

Dr. Chandan Pradhan

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Assistant Professor

Department of Water Resources and Ocean Engineering, NITK Surathkal

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Research Interests

- Remote Sensing
- River Engineering & Fluvial Hydraulics
- Stream Health Management

Educational Qualification

- **Ph. D. in Department of Civil Engineering (2022)**
Indian Institute of Technology Guwahati
- **M-Tech in Water Resources Engineering and Management (2016)**
Department of Civil Engineering, Indian Institute of Technology Guwahati
- **B-Tech (Civil Engineering, 2013)**
Indira Gandhi Institute of Technology, Sarang, Odisha

Research and Consultancy Projects

1. Condition Assessment & Management Plan for Krishna River Basin under the National River Conservation Plan (cKrishna), funded by the Ministry of Jal Shakti, Government of India (Co-PI)

Conference, Workshops and Sessions Organized

1. Convener for **AGU 2025** session: River Resilience and Hydrologic Connectivity: Integrating Morphodynamic Insights and Climate Adaptation Across Scales, Earth and Planetary Surface Processes (Accepted)
2. Co-convener for the **EGU General Assembly 2025** Session: HS5.4.2 Urban Watersheds and Urban Water Challenges

Publications

1. **C. Pradhan**, Ketan K Nandi, Rishikesh Bharti, Subashisa Dutta (2023), Developing process-based geomorphic indicators for understanding river dynamics of a highly braided system: Implications for designing resilience based management strategies, **CATENA**, Volume 232, 107411. <https://doi.org/10.1016/j.catena.2023.107411>
2. **C. Pradhan**, S. K. Padhee, R. Bharti & S. Dutta (2022). A process-based recovery indicator for anthropogenically disturbed river system. **Scientific Reports**, 12 (1), 1-14. [10.1038/s41598-022-14542-x](https://doi.org/10.1038/s41598-022-14542-x)
3. **C. Pradhan**, V. Chembolu, S. Dutta, & R. Bharti (2021). Role of effective discharge on morphological changes for a regulated macrochannel river system. **Geomorphology**, 385, 107718. <https://doi.org/10.1016/j.geomorph.2021.107718>
4. **C. Pradhan**, V. Chembolu, R. Bharti & S. Dutta (2021). Regulated rivers in India: research progress and future directions. **ISH Journal of Hydraulic Engineering**, <https://doi.org/10.1080/09715010.2021.1975319>
5. **C. Pradhan**, V. Chembolu & S. Dutta (2019). Impact of river interventions on alluvial channel morphology. **ISH Journal of Hydraulic Engineering**, 25:1, 87-93. <https://doi.org/10.1080/09715010.2018.1453878>
6. K.K. Nandi, **C. Pradhan**, S. Dutta, K.K. Khatua (2023). Identifying the stability trajectory of a large braided Brahmaputra River using reach-scale process-based approach. **Journal of Hydrology**. Volume 626, Part B. <https://doi.org/10.1016/j.jhydrol.2023.130329>

7. K.K. Nandi, **C. Pradhan**, S. K. Padhee, S. Dutta, K.K. Khatua (2022). Understanding the Entropy-based Morphological Variability and Energy Expenditure Mechanism of a large Braided River System. **Journal of Hydrology**, 615, Part A <https://doi.org/10.1016/j.jhydrol.2022.128662>
8. K.K. Nandi, **C. Pradhan**, S. Dutta, & K.K. Khatua (2022). How dynamic is the Brahmaputra? Understanding the process-form-vegetation interactions for hierarchies of energy dissipation. **Ecohydrology**, 15, e2416 <https://doi.org/10.1002/eco.2416>
9. V. G. Rangarajan, R. Bharti, S. K. Mondal, **C. Pradhan**, & S. Dutta (2018). Remote Sensing for Martian Studies: Inferences from Syrtis Major. **Journal of the Indian Society of Remote Sensing**, 46(9), 1537-1551. <https://doi.org/10.1007/s12524-018-0826-7>

Book Chapters

1. **C. Pradhan**, S. Dutta, & R. Bharti (2023). Exploring Large Braided River Systems: Understanding the Dynamics and Pathways of River Recover. Recent Development in River Corridor Management. Lecture Notes in Civil Engineering 376, https://doi.org/10.1007/978-981-99-4423-1_10
2. **C. Pradhan**, S.K. Padhee, S. Dutta, & R. Bharti (2022). Assessment of Fluvial Controls and Cross-Sectional Recovery Indicators in a Large Regulated River. Recent Trends in River Corridor Management. Lecture Notes in Civil Engineering, vol 229. Springer, Singapore. https://doi.org/10.1007/978-981-16-9933-7_3
3. **C. Pradhan**, Suresh Modalavalasa, S. Dutta & Rishikesh Bharti (2020). A geomorphic approach to evaluate river recovery potential for regulated river basin. In Riverflow 2020, 7th-10th July, 2020, Delft, Netherland DOI:10.1201/b22619-253
4. S.K. Padhee, **C. Pradhan**, K.K. Nandi, & S. Dutta, (2022). Development of a Semi-distributed Rainfall-Runoff Model for Water Budgeting in Macropore Dominated Hilly River Basins, Water Sci., Technol. Library, Vol. 113, Swatantra Kumar Dubey et al. (Eds): Soil-Water, Agriculture, and Climate Change

Conferences (International and National)

1. **C. Pradhan**, Dutta, S., & Bharti, R. (2024). Recovery and Resilience Enhancement Strategies for Anthropogenically Disturbed Braided River Systems. In AGU Fall Meeting Abstracts (Vol. 2024, pp. EP01-62).
2. **C. Pradhan**, S. Dutta & R. Bharti (2023) Sediment Connectivity and River Recovery: Application of Pertinent River Science Concepts in Himalayan Catchments, 3rd International Conference on River Corridor Research and Management (RCRM 2023).
3. **C. Pradhan**, K.K. Nandi, S.K. Padhee, S. Dutta & R. Bharti (2023) Evaluating the Influence of Hydrological Changes on the Process-based River Recovery Trajectory in Asian River Systems, AOGS 2023 Singapore.
4. **C. Pradhan**, K.K. Nandi, S.K. Padhee, R. Bharti & S. Dutta (2022). Understanding River Recovery for Indian Rivers: Emerging Challenges and Solutions, AGU Fall Meeting 2022.
5. **C. Pradhan**, S. Dutta & R. Bharti (2021). Understanding River Freedom Space and Seasonal Variation of Surface Water Dynamics in Large Fluvial Landscapes: Implications for Floods and Anthropogenic Stress; Abstract submitted to AGU Fall Meeting 2021.
6. **C. Pradhan**, S. Dutta & R. Bharti (2021). Assessing The River Freedom Space along the continuum of braided channel patterns using advanced geo-spatial analysis, 4th International Conference on the status and future of the World's Large Rivers, Moscow 2021.
7. **C. Pradhan**, S.K. Padhee, S. Dutta & R. Bharti (2021). An entropy-based investigation on the river recovery potential in a regulated river basin, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-9362, <https://doi.org/10.5194/egusphere-egu21-9362>, 2021.
8. **C. Pradhan**, S.K. Padhee, S. Dutta & R. Bharti (2021). Assessment of transport effectiveness and recovery trajectory in regulated Mahanadi river, International Conference on River Corridor Research and Management (RCRM 2021), IIT Jammu, 2021/2/27.
9. **C. Pradhan**, S. Pani, S. Dutta & R. Bharti (2019). Temporal Changes in Geomorphic Effectiveness of Floods in Regulated River Basins, 2019/7/29, 16th Annual Meeting, AOGS 2019, Singapore.

10. **C. Pradhan**, S. Dutta & R. Bharti (2017). A spatio- Temporal Analysis of Channel Migration using Remote sensing, field investigation and GIS techniques: The Kameng River (Lower Reach), India; 9th International conference of Geomorphology, 6-11th November, 2017, New Delhi, India.
11. **C. Pradhan**, R. Bharti and S. Dutta (2017). Assessment of post-impoundment geomorphic variations along Brahmani River using remote sensing, IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Fort Worth, TX, 2017, pp. 5598-5601, DOI: 10.1109/IGARSS.2017.8128274.
12. **C. Pradhan**, V. Chembolu and S. Dutta (2016). Impacts of River Interventions on Alluvial Channel Morphology- Hydro International, Organized by Indian Society of Hydraulics, 8-10th December, 2016, CWPRS, Pune.
13. Maurya, O. P., Modalavalasa, S., Nandi, K. K., **C. Pradhan**, & Dutta, S. (2023, December). Quantifying the influence of floodplain vegetation and sand mining pit on the hydrodynamics of low sinuous channels: an integrated experimental and numerical approach. In AGU Fall Meeting Abstracts (Vol. 2023, pp. EP31A-03).
14. K. K. Nandi, C. Pradhan, K. K. Khatua, & S. Dutta (2022). Assessment of braided dynamics of a large river system with respect to the energy dissipation mechanism using cloud computing technique. In AGU Fall Meeting 2022.
15. K. K. Nandi, A. Akkimi, **C. Pradhan**, S. Dutta, & K. K. Khatua (2021, December). Entropy Based Relation Between In-stream Green Corridor and Channel Stability of a Large Braided Brahmaputra River. In AGU Fall Meeting 2021.
16. K. K. Nandi, **C. Pradhan**, J. Sultan, S. Dutta, & K. K. Khatua (2021). Energy Dissipation Modeling in Highly Braided Brahmaputra River, HYDRO 2020- International Conference
17. L.L. Sahoo, K.K. Nandi, A. Anjaneyulu, **C. Pradhan**, A. Dubey, S. Dutta; Catchment Scale Vulnerability Assessment of Physio-climatic Characteristics in the Brahmaputra River Basin; AOGS 2021.
18. S. K. Saha, **C. Pradhan**, S. Dutta; Soil Erosion Assessment in Anthropogenically disturbed Ungauged Himalayan Catchment Using Geospatial Techniques; Abstract submitted to AGU Fall Meeting 2021.
19. K.K. Nandi, **C. Pradhan**, Dutta. S., K.K. Khatua; Sediment transport and morphological characterization for a large braided river using hydrodynamic modeling, 4th International Conference on the status and future of the World's Large Rivers, Moscow 2021.
20. A. Siddharth, **C. Pradhan**, M. Suresh, S. Dutta (2019). Effect of In-stream Variable on the Lower Mahanadi River, India, 2019/7/31, 16th Annual Meeting, AOGS 2019, Singapore.
21. M. Suresh, **C. Pradhan**, S. Dutta, V. Kulkarni (2019). Flow Structure in Meandering Channel with Vegetation, 2019/7/31, 16th Annual Meeting, AOGS 2019, Singapore.

Talks, Presentations and Masterclass

1. Conducted a hands-on training session for the Pre-conference Workshop OF (AWaRe 2025) Urban Flood Modelling and River Survey Integration on 9th June 2025, Maulana Azad National Institute of Technology (MANIT) Bhopal.
2. Delivered lectures on Winter School on Geospatial Technologies from 04-24, December 2024 in the Department of Water Resources and Ocean Engineering, National Institute of Technology Karnataka, Surathkal
3. Participated in the Master Class “River functions under pressure”, by Hervé Piégay, Jorge Abad and Virginia Ruiz-Villanueva, Delft, 10th July 2020, 10th International Conference on Fluvial Hydraulics River Flow 2020, Delft, Netherland.
4. Delivered a lecture on HEC-RAS hydrodynamic model in two-day training program entitled “River Bank Erosion Stabilization and River Modelling under National Hydrology Project” at Department of Civil Engineering, IIT Guwahati.
5. Delivered a lecture on ‘Implications of Google Earth Engine in Hydro-ecological Modeling’ to Assam State Water Resources Engineers in workshop conducted by NHP Project.
6. Delivered a lecture on ‘River Recovery and Use of Geospatial Techniques’ in 5th Pre-event of the 2nd UN-WGI Congress, Gauhati University, India
7. Delivered a lecture on “Implications of GEE in Fluvial Geomorphology” at IIT Guwahati-2021
8. Delivered a lecture on “HEC-RAS and flood management in the Brahmaputra River basin” at Tezpur University-2015

Research Profile and Experience

- Advanced Hydro-geomorphic Surveys to the large Himalayan and peninsular fluvial systems of India (Conducted at NITK Surathkal and Geo-Informatics Lab, IIT Guwahati) (2014-2025).
- **Post-Doctoral Fellow:** Design of smart flood-wetland monitoring system, study bio morphological health of fluvial system and underwater exploration
- **Ph.D.:** “Study of the process-form relationships in continuum of braided channel patterns”
Overview: Understanding braided river behavior and underlying concepts through field-based studies, modeling, analysis and cloud computing can be beneficial for their effective management. My research aimed to understand the process-form relationships along the continuum of braided patterns.
- **M-Tech:** “Impacts of river interventions on alluvial channel morphology”
Overview: My M-Tech research aimed at investigating the impacts of variable flow-sediment regimes and anthropogenic stresses on river morphology using numerical modeling for improved understanding of flow-sediment-morphology dynamics in human-influenced river systems.

Research Supervision and Associated Scholars

- Ph.D. Student - Ongoing: 02
- MTech. Student - Ongoing: 04 Completed: 01

Awards & Achievements

- MHRD Fellowship during M. Tech and PhD (July 2014- July 2021)
- LANCO Foundation Merit Award for excellent performance in Department of Civil Engineering, Indira Gandhi Institute of Technology, Odisha, India (2012)

Peer Review

- Journal of Hydrology
- ISH Journal of Hydraulic Engineering
- International Journal of Applied Earth Observation and Geoinformation
- Remote Sensing Applications: Society and Environment
- River Corridor Research and Management

Membership in Professional Societies

- American Geophysical Union (AGU)
- British Society of Geomorphology (BSG)
- European Geosciences Union (EGU)
- International Association for Hydro-environment Engineering and Research (IAHR)
- Asia Oceania Geosciences Society (AOGS)
- American Society of Civil Engineers (ASCE)
- The Indian Society for Hydraulics (ISH)

Declaration:

I hereby declare that the information furnished above is true to the best of my knowledge and I am in possession of documents in proof of it.

Date: 30-06-2025

Place: NITK SURATHKAL

Dr. Chandan Pradhan