Kaushlendra Verma

Post-Doctorate at
Meteo-France, Toulouse

Date of Birth: Nov. 10, 1992

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Interests

- Remote Sensing
- Satellite Altimetry
- Hydrological Modelling
- Machine Learning

Skills

Programming:
- Python
- Bash scripting

Operating System:
- Linux, Windows

Software:
- ArcGIS, ERDAS, SNAP and QGIS

Hydrological Models:
- ISBA-CTRIP
- WRF, WRF-Hydro
- SWAT^{+}

Working Knowledge:
- High-Performance Computing
- Google Cloud Computing

Research Objective

Driving advancement in global hydrology as a CNES Postdoctoral Fellow, through the integration of satellite altimetry and land-atmospheric model to enhance hydrological simulations, bridging the gap between remote sensing technology and practical water management solutions.

Experience

2023 – 2025 **Post-Doctorate** — **Meteo-France, Toulouse**
Title: Towards a Global Scale SWOT-CTRIP Hydrological Data Assimilation System.
Supervisor: Simon Munier and Aaron Boone

Education

2018 – 2022 **Ph.D. in Remote Sensing** — **IIT Bombay, India**
Title: Potential of Surface Water and Ocean Topography (SWOT) Mission for Inland Hydrology.
Supervisor: Prof. J. Indu
Grade: CGPA: 7.64/10

2016 – 2018 **M.Tech. in Water Resource Engineering** — **VNIT-Nagpur, India**
Title: Validation of Sensitivity of GRACE and GLDAS Data to Groundwater Variation within Basaltic Aquifer System using Spatial Analysis and ANN.
Supervisor: Dr. Y.B.Katpatal
Grade: CGPA: 9.26/10

2010 – 2014 **B.Tech. in Civil Engineering** — **UPTU, India**
Title: Analysis and Design of a Multi-Storey Buildings.
Supervisor: Mr. Shailendra Kumar Prajapati
Grade: 75.88/100%

Recent Training

2023 **Adaptation and development of skills** — **CERFACS**
Title: Training on Data Assimilation by Centre Europeen de Recherche et de Formation Avancee en Calcul Scientifique.

2020 **Community WRF-Hydro Modeling System Abridged Virtual Training** — **NCAR**
Title: First virtual abridged WRF-Hydro Training Workshop by National Center for Atmospheric Research.

Short-term Courses

2016 **Global Initiative of Academic Networks** — **IIT BBS**
Title: Extreme Weather and Climate Variability: Observation, Understanding and Prediction.

2016 **Global Initiative of Academic Networks** — **IIT Madras**
Title: Hydro-informatics for Integrated Water Resource Management using SWAT-Model.

Awards and Achievements

2023-25 Centre National d'Etudes Spatiales (CNES)-Post Doctoral Fellowship 2022.
2021 Awarded AGU Fall meeting 2021 Travel Grant.
2018-23 Awarded MHRD India Fellowship for pursuing Ph.D.
2016-18 Awarded MHRD India Fellowship for pursuing M.Tech.

Hobbies

I do science communication through stories on my LinkedIn. I actively participate in sports and served as the hostel sports secretary of IIT Bombay. I also served on the hostel election commission committee in 2021, and was positioned as the Academic Unit Representative for Academic Affairs in 2022, and hostel warden nominee.

Metrics

Profiles

Languages

Hindi (First Language)

English (Second Language)

International-Collaboration

NASA SWOT Early Adopters Project-2021; SWOT Science Team Member 2024

- Through the DST-CNRS project I did a scientific visit at INRAE and LEGOS from Nov,2021 to Jan,2022. Currently, I am a member of the science team through the Meteo-France Surface Team working on global hydrology and data assimilation

Publications

Journals

- **Verma K.**, and Indu J. (2023), "Applicability of SWOT data in calibrating WRF-Hydro hydrological model over the Tawa River basin", Geocarto International, 38(1). 10.1080/10106049.2023.2185292
- **Verma K.**, Nair A., Indu J., Karmakar S. and Calmant S. (2021), "Satellite Altimetry for Indian Reservoirs", Water Science and Engineering, 14(4),277-285. 10.1016/j.wse.2021.09.001
- **Verma K.**, and Indu J. (2021),"Effect of satellite altimetry sampling error in estimating reservoir storage and outflow",Geocarto International. 10106049.2021.1980615
- Nair A. **Verma K.**, Ghosh S., Karmakar S. and Indu J. (2021), "Exploring the potential of SWOT mission for reservoir monitoring in Mahanadi basin", Advances in Space Research, 69 (3),1481-1493. 10.1016/j.asr.2021.11.019
- **Verma, K.**, and Katpatal, Y. B. (2019),"Groundwater Monitoring Using GRACE and GLDAS Data after Downscaling Within Basaltic Aquifer System", Groundwater, 58(1),143–151. 10.1111/gwat.12929

International Conferences

- **Verma K.**, Munier S., Boone A., and Le Moigne P. (2024). "Beyond Gauges: A Framework for Revealing Global River Discharge Dynamics using SWOT and CTRIP-HyDAS.", AGU 2024
- **Verma K.**, Munier S., Boone A., and Le Moigne P. (2024). "Navigating Uncertainties: Optimizing SWOT Assimilation for River Discharge Estimation.", 30 Years of progress in radar altimetry symposium
- **Verma K.**, Munier S., Boone A., and Le Moigne P. (2023). "Advancing Global-Scale River Discharge Estimation: A Novel Framework for Assimilating SWOT altimetry using CTRIP-HyDAS.", Hydrospace
- **Verma K.**, and Indu J. (2021). "Assessing the Potential of the Surface Water and Ocean Topography (SWOT) Mission for Reservoir Monitoring over India", AGU Fall Meeting
- **Verma K.**, Katpatal Y.B. and Chengot R.(2018). "Performance evaluation of SWAT Model for groundwater variability analysis in Venna river basin of central India", International Conference and Workshop on Soil and Water Assessment Tool at Indian Institute of Technology Madras ICSR
- **Verma K.** and Katpatal Y.B. (2018). "Soil moisture variability correlation with GLDAS data using SWAT-Model output data for Upper Godavari River basin", International Conference and Workshop on Soil and Water Assessment Tool at Indian Institute of Technology Madras ICSR

Book Chapter

- Indu J., Nair A., Pradhan A., Mangla R., Krishnan S. **Verma K.**, and Huggannavar V. (2022), "Terrestrial water budget through radar remote sensing", In Earth Observation, Radar Remote Sensing, Elsevier, 123-148. 10.1016/B978-0-12-823457-0.00005-7
- **Verma K.** and Katpatal Y.B. (2021). "Monitoring of Soil Moisture Variability and Establishing the Correlation with Topography by Remotely Sensed GLDAS Data. In: Pandey A., Mishra S., Kansal M., Singh R., Singh V. (eds) Water Management and Water Governance. Water Science and Technology Library, vol 96. Springer, Cham. 10.1007/978-3-030-58051-3$_10$