

Faculty Profile

Name : Dr. Abhishek A Pathak
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About me:

I work in the areas of Water Resources Engineering, Remote Sensing, and data-driven approaches in Civil Engineering, with a focus on hydro-climatic extremes, urban hydrology, multivariate statistical analysis, and the application of Artificial Intelligence and Machine Learning for Water Resources Engineering.

I earned my Ph.D. from the National Institute of Technology Karnataka (NITK), Surathkal. I also worked as a Visiting Researcher at the Hydrological Sciences Laboratory at NASA's Goddard Space Flight Center (GSFC), USA.

At the National Institute of Engineering (NIE), Mysore, I serve as the Postgraduate Coordinator for the Hydraulics Program and the Faculty Advisor for the IEEE Geoscience and Remote Sensing Society (IEEE-GRSS) Student Chapter. I am a Life Member of the International Association of Hydrological Sciences (IAHS) and a Senior Member of IEEE. I have also been supported by several national and international organizations to participate in conferences and training programs across the USA, Germany, the United Kingdom, France, and Austria.

Awards:

- ANRF International Travel Grant For Young Scientists.
- SIRE Fellowship to **Work at NASA, USA.**
- **American Geophysical Union (AGU)** Travel grant.
- **DST International Travel Support (ITS) For Young Scientists**, from Science & Engineering Research Board (SERB), India.(2019)
- **India-UK water center sponsorship** for the workshop held at Lancaster University UK.

Qualification:

B.E (Civil Engineering), M.E (Water Resources Engineering), Ph.D.(NITK, Surathkal), Research Experience at NASA, USA.

Courses Taught:UG Courses

Engineering Mechanics, Fluid Mechanics, Hydraulics and Hydraulic Machineries, Irrigation Engineering Hydraulic Structures, Water Supply Engineering, Research Methodology, Hydrology and Irrigation Engineering, Design and Drawing of Irrigation Structures, Building Materials and Concrete Technology, Fluid Mechanics Laboratory.

PG Courses

Surface Water Hydrology, Hydrological Modeling, Applications of AI in Civil Engineering, Hydraulics and Hydrologic Engineering Laboratory, Research Methodology, Hydro Systems and Computational Laboratory

Publications:**Journal Publication:**

1. **Pathak, A.A.**, Mathad, A.R. & Gagnon, A.S. (2024) Integrating socio-economic variables in urban flood damage assessments: a case study of Bengaluru, India. Nat Hazards (2024). <https://doi.org/10.1007/s11069-024-07019-9>
2. Rajeev, H., Gururaj, P., & **Pathak, A. A.** (2024). Dynamic Monitoring of Surface Soil Moisture Fluctuations Using Synthetic Aperture Radar and Data-Driven Algorithms. Applied Geomatics.
3. Thaggahalli Nagaraju, S.K., **Pathak, A.A.** (2024) Retrieving Surface and Rootzone Soil Moisture Using Microwave Remote Sensing. J Indian Soc Remote Sens 52, 1415–1430 (2024). <https://doi.org/10.1007/s12524-024-01881-7>
4. Harshith, Y., & **Pathak, A. A.** (2023). Evaluation of Infiltration Models in an Agricultural Catchment Using Guelph Permeameter in Mysore District. In Surface and Groundwater Resources Development and Management in Semi-arid Region: Strategies and Solutions for Sustainable Water Management (pp. 57-78). Cham: Springer International Publishing.

5. **Pathak, A.A.,** Dodamani, B.M. (2021). "Connection between Meteorological and Groundwater Drought with Copula-Based Bivariate Frequency Analysis". *Journal of Hydrologic Engineering (ASCE)*. 26 (7). [https://doi.org/10.1061/\(ASCE\)HE.1943-5584.0002089](https://doi.org/10.1061/(ASCE)HE.1943-5584.0002089).
6. **Pathak, A.A.,** Dodamani, B.M., (2020). "Trend Analysis of Rainfall, Rainy-days and Drought: A Case Study for Ghataprabha River Basin, India". *Modeling Earth Systems and Environment*. 6, (1357–1372). DOI: 10.1007/s40808-020-00798-7.
7. **Pathak, A.A.,** Dodamani, B.M., (2019). "Comparison of Meteorological Drought Indices for Different Climatic Regions of an Indian River Basin". *Asia-Pacific Journal of the Atmospheric Sciences*. DOI: 10.1007/s13143-019-00162-5.
8. **Pathak, A.A.,** Dodamani, B.M., (2019). "Application of remotely sensed NDVI and soil moisture to monitor long-term agricultural drought". *Earth Resources and Environmental Remote Sensing/GIS Applications*. 111 56. doi.org/10.1117/12.2532852.
9. **Pathak, A.A.,** Dodamani, B.M., (2018). "Trend Analysis of Groundwater Levels and Assessment of Regional Groundwater Drought: Ghataprabha River Basin, India". *Natural Resources Research*. 28-3 (631–643) doi.org/10.1007/s11053-018-9417-0.
10. **Pathak, A.A.,** Dodamani, B.M., (2018). "Assessment of Agricultural Drought by Remote Sensing Technique". *Remote Sensing for Agriculture, Ecosystems, and Hydrology*. 10783, (1-13). doi.org/10.1117/12.2325494.
11. **Pathak, A.A.,** Nizar, S., Dodamani, B.M., (2018) "Trends in Agro-Meteorological Parameters as Groundwater Exploitation Indicators". *Earth and Environmental Science*., 167(1-9). doi :10.1088/1755-1315/167/1/012004.
12. **Pathak, A.A.,** Channaveerappa, Dodamani, B.M., (2016). "Comparison of Two Hydrological Drought Indices". *Perspectives in Science* 8 (1–4). doi:10.1016/j.pisc.2016.06.039.

International Conference

1. **Pathak A A**, Apoorva Mathad and Alexandre Gagnon, (2025), "Development of Depth-Damage Curves for Urban Flood Damage Assessment: A Case Study from India's Silicon Valley" AGU General Assembly 2025, held at New Orleans, LA from 15-19 December 2025,
2. Kumar, T.N.S., **Pathak, A.A.** (2024). Evaluation of Surface Soil Moisture Using Remote Sensing and Field Studies. In: Mesapam, S., Ohri, A., Sridhar, V., Tripathi, N.K. (eds) Developments and Applications of Geomatics. DEVA 2022. Lecture Notes in Civil Engineering, vol 450. Springer, Singapore. https://doi.org/10.1007/978-981-99-8568-5_16
3. B. S. Pavithra, G. Punithraj and **A. A. Pathak**, (2023) "Flood Hazard Mapping Using GIS-Enhanced Multi-Criteria Decision Analysis In Kushalnagara Taluk, India," 2023 IEEE India Geoscience and Remote Sensing Symposium (InGARSS), Bangalore, India, 2023, pp. 1-4, doi: 10.1109/InGARSS59135.2023.10490352.
4. Hrushikesh. R, **A. A. Pathak** and G. Punithraj, (2023) "Quantifying Surface Soil Moisture Variability Through Synergistic Applications of SAR and Machine Learning Techniques," 2023 IEEE India Geoscience and Remote Sensing Symposium (InGARSS), Bangalore, India, pp. 1-4, doi: 10.1109/InGARSS59135.2023.10490387.
5. R., P. Gururaj and **A. A. Pathak**, (2023) "Flood Frequency Analysis and Assessment of Submergence Level for the Mathikere Catchment - A Flood Resilient Region in Bengaluru," 2023 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), Bangalore, India, pp. 1-6, doi: 10.1109/CONECCT57959.2023.10234747.
6. Shekar, N.C.S., **Abhishek, P.A.** (2022). Evaluation of ArcSWAT Model for Streamflow Simulation in the Humid Tropical Netravathi Catchment. In: Bhattacharjya, R.K., Talukdar, B., Katsifarakis, K.L. (eds) Sustainable Water Resources Management. Advances in Sustainability Science and Technology. Springer, Singapore. https://doi.org/10.1007/978-981-16-7535-5_8
7. Datta R., **Pathak A.A**, Dodamani B.M. (2019) "Assessment of Meteorological Drought Return Periods Over A Temporal Rainfall Change" International conference on "Civil

Engineering Trends and Challenges for Sustainability” (CTCS-2019). Held from 23-24 May 2019 at NMAM Institute of Technology, Nitte, Karkala, India.

8. **Pathak A.A.**, Dodamani, B.M. (2019) “Enhancement in the Characterization of Historical and Future Droughts with a Copula Based Integrated Drought Index” AGU General Assembly 2019, held at San-Francisco, CA, USA from 9-13 December 2019.
9. **Pathak A.A.**, Dodamani, B.M. (2019) “Analysis of Agricultural Drought and Investigation of Bivariate Return Periods using Copula” EGU General Assembly 2019, 7–12 April 2019, Vienna, Austria.
10. **Pathak A.A.**, Dodamani B.M. (2018) “Assessment of Agricultural Drought by Remote Sensing Technique” SPIE Remote Sensing 2018. 10-13 September 2018, Berlin, Germany.
11. **Pathak A.A.**, Dodamani B.M. (2017) “Drought assessment for Ghataprabha River basin - a multi probability approach” 3rd World’s Large River Conference on the “Status and Future of the World’s Large Rivers”. April 18 - 21, 2017. New Delhi, India
12. P., Inayathulla M., Chalapathi K., **Pathak A.A.** (2016) “Hydrologic Analysis Of Suryanagar watersheds Using IDF Curves And Runoff Models” International Conference & Exhibition on Best Practices in Sustainable Water, Wastewater & Energy Management-SWWEM-2016. 16-19th August, 2016, IISC Bangalore, India.
13. **Pathak A.A.**, Dodamani B.M. (2016) “A Review on Agricultural Drought Indices”, HYDRO 2016 - 21st International Conference on Hydraulics, Water Resources and Coastal Engineering, 8-10 December 2016. ISH-Pune, India.

Book chapters

1. Santhosh Kumar T N and **Pathak A A** (2024) Evaluation of Surface Soil Moisture Using Remote Sensing and Field Studies. Lecture Notes in Civil Engineering.

2. Harshith Y **Pathak, A. A.** (2023). Evaluation of Infiltration Models in an Agricultural Catchment Using Guelph Permeameter in Mysore District, Surface and Groundwater Resources Development and Management in Semi-arid Region, Springer. DOI: 10.1007/978-3-031-29394-8_4
3. Shekar, N.C.S., **Pathak, A.A.** (2022). Evaluation of ArcSWAT Model for Streamflow Simulation in the Humid Tropical Netravathi Catchment. Water Resources Management. Advances in Sustainability Science and Technology. Springer. https://doi.org/10.1007/978-981-16-7535-5_8
4. Datta R., **Pathak A.A.**, Dodamani B.M. (2019) 'Assessment of Meteorological Drought Return Periods Over A Temporal Rainfall Change' Trends in Civil Engineering and Challenges for Sustainability, Springer. DOI: 10.1007/978-981-15-6828-2_42

Other achievements:

Ph.D. Guidance: 4 (Ongoing)

Consultancy works:

1. Discharge Measurements in Varuna Canal and in Hemavathi canal.
2. Vetting of Lift Irrigation Project for Minor Irrigation and Groundwater Development Department, Mandya Division.
3. Flood Protection works at Kushalnagar, Kodagu
4. Hydrological Studies for Kukkrahalli Lake Mysore for INTACH Delhi.
