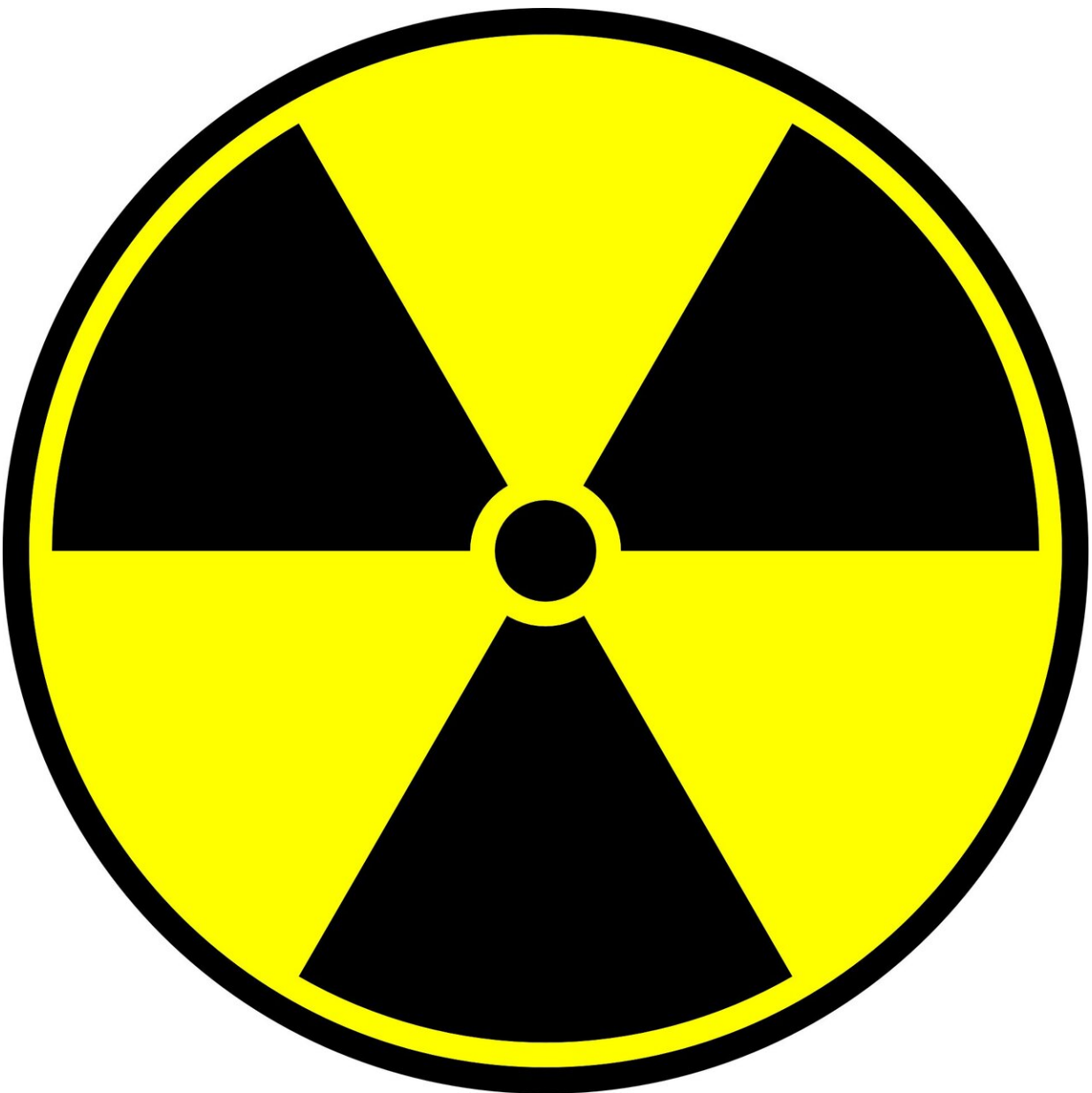


It's not just toxic chemicals: Radioactive waste was also dumped off Los Angeles coast, scientists conclude

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Credit: CC0 Public Domain

For decades, a graveyard of corroding barrels has littered the seafloor just off the coast of Los Angeles. It was out of sight, out of mind—a not-so-secret secret that haunted the marine environment until a team of researchers came across them with an advanced underwater camera.

Speculation abounded as to what these mysterious barrels might contain. Startling amounts of DDT near the barrels pointed to a little-known history of toxic pollution from what was once the largest DDT manufacturer in the nation, but [federal regulators](#) recently determined that the manufacturer had not bothered with barrels. (Its acid waste was poured straight into the ocean instead.)

Now, as part of an unprecedented reckoning with the legacy of ocean dumping in Southern California, scientists have concluded the barrels may actually contain low-level [radioactive waste](#). Records show that from the 1940s through the 1960s, it was not uncommon for local hospitals, labs and other industrial operations to dispose barrels of tritium, carbon-14 and other similar waste at sea.

"This is a classic situation of bad versus worse. It's bad we have potential low-level radioactive waste just sitting there on the seafloor. It's worse that we have DDT compounds spread across a wide area of the seafloor at concerning concentrations," said David Valentine, whose research team at UC Santa Barbara had first discovered the barrels and sparked concerns of what could be inside. "The question we grapple with now is how bad and how much worse."

This latest revelation from Valentine's team was [published](#) in *Environmental Science & Technology* as part of a broader, highly anticipated study that lays the groundwork for understanding just much DDT is spread across the seafloor—and how the contamination might still be moving 3,000 feet underwater.

Public concerns have intensified since The Times reported in 2020 that dichlorodiphenyltrichloroethane, banned in 1972 following Rachel Carson's "Silent Spring," is still haunting the [marine environment](#) in insidious ways. Scientists continue to trace significant amounts of this decades-old "forever chemical" all the way up the marine food chain, and a recent study linked the presence of this once-popular pesticide to an aggressive cancer in California sea lions.

Dozens of ecotoxicologists and marine scientists are now trying to fill key data gaps, and the findings so far have been one plot twist after another. A research team led by UC San Diego's Scripps Institution of Oceanography just recently set sail to help map and identify as many barrels as possible on the seafloor—only to discover a multitude of discarded military explosives from the World War II era.

And in the process of digging up old records, the U.S. Environmental Protection Agency discovered that from the 1930s to the early 1970s, 13 other areas off the Southern California coast had also been approved for dumping of military explosives, radioactive waste and various refinery byproducts—including 3 million metric tons of petroleum waste.

In the study, Valentine found high concentrations of DDT spread across a wide swath of seafloor larger than the city of San Francisco. His team has been collecting hundreds of sediment samples as part of a methodical, large-scale effort to map the footprint of the dumping and analyze how the chemical might be moving through the water and whether it has broken down. After many trips out to sea, they still have

yet to find the boundary of the dump site, but concluded that much of the DDT in the deep ocean remains in its most potent form.

Further analysis, using carbon-dating methods, determined that the DDT dumping peaked in the 1950s, when Montrose Chemical Corp. of California was still operating near Torrance during the pesticide's postwar heyday—and prior to the onset of formal ocean dumping regulations.

Clues pointing to the radioactive waste emerged in the process of sorting through this DDT history.

Jacob Schmidt, lead author of the study and a Ph.D. candidate in Valentine's lab, combed through hundreds of pages of old records and tracked down seven lines of evidence indicating that California Salvage, the same company tasked with pouring the DDT waste off the coast of Los Angeles, had also dumped low-level radioactive waste while out at sea.

The company, now defunct, had received a permit in 1959 to dump containerized radioactive waste about 150 miles offshore, according to the U.S. Federal Register. Although archived notes by the U.S. Atomic Energy Commission say the permit was never activated, other records show California Salvage advertised its radioactive waste disposal services and received waste in the 1960s from a radioisotope facility in Burbank, as well as barrels of tritium and carbon-14 from a regional Veterans Administration hospital facility.

Given recent revelations that the people in charge of getting rid of the DDT waste sometimes took shortcuts and just dumped it closer to port, researchers say they would not be surprised if the radioactive waste had also been dumped closer than 150 miles offshore.

"There's quite a bit of a paper trail," Valentine said. "It's all circumstantial, but the circumstances seem to point toward this company that would take whatever waste people gave them and barge it offshore ... with the other liquid wastes that we know they were dumping at the time."

Ken Buesseler, a marine radiochemist who was not affiliated with the study, said that generally speaking, some of the more abundant radioactive isotopes that were dumped into the ocean at the time—such as tritium—would have largely decayed in the past 80 years. But many questions remain on what other potentially more hazardous isotopes could've been dumped.

The sobering reality, he noted, is that it wasn't until the 1970s that people started to take radioactive waste to landfills rather than dump it in the ocean.

He pulled out an old map published by the International Atomic Energy Agency that noted from 1946 to 1970, more than 56,000 barrels of radioactive waste had been dumped into the Pacific Ocean on the U.S. side. And across the world even today, low-level radioactive waste is still being released into the ocean by nuclear power plants and decommissioned plants such as the one in Fukushima, Japan.

"The problem with the oceans as a dumping solution is once it's there, you can't go back and get it," said Buesseler, a senior scientist at Woods Hole Oceanographic Institution and director of the Center for Marine and Environmental Radioactivity. "These 56,000 barrels, for example, we're never going to get them back."

Mark Gold, an environmental scientist at the Natural Resources Defense Council who has worked on the toxic legacy of DDT for more than 30 years, said it is unsettling to think just how big the consequences of

ocean dumping might be across the country and the world. Scientists have discovered DDT, military explosives and now radioactive waste off the Los Angeles coast because they knew to look. But what about all the other dump sites where no one's looking?

"The more we look, the more we find, and every new bit of information seems to be scarier than the last," said Gold, who called on federal officials to act more boldly on this information. "This has shown just how egregious and harmful the dumping has been off our nation's coasts, and that we have no idea how big of an issue and how big of a problem this is nationally."

U.S. Sen. Alex Padilla and Rep. Salud Carbajal, in a letter signed this week by 22 fellow members of Congress, urged the Biden administration to commit dedicated long-term funding to both studying and remediating the issue. (Congress has so far allocated more than \$11 million in one-time funding that led to many of these initial scientific findings, and an additional \$5.2 million in state funding recently kicked off 18 more months of research.)

"While DDT was banned more than 50 years ago, we still have only a murky picture of its potential impacts to human health, national security and ocean ecosystems," the lawmakers said. "We encourage the administration to think about the next 50 years, creating a long-term national plan within EPA and [the National Oceanic and Atmospheric Administration] to address this toxic legacy off the coast of our communities."

As for the EPA, regulators urged the growing research effort to stay focused on the agency's most burning questions: Is this legacy contamination still moving through the ocean in a way that threatens the marine environment or human health? And if so, is there a potential path for remediation?

EPA scientists have also been refining their own sampling plan, in collaboration with a number of government agencies, to get a grasp of the many other chemicals that had been dumped into the ocean. The hope, they said, is that all these research efforts combined will ultimately inform how future investigations of other offshore dump sites—whether along the Southern California coast or elsewhere in the country—could be conducted.

"It's extremely overwhelming. ... There's still so much we don't know," said John Chesnutt, a Superfund section manager who has been leading the EPA's technical team on the ocean dumping investigation. "Whether it's radioactivity or explosives what have you, there's potentially a wide range of contaminants out there that aren't good for the environment and the food web, if they're really moving through it."

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