

Dhritiraj Sengupta, Ph.D.

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WORK EXPERIENCE

Research Fellow, School of Geography and Environmental Sciences, University of Southampton (2022-present)

- Funded by The Leverhulme Trust, key role is to perform in depth research on the state of current anthropogenic impact at the global coastal floodplain.
- Quantitative analysis of coastal environmental data, with Python and/or R
- Disseminate findings by taking the lead in preparing publication materials for referred journals, presenting results at conferences, or exhibiting work at other appropriate events

Research Associate, State Key Laboratory of Estuarine and Coastal Research, Shanghai, China (2020-2022)

- Built advanced geospatial and cloud computing methods to map long term coastal change and habitat loss due to land reclamation in major cities worldwide.
- Analysis of remote sensing and GIS data along with machine learning application for coastal conservation
- Successful accomplishment of research objectives within funding timelines
- Publishing of scientific papers in peer-reviewed journals to support the research program
- Regular attendance and presenting of results at national and international meetings to disseminate and promote the research

Code for Climate, Shanghai (2020-2021) - Public workshops on making cities resilient to climate change

- Partnered with Le Wagon and Green Initiatives, Shanghai to deliver capacity-building workshops on getting started with Python for geospatial analysis. (Geopandas, Numpy, OSMNX, Rasterio etc)
- Workshop on JavaScript for Google Earth Engine application in long-term vegetation and rainfall changes.
- Please visit my website for more information- <https://dhritirajsen.github.io/spatially-Enabled/Resources.html>

Ph.D. Research, School of Geographic Sciences, East China Normal University (2016-2020)

- Understanding the spatial patterns of urban expansion at the coast.
- Building high resolution map data of reclaimed land and features using Drone imagery
- Mapping spatial patterns and trends of coastal land reclamation at 3 levels viz global, regional and national scales.
- Application of automatic and adaptive thresholding method for mapping long term coastline changes
- Gaining expertise in a broad range of big data and remote sensing application

Research Trainee. Department of Environmental and Geographical Sciences (EGS), University of Cape Town, South Africa. (2018)

- Fieldwork on sediments coring in semi-arid regions of Southern Africa
- Delivered workshop on "Getting started with Google Earth Engine"
- Participated in 2018 Macalester-Promona-Swarthmore Consortium Field Excursion to Kalahari Trans-boundary national park.
- Assisted with pre-field work planning by building a GIS based decision making support system for sediment coring in the estuarine region.

RELEVANT SKILLS

- Time series analysis using Normalized Difference indices in Google Earth Engine for application in forest management, coastal flooding and hydrology of the Himalayan system.
- Statistical analysis using SPSS and MATLAB for significance and trend estimation in long term observation.
- Use of Sentinel-1 SAR data to map off-shore marine objects and surface motion estimation.
- Use of DJI RTK and Mavic Mini drone to map coastal structures and retrieve high-resolution Digital

- Elevation Models (DEM)
- Cartographic applications in QGIS, ArcGIS, and Matlab
- VGI (Volunteered Geographic Information) using Open Street Maps (OSM) (Building footprint extraction and disaster mitigation mapping)
- Machine learning applications (CART, SMV and RF) for mapping long term habitat loss due to urban expansion

AWARDS

- 2016-2020-The Chinese government scholarship (CSC)
- 2020-International Geographical Union Travel Grant (2020) to attend the IGU General Assembly in Istanbul 2021.
- 2018 & 2019- Awarded the ECNU (East China Normal University) Excellent International Student Scholarship Academic Award.
- (2017 and 2018) Full Scholarship to participate in the International Geoinformatics Summer School, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China.

EDUCATION

East China Normal University (2016-2020)

Ph.D. Natural Sciences (Physical Geography): Cities from the sea; Mapping Spatial Patterns and Trends of Coastal Land Reclamation

University of Mysore (2014-2016)

MA (First Class) Geographical Sciences

University of Pune (2011-2014)

BA (First class with distinction) Geography

TEACHING/TRAINING EXPERIENCE

Teaching Assistant, East China Normal University (2020-2022)

- Delivering practical sessions for courses in Coastal Zone Remote Sensing Technology and Application for groups of up to 10 graduate students
- Responsible for prior-assessment of curriculum, development of suitable resources in collaboration with Prof. Bo Tian, organisation and delivery of sessions and coursework marking and feedback.

Mentor/Supervisor, State Key Laboratory of Coastal and Estuarine Studies (2020-2022)

- Training graduate students in practical techniques of geoscience fieldwork.
- Supervising one graduate student on developing new techniques in mapping coastal aquaculture ponds using advanced machine learning techniques on satellite imageries

Facilitator, Jamia Millia Islamia University and Delhi School of Economics, New Delhi (2019/2020/2021)

- Capacity building through Geo-spatial Techniques
- Hands-on Training on Google Earth Engine for Earth Observation

ADDITIONAL RELEVANT EXPERIENCE

Virtual Guest Lectures, (2019-2022)

- Invited for interview by the founder of Stand Stories (<https://www.sandstories.org/about>). The video can be accessed here- <https://www.youtube.com/watch?v=25mg9xKnT1s>
- Guest Lecture on Code for Climate: Getting Started with Planetary Scale analysis with Google Earth Engine. Department of Geography, Gawahati University, India.
- Guest lecture on Geography Theory and Practice', a part of BSc (Hons) Geography, Urban Environments and

Climate Change. School of Architecture and Built Environment. The University of Wolverhampton. The United Kingdom.

- Guest lecture on 'Cities from the sea; an introduction to coastal land reclamation. Department of Global & Sociocultural Studies Steven J. Green School of International and Public Affairs Florida International University. USA.
- Delivered online webinar on basics of cloud computing for remote sensing applications using Google Earth Engine (<https://www.youtube.com/watch?v=xqyUrPyT0QQ>)
- IGU-YECG Introduction to Google Earth Engine (GEE) Training Workshop, Delhi School of Economics, New Delhi, India. <https://igu.younggeographers.org/event/igu-yecg-introduction-google-earth-engine-gee-training-workshop/>

ADDITIONAL SKILLS & COURSES

51st Short course on MATLAB Recipes for Earth Sciences (University of Potsdam. Germany, 2020) - a one-week online course on the application of MATLAB in earth science research. This involved making 3D DEMs, performing statistical equations

International summer school on the governance of socio-ecological systems exploring the land-ocean continuum: coastal zones, river deltas, islands, and wetlands. (School of geographical sciences, East China Normal University, Shanghai, China. July 2019)

International Geoinformatics Summer School on SAR and DEM image creation; State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan. (July 2018)

SCIENTIFIC AND SOCIETAL IMPACT

Fellow: Future Earth Coasts (<https://www.futureearthcoasts.org/fellows/>)

SC Member: Commission on Coastal System, International Geographical Union (IGU) (<http://igu-coast.org/>)

Board Member: Young Geographer Working Group (YGGWG) Asian Geographical Association (AGA) (<http://www.aga-yggwg.com/>)

NASA Earth Observatory blog- <https://earthobservatory.nasa.gov/images/145968/the-expansion-of-shanghai> and <https://earthobservatory.nasa.gov/images/148303/as-jakarta-grows-so-do-the-water-issues>

Shanghai Garbage Sorting initiative- <https://www.shine.cn/news/metro/1906066162/>

Moderator for the panel discussion on "Solutions towards Carbon Emissions" at the SHANGHAI CLIMATE ACTION CONFERENCE 2021 (<https://greeninitiatives.cn/event/forum-pwc-sep2021/>)

PUBLICATIONS

2022- Peng Y, **Sengupta D**, Duan Y, Chen CP, Tian B. Accurate mapping of Chinese coastal aquaculture ponds using biophysical parameters based on Sentinel-2 time series images. Marine Pollution Bulletin. 181. <https://doi.org/10.1016/j.marpolbul.2022.113901>

2022: - **Sengupta D**, Choi YR, Tian B, Brown S, Li Y, Hackney C, Banerjee A, Chen R, Meadows ME, Zhou Y. 21st-century global coastal reclamation is driven by port expansion, real-estate growth and prestige. Submitted Earth's Future (In Review)

2021:- Zhang, T., Tian, B., **Sengupta, D**. et al. Global offshore wind turbine dataset. Sci Data 8, 191. <https://doi.org/10.1038/s41597-021-00982-z>

2021:- Duan Y, Tian B, Li X, Liu D, **Sengupta D**, Wang Y, Peng Y, Tracking aquaculture ponds changes on China coast using 30 years of Landsat images. International Journal of Applied Earth Observations and Geoinformation 102. 102383 <https://doi.org/10.1016/j.jag.2021.102383>

2021 :- Machiwa H, Tian B, **Sengupta D**, Chen Q, Meadows ME, Zhou Y Vegetation dynamics in response to human and climatic factors in the Tanzanian Coast. Front. Earth Sci. 15, 595–605 (2021). <https://doi.org/10.1007/s11707-021-0916-7>

2021:- Jia J, Zhang X, Zhou R, Meadows ME, **Sengupta D** and Zhu L Sediment sources of tidal flats in the Zhejiang coastal area of southeast China. Journal of Oceanology and Limnology. 39(4), 1245-1255, <https://doi.org/10.1007/s00343-020-0179-2>

2021:- Banerjee B, Chen R, Meadows ME, **Sengupta D**, Pathak S, Zilong X and Mal S. Recent climate dynamics of the Third Pole: analysis of topo- climate impacts on snow cover in the central Himalaya (2000-2018) using Google Earth Engine. Journal of Applied Earth Observations and Geoinformation. 103, 1 <https://doi.org/10.1016/j.jag.2021.102490>

2020:- **Sengupta D**, Chen R, Meadows ME, Banerjee, A. Gaining or losing ground? Tracking Asia's hunger for 'new' coastal land in the era of sea level rise. Science of the Total Environment 732: 13920 <https://doi.org/10.1016/j.scitotenv.2020.139290>

2020:- Banerjee A, Chen R, Meadows ME, Singh RB, Mal S and **Sengupta D**. A critical appraisal of long-term rainfall variability in Uttarakhand Himalaya using Google Earth Engine. Remote Sensing 12: 709. <https://doi.org/10.3390/rs12040709>

2019:- Wu, Z., Chen R and Meadows ME and **Sengupta, D** 2019: The change of urban green spaces in Shanghai: trends, drivers and policy implications. Land Use Policy 87: 104080. <https://doi.org/10.1016/j.landusepol.2019.104080>

2019:- **Sengupta, D**, Chen R, Meadows ME, Choi, YR, Banerjee, A and Xia, Z. Mapping trajectories of coastal land reclamation in nine deltaic megacities using Google Earth Engine. Remote Sensing 11: 2621. <https://doi.org/10.3390/rs11222621>

2018:- **Sengupta, D**, Meadows ME and Chen R Building beyond land: coastal land reclamation and urban expansion. Applied Geography 90: 229-238. <https://doi.org/10.1016/j.apgeog.2017.12.015>

Book Chapters

2018:- Das A, Kimoto K, Kumar MR, Umakanth R, **Sengupta D**, Vishwanth HR, Landuse Sustainability of agricultural zones, in Exploring Sustainable Land Use in Monsoon Asia. Springer Geography Publication (103-135).

2018:- Das A, Kimoto K, Jabir K, **Sengupta D**, Shriharsha BS, Ravikumar M . Urban land use land cover change, in sustainability of agricultural zones, in Exploring Sustainable Land Use in Monsoon Asia. Springer Geography Publication (175-189).

CONFERENCE PRESENTATIONS

Sengupta. D. Mapping Trajectories of Coastal Land Reclamation in Nine Deltaic Megacities using Google Earth Engine. Virtual International Geographical Union Congress, Istanbul, 16th to 19th August 2021

Sengupta. D. Global coastal land dynamics in the age of sea-level rise: gaining ground or losing ground?. Asia Conference on Geography, Sun Yat-Sen University, 24th - 26th December 2018.

