

CRUISE REPORT

OCEANUS 91

January 16 - 22, 1981

Bradford Butman  
U.S. Geological Survey  
Woods Hole, MA 02543

Vessel: OCEANUS

Cruise No.: 91

Dates of Operation: 1000 January 16 - 1620 January 22, 1981

Area of Operation: Lydonia Canyon, Georges Bank

Personnel: Paul Howland, Master  
Brad Butman, Chief Scientist, USGS  
Mike Bothner, USGS  
Andy Eliason, Eliason Data Services  
Dave Folger, USGS  
John Larson, USGS  
Frank Musialowski, USGS  
Marlene Noble, USGS  
Carol Parmenter, USGS  
Rose Petrecca, WHOI  
Rick Rendigs, USGS  
Polly Shoukimas, USGS  
Bill Strahle, USGS

Objectives: The objectives of the OCEANUS cruise were to:

1. Conduct hydrographic survey of Lydonia Canyon around moored array (CTD and suspended matter).
2. Deploy two moorings in Lydonia Canyon.
3. Collect surface grab samples near Lease Block 312 (for analysis of texture, trace metals, petroleum hydrocarbons, and benthos) in anticipation of site-specific study to be conducted by Georges Bank Biological Task Force.
4. Collect grab samples at four long-term stations for study of seasonal changes in benthic community and importance in sediment transport.
5. Collect grab samples around Lydonia Canyon to map surficial sediment distribution.

Equipment: Northstar 6000 Loran-C  
Giffit echosounder  
XBT  
NBIS CTD and rosette  
Van Veen grab  
Smith-MacIntyre grab

Navigation: All latitude and longitude are from Northstar 6000 Loran-C using 9960 chain and slaves W and Y. Program 5101.

Narrative:

Jan. 16 1000 Depart Woods Hole.  
1800 Arrive station Q. Recover tripod mooring 206.  
1930 Surface sediment sample.  
2120 Recover surface buoy P.  
2205 Start dragging for current mooring 1831.  
2325 Recovered old USGS grappling hook.

Jan. 17 0230 Terminate dragging. Head to Lydonia Canyon.  
0800 South of Nantucket Lightship. Leaking shaft alley;  
variable pitch hydraulic system flooded.  
1300 Underway to Woods Hole for additional hydraulic oil.  
Heavily iced on way into Woods Hole.

Jan. 18 0035 Arrive Woods Hole.  
0830 Depart Woods Hole. Head for Lydonia Canyon.

Jan. 19 0145 Arrive Lydonia Canyon. Seas too rough for CTD.  
Start grab sampling.  
1330 Arrive LCA. CTD and grab samples. Start  
canyon CTD transect.

Jan. 20 Continue CTD transect.  
1800 Deploy deep tripod mooring 221 at station LCH.  
2130 Deploy pressure mooring 222 at LCO.

Jan. 21 Continue CTD transect.  
0840 Arrive station GBK. Start grab samples.  
1000 Start surface buoy recovery; B and E.  
1058 Complete surface buoy recovery. Underway to  
Block 312.  
1308 Start grab sampling. Sample at 9 stations,  
8 replicates at 3 stations (5 for benthos,  
3 for chemistry), 3 replicates (chemistry only)  
at 2 stations. Heavy bottom shell hash and grabs often  
partially washed.

Jan. 22 0142 Complete grabs. Underway to Woods Hole.  
1620 Arrive Woods Hole.

Tabulated information:

Days at sea: 7  
Mooring deployed: 2 (221, 222)  
Mooring recovered: 1 (206)  
XBT's: 13  
CTD's: 18  
Surface salinity: 28  
Surface grab samples: 104

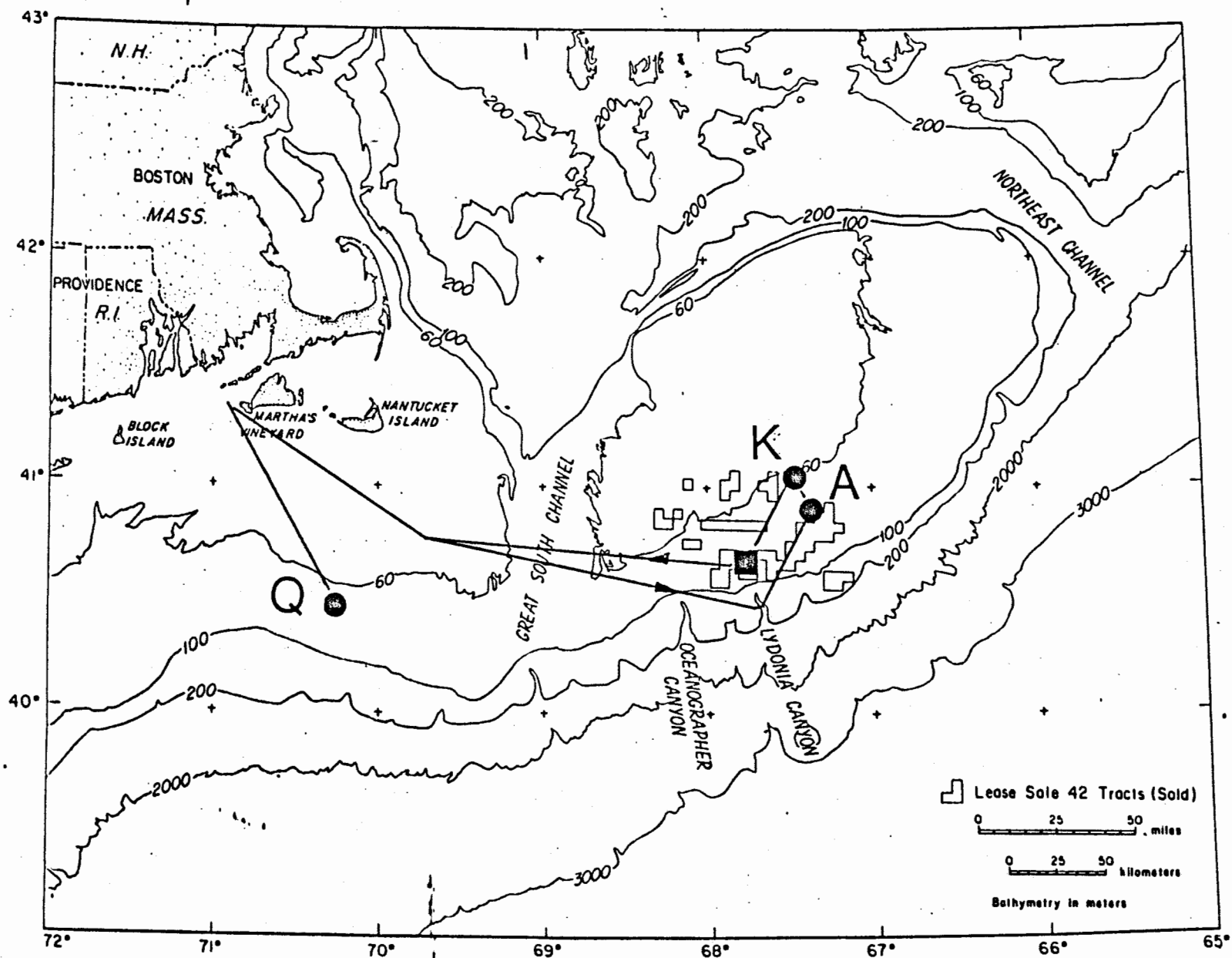


Figure 1. Cruise track for OCEANUS 91 showing sample stations A, K, and Q and lease block 312 (square).

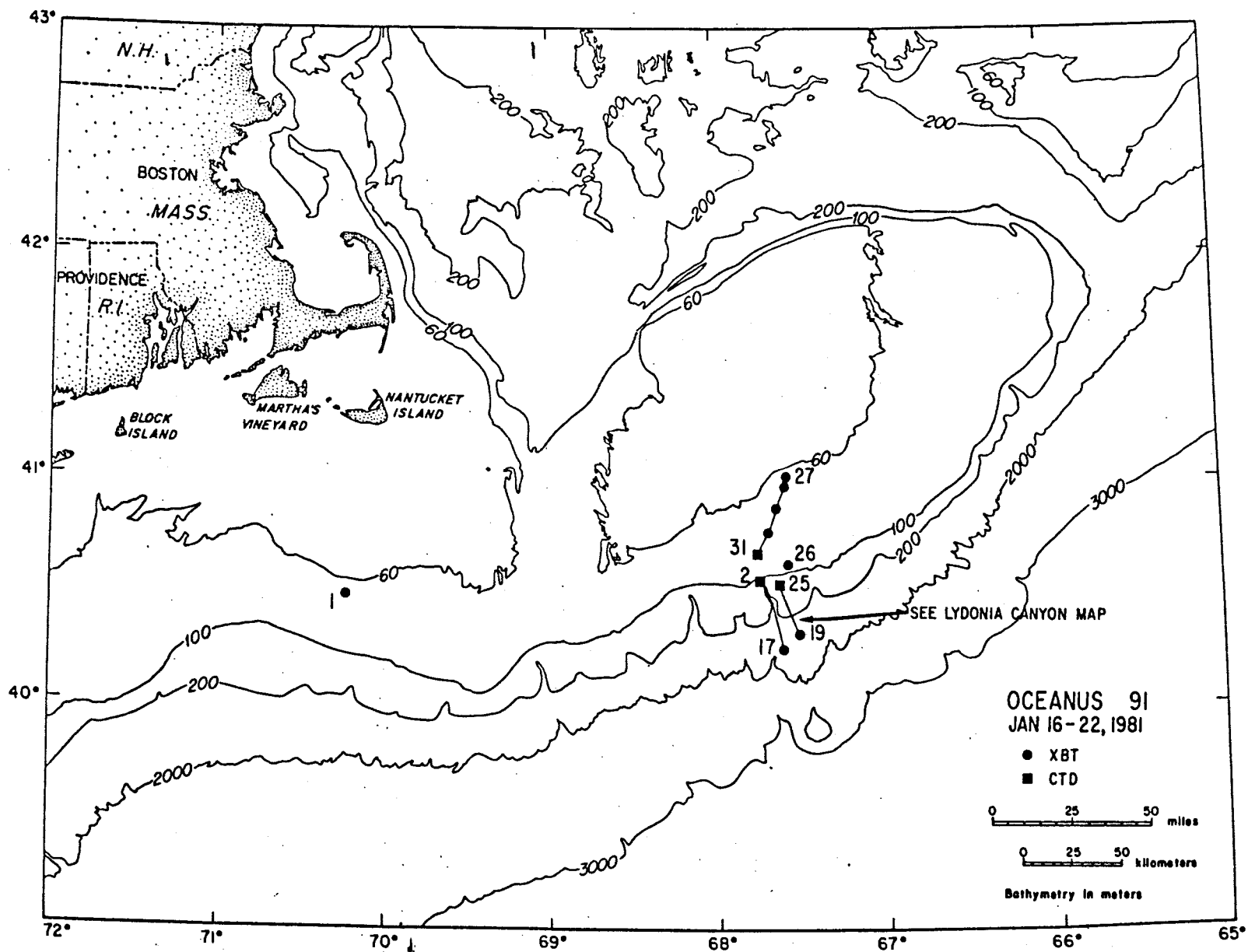


Figure 2. Hydrographic stations, OCEANUS 91.

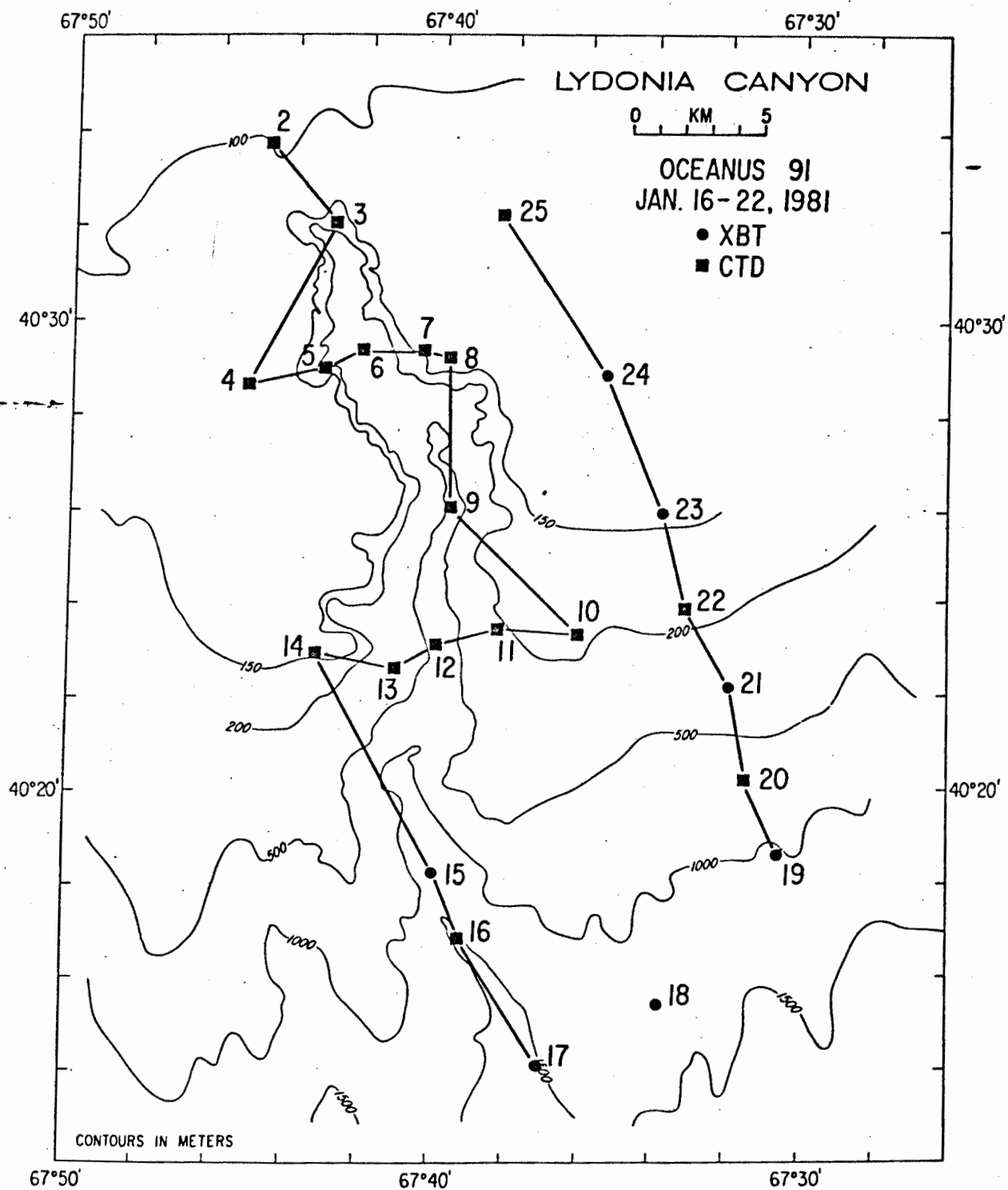


Figure 3. Hydrographic stations near Lydonia Canyon, OCEANUS 91, January 16 - 22, 1981.

## HYDROGRAPHIC STATIONS OCEANUS 91 JANUARY 16-22, 1981

Sta.	Depth (m)	Date	(Start) Time	Latitude N.	Longitude W.	XBT	CTD	SS	DS (m)
1	60	1/17/81	0033	40°29.97'	70°13.44'	X			
2	106	1/19/81	1503	40°33.70'	67°44.72'		X	X	103
3	180	1/19/81	1930	40°32.07'	67°42.95'		X	X	60
4	135	1/19/81	2120	40°28.66'	67°45.23'		X	X	
5	165	1/19/81	2235	40°29.00'	67°43.28'		X	X	
6	422	1/19/81	2330	40°29.35'	67°42.18'		X	X	
7	155	1/20/81	0150	40°29.35'	67°40.51'		X	X	130
8	153	1/20/81	0311	40°29.23'	67°39.86'		X	X	
9	605	1/20/81	0516	40°26.09'	67°39.73'		X	X	103
10	190	1/20/81	0740	40°23.36'	67°36.17'		X	X	99
11	255	1/20/81	0855	40°23.37'	67°38.38'		X	X	
12	665	1/20/81	0955	40°23.12'	67°39.88'		X	X	
13	350	1/20/81	1155	40°22.64'	67°40.98'		X	?	
14	160	1/20/81	1330	40°22.88'	67°43.14'		X	X	
15	-	1/20/81	1451	40°18.25'	67°39.83'	X		X	
16	1,355	1/20/81	2259	40°16.90'	67°39.12'		X	X	
17	1,450	1/21/81	0011	40°14.09'	67°37.00'	X		X	
18	1,380	1/21/81	0024	40°15.52'	67°33.77'	X		X	
19	1,100	1/21/81	0047	40°18.61'	67°30.56'	X			
20	755	1/21/81	0100	40°20.19'	67°31.47'		X	X	
21	360	1/21/81	-	40°22.15'	67°31.98'	X		X	
22	195	1/21/81	0210	40°23.81'	67°33.14'		X	X	
23	155	1/21/81	0243	40°25.99'	67°33.70'	X		X	
24	140	1/21/81	0300	40°28.92'	67°35.44'	X		X	
25	132	1/21/81	0324	40°32.28'	67°38.43'		X	X	
26	98	1/21/81	0420	40°36.78'	67°34.99'	X		X	
27	-	1/21/81	1054	41°00.70'	67°34.41'	X		X	
28	70	1/21/81	1107	40°58.13'	67°35.68'	X		X	
29	73	1/21/81	1140	40°31.94'	67°38.30'	X		X	
30	-	1/21/81	1210	40°45.88'	67°41.26'	X		X	
31	78	1/21/81	1336	40°40.00'	67°45.40'		X	X	

## SURFACE GRAB SAMPLES OCEANUS 91 JANUARY 16-22, 1981

Sta.	Sample	Area	Water depth (m)	Date	Latitude N.	Longitude W.
4775	A	GBQ	68	1/16/81	40°29.70'	70°12.72'
4775	B	GBQ	68	1/16/81	40°29.69'	70°12.78'
4775	C	GBQ	68	1/16/81	40°29.66'	70°12.83'
4775	D	GBQ	68	1/16/81	40°29.68'	70°12.74'
4775	E	GBQ	68	1/16/81	40°29.65'	70°12.82'
4775	F	GBQ	68	1/16/81	40°29.62'	70°12.88'
4775	G	GBQ	68	1/16/81	40°29.65'	70°12.72'
4775	H	GBQ	68	1/16/81	40°29.60'	70°12.83'
4775	I	GBQ	68	1/16/81	40°29.62'	70°12.98'
4776		LC	123	1/19/81	40°28.09'	67°52.55'
4777		LCM	130	1/19/81	40°28.67'	67°48.15'
4778		LC	-	1/19/81	40°29.99'	67°46.14'
4779		LC	140	1/19/81	40°30.63'	67°43.84'
4780		LC	140	1/19/81	40°31.20'	67°41.21'
4781		LC	137	1/19/81	40°31.62'	67°39.29'
4782		LCL	127	1/19/81	40°32.33'	67°35.80'
4783		LC	115	1/19/81	40°33.24'	67°31.59'
4784		LC	142	1/19/81	40°28.11'	67°35.08'
4785		LC	147	1/19/81	40°27.48'	67°37.61'
4786		LC	141	1/19/81	40°26.43'	67°42.07'
4787		LC	141	1/19/81	40°25.70'	67°44.50'
4788	A	LCA	102	1/19/81	40°34.03'	67°45.05'
4788	B	LCA	102	1/19/81	40°34.04'	67°45.19'
4788	C	LCA	101	1/19/81	40°34.05'	67°45.29'
4788	D	LCA	102	1/19/81	40°34.05'	67°45.44'
4788	E	LCA	101	1/19/81	40°34.06'	67°45.55'
4788	F	LCA	101	1/19/81	40°34.14'	67°45.01'
4788	G	LCA	101	1/19/81	40°34.20'	67°45.37'
4788	H	LCA	100	1/19/81	40°34.23'	67°45.62'
4788	I	LCA		1/19/81	40°34.35'	67°45.85'
4789	A	GBA	85	1/21/81	40°51.09'	67°24.14'
4789	B	GBA	85	1/21/81	40°51.08'	67°24.25'
4789	C	GBA	85	1/21/81	40°51.05'	67°24.37'
4789	D	GBA	85	1/21/81	40°51.05'	67°24.47'
4789	E	GBA	85	1/21/81	40°51.03'	67°24.58'



Sta.	Sample	Area	Water depth (m)	Date	Latitude N.	Longitude W.
4789	F	GBA	88	1/21/81	40°51.02'	67°24.79'
4789	G	GBA	85	1/21/81	40°51.02'	67°24.08'
4789	H	GBA	85	1/21/81	40°51.01'	67°24.26'
4790	A	GBK	65	1/21/81	41°02.37'	67°34.32'
4790	B	GBK	65	1/21/81	41°02.42'	67°34.35'
4790	C	GBK	65	1/21/81	41°02.48'	67°34.44'
4790	D	GBK	65	1/21/81	41°02.53'	67°34.49'
4790	E	GBK	65	1/21/81	41°02.58'	67°34.53'
4790	F	GBK	65	1/21/81	41°02.44'	67°34.33'
4790	G	GBK	65	1/21/81	41°02.61'	67°34.33'
4790	H	GBK	65	1/21/81	41°02.37'	67°34.32'
4791	A	LB312	78	1/21/81	40°40.00'	67°45.40'
4791	B	LB312	78	1/21/81	40°40.00'	67°45.36'
4791	C	LB312	78	1/21/81	40°39.90'	67°45.30'
4791	D	LB312	78	1/21/81	40°39.89'	67°45.29'
4791	E	LB312	78	1/21/81	40°39.96'	67°45.34'
4791	F	LB312	72	1/21/81	40°40.10'	67°45.52'
4791	G	LB312	72	1/21/81	40°40.10'	67°45.53'
4791	H	LB312	72	1/21/81	40°40.11'	67°45.51'
4792	A	LB312	75	1/21/81	40°39.65'	67°47.34'
4792	B	LB312	75	1/21/81	40°39.68'	67°47.40'
4792	C	LB312	75	1/21/81	40°39.70'	67°47.45'
4792	D	LB312	75	1/21/81	40°39.71'	67°47.46'
4792	E	LB312	75	1/21/81	40°39.74'	67°47.48'
4792	F	LB312	75	1/21/81	40°39.68'	67°47.42'
4792	G	LB312	75	1/21/81	40°39.64'	67°47.47'
4792	H	LB312	75	1/21/81	40°39.65'	67°47.41'
4793	A	LB312	79	1/21/81	40°39.23'	67°49.39'
4793	B	LB312	79	1/21/81	40°39.29'	67°49.31'
4793	C	LB312	79	1/21/81	40°39.27'	67°49.36'
4793	D	LB312	79	1/21/81	40°39.32'	67°49.31'
4793	E	LB312	79	1/21/81	40°39.31'	67°49.34'
4793	F	LB312	79	1/21/81	40°39.28'	67°49.29'
4793	G	LB312	79	1/21/81	40°39.28'	67°49.32'
4793	H	LB312	79	1/21/81	40°39.34'	67°49.40'
4794	A	LB312	86	1/21/81	40°37.30'	67°48.51'
4794	B	LB312	86	1/21/81	40°37.30'	67°48.54'
4794	C	LB312	86	1/21/81	40°37.33'	67°48.61'
4794	D	LB312	86	1/21/81	40°37.32'	67°48.66'
4794	E	LB312	86	1/21/81	40°37.27'	67°48.47'
4794	F	LB312	86	1/21/81	40°37.35'	67°48.53'
4794	G	LB312	86	1/21/81	40°37.38'	67°48.55'
4794	H	LB312	86	1/21/81	40°37.44'	67°48.60'

Sta.	Sample	Area	Water depth (m)	Date	Latitude N.	Longitude W.
4795	A	LB312	82	1/21/81	40°37.85'	67°46.67'
4795	B	LB312	82	1/21/81	40°37.88'	67°46.62'
4795	C	LB312	82	1/21/81	40°37.87'	67°46.58'
4795	D	LB312	82	1/21/81	40°37.84'	67°46.55'
4795	E	LB312	82	1/21/81	40°37.79'	67°46.51'
4795	F	LB312	82	1/21/81	40°37.88'	67°46.74'
4795	G	LB312	82	1/21/81	40°37.86'	67°46.72'
4795	H	LB312	82	1/21/81	40°37.86'	67°46.68'
4796	A	LB312	79	1/21/81	40°38.21'	67°44.77'
4796	B	LB312	79	1/21/81	40°38.25'	67°44.76'
4796	C	LB312	79	1/21/81	40°38.25'	67°44.72'
4796	D	LB312	79	1/21/81	40°38.17'	67°44.67'
4796	E	LB312	79	1/21/81	40°38.20'	67°44.78'
4796	F	LB312	79	1/21/81	40°38.24'	67°44.78'
4796	G	LB312	79	1/21/81	40°38.25'	67°44.75'
4796	H	LB312	79	1/21/81	40°38.25'	67°44.75'
4797	A	LB312	80	1/21/81	40°39.30'	67°45.24'
4797	B	LB312	80	1/21/81	40°39.26'	67°45.17'
4797	C	LB312	80	1/21/81	40°39.21'	67°45.20'
4798	A	LB312	81	1/21/81	40°38.62'	67°46.83'
4798	B	LB312	81	1/21/81	40°38.57'	67°46.82'
4798	C	LB312	78	1/21/81	40°38.52'	67°46.79'
4798	D	LB312	81	1/21/81	40°38.52'	67°46.73'
4798	F	LB312	81	1/21/81	40°38.72'	67°47.08'
4798	G	LB312	81	1/21/81	40°38.70'	67°47.02'
4798	H	LB312	81	1/21/81	40°38.65'	67°46.97'
4799	A	LB312	83	1/22/81	40°38.65'	67°47.08'
4799	B	LB312	83	1/22/81	40°38.68'	67°47.18'
4799	C	LB312	83	1/22/81	40°38.64'	67°47.05'
4799	D	LB312	83	1/22/81	40°38.65'	67°46.97'
4799	E	LB312	83	1/22/81	40°38.66'	67°46.95'
4800	A	LB312	84	1/22/81	40°38.31'	67°48.89'
4800	B	LB312	84	1/22/81	40°38.31'	67°48.88'
4800	C	LB312	84	1/22/81	40°38.23'	67°48.79'

NUTRIENT AND SUSPENDED-SEDIMENT OBSERVATIONS  
OCEANUS 91 JANUARY 16-22, 1981

Sta.	NUTRIENTS						SUSPENDED SEDIMENTS			
	(m)						(m)			
	1	2	3	4	5	6	1	2	3	4
2	2.8	59	103				2.8	59	103	
3	SFC	30	60	127	170		30	60	127	170
4	SFC	60	127				60	127		
5	SFC	31	62	102	151					
6	60	120	350	399			60	120	350	399
7	SFC	31	63	130	145					
8	SFC	30	57	136	146		SFC	30	136	146
9	SFC	60	100	400			60	100	400	
10	SFC	60	100	155			60	100	155	
11	SFC	31	57	103	239					
12	SFC	99	199	437	668		99	199	437	668
13	SFC	30	60	100			30	60	100	
14	SFC	30	100	143	158		30	100	143	158
16	SFC	61	101	402	799	1,000	100	400	800	1,000
20	SFC	34	63	102	399		34	63	102	399
22	SFC	30	62	180	195		0	62	180	195
25	SFC	31	60	112	125		31	60	112	125
31	2.4	30	60	80			2.4	30	60	80

APPENDIX I

BRIDGE LOG

OCEANUS 91



Vessel OCEANUS

Page 2

Cruise # 91

LORAN LOG

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Vessel OCEANUSPage 3Cruise 91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	SAT 17 JAN 1981
1334	1834	LC			40-17.05	69-22.13	1334- UNDERWAY 000'
1400	1900	LC			40-21.40	69-22.72	
1500	2000	LC			40-31.55	69-23.35	
1505	2005	LC			40-32.39	69-25.82	1505 c/c 293°
1600	2100	LC			40-36.39	69-40.51	
1700	2200	LC			40-40.83	69-55.74	
1722	2222	LC			40-42.42	70-01.14	04 25° <sup>324°SC</sup> c/c 310°
1800	2300	LC			40-47.16	70-08.91	<sup>319°SC</sup> c/c 305°
1900	2400	LC			40-53.96	70-21.50	
1930	0030	LC			40-57.51	70-27.80	
2000	0100	LC			41-01.08	70-34.16	
							2020-2045- H-T
2045	0145	LC			41-03.65	70-38.85	c/c 307-10
2112					41-06.7	70-44.61	c/c 320-G
2152					41-12.44	70-51.57	c/c 355-G
Bay Head				113°	2.1 mi dist		c/c 045

Vessel OCEANUS

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Cruise 91

LORAN LOG

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Vessel OCEANUSPage 6Cruise 91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	±5	GMT			NORTH	WEST	SUNDAY JAN 18 1953
	1200	1700	LC		41.05.38	70.39.85	
	1300	1800	LC		40.57.50	70.27.66	
	1400	1900	LC		40.50.64	70.16.27	
	1506	2006	LC		40.42.21	70.02.98	1506 H.T. TEST CTD
	1640	2040	LC		40-43.36	70-05.77	
	1700	2200	LC		40-43.52	70-05.56	
	1800	2300	LC		40-42.50	69-52.42	
	1900	2400	LC		40-42.49	69-36.06	
	2000	0100	LC		40-41.85	69-19.41	
	2028	0128	LC		40-41.44	69-11.7	c/r 106-6
	2142	0242	LC		40 38.9	68 52.17	
	2304	0404	LC		40-34.8	68-30.9	

Vessel OCEANUSPage 7Cruise 891LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+5	6mT			NORTH	WEST	MONDAY 19 JAN 1981
	0000	0500	LC		40-31.34	68-16.79	0008 C/L
	0100	0600	LC		40-29.01	68-01.97	
	0136	0636	LC		40-28.29	67-52.88	0136 HT MUD GRAB #4776
	0215	0715	LC		40-28.13	67-52.58	0215 MUD GRAB ON BOTTOM #4776
	0250	0750	LC		40-29.38	67-48.66	0250 HT MUD GRAB #4777
	0316	0816	LC		40-28.89	67-48.30	0316 MUD GRAB #4777 ON BOTTOM
	0328	0828	SUSPEND FURTHER				MUD GRABS - HEAVY SEAS - JOGGING CME.
	0402	0902	LC		40-28.80	67-47.78	
	0500	1000	LC		40-28.86	67-49.17	
	0600	1100	LC		40-29.64	67-49.99	
	0700	1200	LC		40-30.09	67-45.97	
	0740	1240	LC		40-30.00	67-46.06	Mud grab 4778
	0800	1300	LC		40-30.47	67-44.12	

Vessel OCEANUS

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Cruise # 91

LORAN LOG

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Vessel OCEANUSPage 9Cruise 91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	MONDAY JAN 19, 1980
1208	1768	LC			40.27.49	67.37.65	MUD GRAB ON BOTTOM #4785
1253	1753	LC			40.26.41	67.42.05	MUD GRAB ON BOTTOM #47
1321	1821	LC			40.25.70	67.44.49	MUD GRAB ON BOTTOM #47
1400	1900	LC			40.29.49	67.44.73	
1511	2011	LC			40.33.56	67.44.62	LAUNCH CTD
1530	2030	LC			40.33.52	67.44.80	CTD ON BOARD
1600	2100	LC			40.32.88	67.44.53	1600 ALTER COURSE AND RETURN TO ABOVE CTD STA
1623	2123	LC			40-34.06	67-45.00	mal grab at "A"
1634	2134	"			40-34.05	67-45.19	" " "
1641	2141	"			40-34.05	67-45.30	" " "
1648	2148	"			40-34.05	67-45.44	" " "
1655	2155	"			40-34.07	67-45.60	" " "
1701	2201	"			40-34.07	67-45.69	" " "
1707	2207	"			40-34.10	67-45.81	" " " go back to this stn by the grab
1724	2224	"			40-34.15	67-45.07	" " " grab
1740	2240	"			40-34.19	67-45.37	" " " new grab

Vessel OCEANUS

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Cruise 91

LORAN LOG

[illegible]

Vessel OCEANUSPage 11Cruise 91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+5	GMT			NORTH	WEST	TUES JAN 20 1981
	0016	0516	LC		40.28.93	67.42.10	CTD ABD #6
	0145	0645	LC		40.29.25	67.40.54	CTD AWAY #7
	0215	0715	LC		40.29.03	67.40.62	CTD ABD #7
	0315	0815	LC		40.29.22	67.40.01	CTD AWAY #8
	0342	0842	LC		40.28.85	67.40.46	CTD ABD #8
	0404	0904	LC		40-28.18	67-40.10	Proceed towards #9
	0440	0940	LC		40-25.98	67-39.86	Arr. at CTD #9
	0515	1015			26.12	39.77	CTD #9 cast
	0610				26.05	40.05	CTD #9 on dh.
	0642	1142			26.07	40.17	Proceed to CTD #10
	0730	1230			40-23.29	67-35.99	Arr. at CTD #10
	0741	1241			40-23.31	67-36.59	CTD #10 cast
	0805	1305			40-23.46	67-36.59	CTD #10 on deck
	0854	1354			40-23.29	67-38.37	CTD #11 away
	0918	1418			40-23.31	67-38.61	CTD #11 abd
	0956	1456			40 23 13	67-39.91	CTD #12 away
	1050				40-22.82	67-39.55	CTD #12 ABD

Vessel OCEANUS

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Cruise #91

LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+Y	GMT			N	W	Tuesday January 20,
	1156	1656	LC		40-22.64	67-40.99	CTD # 13 away
	1235	1735	LC		40 22.88	67.43.12	CTD # 13 ADD
	1320	1820	LC		40 22.57	67.43.06	CTD # 14 AWAY
	1356	1856	LC		40.22.50	67.43.04	CTD # 14 ADD
	1501	2201	LC		40-17.94	67-39.50	Array in water at Station H
	1819	2319	LC		40-18.16	67-39-43	Take @ "H".
	1849	2349	LC		40-18.09	67-39.45	S/C 358°C @ 150 RPM
	1950	0050	LC		40-26.63	67-40.09	Stop & work
	2123	0223			40.26.73	67-39.73	S&T Moving #222
	2259				40 16.91	67-39.11	2145-S/c 178°C - 150 2250-H-T CTD #16 away
							2357- CTD abd S/c 165°C @ 190 RPM



Vessel OCEANUSPage 13Cruise 91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+5	6MT			NORTH	WEST	WED JAN 21, 1981
	0110	0610	LC		40-20.08	67-31.07	CTD #19 AWAY
	0143	0643	LC		40-20.32	67-31.11	CTD #19 ABD
	0209	0709	LC		40-23.79	67-33.15	CTD #20 AWAY
	0230	0730	LC		40-22.99	67-32.85	CTD #20 ABD
	0329	0839	LC		40-32.34	67-38.60	CTD #21 AWAY
	0500	1000	LC		40-43.32	67-29.76	Coe 030° - at 11.6 fms
	0556	1055	LC		40-51.03	67-24.02	Arr at station "A"
	0605	1105	LC		40-51.09	67-24.24	1st haul away
	0609	1109	LC		40-51.08	67-24.27	2 " "
	0614	1114	LC		40-51.05	67-24.39	3 " "
	0620	1120	LC		40-51.05	67-24.49	4 " "
	0625	1125	LC		40-51.04	67-24.60	5 " "
	0638	1138	LC		40-51.01	67-24.81	6 " " Manover close to station
	0656	1156	LC		40-51.02	67-24.07	7 " "
	0713	1213	LC		40-51.03	67-24.33	8 " "
	0720	1220	LC		40-51.05	67-24.44	Left under way for station "K" Coe 328 - 12 fms

Vessel \_\_\_\_\_

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Cruise \_\_\_\_\_

LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+5	6mT			NORTH	WEST	WED JAN 21, 1981
	0823	1323			41-01.09	67-34.24	H-T St "K"
	0838				41-02.28	67-34.34	Mud Grab Site #479
	0847				41-02.42	67-34.39	2nd grab
	0851				41-02.48	67-34.46	3rd grab
	0858				41-02.57	67-34.55	4th grab
	0900	1400			41-02.60	67-34.54	5th grab
	0910	1410			41-02.76	67-34.67	6th grab
	0919	1419			41-02.43	67-34.32	7th grab
	0934				41-02.6	67-34.39	8th grab
	0952				41-02.36	67-34.33	9th grab
	1017				41-02.04	67-34.31	Recover Surface Horizon
	1048				41-01.01	67-34.28	Recover 2nd Surface Horizon; 1050-5K 201-6 to 193RPA
	1150	1650					1050-5K 201-6 to 193RPA

-11-1m

Vessel OCEANUSPage 15Cruise 91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	+S	CMT			NORTH	WEST	WED JAN 21, 1958
	1200	1700	LC		40-47.96	67-39.97	
	1230	1730	L.C.	NAV PAC CHECKED: NAVIGATING ON CARIBOL CAROLINA. MPH SNR 800 MASTER, 700 800 S 5152			
1ST STA	1249	1749	LC		40-40.17	67-45.41	1249 H.T. PREPARE FOR MULTIPLE MUD
	1508	2008	LC		40-40.12	67-45.48	GRABS & CTD
2ND STA	1520	2020	LC		40-39.71	67-47.42	1520 H.T. PREPARE FOR MULTIPLE MUD GEN
	1629	2129	LC		40-40.03	67-47.02	Final Station #2
	1648	2148	LC		40-39.26	67-49.35	arr at sta #3 1649 mud grabs.
	1811	2311	LC		40-39.32	67-49.33	Proceed to sta #4 Case 11
	1838	2338	LC		40-37.01	67-48.50	sta #4 mud grabs.
	1953	0053	LC		40-37.50	67-48.45	Proceed to #5 Case 073
	2007	0107			40-37.83	67-46.65	Sta #5
	2100	0200			40-37.86	67-46.68	End #5
	2113				40-38.2	67-44.76	Sta #6
	2217				40-39.27	67-45.2	Sta #7
	2245				40-39.17	67-45.16	End #7

Vessel OCEANUSPage 16Cruise Voyage #91LORAN LOG

Date	Time	Sta.	+/-	Reading	Latitude	Longitude	Remarks
	<u>15</u>	<u>GMT</u>			<u>N</u>	<u>W</u>	<u>Wednesday Jan. 21,</u>
	<u>2258</u>	<u>0358</u>	<u>LC</u>		<u>40-38.72</u>	<u>67-47.12</u>	<u>Sta #8</u>
							<u>Thursday Jan. 22</u>
	<u>0018</u>	<u>0518</u>	<u>LC</u>		<u>40-38.66</u>	<u>67-47.16</u>	<u>END STA #8</u>
	<u>0050</u>	<u>0550</u>	<u>LC</u>		<u>40-38.34</u>	<u>67-48.86</u>	<u>ARRIVE STA #9</u>
	<u>0145</u>	<u>0645</u>	<u>LC</u>		<u>40-38.30</u>	<u>67-48.91</u>	<u>END STA #9</u>
							<u>5/c 274° - 190 RPM</u>
	<u>0200</u>	<u>0700</u>	<u>LC</u>		<u>40-38.20</u>	<u>67-53.78</u>	<u>FOR WOODS HOLE</u>
	<u>0300</u>	<u>0800</u>	<u>LC</u>		<u>40-38.35</u>	<u>68-09.52</u>	<u>0305 c/c 278°</u>
	<u>0326</u>	<u>0826</u>	<u>Sat</u>	<u>23°</u>	<u>40-38.488</u>	<u>68-16.340</u>	<u>0326 SAT AND</u>
							<u>LC ADVANCED POS.</u>
							<u>IN AGREEMENT</u>
	<u>0400</u>	<u>0900</u>	<u>LC</u>		<u>40-38.85</u>	<u>68-25.46</u>	<u>Ca 278° to 274°</u>
	<u>0500</u>	<u>1000</u>	<u>LC</u>		<u>40-39.28</u>	<u>68-41.27</u>	
	<u>0600</u>	<u>1100</u>	<u>LC</u>		<u>40-40.15</u>	<u>68-57.75</u>	
	<u>0700</u>	<u>1200</u>	<u>LC</u>		<u>40-41.60</u>	<u>69-14.57</u>	<u>5/c to 271° T</u>
	<u>0801</u>	<u>1301</u>	<u>LC</u>		<u>40-42.14</u>	<u>69-31.74</u>	
	<u>0911</u>				<u>40-42.03</u>	<u>69-50.45</u>	

Vessel OCEANUS

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Cruise # 91

LORAN LOG

[illegible]

Vessel OCEANUS

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LORAN LOG

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APPENDIX II  
SMOOTH SHEETS  
OCEANUS 91

41°N

①

OCEANUS VOYAGE #91-115.GS

1508-1-16-81 - 0520-1-18-81

WOODS HOLE - SEA

TIME GMT

40°N

71°W

70°W

69°W

1508  
DEPART W.H. 1-16-81

0520  
ARRIVE W.H. 1-18-81

1722

0252

0212

0100

1900

1900

2100

0000  
1-18-81

2300

2200

2100

2005

2155-1/16-0747-1/17

0800

0917

MUD SAMPLE SITE

1000

1200

1900

1700

1834



71°W

70°W

(2)

69°W

68°W

67°W

OCEANUS, VOYAGE # 91 U.S.G.S.

1336 ~ 1.19.81 ~ 2110 ~ 1.22.81

WOODS HOLE - SEA

TIME G.M.T.

HPH

2112 1336  
2ND DEPARTURE WH 1.19.81  
1.22.81

2ND DEPARTURE WH 1.19.81  
1.22.81  
1531 DEVILS BRIDGE

1610 LC CL  
1.22.81

1700 LC  
(NOTE CONTINUED)  
1700 DE  
1600 LC  
1500 DE  
1400 LC  
1300 DE  
1200 LC  
1100 DE  
1000 LC  
0900 DE  
0800 LC  
0700 DE  
0600 LC  
0500 DE  
0400 LC  
0300 DE  
0200 LC  
0100 DE  
0000 LC  
1.20.81

2005 HT  
TEST CTD

41°N

41°N

MOBIL OIL LEASE  
BLOCK # 312  
1749 - 0845  
1.22.81

SCIENCE STA "W"  
1323-1548

SCIENCE STA "A"  
1056 - 1220

MULTIPLE  
MUD GRABS

0850 1.21.81  
DEPART LYDONIA CANYON  
SCIENCE STA'S

0836 ARRIVE LYDONIA  
CANYON SCIENCE STA'S

71°W

70°W

69°W

68°W

67°W

40°N

40°N