

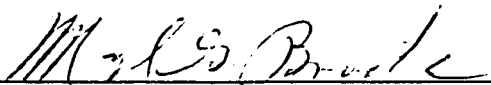
Research Proposal

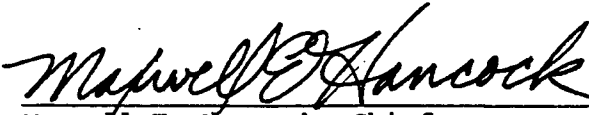
QUANTITATION OF OIL/TARBALLS
FOUND ON THE BEACHES OF
PADRE ISLAND NATIONAL SEASHORE

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Introduction

The return of IXTOC I oil to Texas beaches during the spring 1980 is inevitable if the well-head is not capped in the very near future. The probability of secondary oiling increases each day as oil continues to flow into the marine environment. Physical oceanographers have predicted that oil will again impact the south Texas coast in early March 1980 barring any change in events at the IXTOC I well site.

In light of the anticipated return of oil from the IXTOC I well to the beaches of Padre Island National Seashore (PAIS) this spring, quantitative documentation should receive high priority. Documentation must begin immediately in order to establish baseline data and should continue throughout the period of impact for three primary reasons; (1) accurate quantitative data will be necessary to correlate faunal responses with varying degrees of oil impact, (2) the park staff must quantify the amount of beached oil in order to avoid possible discrepancies with other agencies estimates, and (3) the need to provide accurate up-to-date information to park visitors.

An initial baseline survey will quantify reports that fairly high concentrations of tar balls presently exist within the National Seashore. A recent survey of tar accumulations remaining on Texas beaches indicates that unusually high concentrations of tarballs and large chunks of tar were almost always found near an exposed "tar mat" (Sturtevant, 1979). The tar mats, consisting of a stable oil/sand/shell mixture, are found in the intertidal zone

or the first trough and are slowly breaking up due to surf action. This material is subsequently deposited on the foreshore in the immediate vicinity of each tar mat.

Sturtevant 1979, reported that the tar mats tend to be highly scattered but were most frequently found within 15 miles of Mansfield Pass. The largest tar mat encountered was 150 m x 10 m, four miles north of Mansfield Pass.

The U. S. Geological Survey (USGS) is presently pursuing a cooperative research program designed to intensively study three of the tar mats within the park. This investigation will determine the depth and aerial coverage of selected tar mats, the extent of sand coverage, geochemistry, infaunal responses, sedimentology, hydrocarbon chemistry and littoral transport of eroded portions. Organizations involved in the development of this program include the U. S. Geological Survey, Padre Island National Seashore and the University of Texas. This investigation will determine the longevity of the tar mats, effects upon endemic biota and whether or not mechanical removal may be appropriate.

Padre Island National Seashore can become an integral part of the cooperative research program by providing quantitative oil/tarball data and physical assistance to the study team.

Objectives

- (1) To determine the percentage of surface oil/tar coverage on the beaches of Padre Island National Seashore.
- (2) To determine the volume of oil/tar washing ashore.
- (3) To determine the amount of tarballs directly attributable to the breaking up of tar mats.

Study Site

A series of permanent transects will be established along the gulf beach of Padre Island National Seashore (Fig. 1). The transects will be located near permanent features already in place. The transect locations are as follows:

1. North Beach Barricade (NBB)
2. South Beach Barricade (SBB)
3. Four-wheel Drive Sign (FWD)
4. Yarborough Pass (YP)
5. 25 mile post (25 MP)
6. 35 mile post (35 MP)
7. Nicaragua (NIC)
8. Mansfield Channel - 0.5 miles north (MC)

In order to obtain tarball data which will correspond to tarmats selected for intensive study by the cooperative research team, additional transects may need to be established. This will be determined during the initial survey.

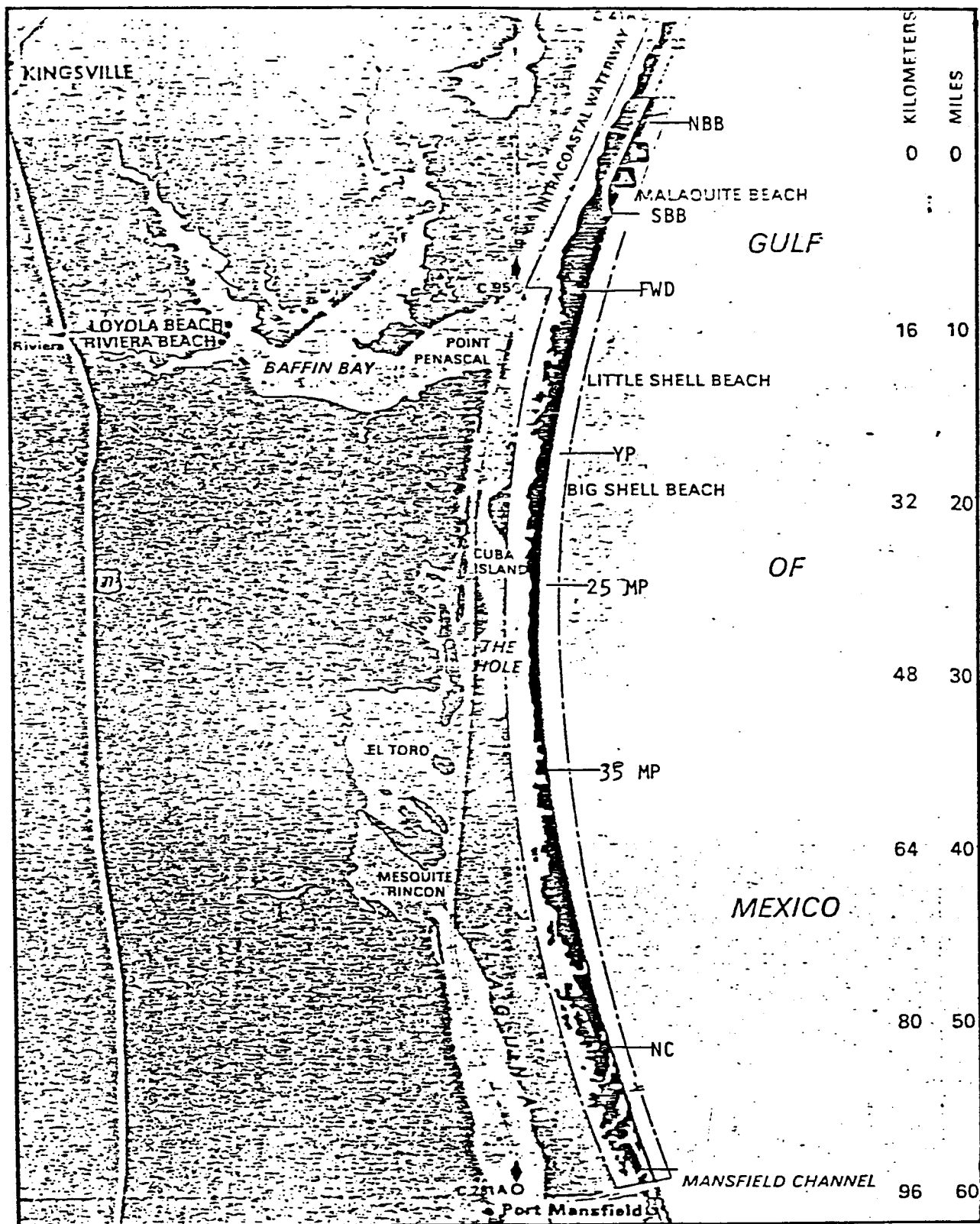


Figure 1. Oil/tarball transect locations.

Methods

At each transect location, two posts will be implanted on an embryonic dune, aligned perpendicular to the surf. Distance between the two posts will be approximately five (5) meters. Two posts at each location will facilitate accurate alignment of the transects during each sampling phase.

Upon arrival at a particular study site, a rope graduated at five (5) meter intervals will be secured to the seaward post and stretched across the beach to the waterline maintaining proper alignment. Beach width and the width of tarball coverage can then be recorded by referring to the graduated rope.

An aluminum one-meter square frame with string stretched across at decimeter intervals producing a grid will be used to document the percentage of tarball coverage. Within the zone of tarball impact the meter square will be placed on the beach adjacent and to the north of the rope. The percentage of tarball coverage within the frame will be visually estimated and photographically documented using 4 x 5 black and white format. An index card bearing the date, transect number and frame location (i.e., distance from seaward post) will be placed at the upper right edge of the meter square. Therefore, this data will be included in the photograph. No more than three stations along each transect will require quantitative documentation. Detailed analysis of the photographs will be accomplished in the laboratory. The percentage of tarball coverage in the immediate area can then be calculated by extrapolation.

In order to determine the volume of tarballs, the petroleum material within the meter square frame will be collected and placed in a container labeled properly. Accurate weight of the collected material will be determined in the

laboratory and volume can then be calculated.

In addition to a vertical photograph of tarballs within each meter square frame, a general view of the beach to the north from the transect line is desirable. In the event that heavy concentrations of oil are encountered in areas other than the designated transects, the impacted area will be documented photographically.

Written documentation of the oil/tar condition at each transect will consist the following information:

1. Date and time
2. Width of beach (post to waterline)
3. Width of beach impacted with oil/tar
4. Estimated coverage (%) of oil/tar within each meter square area
5. Consistency of the oil/tar
6. Depth of the oil/tar
7. Note oil/tar in the surf
8. General observation of oil/tar in the area (i.e., restricted to forebeach, berm, backbeach, etc.)

During the return trip, species of shorebirds and the number of individuals observed will be logged. Documentation of stranded sea turtles will also be included.

Time Schedule

Transect site selection and initial documentation will be completed prior to 15 February 1980. The transects will then be monitored at bi-weekly intervals throughout the fiscal year.

Trip reports will be submitted to the Superintendent immediately following each sampling phase. A comprehensive final report will be prepared upon completion of the study.

BUDGET

Personal Services

1. Transect site selection (1 M/D)	= \$ 70
2. Transect monitoring (2 M/D/Trip x 16 Trips)	= 2240
3. Laboratory analysis (1 M/D/Trip)	= 1120
4. Report Preparation (3 M/D)	= <u>210</u>

\$3640

Equipment cost

1. Gasoline (130 miles/Trip; 10 miles/gal; \$1/gal)	= 208
2. GSA vehicle rental (.12/mile; 40 miles/Trip)	= <u>77</u>

\$ 285

Field Supplies

1. 4 x 5 black & white film (600 sheets)	= 85
2. 2 aluminum meter square frames	= 35
3. ½ inch nylon rope	= 32
4. Miscellaneous (log books, pencils, etc.)	= <u>10</u>

\$ 162

TOTAL = \$4087

