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Decadal Resolution of 'Forever Chemical' of PFOS in the groundwater of Yorkshire County, United Kingdom: The Future of the Past Learnings

Kanika Dogra¹, **Manish Kumar**^{2,1}, and Vivek Agarwal³

¹Sustainability Cluster, School of Advanced Engineering, UPES, Dehradun, India

²Technologico de Monterrey, Campus Monterrey, Monterrey, Mexico

³University of Nothumbria, Newcastle, United Kingdom

We present the interpretation of the Perfluorooctane sulfonate (PFOS) dataset spread over eighteen years between 2005 to 2023. The data explicitly depicts the essence of i) a growing monitoring network with growing concern i.e. ten to nearly 100 locations; ii) increasing resolution in knowing the chemical closely with advancing technologies i.e. inclusion of branched and linearity of PFOS rather than just ionic form; iii) increasing the diversity of systems being gradually included in the monitoring system to appreciate the environmental interactions, i.e. only groundwater to freshwater to even brackish water systems. This government-supported monitoring data tracks the curve of PFC-related concern for water sectors over the last two decades of the 21st century and thus provides the learnings for the future. The dataset also indicates that knowing a problem is the first step towards taking the right steps towards correcting that given system, as evident by decreasing PFOS concentrations between 2005 (ND to $0.5 \mu\text{g L}^{-1}$) to 2023 (ND to $0.012 \mu\text{g L}^{-1}$) in the groundwater environment of Yorkshire, UK. However, the data fails to provide confirmatory evidence of PFC pathways linking with surface-groundwater interactions. This work can be an eye-opener for policymakers of developing countries who are so reluctant to acknowledge the lack of regulations, and thus the associated need to monitor of chemicals of emerging concerns like PFAs, thus completely losing the opportunity of establishing stringent guidelines at the right time.