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## Restoring Local Waterways



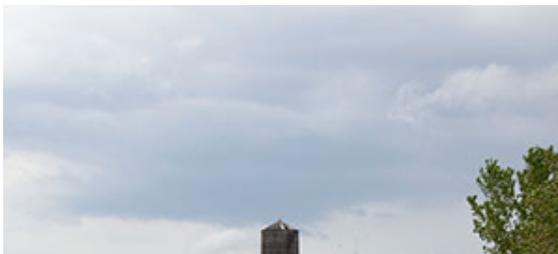
Even if the beds of the lower Passaic River and Gowanus Canal were scraped clean and given the chance for new sediment to develop, these waterways would soon be back to their current levels of contamination, concludes Michael Kruge and his colleagues at the [Passaic River Institute](#), after eight years of research.

Tests of the waterways show a messy blur of chemical fingerprints from various types of human activity. Coal tar, ash, oil and exhaust from cars and lawn fertilizer are among the many pollutants found in the Passaic and Gowanus.

So why is cleanup such a daunting task? There are two reasons: the legacy of contaminants and ongoing insults to the environment, mostly from combined sewer overflows.

Legacy contaminants are the “chemical memories of former industries,” Kruge says. During the Industrial Revolution, factories proliferated along these waterways, which provided a cheap and easy place to dump waste made up mostly of the ash and tar by-products of coal used to produce energy for heat and light.

The other reason is that new contaminants, including storm-water runoff mixed with car oil and lawn fertilizers, are continually flowing into the Passaic and the Gowanus. Century-old single-pipe sewer systems that combine runoff with municipal sewage become overwhelmed in big storms, causing the systems to drain untreated into the waterways.



In both the Passaic and the Gowanus— each classified as a Superfund site by the EPA—Krugé’s team identified both sources of pollution. “Gradual buildup would come back, even if the rivers were scraped clean. The only solution is to modernize the sewers, to separate sanitary from storm sewers,” Kruge says.

Besides it being difficult and expensive to improve the



infrastructure, there is the issue of disposing of the toxic matter. Shipping it to landfills doesn't fix the problem, it only moves it.

Kruger is also exploring a solution for the toxic sludge: using it as an energy source. Such waste-to-energy plants are plentiful in Europe and there's one in Newark, where municipal waste is used to generate electricity. The sludge contains methane, which can also be burned off to generate electricity. Once the chemicals are removed, what is left can be discarded or recycled into building materials. "We have to take responsibility," Kruger says. "Think of the future. What lessons can we learn? There are smarter ways to do things. Think about chemical memory," he advises.

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