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## Laundry Lint Pollutes the World's Oceans

 by *Elsa Youngsteadt* on 21 October 2011, 3:15 PM | 0 Comments

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There's nothing subtle about dryer lint: Clean the fluffy, gray mat off the filter or risk a fire. Washer lint, however, is sneaky. Nearly 2000 polyester fibers can float away, unseen, from a single fleece sweater in one wash cycle, a new study reports. That synthetic lint likely makes its way through sewage treatment systems and into oceans around the world. The consequences of this widespread pollution are still hazy, but environmental scientists say the microscopic plastic fibers have the potential to harm marine life.

The existence of so-called microplastics in marine environments is not, in itself, a revelation. Larger bits of plastic, such as those in the infamous Great Pacific Garbage Patch, gradually break down into microscopic fragments. And minute plastic fibers have turned up before in treated sewage and on beaches. But no one had looked at the issue on a global scale, says ecologist Mark Browne of University College Dublin.

So Browne and his team recruited far-flung colleagues on six continents to scoop sand from 18 beaches. (The scientists had to wear all natural-fiber clothing, lest their own garments shed lint into the samples.) Back in the lab, the researchers painstakingly separated the plastic from the sand—a process that involved, among other things, hand plucking microscopic fibers from filter papers. A chemical analysis showed that nearly 80% of those filaments were made of polyester or acrylic, compounds common in textiles.

Not a single beach was free of the colorful synthetic lint. Each cup (250 milliliters) of sand contained at least two fibers and as many as 31. The most contaminated samples came from areas with the highest human population density, suggesting that cities were an important source of the lint.

Cities come with sewers, and Browne's team thought the plastic fibers might enter the ocean via sewage. Sure enough, synthetic lint was relatively common in both treated wastewater and in ocean sediments from sites where sewage sludge had been dumped. In all the samples, the fibers were mainly polyester and acrylic, just like the ones from the beaches.

Finally, the researchers wanted to see how synthetic lint got into sewage in the first place. Given its polyester-acrylic composition, they thought clothing and blankets were a good bet. So they purchased a pile of polyester blankets, fleeces, and shirts and commandeered three volunteers' home washing machines for several months. They collected the wastewater from the machines and filtered it to recover the lint. Each polyester item shed hundreds of fibers per washing, the team reports in the 1 November issue of *Environmental Science and Technology*.

A polyester sweater may seem cozy and innocent on a winter day, but its disintegrated fibers could be bad news in marine environments, Browne says. Other studies have found that microplastics in the ocean absorb pollutants such as DDT. And Browne's own work has shown that filter-feeding mussels will consume tiny plastic particles, which then enter the animals' bloodstreams and even their cells. If the same thing happens in nature, the plastic fibers could "end up on our dinner plates," incorporated into seafood, Browne warns.

There is still no direct evidence that the fibers—pollutant-tainted or otherwise—harm marine life, but Browne says it's worth figuring out. He argues that the fibers are "guilty until proven innocent" and says that textile and washing machine manufacturers, as well as sewage treatment plants, should be looking for ways to keep the fibers out of the ocean. Garments that shed less lint, or filters that trap the fibers, might help.

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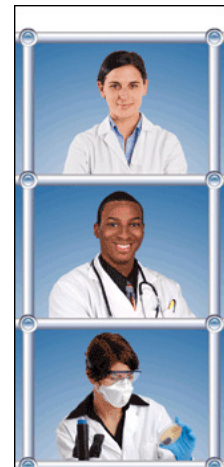

**The source.** In the laundry, synthetic clothing sheds microscopic plastic fibers (shown in the inset along with other plastic debris) that make their way through sewage treatment systems and into oceans.

Credit: Fotosearch; Mark Browne (inset)

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ScienceNOW sent a copy of the study to Patagonia, one popular maker of fleece sweaters. No one was able to review the study and comment before deadline, but spokesperson Jess Clayton said that Patagonia does intend to follow up on the findings with Polartec, its primary supplier of fleece.

Christopher Reddy, an environmental chemist at the Woods Hole Oceanographic Institution in Massachusetts, says it's still hard to tell where lint pollution fits in the spectrum of environmental problems. It won't "trump CO<sub>2</sub> in the atmosphere" as a priority issue, but he calls the new results "provocative" and says they should trigger follow-up studies that measure the effects of the fibers on marine life. "It never ceases to amaze me that we continue to find more pollutants entering the coastal environment," he adds. "What else is out there we may be missing?"

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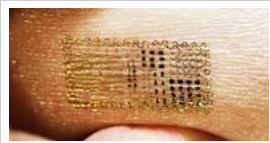
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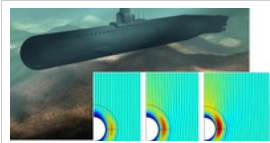
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