30 January 2020
Issue 537

Subscribe to free weekly News Alert

Source: Lapworth, D. J. *et al.* (2019) Developing a groundwater watch list for substances of emerging concern: a European perspective. *Environmental Research Letters* 14 (2019) 035004.

Contact: djla@bgs.ac.uk

Read more about:
Chemicals, Emerging risks, Environmental information services, Risk Assessment, Water

European Commission

Science for Environment Policy

Groundwater protection: first voluntary initiative to develop a pollutant watch list

Over the past two decades, concern has grown globally about the occurrence of anthropogenic organic contaminants in the environment, such as substances used in pharmaceuticals, food production and manufacturing. Many of these compounds are not sufficiently monitored or regulated in groundwater — a critical water resource in Europe. A recent paper proposes an approach to developing the first voluntary Groundwater Watch List (GWWL): an initiative with which to identify, monitor, and characterise substances that have the greatest potential to pollute this water resource.

In the EU, water legislation is governed by the Water Framework Directive (WFD), which aims to protect the quality and quantity of water resources and bodies across Europe. The European Groundwater Directive (GWD), 2006/118/EC aims to prevent and combat groundwater pollution in the EU.

Healthy groundwater helps to support public health, economic growth and ecosystem functions. Various measures have been introduced to regulate substances that are released into groundwater, such as nitrates and pesticides, but these only cover a fraction of the anthropogenic substances that impact on and pollute this water resource. In addition, monitoring of these substances is either scant or non-existent, highlighting the need for a new approach to groundwater pollution and protection.

Recent research has drawn attention to the occurrence of 'emerging organic contaminants' in groundwater; however, studies often have small sample sizes, explore limited groups of compounds, or cover small geographical areas. To tackle this, the EC declared the need for a Groundwater Watch List (GWWL) in 2014: a way to identify, monitor, and characterise substances (or substance groups) of priority — in terms of groundwater pollution — to inform policy development and substance regulation in Europe.

This paper describes the development of a voluntary GWWL initiative by the EU's Common Implementation Strategy Working Group on Groundwater — the first process of its kind, according to the researchers. It defines a number of key principles and methodologies, bringing together researchers, regulators, and industry stakeholders across Europe. The researchers also test their methodology via two pilot studies on pharmaceuticals and per- and polyfluoroalkyl substances (PFAS), both chosen due to their ubiquitous nature, persistence in the environment, and potential impact on human and ecosystem health.

The paper's GWWL process began in 2014, following a review of annexes to the GWD and drew on the establishment of the Surface Water Watch List process in 2013 — a mandatory watch list for surface waters (in contrast, the GWWL is currently voluntary for EU Member States). The researchers then set up a voluntary Europe-wide team of researchers, regulators, industry and EC representatives to develop the GWWL; this group drafted, discussed, debated, reviewed, edited and gathered feedback on the proposed methodology, and the consultative process was facilitated by several meetings and workshops.

Continued on next page.

European Commission

Science for Environment Policy

Groundwater protection: first voluntary initiative to develop a pollutant watch list *(continued)*

30 January 2020
Issue 537
Subscribe to free weekly News Alert

Source: Lapworth, D. J. *et al.* (2019) Developing a groundwater watch list for substances of emerging concern: a European perspective. *Environmental Research Letters* 14 (2019) 035004.

Contact: djla@bgs.ac.uk

Read more about:
Chemicals, Emerging risks, Environmental information services, Risk Assessment, Water

The new proposed GWWL ranking and selection process involves the following steps, and relies upon aggregate data (data combined from different measurements) from national agencies across Europe on substance occurrence, persistence, mobility and potential toxicity and bioaccumulation behaviour:

- Substances are initially identified based on either **exposure risk** (their theoretical leaching potential, mobility, persistence or extent) or **existing monitoring data** (their proven presence in groundwater);
- Substances are then given a '**groundwater leaching score**,' and identified as either a toxicological or ecotoxicological hazard;
- If **sufficient monitoring data are available**, the substances are deselected and added to a list with which to inform other relevant GWD annexes;
- If **sufficient monitoring data are not available**, the substances are added to the new GWWL;
- Substances on the GWWL are then **prioritised** based on their identified toxicity risk. Those posing the highest risk are monitored until data are sufficient for them to be removed from the GWWL.

The GWWL team requested data from Member States for two pilot groups of substances, pharmaceuticals and PFAS, to test their proposed methodology; overall, the process found that Member-state representatives showed a high willingness to deliver data voluntarily. These studies validated the proposed methodology, and revealed that approaches to hazard assessment are sometimes inconsistent; and that datasets are incomplete on some aspects of substance risk (e.g. mobility). The studies also revealed that different names and classifications are often used across countries to identify the same substance, and concluded that their chemical abstract service (CAS) numbers (unique identifying codes) should be used more widely to ensure consistent identification.

The researchers hope that a well-developed GWWL process will help achieve a sound base of consistent monitoring data and provide advice to participants: firstly on how to improve their surveillance of anthropogenic substances and secondly, on how to inform water managers and policymakers. It will enable evidence-based decisions on which substances to include in priority lists, they suggest, and will contribute to ensuring that, in the future, European citizens benefit from high-quality groundwater as their principal drinking water resource.