

# Making the invisible water crisis visible

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Wastewater treatment plant, picture by Izzet Cakalli. Credit: Izzet Cakalli

While achieving the United Nations (UN) ambitious Sustainable Development Goal (SDG) for wastewater treatment would cause

substantial improvements in global water quality, severe water quality issues would continue to persist in some world regions. So conclude researchers at Utrecht University. They have developed a new water quality model to further elucidate the current and future pollution status of rivers and streams globally. The paper was published on 6 October in *Nature Communications Earth & Environment*.

Water quality issues are branded an "invisible crisis" by the World Bank, being under-monitored, difficult to detect and often imperceptible to the human eye. Nevertheless, the quality of global water resources is increasingly coming under pressure due to [population growth](#), economic development and climate change. Yet, clean water is vital for our societal needs—such as public health, [energy generation](#) and crop production—and for protecting [ecosystem health](#). To illustrate, an estimated 829,000 deaths worldwide are attributed each year to diarrhea caused by the use of contaminated water for drinking or sanitation purposes.

In this study, the authors developed a new high-resolution global water quality model that can "help to fill-in-the-gaps in water quality knowledge, particularly in world regions where we lack observations," according to lead author Edward Jones.

In addition to identifying hotspots of water quality issues, the model can help with attributing the source of pollution to particular sectors. "For instance, large-scale irrigation systems for agriculture drive salinity issues in Northern India, while industrial processes are more responsible in eastern China. Conversely, the domestic and livestock sectors drive organic and pathogen pollution worldwide," Jones says.

The authors extended their focus beyond just past and current water quality. They applied their model to investigate how achieving the SDG target to halve the proportion of untreated wastewater entering the

environment in 2030 would benefit global river water quality.

"Our simulations show that for a large part of the year, water quality in several regions would still exceed critical thresholds for human uses and ecosystem health. This is especially the case for developing countries, particularly in sub-Saharan Africa and South Asia," Jones explains. So, while the SDG target improves water quality, it is not always enough.

Finding an optimal way to manage these problems is a difficult puzzle, however. "Even achieving the current SDG target will pose serious economic challenges, as expansion of [wastewater treatment](#) can be an expensive process," Jones warns.

"Yet the cost disadvantages of inadequate water quality for sectoral uses must also be considered. Ultimately, however, we also need to reduce our [pollutant emissions](#) and develop new approaches towards wastewater management," Jones says. "As such, with this paper we hope to underline the [water quality](#) problems we're facing and firmly place these issues back on the political agenda."

**More information:** Current wastewater treatment targets are insufficient to protect surface water quality, *Nature Communications* (2022). [DOI: 10.1038/s43247-022-00554-y](https://doi.org/10.1038/s43247-022-00554-y)

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