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ASAF ASHRAF

Graduate School of Oceanography · Narragansett Bay Campus

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Core Laboratory
Graduate School of Oceanography TR-123 CRUISE REPORT
University of Rhode Island

Itinerary

- 10 September 1972, 1530 Local time (GMT + 1): Departed Ponta Delgada, San Miguel, Azores
- 26 September 1972, 1800 Local time (GMT + 4): Arrived St. George's, Bermuda.

The cruise was 17 days in duration with 8.0 days of station time and 2343 nautical miles steaming.

The following funding of ship time was provided:

- 13 days - International Decade of Ocean Exploration (IDOE) program to study "Atmospheric Pollutant Transport and Deposition on the Sea Surface" NSF Grant GX 33777
- 4 days - National Science Foundation study "Submarine Geology of the Azores" NSF Grant GA 30677X

The following programs benefitted from work conducted on this cruise:

- IDOE Sea Surface Program (Investigators - R.A. Duce, J. Fasching, D.R. Kester, C. Olney, M.E.Q. Pilson, and J.G. Quinn)
- NSF Submarine Geology of the Azores (Investigators - J-G. Schilling and D.C. Krause)
- ONR proposed study of oceanic manganese distribution (Investigator: M.L. Bender)

Scientific Party

- Dr. Dana R. Kester, Chief Scientist, U.R.I.
- Dr. James G. Quinn, Co-investigator, U.R.I.
- Dr. Michael L. Bender, Co-investigator, U.R.I.
- Mr. Reinier A. Courant, Graduate Assistant, U.R.I.
- Mrs. Eva J. Hoffman, Graduate Assistant, U.R.I.
- Mr. James F. Holzgraf, Research Technician, U.R.I.
- Mr. Edward Houde, Marine Technician, U.R.I.
- Mr. Terry Wade, Graduate Assistant, U.R.I.
- Mr. Paul Walsh, Research Technician, U.R.I.
- Mr. Edward Weitzner, Marine Technician, U.R.I.
- Mr. Mark Zajac, Research Technician, U.R.I.

TR-123

Summary of Scientific Program

Three types of work were carried out on this cruise: atmospheric and sea surface sampling for the IDOE pollutant transport program, dredging of rocks from the Mid Atlantic Ridge for the study of Azorian submarine geology, and hydrographic water sampling for a study of manganese in the ocean. The cruise track is shown in Fig. 1. and a summary of the stations occupied is given in Table 1.

The study of atmospheric pollutants and their deposition on the sea surface involved sampling of atmospheric particulate matter from a specially constructed bow tower, collection of rain water, sea surface microlayer sampling, and vertical profiling of chemical gradients in the upper one meter. Observations were also made of the thermal mixed layer and its response to wind fluctuations. The sea surface microlayer samples were collected with nylon screens for trace metal pollutants and with stainless steel screens for organic pollutants using small rubber boats at distances of about 1/4 mile from the ship to avoid contamination. Chemical analyses will be performed ashore. Tar balls were observed and collected at six of the eight stations and will be analyzed for organic components. The vertical profiling collected samples for phosphate analyses at ten depths in the upper 1 m; phosphate was employed as a chemical indicator of surface active enrichment. Some of the phosphate results are represented in Fig. 2.

The dredging program consisted of preliminary geophysical surveys monitoring depth, magnetic intensity, and acoustic sediment profiling across the axis of the Mid Atlantic Ridge. Excellent samples were obtained at dredge site #9, a dredge was lost on site #10, and some material was obtained at sites #11 and #12. (3)

Hydrographic and chemical water samples were taken at all stations except #7. This work included STD-O₂ profiles in the upper 1500 m and 5 liter and 30 liter water samples from various depths for manganese analyses.

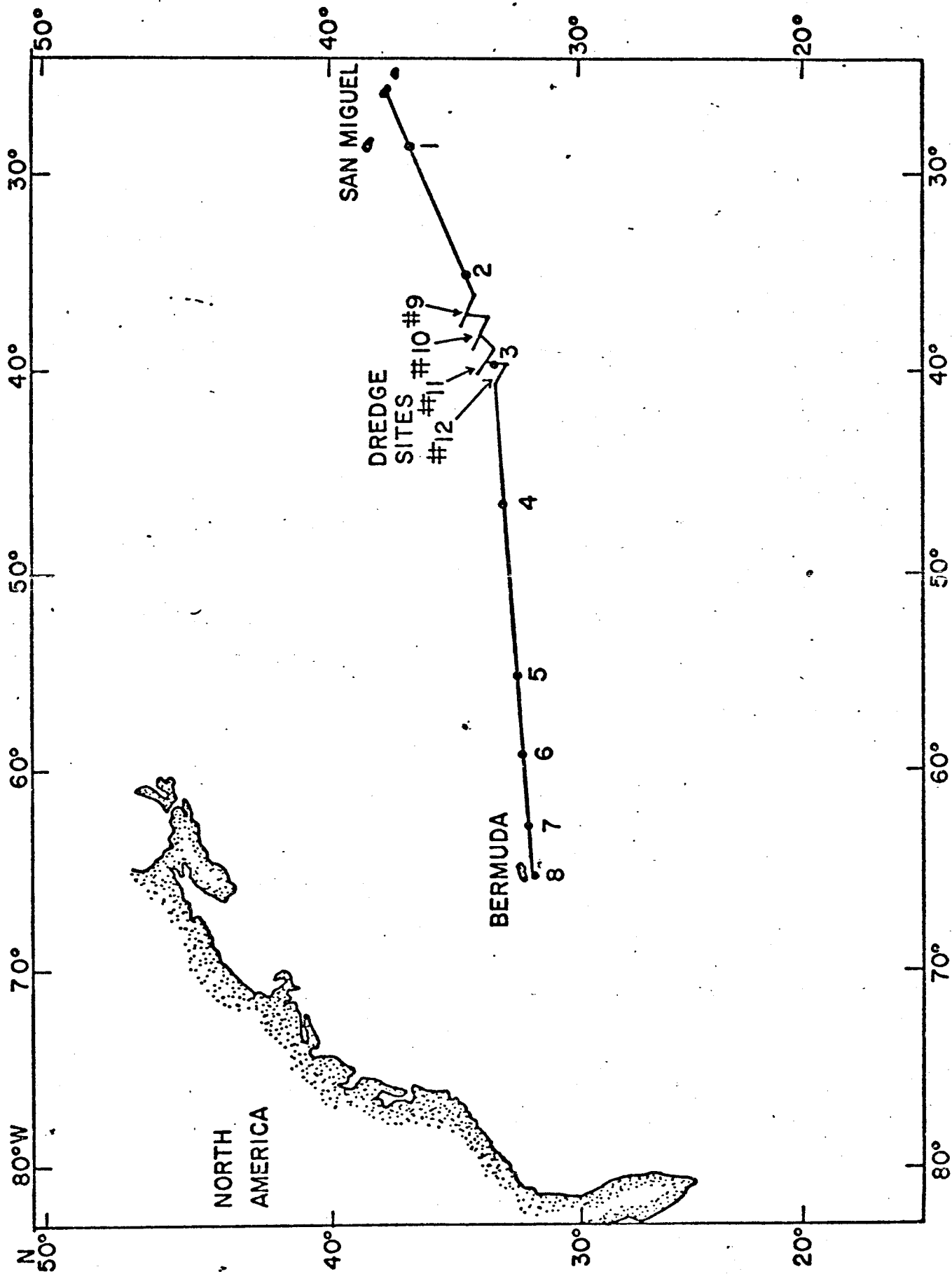


FIGURE 1. CRUISE TRACK AND STATION LOCATIONS FOR TR-123.

TR-123

Table 1. SUMMARY OF STATIONS FOR TR-123

Station No.	Arrival Time (GMT)	Date	Latitude	Longitude	Type of Work (See below of code identification)	Duration (Hours)
1	1432	11 Sept.	36°35.1'N	29°13.3'W	OML, TMM, STD-O ₂ , Hydro	8.0
2	1023	13 Sept.	34°29.0'N	35°38.9'W	OML, TMM, SP, STD-O ₂ , Hydro	7.0
3	2200	13 Sept	34°12.0'N	36°36.2'W	Begin Dredge Survey	91.8 hr. Dredge Study 6.0 hr. Chemical Sampling
3	0625	14 Sept.	34°14.5'N	37°09.2'W	Dredge Site #9	
3	0300	15 Sept	33°45.2'N	37°45.4'W	Dredge Site #10	
3	0500	16 Sept.	33°21.1'N	39°06.6'W	Dredge Site #11	
3	0927	16 Sept.	33°22.5'N	39°08.6'W	OML, TMM, SP, STD-O ₂ , Hydro	7.0
3	0930	17 Sept.	32°37.2'N	39°51.8'W	Dredge Site #12	
4	1012	19 Sept.	32°23.6'N	46°52.5'W	OML, TMM, SP, STD-O ₂ , Hydro	7.0
5	1140	21 Sept	32°05.8'N	55°02.4'W	OML, TMM, SP, STD-O ₂ , Hydro	7.0
6	1607	22 Sept.	31°54.9'N	59°18.4'W	OML, TMM, SP, STD-O ₂ , Hydro	7.0
7	1602	23 Sept.	31°48.1'N	62°44.2'W	OML, TMM, SP	3.5
8	0651	23 Sept.	31°46.0'N	64°50.0'W	Time Series: OML, TMM, SP, STD-O ₂ , Hydro	78.2

1-D
4-D
5-D

Hydro: 5:1 and 30 l water samples
 O/L: Organic micro-layer sampling
 SP: Surface profiler in the upper 1 m
 STD-O₂: Temperature, salinity, oxygen profiling to 1500 m
 TMM: Trace metal micro-layer sampling

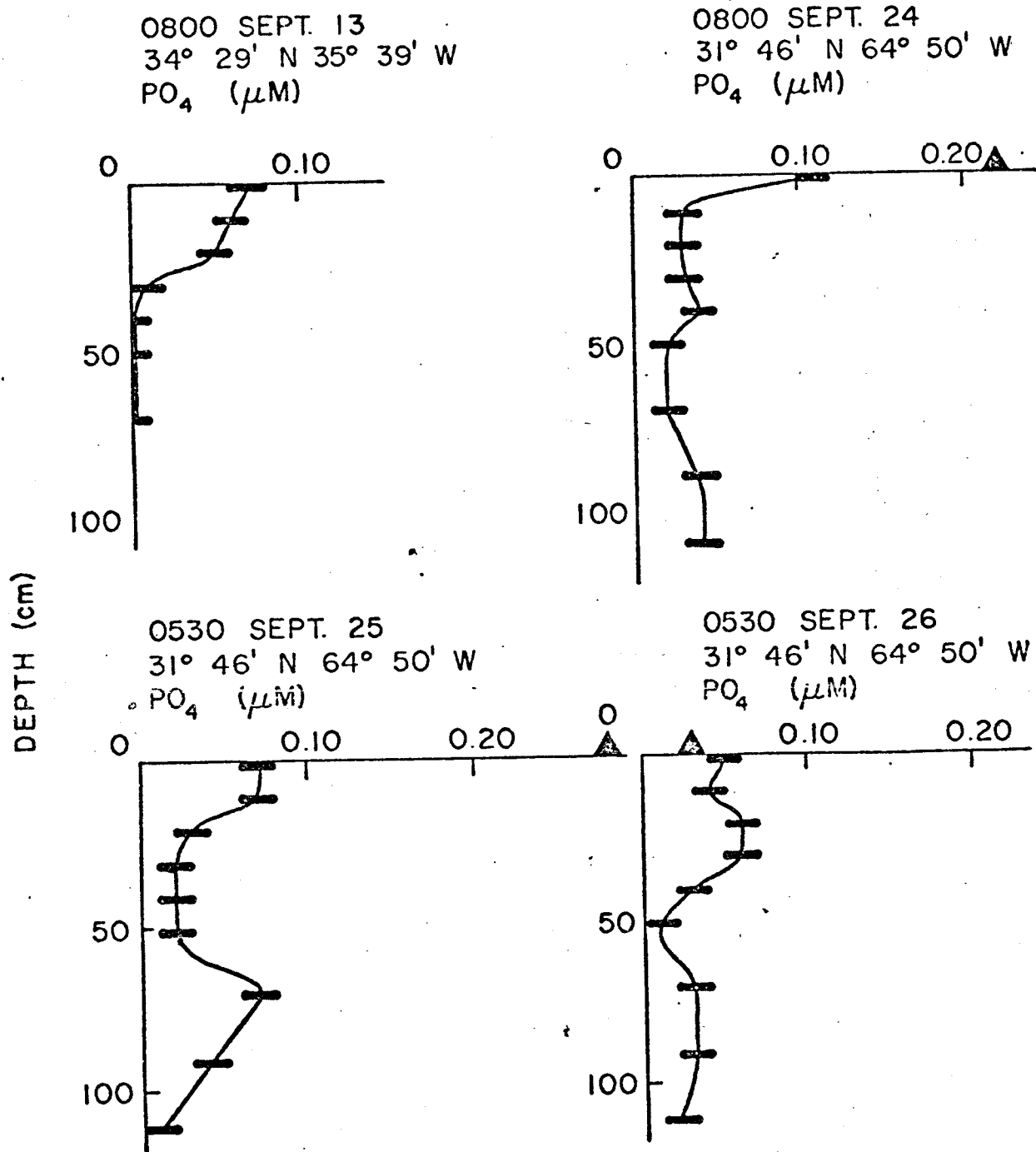


FIGURE 2. PHOSPHATE CONCENTRATIONS IN THE UPPER ONE METER (RECTANGLES) AND FROM SCREEN MICROLAYER SAMPLES (TRIANGLES).