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*Lawnmower for Plastic: Removing Plastic from Sand on Beaches*

UV light causes significant changes to occur in plastic, making the plastic release and bond with various gases. Different types of plastics were placed under a UV light with mass measurements made daily, and volume measurements made weekly. These pieces of plastic were then analyzed for change in density over time. For each plastic except polyvinyl chloride and polyethylene terephthalate, there was greater change overall for the manipulated sets of plastic than there was for the control sets. UV light induces photo-oxidation in plastics and increases the density of said plastics. Some plastic's densities decrease naturally, and the photo-oxidation process does not change density enough to overcome that, so the density still decreases when exposed to UV light. This research could be used to determine how plastics change when undergoing photo-oxidation, and when they aren't. We could effectively predict the changes that would occur, and adapt existing machinery that removes plastics from the ocean to remove most plastics at any or several stages of photo-oxidation, instead of one type of plastic at one stage of photo-oxidation. We could also use this data to inexpensively predict how long any piece of plastic has been in the ocean, on land, or in/on both. This would help environmental cleanup organizations to show how long plastic has been changing things for the worse, and what changes it has undergone. It would help show the harmful effects, like marine deaths, chemical emissions, and most of all, the need to stop using and producing plastics.