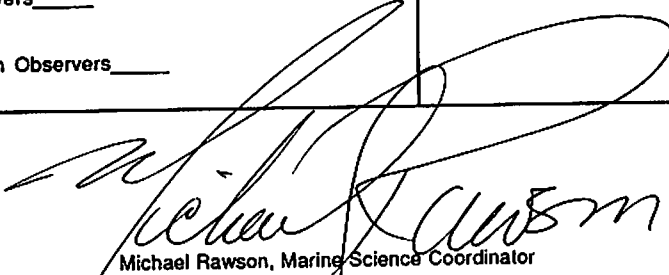


CRUISE REPORT

Ship Utilization Data

1. Ship Name W MAURICE EWING		2. Operating Institution Lamont-Doherty Earth Observatory Palisades, N.Y. 10964		3. Cruise (log) Number EW 92-11	
4. Dates of Project: Begin: 14-Nov-92 End: 17-Nov-92		7. Participating Personnel:		Function on Cruise (Ch.Sci., Obs., Tech., Grad. Student, Undergrad, For. Obsv.)	
Port Calls Place Date St. Georges, Bermuda 14-Nov-92 Jacksonville, FL 17-Nov-92		Code Title Name Institution 1. Mr. Dale Chayes, L-DEO 2. Mr. Michael Rawson 3. Toshiya Fujiwara, Chiba University, Tokyo 4. William Koczynski, L-DEO 5. S. Budhypromano, L-DEO 6. Joseph Stennett, L-DEO		Dates (If less than entire cruise) Chief Scientist Scientist Student Technician Technician Science Officer	
5. Number, Sea Days 6. Number, Port Days 3 0		Use reverse of necessary			
8a. Area of Operations, Area Index and Geographic Description 89 NL NA6 Western North Atlantic, Bermuda Basin					
8b. Research in Foreign Waters? y__ Country: Bermuda					
9. Primary Project(s)					
a. Project Title, Principal Investigator, Institution		b. Sponsoring Agency/		c. Grant or Contract d. Participating Personnel ee. Discipline	
Hydrosweep calibration for background noise levels in varying sea states and speeds					
10. Ancillary Project(s)					
a. Project Title, Principal Investigator, Institution		b. Sponsoring Agency/		c. Grant or Contract d. Participating Personnel ee. Discipline	
11. Science Party: Scientists_2_ Grad. Students_1_ Undergrads_ Technicians_3_ Observers_ Foreign Observers_		12. Cost Allocation Data a. Days Charged b. Agency or Activity Charged c. Grant or Contract No. These days will be charged as Out of Service transit days to Lay up port.			
13  Michael Rawson, Marine Science Coordinator Title, Signature, Operating Institution Official		Date: January 26, 1993			

Date: February 26, 1993

To: Aitken, T. L-DEO
Chayes, D. L-DEO
Cox, L. L-DEO
Eaton, G. L-DEO
Hayes, D. L-DEO
Mutter, J. L-DEO
Science Officer EWING
Captain EWING
Stennett, J. L-DEO
Robinson, W. L-DEO

RESEARCH CRUISE REPORT
R/V MAURICE EWING, LEG 92-11

"A Quantitative Baseline Analysis of Multi-Beam Mapping Data Acquisition
under Various Operating Parameters on the R/V MAURICE EWING"

P.I. M. Rawson & D. Chayes
Dates: November 10-14, 1992
Ports: Bermuda to Jacksonville

mr/2/93

Mercy Garland
Marine Department

February 26, 1993

Lamont-Doherty Geological Observatory
of Columbia University

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R/V MAURICE EWING CRUISE REPORT: EW92-11

Principal Investigators:

Mr. Dale Chayes, Mr. Michael Rawson; Lamont-Doherty Earth Observatory,
Palisades, N.Y. 10964

**Program: "A Quantitative Baseline Analysis of Multi-Beam Mapping Data
Acquisition under Various Operating Parameters on the R/V MAURICE
EWING"**

The objective of this program was to determine the effect of the bow thruster covers on the quality of data acquired through the Hydrosweep multibeam mapping system.

Background: The Hydrosweep system was installed on the MAURICE EWING during the 1989-90 shipyard modification period. Initially it was planned to install bow thruster tunnel covers that could be activated remotely from the bridge to open the tunnel when needed for maneuvering at sea or entering and clearing ports. The covers would be closed during multibeam mapping surveys to reduce noise levels resulting from inefficient hydrodynamic flow along the hull. Budget constraints deferred the installation of these covers and an alternative of plywood covers bolted over the tunnels was adopted. Although it appeared that these covers were effective in reducing noise levels, we wished to make a quantitative analysis of the effect under varying sea conditions and speeds. For logistical reasons, it was decided to conduct these tests during a transit period when no science objectives would be impaired.

The original plan to conduct one portion of the survey during a transit back from Cruise EW 92-10 into Bermuda was adjusted to make three controlled legs with the opportunity to change the thruster covers in the Harbor at St. George's Bermuda. It was felt that this would result in more consistent data parameters in which the same slope could be measured under a variety of weather and operating conditions.

CRUISE EW 92-11: EVENTS

Survey Number 1 (Passes 1-4)
NOVEMBER 10, 1992 (Julian Day 315)
2012 GMT Clear St. Georges Harbor
2100 GMT Commence Survey Number 1.

Conditions:

Bow thruster covers in place
Weather: Force 6 NE
NOVEMBER 11, 1992 (Julian Day 316)
1337GMT Survey completed

1500 GMT At Anchor, St Georges Harbor
Remove bow thruster covers

Survey Number 2 (Passes 5-8)
NOVEMBER 11, 1992 (Julian Day 316)
1830 GMT Clear St. Georges Harbor
1847 GMT Commence Survey Number 2.

Conditions:

Bow thruster covers removed
Weather: Force 2-3 NE
NOVEMBER 12, 1992 (Julian Day 317)
1036 GMT Survey completed

1215 GMT At pier, St. Georges Harbor
Replace bow thruster covers for final survey & Transit

Survey Number 3
NOVEMBER 13, 1992 (Julian Day 318)
1429 GMT Clear St. Georges Harbor
1516 GMT Commence Survey Number 3
NOVEMBER 14, 1992 (Julian Day 319)
0310 GMT Complete Survey number three.
0312 GMT C/C to 271 degrees, depart for Jacksonville, FL.

Conditions:

Bow thruster covers in place
Weather: Force 2-3 NE

HYDROSWEEP NOISE SURVEY

(Times in GMT)

SURVEY NO.	JULIAN DAY	SPEED KNOTS	POINT A	POINT B	POINT C
Harbor	315		2012	Depart St. Georges	
1	315	10.6	2100	2349	
1	316	8.3-11.2			0110
1	316	11.5	0444	0206	
1	316	9.5		0800	0910
1	316	9.5	1337	1021	
1	316		1530	At Anchor, St. Georges	
2	316				
2	316	10.5	1847	2135	2234
2	317	10.7-11.8		2330	
2	318	9.5	0203	0530	0617
2	318	9.5-10.0	1036	0726	
3	319	8.0-9.5	1516	1840	1943
3	319	9.0	2319	2046	
3	320	11.7		0203	0310

MEMORANDUM
Lamont-Doherty Earth Observatory
of Columbia University

To: Michael Rawson
Cc:
Subject: EW9211 Hydrosweep tunnel cover test
Date: February 11, 1993
From: Dale Chayes

Sorry for the delay in generating an initial interpretation of the tests which we made on the Ewing off of Bermuda in November, 1992. The intent of this test was to estimate the difference in performance of our Atlas Hydrosweep-DS multibeam swath mapping sonar system caused by the bow thruster tunnel openings.

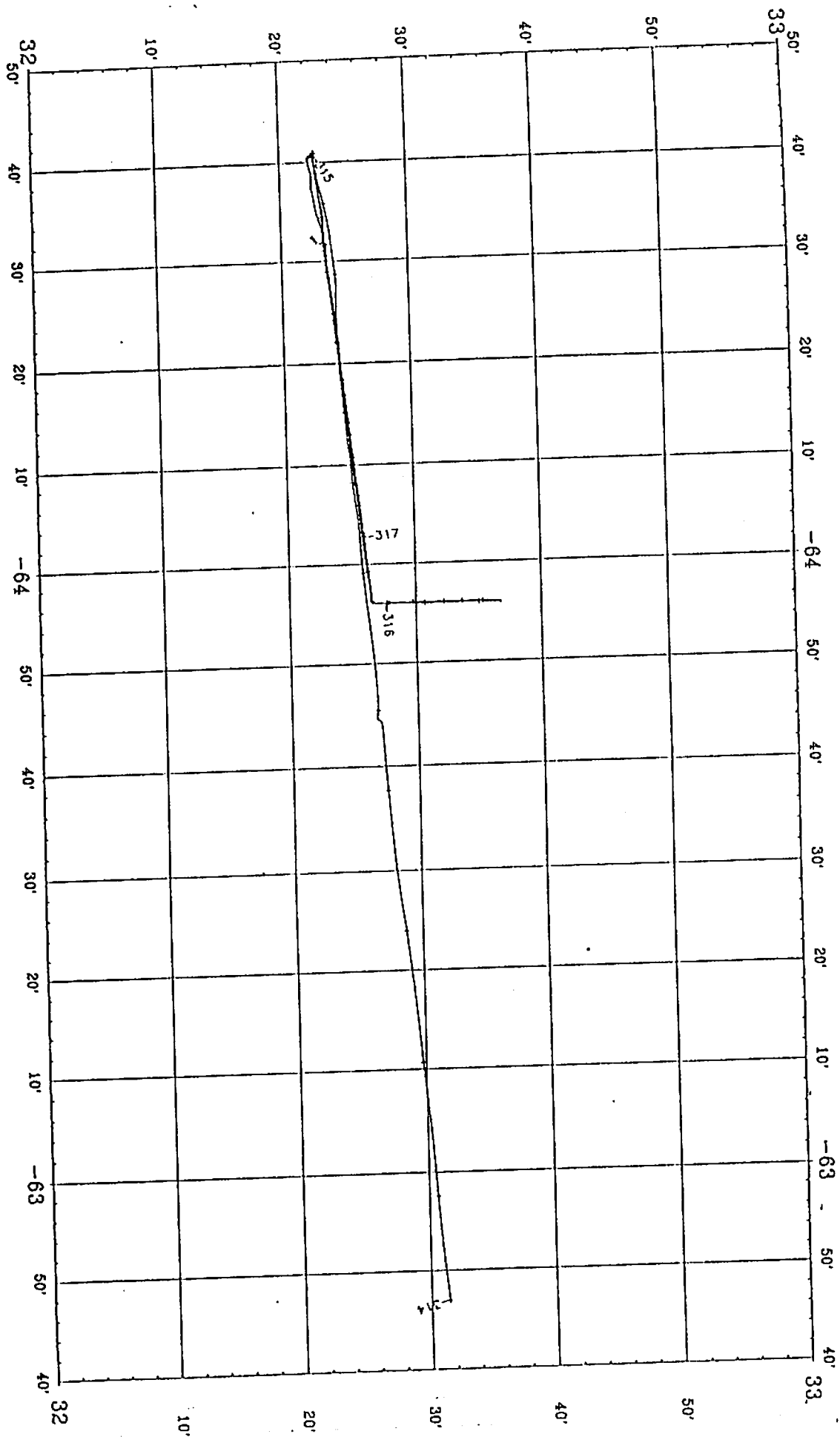
We ran a series of passes over the same set of track lines at various speeds and in different sea conditions with and without the tunnel covers installed. Included are a track chart showing the location of these test, the statistics from four of these tracks produced with *mbinfo*, a color plot of results from Pass 1, a table of the results from Pass 1, 2, 3, and 5, and a graph of the statistics from these four data segments.

Pass Number	Speed (knots)	Cover Status	Sea State
1	12	On	6
2	12	On	6
3	10	On	6
4	10	On	6
5	12	Off	3
6	12	Off	3
7	10	Off	3
8	10	Off	3

The initial results indicate that in the very rough conditions of Passes 1-4, the number of beams dropped by Hydrosweep is only three or four percent greater with the covers on compared with the second set of data where the sea-state was substantially reduced.

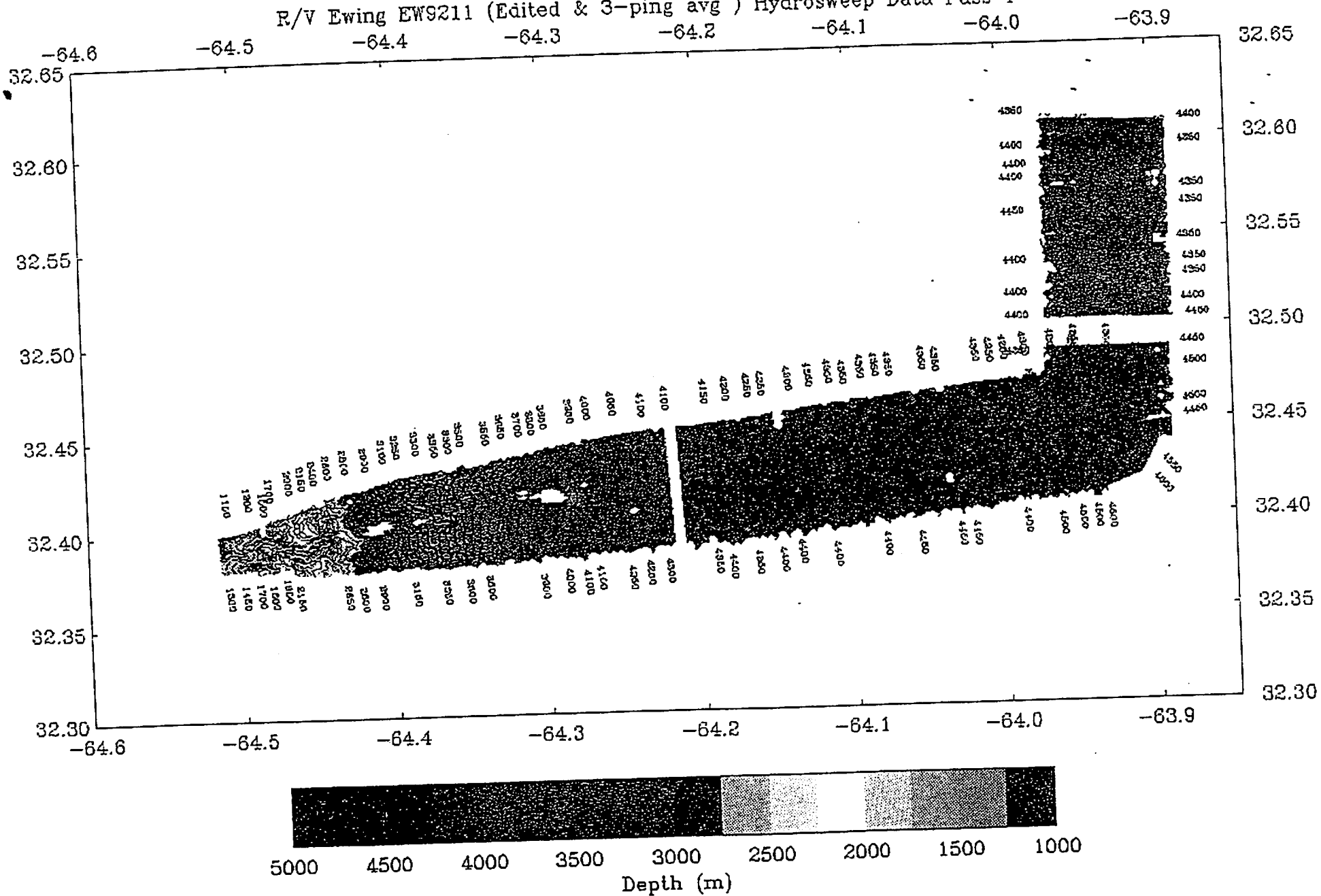
I have not yet found a satisfactory method of normalizing this data to eliminate the highly variable sea-state which we did not expect to encounter during this short test.

DALE

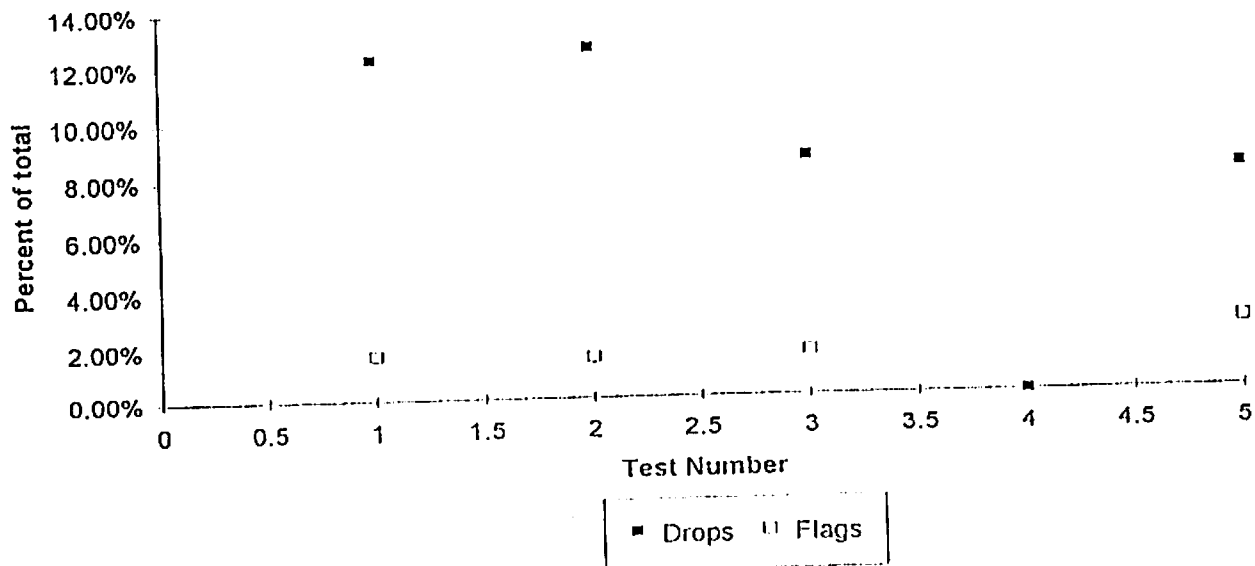


EW-9211 TRACK LINE OF THE HYDROSWEEP SURVEY AREA: SCALE = 4.4 inch/deg.

R/V Ewing EW9211 (Edited & 3-ping avg) Hydrosweep Data Pass 1



EW9211



Leg	Pings	Beams	Good	Drop	Flags	Drop%	Flag%
p1	1163	68617	59086	8369	1162	12.20%	1.69%
p2	961	56699	48745	7083	871	12.49%	1.54%
p3	1222	72098	64753	6156	1189	8.54%	1.65%
p4							
p5	886	52574	46716	4205	1353	8.00%	2.57%

multibeam data file: pln.edit
multibeam format 5: NRL/LDGO 59 ping edmb format
(binary, centered, Hydrosweep)

data totals:

number of records:	1163
number of beams:	68617
number of good beams:	59086
number of zero beams:	8369
number of flagged beams:	1162

navigation totals:

total time:	4.1608 hours
total track length:	73.9034 km
average speed:	17.7617 km/hr

begin stats:

time:	11 10 1992 21:00:20		
lon:	-64.5153	lat:	32.3899 depth: 1193.00
speed:	17.9829	heading:	82.6000 pitch: -6.00

end stats:

time:	11 11 1992 01:10:00		
lon:	-63.9319	lat:	32.6102 depth: 4408.00
speed:	17.9829	heading:	13.4000 pitch: 2.30

limits:

minimum lon:	-64.52	maximum lon:	-63.93
minimum lat:	32.39	maximum lat:	32.61
minimum depth:	1109.00	maximum depth:	4624.00
minimum pitch:	-6.00	maximum pitch:	6.50

multibeam data file: ./p2/p2n.edit
multibeam format 5: NRL/LDGO 59 ping edmb format
(binary, centered, Hydrosweep)

data totals:

number of records:	961
number of beams:	56699
number of good beams:	48745
number of zero beams:	7083
number of flagged beams:	871

navigation totals:

total time:	3.4028 hours
total track length:	72.3809 km
average speed:	21.2711 km/hr

begin stats:

time:	11 11 1992 01:19:45		
lon:	-63.9328	lat:	32.5935
speed:	19.9831	heading:	180.4000
		depth:	4419.00
		pitch:	-4.00

end stats:

time:	11 11 1992 04:43:54		
lon:	-64.5203	lat:	32.3912
speed:	18.9830	heading:	319.0000
		depth:	1145.00
		pitch:	1.40

limits:

minimum lon:	-64.52	maximum lon:	-63.93
minimum lat:	32.39	maximum lat:	32.59
minimum depth:	1099.00	maximum depth:	4539.00
minimum pitch:	-4.00	maximum pitch:	3.90

multibeam data file: ./p3/p3n.edit
multibeam format 5: NRL/LDGO 59 ping edmb format
(binary, centered, Hydrosweep)

data totals:

number of records:	1222
number of beams:	72098
number of good beams:	64753
number of zero beams:	6156
number of flagged beams:	1189

navigation totals:

total time:	4.3244 hours
total track length:	73.0572 km
average speed:	16.8940 km/hr

begin stats:

time:	11 11 1992 04:50:26		
lon:	-64.5118	lat:	32.3906
		depth:	1218.00
speed:	13.9826	heading:	84.8000
		pitch:	-5.70

end stats:

time:	11 11 1992 09:09:54		
lon:	-63.9298	lat:	32.6069
		depth:	4417.00
speed:	16.9828	heading:	359.6000
		pitch:	-1.40

limits:

minimum lon:	-64.51	maximum lon:	-63.93
minimum lat:	32.39	maximum lat:	32.61
minimum depth:	1120.00	maximum depth:	4637.00
minimum pitch:	-5.70	maximum pitch:	5.60