

DR. VITTAL H

Full publication list

Peer-reviewed papers, book chapters and conference proceedings:

Book Chapters:

1. **Vittal, H.**, & Karmakar, S. (2019). A comprehensive social vulnerability analysis at a national scale. *Climate change signals and response*, 163-176

Peer-reviewed articles

1. Pragnya, P., **Vittal, H.** (2026) Impact of the Pacific Meridional Mode on the Variability of Pre-Monsoon Cyclones over the Bay of Bengal. *Global and Planetary Change*, Accepted
2. Tripathy, P., Thakur, D. A., **Vittal, H.**, Mohanty, M. P. (2026) From Single to Compound Hazards: How Flood and Drought Vulnerabilities have Intensified across India. *npj Natural Hazards*, Accepted
3. Dalal, G., Chaudhary, S., **Vittal, H.** (2026) Reproduction of Indian High Temperature Patterns: A CMIP6 Model Evaluation. *International Journal of Climatology*, 46 (8), e70391
4. **Vittal, H.**, Zhang, W., Dutta, R., Rakovec, O., Koppa, A., Gao, S., Yang, W., Vecchi, G., Kumar, R. (2026) The role of the North Pacific meridional mode on improved predictability of central European summer rainfall. *Environmental Research: Climate*, 5 (2), 025024
5. Koppa, A., Bassani, F., Keune, J., Deman, V., Insua-Costa, D., **Vittal, H.**, Ghosh, S., Miralles, D. G., Bonetti, S. (2026) Irrigated agriculture supports rainfed crops in India through atmospheric moisture recycling. *Environmental Research Letters*, 21 (10), 104037
6. Swain, B., Vountas, M., Singh, A., Panda, U., Song, R., Anchan, N. L., Malasani, C. R., Mallick, D., Alawode, R., Deroubaix, A., Lelli, L., Schmale, J., Tandon, A., Gunthe, S. S., Wendisch, M., **Vittal, H.**, Bösch, H. (2026) Contrasting anthropogenic drivers behind asymmetric warming in the Arctic and Antarctica. *Ocean-Land-Atmosphere Research*, 5, 0127
7. Swain, B., Vountas, M., Song, R., Singh, A., **Vittal, H.**, Saharwardi, M. S., Nikumbh, A., Deroubaix, A., Shende, P., Lelli, L., Alawode, R., Gunthe, S. S. (2026) Human-induced temperature rise is driving Africa towards drought-prone climatic conditions. *Earth Systems and Environment*, 16, 630
8. Pradhan, P., Dutta, R., Zhang, W., Swain, B., Koppa, A., Kumar, R., Karmakar, S., **Vittal, H.** (2025) North Atlantic Forcing on the Post-monsoon Arabian Sea Cyclones. *Earth Systems and Environment*, 10, 4655–4670
9. Ranjan, R., **Vittal, H.**, Ghosh, S., Karmakar, S. (2025) Comprehensive multivariate characterization of tropical cyclone and its district-level exposure characteristics over India. *npj Natural Hazards*, 2 (1), doi: <https://doi.org/10.1038/s44304-025-00128-w>

10. Dubey, N., **Vittal, H.**, Bastos, A., Ghosh, S. (2025) Vegetation productivity in India is modulated by climate teleconnections from the Pacific Ocean. *Journal of Geophysical Research: Biogeosciences*, 130 (9), e2024JG008682
11. Swain, B., Vountas, M., Singh, A., Anchan, N., Malasani, C. R., Mallick, D., Deroubaix, A., Lelli, L., Patel, N., Alawode, R., Gunthe, S. S., Grainger, R. G., Schmale, J., **Vittal, H.**, Kokhanovsky, A., Wendisch, M., Bösch, H., Burrow, J. P. (2025) Insights of aerosol-precipitation nexus in the central Arctic through CMIP6 climate models. *npj Climate and Atmospheric Science*, 8 (1), 103.
12. Zhang, W., Wang, S. S. Y., Chikamoto, Y., Gillies, R., LaPlante, A., **Vittal, H.** (2024) A weather pattern responsible for increasing wildfires in the western United States. *Environmental Research Letters*, 20 (1), 014007.
13. Dalal, G., Chaudhary, S., Dutta, R., Karmakar, S., Koppa, A., **Vittal, H.** (2024) East–West asymmetry in intensity, duration, frequency of heatwaves over Northern India. *Environmental Research Letters*, 19 (12), 124089.
14. Affram, A., Zhang, W., **Vittal, H.**, Gao, S., Ratterman, C., Zhu, L., Gillies, R. R. (2024) Modulation of the Pacific Meridional Mode on the Dipole Pattern of the CONUS Summertime Precipitation. *Geophysical Research Letters*, In Print.
15. Dalal, G., Pathania, T., Koppa, A., **Vittal, H.** (2024) Drivers and Mechanisms of Heatwaves in South West India. *Climate Dynamics*, doi: <https://doi.org/10.1007/s00382-024-07242-x>.
16. **Vittal, H.**, Rakovec, O., Zhang, w., Koppa, A., Collins, M., Kumar, R (2024) On the role of the Atlantic Meridional Mode in eastern European temperature variability. *Atmospheric Research*, 297, doi: <https://doi.org/10.1016/j.atmosres.2023.107082>
17. Kulkarni, S., Anurag, T., Hussain, M., Prasanna, S., **Vittal, H.** (2023) Comparison of multi-objective and single objective calibration for SWAT model: a case study on Musi river basin, India. *ISH Journal of Hydraulic Engineering*, 29 (5), 714–721
18. Shah, J., Kumar, R., Samaniego, L., Markonis, Y., Hanel, M., Attinger, S., **Vittal, H.**, Rakovec, O. (2023) On the role of antecedent meteorological conditions on flash drought initialization in Europe. *Environmental Research Letters*, doi: <https://doi.org/10.1088/1748-9326/acd8d3>
19. **Vittal, H.**, Ghosh, S., Zhang, W., & Kumar, R. (2022) Strong influence of north Pacific Ocean variability on Indian summer heatwaves. *Nature Communications*, 13, 5349, doi: <https://doi.org/10.1038/s41467-022-32942-5>, Editors' Highlights
20. Shah, J., **Vittal, H.**, Rakovec, O., Markonis, Y., Samaniego, L., Mishra, V., Hanel, M., Hinz, C., & Kumar, R. (2022) Increasing footprint of anthropogenic warming on flash droughts occurrence in Europe. *Environmental Research Letters*, doi: <https://doi.org/10.1088/1748-9326/ac6888>
21. Rakovec, O., Samaniego, L., **Vittal, H.**, Markonis, Y., Moravec, V., Thober, S., Hanel, M., & Kumar, R. (2022). The 2018-20 multi-year drought sets a new benchmark in Europe. *Earth's Future*, e2021EF002394, doi: <https://doi.org/10.1029/2021EF002394>, **Impact Factor: 7.5**
22. Zhang, W., **Vittal, H.**, Wang, S., LaPlante, M. D., Grafin, G., Affram, G., & Kumar, R. (2022). Fewer troughs, not more ridges, have led to a drying trend in the western United States. *Geophysical Research Letters*, doi: <https://doi.org/10.1029/2021GL097089>

(Highlighted in **Science** ; doi: <https://doi.org/10.1126/science.acz9984>), **Impact Factor: 4.72**

23. Zhang, W., Luo, M., Gao, Si, Chen, W., **Vittal, H.**, & Khouakhi, A. (2021). Compound hydrometeorological extremes: drivers, mechanisms and methods. *Frontiers in Earth Science*, 9, 941, doi:<https://doi.org/10.3389/feart.2021.673495>, **Impact Factor: 3.49**
24. **Vittal, H.**, Dharmasthala, S., Koppa, A., Karmakar, S., & Kumar, R. (2021). Climate hazards are threatening vulnerable migrants in Indian megacities. *Nature Climate Change*, 11 (8), 636-638, doi:<https://doi.org/10.1038/s41558-021-01105-7>, **Impact Factor: 21.72**
25. Malakar, K., Mishra, T., **Vittal, H.**, & Karmakar, S. (2021). District-level risk mapping for the Indian coastline following the IPCC-AR5 framework: A multi-attribute decision-making approach for coastal zone management. *Journal of Environmental Management*, 294, 112948, doi:<https://doi.org/10.1016/j.jenvman.2021.112948>, **Impact Factor: 6.78**
26. **Vittal, H.**, Pathak, A., & Koppa, A. (2020). Dual response of Arabian Sea cyclones and strength of Indian monsoon to Southern Atlantic Ocean. *Climate Dynamics*, 1-13, doi:<https://doi.org/10.1007/s00382-020-05577-9>, **Impact Factor: 4.37**
27. **Vittal, H.**, Villarini, G., Karmakar, S., Wilcox, L. J., & Collins, M. (2020). Northward propagation of the Intertropical Convergence Zone and strengthening of Indian summer monsoon rainfall. *Geophysical Research Letters*, 47(23), e2020GL089823, doi:<https://doi.org/10.1029/2020GL089823>, **Impact Factor: 4.72**
28. **Vittal, H.**, Rakovec, O., Markonis, Y., Hanel, M., & Kumar, R. (2020). Increased future occurrences of the exceptional 2018–2019 Central European drought under global warming. *Scientific reports*, 10(1), 1-10, doi:<https://doi.org/10.1038/s41598-020-68872-9>, **Impact Factor: 4.38**
29. **Vittal, H.**, Karmakar, S., Ghosh, S., & Murtugudde, R. (2020). A comprehensive India-wide social vulnerability analysis: highlighting its influence on hydro-climatic risk. *Environmental Research Letters*, 15(1), 014005, doi:<https://doi.org/10.1088/1748-9326/ab6499>, **Impact Factor: 6.79**
30. **Vittal, H.**, Villarini, G., & Zhang, W. (2020). Early prediction of the Indian summer monsoon rainfall by the Atlantic Meridional Mode. *Climate Dynamics*, 54(3), 2337-2346, doi:<https://doi.org/10.1007/s00382-019-05117-0>, **Impact Factor: 4.37**
31. **Vittal, H.**, Villarini, G., & Zhang, W. (2020). On the role of the atlantic ocean in exacerbating Indian heat waves. *Climate Dynamics*, 54(3), 1887-1896; doi:<https://doi.org/10.1007/s00382-019-05093-5>, **Impact Factor: 4.37**
32. **Vittal, H.**, Villarini, G., & Zhang, W. (2020). Fidelity of global climate models in representing the horizontal water vapour transport. *International Journal of Climatology*, 40(13), 5714-5726, doi:<https://doi.org/10.1002/joc.6546>, **Impact Factor: 4.06**
33. Sharma, T., **Vittal, H.**, Karmakar, S., & Ghosh, S. (2020). Increasing agricultural risk to hydro-climatic extremes in India. *Environmental Research Letters*, 15(3), 034010, doi:<https://doi.org/10.1088/1748-9326/ab63e1>, **Impact Factor: 6.79**
34. Mohanty, M. P., **Vittal, H.**, Yadav, V., Ghosh, S., Rao, G. S., & Karmakar, S. (2020). A new bivariate risk classifier for flood management considering hazard and socio-economic dimensions. *Journal of environmental management*, 255, 109733, doi:<https://doi.org/10.1016/j.jenvman.2019.109733>, **Impact Factor: 6.78**

35. Tripathy, S. S., **Vittal, H.**, Karmakar, S., & Ghosh, S. (2020). Flood risk forecasting at weather to medium range incorporating weather model, topography, socio-economic information and land use exposure. *Advances in Water Resources*, 146, 103785, doi:<https://doi.org/10.1016/j.advwatres.2020.103785>, **Impact Factor: 4.51**
36. Sudharsan, N., Karmakar, S., Fowler, H. J., & **Vittal, H.** (2020). Large-scale dynamics have greater role than thermodynamics in driving precipitation extremes over India. *Climate Dynamics*, 55(9), 2603-2614, doi:<https://doi.org/10.1007/s00382-020-05410-3>, **Impact Factor: 4.37**
37. Zhang, W., **Vittal, H.**, & Villarini, G. (2019). Potential impacts of anthropogenic forcing on the frequency of tropical depressions in the North Indian Ocean in 2018. *Journal of Marine Science and Engineering*, 7(12), 436, doi:<https://doi.org/10.3390/jmse7120436>, **Impact Factor: 2.45**
38. Gusain, A., **Vittal, H.**, Kulkarni, S., Ghosh, S., & Karmakar, S. (2019). Role of vertical velocity in improving finer scale statistical downscaling for projection of extreme precipitation. *Theoretical and Applied Climatology*, 137(1), 791-804, doi:<https://doi.org/10.1007/s00704-018-2615-1>, **Impact Factor: 3.17**
39. Shashikanth, K., Ghosh, S., **Vittal, H.**, & Karmakar, S. (2018). Future projections of Indian summer monsoon rainfall extremes over India with statistical downscaling and its consistency with observed characteristics. *Climate Dynamics*, 51(1), 1-15, doi:<https://doi.org/10.1007/s00382-017-3604-2>, **Impact Factor: 4.37**
40. Sharma, T., **Vittal, H.**, Chhabra, S., Salvi, K., Ghosh, S., & Karmakar, S. (2018). Understanding the cascade of GCM and downscaling uncertainties in hydro-climatic projections over India. *International Journal of Climatology*, 38, e178-e190, doi:<https://doi.org/10.1002/joc.5361>, **Impact Factor: 4.06**
41. Singh, S., Ghosh, S., Sahana, A. S., **Vittal, H.**, & Karmakar, S. (2017). Do dynamic regional models add value to the global model projections of Indian monsoon?. *Climate dynamics*, 48(3), 1375-1397, doi:<https://doi.org/10.1007/s00382-016-3147-y>, **Impact Factor: 4.37**
42. Singh, J., **Vittal, H.**, Karmakar, S., Ghosh, S., & Niyogi, D. (2016). Urbanization causes nonstationarity in Indian summer monsoon rainfall extremes. *Geophysical Research Letters*, 43(21), 11-269, doi: <https://doi.org/10.1002/2016GL071238>, **Impact Factor: 4.72**
43. **Vittal, H.**, Ghosh, S., Karmakar, S., Pathak, A., & Murtugudde, R. (2016). Lack of dependence of Indian summer monsoon rainfall extremes on temperature: an observational evidence. *Scientific reports*, 6(1), 1-12, doi: <https://doi.org/10.1038/srep31039>, **Impact Factor: 4.38**
44. Ghosh, S., **Vittal, H.**, Sharma, T., Karmakar, S., Kasiviswanathan, K. S., Dhanesh, Y., K. P. Sudheer, & Gunthe, S. S. (2016). Indian summer monsoon rainfall: implications of contrasting trends in the spatial variability of means and extremes. *PloS one*, 11(7), e0158670, doi:<https://doi.org/10.1371/journal.pone.0158670>, **Impact Factor: 3.24**
45. **Vittal, H.**, Singh, J., Kumar, P., & Karmakar, S. (2015). A framework for multivariate data-based at-site flood frequency analysis: Essentiality of the conjugal application of parametric and nonparametric approaches. *Journal of Hydrology*, 525, 658-675, doi: <https://doi.org/10.1016/j.jhydrol.2015.04.024>, **Impact Factor: 5.72**

46. Singh, J., **Vittal, H.**, Singh, T., Karmakar, S., & Ghosh, S. (2015). A framework for investigating the diagnostic trend in stationary and nonstationary flood frequency analyses under changing climate. *Journal of Climate Change*, 1(1, 2), 47-65, doi:10.3233/JCC-150004
47. **Vittal, H.**, Karmakar, S., & Ghosh, S. (2013). Diametric changes in trends and patterns of extreme rainfall over India from pre-1950 to post-1950. *Geophysical Research Letters*, 40(12), 3253-3258, doi:https://doi.org/10.1002/grl.50631, **Impact Factor: 4.72**
48. Manu, B., Mahamood, S., **Vittal, H.**, & Shrihari, S. (2011). A novel catalytic route to degrade paracetamol by Fenton process. *International Journal of Research in Chemistry and Environment*, 1, 157

Details of Research Publications presented in Conferences:

1. **Vittal, H.**, Rakovec O., Hanel M., Markonis Y., Kumar R. Potential impacts of anthropogenic forcing on the consecutive 2018–19 droughts in the central Europe. EGU General Assembly, Virtual, 2020
2. Rakovec O., **Vittal, H.**, Markonis Y., Luis S., Hanel M., Stephan S., Maca P., Kumar R. The 2018–2019 European drought sets a new benchmark over 250 years. EGU General Assembly, Virtual, 2020
3. Singh J., **Vittal H.**, Sharma T., Karmakar S., Ghosh S. Signature of nonstationary in precipitation extremes over urbanizing regions in India identified through a multivariate frequency analysis, EGU General Assembly, Vienna, Austria, 2016
4. **Vittal H.**, Karmakar S., Ghosh S. Mapping decadal spatio-temporal variation of social vulnerability to hydro-climatic extremes over India, AGU Fall meeting, San Francisco, USA, 2015
5. **Vittal H.**, Singh J., Karmakar S., Ghosh S. Dependence of precipitation extremes on temperature over united states, AGU Fall meeting, San Francisco, USA, 2014
6. Singh J., **Vittal H.**, Karmakar S., Ghosh S. Evidences of significant nonstationarity in precipitation extremes over urbanizing areas in India, AGU Fall meeting, San Francisco, USA, 2014
7. Sen S., **Vittal H.**, Singh T., Singh J., Karmakar S. At-sight design rainfall estimation with diagnostic check for nonstationarity: an application to Mumbai rainfall datasets, Hydro, Chennai, 2013
8. **Vittal H.**, Karmakar S., Ghosh S. Detection of spatio-temporal variatio of rainfall and temperature extremes over India, GU Fall meeting, San Francisco, USA, 2012