Microplastics

What is Microplastics?

Microplastics are small plastic particles less than 0.2 inches (5 millimeters) long, according to the National Oceanic and Atmospheric Administration (NOAA). For a visual representation, think of a sesame seed. Now imagine millions of sesame-seed sized plastics floating in the ocean every day, with more continually added from various sources. In 2014 alone, researchers estimated there to be up to 51 trillion pieces of microplastics in the ocean. This quantity outnumbers the stars in the Milky Way by 500 times. In contrast, macroplastics are larger objects like plastic bottles, hair combs, and toothbrushes. Both types of plastic continuously flow into the ocean, but microplastics prove much more challenging to remove due to their small size. Volunteers can easily pick up large items during beach cleanups, but microplastics are often too small to spot or grab in moving water. Researchers study microplastics by using plankton nets, which have mesh netting that measures 0.004 to 0.02 inches (0.1 to 0.5 mm) — small enough to capture plastic particles. Others conduct visual surveys, though this method can be hard to use because of the variation in techniques.

Where do microplastics come from?

How are microplastics made? Microplastics often originate from macroplastics that have broken apart in the ocean. Plastic may break apart due to weathering from the sun, wind, or other causes. The microbeads in many personal care products — such as toothpaste and facial scrubs — also count as microplastics. Microbeads often consist of polyethylene plastic, though they may also contain polystyrene or polypropylene.

How do microplastics affect the environment?

Why are microplastics a problem? Though they are small, these bits of plastic bring similar issues that macroplastics do — plus their own set of harms. These small particles serve as carriers for bacteria and persistent organic pollutants (POPs). POPs are toxic organic compounds that, much like plastic, take years to degrade. They consist of chemicals like pesticides and dioxins, which are hazardous to human and animal health in high concentrations. POPs biomagnify as they move up the food chain, meaning that larger animals accumulate more of these toxic substances within their fat and tissues than smaller organisms. Naturally, this leads to a more prominent risk factor for large marine creatures and humans. Consuming plastic itself is harmful to marine animals, but ingesting bacteria-ridden plastic — or materials containing POPs — could be fatal. POPs aren't very water-soluble, meaning they don't dissolve easily. Because of this quality, it's easy for them to accumulate within aquatic sediment and create toxic reservoirs. These deposits don't pose too much danger if they remain undisturbed — but there's always a chance that they could be. It's more beneficial for our ecosystems to eliminate their presence than rely on the hope that these chemicals won't be re-released into the ocean.

How do microplastics affect marine life?

Scientists are still drawing a comprehensive picture of how microplastics affect marine creatures. Research is in this area is relatively new, and ongoing studies are helping researchers form conclusions about the dangers of microplastics on aquatic life. In addition to bacterial growth,