University Research for a Better Ireland

Water | **Safeguarding Water Quality**

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Trinity College Dublin Coláiste na Tríonóide, Baile Átha Cliath The University of Dublin

UCC University College Cork, Ireland Coláiste na hOllscoile Corcaigh

UCD DUBLIN University College Dublin An Coláiste Ollscoile, Baile Átha Cliath

UNIVERSITY OF LIMERICK OLLSCOIL LUIMNIGH

OLLSCOIL NA GAILLIMHE UNIVERSITY OF GALWAY

Water systems infrastructure across Ireland faces significant challenges, particularly in adapting to European environmental, and regulatory demands. Ireland must meet the rigorous requirements of the **EU Water Framework Directive** and **Urban Wastewater Treatment Directive** or be penalised heavily. Our researchers are addressing these challenges with policymakers, researchers, and industry ensuring quality infrastructure.

Reducing Farming Pollution in Irish Waters

Reducing pollution in Ireland's rivers, lakes, and estuaries is vital, with over 50% failing to meet EU standards due to agricultural runoff. Research by Dr. Patrick Quille, Dr. Joanna Kacprzyk and Associate Prof. Carl Ng at **University College Dublin** offers a solution: an algal biostimulant that cuts farmers use of chemical fertilizer by 25%, without sacrificing crop quality. This breakthrough led to a new range of products by Terra fertilizer and demonstrates how research helps protect our waterways and support farmers' livelihoods— paving the way for a greener future in agriculture.

On-the-spot Testing for Public Bathing Water

Across parts of Ireland, heavy rain is washing animal and human waste into our water supplies. Increasingly Shiga toxigenic E. coli (STEC), a dangerous pathogen is found in Irish bathing water. These bacteria cause severe illness if young children and vulnerable populations are exposed to them. Researchers Dr. Zina Alfahl and Dr. Louise O'Connor, **University of Galway**, have developed a groundbreaking portable technology for rapid, on-the-spot testing of water quality. This innovation prevents life-threatening infections and protects public health.

Monitoring Quality of Public Water

Much of Ireland's water supply infrastructure, especially in older urban areas, consists of water mains that are over 100 years old. Prof. Fiona Regan's cutting-edge research at **Dublin City University**, has developed sensor technology, transforming Irish water monitoring, to detect threatening pollutants. Her technology provides data to the Environmental Protection Agency (EPA), local government, and Irish Water, allowing faster responses to protect Irish water ecosystems and public health.

Improving our Water Treatment Plants

In 2023, 350,000 people in Greater Dublin were issued boil water notices by the Environmental Protection Agency (EPA), due to water treatment plant failures. Environmental Engineer Dr. Mohamad Ali, **Trinity College Dublin**, has developed new water filtration technology using graphene-based material that selectively filters out heavy metals, bacteria, and even viruses, while allowing clean water molecules to filter. This innovation offers Ireland a cost-effective and scalable solution to improve our water quality.