CRUISE REPORT FM3101 Slightly Revised

4 - 14 January 1986

Student Cruise VIII

Chronological Narrative

2 Jan. Departed Austin in UTIG van with 7 students and driver; arrived Galveston about 1330. Ten more students arrived on their own. Assigned cabins and watches and began watch standing schedule. Began rigging piston corer and explaining coring operations.

3 Jan. Continued core rigging and mock coring including lowering the trigger corer and transferring weight from chain hoist to winch and back. Dropped one core barrel overboard at dockside. This will need to be retrieved at a later date. Simulated multi-channel data acquisitions operations although DEMUXR was down much of the time.

4 Jan. Mark Wiederspahn solved some DEMUXR (PDP1134) hardware problems (involving cables to tape drives and a bad chip in the blue box); and we were ready to depart at high tide as recommended by Bill Mitchell. Undocking went smoothly; seas were calm; emergency drills at about 1300 went smoothly. Arrived at site intended for first coring operation about 2315.

5 Jan. A brief but intense norther (wind peak @ 60 knots) caused survey of core site to proceed more slowly than planned (4 kt rather than 8 kt) and roughened seas enough to prevent coring. Very few students could stand watch (about three out of 17). Continued survey of the site with 3.5 kHz throughout the day.

6 Jan. Proceeded to first earthquake OBS drop site dropping it at 03:13:50 (26°56.57'N, 94°13.68'W); second earthquake OBS dropped at 04:05:26 (26°58.87N, 94°07.46'W). 05:50 deployed 2 air guns for calibrations shots to OBSs. 06:00:51 to 06:01:58 Oscar fired 4 test shots to check out air guns. Calibration shots:

1	0640	26°50.61'	94°07.14'	approx. (logger off)
2	0655.0	26°51.70'	94°07.64'	logger keyed on shot
3	0710.0	26°52.78'	94°08.17'	" " " "
4	0725.0	26°53.83'	94°08.70'	" " " "
5	0740.0	26°54.89'	94°09.19'	" " " "

All locations are from Northstar6000 LORAN-C.
Retrieved guns and returned to first OBS drop site to core.
0850 - 1245 Proceeded slowly to core and rerig corer.
1245 - 1415 transit to second coring site
1415 - 1609 successfully obtained FM piston core #2 and began transit to streamer party site. Doppler sonar speedometer lost calibration and we entered speeds manually for the rest of the cruise.
2010 - 2250 deployed streamer removing 38 lbs of lead. Water temp. = 23.2°C - 73.8°F. One part of the streamer (around channels 20 & 21) towed quite a bit shallower than most of the rest of the streamer, so I held a second streamer party and added 6 lbs of lead around that part of the streamer. The towing depths did not change appreciably. The streamer was heavy - sank at dead stop - but the birds brought it up to reasonable depths (20 to 60 feet) so we proceeded to the first line (SC80).

7 Jan. Started taking data on SC80. Retrieved and redeployed the port gun several times during the first five hours. 1100 deployed magnetometer. Went off line considerably at 1600 watch change. Large storm prediction received at 1500. In anticipation, magnetometer was retrieved at Ken Griffith's suggestion. 1930 - due to rapidly building seas from the north, we secured the air guns and shut down the compressors until further notice. Continued on planned survey course beginning a long line to the west.

8 Jan. Seas from the north required severe crabbing to maintain a westerly course. This put the streamer against the starboard post, so we turned down wind at about 1430. Following seas 8 - 12' caused water to enter over the water-tight door on the main deck bulkhead. Continued down wind dead slow on two engines.

9 Jan. Continued genereally down wind - so that the streamer remained straight behind us. 1700 tried slowing to dead slow on one - little slowing and no loss of control. Seas 10 - 14'. Many student have grown rudimentary sea legs.

10 Jan. Seas diminished slightly but became more confused. Checked the back deck - the starboard gun was swinging freely. Its cradle had broken loose and was washed forward against the bulkhead. Oscar and I resecured it.
0830 seas reduced to 6 - 8' enabled us to turn back northward. The wooden decking around the streamer had been entirely torn out by the storm. George Pearcy had secured what survived of it when it was possible to do so.
1700 winds still sustained at 40 - 45 kt, seas 7 - 10'.

11 Jan. 0800 winds down to 20 - 25 kt; seas down to 4 - 6'; speed up to 5 1/2 kt. Rebuilt 2/3 to 3/4 of the wooden work deck after breakfast. Cleaned and reorganized all coring gear after lunch. We were now speed limited by the streamer; but retrieving it and redeploying it would have taken the same amount of time that steaming without it would have saved - so we continued at about 6 kt.

12 Jan. 0020 air guns deployed and shot line from 26°00' to 26°09'N along long. 95°00'W as line SC81. It took much of the line to get the guns working smoothly. Continued shooting SC82 & SC83. Turned to last line (SC84) about 1700. Port airgun suffered repeated broken air hoses.

13 Jan. 0355 awakened to the news that the OBSs probably released 24 hours early (programming error). Verified error; began students tabulating drift (from SATNAV printouts) since release; pulled magnetometer; pulled airguns; retrieved streamer 0830 - 1000. Drift calculations and Sandy's fix on an OBS signal near the end of the multichannel line were in agreement, so we proceeded in that direction and hunted OBSs. A small norther had roughened seas to 3 - 5' thus hindering visibilty of surface objects. Numerous fishing gear floats were also a distraction; but we retrieved the OBS released second at 1245 and retrieved the OBS released first at 1410; respective pickup sites: 26°46.5'N 94°04.1'W; 26°41.7'N 94°07.3'W. Proceeded to first OBS drop site (= first core site at which we drifted beyond the coring target) and took piston core FM3 about 1700. Planned a water gun line for

the night and additional cores for the next day. However, Oscar had slipped on a greasy deck during the first OBS retrieval and knocked himself out. He seemed to be OK after revival, but became progressively more disoriented after coring. As soon as this progression became evident, we headed for Galveston. At the same time the ship's crew began attempting to get medical advice from marine advisory services via radio. This led to the dispatch of a Coast Guard helicopter and corpsman.

14 Jan. 0100 Coast Guard helicopter arrived and picked up Oscar who was, at best, semiconscious by then. Passed sea buoy 11:09; entered boat basin at 12:15. Unloaded most gear and departed for Austin in UTIG van. Griffiths, McPherson, and Wiederspahn returned with remaining gear in a rent-truck the following day.

OVERVIEW

This student cruise had several objectives additional to the standard instruction in and collection of multichannel, 3.5 kHz, and magnetometer data. We planned to attempt, for the first time, to take piston cores from the FRED H. MOORE. We planned to test newly configured earthquake and refraction OBSs. The OBSs configured to record earthquakes were dropped where there was a maximum likelyhood of a seismic event, atop very active, very shallow salt. We planned to attempt to use the Mass Comp data acquisition system to digitize data from the streamer to compare it with DFS digitized data. And we planned to attempt to acquire deeper velocity structure with a longer OBS refraction line than any shot previously (117 km).

These plans were crimped somewhat by three northers in 10 days. The first norther on Feb. 5 only prevented us from taking one core. The last norther on Feb. 12/13 was of almost no consequence; but the norther that passed us on Feb. 7 took over 4 days out of our work schedule. In spite of this, our losses were only a few hundred miles of multichannel lines and the long refraction line.

The Mass Comp successfully digitized not only two of the airgun channels while we were taking multichannel data but also sonobuoy data, 3.5 kHz data (both raw and rectified signals), and some more esoteric items that Mark and Ken found to plug into it. This experiment was highly successful.

Both earthquake OBSs activated. OBS #2 did not record any data; but OBS #1 recorded 62 events. These were all airgun shots - mostly from ships other than the FRED H. MOORE. Although no earthquake data were recorded (a very long shot to begin with), the experiment was very successful in providing the first field confirmation of a working earthquake recording system and failures that will enable improvement of the instrument's software. Thus this experiment was quite successful in spite of the miscalculated release times.

The coring was highly successful and represents a fully operational, **new capability** for the FRED H. MOORE. Small improvements will, of course, evolve from use. The A-frame extends too far overboard for work on-wire (e.g., dropping or retrieving a

messenger or servicing a trigger mechanism); but moving the A-frame with its hydraulic ram is a pleasant solution to this (non)problem. The most needed item is an additional intercom station or stations on the coring deck. The nearness of the corer to the bottom can be seen clearly on an EPC recorder set up for 12 kHz - the frequency of a pinger mounted in the corer head. But a person observing this in the lab cannot communicate - except through a three-step relay (intercom to word-of-mouth to hand-signal) to the winch operator. This is unsatisfactory and could be dangerous. The trigger corer could have a better rack for securing it (more than just a base plate); and its lift point could be more inboard. The trigger correr's winch should have smoother controls. It is very difficult to keep it from jumping several inches at the start of each movement; and this is hazardous to nearby hands and fingers.

The addition of the coring winch apparently has caused a shift in deck inclination such that oily drippings from the compressors flow forward and collect in the walkways between them and the bulkhead forward of them rather than collecting beneath them and/or running off wherever they did before. This oiliness caused Oscar's accident. If this situation cannot be changed, scrubbing this deck with grease-cutting soap should become a regularly scheduled operation. It was a failure of the cruise leadership not to have recognized and corrected this hazard immediately.

Otherwise, the ship's operation was conducted with such competent professionalism that the scientific party was able to devote unhindered concentration to their objectives. In computer operations, highly skillful programming is manifest by complex operations being <u>invisible</u> to the users. In a highly successful cruise, the complex work of the ship's crew is similarly unobtrusive. On this cruise, it seemed that the ship almost ran itself.

Respectfully submitted,

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Chief Scientist

ps. The cores were opened in Galveston Feb. 25 - 26 and contained unremarkable hemipelagic slope muds. Oil seepage was considered a possibility, but was not observed. On the other hand, the conditions of the cores indicated a normal core collection operation.