TR-085

UNIVERSITY OF RHODE ISLAND • KINGSTON, RHODE ISLAND 02881

Narragansett Marine Laboratory *Graduate School of Oceanography*

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NADIR CRUISE REPORT
R/V TRIDENT
TR-085

Schedule

Depart St. John's, Newfoundland, 1500, 10 July 1970
Arrive Ponta Delgada, Azores, 0930, 21 July 1970

Region Investigated

Grand Banks to the Mid-Atlantic Ridge

Total Days of Cruise

11 days

Scientific Party

Dana R. Kester, Chief Scientist, G.S.O.
Michael E. Q. Pilson, Co-investigator, G.S.O.
Jarvis Moyers, Research Associate, G.S.O.
Kent A. Fanning, Research Assistant, G.S.O.
David L. Johnson, Research Assistant, G.S.O.
Brendan T. Doherty, Research Assistant, G.S.O.
Robert H. Byrne, Jr., Research Assistant, G.S.O.
William Hahn, Oceanographic Specialist, G.S.O.
Joel Knee, Oceanographic Specialist, G.S.O.
Martin R. Fisk, Research Assistant, G.S.O.
John Richmond, Summer Assistant, G.S.O.
Thomas Casadevall, Graduate Student, U.R.I., Geology
Frederick Haug, Graduate Student, U. N. H., Geology

Scientific Objectives

1. To investigate the use of several chemical parameters as tracers of deep water between the Grand Banks and the Mid-Atlantic Ridge.

2. To study chemical interactions between sediments and seawater.

3. To examine the occurrence of various trace elements in atmospheric particulate matter.

4. To obtain continuous observations of depth and total magnetic intensity between St. John's and Ponta Delgada.

Station List

See attached page for station list and cruise track.

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Continuous Observations

1. Depth was monitored throughout the cruise track.

2. Total Magnetic intensity was obtained on all portions of the cruise track except between stations 2 and 4.

Preliminary Results

Seawater samples were collected from the surface to within 100 m of the bottom using 5 liter Niskin sampling bottles. Analyses were performed aboard ship for oxygen, phosphate, silicate, pH, alkalinity, arsenate, fluoride, salinity, and temperature. Expendable BT's were taken at each hydrographic station except No. 1.

A layer of cold water with high oxygen concentrations was observed at depths of 50-100 m from the Grand Banks to the Gulf Stream. It is likely that this water originates on the Grand Banks (probably during the winter) and then spreads laterally with mixing.

Water below 1500 m along the transect of this cruise contained relatively high oxygen concentrations (greater than 6 ml/l). Initial examination of the data indicates that the high fluoride concentrations which have been reported between Greenland and the Mid-Atlantic Ridge are not detectable between the Grand Banks and the Mid-Atlantic Ridge.

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Eleven sediment cores averaging more than one meter in length were obtained at various positions along the cruise track. The interstitial water was squeezed from six of these cores and was analyzed for silicate, phosphate, arsenate, pH, alkalinity, fluoride, and salinity. The remaining cores will be used in laboratory studies at the Narragansett Marine Laboratory, and in the Department of Agricultural Chemistry.

Five samples of 12 hours duration were obtained for the analysis of atmospheric particulate matter.

At station 6 we collected 300 ml of rain water which was analyzed for fluoride. Portions of this sample were returned to the laboratory for determinations of silicate, chloride, bromide, and iodide.

While on the island of Saõ Miguel, Azores, several liters of water were collected from the geothermal fumaroles of the Furnas Valley. We will determine silicate, arsenate, fluoride, and chloride in these samples.

Hydrographic Station List TR-085

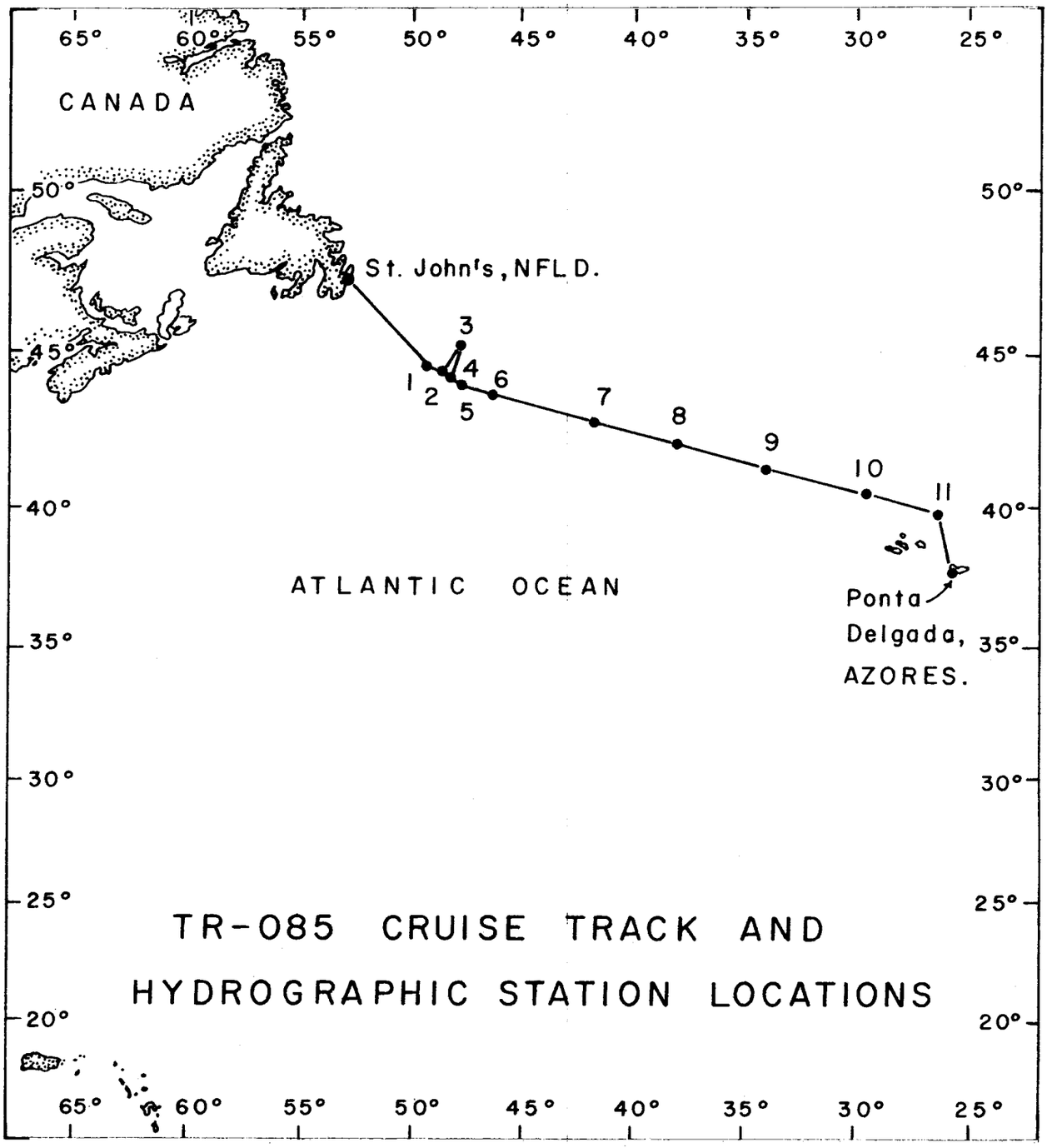
No.	Latitude	Longitude	Depth (m)	Date	Duration (hr)
1	44°44.3' N	49°21.9' W	57	11 July	1.0
2	44°15' N	48°41' W	1923	11 July	2.0
3	45°21.1'N	47°42.8' W	2430	12 July	4.5
4	44°14.5' N	48°27.3' W	3277	12 July	5.0
5	44°06.5' N	47°57.5' W	3583	13 July	11.5
6	43°50' N	46°24.2' W	3965	14 July	6.0
7	42°50' N	41°56.1' W	4922	15 July	11.5
8	42°10' N	38°00' W	4206	16 July	8.5
9	41°22' N	34°00' W	4024	18 July	5.5
10	40°31' N	29°31' W	3130	19 July	6.5
11	39°42.4' N	26°22' W	2845	20 July	6.5

Core Location List TR-085

✓ in core storage

Core No.	Latitude	Longitude	Depth (m)	Date	Hydro. No.
C1	44°42" N	49°08' W	470	11 July	--
C2	44°42' N	49°08' W	450	11 July	--
C3	44°34' N	49°03' W	370	11 July	--
C4 (H-3)	45°21.1' N	47°42.8' W	2430	12 July	3
C5 H-3	45°21.1' N	47°42.8' W	2430	12 July	3
C6 H-5	44°06.5' N	47°57.2' W	3585	13 July	5
C7 H-6	43°50' N	46°24.2' W	3965	14 July	6
C8	42°14.9' N	39°52' W	4860	16 July	--
C9 H-8	42°10' N	38°00' W	4206	16 July	8
C10 H-9	41°22' N	34°00' W	4055	18 July	9 — 170cm
C11	39°42.4' N	26°22' W	2855	20 July	11

core marked as station 12



TR-085 CRUISE TRACK AND HYDROGRAPHIC STATION LOCATIONS