

U.S. DEPARTMENT OF THE INTERIOR / U.S. GEOLOGICAL SURVEY

U.S. GEOLOGICAL SURVEY DIGITAL DATA SERIES DDS-13

International Phase of Ocean Drilling
Seismic Line 1 Demultiplexed Data
Cape Hatteras to Mid-Atlantic Ridge

PROCESSING HISTORY

ABSTRACT

In an ongoing effort to reduce the amount of data loss due to old, deteriorating magnetic tapes, data from a 3400-km-long multichannel seismic-reflection line collected between Cape Hatteras and the Mid-Atlantic Ridge were demultiplexed, compressed, and output in an industry-standard SEG-Y format.

INTRODUCTION

A 3400-km-long multichannel seismic-reflection profile (Line 1) extending from Cape Hatteras to the rift valley of the Mid-Atlantic Ridge was recorded in 1974 by Digicon, Inc. Two small lines totaling 80 km (Lines A and B), connecting the main line to two coastal wells in North Carolina were simultaneously acquired. The experiment was part of the International Phase of Ocean Drilling (IPOD) and was jointly funded by the U.S. Geological Survey (USGS) and the National Science Foundation's Deep Sea Drilling Project (DSDP). The data were recorded from the marine vessel Gulf Seal using a Texas Instruments DFS III recording system. A tuned airgun array totaling 1,700 cubic inches was used to generate seismic source signals generally every 50 m, and a streamer with 48-nonlinearly spaced hydrophone groups was used to detect the returning seismic signals. A summary of the shooting and recording parameters is shown in table 1. Segments of the western half of the data totaling approximately 1,520 km, or slightly less than half of the line, were processed by Geophysical Services, Inc. (GSI), in the spring of 1975, and a geologic overview of this experiment can be found in Grow and

Markl (1977). Copies of the demultiplexed field tapes are currently stored at the USGS seismic data processing center in Denver, Colorado.

DEMULPLEXING AND COMPRESSION

Testing revealed that the data on the original field tapes were deteriorating. To prevent any further loss of data, we demultiplexed the original 631 field tapes and transferred the output to 183 new magnetic tapes at 6250 bpi in an industry standard SEG-Y format (Barry and others, 1975). Our efforts

yielded a data compression ratio of more than 3 to 1. Although some of the field tapes had segments in which the magnetic oxide had actually fallen off, we preserved as much of the data as possible. Close monitoring of the processing system during demultiplexing enabled the computer operators to prevent any further data loss (or misreading of data) due to parity read errors. When excessive parity errors were found on input tapes, operators either passed the tapes through a tape cleaner or, in more severe cases, made a bit-for-bit tape copy. Less than 0.2 percent of the original data could not be recovered during demultiplexing. Shown in appendix I are the slot numbers, shotpoint ranges, and field file ranges of all the output tapes. Slot numbers refer to storage-location numbers within the Denver tape library, and reel numbers refer to the database reference number of our processing system. Observers' notes are also archived at the Denver processing center and can be obtained from the authors.

REFERENCES

- Barry, K.M., Cavers, D.A., and Kneale, C.W., 1975, Recommended standards for digital tape formats: *Geophysics*, v. 40, p. 344-352.
- Grow, J.A., and Markl, R.G., 1977, IPOD-USGS multichannel seismic reflection profile from Cape Hatteras to the Mid-Atlantic Ridge: *Geology*, v. 5, p. 625-630.

Table 1 -- Field parameters used in survey

DATA ACQUISITION RECORDING PARAMETERS

Instrument	DFS III
Near Offset Distance	346 m
Spacing: traces 48 - 25	50 m
Spacing: traces 25 - 24	75 m
Spacing: traces 24 - 1	100 m
Sample Rate	4 ms

Recording length 10 - 12 s
 Fold Coverage 36
 Gun Depth 9 m
 Airgun Array Displacement 1700 cu. in.
 Filter, 18dB/octave slope 6 - 12 Hz

NOTE: CD-ROM VOL numbers may change during production.

APPENDIX I - USGS Tape Library Listing of IPOD Demultiplexed Tapes

Library Slot	Reel ID	Shot Points	Files	CD-ROM VOL
4567	IPOD1A	101-228	1-256	1
4566	IPOD1B	228-422	256-643	1
6453	IPOD1C	422-549	643-897	1
4565	IPOD1D	549-600	897-999	1
13244	IPOD-1	600-727	999-254	2
13245	IPOD-2	727-854	254-508	2
13246	IPOD-3	854-984	508-768	2
13247	IPOD-4	984-1102	768-4	2
13248	IPOD-5	1102-1229	5-258	3
13249	IPOD-6	1229-1356	258-512	3
13250	IPOD-7	1356-1482	512-764	3
13251	IPOD-8	1482-1575	764-950	3
13252	IPOD-9	1539A-1668	1-260	4
13253	IPOD-10	1668-1795	260-513	4
13254	IPOD-11	1795-1921	513-766	4
13255	IPOD-12	1921-2051	766-26	4
13256	IPOD-13	2051-2067	26-58	5
13257	IPOD-14	2068-2194	59-312	5
13258	IPOD-15	2194-2321	312-566	5
13259	IPOD-16	2321-2348A	566-98	5
13260	IPOD-17	2348A-2478	98-357	6
13261	IPOD-18	2478-2585	357-572	6
13262	IPOD-19	2586-2740	573-882	6
13263	IPOD-20	2740-2881	882-164	6
13264	IPOD-21	2882-3057	165-516	7
13265	IPOD-22	3057-3102	516-606	7
13266	IPOD-23	3103-3274	607-950	7
13267	IPOD-24	3274-3407	950-336	7
13268	IPOD-25	3407-3579	336-680	7

13269	IPOD-26	3579-3753	680-28	8
13270	IPOD-27	3753-3925	28-372	8
13271	IPOD-28	3925-3940	372-402	8
13272	IPOD-29	3940-4111	403-743	8
13273	IPOD-30	4111-4281	743-83	8
13274	IPOD-31	4281-4414A	83-10	9
13275	IPOD-32	4414A-4583	10-348	9
13276	IPOD-33	4583-4779	349-739	9
13277	IPOD-34	4779-4972	739-125	9
13278	IPOD-35	4972-5058	125-298	9
13279	IPOD-36	5059-5256	299-694	10
13280	IPOD-37	5256-5454	694-90	10
13281	IPOD-38	5454-5652	90-485	10
13282	IPOD-39	5652-5850	485-881	10
13283	IPOD-40	5850-6047	881-275	11
13284	IPOD-41	6047-6246	275-673	11
13285	IPOD-42	6246-6422	673-26	11
13286	IPOD-43	6422-6621	27-424	11
13287	IPOD-44	6621-6748	424-677	11
13288	IPOD-45	6748-6918	678-18	12

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13289	IPOD-46	6918-7100	18-401	12
13290	IPOD-47	7100-7294	401-790	12
13291	IPOD-48	7294-7483	790-168	12
13292	IPOD-49	7483-7677	168-555	12
13293	IPOD-50	7677-7681	555-564	12
16597	IPOD-51	7682-7935	565-71	13
16598	IPOD-52	7935-8188	71-577	13
16599	IPOD-53	8188-8441	577-83	13
16600	IPOD-54	8441-8695	83-592	13
16601	IPOD-55	8695-8948	592-98	14
16602	IPOD-56	8948-8967	98-135	14
16603	IPOD-57	8967-9220	135-641	14
16604	IPOD-58	9220-9295	641-812	14
16605	IPOD-59	9296-9556	813-334	14
16606	IPOD-60	9556-9810	334-841	14
16607	IPOD-61	9810-10063	841-347	15
16608	IPOD-62	10063-10316	347-853	15
16609	IPOD-63	10316-10569	853-360	15
16610	IPOD-64	10569-10823	360-867	15
16611	IPOD-65	10823-10861	867-943	15
16612	IPOD-66	10861-11108	943-438	16
16613	IPOD-67	11108-11117	438-456	16
16614	IPOD-68	11118-11328	457-417	16
16615	IPOD-69	11328-11581	417-923	16
16616	IPOD-70	11581-11827	923-416	16
16617	IPOD-71	11827-12074	416-910	16
16618	IPOD-72	12074-12320	910-402	17
16619	IPOD-73	12320-12567	402-895	17
16620	IPOD-74	12567-12820	895-402	17
16621	IPOD-75	12820-12834	402-430	17
16622	IPOD-76	12835-13057	431-876	17
16623	IPOD-77	13057-13279	876-319	18
16624	IPOD-78	13279-13501	319-764	18

16625	IPOD-79	13501-13722	764-206	18
16626	IPOD-80	13722-13944	206-650	18
16627	IPOD-81	13944-14111	650-984	18
16628	IPOD-82	14112-14363	985-487	19
16629	IPOD-82B	14242-14258	246-277	19
16630	IPOD-83	14363-14616	487-993	19
16631	IPOD-84	14616-14867	993-496	19
16632	IPOD-85	14867-15120	496-1	19
16633	IPOD-86	15120-15371	1-504	20
16634	IPOD-87	15371-15624	504-10	20
16635	IPOD-88	15624-15875	10-512	20
16636	IPOD-89	15875-16128	512-17	20
16637	IPOD-90	16128-16249	17-259	20
16638	IPOD-91	16250-16454	260-229	21
16639	IPOD-92	16454-16706	229-733	21
16640	IPOD-93	16706-16959	733-240	21

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Library Slot	Reel ID	Shot Points	Files	CD-ROM VOL
16641	IPOD-94	16959-17212	240-746	21
16642	IPOD-95	17212-17465	746-252	21
16643	IPOD-96	17465-17717	252-755	22
16644	IPOD-97	17717-17970	755-261	22
16645	IPOD-98	17970-18222	261-765	22
16646	IPOD-99	18222-18475	765-271	22
16647	IPOD-100	18475-18726	271-773	22
16648	IPOD-101	18726-18979	773-279	23
16649	IPOD-102	18979-19197	279-716	23
16650	IPOD-103	19198-19420	717-161	23
16651	IPOD-104	19420-19643	161-607	23
16652	IPOD-105	19643-19865	607-51	23
16653	IPOD-106	19865-20087	51-496	24
16654	IPOD-107	20087-20309	496-939	24
16655	IPOD-108	20309-20531	939-383	24
16656	IPOD-109	20531-20753	383-827	24
16657	IPOD-110	20753-20970	827-262	25
16658	IPOD-111	20970-21180	262-682	25
16659	IPOD-112	21181-21403	683-128	25
16660	IPOD-113	21403-21626	128-573	25
16661	IPOD-114	21626-21847	573-16	26
16662	IPOD-115	21848-22053	17-427	26
16663	IPOD-116	22053-22276	427-874	26
16664	IPOD-117	22276-22498	874-317	26
16665	IPOD-118	22498-22719	317-759	27
16666	IPOD-119	22719-22941	759-204	27
16667	IPOD-120	22941-23128	204-257	27
16668	IPOD-121	23128-23346	257-694	27
16669	IPOD-122	23346-23567	694-135	28
16670	IPOD-123	23567-23730	135-462	28
16671	IPOD-124	23732-23954	465-910	28
16672	IPOD-125	23954-24173	911-347	28
16673	IPOD-126	24173-24391	348-784	28

16674	IPOD-127	24392-24614	785-229	29
16675	IPOD-128	24614-24836	229-673	29
16676	IPOD-129	24836-25057	673-115	29
16677	IPOD-130	25057-25101	115-204	29
16678	IPOD-131	25102-25325	205-651	29
16679	IPOD-132	25325-25544	651-90	30
16680	IPOD-133	25544-25767	90-535	30
16885	IPOD-134	25767-25989	535-979	30
16886	IPOD-135	25989-26210	979-422	30
16887	IPOD-136	26210-26432	422-866	31
16888	IPOD-137	26432-26647	866-296	31
16889	IPOD-138	26647-26870	296-741	31
16890	IPOD-139	26870-27091	741-184	31
16891	IPOD-140	27091-27314	184-630	32
16892	IPOD-141	27314-27536	630-74	32
16893	IPOD-142	27536-27759	74-520	32

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16894	IPOD-143	27759-27766	520-533	32
16895	IPOD-144	27766-27988	533-977	32
16896	IPOD-145	27988-28211	977-423	33
16897	IPOD-146	28211-28433	423-867	33
16898	IPOD-147	28433-28655	867-311	33
16899	IPOD-148	28655-28878	311-757	33
16900	IPOD-149	28878-29100	757-201	34
16901	IPOD-150	29100-29322	201-646	34
16902	IPOD-151	29322-29544	646-90	34
16903	IPOD-152	29544-29768	90-537	34
16904	IPOD-153	29768-29886	537-774	35
16905	IPOD-154	29886-29911	774-824	35
16906	IPOD-155	29912-30133	825-269	35
16907	IPOD-156	30134-30356	269-713	35
16908	IPOD-157	30356-30580	713-162	35
16909	IPOD-158	30580-30803	162-608	36
16910	IPOD-159	30803-31026	608-53	36
16911	IPOD-160	31026-31244	53-490	36
16912	IPOD-161	31244-31467	490-936	36
16913	IPOD-162	31467-31688	936-378	36
16914	IPOD-163	31688-31912	378-825	37
16915	IPOD-164	31912-32133	825-268	37
16916	IPOD-165	32133-32355	268-711	37
16917	IPOD-166	32355-32576	711-153	37
16918	IPOD-167	32576-32798	153-598	38
16919	IPOD-168	32798-33019	598-40	38
16920	IPOD-169	33019-33241	40-484	38
16921	IPOD-170	33241-33463	484-927	38
16922	IPOD-171	33463-33686	927-374	39
16923	IPOD-172	33686-33909	374-819	39
16924	IPOD-173	33909-34110	819-222	39

