Engaging Citizen Scientists in PMT/vPvM Chemical Detection: A Community-Based Training and Sampling Approach

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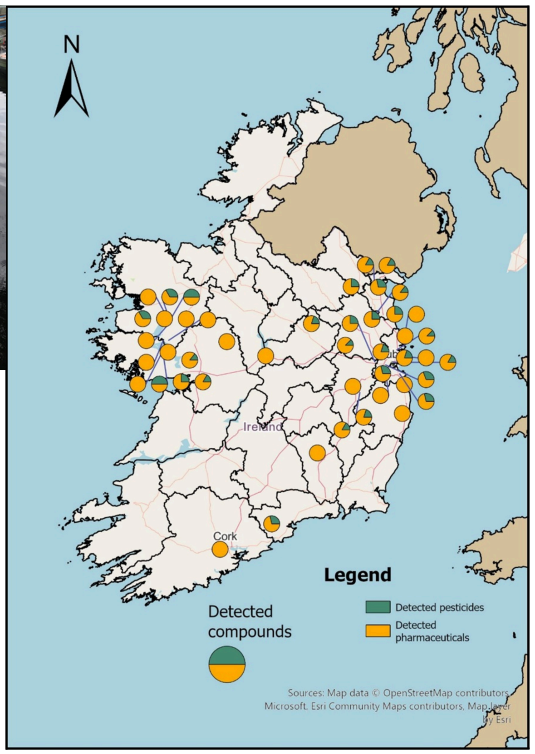
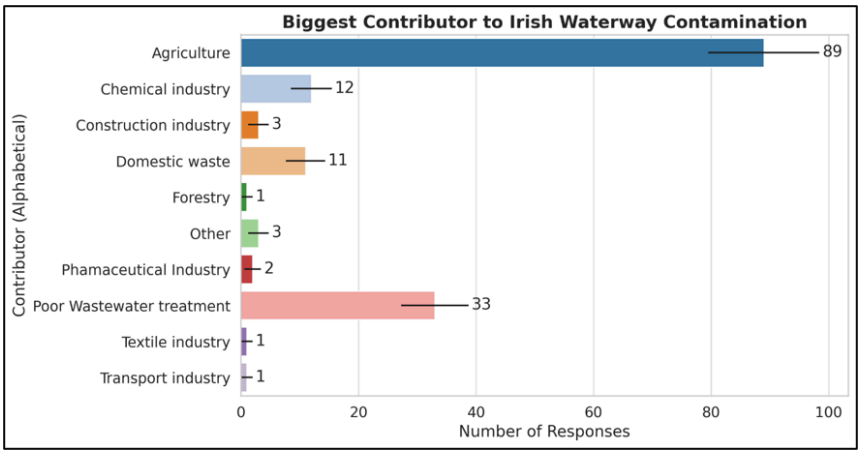


Clean water is essential for protecting environmental health, human wellbeing, and economic stability. However, growing pressures from industry, agriculture, and urbanisation are driving a global decline in water quality. In Ireland, reliance on groundwater sources in many rural communities increases vulnerability to contamination. Among the most significant emerging threats are PMT/vPvM (Persistent, Mobile, Toxic / very Persistent, very Mobile) chemicals. These contaminants are capable of bypassing wastewater treatment systems, spreading rapidly through aquatic environments, and reaching drinking water sources.

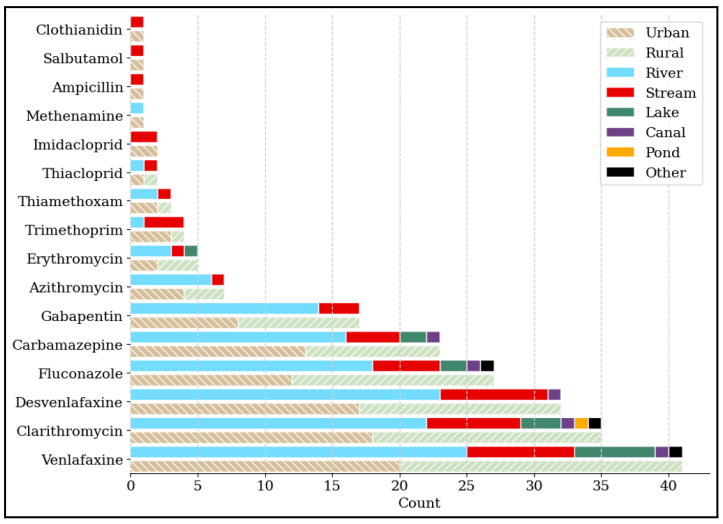
Traditional monitoring programmes are often expensive, labour-intensive, and limited in geographic coverage. In response, this Water Blitz initiative utilised citizen science as a scalable and cost-effective approach to expand national sampling coverage while simultaneously engaging and educating the public on water quality issues. The high level of participation demonstrated a strong public interest in water quality and highlighted the value of citizen science as a scalable and cost-effective approach for monitoring contaminants of emerging concern.

The analytical results revealed a higher number of detections of pharmaceutical related compounds compared to pesticides within the analysed samples. This contrasts with the Citizen Scientists' perception that agriculture represents the greatest threat to Irish water

quality. The findings highlight a disconnect between public understanding and emerging scientific evidence, emphasising the need for improved science communication, education, and transparency surrounding contaminants of emerging concern. Overall, this project demonstrates the powerful role citizen science can play in expanding environmental monitoring and supporting future evidence-based water management strategies.



Perceived major threats to Irish waterways among citizen scientists



Comparison of compound detections between rural and urban sampling locations