

Pharmaceuticals common in small streams in the U.S., can be a concern for aquatic life

Human-use pharmaceuticals are frequently present in many small streams, even those that don't receive wastewater treatment plant discharges, reports [a new study](#) by the U.S. Geological Survey. In some streams, pharmaceuticals were detected at concentrations that could potentially be of concern for fish health.

USGS scientists analyzed pharmaceutical compounds in three to four water samples from more than 400 small streams across four major regions of the U.S. as part of the USGS [Regional Stream Quality Assessment](#). The number of compounds detected in a stream and the sum of their concentrations was higher in streams with more urban land use and in streams receiving wastewater treatment plant discharge.

Pharmaceuticals were commonly detected at the 444 stream sites studied. Pharmaceuticals detected at 17–68% of sites included metformin, a type-II diabetes medicine; lidocaine, acetaminophen, and tramadol, all painkillers; carbamazepine, an anti-seizure medication; and fexofenadine, an antihistamine. Nicotine was detected at 70% of sites. Two or more pharmaceuticals were detected at least once in 95% of the streams that have some urban land use in their watershed.

Because pharmaceuticals are designed to affect biological activity, their presence in streams is a potential concern for aquatic ecosystems. The potential risk to aquatic biota associated with exposure to pharmaceuticals in the streams was evaluated through comparison with concentrations at which a chemical causes different types of cellular activity, available through the U.S. Environmental Protection Agency Toxicity Forecaster [ToxCast™]. More than 60% of sites had at least one pharmaceutical compound at a concentration in at least one sample that might be of potential concern for fish.

For more information, contact [Paul Bradley](#).

Citation: Multi-region assessment of pharmaceutical exposures and predicted effects in USA wadeable urban-gradient streams. Bradley, P.M., Journey, C.A., Button, D.T., Carlisle, D.M., Huffman, B.J., Qi, S.L., Romanok, K.M., and Van Metre, P.C. PLOS One, <https://doi.org/10.1371/journal.pone.0228214>.

Access associated data [here](#).