CRUISE REPORT FOR UTIG STUDENT CRUISE XIII ABOARD THE R/V LONGHORN
L90-566A & L90-566B
20 August - 10 September 1990

Chronological Narrative

15-19 August Mobilization at the Marine Science Institute boat basin Port Aransas, Texas.

20 August * all times are local (=GMT - 5 hours)

0038* departure from MSI; 0045-50 safety meeting
0038-1058 transit to an upperslope wave field
1058-1540 3.5 kHz survey wave field - hampered by LORAN-C problems
1540-1848 transit to first seismic line.
1848-1938 streamer & gun deployment
1938-

21 August

-0546 shot line 1; compressor failed (shut itself off when shaft between diesel & compressor sheared)
0549-0618 seismic gear retrieved
0618-2103 transit to Port Aransas; END SC13-01A
2103-2152 ARDCO man replaced shaft & universal joint
2152-

22 August

-0924 transit to second seismic line
0924-0937 deployed streamer & gun
0937-

23 August

-0135 shot seismic lines 2, 3, 4, 5, 6, &7; begin line 8
0200 - ship generator failure, loss of gyro & course.
0200-0423 worked on both generator and one main engine but both refuse to restart.
0421 second main shut down; dead in the water
0446 second main restarted
0446-

24 August

-0053 transit to MSI, Port Aransas; END SC13-01B
0053-1820 dockside; engines restarted, no major problems found.
1820-

25 August

-0830 transit back to study area

0830-0843 deployed & tested seismic gear

0843-1426 completed line 8; on turn to line 9, compressor auto-shut down as universal joint on main shaft failed.

1426-2228 3.5 kHz survey debris flow for first core site.

2228-

26 August

-0044 two attempts to piston core. No trigger event was observed & corer returned to the surface untripped. On second attempt, level-wind on hydrowinch failed requiring hand leveling during retrieval - the tediousness of this prohibited further coring work. Subsequently it was found that the corer never tripped because the wire-out indicator was grossly in error.

0100-1204 continued 3.5 kHz profile survey of sediment distributions.

1204-

27 August

-0515 transit to MSI, Port Aransas for compressor & winch repairs prior to leg 2.

END SC13-01C

29 August BEGIN SC13-02

1805 depart MSI, Port Aransas

1805-

30 August

-0113 transit to 250m coring station STATION 1

0143-0240 piston core 1 (trigger @0152.5) |

0245-0255 reposition |

0308-0330 box core 1 |

0332-0338 plankton tow |

0340-0359 box core 2 |

0406-1020 transit to first seismic line

1020-1031 deployed & test seismic gear

1031-1849 line 9

1849-1905 retrieved seismic gear

1907-1948 two CTD casts STATION 2

2001-2253 three unsuccessful attempts at box coring. |

2253-2330 transit to next seismic line

2330-2340 deploy seismic gear

2341-

31 August

-0120 line 10
0120-0320 line 11
0320-0420 line 12
0420-0558 line 13
0558-0656 line 14
0656-1048 line 15
1048-1136 retrieve seismic gear; deploy box corer (with pinger) STATION 3
1136-1230 box cored; pinger not visible on 12 kHz flat bed
1230-1256 CTD cast
1256-1321 water sampling
1321-1330 plankton tows
1408-1538 piston cored 2 , no triggering observed but mud up to weights
1538-1600 repositioned & deployed seismic gear
1600-1900 line 17
1900-2017 line 18
2017-2330 line 19
2330-

1 September

-0539 line 20 interrupted by compressor shut-down
0539-0740 circle, repair compressor
0740-1024 complete line 20a
1024-1105 line 21a
1105-1140 line 21b
1140-1221 line 21c
1221-1320 retrieve seismic gear & transit to STATION 4
1342-1425 piston core 3, no visible trigger, good penetration, poor recovery
1440-1500 CTD cast
1500-1604 box cored
1604-1625 water sampling
1625-1635 plankton tows
1635-1757 transit to next seismic line
1757-1806 deploy seismic gear
1806-

2 Septermber

-0020 line 22
0020- line 23
-0707 line 24; brief shut-down for compressor oiling
-1104 line 25

1104-1114 retrieve seismic gear
1114-1240 transit to new location for STATION 5
1240-1257 CTD cast |
1257-1330 box core |
1330-1340 2nd CTD cast |
1340-1420 reposition for piston core 4 STA 5A
1427-1520 piston core |
1520-1533 water samples |
1534-1600 plankton tows |
1700-1800 re-piston core 5 5B
1800-1840 reposition for re-box core |
1840-1924 box core |
1948-2057 transit to next seismic line
2057-2108 deploy seismic gear
2109-

3 September

-0550 line 26
0550-0600 retrieve seismic gear
0600-0656 reposition for STATION 6
0656-0800 piston core 6 |
0800-1000 box core, 2 tries |
1000-1020 CTD cast |
1020-1040 water samples |
1040-1134 reposition for seismic line
1134-1145 deploy seismic gear
1145-1926 line 27
1926-1945 line 28
1945-2325 line 29 abandoned; compressor had to be shut down, severe oil leak
2325-

4 September

-0015 retrieved seismic gear and revised plans to headed south to trace out channel courses with 3.5 kHz
-2310 abandonded 3.5 surveying because rough seas made records nearly useless. Begin transit to intraslope basin core site.
2310-

5 September

-1107 transit
1116-1211 box core - poor recovery STATION 7

1215-1225 reposition |
1227-1320 box cored - excellent STA. 7A
1327- CTD CAST |
1340-1435 reposition & rig piston core 7 STA. 7B
1437-1603 piston cored, clear hit >1700m |
1610-1616 water samples |
1619-1625 plankton tow |
1631-1700 tranist to basin margin STATION 8
1708-1920 box cored; two tries, 2nd good, delayed repeatedly by overheating circuit breakers
1937-

6 September

-0142 3.5 survey & transit to next station (sandy basin 4); complicated by dodging around seismic ship, GECO APOLLO
0145-0324 box cored, 3 tries to get a successful closing (1414m) STATION 9
0330-0515 transit to south (sand-free?) end of basin
0620-0748 2 box core tries failed
0748-0859 repositioned & rigged piston core
0859-0950 piston cored 8 STATION 10
0958-1005 CTD cast |
1005-1050 box cored failed to close |
1055-1110 water samples |
1120-1155 repositioned |
1200-1455 3 box core tries, last one half full
1500-1525 transit to bathymetric high
1533-1702 2 box core tries, got only disturbed (tipped) sample STATION 11
1710-2004 transit to retry seismic survey
2004-2054 line 30, compressor complaining but working
2054-2231 turn for line 31; bridge made turning error (left -north- instead of right -south)
2231-2301 tried to shoot line 31; compressor shut itself off; will not retry to use it.
2330-

7 September

-0452 transit to next STATION 12
0459-0550 successful piston core 9
0607-0735 transit to STATION 13
0750-0835 successful piston core 10
0900-1817 transit & 3.5 kHz survey to STATION 14
1831-1934 successful piston core 11 |

1950-1955 CTD cast |
2000-2041 unsuccessful box core |
2042-2050 plankton tow |
2050-2115 reposition |
2120-2204 box core (unsuccessful?) |
2204-2240 reposition |
2245-2329 SUCCESSFUL box core |
2330-

8 September

-1645 3.5 survey & transit to next STATION 15
1650-1744 piston core 12 |
1745-1800 reposition |
1805-1900 successful box core |
1915-1930 CTD cast |
1945-2005 plankton tows |
2005-2022 transit to STATION 16
2040-2130 piston core 13 |
2200-

9 September

-0621 3.5 survey & transit to STATION 17
0628-0710 piston core 14 |
0737-1121 transit & 3.5 survey to STATION 18
1127-1147 box core |
1147-1243 reposition |
1250-1330 piston core 15 |
1340-1350 CTD cast |
1400-1410 water samples |
1412-1418 plankton tows (3) |
1420-1630 transit to STATION 19
1632-1645 box cored |
1700-1727 piston cored 16 |
1730-1906 transit to STATION 20
1915-1919 box core too full |
1923-1930 box core unsuccessful |
1935-1945 box core successful |
2000-

10 September

-0155 transit to MSI Port Aransas

DISCUSSION AND EVALUATION

The priorities of data acquisition were: seismic reflection profiles of the salt and associated stratigraphy of prospective heat flow sites; surficial sediment character of these sites (as determined by 3.5 kHz profiles, piston, and box cores, micropaleontologic and geochemical sampling of box cores; and shallow plankton tows with supporting water samples and CTD casts. Overall, the data acquisition was quite successful. Shallow water and sediment sampling were most successful quantitatively, because they took place during some of the time that would have been devoted to seismic data acquisition had not the compressor failed so much. On the other hand, had there been no down time at all, all phases of data acquisition would have had sufficient time for success.

Success was somewhat inversely proportional to priority with water sampling, CTD casts and plankton towing having no hitches. Box coring was rather inefficient with two and three tries often needed to get a satisfactory sample (sometimes not even then). This was probably due largely to mechanical inefficiency of the instrument - too much friction of some parts, not enough weight, sticky release - and somewhat to vagaries of entry angle and other mysterious events at the end of the wire. None the less, a good data set for examining the relationships between depositional environment and benthic assemblages and their taphony was acquired. The first few piston cores were also poor (short) until subtleties of the art of rigging were recalled. The 16 cores will provide verification of sediment type associated with the variety of acoustic reflection characteristics mapped. This cruise was the first to successfully do 3.5 profiling from the LONGHORN. Eleven of the 12 transducers originally mounted in the R/V IDA GREEN were mounted in a sea chest in the engine room and used in our usual configuration with Raytheon transceiver and EPC recorder. Excellent records were gotten when the weather was good - much of the time. However, two detractions were: 1) It is easy to get air under the relatively small LONGHORN, so 3.5 quality goes down quickly with rough weather; and 2) High frequency noise increases dramatically with engine rpm so that very good records can be gotten at 4 or 5 knots, but from 6 to 10 knots background noise darkens the records considerably. In rather striking contrast, excellect records can be obtained on the GYRE at full speed of 10 or 11 knots. The Masscomp-centered seismic system worked well. There were some statics problems, apparently related to the blast phone. Only three of the four channels in the streamer were active. Three failures of the compressor (a sheared drive shaft, a blown universal joint on the replaced drive shaft, and finally compressor oil loss and overheating) not only limited the amount of seismic data collected, but also prevented experimentation with source (trying the larger air gun) and an on-station experiment that was planned.

A few LONGHORN problems also limited our success somewhat. 60-cycle noise is in the seismic data but should not be a problem for frequency filtering. Pervasive interference from CRT displays (e.g., TV & Mac terminals) frequently wiped out our LORAN. We slowly solved the problem with our LORAN, but the dry lab LORAN was out-to-lunch much of the time, possibly due to this problem. A major source of the problem is computer terminals. Users should be warned of the possible need for special shielding and grounding arrangements.

Failed generator and main engines caused one unplanned return to port, and failure of the hydrowinch level-wind contributed to another. Furthermore, remote readouts had to be disconnected and the wireout display was often much too high. This caused complete failure of the first coring attempt. A mechanical meter wheel had to be used to verify wireout. Triggering of the piston corer was visible most of the time as a slight slackening of the tension on the wire. This was a pleasant surprise considering that the corer weighed only a little over 300 lbs and we had over 1000 lbs of wire out (most stations were in 1300 to 1700 meters of water). It would have been better, however, if there was a tension meter in the system. This and a stress accumulator would add safety to the system.

When the wireout display was correct, the difference between wireout and PDR (precision depth recorder) depth was almost always less than 10 meters and often less than 5. Post cruise depth corrections with Matthews Tables decreased the differences even more. This is, by far, the closest correspondence I have ever seen in my 30 year career. It tells me two things. When the indicator is correct, it is very accurate; and the LONGHORN's crew can keep station better than any of the 30 other ship's crews with which I've worked.

Work was slowed signifcantly, because hydrowinch operations overloaded the generator and caused repeated circuit breaker cut-offs. The ship is clearly underpowered for regular hydrowinch work. Upgrading the generator capacity should be high on the priority list for ship improvements.

The starboard davit caused no delay or lost data, but it is very poorly designed (small ram forcing a large throw) and engineered (loose fitting hinge pins) and seems like a real a disaster waiting to happen. The davit should be made enormously more, both useful and safe, by replacing the small hydraulic ram at the base with a larger one supported by stout framing welded out from the aft steering station.

Also causing no scientific problems was the bathroom plumbing. However, frequent, powerfully unpleasant smells and the total failure of the pump servicing the two lower heads on the second leg detracted signifcantly from the cruise. Cramped quarters on a small ship make the quality of those quarters important, and trying to sleep in fetid air can make a whole cruise seem sour. Serious redesign of the sewage system and plumbing is recommended. The quality of sleep was also lessened because of the

mattresses. Two that I have sampled seemed like they had been slept in for years by 800 lb gorillas. That is, there was very little of substance in the central half of the mattresses.

Many of the above criticisms have positive counterparts. The crew seemed not only quite aware of all of the problems but also had plans for correcting them. Most outstanding was the conduct of the ship's crew. I cannot imagine greater accomodation and all-around assistance with every phase of our operations, from Don sleeping with his door open for complete access to his toilet to hands always being ready and willing to give as much assistance as needed with every operation. This extremely helpful attitude was actually characteristic of all Institute personnel with whom we came in contact at Port Aransas and is much appreciated by all cruise participants.