

## THE PERSISTENCE OF IXTOC-I OIL ALONG THE SOUTH TEXAS COAST

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Floating oil from the IXTOC-I blowout came ashore in quantity along the South Texas Gulf coastline during August and September 1979. This was a short time-span compared to the 295 days that oil from the IXTOC well flowed into the Gulf of Mexico (June 1979 to March 1980). Within a 12-km long study site on Mustang Island beach, thick deposits of IXTOC oil remained visible also for a comparatively short time due to several factors, among them, seasonal changes in the longshore current system, mechanical oil removal efforts, and two (September 1979) storms that eroded beach, dunes, IXTOC oil, and man-made storage piles of oiled sand and swept them out to sea. IXTOC deposits remained in the form of "tar-reefs" deposited just offshore in the region of the first sandbar and trough. Some effort was made to remove these mechanically in the more popular parts of the beach up until the end of 1979.

The ongoing study, initiated in April 1978, monitors the bird population utilizing this stretch of Gulf coast beach along with sea and weather conditions, beach profile measurements, demographic trends in this rapidly developing area, and the types of beach debris, natural and man-made, including oil and tarballs. The survey is now done on alternate days, and at this writing, 665 have been completed covering 8,000 km of beach, taking 1300 man-hours; 700,000 individual birds of 204 species have been counted. The survey is done by automobile, and distances are measured using a calibrated odometer with a repeatability of 0.03 km to known landmarks. The location of all tar-reefs along the beach has been monitored since 1979. Due to seasonal variations in sea level the tar-reefs remain submerged for much of the year. From late November through February low tides expose the reefs, but at the same time the passage of winter "northers"

creates energetic wave systems which erodes them. Fields of characteristic tarballs eroded from the reefs are washed onto the beach and remain there until buried by sand or washed into the foredunes during storms. Figure 17 shows the location of reefs and tarball fields associated with the reefs from September 1979 through June 1983. The last period when the reefs were exposed (in early 1983) revealed several small reefs, the largest being 25 m long by 3 m wide by 25 cm thick, and many tarball fields. It should be noted that due to the limited resources and time available for this project, no effort has been made to locate the tar-reefs when they are submerged. Tar-reef and tarball samples have been collected at intervals throughout the study period and are preserved frozen at UT-MSIPA.

In November 1980 small fields of Callianassa islagrande burrows were discovered that had been filled with IXTOC oil, presumably when the semi-liquid mousse first beached and, mixed with sand, flowed down, and permeated the burrows to form an IXTOC oil burrow cast (Amos et al., 1983). Another event that followed the IXTOC oil beaching was the oiling of shorebirds (Amos, 1980). While gulls and terns and sandpipers occupy the study beach in about equal numbers averaged over a year, the shorebirds were much more vulnerable to oiling than were the gulls and terns. This was particularly so with Sanderling (Crocethia alba). Sanderling feed at the strand-lines where oil and oiled debris are found. Their bills and feet become oiled, and oil is then transferred to the body plumage by preening, by their habit of standing on one foot with the other drawn up to the belly plumage, and by their territorially aggressive/submissive postures when they lie flat on the oiled sand or debris. Figure 18 shows the incidence of oiling of Sanderling compared to Piping Plover (Charadrius melodius) from 1978 to the present. Each spring since IXTOC beached (especially during May), numbers of Sanderlings are oiled. While there is some identification of this being a dimishing phenomenon when comparing percentage of birds oiled rather than total numbers oiled, this oiling coincides with a seasonal beaching of fresh tarballs and oiled Sargassum weed. How much of this can be attributed to IXTOC oil and how much to other oil production/transportation spillage or to natural seepage cannot be determined from the present observations. It is interesting to note that

LOCATION OF TARMATS (\*) and TARBALL FIELDS (o) ON MUSTANG ISLAND

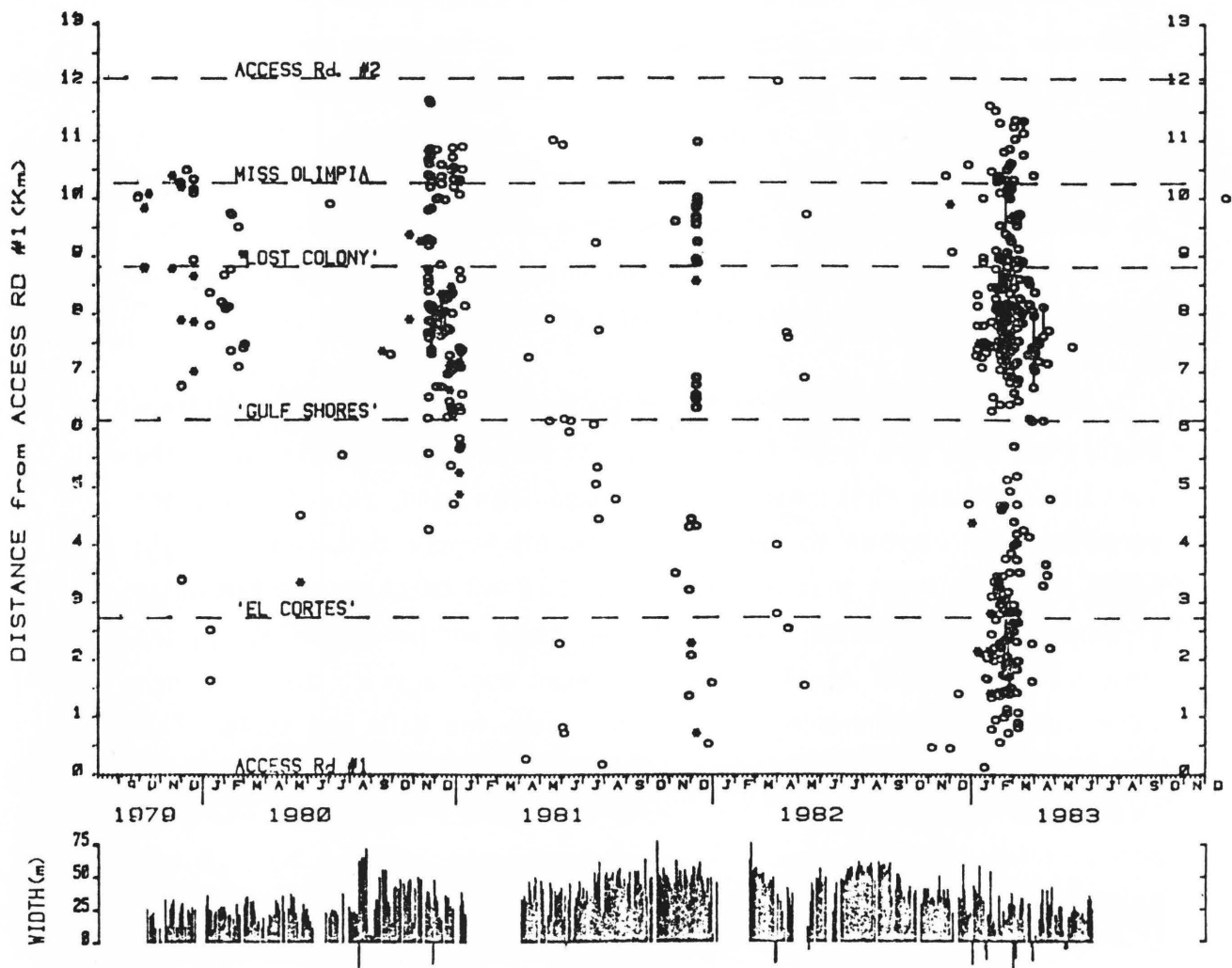


Figure 17. Location of Tarmats (\*) and Tarball Fields (o) Associated with Tar-Reefs from September 1979 through June 1983. Frequency of observation can be seen from the beach width (distance from dune line to high-tide line) bars along the bottom of the plot. Location of prominent beach landmarks are shown by the dashed lines.

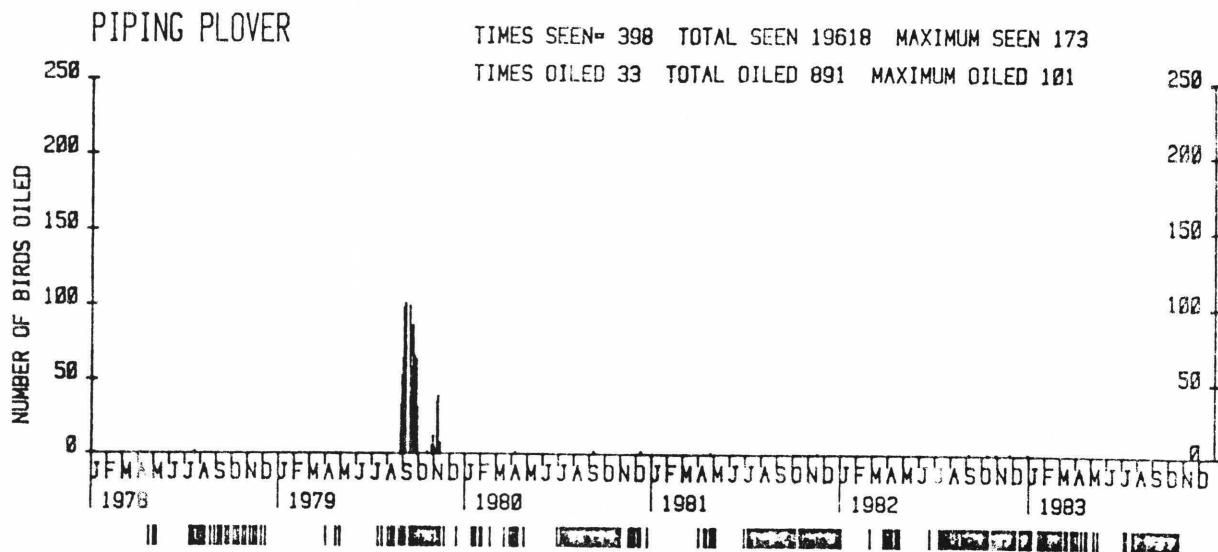
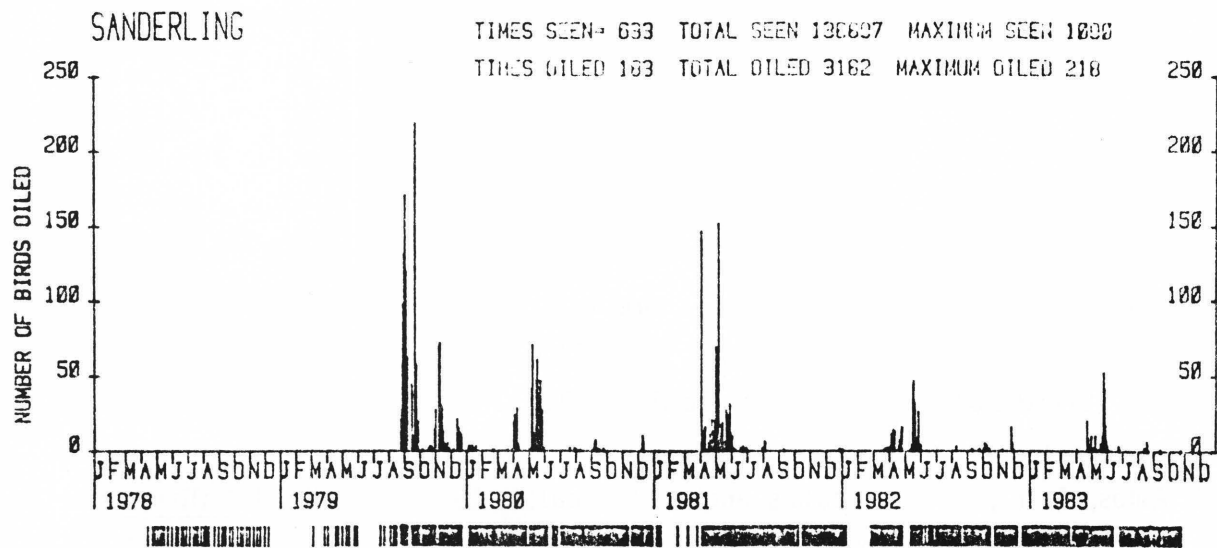


Figure 18. Oiling of Sanderling (Crocethia alba) and Piping Plover (Charadrius melodius) from April 1978 to November 1983. Frequency of observation of each species is given by the vertical bars at the bottom of each plot. Sanderling is the most commonly seen bird on the beach with a sighting frequency of about 99 percent.

Piping Plover and other shorebirds, while initially badly oiled following the IXTOC spill, have not continued to be oiled in the same way that Sanderling has.

#### REFERENCES

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- Amos, A. F., S. C. Rabalais and R. S. Scalan, 1983. Oil-filled Callianassa burrows on a Texas barrier island beach. J. Sed. Petrol. 53(2): 411-416.