Ankit **Deshmukh**

PH.D. • ASSISTANT PROFESSOR • HYDROLOGIST

(+91)96-3052-1359 | deshmukh.acad@gmail.com | ankitdeshmukh.com | anixn

BRIEF BIO-SKETCH

I am working as an assistant professor in the Department of Civil Engineering at Pandit Deendayal Energy University, Gujarat, India. I obtained my doctoral degree in Water Resources from the Indian Institute of Technology, Hyderabad (January 2021). My fields of interest are Computational Hydrology, water resource management, and understanding the catchments' responses to anthropogenic changes. In my doctorate, I worked on approaches to identify the catchments' vulnerability to environmental changes. My current research focuses on the development of a Physio-climatic catchment characteristics dataset for the Indian subcontinent that can be utilized for prediction in the ungauged basins. I possess a strong understanding of GIS processing and am efficient in geospatial analysis. I am highly motivated in the fields of R, Python, and MATLAB scripting. By leveraging my skills in computational hydrology and geospatial analysis technologies, I aim to play a pivotal role in optimizing water resource management and hydroelectric power generation and shaping the future of clean energy.

PROFESSIONAL EXPERIENCE

Assistant Professor at Department of Civil Engineering — Gujarat, India, August 2020
Pandit Deendayal Petroleum University, Gujarat

- Hydrology & Water Resources
- Geospatial Analysis.
- Disaster Management
- Advanced Surveying & Geomatics

SKILLS

Area of Interests:
- Hydrologic modeling, Surface water hydrology, Computational hydrology, Drought analysis.
- Climate change modeling, Catchment vulnerability frameworks, Physio-climatic database development, LULC mapping
- Geospatial analysis, Geoinformatics, Geographical information systems, Cartography, Drone survey and mapping.

Tools: Data analysis, GIS automation and scripting with R, GRASS, and QGIS, Python.
Programming Experience: R(1), Python(2), MATLAB(3), SQL(4)
Content organization: GIT, LaTeX, Markdown, Zotero
Languages: English, Hindi

EDUCATION

Doctor of Philosophy in Water Resource — Hyderabad, January 2021
Indian Institute of Technology Hyderabad
Topic: Assessing vulnerability of catchments to environmental changes
Supervisors: Dr. Riddhi Singh

Master of Technology in Water Resources Engineering — Hyderabad, January 2016
Indian Institute of Technology Hyderabad

Topic: Physio-climatic controls on vulnerability of watersheds to climate and land use change across the United States
Supervisors: Dr. Riddhi Singh
CGPA: 8.87

Bachelor of Engineering in Civil Engineering — Bhopal, August 2013
Bansal Institute of Science and Technology, Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

Topic: Study of Rainwater Harvesting System at BIST Bhopal
Supervisors: Prof. Maroof Khan
Percentage: 76.6% with distinction

PUBLICATIONS

Articles

Deshmukh, A., and Singh, R. (2016). Physio-climatic controls on vulnerability of watersheds to climate and land use change across the United States. Water Resources Research, doi: 10.1002/2016WR019189. — Water Research Resources

- We quantify watershed vulnerability to environmental change using an exploratory modeling framework.
- We relate catchment's vulnerability to environmental change with its Physio-Climatic characteristics.

Deshmukh, A., and Singh, R. (2019). A Whittaker- Biome based framework to account for the impact of climate change on catchment behavior. Water Resources Research, doi: 10.1029/2018WR023113. — Water Research Resources

- Propose a method to account for changes in model parameters with climate.
- Show when vulnerability to climate change might be under-estimated.

Conference Papers

Deshmukh, A., Prediction of hydrological drought pattern and duration in data scarce catchments with catchments' physio-climatic attributes, 28th International Conference on Hydraulics, Water Resources, River and Coastal, Engineering, NIT Warangal, India, December 2023, (accepted for publication).

Rakhecha, V., **Deshmukh, A**, An Enhanced Bottom-Up Approach to Assess the Catchments' Vulnerability to Climate Change, Innovation in Smart and Sustainable Infrastructure, Lecture Notes in Civil Engineering, 10 February 2024, India, 10.1007/978-981-99-3557-4_32

Anand, N., Kumari S., **Deshmukh A.**, Comparison of image processing techniques to identify the land use/ land cover changes in the Indian semi-arid region, Innovation in Smart and Sustainable Infrastructure, Lecture Notes in Civil Engineering, 10 February 2024, India, 10.1007/978-981-99-3557-4_4

Kumari, S., **Deshmukh, A.**, Impact of Climate Change on Meteorological Drought in Different Climate Zones Across the Indian Sub-Continent, Fall meeting of the American Geophysical Union, December 2020, San Francisco, USA, 10.1142/9789811260100_0030.

Book Chapters

Singh, R., Veena, S., and **Deshmukh, A.**, (2017). Assessing the vulnerability of water availability across India to climate change and interlinking of rivers. In, Sustainable Holistic Water Resources Management, Raju, S., and Vasan, A. (eds)., 2017, M/S Jain Brothers, New Delhi, ISBN: 978-81-8360-253-2

- Implications of river interlinking on vulnerability of water availability across India.

Conference Presentations

Deshmukh, A., Singh, R., Discovering linkages between catchment characteristics and water quality using catchment classification, Water Future International Conference: September 24 – 27, 2019 in Bengaluru, India.

Singh, R., **Deshmukh, A.**, and Samal, A. Catchment classification: a tool to understand hydrology in data scarce regions. 15th Annual Meeting of the Asia Oceania Geosciences Society (AOGS), 03-08 June 2018, Honolulu, Hawaii, USA.

Deshmukh, A., and Singh, R., 2018. Identifying physio-climatic controls on watershed vulnerability to climate and land use change. International Soil and Water Assessment Tool Conference, 10-12 January 2018, Chennai, India.

Deshmukh, A., Samal, S., and Singh, R., 2017. Towards a robust framework for catchment classification. Fall Meeting of the American Geophysical Union, 11-15 December 2017, New Orleans, USA.

Deshmukh, A., Singh, R., Veena Sai. How do watersheds physio-climatic characteristics control its vulnerability to climate and land use change? NWMCCAAAS (2016), MANAGE, Hyderabad, India.

Singh, R., and **Deshmukh, A.**, 2015, December. What controls vulnerability of watersheds to climate and land use change across the United States? Fall meeting of the American Geophysical Union, 14-18 December 2015, San Francisco, USA.

TEACHING AND MENTORING

Teaching at Pandit Deendayal Energy University, India

Undergraduates

- Geospatial Analysis (22CV316T)
- Disaster management (22CV305T)
- Advanced Surveying and Geomatics (18CE305T)
- Surveying (22CE209T)
- Guided undergraduate project on "Introduction of Hydrologic modeling"

Postgraduates

- Taught “Introduction of GIS”
- M. Tech thesis on “Pavement distress detection using machine learning-based image processing”

Teaching assistant at IIT Hyderabad

- Water resources engineering (CE4502)
- Taught data science topics, "Basics of Python", "Data analysis with R", "Basics of LaTeX" to student group at IIT Hyderabad.

HONORS AND TALKS

- Invited talk on “Geospatial Analysis with R-Programming” at National Level Karyashalal on “Open-Source RS, GIS Tools, Drone Flight Control and Data Analysis” (OSRSDF-2024) — **March 2024, Gandhinagar**

- Online Seminar by Dr. Ankit Deshmukh on “How is climate change affecting catchment response?” at Pandit Deendayal Energy University, Gandhinagar. — June 2022, Gandhinagar

- Invited talk on SVNIT Surat in 5-days Atal FDP (Air Pollution & Climate Change APCC-2021) The title of the talk is “What is “Climate Change” and how it’s affecting catchments’ response?” — September 2021, Gandhinagar

- Recipient of research travel grant from Ministry of Human Resource Development, Govt. of India for presenting research work at the American Geophysical Union Fall Meeting 2017, held at New Orleans, Louisiana, USA. (December 2017). — Hyderabad, India

- Recipient of national fellowship from Ministry of Human Resource Development, Govt. of India to pursue doctoral studies at Indian Institute of Technology Hyderabad, India (2016-20). — Hyderabad, India

- Recipient of research excellence award for research performance at IIT Hyderabad for the years in 2016 and 2017. — Hyderabad, India

- Recipient of UGC-GATE fellowship from Ministry of Human Resource Development, Govt. of India to pursue Masters’ studies at India Institute of Technology Hyderabad, India (2014-15). — Hyderabad, India

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