CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)

Taylor Simpkins

Project Number

J0927

Project Title

Industry's Foul Little Secret: Pre-Production Plastics Found on Beaches Come Directly from Industrial Sources

Abstract

Objectives/Goals

My objective was to determine if Pre-Production Plastics (small, 1-2 mm. circular plastics used to produce plastic containers) are washing up on shore because of industrial run-off into the Santa Ana River Jetty. The recent study, Plastics White Paper: Optimizing Plastics Use, Recycling, and Disposal in California, for the California Integrated Waste Management Board, shows that the plastics products and packaging industry is not directly polluting the waterways. See CIWMB.ca.gov.

Methods/Materials

Collections of research samples were taken over 11 months from the East and West sides of the Santa Ana River Jetty. I collect 100 meters on either side of the Jetty, in 1 square meter, at the rack line, which is the highest, most recent, high-tide line. Using a spatula, I collect the top surface of the collection area down approximately 1 cm. deep, and then deposit the sand and materials into a 5-gal. bucket. Materials from the East and West sides are put into two separate buckets. At home, I sift the sand through two sifters: one with larger holes on top and the other with smaller holes on the bottom. The Pre-Production Plastics (or PPPs) go through the bigger sifter and sit on top of the small sifter because they cannot pass through like the sand. This separates the PPPs from the twigs, and larger objects, and the sand. Finally, I count the Pre-Production Plastics, deposit them into labeled containers, and log the results, weather conditions, and observations in my log.

Results

After rainfall there was a significant amount more Pre-Production Plastics compared to during the dry season when there is not a great flow from the Santa Ana River into the ocean. The lowest count of PPPs when it was dry was 0 per square meter; the highest number of PPPs was after heavy rainfall when there were 794 PPPs per square meter.

Conclusions/Discussion

My conclusion is that Pre-Production Plastics are coming from industrial runoff, which flows into the Santa Ana River and eventually the Pacific Ocean and back on its beaches.

Summary Statement

My project shows that some plastics pollution in our oceans and beaches, specifically Pre-Production Plastics, are coming directly from run-off from industries, which flow into the Santa Ana River and eventually the Pacific Ocean and its be

Help Received

Parents helped drive me to collection sites. Discussed findings with Charles Moore of Algolita Foundation and O.C. Coastal Coalition who gave me names of additional sources for more research.