

CRUISE REPORT FOR FM-26  
Student Cruise V  
21-29 August 1984

Chronological Narrative (all times are local, CDST)

**Pre-cruise**

18 Aug (Sat) Arrived Galveston early afternoon. Started and ran main lab systems: PDP 11/34, Data Logger, & DFS-DEMUXR. Having a short streamer to work with (24 traces, no dead sections) we would have shoot rapidly to attain a high fold, so I ran DEMUXR at several combinations of rep rates, record lengths, and sampling rates to determine the fastest rates at which it would change tapes without losing shots. PDP 11/34 crashed routinely; other systems behaved reasonably well. Three students arrived; berths and watches were assigned.

19 Aug (Sun) More students arrived and began learning lab operations and watch schedules. PDP 11/34 continued to crash during or after each job.

20 Aug (Mon) Stirling repaired PDP 11/34 by replacing a cooling fan. Most students arrived and continued learning and practicing DEMUXR and other lab operations.

**Cruise**

21 Aug (Tues) The last two students arrived (one with a sprained ankle). 1100 - held a general meeting with scientific party and crew to review ship's operations and safety procedures. Separated from the dock at 1200; left boat basin about 1230. Mid-afternoon drills went smoothly. A few students were sick in spite of seas being less than 4 feet. Data logging (navigation and bathymetry) began officially at 7 pm (0000 22 Aug GMT). Students continued to practice with DEMUXR and prepare tapes with TAPCHK.

22 Aug (Wed) Streamer party 1230-1640 adding 33 lbs of lead (based on water temperature being about 8-10 F° higher than the last cruise. The new birds made the streamer tow quite evenly at slightly below whatever depth setting was dialed into the controller (40'). The slightly deep streamer position may have been due to slight overweighting. It sank slowly when the ship stopped or went very slowly. Only one patch was needed. A streamer log is filed in the data archives. Headed for first line testing towing characteristics.

Deployed one air-gun about 1800 and completed two lines (taking 8 second records with 12 sec rep rate and 2 ms sampling rate). The first tape change failed because of insufficient time (after more than 20 successful changes at the same rates during practice); but DEMUXR was returned to normal operation by the STOP YES CANCEL command sequence and the problem did not recur for the remainder of the cruise.

23 Aug (Thur) We completed nine short lines in the oil seep area (avoiding an active semi-submersible drilling rig whose presence proved that we were at an exploration frontier). I received radio instructions from Austin to try to accommodate other seismic ships in the area (about 3). I reviewed my schedule and initiated a call to the Western Sound (chosen simply because previous radio contact with them had been clearest. I advised them that we were generally working away from them (six hours more in this area, then about 22 hours in an area 20 to 30 miles to the southeast, then steadily farther away to the south and southwest. They opined that we would have no further problems. I replied that if any arose, they should call us, and I would try to adjust my operations to help out.

24 Aug (Fri) Completed seven lines through the oil seep and unifite basin areas. Most problems arose from air hose failures on guns. Most data very good except for one line through the heart of the oil seep area which had to be aborted because of erratic gun firing.

25 Aug (Sat) Four lines were completed including two across Orca Basin (one with one gun and one with two guns). There were only minor, brief gun and compressor failures (seemingly all at night). The Western Sound requested relief from our noise, so I aborted one line (3 hours) and resumed on one of our earlier OBS lines. The first of three spontaneous DEMUXR crashes occurred on the 4 to 8 watch.

26 Aug (Sun) We completed three lines most of which was a long southwestward line crossing the Sigsbee Escarpment. Night time equipment failures included having to shut down the lab generator to clean or change a filter. This resulted in loss of Gyro compass and, consequently, of auto-pilot. Sandy had to hand-steer with magnetic compass for a couple of hours. One compressor was also lost (a pump shaft broke). Thus our firing rate was halved as was the fold (down to four fold with two guns or eight fold with one gun). The ship's main electrical power also began to fade-out and drop-out repeatedly. Attempts to bring two guns on line failed until we were across the Sigsbee Escarpment because of repeated air hose breaks. Before retiring I recalculated the remaining schedule several times (with adjustments) so that we would return by noon on the 29th. The second spontaneous DEMUXR crash occurred on the 4 to 8 watch.

27 Aug (Mon) Three lines were completed on the continental rise and 1 1/2 on a dip transect back up across the Sigsbee Escarpment and continental slope. A magnetometer was deployed for the latter. One electrical short was found and repaired eliminating one source of power failures, but fade-outs and drop-outs of the main deck interior circuit continued. We encountered exceptional (up to 1.6 kt) cross currents (east-west) that seemed to shift on a diurnal basis (tidal or passing through gyres?) These caused the students to have a hard time

navigating. I noticed (on the camera records) cyclic noise on several traces. The noisy traces each had birds on them or were immediately outboard of sections with birds. The noise was from 18 to 24 Hz with a narrower range (1/2 to 1 Hz) for any one trace (well, for most of them). Unfortunately, the birds appear to strum! A copy of the data is included. The third spontaneous DEMUXR crash occurred on the 0 to 4 shift.

28 Aug (Tues) The last three lines were completed crossing two mid-slope basins, a submarine channel, and an upper-slope erosional escarpment but not quite reaching the shelf-slope break. The ETE (estimated time of ending) was 2300. 2310-2320 the maggie was retrieved; 2320-2335 the air gun was retrieved; 2340-0017 the streamer was retrieved (removing six leads to attempt to improve the balance). Specially made rubber boots were placed on the bird collars (a new procedure for us). ETA (satnav) Galveston - 1030.

29 Aug (Wed) Arrived Galveston before 10 am.

## Discussion

This student cruise was three days longer than any other, so it broke many records. Over 800 miles of line were shot, more than doubling the total number of student cruise lines (grand total for all cruises is 60). The types of areas studied varied greatly from short lines on a detailed grid of an oil seep site presently being drilled, to intermediate length lines over specific intraslope basins, to regional dip (lower slope and Sigsbee Escarpment) and strike (continental rise) lines. Other accomplishments included: two OBS refractions lines were tied into the grid; one DSDP site was crossed (nearly) and a deep, clear reflection was obtained of the gun signature and the first complete bubble pulse from the 200 m (240 ms) thick brine pool in Orca Basin. Hopefully, this last item will provide an operator to design a filter that will be broadly useful in debubbling all our 2,000 psi gun data.

The chief deficiency of the trip was the loss of one compressor due to a pump failure and the lack of a replacement aboard. Apparently this was a highly unusual type of failure, and thus the need for a spare was unanticipated. However, the spare was not a huge, expensive item; and so it could have been stocked without a significant change in overhead costs. Perhaps compressor components should be itemized and inventoried with this type of thing in mind.

Many smaller scale failures causing brief data interruptions (as opposed to large scale data losses due to complete loss of a compressor) are more or less expected and require only the continuation of the sincere efforts of all to improve our maintenance procedures and operating systems. In approximate order of decreasing seriousness these problems were:

Gun failures due to air hose breaks. More frequent renewal of hoses may be needed.

Ship's power interruptions. It seems desirable to have a system for quickly switching lab power to a temporary source and thus avoiding loss of Gyro and autopilot for several hours at a time.

The three spontaneous DEMUXR crashes are a new event in DEMUXR history. They are apparently related to a hardware problem on drive C in that all crashes occurred while the first new record was being acquired after a switch from drive C. Twice, the new drive was drive D, but after that was disabled, the same thing occurred on drive A. Then drive C was disabled and the problem did not recur. The crash amounts to the whole system just stopping - going off in effect - without any warning signal. Rebooting is necessary. Mark Wiederspahn is aware of the problem, has been unable to reproduce it, and is, so far, mystified. The crash documentation procedures are a little lengthy, but very worthwhile. I recommend that watch standers practice them during pre-cruise times to maximize the available information on problems and to minimize down time. Disabling the return key during HEADER and TAPE functions is recommended to avoid display corruptions which may be impossible to correct.

The PDP 11/34 NAV and QC routines are apparently improving, because we were able to use them to some extent. I believe that this is the first time that a cruise of 100% neophyte watch standers has attempted to do so, i.e., we had no Mark Wiederspahn, Eddie Nicol, Patty Ganey, or John Crowe aboard. A few odd problems that we could not solve were: the program NAVLOG just disappeared from its directory after a couple of uses (we did it I'm sure, but I don't know how); QCPLLOT just ran tapes off their reels (it worked fine for Mark a week later); and the procedures for transferring NAV and QC files from the disk to tape did not work. The 11/34 apparently would not recognize the necessary commands, although everything worked for Patty Ganey the following weekend. Apparently some things obvious to experienced, practiced users are unobvious to inexperienced users.

A small item that would make navigation watch standing easier is to reformat the Data Logger print-out so that the LORAN C lat/long is placed in an easily spotted position rather than in the middle of the print-out.

The bird strumming noise needs to be investigated further. The frequencies are within the range of data of scientific interest but may be of narrow enough range to be filtered out without serious loss of desired data. More specific characteristics of the noise (e.g., frequency variations with different towing speeds and streamer depths) could be obtained on day cruises with the presently configured streamer, because it takes only 3 to 4 hours to deploy it (possibly much less without checking DTs and adjusting weights) and less than 1 hour to retrieve it.

Most scientific supplies aboard are well stocked except for navigation and DFS Line logs. Thirty-four boxes (340 reels) of magnetic tape remain aboard.

All supporting personnel including ship's crew were excellent - a standard so consistently met by these people that it could be overlooked.

A group of students will be processing cruise data for the first time. Thus the scientific potential of this program will finally begin to be realized.

Respectfully submitted,

A handwritten signature in cursive script that reads "E. William Behrens".

E. William Behrens  
Chief Scientist

11 Sept. 84

R/V FRED H. MOORE

FM-26

Student Cruise

21 - 29 August 1984

SAILING ROSTER

Scientific Party

Dr. E. William Behrens, Chief Scientist  
Dr. Lawrence E. Lawver

Students

Dieter Beike  
David Chow  
Leo Ehrhart  
Laura Lee Hill  
Danny Katzman  
Steve Kautz  
Teresa Klump ~~X~~  
Curtis A. O'Dell  
David F. Patton ?  
James N. Piper  
L. Scott Underwood  
Allison Westbrook ~~X~~

Ship Crew

Captain Bruce H. Collins  
Mo Ali  
Jean Hudspeth  
James E. Johnson  
Raymond L. Klinepeter  
John P. Kriesa  
Peter A. Kriesa  
Sanzio C. Marchetti  
Lewis R. Rosenboom, Jr.  
Michael P. Wright

Technical Support

Oscar Febres-Cordero  
Stirling Gilfillan  
George T. Percy

# SECOND MARINE RESEARCH TRAINING CRUISE IN GEOPHYSICS FOR 1984

SPONSORED BY THE INSTITUTE FOR GEOPHYSICS

SHIP: FRED H. MOORE

DEPARTURE: 20 August 1984 Galveston, Texas

RETURN: 26 - 28 August 1984 Galveston, Texas

OBJECTIVES: PRIMARY - multichannel seismic reflection profiling of portions of the Texas and western Louisiana continental slopes and rise. Complex salt tectonics; intraslope sedimentary basins; Sigsbee Escarpment salt front; continental rise - deep basin seismic stratigraphy.  
SECONDARY - high resolution sedimentary structures overlying the above features; magnetic profiles.

MEETING: Tuesday 1 May 5:30 - 6:30 PM (see Institute for Geophysics office for place)

Previous cruises' data displays and discussions; pre-cruise planning and assignments.

If you cannot make this meeting, be sure to contact Dr. E. W. Behrens, 130 Inst. for Geophysics 4920 North IH-35, 458-4238.