

**STUDY TITLE:** Marine Debris Point Source Investigation: Padre Island National Seashore March 1994-September 1995

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**BACKGROUND:** Padre Island is a barrier island located on the southeastern coast of Texas. Created by the Congress of the United States in 1962, Padre Island National Seashore (PINS) is the longest undeveloped beach in the United States -- 68 miles in length. Although similar in many ways to other National Seashores, PINS is atypical because of the large quantity of garbage that washes onto its shoreline. At times, the shoreline is inundated by as much as one ton of debris per linear mile. The primary reason for this large accumulation of debris is the convergent currents occurring off the park's coastline. Because of these currents, any item discarded into the Gulf of Mexico has the potential of washing onto the PINS shoreline. Marine debris represents the foremost natural resource management problem at the National Seashore and includes aesthetics and impacts to marine mammals, birds and reptiles from entanglement and ingestion. Additionally, toxic chemicals and medical waste wash ashore and pose a safety hazard to the visiting public. With the signing of the Plastics Act in 1987, the United States joined 39 other nations in ratifying Annex V of the International Convention for the Prevention of Pollution from Ships, known as MARPOL. This treaty bans the dumping of plastics by vessels at sea. It also limits the dumping of other vessel -- generated garbage to specific distances from shore. In the Gulf of Mexico, the

treaty expressly prohibits the discharge of any vessel generated garbage. Because of the sheer amount of plastics and other debris washing onto the PINS shoreline, we questioned whether MARPOL regulations are working. The amount of garbage washing onto PINS will not be reduced, nor will the overall problems of marine debris in the Gulf of Mexico be adequately addressed, unless point sources are identified. The objective of the seven-year long PINS research was to identify point sources and to furnish the results to state and federal agencies concerned with the health of the Gulf of Mexico.

**OBJECTIVE:** To analyze the numbers of specific debris items associates with the offshore oil and gas industry per month for 18 months (March 1, 1994 -September 30, 1995).

**DESCRIPTION:** Based on findings from previous marine debris studies conducted at Padre Island National Seashore (PINS), methods were developed to identify and assess the magnitude of marine point source pollution in the Gulf of Mexico. In February 1994, PINS began an investigation to connect the amount of garbage washing onto the beach from specific sources. This project involved a 7 days/week survey of 16 miles of shoreline between March 1, 1994 until September 30, 1995. During this time, 42 specific items were collected from the tidal area. Thirteen items associated with offshore oil and gas platforms were identified. These items were compiled in partnership with the Minerals Management Service and the Offshore Operators Committee (whose members include major oil and gas companies operating the Gulf of Mexico). ARCO Oil and Gas Company conducted a marine debris survey in 1990 to assess offshore operator compliance with U.S. Coast Guard regulations under MARPOL Annex V. ARCO's study developed a list of items that is representative of platform debris. A list of items associates with the shrimping industry was developed through communications with the United States Coast Guard and conversations with individuals familiar with the shrimping industry in the Gulf of Mexico. Fifteen items were selected and targeted for the investigation. Before beginning, items were grouped into two categories -- probable and suspected. "Probable" items were unique and specific to the shrimping industry; "suspected" items were those that appeared in great numbers during the same time that the probable items washed ashore. Fourteen items from an unknown source were selected for long-term analysis of marine debris composition and accumulation at PINS. These items may be associated with shipping, recreational boating, beach visitation, or land-based non-point sources (e.g., landfills, storm drains, etc).

**SIGNIFICANT CONCLUSIONS:** Environmental factors directly influence the amount of daily debris accumulation. PINS research indicates that mathematical extrapolation of data from infrequent surveys is inaccurate. Additionally, PINS research indicates that debris collected from the backshore area of there beach is not post-MARPOL Annex V garbage. Results from this research indicate that point source violators can be identified. The research indicates that the shrimping industry is directly responsible for 30 percent of garbage that washes into the PINS survey area. They are suspected of contributing an additional 35 percent. We have also shown that the offshore oil and gas

industry is suspected of contributing 13 percent of the garbage that accumulated in the PINS survey area. Taken together, over 70 percent of most items that wash ashore are contributed by identifiable point sources.

**STUDY RESULTS:** During the sample period, 63,410 debris items were collected from the 16-mile transect. Thirteen items associated with the offshore oil and gas industry numbered 8,063 (13% of the total), 14 items from an unknown source totaled 13,382 (21% of the total), and the items associates with the commercial shrimping industry numbered 41,965 (66% of the total). In the offshore oil and gas category, the most abundant items included strip lumber (3,781), plastic straps (2,042) and five-gallon containers (3,781). Of the items that are considered to be probable shrimping items, a total of 18,751 were collected. Of these items the most abundant were rubber gloves (10,178), onion sacks (3,150) and scoops (2,484). In the “suspected” shrimping category, 23,214 items were collected. The most abundant were one-gallon milk containers (8,689), incandescent light bulbs (4,125) and glass condiment bottles (3,418). Items collect in the “unknown source” category contained the greatest number of items in the following: green quart bleach bottles (4,880), one-quart oil containers (2,479), and balloons and ribbons (2,340). Compared to previous survey’s, the percentages of each category did not significantly change nor did the types and amounts of abundant items within each category change significantly either.

**STUDY PRODUCT:** Marine Debris Point Source Investigation, March 1994-September 1995. 1996. OCS Study MMS 96-0023. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA, and U.S. Dept. of the Interior, National Park Service, Padre Island National Seashore, Corpus Christi, TX. 38 pp.

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