

Today's disposable society: Pharmaceuticals and other contaminants of emerging concern

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An increasing amount of drugs taken by humans and animals make it into our streams and waterways, and pharmaceutical pollution has had catastrophic ecosystem consequences despite low levels of concentration in the environment. The effect of pharmaceuticals and other contaminants of emerging concern on the environment will be addressed in a special issue of *Environmental Toxicology and Chemistry*. Much progress has been made in the recent years on the topic and this special issue will illustrate the state of the science. Several preview articles are now available, and the complete issue will be online in spring 2016.

The first article, "Complex mixtures, complex responses: Assessing pharmaceutical mixtures using field and laboratory approaches," reports on studies monitoring multiple the life stages of fathead minnows using both simple (groups of drugs with similar modes of action) and complex (groups with diverse modes of action) mixtures of pharmaceuticals commonly found in treated wastewater effluent. The complexity of the mixtures detected, coupled with the variance of biological reactions contingent on an organism's stage of life, result in inconsistent responses to exposure - highlighting the importance of including diverse biological endpoints when assessing contaminants.

The second article, "Evaluating the extent of pharmaceuticals in United States surface waters using a national scale rivers and streams assessment survey," reports on a national survey of US surface waters, particularly those closest to urban areas. The [active pharmaceutical ingredients](#) most prevalent in the water may help prioritize research. This expansive

survey alleviates the concern that pharmaceutical pollution, for example through drinking water contamination, has negative effects on human health at current concentrations. However, more work is needed to provide data elucidating the risk to aquatic organisms from ecosystem exposure.

"Landfill leachate as a mirror of today's disposable society: Pharmaceuticals and other contaminants of emerging concern in final leachate from landfills in the conterminous United States" is the topic of the third preview article. Leachate is defined as the beginning of the liquid-waste stream emanating from a source before any storage or treatment process. Final leachate is what follows this process. To address what makes it through the treatment process, this study collected and analyzed samples from 22 landfills across 12 states looking for 190 chemicals of emerging concern (CECs), including prescription and nonprescription pharmaceuticals, steroid hormones, industrial and household chemicals, and plant or animal sterols. Final leachate samples contained 101 of the 190 (53 percent) of the chemicals sought in the analysis. Results from this study will aid in future investigations of the fate, risk and toxicity of CECs in landfill leachate.

More information: Angela L. Batt et al. Evaluating the extent of pharmaceuticals in surface waters of the United States using a national-scale rivers and streams assessment survey, *Environmental Toxicology and Chemistry* (2015). [DOI: 10.1002/etc.3161](https://doi.org/10.1002/etc.3161)

Jason R. Masoner et al. Landfill leachate as a mirror of today's disposable society: Pharmaceuticals and other contaminants of emerging concern in final leachate from landfills in the conterminous United States, *Environmental Toxicology and Chemistry* (2015). [DOI: 10.1002/etc.3219](https://doi.org/10.1002/etc.3219)

Heiko L. Schoenfuss et al. Complex mixtures, complex responses:

Assessing pharmaceutical mixtures using field and laboratory approaches, *Environmental Toxicology and Chemistry* (2015). DOI: [10.1002/etc.3147](https://doi.org/10.1002/etc.3147)

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