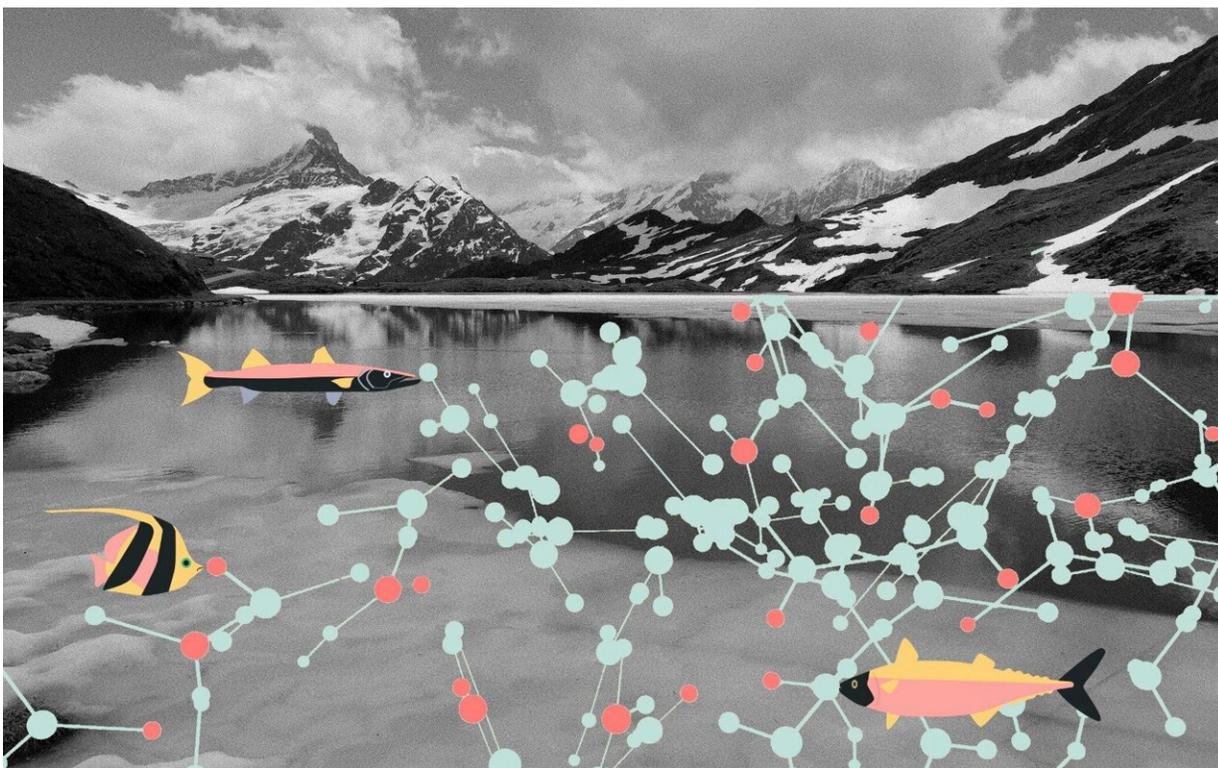


Even state-of-the-art treatment plants do not eliminate all industrial contaminants

July 19 2022



Credit: Wikimedia commons and Water-Science-Policy

Certain sources of chemical pollution of the aquatic environment, such as agriculture or municipal wastewater, are now reasonably well known. But knowledge of the quantities and diversity of synthetic organic compounds released in industrial wastewater from chemical and

pharmaceutical production remains fragmentary. This is not unproblematic, as the substances in question include compounds which are highly persistent, bioaccumulative or may promote the development of antibiotic resistance. In addition, many substances slip through the net of conventional monitoring since they are simply not targeted.

Non-registered chemicals also found

In this nationwide study published in *Water Research*, effluents from 11 [wastewater treatment plants](#) (WWTPs) were investigated in detail over a period of several months. At the WWTPs selected, discharges from industry made up a widely varying proportion of the wastewater treated—from 0 to 100%. Effluent samples were analyzed using (partly automated) [high-resolution mass spectrometry](#). It was thus possible to determine the total number of compounds present and also to monitor substances for which only short-term peaks were detected. The findings of this extensive sampling campaign were essentially threefold:

- Larger variety of substances and higher concentrations than in treated domestic wastewater: Compared to domestic effluents, treated industrial wastewater contains at times up to 15 times more substances, with 1–2 orders of magnitude higher maximum concentrations of synthetic organic compounds and greater fluctuations.
- Composition reflecting [production processes](#): The chemical diversity of effluents is highly site-specific, reflecting the production processes of the companies concerned. However, it is also strongly influenced by other factors, such as the extent of on-site pretreatment, companies' wastewater storage and discharge practices, and the type of WWTP facilities available.
- Complex mixtures: Among the enormous variety of substances detected, there may also be toxic compounds, which pose risks to aquatic communities—not least because the highly fluctuating

emissions can lead to unexpected peak concentrations and this in constantly changing chemical compositions. Also identified in the effluent samples were non-registered chemicals.

More information: Sabine Anliker et al, Large-scale assessment of organic contaminant emissions from chemical and pharmaceutical manufacturing into Swiss surface waters, *Water Research* (2022). [DOI: 10.1016/j.watres.2022.118221](https://doi.org/10.1016/j.watres.2022.118221)

Provided by Swiss Federal Institute of Aquatic Science and Technology

Citation: Even state-of-the-art treatment plants do not eliminate all industrial contaminants (2022, July 19) retrieved 5 May 2024 from <https://phys.org/news/2022-07-state-of-the-art-treatment-industrial-contaminants.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.