

First evaluation of the Clean Water Act's effects on coastal waters reveals major successes

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Levels of copper, cadmium, lead and other metals in Southern California's coastal waters have plummeted over the past four decades, according to new research from USC.

Samples taken off the coast reveal that the waters have seen a 100-fold decrease in lead and a 400-fold decrease in [copper](#) and [cadmium](#). Concentrations of metals in the [surface waters](#) off Los Angeles are now comparable to levels found in surface waters along a remote stretch of Mexico's Baja Peninsula.

Sergio Sañudo-Wilhelmy, who led the research team, attributed the cleaner water to sewage treatment regulations that were part of the Clean Water Act of 1972 and to the phase-out of leaded gasoline in the 1970s and 1980s.

"For the first time, we have evaluated the impact of the Clean Water Act in the waters of a coastal environment as extensive as Southern California," said Sañudo-Wilhelmy, professor of Biological and Earth sciences at the USC Dornsife College of Letters, Arts and Sciences.

"We can see that if we remove the contaminants from wastewater, eventually the ocean responds and cleans itself. The system is resilient to some extent," he said.

The USC researchers compared water samples from roughly 30 locations between Point Dume to the north and Long Beach to the south to samples taken in the exact same locations in 1976 by two researchers at the University of California, Santa Cruz: Kenneth Bruland and Robert Franks.

"We wanted to assume that the Clean Water Act was working, but we needed good data to allow us to compare water conditions 'before and after,'" he said. "Fortunately for us, we have the data generated by Bruland and Franks. That gave us a rare opportunity to see the impact of cleaning our sewage and see the effect on the coastal ocean. The population of Southern California has increased in the last 40 years, the sewage treatment has been improved, and the levels of metals in the coastal ocean have declined."

More information: Sañudo-Wilhelmy's team—which includes USC doctoral researcher Emily A. Smail and Eric A. Webb, associate professor at USC Dornsife—published its findings this month in *Environmental Science and Technology*.

Provided by University of Southern California

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