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### **Feds want to survey, possibly clean up vast garbage pit in Pacific**

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The so-called Great Pacific Garbage Patch, a stewy body of plastic and marine debris that floats an estimated 1,000 miles west of San Francisco, is a shape-shifting mass far too large, delicate and remote to ever be cleaned up, according to a researcher who recently returned from the area. But that might not stop the federal government from trying.

Charles Moore, the marine researcher at the Algalita Marina Research Foundation in Long Beach who has been studying and publicizing the patch for the past 10 years, said the debris - which he estimates weighs 3 million tons and covers an area twice the size of Texas - is made up mostly of fine plastic chips and is impossible to skim out of the ocean. "Any attempt to remove that much plastic from the oceans - it boggles the mind," Moore said from Hawaii, where his crew is docked. "There's just too much, and the ocean is just too big."

The trash collects in one area, known as the North Pacific Gyre, due to a clockwise trade wind that circulates along the Pacific Rim. It accumulates the same way bubbles gather at the center of hot tub, Moore said. A two-liter plastic bottle that begins its voyage from a storm drain in San Francisco will get pulled into the gyre and take weeks to reach its place among the other debris in the Garbage Patch. While the bottle floats along, instead of biodegrading, it will "photodegrade," Moore said - the sun's UV rays will turn the bottle brittle, much like they would crack the vinyl on a car roof. They will break down the bottle into small pieces and, in some cases, into particles as fine as dust.

The Garbage Patch is not a solid island, as some people believe, Moore said. Instead, it resembles a soupy mass, interspersed with large pieces of junk such as derelict fishing nets and waterlogged tires - "an alphabet soup," he called it. Also, it's undetectable by overhead satellite photos because it's 80 percent plastic and therefore translucent, Moore added. The plastic moves just beneath the surface, from one inch to depths of 300 feet, according to samples he collected on the most recent trip, he said.

By Moore's estimation, the "floating landfill" is also simply too far from land to conduct any meaningful cleanup operation. It's about 1,000 miles west of California and 1,000 miles north of the Hawaiian Islands - a week's journey by boat from the nearest port. It swirls in a convergence zone located about 30 to 40 degrees north latitude and 135 to 145 west longitude.

There's no doubt that a stew of marine debris exists in the convergence zone of the gyre, said Holly Bamford, an oceanographer and director of the marine debris program at the National Oceanic and Atmospheric Administration, but there is some debate as to its size. Moore has led most of the research and publicity surrounding the Garbage Patch, so Bamford said her federal agency, which oversees ocean conditions, is

collecting its own data to assess the area and density. Bamford said she has noted some "gaps in the research" that suggest the affected area is not as large as Moore estimates. Yet there's no question that marine debris is gathering in the area and is having a negative impact on marine life, such as fish who mistake the particles for food.

"But before we embark on a huge removal process," Bamford said, "we need to understand what we're dealing with." Bamford added that the agency had attempted to take satellite photos of the area last year, but the overhead photos were inconclusive. "It's hard to distinguish a whale reaching the surface versus a piece of plastic," she said. Still, Bamford said the agency is considering flying unmanned aircraft that can be launched from boats to skim the ocean's surface and collect data. But launching the drones is 18 months away, Bamford said. It could be two years before a federal plan is enacted to remove the plastic - if it's warranted, Bamford said. "Once we get to that stage, we'd need to ask, 'If we can remove it, what would be the best way? And what would we do with it afterward? If we collect it, would we bring it back to shore - and then what, put it in a landfill?'" "

In the meantime, as the production and the use of plastic continue to grow, so will the Garbage Patch, Moore said. The only way to reduce marine debris, all sides agree, is to cut it off at its source - on land. The dramatic growth in plastics use over the past two decades is what distresses activists like Moore. The annual production of plastic resin in the United States has roughly doubled in the past 20 years, from nearly 60 billion pounds in 1987 to an estimated 120 billion pounds in 2007, according to a study by the American Chemistry Council, which represents the nation's largest plastic and chemical manufacturers.

Keith Cristman, a senior director of packaging at the American Chemistry Council, said the plastics industry is aware of its connection to marine debris and said the council is working with federal and state agencies to put more recycling bins on California beaches in an attempt to stop plastic bottles and bags from making their way to the sea.

At the end of November, Cristman said, the council is co-sponsoring its first marine debris workshop with state and federal agencies. Cristman said he'd rather see more plastic recycled than production slowed. "Plastic is a valuable resource," he said. "It shouldn't be wasted, it should be recycled." Asked if the council would assist in any cleanup of the Garbage Patch if the federal government called on it, Cristman said, "We're always interested in working with NOAA and the EPA."

Moore said his crew had collected new data that suggested more plastic is entering the gyre, yet he was hesitant to elaborate until he finalized the research. "The ocean is downhill from everywhere," Moore said. "It's like a toilet that never flushes. You can't take these particles out of the ocean. You can just stop putting them in."

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