Poulomi Ganguli

Assistant Professor, Indian Institute of Technology Kharagpur
Department of Agricultural and Food Engineering

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Research Interests

My research interest is at the intersection between hydrology and climate extremes, with particular emphasis on statistical modeling of hydroclimatic extremes while relating these statistical properties to physics and dynamics of the atmosphere. My research focuses on modeling and estimation of hydroclimatic events in multivariate context, which can help more accurate assessment of risk of extreme events, especially droughts, low flows and floods, and compound extremes in hydrology. I have applied my skills to different aspects of the field of hydroclimatic extremes, such as analysis of precipitation, both in point and regional scales.

Areas of Research

Hydroclimatology and hydrological extremes, Statistical hydrology, hydrometeorology, Hydroinformatics, data assimilation, Climate model evaluations, Climate change impact assessment on surface and subsurface hydrology, Climate dynamics, Complex networks, Sea Level Rise, Climate-water-energy nexus

Education

July 2008 – October 2012	**Indian Institute of Technology Bombay**, India, CPI: 9.25/10 **Ph.D.,** Civil Engineering (Advisor: Prof. M. Janga Reddy) **Thesis**: Multivariate Frequency Analysis and Predictive Uncertainty Assessment of Droughts using copulas (**Best Dissertation award in Civil Engineering**)
July 2005 – May 2007	**Indian Institute of Technology Kharagpur**, India, CPI: 9.42/10 **M.Tech.,** Water Resources Development and Management (Advisor: Prof. M. K. Jha) **Thesis:** Development of computer tool for analyzing aquifer system
July 2001 – May 2005	**College of Agricultural Engineering, University of Agricultural Sciences Dharwad**, CPI: 8.97/10 (**University Gold Medal**) **B.Tech,** Agricultural Engineering (Advisor: Er. Vijay Kumar Palled) **Thesis:** Performance and Emission Characteristics of Biodiesel Fuel from Jatropha in a Direct Injection Compression Ignition Engine

Awards and Fellowships

Fellowships

- 2020: Nominated for USERN (Universal Scientific Education and Research Network) 2020 young investigator (below age of 40) award.
- 2017: **Alexander von Humboldt** Research Fellowship (**Host Institute** Section: Engineering Hydrology, GFZ Potsdam, Germany)
- 2016: Postdoctoral fellowship at McMaster Water Resources and Hydrologic Modeling Group (NSERC FloodNet, Canada), McMaster University
- 2013: Postdoctoral fellowship at Northeastern University (NSF Expedition in Computing)
- 2005-07: MHRD, Govt. of India scholarship to pursue M. Tech degree at IIT Kharagpur
- 2005-06: Indira Gandhi postgraduate scholarship, University Grant Commission, New Delhi
- 2001-05: Merit Scholarship from Govt. of Karnataka for pursuing B.Tech degree program
- 2004-2007: TATA Motors Golden Jubilee Scholarship
- 2002-2004: TATA Motors Silver Jubilee Scholarship
- 2004: All India 27th rank (95.54 percentile) in Graduate Aptitude Test in Engineering (GATE) - 2004
- 1999: TATA Hitachi Scholarship (at Grade 10th)

Honors and Awards

- 2013: **Best PhD dissertation award** in Civil Engineering, IIT Bombay
- 2007: Employee performance award (July – December 2007) at Evalueserve India for team work
- 2005: **University of Agricultural Sciences, Dharwad Gold Medal** for Securing First Rank in B.Tech
- 2005: Faruk Anwar Co. Raichur Gold Medal in B. Tech
- 2005: Sri. Veerabhadrappa Channappa Mataldinni Gold Medal in B. Tech
- 2005: Gangu Bai R Patil Cash award in B. Tech
- 2005: Sri. S. Eshwarappa, Raichur cash award in B. Tech

Professional Experience

July 2018 – **present**	**Assistant Professor Grade - I**, Department of Agricultural and Food Engineering, IIT Kharagpur, India
May 2019 – December 2019	**Visiting Research Scientist**, GFZ German Research Centre for Geosciences, Potsdam, Germany
June 2017 – June 2018	**Scientist (Research Fellow)**, Section Hydrology, Helmholtz Center Potsdam, GFZ German Research Center for Geosciences, Potsdam, Germany
May 2016 – May 2017	**Postdoctoral Fellow**, Department of Civil Engineering, McMaster University, Hamilton, Canada
May 2013 – December 2015	**Postdoctoral Fellow**, Department of Civil and Environmental Engineering, Northeastern University, Boston, USA
December 2012 – April 2013	**Assistant Professor,** School of Civil Engineering, Kalinga Institute of Industrial Technology (KIIT) University, Bhubaneswar, India
August 2007 – April 2008	**Patent Analyst**, Intellectual Property Group, Evalueserve, Gurgaon, India

Referred Journal Publications

Citation Statistics: *Google scholar* Citations **1122**, h-index **18**; *Scopus* Citations **825**, h-index **16**

ORCID: orcid.org/0000-0002-2372-1121

2022

1. Das, S.R., **Ganguli, P.** Predictability of rainfall-induced landslides: The case study of Western Himalayan Region. Submitted to Special Issue at *Natural Hazards and Earth System Sciences*: Hydro-meteorological extremes and hazards: vulnerability, risk, impacts, and mitigation. Manuscript #: EGUSPHERE-2022-243 (In 2nd *stage of revision*).
2. **Ganguli, P**., Pradhan, S. Multivariate approach reveals a higher likelihood of compound heat stress-pluvial floods in urban India. Article pre-print: https://doi.org/10.1002/essoar.10510858.1
3. **Ganguli, P**., Majhi, A., Kumar, R. (2022). Observational evidence for multivariate drought hazard amplifications across disparate climate regimes. Earth's Future. DOI: 10.1029/2022EF002809.
4. **Ganguli, P**. (2022). Amplified risk of compound heat stress - dry spells in urban India. Climate Dynamics. DOI: 10.1007/s00382-022-06324-y. IF 4.375.
5. **Ganguli, P**., Singh, B., Reddy, N.N., Raut, A., Mishra, D., Das, B.S. (2022). Climate-catchment-soil control on hydrological droughts in peninsular India. Scientific Report. DOI: 10.1038/s41598-022-11293-7. IF 4.379

6. **Ganguli, P**., Rama, N.Y., Chatterjee, C. (2022). Understanding Flood Regime Changes of the Mahanadi River. *ISH J. Hydraulic Engineering.* DOI: 10.1080/09715010.2022.2068356. IF 1.7

7. Khatun, A., **Ganguli, P**., Bisht, D.S, Chatterjee, C., Sahoo, B. (2022). Understanding the impacts of predecessor rain events on flood hazard in a changing climate. *Hydrological Processes.* Doi: 10.1002/hyp.14500. IF 3.565.

2020

8. **Ganguli, P.**, Paprotny, D., Hasan, M., Guentner, A., Merz, B. (2020). Projected changes in compound flood hazard from riverine and coastal floods in northwestern Europe. Earth's Future. DOI: 10.1029/2020EF001752. IF 7.50.

9. **Ganguli, P**., Rama, N.Y., Chatterjee, C. (2020). Analysis of persistence in the flood timing and the role of catchment wetness on flood generation in a large river basin in India. *Theoretical and Applied Climatology.*139, 373-388. IF 2.882.

2019

10. **Ganguli, P.,** Merz, B. Trends in compound flooding in Northwestern Europe during 1901-2014. *Geophysical Research Letters.* DOI: 10.1029/2019GL084220. IF 4.72

11. **Ganguli, P.,** Merz, B. Extreme coastal water levels exacerbate fluvial flood hazards in Northwestern Europe. *Scientific Reports.* 9, 13165, IF* 4.38 (*Featured as a* ***Top in Scientific Reports Earth Sciences Papers****, with* ***4280*** *downloads since September 2019*).

12. **Ganguli, P.,** Coulibaly, P. Assessment of future changes in Intensity-Duration-Frequency curves for Southern Ontario using North American (NA)-CORDEX models with nonstationary methods. Journal of Hydrology*: Regional Studies 22,* 100587. IF 5.023

2017

13. **Ganguli, P.,** Coulibaly, P. (2017). Does nonstationarity in rainfall require nonstationary Intensity-Duration-Frequency Curves? Hydrology and Earth System Sciences, 21(12):6461-6483. IF* 5.24

14. **Ganguli, P.,** Kumar, D., Ganguly, A.R (2017). US power production at risk from water stress in a changing climate. *Nature Scientific Report.* 7 (11983), DOI: 10.1038/s41598-017-12133-9. IF 4.38 (*Featured as a* ***Top 100 in Scientific Reports Earth Sciences Papers*** *in 2017*)

2016

15. **Ganguli, P.,** Ganguly, A.R. (2016). Space-time trends in US meteorological droughts. *Journal of Hydrology: Regional Studies*. 8, 235-259, IF 5.023

16. **Ganguli, P.,** Ganguly, A.R. (2016). Robustness of meteorological droughts in dynamically downscaled climate simulations. *Journal of the American Water Resources Association (JAWRA).* 52(1): 138-167, IF 3.202

2015

17. Ganguly, A.R., Kumar, D., **Ganguli, P.**, Short, G., Klausner, J. (2015). Nonstationarity and deep uncertainty: Water stress on US power production. *Computing in Science and Engineering Magazine*, 17(6): 53 – 60, IF 1.935

2014

18. Ganguly, A.R., Kodra, E.A., Banerjee, A., Boriah, S., Chatterjee, S., Chatterjee, S., Choudhary, A., Das, D., Faghmous, J., **Ganguli, P.**, Ghosh, S., Hayhoe, K., Hays, C., Hendrix, W., Fu, Q., Kawale, J., Kumar, D., Kumar, V., Liess, S., Mawalagedara, R., Mithal, V., Oglesby, R., Salvi, K., Snyder, P.K., Steinhaeuser, K., Wang, D., Wuebbles, D (2014). Toward enhanced understanding and projections of climate extremes using physics –guided data mining techniques. *Non-linear processes in Geophysics.* 21, 777-795. IF: 1.74

19. **Ganguli, P.**, Reddy, M.J. (2014) Ensemble prediction of regional droughts using climate inputs and SVM-copula approach. *Hydrological Processes.* 28, 4989–5009. IF: 3.565

20. **Ganguli, P**. (2014) Probabilistic analysis of extreme droughts in southern Maharashtra using bivariate copulas. *ISH Journal of Hydraulic Engineering*. 20(1): 90-101. DOI: 10.1080/09715010.2013.843279. IF: 1.70

2013

21. **Ganguli, P.**, Reddy, M.J. (2013) Probabilistic assessment of flood risks using trivariate copulas. Theoretical and Applied Climatology. 111 (1-2): 341-360. IF: 2.882

22. **Ganguli, P.**, Reddy, M.J. (2013) Analysis of ENSO based climate variability in modulating drought risks over Western Rajasthan in India. Journal of Earth System Sciences. 1: 253 – 269. IF: 1.423

23. **Ganguli, P**., Reddy, M.J. (2013) Evaluation of trends and multivariate frequency analysis of droughts in three meteorological subdivisions of western India. International Journal of Climatology. 34(3): 911-928. IF: 4.069

24. Reddy, M.J., **Ganguli, P**. (2013) Spatio-temporal analysis and derivation of copula-based intensity-area-frequency curves for droughts in western Rajasthan (India). Stochastic Environmental Research and Risk Assessment. 27(8):1975-1989. IF: 3.379

2012

25. **Ganguli, P.,** Reddy, M.J. (2012) Risk assessment of droughts in Gujarat using bivariate copulas. Water Resources Management. 26(11): 3301-3327. IF: 2.848
26. Reddy, M.J., **Ganguli, P.** (2012). Bivariate flood frequency analysis of Upper Godavari River flows using Archimedean copulas. Water Resources Management. 26(14): 3995-4018. IF: 3.537
27. Reddy, M.J., **Ganguli, P**. (2012) Application of copulas for derivation of drought Severity-Duration-Frequency curves. Hydrological Processes. 26(11): 1672-1685. IF: 3.565
28. Reddy, M.J., **Ganguli, P**. (2012) Risk assessment of hydro-climatic variabiliy on groundwater levels in the Manjara Basin aquifer in India using Archimedean copulas. *ASCE* Journal of Hydrologic Engineering. 17(12): 1345 – 1357. IF: 1.594

*indicates Impact Factor reported in the journal website

Working Papers

- Raut, A., **Ganguli, P.,** Woehling, T., Kumar, R. Coincidence analysis of hydrological drought severity and onset reveals strong spatial coherence in tropical rain-dominated flow regimes in Peninsular India. In Preparation.

Scholarly Presentations and Conference Proceedings

2022

1. **Ganguli, P.**, Majhi, A., Kumar, R. (2022). Robust amplifications in multivariate risks in global drought propagations. Abstract submitted at AGU Fall meeting 2022, Abstract ID: 1049000.
2. **Ganguli, P.**, Raut, A. Purushothaman, N.K., Reddy, N.N., Das, B.S. (2022). Climate-Catchment-Soil- and Land Use and Land Cover Controls on Streamflow Droughts in Tropical Catchments of Peninsular India. Abstract submitted at AGU Fall meeting 2022, Abstract ID: 1054399.
3. Raut, A., **Ganguli, P.** (2022). Understanding rarity of streamflow droughts across global tropics. Abstract submitted at AGU Fall meeting 2022.
4. **Ganguli, P.** (2022). Compound hot-dry events in urban India: variability and drivers. EGU General Assembly 2022, Paper # EGU22-934, Vienna, Austria (Oral).
5. Raut A., **Ganguli, P**., Wöhling, T., Kumar, R. (2022). Detecting drivers of nonstationarity in hydrological droughts across tropical Indian catchments. Abstract submitted at Frontiers in Hydrology, 19-24 June 2022, San Juan, Puerto Rico. Abstract ID#: 1032616.
6. Pradhan, S., **Ganguli, P**. (2022). Multivariate approach reveals a higher likelihood of compound warm-wet spells in urban India. European Geophysical Union's EGU General Assembly 2022, paper # EGU22-2647, Vienna, Austria.
7. Raut, A., **Ganguli, P.,** Reddy, N.N., Wöhling, T., Kumar, R., Das, B.S. (2022). Regional trends and physical controls of streamflow drought characteristics in tropical catchments. EGU General Assembly 2022, Paper # EGU22-1239, Vienna, Austria.

2021

8. Raut, A., **Ganguli, P**. (2021). Space-time Synchronicity and drivers of hydrological droughts in tropical rain-dominated catchments of peninsular India. Workshop on Knowledge Guided Machine Learning (KGML2021), August 9 – 11, 2021, University of Minnesota.
9. **Ganguli, P**., Pradhan, S. (2021). Compounding risk of heat stress – rain induced floods in urban India. AGU Fall Meeting 2021, at session H125. Hydrometeorological extremes: prediction, simulation, and change. Paper number: H41J-02.
10. Khatun, A., **Ganguli, P**., Chatterjee, C., Sahoo, B. (2021). Assessing compound floods in a large tropical river basin under changing climate. AGU Fall Meeting 2021, Abstract number: 888027.

11. Raut A., **Ganguli, P**., Wöhling, A., Kumar, R. (2021). Timing of drought onset controls hydrological drought responses in tropical catchments. AGU Fall Meeting 2021, at session GC027. Compounding climate extremes: Mechanisms, Diagnostics, and Current and Future Impacts. Paper number: GC55D-0470.
12. **Ganguli, P.**, Singh, B., Raut, A. (2021). Spatiotemporal clustering of hydrological droughts in peninsular India. EGU General Assembly 2021, Abstract no. EGU21-87.
13. **Ganguli, P.**, Paprotny, D., Hasan, M., Guentner, A., Merz, B. (2021). Impact of sea-level rise on projected changes in compound flood hazard. Workshop on compound weather and climate events, 13-15 January 2021, Bern, Switzerland.

2020

14. **Ganguli, P.**, Paprotny, D., Hasan, M., Guentner, A., Merz, B. (2021). Correlation among drivers affects projected 21st century changes in compound floods over European coasts. Paper # NH024-01. **Oral presentation** at AGU Fall meeting 11 December, 2020; at session NH003. Concurrent, Consecutive and Cascading Events: An Emerging Challenge For Risk Assessment And Management Of Compound Natural And Natech Hazards.
15. **Ganguli, P.**, Merz, B. (2020). Importance of tail dependence in compound flood modelling. Presented at RISK KAN webinar series on compound event, 3rd June 2020. Organized by Future Earth and WCRP.
16. **Ganguli, P.**, Merz, B. (2020). Compounding effects of riverine and coastal floods and its implications for coastal urban flood resilience. Abstract #: EGU2020-6439, Oral presentation at EGU General Assembly, 4th May 2020, Vienna, Austria.
17. Vorogushyn, S., Wietzke, L., Guse, B., **Ganguli, P.**, Lun, D., Blöschl, G., Merz, B. (2020). Muster von Heavy-Tail Verhalten von Hochwasser in Europa. Tag der Hydrologie 2020 (Day of Hydrology 2020), March 31 – April 1, 2020, University of Potsdam, Potsdam, Germany.
18. Khatun, A., **Ganguli, P.**, Chatterjee, C., Sahoo, B. (2020). Effect of catchment wetness in flood generation of a medium-sized catchment with tropical pluvial regime. Roorkee Water Conclave (RWC) 2020, February 2628, IIT Roorkee, India.

2019

19. Rama, N.Y., **Ganguli, P.**, Chatterjee, C. (2019). Trends and shifts in timing of flood peaks across Mahanadi River Basin, India. Abstract for presentation at International Conference on Climate Change Impacts, Vulnerabilities, and Adaptation: Emphasis on India and Neighborhood (CCIVA 2019), IIT Kharagpur, India.

2018

20. **Ganguli, P.,** Merz, B. (2018). Risk of compound flooding from coastal and fluvial floods over Northwestern Europe. EGU Abstract, Vol. 20, EGU2018-1929, 2018.

2017

21. **Ganguli, P.** (2017). *Guest lecture* on Frequency Analysis in Hydrology: focused on flood frequency (probability) distributions. Department of Civil Engineering University of Manitoba, Winnipeg, Canada, November 9, 2017.
22. **Ganguli, P.,** Coulibaly, P. (2017). Assessing nonstationarity in rainfall extremes and changes in future design rainfall in NA-CORDEX regional climate models across Southern Ontario. Poster: The FloodNet Annual General Meeting, Montreal, June, 27-28, 2017.
23. **Ganguli, P.,** Coulibaly, P. (2017). Assessing nonstationarity in extreme rainfall records in Southern Ontario. Paper ID: 243896, Oral: ASCE-EWRI Congress, Sacramento, California, May, 21-25, 2017.

2016

24. **Ganguli, P.,** Coulibaly, P. (2016). Extreme rainfall nonstationary investigation and evaluation of nonstationary-based Intensity-Duration-Frequency (IDF) curves for Southern Ontario region in a changing climate. Poster: The FloodNet Annual General Meeting, Vaughn, Toronto, September 19, 2016.

2014

25. **Ganguli, P.,** Kumar, D., Yun, J., Short, G., Klausner, J., Ganguly, A.R. (2014). Water stress on US power production at decadal time horizons. Poster: AGU Fall meeting, San Francisco, California, December 15, 2014, paper no. GC13B-0633.

2013 26. **Ganguli, P.**, Ganguly, A.R. (2013). Severity-duration-frequency curves of meteorological droughts over US. **Oral**: AGU Fall meeting, San Francisco, California, December 12, 2013, paper no. H44C – 04.

27. Mawalagedara, R., **Ganguli, P**., Ganguly, A. R., Oglesby R.J. (2013). Hydrology and water resources of Tropical Island and implications of global warming: Case studies over Puerto Rico. Poster: AGU Fall meeting, San Francisco, California, December 13, 2013, poster no. GC51A.

2012 28. **Ganguli, P**., Reddy, M.J. (2012). Copula-based drought severity-area-frequency analysis in Western Rajasthan, India. 21st Century Watershed Technology: Improving Water Quality and Environment, **Oral**: ASABE, Bari, Italy, May 27-June 1st, 2012. (Received travel grants from **Department of Science & Technology** and **Council of Scientific and Industrial Research,** India). DOI: 10.13031/2013.41421.

2011 29. **Ganguli, P.**, Reddy, M.J. (2011) Bivariate Archimedean copula in drought frequency analysis in Maharashtra. Oral: International Congress of Environmental Research, SVNIT Surat, India, December 15-17, 2011.

30. **Ganguli, P.,** Reddy, M.J. (2011). Hydro-climatic variability study of Manjara Basin aquifer using bivariate Archimedean copula. Oral: International Conference on Sustainable Water Resources Management and Climate Change Adaptation, NIT Durgapur, India, February 17-19, 2011.

2010 31. **Ganguli, P**., Reddy, M.J. (2010). Probabilistic characterization of hydrologic extremes using bivariate copulas. Oral: 9th International Conference on Hydro-science and Engineering (ICHE-2010). IIT Madras, India, August 2-5, 2010.

32. Reddy, M.J., **Ganguli, P**. (2010). Multivariate statistical analysis of flood flows using copulas. Oral: National conference on Sustainable Water Resources Management and Impact of Climate Change (SWRM-2010). BITS-Pilani campus, Hyderabad, India, March 5-6, 2010.

2009 33. **Ganguli, P.,** Reddy, M.J., Rastogi, A.K. (2009). Estimation of groundwater recharge using Support Vector Regression. Oral: FSES-2009, IIT Kharagpur, India, December 17-19, 2009

2007 34. **Ganguli, P.,** Jha, M. K. (2007). Computer-aided analysis of well interference in confined and unconfined aquifer systems. Oral: National Conference on Technologies for Sustainable Utilization of Natural Resources (TechSUNR-2007). JITM Paralakhemundi, Orissa, India, February 24-25, 2007.

Invited Talk/Lecture

2021

1. **Invited Speaker**: Interconnected risks and cascading disaster: Implications for climate resilience. Participated as panelist at Resilience week 2021. Organized by Idaho National Laboratory, October 18-21, 2021. Washington, D.C.
2. **Keynote speaker**: Big data in natural hazard modelling: Challenges and Opportunities for Machine Learning. Workshop on High Performance Computing in Agriculture Domain under the National Supercomputing Mission (NSM) from Supercomputer Education and Research Centre (SERC) on 14-16th July, 2021. Jointly organized by IIT Indore, IISR Indore, Mahindra University Hyderabad, IISc Bangalore, IIT Kharagpur, and C-DAC Pune.
3. **Invited Speaker**: ASCE Manual of Practice on Compound Flooding. Virtual Workshop on Compound flooding. Compound Floods – A synthesis of current understanding with a focus on mid-latitudes and tropical pluvial catchments. 15th March – 23rd July, Washington DC, USA.
4. **Invited Speaker**: Understanding the implications of compound climate extremes on regional hydrology, 11th May, 2021, Interdisciplinary Center for Water (ICWaR), IISc Bengaluru.
5. **Lightning presenter**: Workshop on Compound Events 2021. 13-15 January 2021, Bern, Switzerland.

2020

6. **Invited speaker**: RISK KAN webinar series on the compound event, June 3, 2020. A joint initiative of Future Earth, IRDR and WCRP.

2019 7. **Session speaker**: Towards understanding single and compound flood extremes in the Anthropocene. Session name: Climate data science – Monsoon and beyond, IISA – 2019, IIT Bombay, December 26-30, 2019.

2018 8. **Invited speaker**: Translating climate uncertainty in risk-informed water resources decisions, Department of Civil Engineering, IISc Bangalore, March 14, 218.

9. **Invited Speaker**: School of Civil Engineering, Newcastle University, Newcastle upon Tyne, UK; November 5, 2018.

10. **Invited Speaker**: School of Civil Engineering, University of Warwick, UK; November 7, 2018.

2017 11. **Guest Lecture**: Frequency analysis in Hydrology: focused on flood frequency (probability) distributions. Department of Civil Engineering University of Manitoba, Winnipeg, Canada, November 9, 2017

2013 12. **Guest Lecture**: Characterization and short-term prediction of droughts over India using copula-based approaches. Presented at Expedition biweekly meeting at Northeastern University, Boston, MA, 26th July, 2013.

New Dataset Developed

Ganguli, P., Paprotny, D., Hasan, M., Güntner, A., Merz, B. (2019). Compound flood drivers for northwestern Europe in high-resolution EURO-CORDEX Simulations. GFZ Data Services. http://doi.org/10.5880/GFZ.4.4.2019.003

Book Chapter

Blumenfeld, L., Hall, T., Henderson, H., Bressler, L., Moskos, C., **Ganguli, P**., Kumar, D., Ganguly, A. R. (2017). Climate and human stresses on the water-energy-food nexus. Ed., S. Shekhar, H. Xiong, X. Zhou. Encyclopedia of GIS, Springer, 179 - 188.

Contributing Author

ASCE Manual of Practice on Compound Floods. (*In Preparation*). Eds. Olsen, R., Pietrzak, J., Obeysekera, J.

- Lead contributing author for the Chapter 2: Background, coauthors: Jain, S., De Michele, C., Salvadori, G.
- Contributing author for the Chapter 7: Analysis of Changing Conditions
- Contributing author for the Chapter 8: Risk and Uncertainty Analysis.

Copyright/Patent

Jha, M.K., **Ganguli, P**. (2007). Aquifer Manager: A Comprehensive Suit of Computer Tools for Forward and Inverse Modeling of Groundwater Systems. Registration No. SW-3559/2007, copyrighted on July 16, 2007 by SRIC IIT Kharagpur.

Reports

- Ganguly, A. R., Ganguli, P., and Kumar, D. (2014). Water Stress on U.S. Power Production at Decadal Time Horizons. United States. DOI:10.2172/1339441.
- Expedition Annual Report (2015) for the period 09/01/2014-8/31/2015, Collaborative Research: Understanding Climate Change: A Data Driven Approach, **Contributed to Climate Extremes and Uncertainty** section**.** NSF Award ID 1029771.

Non-peer Reviewed Publications

- **Ganguli, P**. (2016) Copula theory: Introduction and application to meteorological droughts. LAP Lambert Academic Publishing. ISBN 978-3-659-96041-3, pp. 277.

- **Ganguli, P**. (2007) Development of computer tools for analyzing aquifer systems. M. Tech. Thesis, Indian Institute of Technology Kharagpur, India.

Research Guidance

Sl. No.	Degree Hierarchy	Number of completed	Number in progress
1	Ph.D.	0	1[a] (PMRF scholar)
2	M. Tech	5 + 2*+ 2[a,*] = 6	3
3	B. Tech, Dual-Degree (5-Year integrated)	2-DD + 5[b]	0
4	B. Tech Research Interns	0	2

* indicates joint guidance, [a] denotes recipient of DAAD KOSPIE fellowship in Germany for Masters Research, [b]indicates supervised at KIIT University, [c]International student, PMRF: Prime Ministers Research Fellowship for PhD Research

M. Tech Research Guidance

	Students	Thesis Title/Topic	Co-supervisor	**Status** (O = Ongoing, A = Awarded)
1.	Biswajeet Mahapatra	Water availability and scarcity estimation for energy production	-	**O**
2.	Pritam Daundkar	Multivariate risk of Heatwaves at South Asia	-	**O**
3.	Danish Monga	Impact of antecedent rainfall conditions on landslides	-	**O**
4.	Harsh Vardhan Bhatt	Assessment of Spatiotemporal Clustering of Streamflow Droughts using Ripley's K	-	**A**; 2021-22
5.	Swadhi Ritumbara Das	Rain-Induced Landslide Modelling using Physics-based Statistical Approach	-	**A**; 2021-22
6.	Sucheta Pradhan	Compound Risk of Heat Stress – Rain-Induced Floods in Homogeneous Regions of India	-	**A**; 2021-22
7.	Aparna Raut	Coincidence Analysis of Hudrological Drought Severity and Onset in Rain-dominated Flow Regimes	Dr. Thomas Wöhling	**A**; 2020-21 (PMRF PhD Candidate at IIT KGP)
8.	Bhupinderjeet Singh	Hydrological Drought Propagation and Recovery in Peninsular River Basins in India	-	**A**; 2020-21 (Graduate student at WSU, USA)
9.	Avijit Majhi	Towards Understanding of Hydrological Drought Propagations at Global Scale	Dr. R. Kumar, Dr. Marc Walther, Prof. O. Kolditz	**A**; 2020-21
10.	Anjana Kumara	Dominating Control of Accessibility of the Resources in Overall Food-Energy-Water Nexus in India	Dr. Amay Pathak	**A**; 2020-21
11.	Kshitish Chandra Behra	Development of Effective Monsoon Onset Criteria for Summer Monsoon Rainfall in India	Dr. Amay Pathak	**A**; 2020-21
12.	Yamini Nandamuri	Identification of Flood Regime Changes in Mahanadi River Basin	Prof. C. Chatterjee	**A**; 2018-19
13.	Sarvesh Kumar	Development and Evaluation of Modified Common Sense Climate Index for Meteorological Subdivisions of India	-	**A**; 2018-19

Teaching (Subjects Taught/Ongoing)

Sl. No.	Subject No.	Subject Name	L-T-P	Credits	Avg. Assessment(/5)	Role
1	AG61654	Statistics of Hydroclimatic Extremes[1]	3-1-0	4	4.33 for 2021-22; 4.60 for 2020-21	Instructor
2	AG60201	Surface Water Hydrology	3-1-0	4	4.23 for 2021-22	Instructor
3	AG69037	Hydrological Systems Laboratory	0-0-3	2	4.30 for 2021-22	Instructor
4	AG69202	Seminar II	0-0-3	3		Instructor
5	DY17003	Do-it-Yourself – Ist year UG project-based learning	0-0-3	2		Instructor
6	NPTEL	Soil & Water Conservation Engg. (Modules 7 – 10)[2]	-	-	-	Instructor
7	-	Fluid Mechanics II*				Instructor
8	-	Fluid Mechanics & Hydraulic Machinery*				Instructor
9	-	Fluid Mechanics Lab*				Instructor
10	AG31003	Land & Water Resources Engineering (Theory)	3-1-0	4	3.75/5 for 2021-22	Instructor
11	AG39003	Land & Water Resources Engineering (Lab)	0-0-3	2	3.83/5 for 2021-22	Instructor
12	DY17003	DIY Project	0-0-3	2	3.90/5 for 2021-22 (Autumn); 3.48/5 for 2021-22 (Spring)	Instructor
13	CE13003	Engineering Drawing and Computer Graphics	1-0-3	3	3.45/5 for 2021-22 (Spring)	Instructor
10		Applied Hydraulic Engineering				TA[3]
11		Probability & Statistics for Civil Engineers				TA
12		Advanced Experimental Fluid Mechanics				TA
13		Fluid Mechanics Lab				TA
14		Time Series and Spatial Statistics				TA

[1]**New Course Development:** AG61654. An elective for senior UGs, M.Techs, and Ph.D.; *Courses taught at KIIT University for which average class assessment is not available, [2]Available in the link: https://nptel.ac.in/courses/126/105/126105012/, [3]Teaching Assistant during Ph.D. studies at IIT Bombay

Outreach & Administrative Experience

Outreach

- Accepted to serve as a judge OSPP for EGU 2022 session on NH10.2 compound events.
- Member of **Undergraduate Curriculum Development team** for B.Tech and Dual Degree M.Tech students at Land & Water Resources Engineering Specialization.

- Contributor of **Agricultural Recruitment Scientist** (**ARS**) Board syllabus development for Land & Water Resources Engineering (Statistical Hydrology section) Specialization.
- Advisory team member (for Software/Algorithmic competition) of **Prakriti 2021 and 2022**, March, 19-21, 2021, jointly organized by Agricultural Engineering Society (AES) and Dept. of Agricultural and Food Engineering, the annual technological festival of Undergraduate students. Also acted as a judge for Data Analytics competition on the topic 'Food Security'.
- Nominated and served as a judge for Outstanding Student Presentation Award (OSPA) for AGU Fall Meeting, 2020, Natural Hazard Division.
- **"Disrupt Climate Data" Challenge**. **The fifth Climate Change Annual Symposium, York University, Toronto, organized by Ontario Climate Consortium**, May, 11-12, 2017. Invited as a **mentor of student team** to help them understand the challenges of translating climate uncertainty into actionable insights for impact assessment.
- Served as a judge for the Outstanding Student Poster and PICCO (OSPP) Award contest at the EGU General Assembly, 2018.
- Mr. Subhankar Ghosh (Roll. No. 18AG90J05): Ph. D. Thesis Committee Member

Administrative Experience

- GATE2023 (Graduate Aptitude Test for Engineers)
- Faculty advisor for Dual Degree B.Tech (3rd year), since Fall 2020
- Prof. In charge- Alumni Affairs for Agricultural and Food Engineering Department at IIT
- Kharagpur since January 2020
- Member of departmental maintenance committee, since Fall 2020
- Member of departmental purchase committee, since Fall 2020.
- Member of JEE Woman's Helpdesk 2019 at IIT Kharagpur.
- Volunteer in Agri-Expo 2020 to be held February 14 -16, 2020 at IIT Kharagpur
- Conveners for comprehensive viva voice and BTP student evaluations of UG studies since academic year 2019.
- Faculty Adviser, 2nd year undergrad students in Civil Engineering, KIIT University; Spring 2013
- Department Placement coordinator for Ph.D. students in Civil Engineering, IIT Bombay; December 2011~ August 2012

Active Overseas Collaborations

- McMaster University, Canada: Development of Future Intensity-Duration-Frequency Curve for the City of Hamilton – mentoring postdoc/research fellows engaged in the project
- UFZ Leipzig and TU Dresden, Germany – Through DAAD student exchange
- INRAE France – Through Embassy of France in India
- GFZ Potsdam, Germany – Alexander von Humboldt research project

Sponsored Projects

2022

- **PI:** Modelling and predicting landslides using physics-based statistical and data-driven approaches. To be submitted at Defense Research & Development Organization (*In Preparation*).
- **PI: CRA-Floods -** Compound risk assessment of heat-stress induced pluvial floods. Indo-German WiSER Grant (*Submitted to Indo-German Science and Technology Centre* in April 2022). Requested grant: 45.3 Lakh INR

2021

- **PI: PERIL** - A **P**roc**E**ss-based Framework for **RI**sk Assessment of rain-induced **L**andslides (*Reviewed, waiting for decision at the next PAMC Meeting* at the Ministry of Earth Sciences, Govt. of India, Submitted on December 2021). Requested grant: 42.8 Lakh INR

Completed Sponsored Projects

Completion Year	***Details of the Project***
2022	***Responsibility:* PI**; Hydrological drought coincidence risk analysis over large river basins in India. Budget: 1.7 M INR; *Funding Agency:* DST SERB. Ended on June 2022. ***Responsibility: CoPI;*** Impact of climate change on Flood Risk (IFR). Budget: 5.85 M INR; *Funding Agency:* DST. Ended on May 2022.
2021	***Responsibility:* PI;** Risk of single and compound extremes from droughts and heatwaves over South Asia. Budget: 2.5 M INR, *Funding Agency*: SRIC, IIT Kharagpur.

Contributor to Proposals

2018
- **PI:** Rainfall thresholds for triggering landslides and slope instability analyses for climate resilient infrastructure: A hybrid physics-based statistical approach. Budget: 5.0 M INR, National Mission to Himalayan Studies (NMHS) with partner Institute: IIT Roorkee and USDMA, India. (*Not granted*)

2015
- Collaborative Research: Data Science for Water Sustainability - Adapting to Climate Change; Budget: $5 M in 5 years with 5 universities

2014
- **Co-PI:** Water Availability in the United States under Climate & Population Change; Budget $85k for 1 year

2013
- PREPARED: Precipitation and Runoff Extremes Projections for Adaptive Resilience & Effective Decisions; Budget: $2.9 M in 5 years

2013
- Collaborative Research: Water in the 21st Century: A Data-Guided Approach; Budget: $10 M in 5 years with 5 universities

Professional Engagement

Reviewer
- **Total number of manuscripts reviewed since 2012: 103,** Journal of Hydrology (27), Journal of Hydrology: Regional Studies (2), Advances in Water Resources (4), Nature Scientific Reports (8), Journal of Earth System Sciences (4), ISH Journal of Hydrologic Engineering (5), Hydrology (1), Atmospheric Research (3), Hydrological Sciences Journal (4), Water Resources Research (4), Journal of Computing in Civil Engineering (3), International Journal of Climatology (4), Computers and Electronics in Agriculture (1), Water (5), Journal of Integrated Disaster Risk Management (1), Environmental Processes (1), Natural Hazard Earth System Sciences Discuss. (3), Global and Planetary Change (1), Journal of Hydrologic Engineering (8), Hydrology and Earth System Sciences (2), Geophysical Research Letters (2), npj Climate and Atmospheric Sciences (1), Environmental Research Letters (3), Natural Hazard (1), water security (1), Earth's Future (3), Communications Earth & Environment (1)
- **Outstanding reviewer recognition** from **Journal of Hydrology,** October 2016, June 2017.
- **Outstanding reviewer recognition** from **Advances in Water Resources**, May 2018.
- **Springer Series Book Review:** Climate change and agrometeorology
- **Associate Editor:** Frontiers in Water (since **February 2020**)
  - **Topic Editor for the Special Issue:** Multivariate extremes and compound, interconnected and cascading events: Understanding the past and projections into the future.
  - **Topic Editor for the Issue:** Resilience of water and built environment as a coupled natural-built-human system.

- **Proposal Reviewer:** DST SERB (Science & Engineering Research Board), NSF Fastlane (Division: Hydrologic Sciences)

Member

- Indian Society of Hydraulics (Life Member, Membership #: LM 910), European Geophysical Union (Regular), American Geophysical Union (Regular), Indian Society of Agricultural Engineer (ISAE, Life Member).

Media Coverage:

- https://www.climatechangepost.com/news/2020/3/10/compound-flooding-northwestern-europe-floods-coast/
- https://www.climatechangepost.com/europe/coastal-floods/
- https://www.eenews.net/stories/1063735943
- https://vmportal.net/news/2017-09-future-droughts-severely-impact-power.html
- https://twitter.com/geomatlab/status/1538915082582761472
- https://twitter.com/ALevermann/status/1541004619211579392?fbclid=IwAR1w1E5OcWcnZgOpog6BikqX616GkC5Vn_VzPcPXbOJkRQjQ3IZd5IsUXiw