

CRUISE REPORT
TR-149
11 March - 27 March 1974
R/V TRIDENT

SCHEDULE

Departed - Colon, Panama, Monday, March 11, 1500 hrs.

Arrived - Port Everglades, Florida, Wednesday, March 27, 0800 hrs.

GRANTS

1. N. D. Watkins, T. C. Huang, D. M. Shaw NSF Grant No. GA28853X
(Atmospherically Transported Dust in Deep Sea Sediments)
2. J. P. Kennett NSF Grant No. GA36191X
(Paleoclimatic and Biostratigraphic Studies of Sediments from
the Gulf of Mexico)

SCIENTIFIC PARTY

Dr. N. D. Watkins	URI	Chief Scientist	USA
Dr. N. Bonhommet		Visiting Scientist	France
Mr. C. Amerigian	URI	Student	USA
Mr. M. Ledbetter	URI	Student	USA
Mr. D. Williams	URI	Student	USA
Mr. R. Thunell	URI	Student	USA
Mr. R. Aspinwall	URI	Student	USA
Miss N. Healy	URI	Geologist, Staff	USA
Miss C. Brunner	URI	Student	USA
Mr. A. Buddington	URI	Marine Technician	USA
Mr. R. Hendershott	URI	Marine Technician	USA

RESULTS

This cruise was designed to accomplish the following:

1. Complete a traverse of cores begun during TRIDENT Cruise 148 so that maximum in-line coverage can be obtained for high-altitude volcanic dust fallout from volcanoes in Costa Rica and Honduras. This traverse will also facilitate study of a model involving compression of climatic zones during glacial periods, which in effect leads to migration of the study region to one featuring contrasting wind systems with time. The cores collected are numbers 1 through 13 (Figure 1) to add to 1 through 8 of Cruise 148 (Figure 1).

2. Test the feasibility of using box coring methods in deep seas, in order to obtain large samples of surface sediments including dust from very recent eruptions. This exercise proved to be only partially successful in that we have defined the logistic problem in finer detail. Basically the major difficulty is one of estimating the hardness of the surface sediment layer so that the correct load can be applied to the corer, since otherwise too great a penetration below

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the surface sediments leads to loss of the youngest layers. In any case, washing out almost certainly takes place of the top millimeter of sediment, so that new means must be sought to sample sediment younger than 500 to 1000 years.

3. Collect traverses of cores for the Ph.D. thesis research of Miss Charlotte Brunner. By combining paleotemperature and paleosalinity data, it should be possible to estimate the paleovelocities of surface waters in the region, for selected isochrons. Cores 14 to 21 and 24 to 39 (Figure 1) were taken for this purpose. Included in these were fine cores for Mr. R. Thunell's M.S. thesis work on the CaCO_3 compensation depth.

4. Collection of two cores (numbers 22 and 23, Figure 1) from the Gulf of Honduras for Dr. J. Kennett's study of coarse volcanic ash distribution in conjunction with paleoclimatic work.

5. To test the newly acquired sub-bottom profiling system, and to use the Correlation Echosound Programming System (on loan from Raytheon). These tests showed conclusively that the sub-bottom profiling system is of extremely limited value without the CESP option, which enables records of high quality and penetration up to 100 meters to be obtained in medium seas, at ship speeds up to 10 knots.

The locations and water depths of all stations are given in Table 1. The cores from Cruise 148 are added to this Table.

No major instrumental problems were encountered, although one complete coring system was lost, due to the poor quality of the main winch cable (which has since been replaced). In order to minimize further breakage possibilities, over 500 meters of cable was cut off. A trigger core assembly was also lost because of an operator error during recovery. As a service to Dr. Eric Christofferson, two long south to north magnetic profiles were taken.

TABLE 1

Station Locations, Piston Core Numbers and Length, and Water DepthsCruise 148

Station No.	Core No.	Lat °N	Long °W	Water Depth(m)	Total Core Length
1	1	17°28.5'	72°44.2'	2640	19 ft.
2	2(box)	16°21.7'	72°54.6'	4262	-
3	3(box)	15°51.2'	74°34.3'	4180	-
4	4(box)	15°51.2'	75°18.9'	4140	-
5	5	13°57.8'	74°02.8'	4020	34.5 ft.
6	6	13°31.6'	75°51.4'	3949	31.5 ft.
7	7	13°45.2'	74°46.3'	4075	24 ft.
8	8	13°00.9'	76°23.9'	3865	32 ft.

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1	1	12°28.3'	80°29.8'	3110	28'4"
2	2(box)	13°22.4'	80°29.4'	1100	-
3	3(box)	13°15.8'	80°13.49'	2380	-
4	4(box)	13°17.0'	79°57'	2380	-
5	5	13°14.3'	79°38.6'	3100	30 ft.
6	6	13°14.7'	79°17.5'	3290	35'7"
7	7	13°16.5'	78°57.6'	3535	32'4"
8	8	13°28.0'	78°24'	3780	35'2"
9	9	13°29.1'	78°08.5'	3650	32'6"
10	10	13°34.0'	77°54'	3990	21'2"
11	11	13°32.5'	77°42'	3985	-
12	12	13°31.5'	77°30.0'	4000	22'8"
13	13(box)	14°25.3'	77°38.4'	730	-
14	14	17°41.6'	79°10.2'	970	15'6"
15	15	17°25.8'	80°33.4'	1720	15'
16	16	17°25'	80°52'	1380	32'6"
17	17	17°19.2'	81°16.7'	1300	22'6"
18	18	17°07.9'	82°20.6'	1300	25'
19	19	16°51.3'	83°01.4'	1830	6'
20	20	16°50.0'	83°06.6'	1830	34'
21	21	16°45'	83°59'	1638	32'
22	22	16°28.5'	85°27.4'	950	25'
23	23	16°14.3'	87°32.5'	2160	18'
24	24	20°45'	85°16'	4530	37.5'
25	25	21°27'	85°55'	1900	20'
26	26	21°58'	87°36.7'	73	11'
27	27	22°06'	86°19'	580	-
28	28	22°22'	85°25'	2170	24'8"
29	29	22°41.2'	84°51.1'	2270	-
30	30	23°38'	84°48'	3425	19'

Cruise 149 (continued)

Station No.	Core No.	Lat ° N	Long ° W	Water Depth(m)	Total Core Length
31	31	23°34.3'	83°59.1'	2325	25'
32	32	23°33.7'	83°12.2'	1800	18'
33	33	23°54.4'	83°03.1'	1250	14'8"
34	34	23°37.7'	81°28.4'	1450	34'
35	35	23°27.4'	81°17.8'	1310	31'7"
36	36	23°39.8'	80°49.4'	1182	37'
37	37	23°56.2'	80°35.3'	1080	38'8"
38	38	24°07.1'	81°09.4'	875	10'

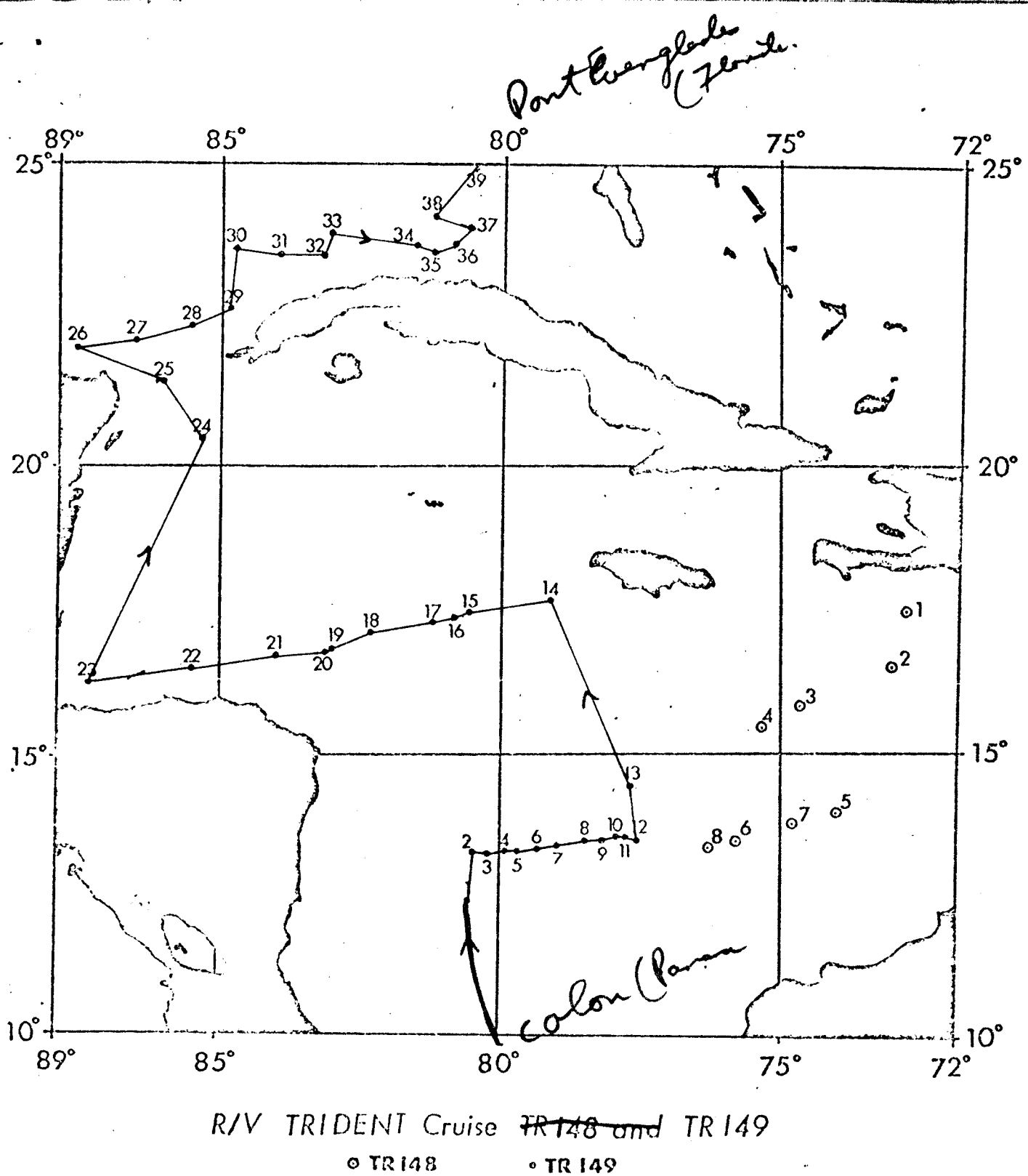


Figure 1. Map showing location of stations for Trident Cruises ~~148~~ and 149.

✓ 11-27 March 1974
 Colon (Panama) — Port Everglades (Florida)