EN-019

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Core Laboratory
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University of Rhode Island

R/V ENDEAVOR
EN-019 CRUISE REPORT

PROJECT: Coring Test Cruise

ITINERARY: 3/27/78 Depart Newport Shipyard 1715 hours.
3/31/78 Arrive Narragansett, RI 0630 hours.

Scientific Party:

1.	H. Sigurdsson	Co-Chief Scientist	URI
2.	A. Silva	Co-Chief Scientist	URI
3.	E. Laine	Scientist	URI
4.	D. Calnan	Research Associate	URI
5.	S. Carey	Graduate Student	URI
6.	K. Moran	Graduate Student	URI
7.	T. Loutit	Graduate Student	URI
8.	S. Akers	Graduate Student	URI
9.	J. Hetherman	Graduate Student	URI
10.	G. Davis	Graduate Student	URI
11.	A. Davis	Graduate Student	URI
12.	N. Penrose	Technician	URI
13.	S. Imms	Marine Technician	URI
14.	P. Knoble	Marine Technician	URI
15.	G. Chiarello	Marine Technician	URI
16.	L. Stein	Technician	URI

PURPOSE:

Testing of standard piston coring system, large-diameter piston corer, modified O.S.U. core cradle, newly overhauled winch system, 5/8" deep-sea cable, deep-sea camera and sparker system.

NARRATIVE:

R/V ENDEAVOR departed from Newport on March 27 for a second test-cruise of the URI coring system. Major improvements of the system had been implemented since the earlier test-cruise of 15 to 22 January 1978 (EN-017) and the ship's deep-sea winch completely overhauled. The 5/8" diameter cable was spliced (two splices) and installed under tension. In addition the tensiometer system was installed. Initial cruise operations involved streaming of the new 5/8" deep-sea cable under-way to the coring test site on the continental rise and rewinding on to the winch drum under tension.

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Station 1: Site on continental rise at 39°10'N and 70°13'W in 2670 m water depth. Rigging of standard piston corer with 3200 lbs. core weight took five hours before launching was effected. After successful launching and lowering of the standard piston corer, pull-out of the corer out of bottom sediment could not be effected with the deep-sea winch. Pull-out was achieved by use of the new booster system, consisting of a hydraulic jack on winch drum. Maximum pull-out tension was 12,000 lbs. Corer was recovered and on deck nine hours after occupation of this station. Core recovery at this station was 27' of sediment, or 67.5% recovery. The use of a solid piston at this station, together with the very stiff nature of the bottom sediment, may have contributed to relatively poor core recovery. The core liner and puppit valve assembly of the trigger corer was lost at this station.

Station 2: The large-diameter piston corer was deployed at this site on the continental rise, at 39°13.2'N and 70°16.3'W in 2700 m water depth. Core plus trigger weight was approximately 4800 lbs in air and free-fall distance was 20 ft. Rigging of the corer required 4.5 hrs before lowering commenced. Major problems were encountered with the J-frame at this station. The hydraulic system on the frame is not sufficiently powerful to transfer corer weight smoothly in and out of the cradle and outboard. It is clear that the 4" diameter hydraulic ram is not sufficiently powerful to handle the large-diameter piston corer system. Further problems were encountered in attempting pull-out of the corer out of the bottom sediment. The ship's deep-sea winch stalled again and pull-out required the jacking of 25 m of cable by means of the booster jacking system. Recovery of the corer from the sea-floor required 5.5 hrs. The corer penetrated approximately 25 ft. into the sediment. Recovery from the 40' corer yielded 38' of sediment, or total recovery of 152% (hence we assume that approximately 13' will be flow-in).

Station 3: This standard piston corer station was also on the continental rise at 38°47'N and 69° 56.0'W in 3055 m of water. By now the corer system had been thoroughly de-bugged and some of the problems with winch and J-frame power and operation ironed out also. Wire tension dropped to 4000 lbs at time of triggering and pull-out was achieved at 12,000 lbs by the deep-sea winch, without requiring the booster jack. Rigging took only one hour and total station time was 3.5 hrs. The 40' corer yielded 83% recovery of sediment. At this time it was apparent that we had an efficient and operational standard piston coring system, and that delays and operational problems were almost entirely due to the underpowered deep-sea winch and J-frame.

Station 4: A second large-diameter piston core was attempted at this site on the continental rise at 38°47.91'N and 69°56.25'W in 3020 m of water. This is the same region as station 3 and the test should give a good assessment of the relative efficiency of the two coring systems. Total core weight including trigger weight, was approximately 4700 lbs in air, and free-fall distance was 15 ft. Total station time was 4.5 hrs. Wire tension on pull-out was 15,200 lbs. The 40' corer penetrated 38.5; recovered 32' of sediment, or 83% core recovery. While the deep-sea winch barely managed corer pull-out without assist from the hydraulic booster, the J-frame presented serious problems in recovery and launching.

Station 5: This station served as a test site for deep-sea camera at 38°48.5'N and 69°57.6'W about 3000 m of water. Camera was successfully deployed, operated and recovered in 4.5 hrs.

Station 6: Dr. E. Laine conducted an STD and Niskin rosette sampler experiment at this station at 39°43.3'N and 70°15.4'W. Experiment was successful after rectification of power supply problem. Station time: 4.5 hrs.

Station 7: Camera station on edge of continental shelf at 40°01.6'N and 70°15.1'W in 210 m of water. On-site processing of film showed test to be successful. Station time: 2 hrs.

A newly acquired sparker system was deployed by Dr. Laine during the cruise. The sparker system operated satisfactorily, but the hydrophone array malfunctioned and needs minor servicing.

COMMENTS:

The URI standard and large-diameter piston coring system can now be deployed successfully from the R/V ENDEAVOR. We wish to emphasize, however, that the winch and J-frame are at the very limit of their capabilities on pull-out, launching and recovery of the corers. The 7" diameter hydraulic ram, to be installed shortly on the J-frame, will hopefully remedy the launching and recovery operations, but it is evident that the winch is underpowered and that the booster hydraulic jack is an essential stand-by item on all piston-coring cruises until a more powerful hydraulic motor has been acquired for the deep-sea winch. Winch operation has been vastly improved with the installation of TV camera and video screen in the winch operator's cabin. A wide-throat trawl block with a 5/8" center groove should be procured for the J-frame. The O.S.U. cradle is ideal for the coring system and requires little modification. The bow-thruster worked well throughout the cruise and the ship keeps very well on station.

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R/V ENDEAVOR

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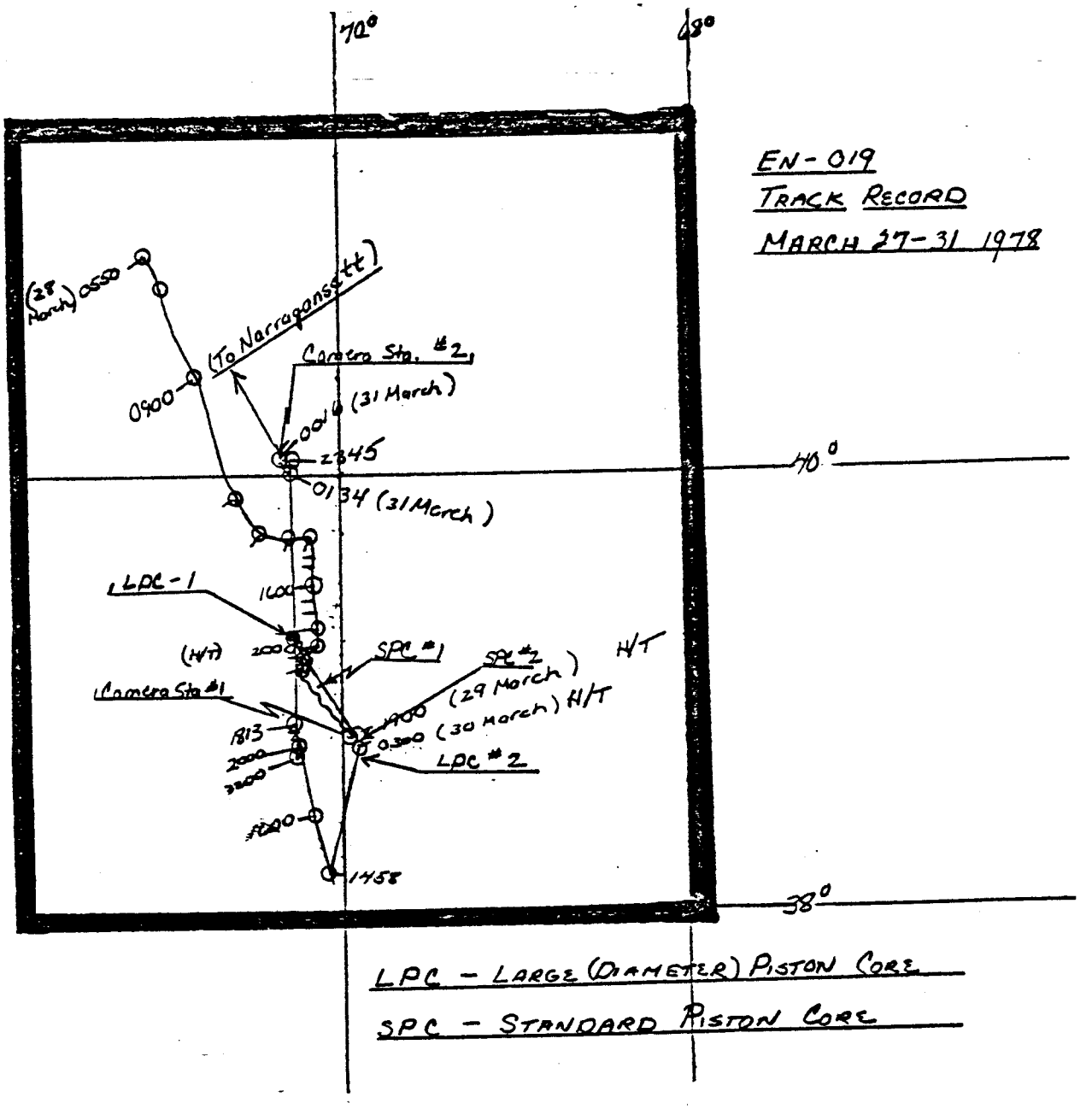
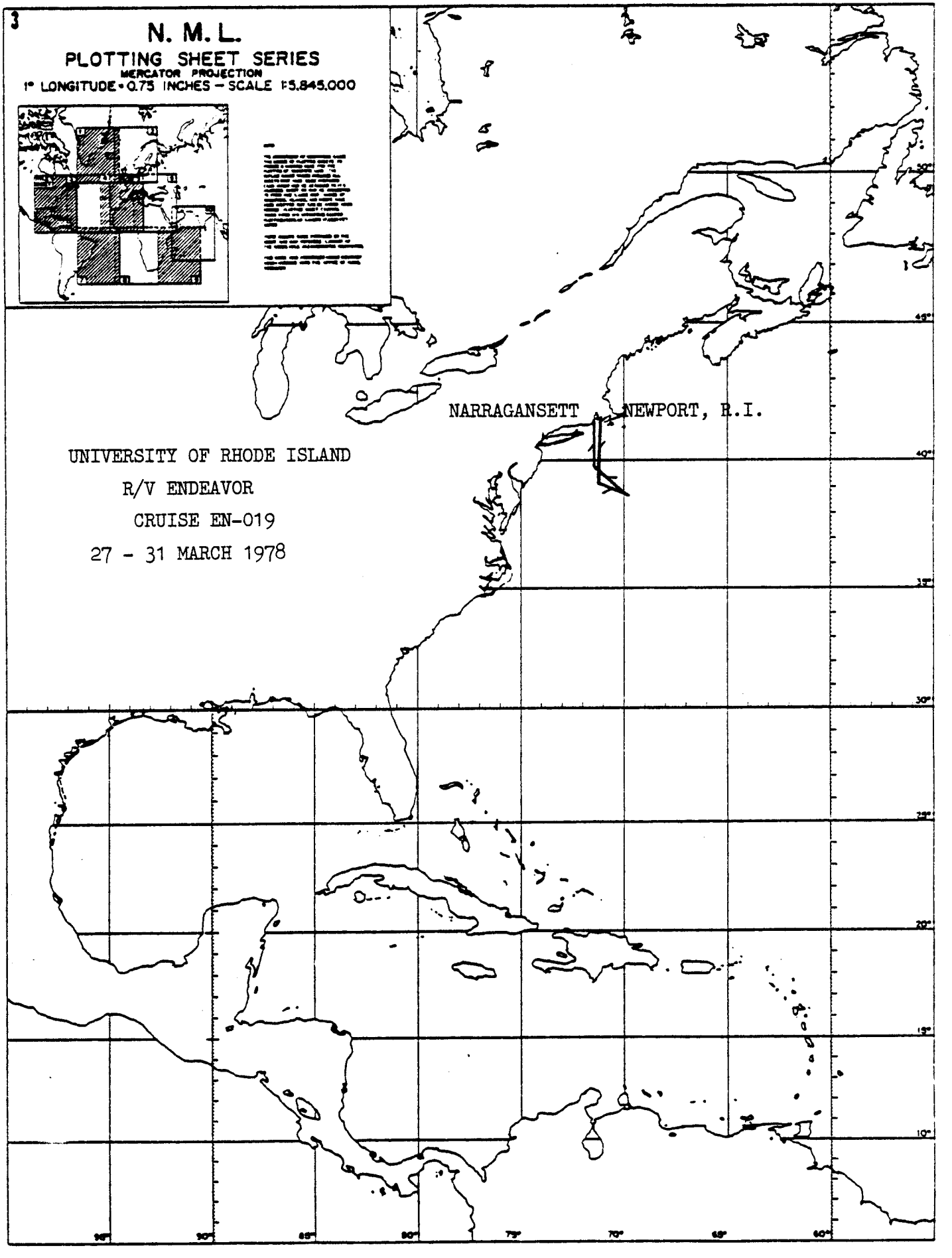
CRUISE TRACK

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CRUISE EN-019
27 - 31 MARCH 1978
40°
35°
30°
25°
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