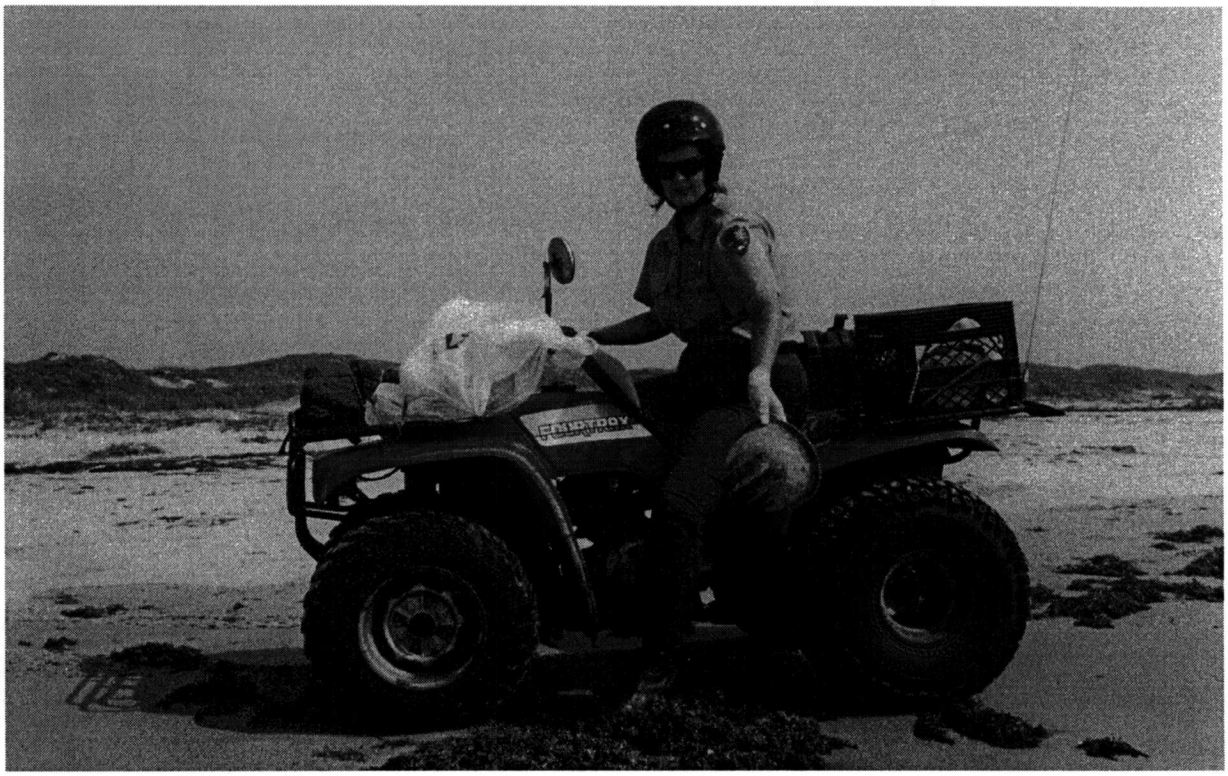
OCS Study
MMS 96-0023

Marine Debris Point Source Investigation: Padre Island National Seashore

March 1994-September 1995



MMS U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

OCS Study
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Marine Debris Point Source Investigation: Padre Island National Seashore

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Authors

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Offshore Operators Committee

EXECUTIVE SUMMARY

The shoreline of Padre Island National Seashore is one of the most polluted in the United States. Marine debris pollution is the foremost natural resource problem at the National Seashore and is responsible for numerous wildlife injuries and deaths from entanglement and ingestion. Debris in the form of toxic chemicals and medical waste pose a health and safety hazard to the public.

For the past decade, the issue of marine debris has been studied by many different government agencies and private organizations, both internationally and in the United States. Most of these studies have focused on answering the question of whether marine pollution laws and regulations are working to decrease the amount of garbage in the world's oceans.

Padre Island National Seashore has conducted intensive marine debris research for the past seven years. From March 1994 until March 1995, the research was conducted daily over a 16-mile section of shoreline, culminating with our 1994-1995 Marine Debris Point Source Investigation (Miller et al., 1995). The result of this research project indicated that two point sources could be identified. These two sources were the commercial shrimping and the offshore oil and gas industries.

Based on the methodologies utilized for the 1994-1995 efforts, the current study, Marine Debris Point Source Investigation: Offshore Oil & Gas Industry, is a continuation of this research. The primary focus of this report is to analyze the numbers of specific debris items associated with the offshore oil and gas industry per month for 18 months (March 1, 1994-September 30, 1995).

Results of this research have indicated the offshore oil and gas industry is suspected of contributing 13% of all debris collected. Of the 63,000 debris items collected from the study site during the 18-month project, the offshore oil and gas industry was tentatively identified for 8,063 items. However, it must be pointed out that, unlike the debris associated with the commercial shrimping industry, which has been statistically correlated to that specific point source, several of the debris item categories associated with the oil and gas industry are also used by other marine industries. Consequently, many of these debris items could have been discarded by those other sources.

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Item Selection 2
2.1 Offshore Oil & Gas Industry 2
2.2 Commercial Shrimping Industry 3
2.3 Items from an Unknown Source 4

3.0 Data Analysis 5

4.0 Results 5
4.1 Total Debris Items Collected (March 1, 1994-September 30, 1995) 8
4.2 Offshore Oil & Gas Industry 10
4.3 Commercial Shrimping Industry 16
4.4 Items from an Unknown Source 24

5.0 Discussion 30

6.0 Bibliography 31

Figures
Figure 1. Map of Padre Island 1

Tables
Table 1. Offshore Oil & Gas Industry 2
Table 2. Commercial Shrimping Industry 3
Table 3. Items from an Unknown Source 4
Table 4. Descriptive Statistics - Marine Debris Items (March 1995-September 1995) 7
Table 5. Descriptive Statistics - Marine Debris Items (March 1994-September 1995) 9

1.0 Introduction

Padre Island is a barrier island located on the southeastern coast of Texas (Figure 1). 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.

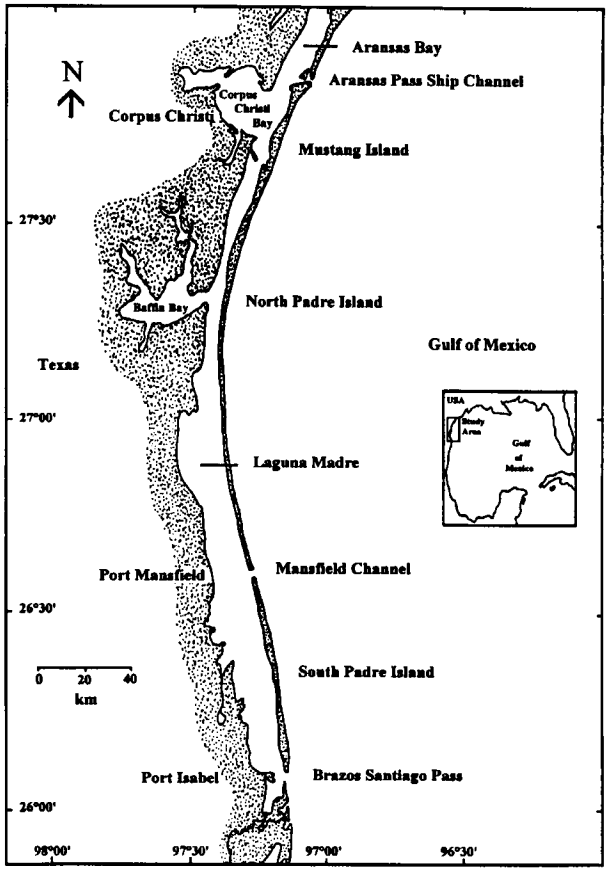


Figure 1. Map of Padre Island.

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.

Padre Island National Seashore has conducted marine debris research since 1988 using a variety of methodologies. These include: 48 months of data from six 50 x 100 meter transects collected quarterly; 19 months of 5 days/week data from four 50 x 100 meter transects; three months of 5 days/week data from a transect covering eight miles of shoreline; and, 19 months of 7 days/week data from a transect covering 16 miles of shoreline.

Based on findings from each of the previous studies, what types of debris items to survey and methods for surveying, 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 day/week survey of 16 miles of shoreline for 42 specific marine debris items. The specific items surveyed included 15 items associated with the commercial shrimping industry, 13 items associated with the offshore oil and gas industry, and 14 items that are associated with an unknown source. These debris items were collected and the number/types were recorded on standardized data sheets. Methods and results from this study have been reported in the Marine Debris Point Source Investigation 1994 - 1995 (Miller, Baker, Echols, 1995).

The Marine Debris Point Source Investigation 1994 - 1995 was inclusive for 12 months of data collection from March 1, 1994 to February 28, 1995. This new report is a continuation of marine debris analysis of accumulation and composition from March 1, 1995 and September 30, 1995. Methods for data collecting, reporting, and analysis are identical to the methods utilized for the Marine Debris Point Source Investigation 1994 - 1995. However, the primary focus of this report is to analyze the numbers of specific debris items associated with the offshore oil and gas industry per month for 18 months (March 1, 1994 - September 30, 1995).

2.0 Item Selection

2.1 Offshore Oil & Gas Industry

Thirteen items associated with offshore oil and gas platforms were identified (Table 1). A list was compiled in partnership with the Minerals Management Service and the Offshore Operators Committee (whose members include major oil & gas companies operating in 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.

Table 1: Offshore Oil & Gas Industry

Item	Use
Strip Lumber	Stripping over pipe or equipment
Clear Plastic Sheeting	Weatherproofing material used during transportation and storage
Wood Pallet	Transporting chemicals and equipment
Wood Spool	Transporting wire, rope and electrical wire
5-Gallon Container	Transporting fuel, lube oil, chemicals and detergents
Plastic Strap	Transporting and storage of chemicals and equipment
Tire *(with attachment holes)*	Vessel and structure bumpers
Hard Hat	Personal protective equipment for offshore personnel
Write Enable Ring	Storing technical information
Life Jacket	Personal protective equipment for platform personnel
Pipe Thread Protector	Protection of drilling pipes
55-Gallon Container	Transporting and storage of lube oils, chemicals, and detergents
Styrofoam Buoy	Marking subsea pipelines and equipment

2.2 Commercial Shrimping Industry

A list of items associated 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 (Table 2).

Table 2: Commercial Shrimping Industry

Item	Use
Probable:	
Rubber Glove	Protection of hands from shrimp and by-catch during separation of the catch
Onion Sack	Packaging/transporting shrimp, storage of vegetables, and storage of garbage
Salt Bag	Separating by-catch from shrimp and storage of garbage
Wood Disk	Placed on lead line of shrimp nets for keeping the net off the sea floor
Plastic Scoop	Picking up shrimp and by-catch
1-Liter Oil Container	Lubricant used in boat engines and generators
Sodium Metabisulfite	An additive used for removing spots from shrimp
Suspected:	
Egg Carton	Galley item
Incandescent Light Bulb	Providing light
Fluorescent Light Bulb	Providing light
Plastic Condiment Container	Galley item
Glass Condiment Container	Galley item
1-Gallon Milk Container	Galley item
Oil and Fuel Filter	Filtering of lube oils and fuels
Fish Basket	Transporting commercial fishing catch

2.3 Items from an Unknown Source

Fourteen items from an unknown source were selected for long-term analysis of marine debris composition and accumulation at PINS (Table 3). These items may be associated with shipping, recreational boating, beach visitation, or land-based non-point sources (e.g., landfills, storm drains, etc.).

Table 3: Items from an Unknown Source

Item	Use
Plastic ½-Gallon Milk Container	Transporting and storing milk
< 1-Gallon Blue Bleach Container	Transporting and storing bleach
Balloon and Ribbon	Decorations and celebrations
Quart Oil Container	Transporting and storing lube oils and chemicals
Black Plastic Sheeting > 2 Meters	Protecting equipment and supplies during storage and transportation
Brush and Broom	Cleaning supplies
Netting	Commercial fishing
Muriatic Acid Container	Cleaning pipes
Propane and Freon Container	Providing gas used in appliances and air conditioners
1-Gallon Oil Container	Transporting and storing lube oils and chemicals
White Quart Bleach Container	Transporting and storing bleach
Paper Milk Container	Transporting and storing milk
1-Gallon White Bleach Container	Transporting and storing bleach.
< 1-Gallon Green Bleach Container	Transporting and storing bleach

3.0 Data Analysis

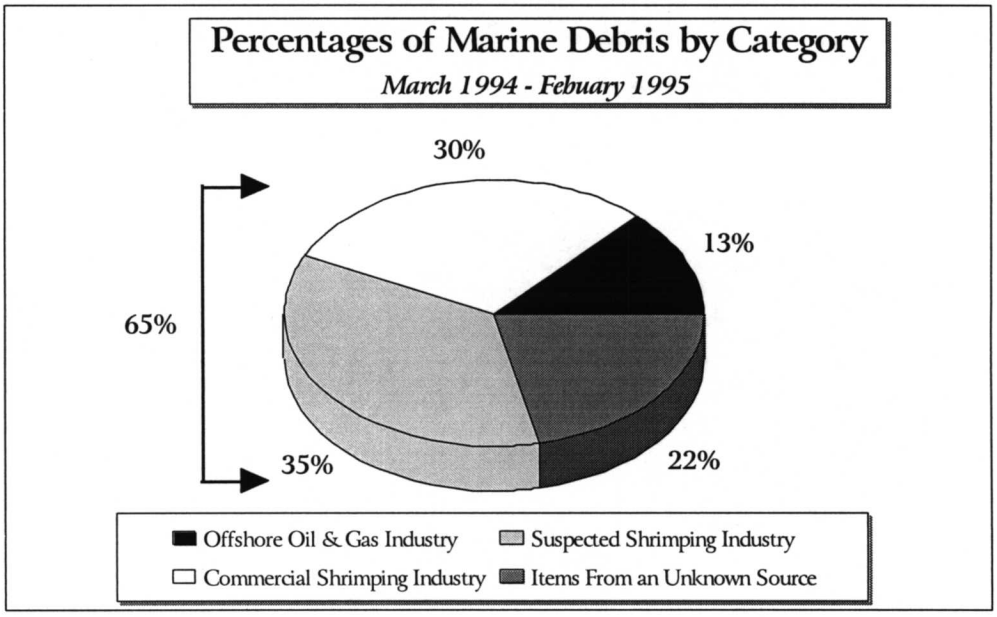
Descriptive statistical tests were performed on all survey data collected from February 1994 - February 1995 (Miller, Baker, Echols, 1995). Statistical tests were performed using data provided by the NMFS, monthly shrimping effort data were correlated with the monthly totals of each shrimping item. A Spearman Rank Order Correlation was performed to detect an association between the total number of shrimping debris items and the effort expended by commercial shrimping vessels in a specific area of the Gulf of Mexico.

Descriptive statistical tests for data collected from March 1995 - March 1996 will not be concluded until May 1996.

4.0 Results

From March 1, 1994 to February 28, 1995, 40,677 debris items were collected in the 16-mile transect. Thirteen items believed to be associated with the offshore oil and gas industry numbered 5,310 (13% of the total) and 14 items from an unknown source totaled 8,761 (22% of the total). Items believed to be associated with the commercial shrimping industry numbered 26,607 (65% of the total).

A total of 12,076 items showed a statistical correlation with the amount of shrimping effort. Of the items that correlated with shrimping effort the most abundant were rubber gloves (6,515), scoops (1,970) and onion sacks (1,920) (Miller, Baker, and Echols, 1995).



From March 1, 1995 to September 30, 1995, 22,733 debris items were collected in the 16-mile transect (Table 4). Thirteen items associated with the offshore oil and gas industry numbered 2,753 (12% of the total) and 14 items from an unknown source totaled 4,621 (21% of the total). Items believed to be associated with the commercial shrimping industry numbered 15,359 (67% of the total).

The most abundant items in the offshore oil and gas category were strip lumber (906), plastic straps (876) and five-gallon containers (479). The most abundant items with identifiable markings (company names or logos) were hard hats (194) and life jackets (19). In the "unknown source" category the greatest number of items collected were green quart bleach bottles (1,581), one-quart oil containers (870) and balloons and ribbons (667).

Of the items that are considered to be probable shrimping items, a total of 6,675 items were collected. Of these items, the most abundant were rubber gloves (3,663), 1 liter oil containers (777) and onion sacks (1,230).

In the "suspected" shrimping category, 8,684 items were collected. The most abundant were one-gallon milk containers (3,753), incandescent light bulbs (1,624) and glass condiment bottles (1,090).

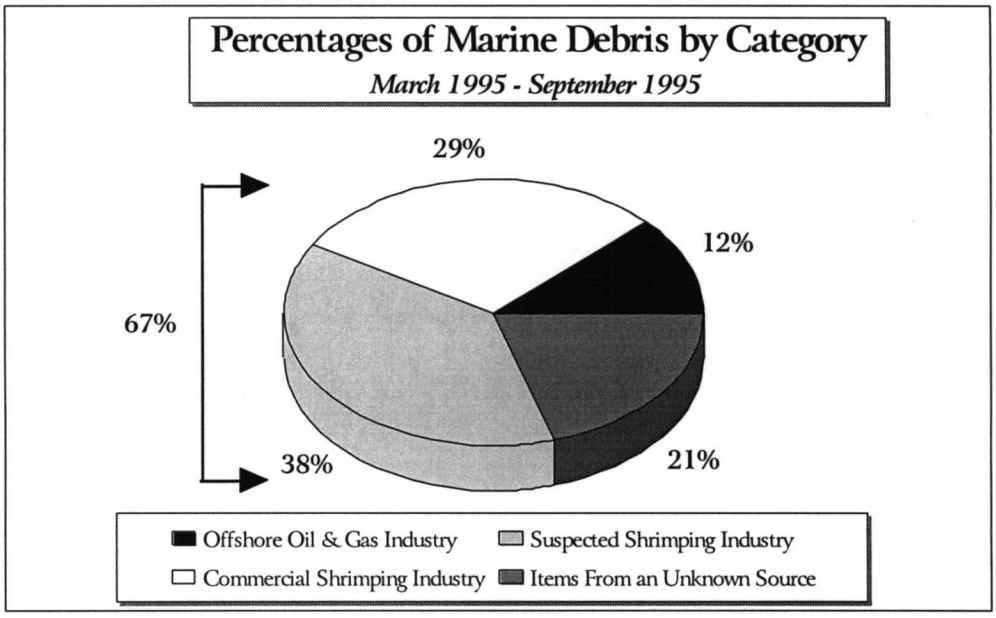


Table 4: Descriptive Statistics - Marine Debris Items (March 1995 - September 1995.)

Category	Monthly Average	Total Number	Category Total
Offshore Oil & Gas Industry			**2,753**
Strip Lumber	129.43	906	
Clear Sheeting > 2m	3.29	23	
Wood Spool	0.71	5	
Wood Pallet	9.71	68	
Write Enable Ring	1.29	9	
5-Gallon Container	68.43	479	
Hard Hat	27.71	194	
55-Gallon Container	2.86	20	
Tire	2.29	16	
Plastic Strap	125.14	876	
Pipe Thread Protector	8.71	61	
Life Jacket	2.71	19	
Styrofoam Buoy	11.00	77	
Commercial Shrimping Industry			**15,359**
Unknown Source			**4,621**
Total:			**22,733**

4.1 Total Debris Items Collected (March 1, 1994 - September 30,1995)

From March 1, 1994 to September 30, 1995, 63,410 debris items were collected in the 16-mile transect (Table 5). Thirteen items associated with the offshore oil and gas industry numbered 8,063 (13% of the total) and 14 items from an unknown source totaled 13,382 (21% of the total). Items associated with the commercial shrimping industry numbered 41,965 (66% of the total).

In the offshore oil and gas category, a total of 8,063 items were collected. Of these, 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).

A total of 13,382 items were collected in the "unknown source" category with the greatest number of items collected in the following: green quart bleach bottles (4,880), one-quart oil containers (2,479), and balloons and ribbons (2,340).

The percentages of each category did not significantly change between the first 12 months and the entire 19 months of survey. The types and amounts of the abundant items in each category did not change significantly either.

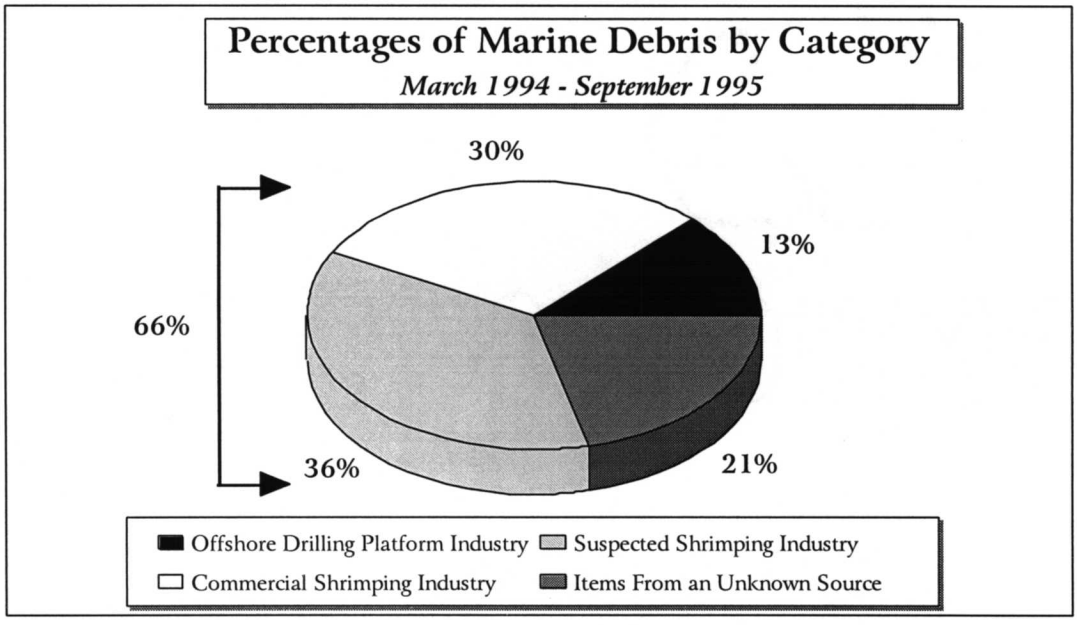
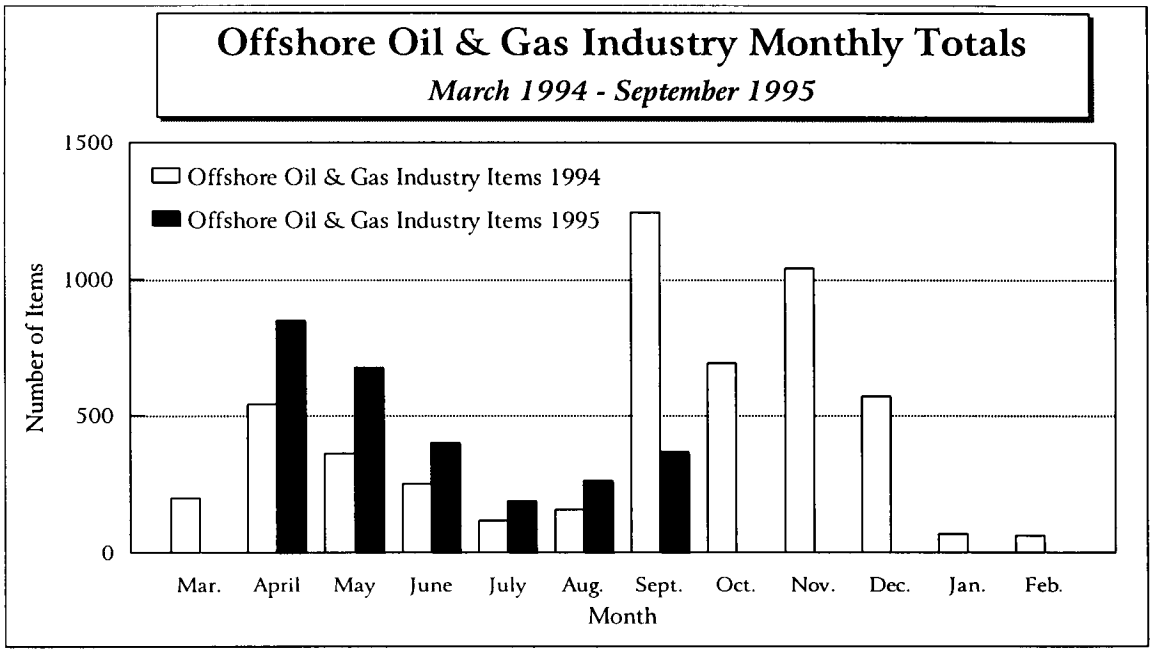


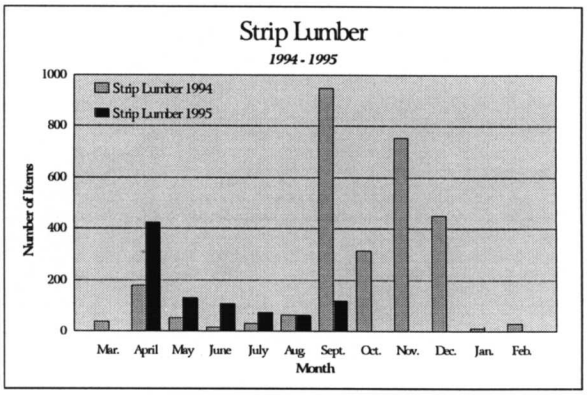
Table 5: Descriptive Statistics - Marine Debris Items (March 1, 1994 - September 30, 1995.)

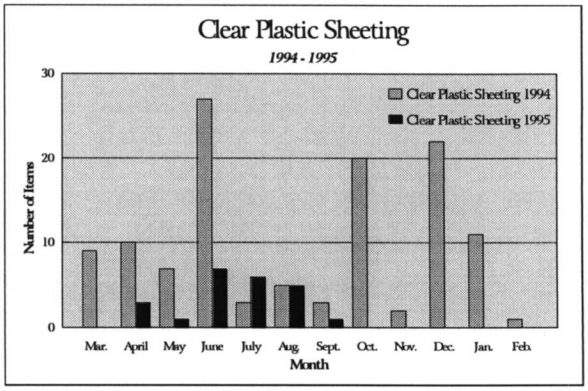
Category	Monthly Average	Total Number	Category Total
Offshore Oil & Gas Industry			**8,063**
Strip Lumber	199.00	3781	
Clear Sheeting > 2m	7.53	143	
Wood Spool	0.95	18	
Wood Pallet	9.48	180	
Write Enable Ring	0.63	12	
5-Gallon Container	46.74	888	
Hard Hat	22.84	434	
55-Gallon Container	2.26	43	
Tire	2.32	44	
Plastic Strap	107.47	2042	
Pipe Thread Protector	11.21	213	
Life Jacket	3.37	64	
Styrofoam Buoy	10.58	201	
Commercial Shrimping Industry			**41,965**
Unknown Source			**13,382**
Grand Total:			**63,410**

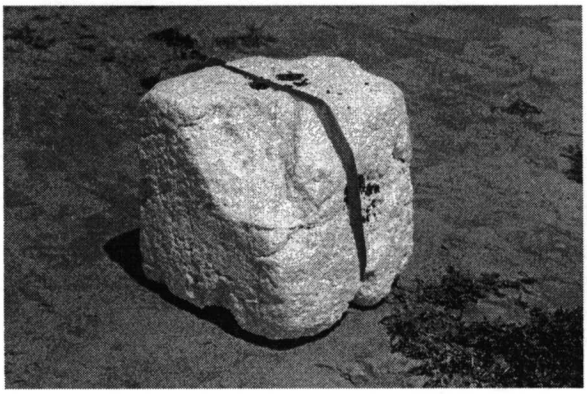
4.2 Offshore Oil & Gas Industry

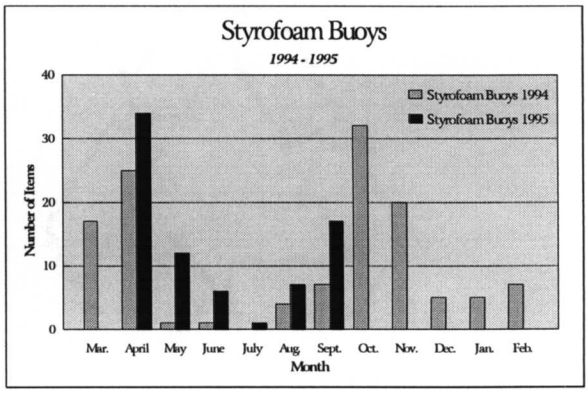
In the following section, graphs (monthly totals) and photographs are presented for all 13 items associated with the offshore oil and gas industry.

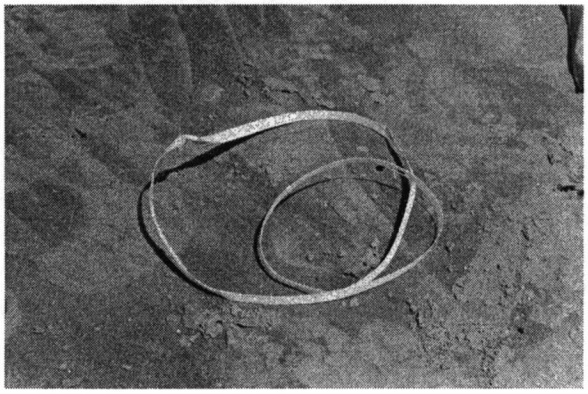


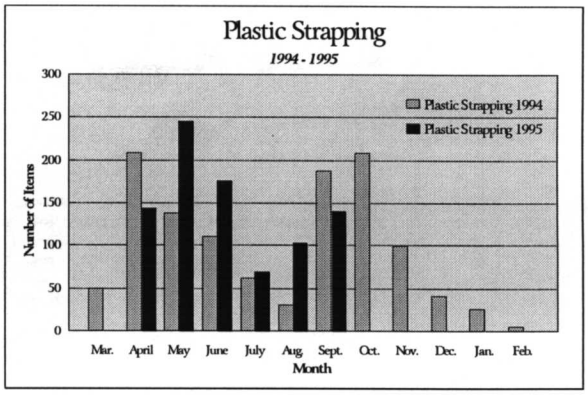

Strip Lumber
1994 - 1995
Strip Lumber 1994
Strip Lumber 1995
Number of Items
1000
800
600
400
200
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

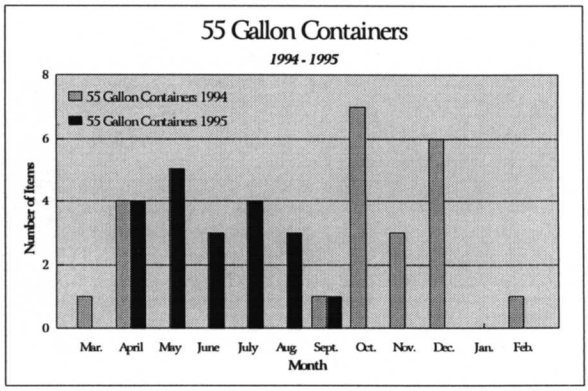

Clear Plastic Sheeting
1994 - 1995
Clear Plastic Sheeting 1994
Clear Plastic Sheeting 1995
Number of Items
30
20
10
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month




Styrofoam Buoys
1994 - 1995
Styrofoam Buoys 1994
Styrofoam Buoys 1995
Number of Items
40
30
20
10
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month




Plastic Strapping
1994 - 1995
Plastic Strapping 1994
Plastic Strapping 1995
Number of Items
300
250
200
150
100
50
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month


55 Gallon Containers
1994 - 1995
55 Gallon Containers 1994
55 Gallon Containers 1995
Number of Items
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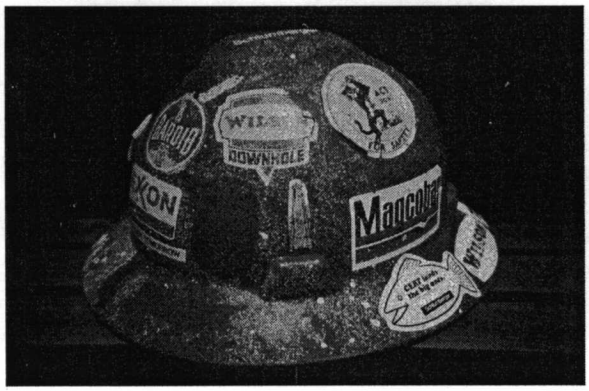
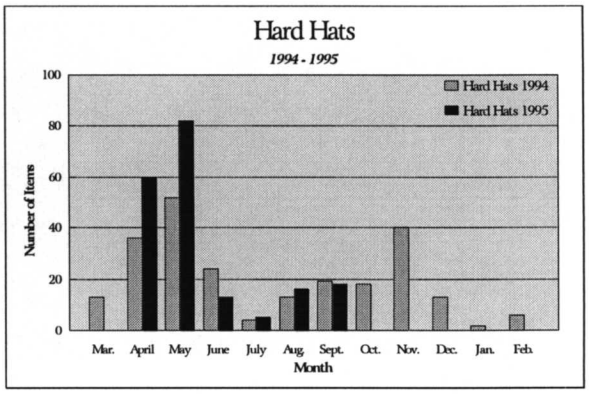
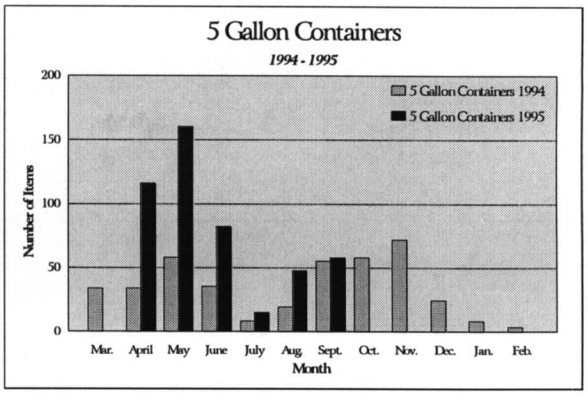
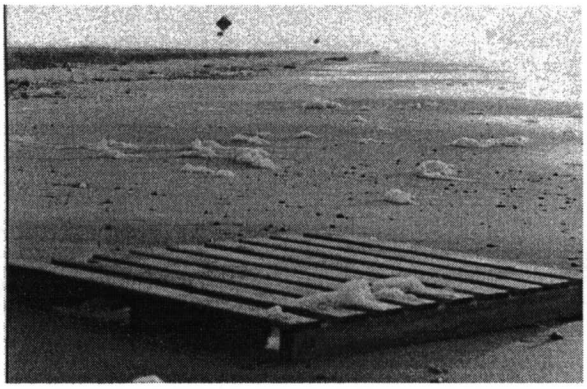
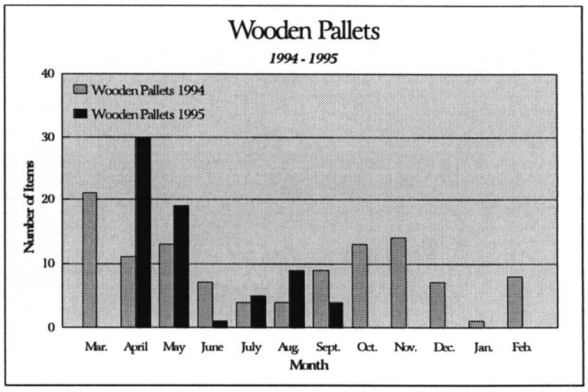
6
4
2
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

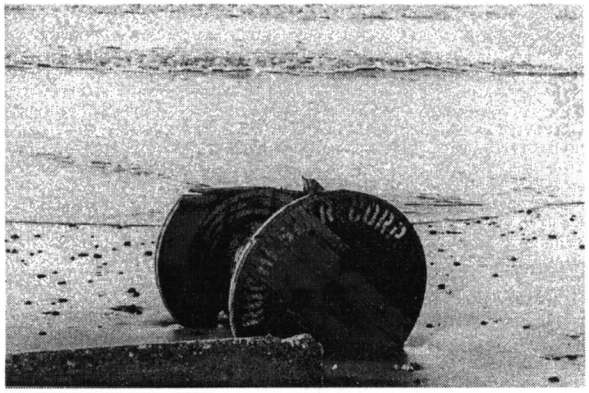

DOWNHOLE
Magcobar

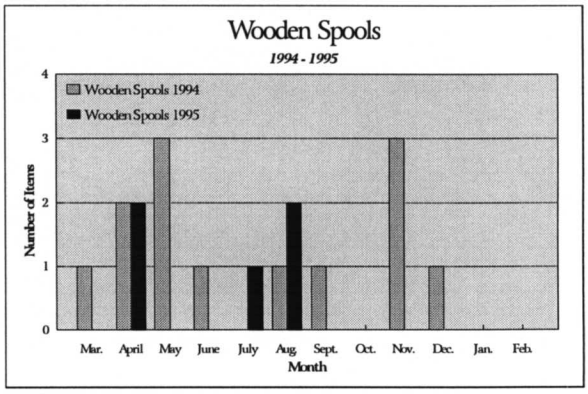

Hard Hats
1994 - 1995
Hard Hats 1994
Hard Hats 1995
Number of Items
100
80
60
40
20
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

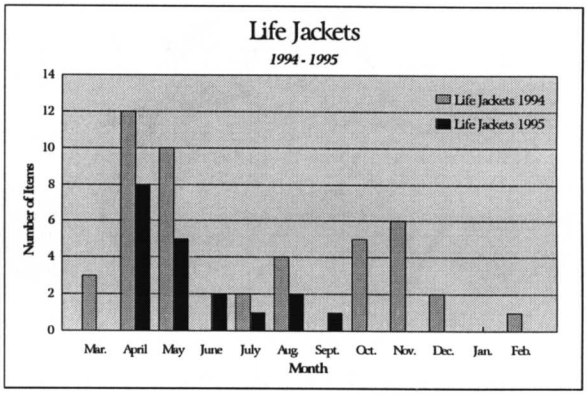

5 Gallon Containers
1994 - 1995
5 Gallon Containers 1994
5 Gallon Containers 1995
Number of Items
200
150
100
50
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

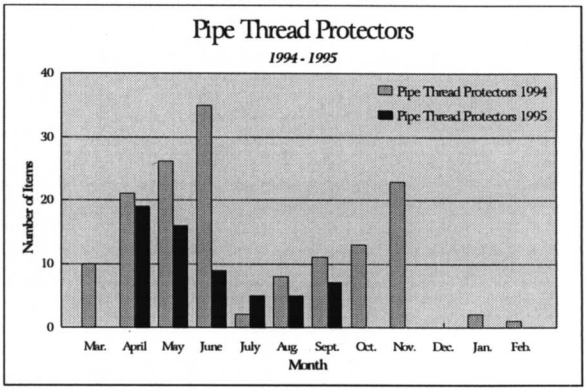


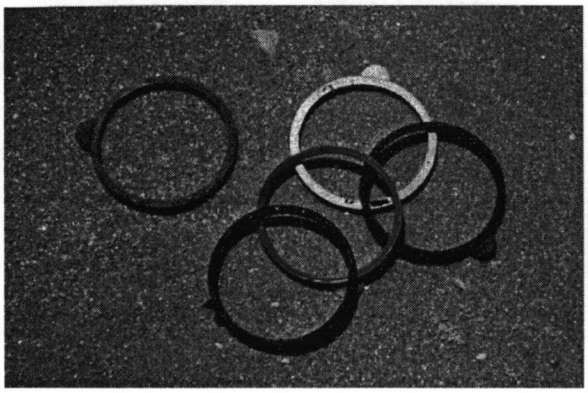

Wooden Pallets
1994 - 1995
Wooden Pallets 1994
Wooden Pallets 1995
Number of Items
40
30
20
10
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

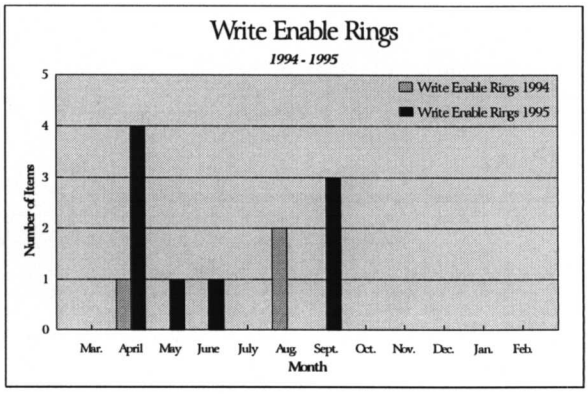


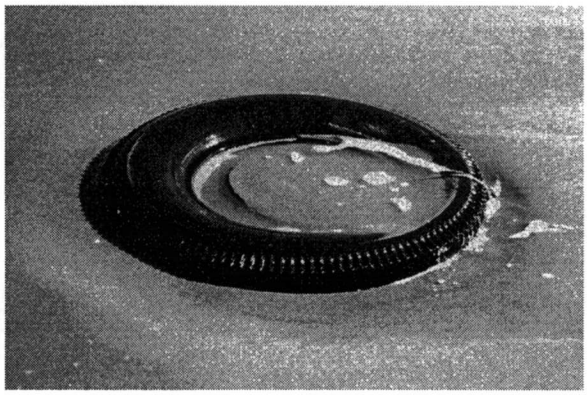

Wooden Spools
1994 - 1995
Wooden Spools 1994
Wooden Spools 1995
Number of Items
4
3
2
1
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

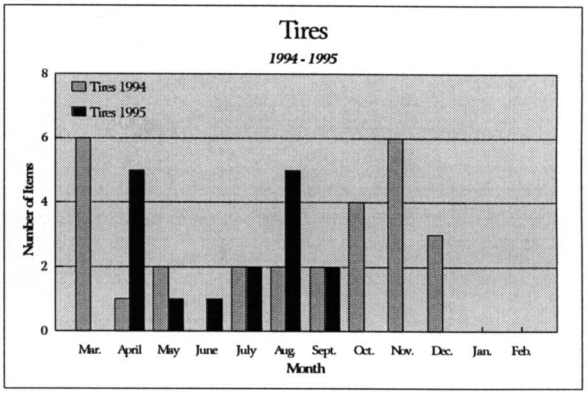

Life Jackets
1994 - 1995
Life Jackets 1994
Life Jackets 1995
Number of Items
0
2
4
6
8
10
12
14
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month


Pipe Thread Protectors
1994 - 1995
Pipe Thread Protectors 1994
Pipe Thread Protectors 1995
Number of Items
0
10
20
30
40
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month



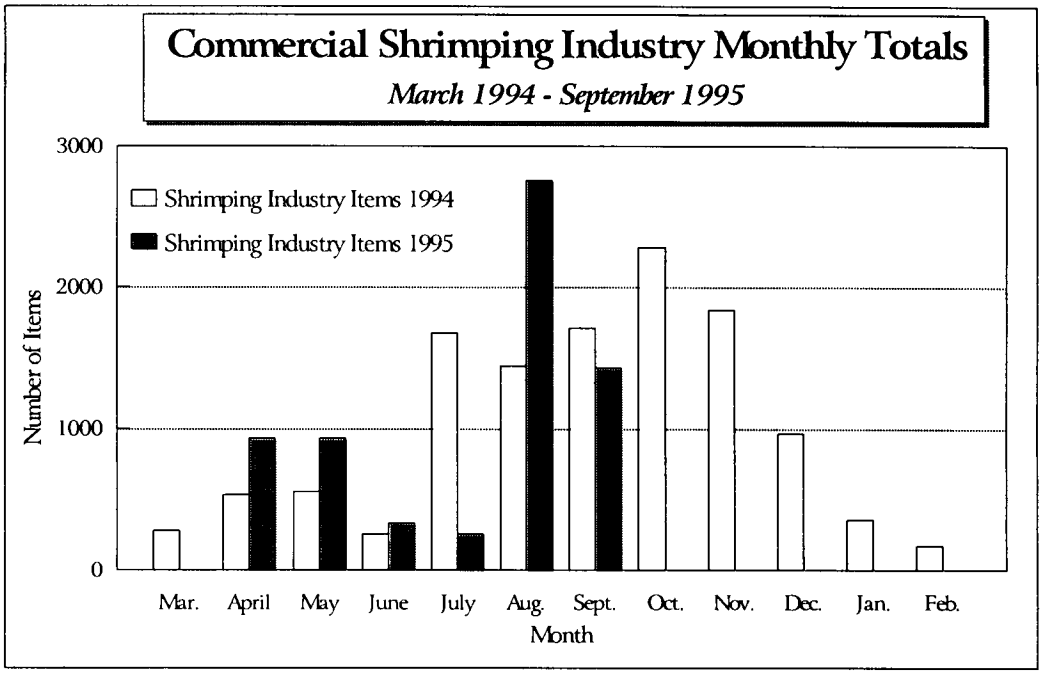

Write Enable Rings
1994 - 1995
Write Enable Rings 1994
Write Enable Rings 1995
Number of Items
0
1
2
3
4
5
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month

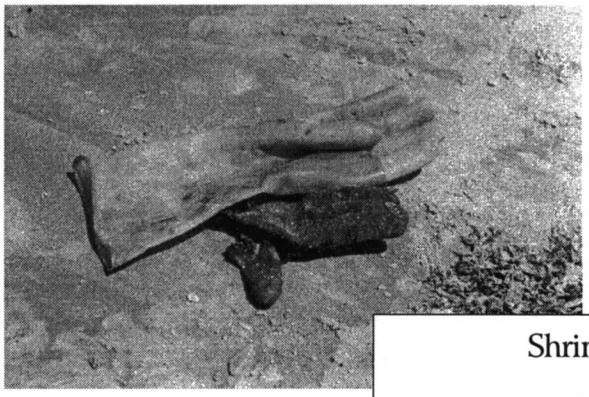


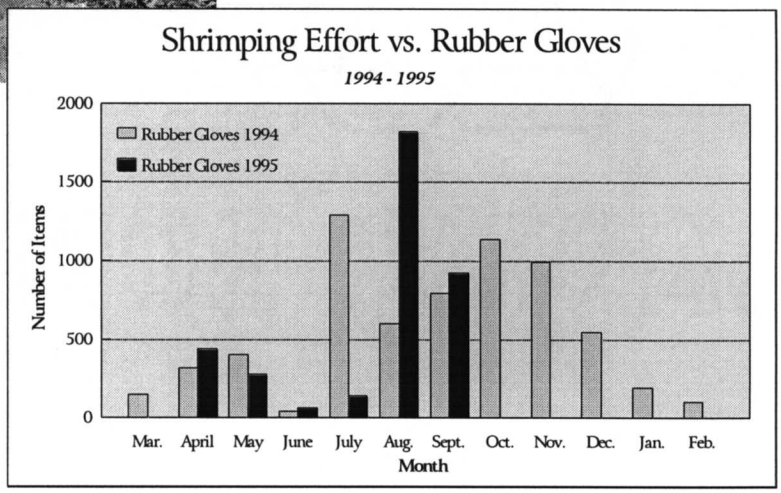

Tires
1994 - 1995
Tires 1994
Tires 1995
Number of Items
0
2
4
6
8
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month

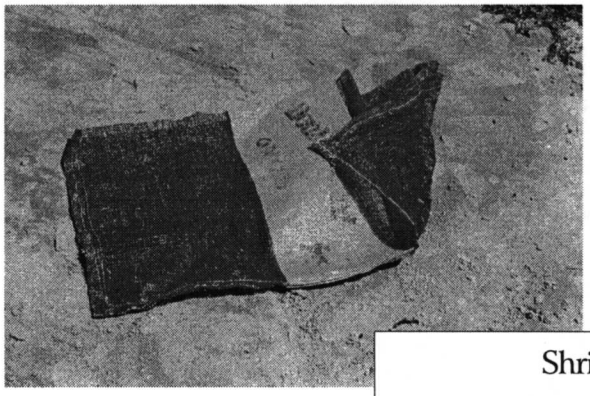
4.3 Commercial Shrimping Industry

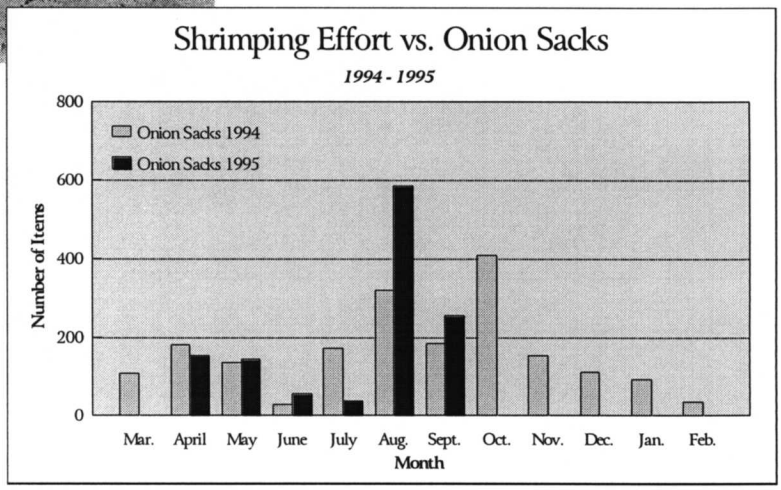
The following section contains graphs and photographs of the seven items that statistically correlated with shrimping effort. Also included are graphs (monthly totals) and pictures of the eight items suspected of coming from shrimping vessels.

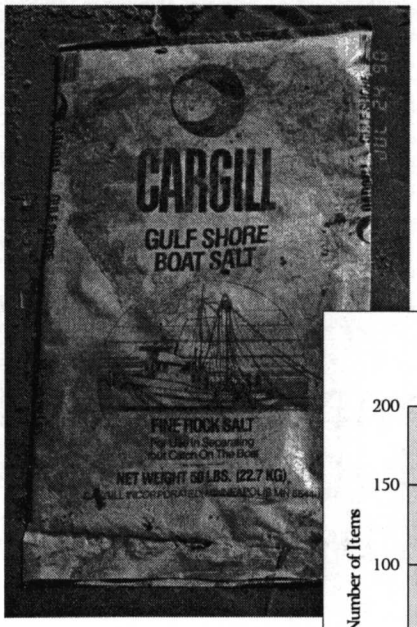


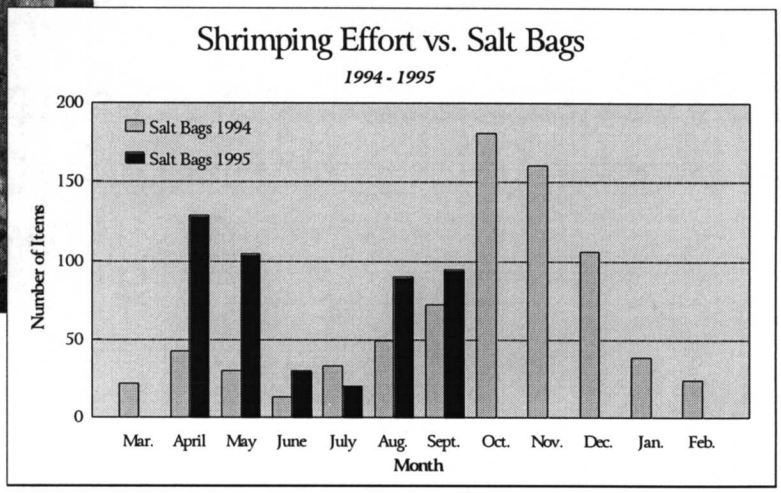


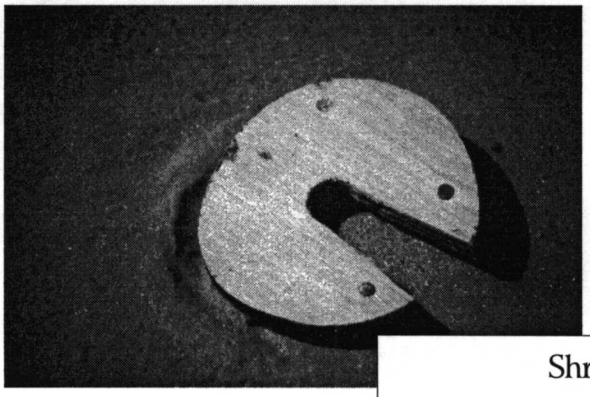

Shrimping Effort vs. Rubber Gloves
1994 - 1995
Rubber Gloves 1994
Rubber Gloves 1995
Number of Items
2000
1500
1000
500
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

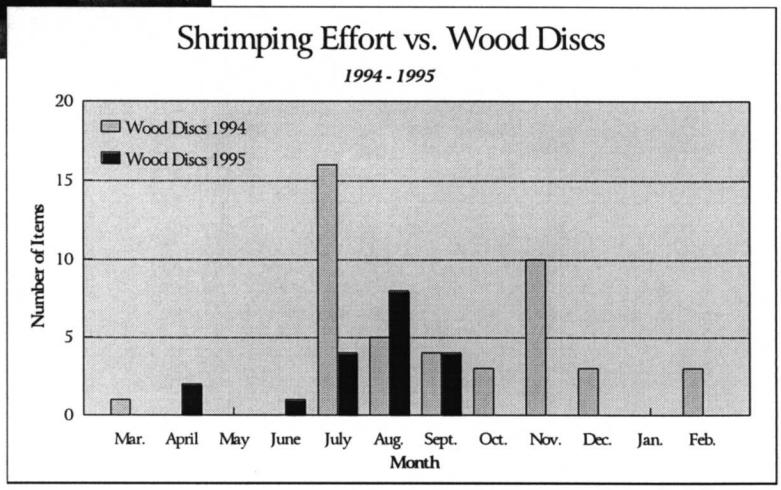


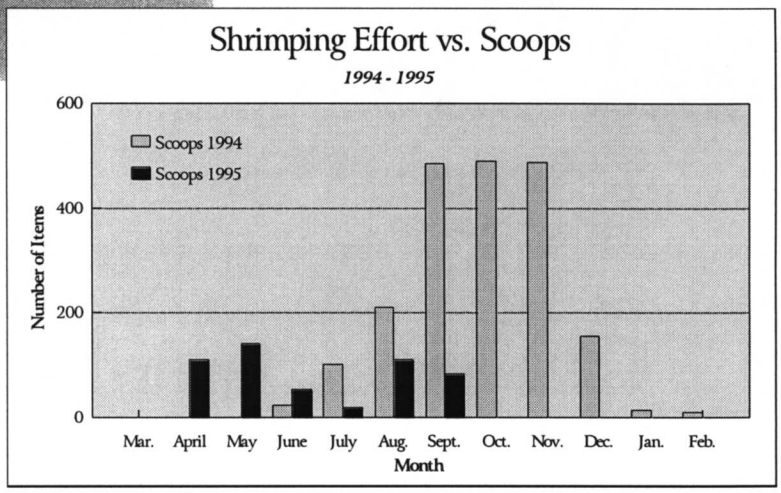

Shrimping Effort vs. Onion Sacks
1994 - 1995
Onion Sacks 1994
Onion Sacks 1995
Number of Items
800
600
400
200
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

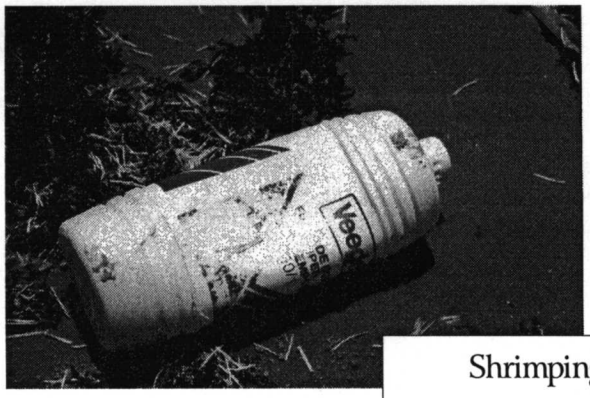

CARGILL
GULF SHORE
BOAT SALT
FINE ROCK SALT
NET WEIGHT 50 LBS. (22.7 KG)

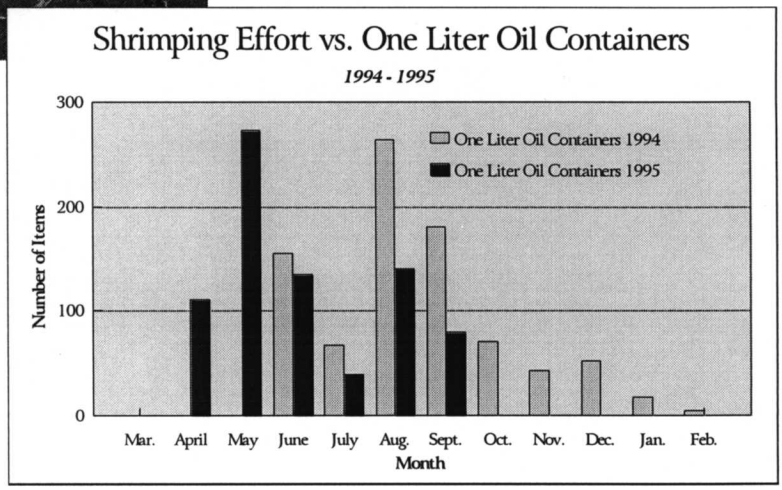

Shrimping Effort vs. Salt Bags
1994 - 1995
Salt Bags 1994
Salt Bags 1995
Number of Items
200
150
100
50
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

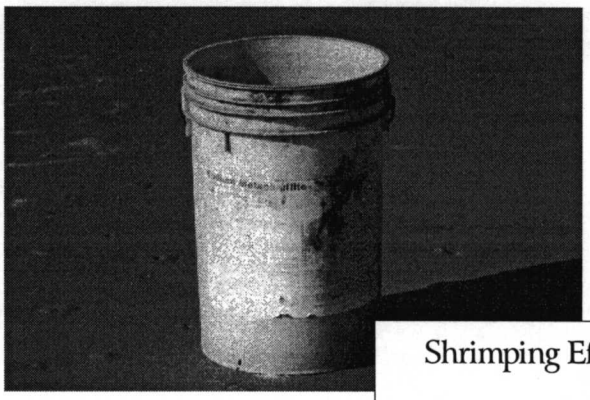


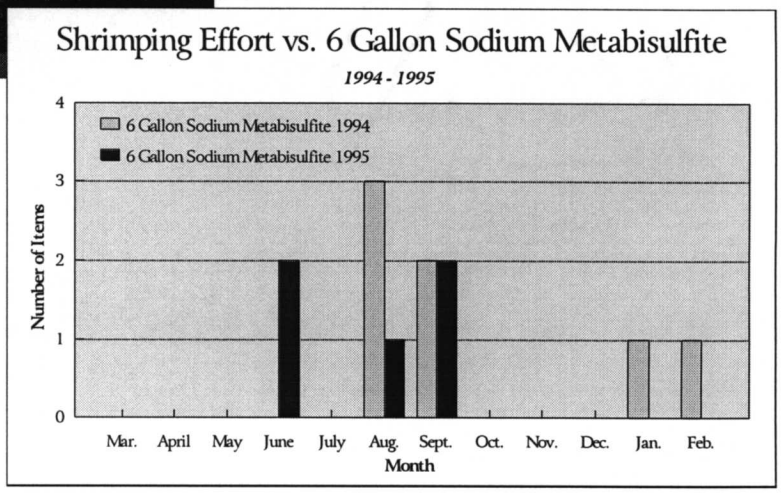

Shrimping Effort vs. Wood Discs
1994 - 1995
Wood Discs 1994
Wood Discs 1995
Number of Items
20
15
10
5
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

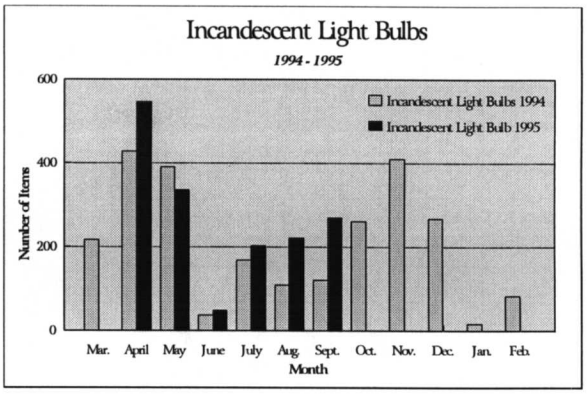

Shrimping Effort vs. Scoops
1994 - 1995
600
400
200
0
Number of Items
Scoops 1994
Scoops 1995
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

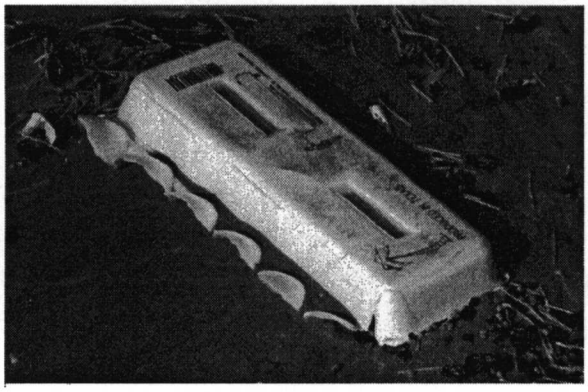


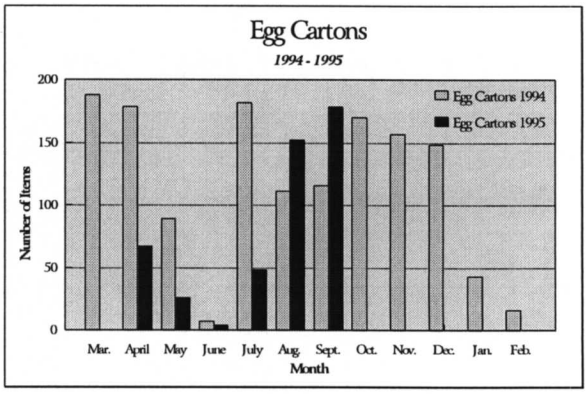

Shrimping Effort vs. One Liter Oil Containers
1994 - 1995
300
200
100
0
Number of Items
One Liter Oil Containers 1994
One Liter Oil Containers 1995
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

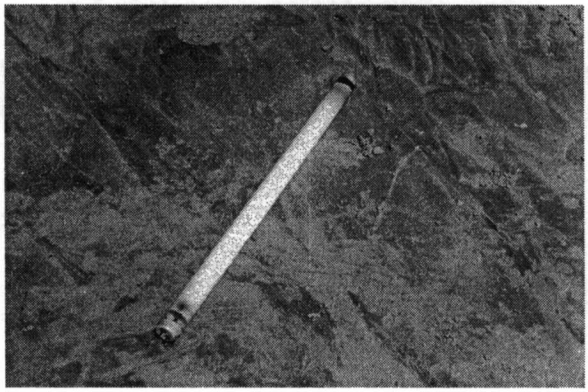


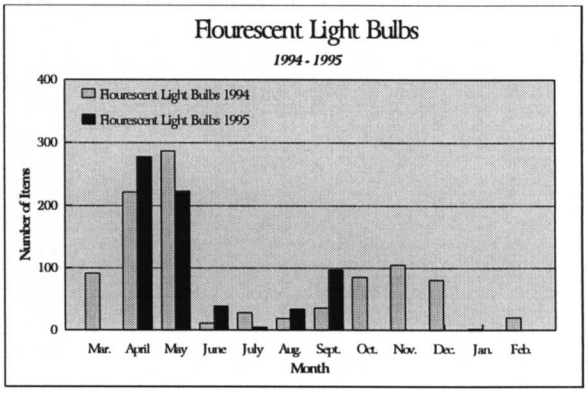

Shrimping Effort vs. 6 Gallon Sodium Metabisulfite
1994 - 1995
6 Gallon Sodium Metabisulfite 1994
6 Gallon Sodium Metabisulfite 1995
Number of Items
0
1
2
3
4
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month

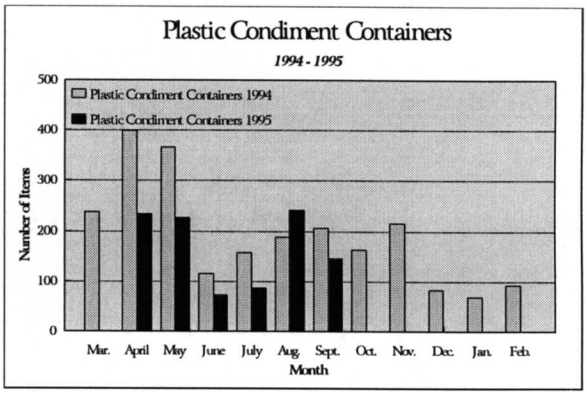

Incandescent Light Bulbs
1994 - 1995
Incandescent Light Bulbs 1994
Incandescent Light Bulb 1995
Number of Items
600
400
200
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

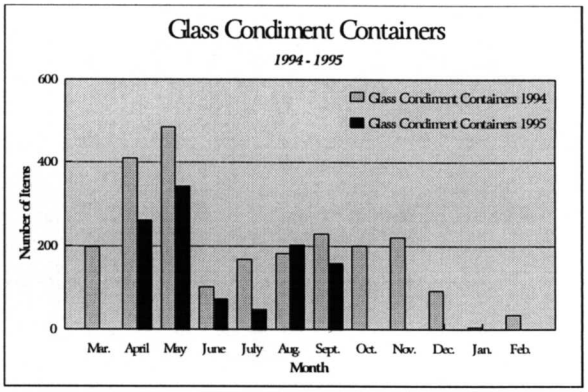


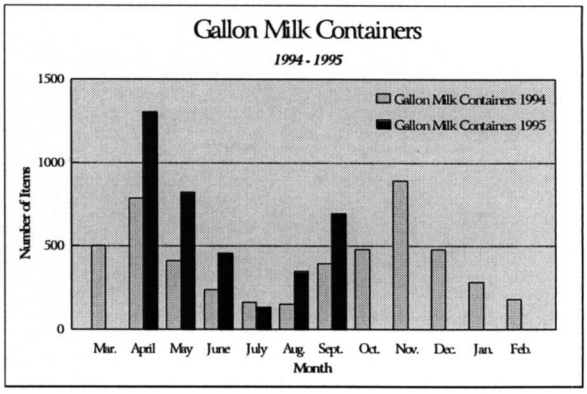

Egg Cartons
1994 - 1995
Egg Cartons 1994
Egg Cartons 1995
Number of Items
200
150
100
50
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month



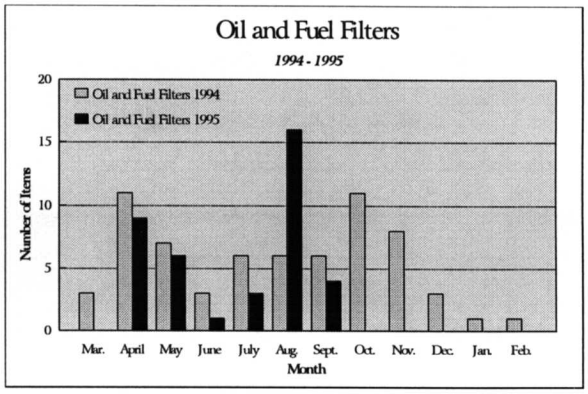

Flourescent Light Bulbs
1994 - 1995
Flourescent Light Bulbs 1994
Flourescent Light Bulbs 1995
Number of Items
400
300
200
100
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

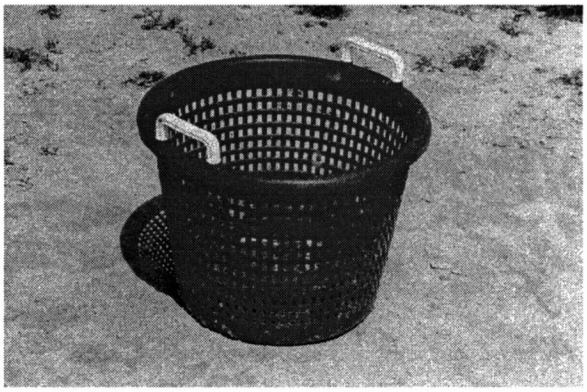

Plastic Condiment Containers
1994 - 1995
Plastic Condiment Containers 1994
Plastic Condiment Containers 1995
Number of Items
500
400
300
200
100
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

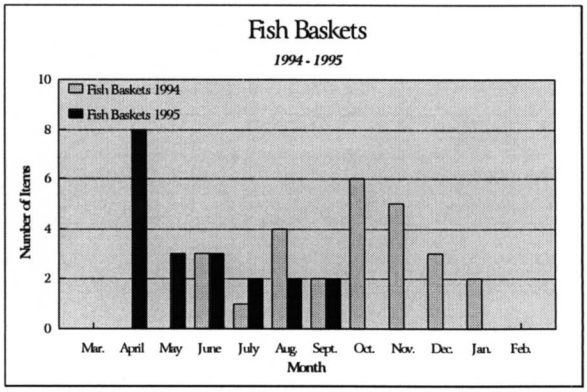

Glass Condiment Containers
1994 - 1995
Glass Condiment Containers 1994
Glass Condiment Containers 1995
Number of Items
600
400
200
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month


Gallon Milk Containers
1994 - 1995
Gallon Milk Containers 1994
Gallon Milk Containers 1995
Number of Items
1500
1000
500
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month


LFF-5823
FUEL FILTER

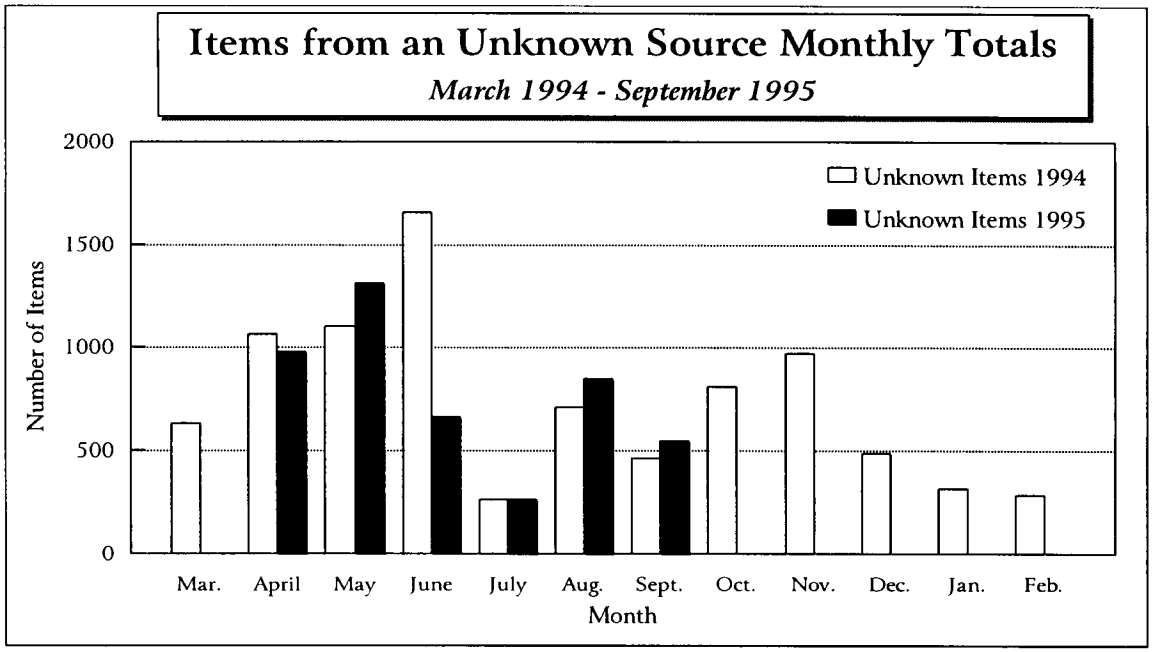

Oil and Fuel Filters
1994 - 1995
Oil and Fuel Filters 1994
Oil and Fuel Filters 1995
Number of Items
0
5
10
15
20
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

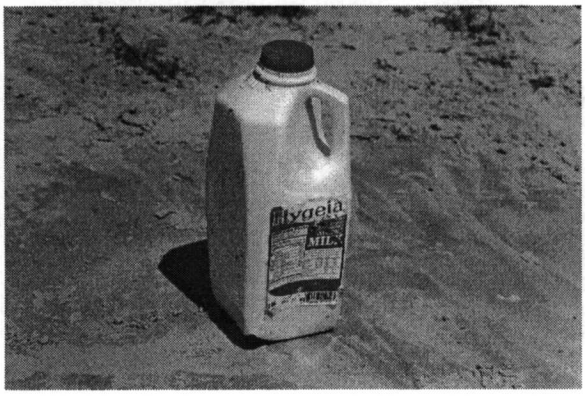


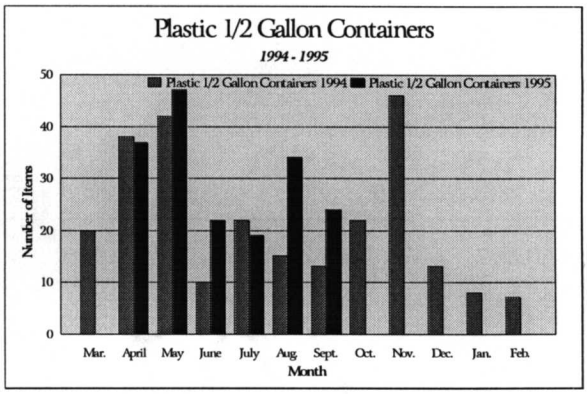

Fish Baskets
1994 - 1995
Fish Baskets 1994
Fish Baskets 1995
Number of Items
0
2
4
6
8
10
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

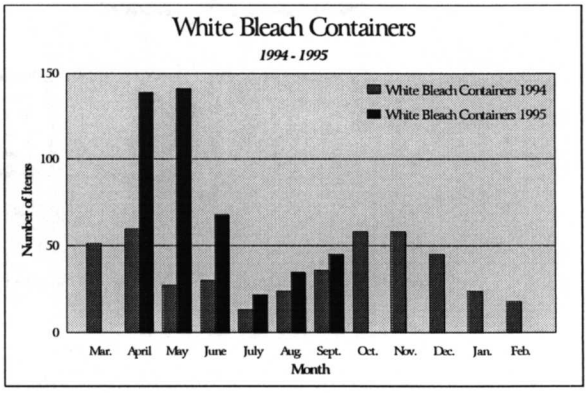
4.4 Items from an Unknown Source

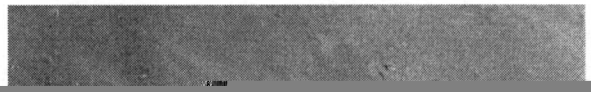
In the following section, graphs (monthly totals) and photographs are presented for all 14 items whose source is unknown.



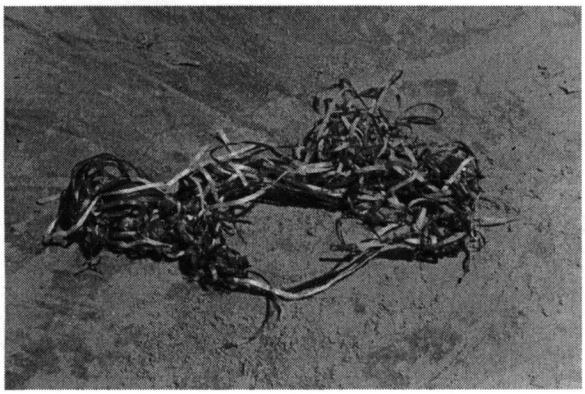

Hygeia
MILK

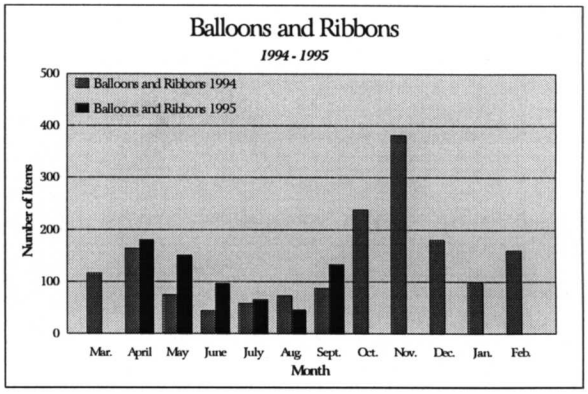

Plastic 1/2 Gallon Containers
1994 - 1995
Plastic 1/2 Gallon Containers 1994
Plastic 1/2 Gallon Containers 1995
Number of Items
0
10
20
30
40
50
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month


White Bleach Containers
1994 - 1995
White Bleach Containers 1994
White Bleach Containers 1995
Number of Items
0
50
100
150
Mar.
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Month

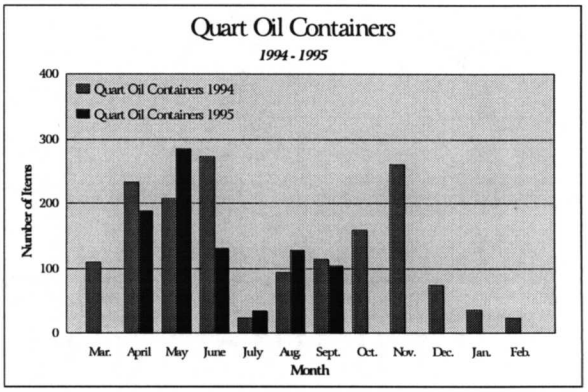


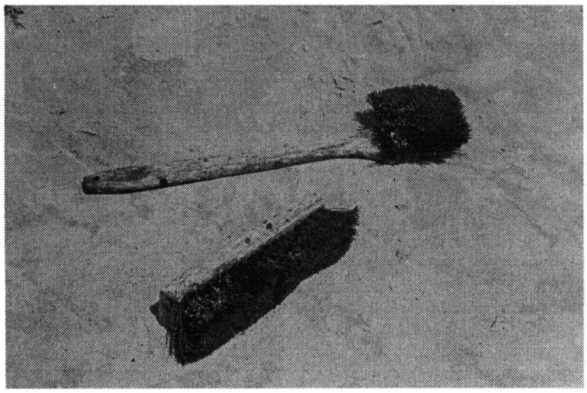

< 1 Gallon Blue Bleach Containers
1994 - 1995
120

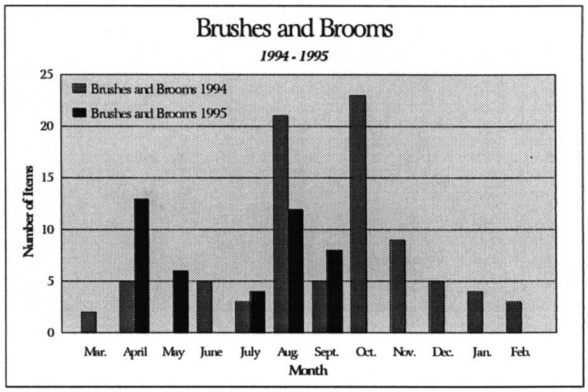


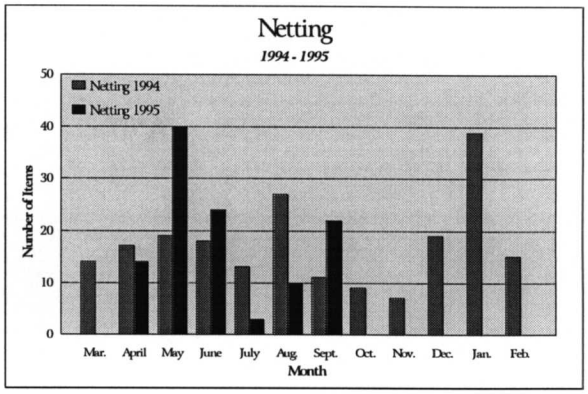

Balloons and Ribbons
1994 - 1995
Balloons and Ribbons 1994
Balloons and Ribbons 1995
Number of Items
500
400
300
200
100
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month


Havoline

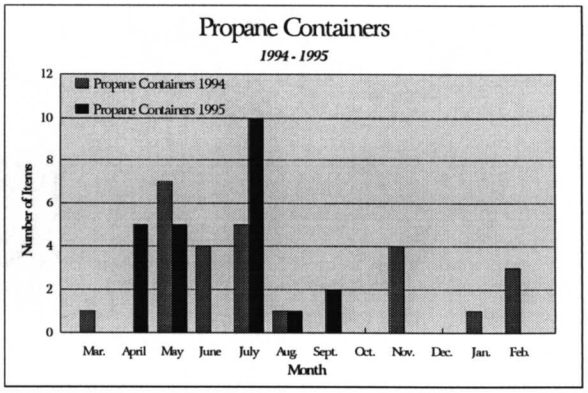

Quart Oil Containers
1994 - 1995
Quart Oil Containers 1994
Quart Oil Containers 1995
Number of Items
400
300
200
100
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

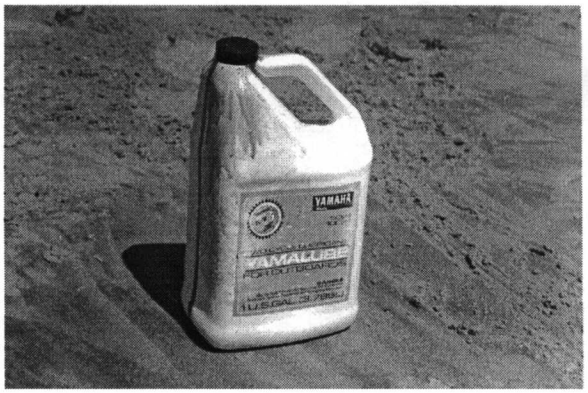


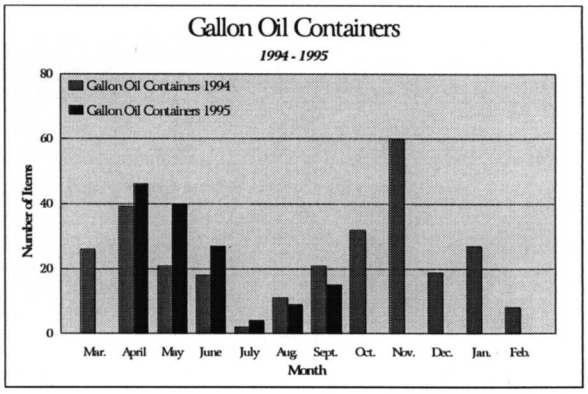

Brushes and Brooms
1994 - 1995
Brushes and Brooms 1994
Brushes and Brooms 1995
Number of Items
25
20
15
10
5
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

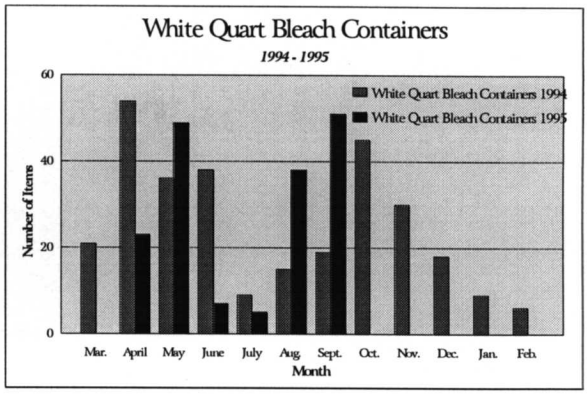

Netting
1994 - 1995
Netting 1994
Netting 1995
Number of Items
0
10
20
30
40
50
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

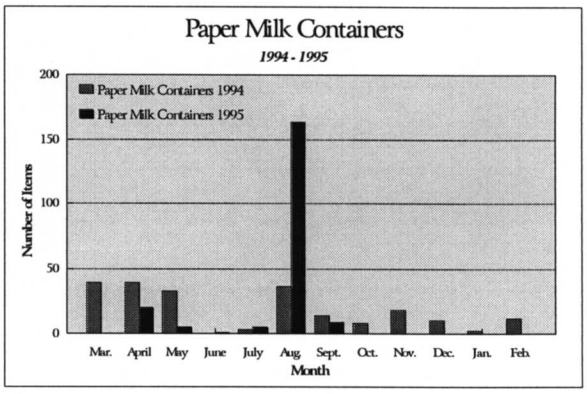

DUPONT
FREON 502

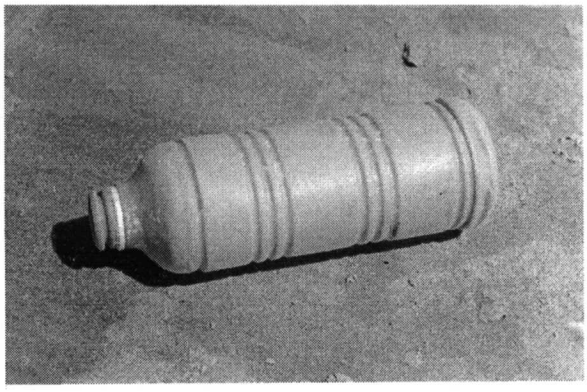

Propane Containers
1994 - 1995
Propane Containers 1994
Propane Containers 1995
Number of Items
0
2
4
6
8
10
12
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

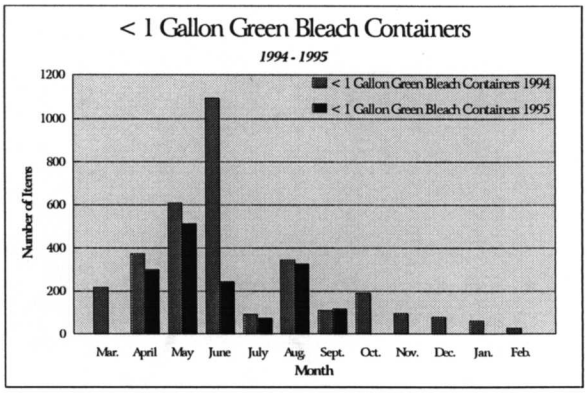

YAMAHA
YAMALUBE


Gallon Oil Containers
1994 - 1995
Gallon Oil Containers 1994
Gallon Oil Containers 1995
Number of Items
0
20
40
60
80
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

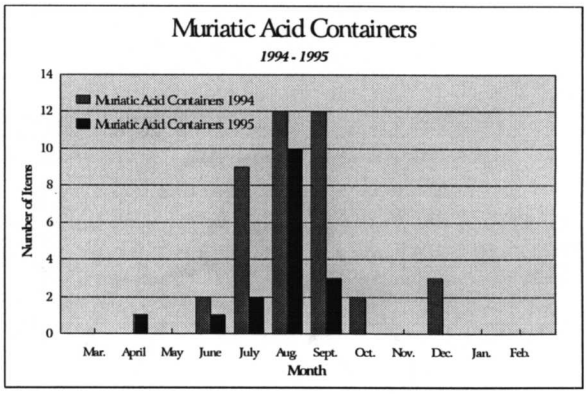

White Quart Bleach Containers
1994 - 1995
White Quart Bleach Containers 1994
White Quart Bleach Containers 1995
Number of Items
60
40
20
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

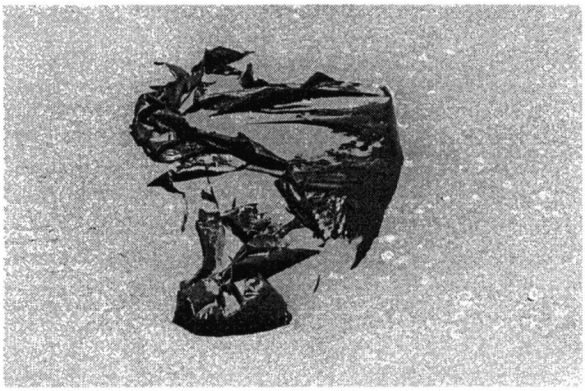

Paper Milk Containers
1994 - 1995
Paper Milk Containers 1994
Paper Milk Containers 1995
Number of Items
200
150
100
50
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

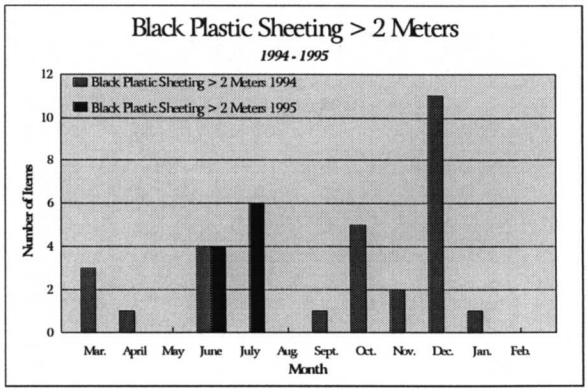



< 1 Gallon Green Bleach Containers
1994 - 1995
< 1 Gallon Green Bleach Containers 1994
< 1 Gallon Green Bleach Containers 1995
Number of Items
1200
1000
800
600
400
200
0
Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb.
Month

Picture Not Available







5.0 Discussion

Environmental factors directly influence the amount of daily debris accumulation. Researchers unfamiliar with these daily influences and resulting variability may unknowingly misinterpret data results. PINS research indicates that mathematical extrapolation of data from infrequent surveys are inaccurate. Additionally, PINS research indicates that debris collected from the backshore area of the beach is not post-MARPOL Annex V garbage. Data collected from the backshore when combined with tidal debris data is inaccurate and does not represent the true accumulation rate.

Marine debris point source research at Padre Island National Seashore was conducted daily (7 days/week) for 19 months to increase data accuracy on debris accumulation and composition. Research was conducted on 16 miles of shoreline to guarantee that the survey area was large enough to understand daily debris accumulation. Quality control procedures were implemented on a frequent basis to ensure data collection and reporting accuracy.

Similar research studies should be conducted in other areas around the United States to identify additional point sources. To solve the marine debris problem, point sources must be identified. Unless they are, actions implemented to reduce the amount of garbage being dumped into our oceans is ineffective.

Results from our research indicate that point source violators can be identified. We have proven 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. Through education and regulatory enforcement we can substantially decrease the amount of garbage generated by these point sources, thus resulting in a cleaner Gulf of Mexico.

6.0 Bibliography

Miller, John E., Sean W. Baker, and Darrell L. Echols. 1995. Marine Debris Point Source Investigation, 1994 - 1995, Padre Island National Seashore. U.S. Dept. of the Interior, National Park Service, Padre Island National Seashore, TX.

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Royalty Management Program** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.