**Effective Tool for Predicting Accumulation Hotspots of Ocean Pollution**

Author: Kaitlynn VanMol   
Major: Microbiology  
Department of Microbiology and Molecular Genetics, Oklahoma State University, Stillwater, OK 74078, USA

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Ocean pollution has recently become a major topic among journals, magazines and news broadcasts. The question “how do we stop ocean pollution” is constantly trying to be answered. However, before people can stop ocean pollution, they must locate the main areas where pollution accumulates. Within the article “A novel GIS-based tool for predicting coastal litter accumulation and optimizing coastal cleanup actions” researchers try to determine the best way to assess where pollution gathers along shorelines. Authors Marthe Larsen Haarr, Levi Westerveld, Joan Fabres, Kriss Rokkan Iversen, and Kjersti Eline Tønnessen Busch, research a new way to locate these hotspots for accumulation of pollution using a GIS Based tool. They found that by categorizing the topography of Norway’s Vestågøy, Gimsøy, and Austågøy’s coasts into shore gradient, curvature, and substrate, they were able to design a program that would locate where pollution would likely accumulate. This study was the first to use a GIS (geographic information system) tool. As explained at the end of the article, there are still many factors that constitute where pollution may be located that was not studied, as in different seasons. However, research done with the GIS tool was highly successful in locating hotspots of accumulation.

**Introduction**

Before research on ocean pollution can be done, first there needs to be evidence of how much pollution and debris is there. There is a zone in the ocean near Hawaii that has a collection of microplastics and plastic floating together. They are in a specific spot because of the gyers (circular ocean currents) and the currents that run through the Pacific Ocean that collect the debris in this area. This area is called the Great Pacific Garbage Patch and holds around 645,834,625 square feet of plastic. Adding to the plastic already in the ocean, this study states that there is approximately eight to thirteen million tons of plastic projected to enter the world’s oceans every year. The projected solution this article poses is that in order to cut down on the plastic within the ocean, people must first look at where the plastic is coming from and stop it at the source. Waiting until plastic is already in the ocean to clean it up can cause multiple problems as well as inefficiency. Some of these problems include a need for an abundance of money, gas releasing into the atmosphere, and bycatch of fish. Bycatch is the catching of fish not targeted. Coastal cleanup cost less and does not harm marine life.

However, one of the problems with coastal cleanup is the reliance on word-of-mouth reports of unclean beaches. This article states that the most polluted beaches may not be the ones easiest to access, therefore word-of-mouth messaging would hinder efforts of cleaning up plastic. This study tries to eliminate the word-of-mouth problem with a GIS-based system to locate where plastic may appear. There are many variables to consider when using a system like this, such as, the characteristics of the coastline. This includes curvature of the coast, gradient, and substrate.

**Recent Progress**

The authors randomly selected twenty-seven shoreline sites. They only recorded liter they could see, and then classified it by materials. These included cloth, plastic, metals, rubber, paper and wood. These materials were then classified by size. Small being less than twenty centimeters, medium being twenty to one hundred centimeters, and large being over one hundred centimeters. Some common items found were “ropes, nets, bottles, carboys, floats, and packing bands”. Substrate was then classified as “bedrock, clay or silt, sand, fine pebbles, coarse pebbles, cobbles, and boulders”. Vegetation was also accounted for. The results concluded that an astounding sixty percent of the total two thousand seven hundred pieces of litter was plastic pieces smaller than twenty centimeters. Overall, ten percent was found to be glass and Styrofoam, fifteen percent soft plastics, and seventeen percent was remains of rope, plastic bottles, and jugs. The effects of curvature over litter, suggested that the greater convex the shoreline, the more litter was found. Regarding substrate, litter found on bedrock and sand was lower compared to shoreline with cobbles.

**Discussion**

The goal of this article was the test the potential use of a GIS-based tool for predicting where plastic may accumulate along shorelines. Though, there may be a few reasons why not all plastic was accounted for, the results for this article was very compelling and showed that using a GIS-based tool would be helpful in predicting where plastic and litter may be.

**References**

Haarr, Marthe Larsen et al. "A Novel GIS-Based Tool For Predicting Coastal Litter Accumulation And Optimizing Coastal Cleanup Actions". *Elsevier*, 2019, Accessed 1 Mar 2019.