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Demultiplexing and Archiving  
the  
Teledyne - Multichannel Seismic Reflection Data Set:  
Lines TD-1 through TD-6

by

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## ABSTRACT

As part of an ongoing effort to preserve data on older, deteriorating magnetic tapes, and to reduce the amount of space required to store those tapes, the USGS seismic processing center in Denver, Colorado, is demultiplexing and compressing raw field tapes of selected data sets. The compressed, demultiplexed data are being transferred to new magnetic tapes in an industry-recognized seismic data exchange format for easier availability. This report describes and summarizes the results of one such data set collected by the U.S. Geological Survey, off the southeastern coast of the United States near Cape Hatteras.

## INTRODUCTION

Between August 15, and October 30, 1977, approximately 3700 km of multichannel seismic reflection data (lines TD-1 through TD-6) were collected southeast of Cape Hatteras as part of a multi-disciplinary effort to study the continental margin. The data were acquired and processed by Teledyne Exploration Company under contract to the U.S. Geological Survey. Shotpoint locations of the study area are shown in figure 1. Field recording parameters included using a streamer with 48 non-linearly spaced hydrophone groups spaced over 3.6 km, and an airgun array with a total volume of 35.4 liters (2160 in<sup>3</sup>). Shotpoint intervals were generally 50m. A summary of the cable layout and shooting parameters is listed in table 1. Processed seismic sections were made available for distribution through the National Oceanic and Atmospheric Administration(NOAA) in 1981(Gilbert and Dillon, 1981). The original unprocessed field tapes were stored at the USGS seismic data processing center in Denver, Colorado, 1648 tapes in all.

## DEMULITPLEXING AND COMPRESSION

The field data were recorded with a Texas Instrument DFS-IV and written to magnetic tapes at 1600 bpi in SEG-B format. We demultiplexed the data and wrote the output to new magnetic tapes at 6250 bpi in SEG-Y format, an industry accepted standard. In total, 1648 field tapes were input and 598 tapes were output yielding nearly a 3:1 data compression ratio. Early testing revealed parity errors on the input tapes that could have resulted in a loss or misreading of data. By closely monitoring the processing system during demultiplexing, the computer operators were able to remedy most of these problems by either running the input tapes through a tape cleaner or in more severe cases doing a simple tape copy. Appendix I lists the slot number, shotpoint, and field file ranges for each output reel and is sorted by line. Slot numbers refer to storage location numbers within the tape library. Field observer's notes for each line are also archived at the Denver processing center and can be accessed through the Geophysics Group of the Branch of Petroleum Geology.

## REFERENCES

Gilbert, L.E., Multichannel seismic profiles collected by the Teledyne Exploration Company in 1977 south of Cape Hatteras, North Carolina: U.S. Geological Survey Open-file Report 81-726.

36 m	Navigation antenna to ship's stern
26 m	Ship's stern to center of airgun array
300 m	Center of airgun array to center of trace 48 (near offset)
50 m	Spacing between center of traces 48 through 25
75 m	Spacing between center of trace 25 and trace 24
100 m	Spacing between center of traces 24 through 1
30	Number of hydrophones per section(trace) for both 50 m & 100 m sections.
10 m	Depth of streamer
50 m	Shot interval
4 x 540 in <sup>3</sup>	Displacement of airgun array towed abreast 4 m apart (with waveshaper)
8 m (+/- 10%)	Depth of airgun array
2000 psi (+/- 10%)	Airgun firing pressure

Table 1. Cable & Source configuration used in survey

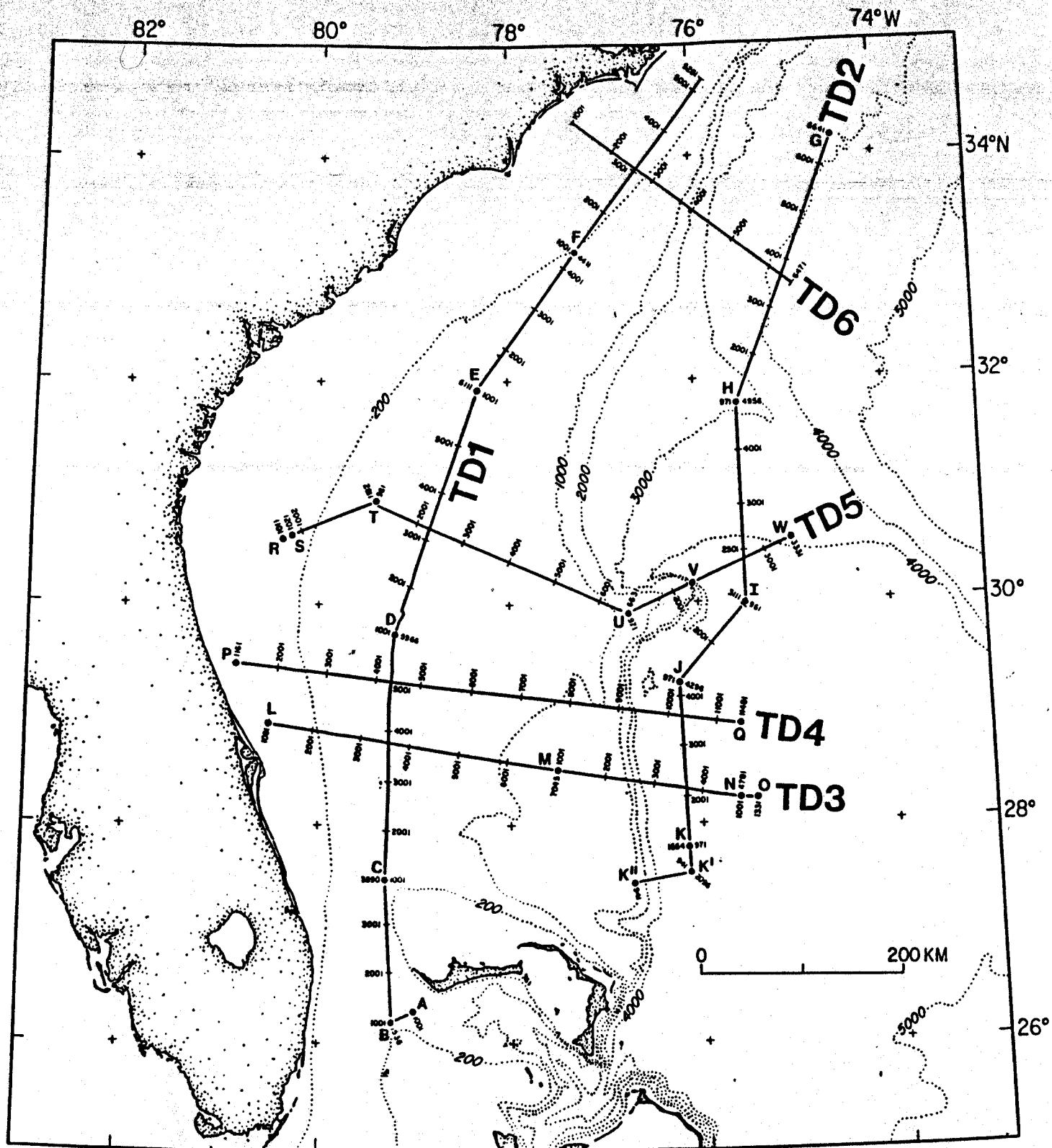


Figure 1. Shotpoint Map of Survey Area

Line	Segment	Shotpoint Range
TD-1	A-B B-C C-D D-E E-E  E-F	1001 - 1536 1001 - 3890 1001 - 5966 1001 - 6111 1001 - 1251A 2161A - 1120 1394 - 4021 4411A - 2711 2761A 1918 5286 - 4588 4841A - 1395
TD-2	H-G H-I I-J J-K K-K KP-K	6641 - 971 4596 - 961 3111 - 971 4296 - 971 1554 - 953 2096 - 936
TD-3	L-M  M-N N-O	1081 - 2525 1441A - 2149A 1918B - 2195 1981B - 2712A 2721A - 1971B 2661 - 7045 1001 - 4780 -29 - 1331
TD-4	P-Q	1171 - 4361 11486 - 4068
TD-5	R-S S-T  T-U V-U V-W	1101 - 1201 1893 - 2406 2173A - 2816 6636 - 966 2326 - 971 3336 - 2149
TD-6	A B	1101 - 3903 3341A - 6471

Table 2. Line-by-line Summary of Shotpoint Ranges. A's and B's appended after shotpoints represent segments that overlap shotpoint ranges of other segments.



























**Segment B (cont.)**

SLOT	PROJECT	LINE	REEL	SPTS	FILES	TYPE
13660	CORAL SEAL	TD6-B	TD6B-3	3623A-3768A	273-414	DEMUX
13661	CORAL SEAL	TD6-B	TD6B-4	3768A-3906	414-551	DEMUX
13662	CORAL SEAL	TD6-B	TD6B-5	3906-4044	551-589	DEMUX
13663	CORAL SEAL	TD6-B	TD6B-6	4044-4181	689-826	DEMUX
13664	CORAL SEAL	TD6-B	TD6B-7	4181-4318	826-963	DEMUX
13665	CORAL SEAL	TD6-B	TD6B-8	4318-4456	963-102	DEMUX
13666	CORAL SEAL	TD6-B	TD6B-9	4456-4593	102-239	DEMUX
13667	CORAL SEAL	TD6-B	TD6B-10	4593-4731	239-377	DEMUX
13668	CORAL SEAL	TD6-B	TD6B-11	4731-4868	377-514	DEMUX
13669	CORAL SEAL	TD6-B	TD6B-12	4868-5006	514-652	DEMUX
13670	CORAL SEAL	TD6-B	TD6B-13	5006-5140	652-786	DEMUX
13671	CORAL SEAL	TD6-B	TD6B-14	5140-5278	787-924	DEMUX
13683	CORAL SEAL	TD6-B	TD6B-15	5278-5412	924-62	DEMUX
13684	CORAL SEAL	TD6-B	TD6B-16	5412-5550	62-200	DEMUX
13685	CORAL SEAL	TD6-B	TD6B-17	5550-5703	200-337	DEMUX
13686	CORAL SEAL	TD6-B	TD6B-18	5703-5841	337-475	DEMUX
13687	CORAL SEAL	TD6-B	TD6B-19	5841-5983	475-612	DEMUX
13688	CORAL SEAL	TD6-B	TD6B-20	5983-6125	612-753	DEMUX
13689	CORAL SEAL	TD6-B	TD6B-21	6125-6260	753-888	DEMUX
13690	CORAL SEAL	TD6-B	TD6B-22	6260-6407	888-29	DEMUX
13691	CORAL SEAL	TD6-B	TD6B-23	6407-6471	29-93	DEMUX