatin, Oraib Almegdadi, and Wang Shuangao

Entropy 19.4 (Apr. 7, 2017) p. 163. 2017. DOI: [10.3390/e19040163](https://doi.org/10.3390/e19040163)

A Remote Sensing Approach to Environmental Monitoring in a Reclaimed Mine Area

Rajchandar Padmanaban, K. Avit Bhowmik, and Pedro Cabral

ISPRS International Journal of Geo-Information 6.12 (2017). 2017. DOI: [10.3390/ijgi6120401](https://doi.org/10.3390/ijgi6120401)

Human Arsenic exposure via dust across the different ecological zones of Pakistan

Ambreen Alamdar, Syed Ali Musstjab Akber Shah Eqani, Saeed Waqar Ali, Mohammad Sohail, Avit Kumar Bhowmik, Alessandra Cincinelli, Marghoob Subhani, Bushra Ghaffar, Rizwan Ullah, Qingyu Huang, and Heqing Shen

Ecotoxicology and Environmental Safety 126 (Apr. 2016) pp. 219–227. 2016. DOI: [10.1016/j.ecoenv.2015.12.044](https://doi.org/10.1016/j.ecoenv.2015.12.044)

Mercury contamination in deposited dust and its bioaccumulation patterns throughout Pakistan

Syed Ali Musstjab Akber Shah Eqani, Avit Kumar Bhowmik, Sehrish Qamar, Syed Tahir Abbas Shah, Muhammad Sohail, Sikandar I. Mulla, Mauro Fasola, and Heqing Shen

Science of The Total Environment 569-570 (Nov. 2016) pp. 585–593. 2016. DOI: [10.1016/j.scitotenv.2016.06.187](https://doi.org/10.1016/j.scitotenv.2016.06.187)

Spatial distribution of dust-bound trace elements in Pakistan and their implications for human exposure

Syed Ali Musstjab Akber Shah Eqani, Ayesha Kanwal, Avit Kumar Bhowmik, Mohammad Sohail, Rizwan Ullah, Syeda Maria Ali, Ambreen Alamdar, Nadeem Ali, Mauro Fasola, and Heqing Shen

Environmental Pollution 213 (June 2016) pp. 213–222. 2016. DOI: [10.1016/j.envpol.2016.02.017](https://doi.org/10.1016/j.envpol.2016.02.017)

Pesticide mixtures in streams of several European countries and the USA

Verena C. Schreiner, Eduard Szócs, Avit Kumar Bhowmik, Martina G. Vijver, and Ralf B. Schäfer

Science of The Total Environment 573 (2016) pp. 680–689. 2016. DOI: <http://dx.doi.org/10.1016/j.scitotenv.2016.08.163>

Mapping human health risks from exposure to trace metal contamination of drinking water sources in Pakistan

Avit Kumar Bhowmik, Ambreen Alamdar, Ioannis Katsoyiannis, Heqing Shen, Nadeem Ali, Syeda Maria Ali, Habib Bokhari, Ralf B. Schäfer, and Syed Ali Musstjab Akber Shah Eqani

Science of The Total Environment 538 (Dec. 2015) pp. 306–316. 2015. DOI: [10.1016/j.scitotenv.2015.08.069](https://doi.org/10.1016/j.scitotenv.2015.08.069)

Spatially shifting temporal points: estimating pooled within-time series variograms for scarce hydrological data

Avit Kumar Bhowmik and Pedro Cabral

Hydrology and Earth System Sciences Discussion 12 (2015) pp. 2243–2265. 2015. DOI: [10.5194/hessd-12-2243-2015](https://doi.org/10.5194/hessd-12-2243-2015)

An automated, objective and open source tool for stream threshold selection and upstream riparian corridor delineation

Avit Kumar Bhowmik, Markus Metz, and Ralf B. Schäfer

Environmental Modelling & Software 63.0 (2015) pp. 240–250. 2015. DOI: [10.1016/j.envsoft.2014.10.017](https://doi.org/10.1016/j.envsoft.2014.10.017)

Large Scale Relationship between Aquatic Insect Traits and Climate

Avit Kumar Bhowmik and Ralf B. Schäfer

PLOS ONE 10.6 (June 16, 2015) e0130025. 2015. DOI: [10.1371/journal.pone.0130025](https://doi.org/10.1371/journal.pone.0130025)

Representativeness impacts on accuracy and precision of climate spatial interpolation in data-scarce regions

Avit Kumar Bhowmik and Ana Cristina Costa

Meteorological Applications 22 (2014) pp. 368–377. 2014. DOI: 10.1002/met.1463

Industries' Location as Jeopardy for Sustainable Urban Development in Asia: A Review of the Bangladesh Leather Processing Industry Relocation Plan

Avit Kumar Bhowmik

Environment and Urbanization Asia 4.1 (Mar. 1, 2013) pp. 93–119. 2013. DOI: 10.1177/0975425313477749

Temporal Patterns of the Two-Dimensional Spatial Trends in Summer Temperature and Monsoon Precipitation of Bangladesh

Avit Kumar Bhowmik

ISRN Atmospheric Sciences 2013 (2013) pp. 1–16. 2013. DOI: 10.1155/2013/148538

Cyclone Sidr Impacts on the Sundarbans Floristic Diversity

Avit Kumar Bhowmik and Pedro Cabral

Earth Science Research 2.2 (2013). 2013. DOI: 10.5539/esr.v2n2p62

A Comparison of Bangladesh Climate Surfaces from the Geostatistical Point of View

Avit Kumar Bhowmik

ISRN Meteorology 2012 (2012) pp. 1–20. 2012. DOI: 10.5402/2012/353408

A Geostatistical Approach to the Seasonal Precipitation Effect on Boro Rice Production in Bangladesh

Avit Kumar Bhowmik

International Journal of Geosciences 03.3 (2012) pp. 443–462. 2012. DOI: 10.4236/ijg.2012.33048

book chapters

Space-Time Variability of Summer Temperature Field over Bangladesh during 1948-2007

Avit Kumar Bhowmik and Pedro Cabral

Lecture Notes in Computer Science *Computational Science and Its Applications – ICCSA 2013*, Murgante, Beniamino, Sanjay Misra, Maurizio Carlini, Carmelo M. Torre, Hong-Quang Nguyen, David Taniar, Bernady O. Apduhan, and Osvaldo Gervasi(Eds), 7974, pp. 120–135, Springer Berlin Heidelberg, 2013. ISBN: 978-3-642-39648-9 978-3-642-39649-6

Statistical Evaluation of Spatial Interpolation Methods for Small-Sampled Region: A Case Study of Temperature Change Phenomenon in Bangladesh

Avit Kumar Bhowmik and Pedro Cabral

Lecture Notes in Computer Science *Computational Science and Its Applications - ICCSA 2011*, Murgante, Beniamino, Osvaldo Gervasi, Andrés Iglesias, David Taniar, and Bernady O. Apduhan(Eds), 6782, pp. 44–59, Springer Berlin Heidelberg, 2011. ISBN: 978-3-642-21927-6 978-3-642-21928-3

Application of GIS in Rural Settlement Development. An Approach towards Identification of Locations for Compact Towns

Avit Kumar Bhowmik

Nagar Shoilee, Hafiz, Roxana(Eds), 4, pp. 128–135, Bangladesh University of Engineering & Technology Dhaka, 2009. ISBN: 978-984-33-0128-4

Environmental concerns regarding Hazaribagh tannery area and present relocation scenario

Avit Kumar Bhowmik and M Samiul Islam

Nagar Shoilee, Hafiz, Roxana(Eds), 4, pp. 33–41, Bangladesh University of Engineering and Technology Dhaka, 2009. ISBN: 978-984-33-0128-4

reports & policy papers

Exponential Roadmap 1.5. Scaling 36 solutions to halve emissions by 2030.

J. Falk, O. Gaffney, A. K. Bhowmik, P. Bergmark, V. Galaz, N. Gaskell, S. Henningson, M. Höjer, L. Jacobson, K. Jónás, T. Kåberger, D. Klingefeld, J. Lenhart, B. Loken, D. Lundén, J. Malmödin, T. Malmqvist, V. Olausson, I. Otto, A. Pearce, E. Pihl, and T. Shalit

, *Future Earth*, New York, 2019

Meeting the 1.5°C climate ambition. Moving from incremental to exponential action.

O. Gaffney, J. Rockstrom, J. Falk, L. Srivastava, N. Nakicenovic, C. Wilson, S. Henningson, P. Bergmark, D. Klingefeld, R.B. Jackson, M. Höjer, B. Loken, and A. K. Bhowmik

High-ambition narrative for the UN Climate Action Summit in September 2019, Exponential Climate Action Roadmap Project, New York, 2019

Exponential Climate Action Roadmap

Johan Falk, Owen Gaffney, Avit K. Bhowmik, Carina Borgström-Hansson, Christopher Pountney, Dag Lundén, Erik Pihl, Jens Malmödin, Jennifer Lenhart, Krisztina Jónás, Mattias Höjer, Pernilla Bergmark, Siddharth Sareen, Sofia Widforss, Stefan Henningsson, Sophie Plitt, and Tomer Shalit

Global Climate Action Summit, Future Earth, Stockholm, Sweden and San Francisco, USA, 2018

Transformations to Achieve the Sustainable Development Goals

E. Kriegler, D. Messner, N. Nakicenovic, K. Riahi, J. Rockström, J. Sachs, S. van der Leeuw, D. van Vuuren, A. P. Aguiar, L. Berg, A. K. Bhowmik, J. Biberman, B. Boza-Kiss, A. Breuer, D. Buscaglia, S. Busch, L. Campagnolo, G. Clarke, D. Collste, S. Cornell, F. Creutzig, I. Dombrowsky, K. L. Ebi, O. Edelenbosch, J. Edmonds, S. Fujimori, O. Gaffney, A. Goujon, A. Grubler, H. Haberl, T. Hasegawa, T. Häyhä, H. Janetschek, M. Kamei, P. Kolp, J. Leininger, H. Lotze-Campen, D. McCollum, A. Miola, K. Murray, R. Mutarak, M. Obersteiner, S. Pachauri, S. Parkinson, A. Popp, J. P. Pereira, J. M. Puyana, V. Rauchenwald, C. Ruhe, R. Schaeffer, P. Scheelbeek, J. Schmidt, G. Schmidt-Traub, S. Sellers, G. Sempeho, U. Svedin, A. Vafeidis, H. van Soest, G. Verburg, Y. Wada, and C. Zimm

TWI 2050 - The World in 2050 report in High Level Political Forum, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, 2018

From incremental steps to transformations: leveraging interactions across the SDGs to secure long-term sustainable development outcomes

M. Schlosser, J. Alcamo, R. Bolam, S. Busch, J. Chotte, A. Dahl, E. Dellas, J. Dodson, E. Ebikeme, P. Elias, T. Elliott, K. Eze, A. Bhowmik, A. Ford, M. Colbert, E. Pihl, B. Walsh, P. Vergragt, T. McPhearson, X. Bai, R. Dawson, D. Roberts, S. Paillard, K. Slavik, A. Arneth, and A. Badhuri

Science and Technology Major Group Position paper in High Level Political Forum, International Council for Science (ICSU), New York, 2018

A 5 °C Arctic in a 2 °C World

P. Schlosser, S. Pfirman, R. Pomeroy, M. Williams, B. Ack, P. Duffy, H. Eicken, M. Latif, M. Murray, D. Wallace, L. Anderson, B. Baker, A. Bhowmik, R. Bronen, B. Ekwurzel, J. Francis, C. Gerlach, R. Horton, M. Karcher, B. Kelly, C. Kelly, S. Kim, A. Levermann, V. Metcalf, F. Mueter, B. Newton, A. Park, J. Pasztor, P. Rasch, V. Romanovsky, R. Shaw, S. Stephenson, S. Tilmes, D. Titley, B. Tremblay, and C. Vorosmarty

Briefing Paper for Arctic Science Ministerial, Columbia Climate Centre, Earth Institute, Columbia University; World Wildlife Fund; Arctic 21; Woods Hole Research Center, New York, 2016

conference papers

Data Scarcity or low Representativeness?: What hinders accuracy and precision of spatial interpolation of climate data?

Avit Kumar Bhowmik and Ana Cristina Costa

Connecting a Digital Europe through Location and Place: 17th AGILE Conference on Geographic Information Science, 2014, Castellón, Spain

Reproducible, Automated and Objective Stream Threshold Selection and Upstream Riparian Corridor Delineation from Digital Elevation Models

Avit Kumar Bhowmik, Ralf B. Schäfer, and Markus Metz

Computing for Geospatial Research and Application (COM.Geo): The 5th International Conference on Computing for Geospatial Research and Application, pp. 43–66, 2014, Washington, DC, USA

Environmental Sustainability vs. Political Decision: A Review of the Bangladesh Leather Processing Industry Relocation Plan

Avit Kumar Bhowmik

Proceedings of the 2nd World Sustainability Forum, Rosen, M. A., 2012, Basel, Switzerland

Damage and Post-cyclone Regeneration Assessment of the Sundarbans Botanic Biodiversity caused by the Cyclone Sidr

Avit Bhowmik and Pedro Cabral

Proceedings of the 1st World Sustainability Forum, Rosen, M. A and S. Grimmer, 2011, Basel, Switzerland

Buriganga pollution: reasons and prospects

Avit Kumar Bhowmik

Environment and Urban development: share your ideas and experiences, Murtoza, M. G., pp. 15–26, 2008, Khulna, Bangladesh

presentations

invited presentations

An Exponential Journey towards Sustainability

A. K. Bhowmik

Center for Sustainable Communications (CESC), Royal Institute of Technology, Sweden, 2018, Stockholm, Sweden

Information and Communication Technology (ICT) as a Social Tipping Element instrumental for sustainability transition

A. K. Bhowmik

Department Computer and Systems Sciences, Stockholm University, 2018, Stockholm, Sweden

Multi and Cross Scale Perspectives on Pathways

A. K. Bhowmik

Townhall meeting: Scaling Climate Action and Sustainable Practices Through Collective Impact, European Geosciences Union General Assembly, 2018, Vienna, Austria

Social Tipping Elements instrumental for Sustainability Transformation

A. K. Bhowmik

Transformation Stream Meeting, Stockholm Resilience Centre, 2018, Stockholm, Sweden

Transforming Knowledge for Climate Action

K. Slavik and A. K. Bhowmik

Tenth meeting of the research dialogue (RD 10), 2018, Bonn, Germany

Environmentally triggered Social Collapse and Social Scaling of Transformation

A. K. Bhowmik

Global Solutions Program, NASA Research Park, 2017, San Francisco, USA

Automated Accumulation Threshold selection and Riparian Corridor delineation

A. K. Bhowmik

Department of System Ecotoxicology, Helmholtz Centre for Environmental Research GmbH - UFZ, 2014, Leipzig, Germany

Evaluation of Spatial Interpolation Techniques for Mapping Climate Variables with Low Sample Density

A. K. Bhowmik

Department of Geology, Lund University, 2012, Lund, Sweden

conference presentations & abstracts

Exponential Climate Action

A. K. Bhowmik

Research to Action. The Science of Drawdown. Workshop 2: Climate, Oceans, and Feedbacks: Integrating Natural Systems, 2019, Pennsylvania

From Person to Planet: Powers of 10 scaling of climate action strategies from individual to global levels

A. K. Bhowmik and M. S. McCaffrey

Geophysical Research Abstracts, EGU2018–16521, 2018, Vienna, Austria

Are we heading towards a Collapse?

A. K. Bhowmik and J. Rockström

Earth League Symposium on Transformation Now!, 2017, Potsdam, Germany

Are we heading towards a collapse? Modelling climatically triggered social collapse

A. K. Bhowmik and J. Rockström

Resilience 2017 - Resilience Frontiers for Global Sustainability, 2017, Stockholm

Modelling social collapse in the World-Earth Model: concepts, data and empirical challenges

A. K. Bhowmik and J. Rockström

LOOPS-3: Transformative change and social-ecological resilience in the World- Earth system, modeling, concepts and data, 2017, Potsdam, Germany

Global sustainability science: current state and future needs

A. Downing, T. Häyä, A. K. Bhowmik, D. Collste, S. Cornell, J. Donges, I. Fetzer, and J. Hinton

Resilience 2017 - Resilience Frontiers for Global Sustainability, 2017, Stockholm

Countdown to Drawdown: an initial overview of exponential scaling of potential societal tipping points for deep decarbonization of global energy infrastructure by 2050

M. McCaffrey and A. K. Bhowmik

Geophysical Research Abstracts, p. 17224, 2017, Vienna, Austria

Social tipping elements instrumental for decarbonization by 2050

I. Otto, F. Allerberger, A. K. Bhowmik, J. Donges, R. Cremades, and W. Lucht

Resilience 2017 - Resilience Frontiers for Global Sustainability, 2017, Stockholm

Estimating pooled within-time series variograms with spatially shifted temporal points

A. K. Bhowmik and P. Cabral

Spatial Statistics: Emerging Patterns, 2015, Avignon, France

Are aerial dispersers good adapters? Association of large scale spatial autocorrelation of semi-aquatic insect trait distribution with climate

A. K. Bhowmik and R. B. Schäfer

9th Symposium of European Freshwater Sciences - SEFS 9, 2015, Geneva, Switzerland

Large Scale Climate-Response of German Stream Macroinvertebrate Traits

A. K. Bhowmik and R. B. Schäfer

International Conference on Chemical, Environment & Biological Sciences, 2014, Kuala Lumpur, Malaysia

Can Uncertainty in Climate Description due to Resource Constraint be reduced? Challenges in the regional scale of Bangladesh

A. K. Bhowmik, A. C. Costa, and P. Cabral

International Conference on Regional Climate - CORDEX, 2013, Brussels, Belgium

Responses of Ecological Traits to Climate on Large Spatial Scales

A. K. Bhowmik and R. B. Schäfer

43rd Annual Meeting of the Ecological Society of Germany, Austria and Switzerland, 2013, Potsdam, Germany

Interpolation in Space-Time with Reduced Uncertainty for Insufficient Spatial Points

A. K. Bhowmik

GeoMundus, 2011, Münster, Germany

Health Cost of Informality in the Tannery Industry: A Study on Hazaribag Tannery

A. K. Bhowmik, M. S. Akther, and M. S. Islam

State, Key Drivers and Scenarios of Urban Informality, 2010, Dhaka, Bangladesh

research grants

2018

How to develop cross-scale and target seeking transformation scenarios through participatory processes?

PI: Dr. Avit K. Bhowmik

Bolin Centre for Climate Research

Total grant: 9,000 euro

Seed grant for pilot research projects on Sustainable Development Goals

2016	Earth Resilience in the Anthropocene (ERA) Co-applicant, PI: Prof. Dr. Johan Rockström European Research Council (ERC) Advanced Grant Total grant: 2,500,000 euro Contributions: (a) wrote and reviewed the grant proposal, (b) led work packages 2 & 4, (c) added geospatial research expertise
2017	Social-ecological Resilience in the Anthropocene PI: Dr. Avit K. Bhowmik Department of Biology, Stockholm University Total grant: 4,200 euro Supported and supervised three master's theses projects
2012–2015	Quantitative Landscape Ecology Ph.D. Grant PI: Avit K. Bhowmik University of Koblenz-Landau, Germany German Research Foundation (DFG) supported project Total grant: 36,000 euro
2010–2012	Erasmus Mundus Scholarship <i>Master of Science in Geospatial Technology</i> The Education, Audiovisual and Culture Executive Agency (EACEA), European Commission Total grant: 24,000 euro

models & software development

10/2012	ATRIC Automated Accumulation Threshold selection and Riparian Corridor delineation Developed by co-interfacing R and GRASS GIS Development page: https://github.com/AvitBhowmik/ATRIC
08/2011	SSTP Spatially Shifting Temporal Points Developed using the gstat package utilities in R Development page: https://github.com/AvitBhowmik/SSTP

research projects

2016–present	Environmentally triggered social collapse: Identifying confounding spatial drivers of demographic changes, armed conflicts and epidemic diseases Collaborator: The Earth League and University of Southampton, UK
2016–2019	Powers of 10: Scaling climate action strategies from individual to global scales Collaborator: National University for Public Service, Budapest, Hungary and Project Drawdown
2016–2019	Social tipping elements instrumental for decarbonization by 2050 Collaborators: The Earth League, Potsdam Institute for Climate Impact Research (PIK), Germany and Climate Service Center, Germany
2017–2018	The Great Acceleration Wave: Spatial propagation patterns of human driven natural resources exploitations Collaborator: Fenner School of Environment and Society, the Australian National University

2015–2017	Effects of extreme climate events and landuse dynamics on the freshwater ecosystems in Europe Collaborator: Institute for Environmental Sciences, University of Koblenz-Landau, Germany
2014–present	Human and ecological risks of freshwater and dust contaminations in developing countries Collaborators: COMSTATS Institute of Information and Technology, Pakistan and The Chinese Academy of Sciences
2012–2017	Filling climate data-gaps: evaluation of the existing geostatistical methods and tools, and developing novel tools for improving climate spatial variability modelling in data-scarce regions Collaborators: New University of Lisbon, Portugal and The Chinese Academy of Sciences

scholarships & awards

2014	AGILE Early Career Scientist Grant 17th International Conference on Geographic Information Science, Castellon, Spain
2013	CORDEX Young Scientist Award International Conference on Regional Climate - CORDEX 2013, Brussels, Belgium
2013	Best Paper Award <i>Space-Time Variability of Summer Temperature Field over Bangladesh during 1948-2007</i> 13th International Conference on Computational Science and its Applications (ICCSA 2013), Ho Chi Minh City, Vietnam
2009	Mitsubishi Corporation International Merit Scholarship <i>For excellent academic performance in bachelor's studies</i> Mitsubishi Corporation, Japan
2009	University Grants Commission Merit Scholarship <i>For sound academic and extra-curricular activities</i> University Grants Commission of Bangladesh

teaching activities

2019–present	Nordic Climate Change Studies Risk and Environmental Studies, Karlstad University, Sweden
2019–present	Introduction Environment and Safety Risk and Environmental Studies, Karlstad University, Sweden
2019–present	Tools of environmental and safety management Risk and Environmental Studies, Karlstad University, Sweden
2019–present	The natural science basis of risk and environmental issues Risk and Environmental Studies, Karlstad University, Sweden
2016–2018	Use of Open Source Spatial Analysis Tools Online course on Spatial Ecotoxicology and Ecotoxicological Risk Assessment - Using an Open Community Approach, Institute for Environmental Sciences, University of Koblenz-Landau, Germany

2016–2018	Entering the Anthropocene (Challenges of the Anthropocene) Course: Social-ecological Resilience for Sustainable Development, Stockholm Resilience Centre, Stockholm University, Sweden
2015	Spatial autocorrelation in ecological modelling Workshop 1: Data analysis in freshwater ecology using R, 9th Symposium for European Freshwater Sciences (SEFS), Geneva, Switzerland
2013–2018	Spatial(-Temporal) Interpolation with R International Summer Academy on Spatial Ecotoxicology and Ecotoxicological Risk Assessment-Using an Open Community Approach (funded by the German Academic Exchange Service (DAAD))
2013–2018	Introduction to open-source software and R for spatial ecotoxicological analyses International Summer Academy on Spatial Ecotoxicology and Ecotoxicological Risk Assessment-Using an Open Community Approach (funded by DAAD)
2013–2018	GIS Application with R Institute for Environmental Sciences, University of Koblenz-Landau, Germany
2013–2018	GIS Projects for Advanced Institute for Environmental Sciences, University of Koblenz-Landau, Germany
2012	Reference Systems for Geographic Information Institute for Geoinformatics, University of Münster, Germany
2012	Developing Demonstrators for Core Concepts of Spatial Information Institute for Geoinformatics, University of Münster, Germany
2012	Introduction to Digital Cartography Institute for Geoinformatics, University of Münster, Germany

supervision

Doctoral Theses

2016–2019	A fusion remote sensing approach to the quantification of urban to global scale social-ecological impacts of anthropogenic land use and land cover changes R. Padmanaban, Doctoral dissertation Nova Information Management School, New University of Lisbon, Portugal
2016–present	Land use and land cover change in Nigeria: A dynamic land system model approach A.O. Arowolo, Doctoral dissertation Chinese Academy of Sciences, China and Federal University of Agriculture, Nigeria

Master's Theses

2017–2018	The Great Acceleration Wave: A timeline of human exploitation of the earth D. Fagerlind, Master's dissertation Stockholm Resilience Centre, Stockholm University, Sweden
2017–2018	Transforming long distance travelling. A qualitative study of incentives to limit air travel in the face of climate change L. Jacobson, Master's dissertation Stockholm Resilience Centre, Stockholm University, Sweden
2016–2017	‘Hazaribagh’- development trajectory or trap? A case study of a leather processing unit in Bangladesh F. Aktar, Master's dissertation Stockholm Resilience Centre, Stockholm University, Sweden

2014–2016	Effects of landuse on the energy transfer across the freshwater-land interface S. V. Kakarlapudi, Master's dissertation Institute for Environmental Sciences, University of Koblenz-Landau, Germany
2013–2015	Extreme weather events and its effects on stream macroinvertebrates: Did the heat wave of 2003 cause a decline in the distribution of stream-macroinvertebrates in German low mountain ranges? G. Oehmichen, Diploma dissertation Institute for Environmental Sciences, University of Koblenz-Landau, Germany
2012–2013	Mapping the ecological risk of agricultural pesticide runoff for Rheinland Palatinate L. Schneider, Master's dissertation Institute for Environmental Sciences, University of Koblenz-Landau, Germany

students' evaluation

Overall Score: 1.25 - 2.0 on a scale from 1 to 5

1 best and 5 worst

pedagogical training

2019	Teaching in Higher Education Karlstad University Sweden	
January 2018	Teachers' Conference 2018 Being a university teacher in an ever-changing world	Stockholm University Sweden
October 2013	Formal pedagogical training on university teaching Higher Education Teaching Center, University of Koblenz-Landau, Germany	

science-policy-industry networks

2016–2019	Earth-Doc, The Earth League Project: Earth Lander - Social tipping elements instrumental for decarbonization by 2050
2016–2018	Analysis, Integration and Modelling of the Earth System (AIMES) Associated with the international project office in Sweden
2016–2018	European Space Agency Project: Earth System Data Cube, partners: Brockmann Consultant GmbH, Max Planck Institute for Biogeochemistry and Stockholm Resilience Centre
2018–2019	Future Earth Liaised with and coordinating two Global Research Projects and two Knowledge Action Networks
2016–present	Sustainable Development Solutions Network (SDSN) Project: The World in 2050 (TWI 2050)
2015–2018	European Geosciences Union (EGU) Member
2013–present	Society of Ecotoxicology and Chemistry (SETAC) Member

editorial activities

2018–2019	Guest Editor Sustainability Science
2016–2019	Reviewer for research project grants Future Earth Sustainable Development Goals Labs Chilean National Science and Technology Commission
2016–present	Editorial board member Water Science and Technology: Water Supply
2014–present	Ad-hoc reviewer Global Ecology and Biogeography Ecography International Journal of Climatology Sustainability PLOS ONE Earth Science Informatics Geomatics, Natural Hazards and Risk Journal of Environmental Informatics Applied Ecology and Environmental Research Journal of Health and Pollution Natural Hazards Geosciences Geoscience Data Journal Environmental Monitoring and Assessment International Journal of Environmental Research and Public Health Agronomy Geomorphology

leadership, management & administration

04/2018	Principal Organizer Workshop: Exponential Climate Action for Cities, Carbon Law Accelerator project, Future Earth, Stockholm, Sweden
02/2018	Theme Leader Pathways to new collaborations in climate research at Stockholm University: Perspectives from the Human Science Academic Area and the Bolin Centre for Climate Research
08/2017	Session Chair Session: Exploring the potential of local innovations and bottom-up change, Social-ecological transformations for sustainability, Resilience 2017 - Resilience Frontiers for Global Sustainability
06/2017	Principal Organizer Workshop: Progress in computational macroecology, The 17th International Conference on Computational Science and Its Applications (ICCSA 2017), Trieste, Italy
12/2016	Principal Organizer Social Tipping Elements Instrumental for Decarbonization by 2050: an Expert Workshop, The Earth League, Stockholm Resilience Centre, Sweden

09/2016	Co-organizer Climate Tipping Points and Safe Pathways to Sustainable Development: an expert review workshop, Stockholm Resilience Centre, Stockholm, Sweden Analysis, Integration and Modelling of the Earth System (AIMES)
05/2016	Principal Organizer 3rd Earth-Doc Meeting, Stockholm Resilience Centre, Sweden (a) Preparation of a strategy document outlining Earth-Doc research, and (b) Advancing on the on-going Earth-League research proposal and perspective paper
07/2015	Principal Organizer Workshop 1: Data analysis in freshwater ecology using R, 9th Symposium for European Freshwater Sciences (SEFS), Geneva, Switzerland
09/2012–12/2015	Developer and Maintainer Geodata Server Institute for Environmental Sciences, University of Koblenz-Landau, Germany
11/2010–02/2011	Group Leader Spatial statistics group Group project seminar on Identifying optimal location for disaster evacuation centres in Lisbon, New University of Lisbon, Portugal
07/2007–present	U.S. Department of State Alumni Study of the United States Institute for Student Leaders 2007, organized by the United States Department of State in Washington and Green River Community College, Seattle, USA Community services

workshops & trainings

April 2013	Final Colloquium of the priority program "Megacities-Megachallenge: Informal Dynamics of GlobalChange" German Research Foundation (DFG), Bonn, Germany
January 2013	Mechanistic Effect Modelling for Ecological Risk Assessment of Chemicals Society of Environmental Toxicology and Chemistry (SETAC) and Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany
February 2012	Recent Development in Geostatistics: Change of Support and Spatial Analysis of Temporal Trends in Health Outcomes Dr. Pierre Goovaerts (Computer Sciences Corporation), School of Statistics and Information Management, New University of Lisbon, Portugal

Karlstad, December 9, 2019



Avit K. Bhowmik