

Q7 Amos

BATHYMETRIC AND HYDROGRAPHIC SURVEY OF THE COASTAL WATERS
OF THE DOMINICAN REPUBLIC

Final Report

to

Instituto Dominicano de Tecnologia Industrial (INDOTEC)

prepared by

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I. INTRODUCTION

This is the final report on a hydrographic and bathymetric survey of the coastal waters of the Dominican Republic. The bulk of the work is devoted to the bathymetry with respect to the suitability of coastal sites for Ocean Thermal Energy Conversion (OTEC) sites or for similar projects that require the proximity of deep, cold water to shore. The report consists of a general introduction to the physiographic structure of the island of Hispaniola, specifically the Dominican Republic, and the surrounding sub-sea topography. This is followed by a detailed report on the bathymetric survey conducted on existing charts and a series of new bathymetric charts of areas of suitability for OTEC sites. Then follows a section on general hydrography of the Caribbean with reference to the Dominican Republic and OTEC compatibility, conclusions, including recommended sites, a bibliography and an Appendix on computer techniques used in the preparation of this report.

The Dominican Republic occupies the eastern two-thirds of the island of Hispaniola which is one of the islands that make up the Greater Antilles (Cuba, Hispaniola, Puerto Rico, Jamaica). Together with the Lesser Antilles, these islands form the outer margin of the Caribbean Sea. The landform of the Dominican Republic is generally mountainous but along the south coast there are considerable areas of low-lying land (approximately one-third of the total area). The mountain ranges have an approximate east-west alignment along the long axis of the island.

The island of Hispaniola is at the end of a classic island arc /deep-sea trench structure (Talwani and Pitman, 1977) with the Puerto Rico Trench to the northeast and the Lesser Antilles Arc to the east.

It is not the intention to discuss the tectonics of the region here or the sedimentary and geological structure which has been discussed by Emery and Uchupi (1972) among others. The surrounding sub-sea topography is described only in terms of its relationship to the proximity of deep water to shore.

Figure 1 is a physiographic diagram of the Caribbean and Atlantic Ocean, immediately adjacent to Hispaniola and the Dominican Republic. Deep water surrounds almost all of Hispaniola. Along the north coast, between Great Inagua, the Caicos Bank, Mouchoir and Silver Banks, is the Hispaniola Basin with depths below 4000 m. The western extremity of the Puerto Rico Trench is north of the eastern tip of the Dominican Republic with depths greater than 8000 m some 80 km offshore. The Mona Canyon, an extension of the Puerto Rico Trench, brings water 4800 m deep also within 80 km from Cabo Engano. Generally, the sub-sea portion of the island arc between Hispaniola and Puerto Rico is shallow, with depths less than 400 m bridging the islands. Off the south coast, the broad Venezuela Basin stretches to the north coast of South America.

The northern part of this basin is the deepest part and water of >5400 m is some 100 km offshore. The Beata Ridge, extending from Cabo Beata towards the Aruba Gap, forms the western margin of this basin. The steepest offshore slopes are found along the western part of the basin, from Barahona to Cabo Beata. On the other side of this peninsula the extension of the Colombia Basin brings deep water again close to shore.

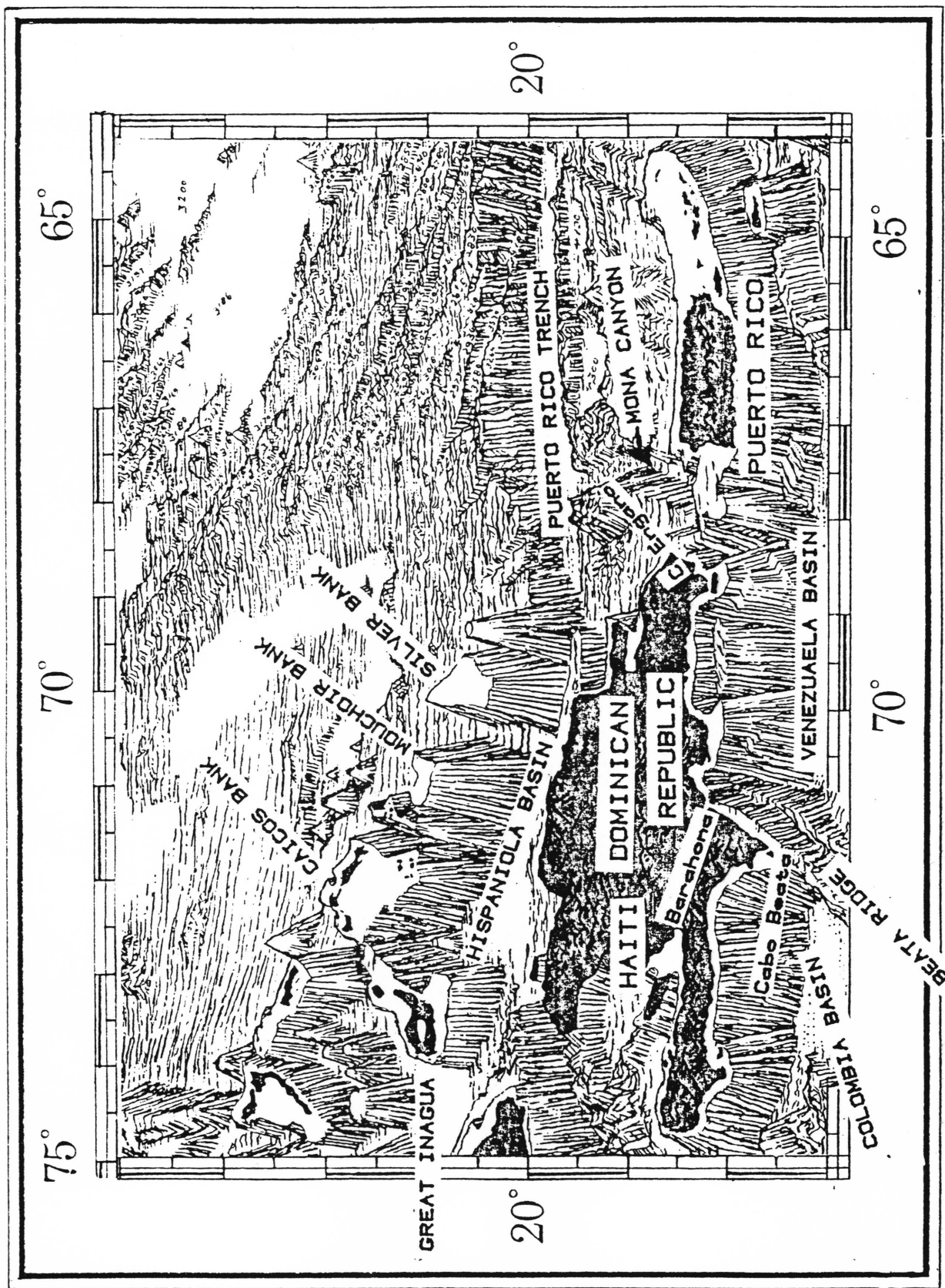
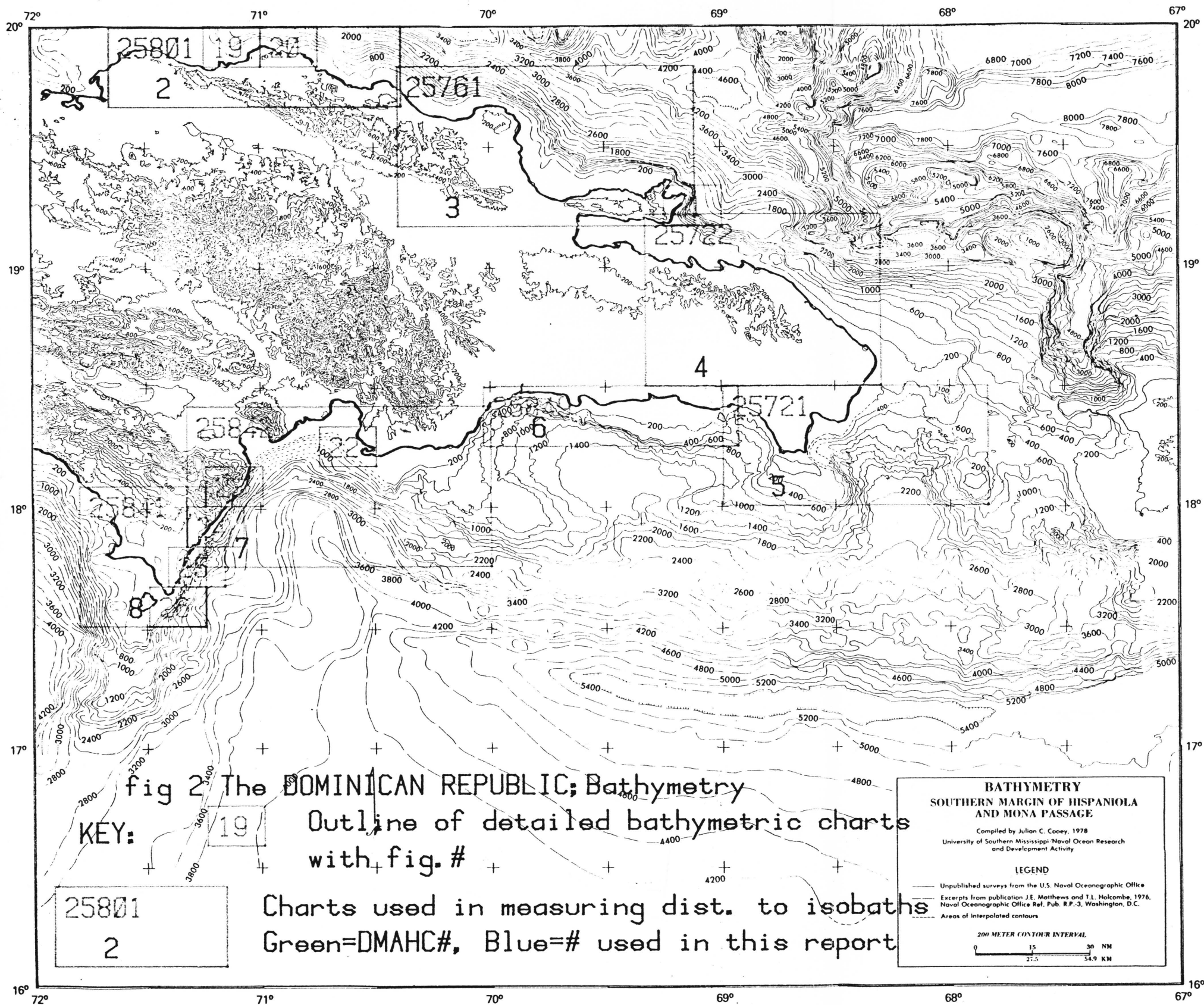


fig 1 PHYSIOGRAPHIC DIAGRAM of the HISPANIOLA REGION after HEEZEN & THARP, 1968

On a smaller scale, some shallow water banks extend from shore, particularly the Banco de Monte Cristi, the eastern extremity and some locations along the south shore.

Figure 2 is a reproduction of a chart compiled by Julian Cooley (personal communication) and is the most detailed bathymetric chart available of waters offshore of the Dominican Republic. It shows immediately the candidate areas for deep water sites, but was not found suitable for measuring because of its scale and because of some gaps in the data available when it was compiled. More will be said about Figure 2 in the next section.

Note: The original of this report contains several computer plots which are printed in color; the copies are in black and white.



II. BATHYMETRY

1 Survey of Existing Bathymetric Charts

The following outlines the methods used to survey existing bathymetric charts:

- Identify all existing charts and maps;
- Make a collection of the charts;
- Tabulate by scale-size and collate in relationship to the coastline;
- Select a series of charts of suitable scale-size;
- Mark a series of locations equidistant around the coastline;
- Measure the distance from shore to the 200 m and 1000 m bathymetric contours;
- Sort, tabulate and plot these data in several different formats:
 - geographically;
 - by distance to isobaths;
 - by bathymetric gradient;
 - by coastal feature;
 - alphabetically.

1.1 Identifying Existing Charts and Maps

In this report the term "chart" refers to a special-purpose map, generally designed for navigation purposes, while "map" usually refers to a representation of the physical topographic features (Mitchell, 1948). Sometimes the terms are overlapping. The major source of navigational charts for the Caribbean region is the U.S.

Defense Mapping Agency Hydrographic Center (formerly the Hydrographic Office). Their Catalog of Nautical Charts (DMAHC, 1977; 1978 and 1975) was used to select many of the Dominican Republic charts. The British Admiralty Catalog of Admiralty Charts (1979) also has charts of the Caribbean region, but since the 1950's the main responsibility for revisions and additions has come under the auspices of DMAHC. These charts range in scale from 1:1,000,000 to harbour approach scales of <1:10,000 and are all in standard Mercator Projection. Most of these are based on U.S. surveys conducted from 1880 to 1915 with additions from U.S. and Dominican Republic surveys in the 1950's and 1960's. A few of the charts are updated by more recent surveys and all are corrected by Notices to Mariners up to 1976, 1977. They are primarily for navigating in coastal waters, entering bays and harbours and show very few soundings beyond the 100 fm line. All soundings are in fathoms.

Topographic maps of the entire Dominican Republic on the Universal Transverse Mercator Grid or Military Grid were made by the U.S. Army Corps of Engineers (USACE), Army Map Service, with information current to 1966-1967. The coastal maps show soundings and contours in meters to the 100 m line. They appear to be based on the soundings contained in the DMAHC charts and are all to a scale of 1:50,000. Also on the Universal Transverse Mercator Grid, with a scale of 1:250,000, is a series of U.S. Department of Defense (USDOD), Joint Operations Graphic (Air) Maps, covering the entire country. Coastal sections show bathymetric contours to the 100 m line, apparently the same as on the Army Corps of Engineers maps.

From 1975 through 1977 the U.S. Naval Oceanographic Office, using

the USNS HARKNESS, conducted an extensive bathymetric survey of the Dominican Republic coastal and offshore waters. A series of 44 "smooth-drafted charts" (smooth sheets) has been produced by the DMAHC from these surveys. All soundings are in meters and the scales are 1:150,000, 1:50,000, 1:10,000, and 1:5,000. On some of the sheets the 200 m and 1000 m depths have been contoured.

The information on these sheets forms the basis of the data presented here.

Other charts showing bathymetry, but not specifically limited to the Dominican Republic, are the General Bathymetric Charts of the Ocean (GEBCO sheets), the Physiographic Diagrams of the Ocean (Heezen and Tharp, 1968, 1971) and various charts prepared by research institutes such as Woods Hole Oceanographic Institute, Lamont-Doherty Geological Observatory, University of Texas Marine Science Institute (Galveston), and the Naval Ocean Research and Development Activity (NORDA), Bay St. Louis, Mississippi (Fig. 2).

The following works of reference were also used in the identification and interpretation of various charts and maps: Definition of Terms Used in Geodetic and Other Surveys (Mitchell, 1948); Nautical Chart Manual (U.S. Department of Commerce, 1963); Sailing Directions—Caribbean Sea (DMAHC, 1977); U.S. Practical Navigator—Bowditch (DMAHC, 1977); The Times Atlas of the World (1977); The National Geographic Atlas of the World (1963); Computer Programs in Marine Science (NOAA, 1976); Gazetteer of Undersea Features (U.S. Army Topographic Command, 1969); Principles of Cartography (Robinson and Sale, 1969); Handbook of Marine Science (Walton-Smith, 1974); Glossary of

Oceanographic Terms (U.S. Naval Oceanographic Office, 1966); A Glossary of Ocean Science and Undersea Technology Terms (Hunt and Groves, 1965).

Over 130 charts of the Dominican Republic and surrounding waters have been identified. These are listed in Table 1.

1.2 Collection of Charts of the Dominican Republic Coastal Waters

Of the charts listed in Table 1, the majority were obtained from the appropriate agency and from the collection used to prepare this report. Except for the standard DMAHC Navigation Charts, difficulty was experienced in obtaining the charts. The most important for this survey, the U.S. Naval Oceanographic Office (USNOO) smooth-sheets, took five months to obtain after the initial order was placed. This was due to a major reorganization of the Defense Mapping Agency Hydrographic Center and other delays in obtaining clearance to purchase them. Of the U.S. Army Corps of Engineers maps (now handled by DMAHC), five were obtained through INDOTEC. These were of the five most promising regions for proximity of deep water to shore, based on information available up to the time of the present study. While the bathymetric information on these maps is of limited use, they are most useful for identification of coastal topographic and geographic zones and place-names.

All of the bathymetric maps produced here are the result of our own analysis and interpretation of the smooth-sheet data.

1.3 Tabulation and Organization of Dominican Republic Charts

Table 1 lists all of the identified charts. It is arranged in order of increasing scale-size.

TABLE 1

PAGE # 1

List of Coastal Charts of the DOMINICAN REPUBLIC

Codes: DMAHC=Defence Mapping Agency Hydrographic Center

----- BA =British Admiralty

USACE=US Army Corps of Engineers

USNOD=US Naval Oceanographic office

USDOD=US Department of Defense

SMALL SCALE CHARTS ($S > 200,000$)

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
25008	DMAHC	931,650	Hispaniola to Saint Lucia	13 40 71 15 20 00 60 00	10 Dec 1977	
26020	DMAHC	915,530	Hispaniola + Wind & Leeward Passages	16 50 76 30 23 10 67 00	5 Feb 1977	
3689	BA	614,000	E. part of Haiti to Puerto Rico	17 00 77 15 20 30 66	July 1950	
60804	DMAHC	1,000,000	Cuba to Hispaniola	17 00 80 00 23 00 70 00	1969	Gen. Bathym. Chart of the Ocean-GEBCO
60704	DMAHC	1,000,000	Hispaniola to Antigua	17 00 70 00 23 00 60 00	1972	GEBCO

MEDIUM SCALE CHARTS ($100,000 \leq S \leq 200,000$)

Progressing clockwise from North-coast border with Haiti

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
26141	DMAHC	145,260	Ile de la Tortue to Monte Cristi	19 30 73 00 20 23 71 31	26 Feb 1976	US surveys between 1905 and 1916
463	BA	200,000	Pointe Yaquezzi to Punta Manale	19 35 72 00 20 10 71 27	Dec 1954	Chart covers several sections(**)
25301	DMAHC	145,257	Monte Cristi to Cape Macoris	19 30 71 47 20 28 70 23	15 May 1976	US surveys between 1905-1916 rev. 1967
463	BA	200,000	Punta Brimball to Punta Cabaret	19 40 71 00 20 15 70 20	Dec 1954	**
25761	DMAHC	144,781	Cabo Macoris to Cabo Semana	19 10 70 32 20 08 68 58	11 Oct 1975	US survey, 1905-06
463	BA	200,000	Bahia Semana and approaches	19 55 69 40 19 30 68 55	Dec 1954	**
25722	DMAHC	145,270	Cabo Semana to Cabo Engano	19 30 69 20 19 28 68 00	20 Mar 1976	US surveys in 1902 and 1905
472	BA	200,000	Mona Passage	17 40 68 55 19 50 67 00	??	
25271	DMAHC	145,260	Cabo Engano to Isla Saona	19 48 68 58 18 42 67 40	31 Jul 1976	US surveys between 1902 & 1952+1969

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

CHART AGENCY NO.	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
25849 DMAHC	145,940	Isla Saona to Santo Domingo	17 48 70 02 18 42 68 44	8 Nov 1975	US survey in 1910 and 1911
467 BA	200,000	Sayajibe to Haina	17 50 70 04 18 38 68 52	May 1961	Chart has three sections(##)
25842 DMAHC	146,074	Santo Domingo to Barahona	17 40 71 20 18 39 69 47	6 May 1974	US survey in 1910 and 1911
471 BA	200,000	Haina to Punta Rescaido	17 35 71 08 18 35 69 54	Feb 1961	Chart has four sections(##)
25841 DMAHC	146,350	Barahona to Baie de Jacmel(Haiti)	17 21 72 37 18 21 71 00	10 May 1971	US survey in 1910 and 1911
471 BA	200,000	Canal Alta Vela	17 23 71 46 17 53 71 20	Feb 1961	##

LARGE SCALE CHARTS (20,000(S<100,000)

US Army Corps of Engineers Maps

Progressing clockwise from North-coast border with Haiti

CHART AGENCY NO.	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
58752 USACE	50,000	Pepillo Salcedo	19 40 71 45 19 50 71 30	1966- 1967	
58751 USACE	50,000	Monte Cristi	19 50 71 45 20 00 71 30	1966- 1967	
59754 USACE	50,000	Cacao	19 50 71 30 20 00 71 15	1966- 1967	
59751 USACE	50,000	Barrancón	19 50 71 15 20 00 71 00	1966- 1967	
60754 USACE	50,000	Luperon	19 50 71 00 20 00 70 45	1966- 1967	
60752 USACE	50,000	Puerto Plata	19 40 70 45 19 50 70 30	1966- 1967	
61753 USACE	50,000	Sabaneta de Yagico	19 40 70 30 19 50 70 15	1966- 1967	
61744 USACE	50,000	Gaspar Hernandez	19 30 70 30 19 40 70 15	1966- 1967	
61741 USACE	50,000	Rio San Juan	19 30 70 15 19 40 70 00	1966- 1967	

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

PAGE # 3

CHART NO.	AGENCY	SCALE(S) (1:5)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
62744	USACE	50,000	Cabrera	19 30 70 00 19 40 69 45	1966- 1967	
62743	USACE	50,000	Nagua	19 20 70 00 19 30 69 45	1966- 1967	
62734	USACE	50,000	Villa Riva	19 10 70 00 19 20 69 45	1966- 1967	
62731	USACE	50,000	Sanchez	19 10 69 45 19 20 69 30	1966- 1967	
63734	USACE	50,000	Santa Barbara de Samana	19 10 69 30 19 20 69 15	1966- 1967	
63731	USACE	50,000	Las Galeras	19 10 69 15 69 20 69 00	1966- 1967	
63732	USACE	50,000	Palmar Nuevo	19 00 69 45 19 10 69 30	1966- 1967	
63733	USACE	50,000	Sabana de la Mar	19 00 69 30 19 10 69 15	1966- 1967	
63721	USACE	50,000	Miches	18 50 69 15 19 00 69 00	1966- 1967	
64724	USACE	50,000	Las Lisas	18 50 69 00 19 00 68 45	1966- 1967	
64721	USACE	50,000	La Vacama	18 50 68 45 19 00 68 30	1966- 1967	
64722	USACE	50,000	El Salado	18 40 68 45 18 50 68 30	1966- 1967	
65723	USACE	50,000	Bavaro	18 40 68 30 18 50 68 15	1966- 1967	
65714	USACE	50,000	Pantanal	18 30 68 30 18 40 68 15	1966- 1967	
65713	USACE	50,000	Juanillo	18 20 68 30 18 30 68 15	1966- 1967	

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

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CHART NO.	AGENCY	SCALE(S) (1:5)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
64712	USACE	50,000	San Rafael del Yuma	18 20 68 45 18 30 68 30	1966- 1967	
64701	USACE	50,000	La Grancheria	18 10 68 45 18 20 68 30	1966- 1967	
64702	USACE	50,000	Nano Juan	18 00 68 45 18 10 68 30	1966- 1967	
64713	USACE	50,000	La Romana	18 20 69 00 18 30 68 45	1966- 1967	
63712	USACE	50,000	Boca del Soco	18 20 69 15 18 30 69 00	1966- 1967	
63713	USACE	50,000	San Pedro de Macoris	18 20 69 30 18 30 69 15	1966- 1967	
62712	USACE	50,000	Boca Chica	18 20 69 45 18 30 69 30	1966- 1967	
62713	USACE	50,000	Santo Domingo	18 20 70 00 18 30 69 45	1966- 1967	
61712	USACE	50,000	San Cristobal	18 20 70 15 18 30 70 00	1966- 1967	
61701	USACE	50,000	Nizao	18 10 70 15 18 20 70 00	1966- 1967	
61704	USACE	50,000	Bani	18 10 70 30 18 20 70 15	1966- 1967	
60701	USACE	50,000	Sabana Buay	18 10 70 45 18 20 70 30	1966- 1967	
60704	USACE	50,000	Barrero	18 10 71 00 18 20 70 45	1966- 1967	
59701	USACE	50,000	Sarahona	18 10 71 15 18 20 71 00	1966- 1967	
59702	USACE	50,000	La Cienaga	18 00 71 15 18 10 71 00	1966- 1967	

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
59691	USACE	50,000	Enriquillo	17 50 71 15 18 00 71 00	1966- 1967	
59694	USACE	50,000	Arroyo Dulce	17 50 71 30 18 00 71 15	1966- 1967	
59693	USACE	50,000	Oviedo	17 40 71 30 17 50 71 15	1966- 1967	
59684	USACE	50,000	Isla Beata	17 30 71 30 17 40 71 15	1966- 1967	
58692	USACE	50,000	Punta Chimamche	17 40 71 45 17 50 71 30	1966- 1967	
58691	USACE	50,000	Cabo Rojo	17 50 71 45 18 00 71 30	1966- 1967	

OTHER LARGE SCALE CHARTS

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
26142	DMAHC	50,128	Fort Liberté, Manzanillo; Monte Cristi	19 43 71 58 20 05 71 34	29 Jan 1968	US surveys in 1905 and 1906
463	BA	25,000	Bahia de Monte Cristi		Dec 1954	**(Plan)
25723	DMAHC	60,000	Bahia de Samana	18 57 69 44 19 23 69 01	13 Mar 1967	US surveys in 1882 and 1952
463	BA	25,000	Pto. Santa Barbara and Approaches		Dec 1954	**(Plan)
25847	DMAHC	50,000	Approaches to Santo Domingo	18 10 70 15 18 30 69 45	20 Dec 1973	US survey-1910/11 Additions to 1965
25848	DMAHC	25,000	Approaches to Santo Domingo	18 24 69 56 18 29 69 51	20 Sep 1975	Plan-see listing "HARBOR APPROACHES"
25857	DMAHC	25,000	Puerto de Haina and Approaches	18 20 70 30 18 26 69 57	3 Sep 1977	Dominican/US surveys to 1968

LARGE SCALE (S<20,000); HARBOR APPROACHES

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
26144	DMAHC	10,065	Manzanillo Bay and Approaches	19 41 71 50 19 51 71 42	10 Aug 1967	US surveys in 1905

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

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CHART NO.	AGENCY	SCALE(S) (1:3)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
26143	DMAHC	9,500	Monte Cristi Bay	19 51 71 42 19 55 71 39	26 Jul 1967	US surveys in 1905 Domin. plan; 1926
28503	DMAHC	10,170	Puerto Plata	19 48 70 42 19 50 70 41	26 Mar 1977	US, UK, Fr. surveys to 1927; addns to 1973
463	BA	12,000	Puerto Plata		Dec 1954	##(Plan)
25802	DMAHC	5,855	Port Gouss	19 46 71 31 19 46 71 31	Feb 1919	US survey in 1904
25851	DMAHC	9,070	Rio La Romana Entrance	18 23 68 58 18 26 68 56	30 Aug 1975	US/Dom. surveys; 191 see Plan; next
25851	DMAHC	2,000	Rio La Romana	none given	30 Aug 1975	Central Romana Cor Plan; 1952; addns - '5
467	BA	12,000	Rio Romana		May 1961	##(Plan)
25850	DMAHC	7,200	San Pedro de Macoris	18 25 69 19 18 28 69 17	14 Mar 1966	US survey; 1905 Domin. chart; 1962
467	BA	12,000	San Pedro de Macoris		May 1961	##(Plan)
467	BA	12,000	Puerto de Andres		May 1961	##(Plan)
25848	DMAHC	7,500	Santo Domingo	18 26 69 55 18 30 69 52	20 Sep 1975	Dom./US survey; 196 +Dom.; 1960/66
467	BA	12,000	Puerto de Santo Domingo		Dec 1961	##(Plan)
471	BA	6,000	Puerto de Haina		Feb 1961	##(Plan)
25845	DMAHC	10,000	Bahia de las Calderas	18 00 70 35 18 16 70 31	22 May 1972	Domin./US surv; 196 +US survey; 1911
25844	DMAHC	7,241	Puerto Viejo de Azua	18 19 70 51 18 21 70 48	14 Oct 1968	US reconn. - 1905 soundings in feet

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

PAGE # 7

CHART AGENCY NO.	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
25843 DMAHC	4,000	Barahona Harbor	18 12 71 05 18 13 71 03	10 Dec 1962	US survey - 1906 +Domin.surv.-1956
471 BA	6,000	Puerto de Barahona		Feb 1961	##(Plan)

US NAVY SMOOTH SHEETS-SOUNDINGS IN METERS

DATA from USNS HARKNESS in 1975-1977: S=150,000; 50,000; 10,000; 5,000
Medium Scale Charts (S=150,000): Progressing Clockwise around coastline

CHART AGENCY NO.	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
765006 USN00 004	150,000	N.Coast:Haitian Border-Pta.Patilla	19 36 71 50 20 30 70 50	1976-1977	Survey to 300m contour only
765006 USN00 005	150,000	N.Coast:Punta Patilla-Cbo.F.Vieja	19 40 70 50 20 30 69 50	1977	Shallowest depth surveyed=189m
765006 USN00 007	150,000	Cabo Frances Viejo to Cabo Cabron	19 10 70 10 20 00 69 10	1976	Shallowest depth surveyed=99m
765006 USN00 009	150,000	Cabo Cabron to Rio Maimon	19 00 69 20 19 50 68 20	1977	Shallowest depth surveyed=35m

THERE IS NO COVERAGE OF THE EAST COAST IN THIS SERIES

CHART AGENCY NO.	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
765006 USN00 002	150,000	S.Coast:La Romana-S.Pedro de Macoris	17 40 69 40 18 30 68 30	1976	Shallowest depth surveyed=45m
765006 USN00 001	150,000	S.Pedro de Macoris Area de la Estancia	17 40 70 20 18 30 69 20	1976	Shallowest depth surveyed=17m
765006 USN00 003	150,000	Punta Santanilla-Isla Beata	17 30 71 30 18 20 70 30	1976	Shallowest depth surveyed=30m
765006 USN00 003	150,000	Punta Santanilla to Punta Realado	18 00 71 30 18 50 70 30	1975	Shallowest depth surveyed=34m
765006 USN00 002	150,000	Pta.Salinas and Barahona-Cbo.Beata	17 20 71 30 18 00 70 20	1975	Majority of soundings <1000m
765006 USN00 001	150,000	Cbo.Beata-Haitian border-not I.Beata	17 10 71 45 18 00 71 30	1975	Shallowest depth surveyed=12m

LARGE SCALE CHARTS (S=50,000)

CHART AGENCY NO.	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
765006 USN00 004A	50,000	Monte Cristi Banks off Punta Granda	19 52 71 50 20 00 71 30	1977	Soundings track 200m contour only

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

PAGE # 2

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.		DATE	REMARKS
765006 0046	USN00	50,000	Monte Cristi Banks P. Manabá-Est. Hondo	19 48 71 30 20 04 71 00		1977	Soundings track 200m contour only
765006 0040	USN00	50,000	Estero Hondo to Punta Cabras	19 48 71 10 20 04 70 48		1977	Soundings track 200m contour only
765006 005A	USN00	50,000	Punta Cabras to Cabo Macoris	19 45 70 52 20 04 70 30		1975	Soundings track 200m contour only
765006 005B	USN00	50,000	Cabo Macoris to E. of Cabo La Roca	19 36 70 32 19 52 70 10		1976	Soundings track 200m contour only
765000 005B	USN00	50,000	E. of Cabo La Roca -Cbo. Frances Viejo	19 36 70 10 19 52 69 53		1976	Soundings track 200m contour
765006 007A	USN00	50,000	Cabo Frances Viejo	19 46 70 30 20 04 69 40		1976	All soundings deeper than 1500m
765006 007D	USN00	50,000	Punta Tres Amores -Pta. Laguna Grande	19 25 70 00 19 40 69 40		1977	Short section of 200m contour only
756006 007B	USN00	50,000	Punta Savaneta to Punta Bonita	19 17 69 55 19 36 69 33		1977	Soundings track 200m contour only
756006 007C	USN00	50,000	Punta Bonita to Cabo Cabron	19 17 69 36 19 36 69 15		1977	Soundings track 200m contour only
765006 009A	USN00	50,000	Cabo Samana to Punta Jicaco	19 06 69 30 19 24 69 00		1977	Soundings from 12- 1300m
765006 009B	USN00	50,000	Punta Jicaco to W. of Rio Maimon	18 55 69 00 19 12 68 40		1977	Soundings to 900m mostly around 200m
765006 002A	USN00	50,000	Isla Saona to Isla Catalina	18 02 68 57 18 24 68 40		1976	Soundings track 200m contour only
756006 001B	USN00	50,000	Isla Catalina to Puerto de Haina	18 10 69 50 18 28 69 28		1976	200m contour-not continuous section
765006 001A	USN00	50,000	Santo Domingo to Puerto Palenque	18 10 70 10 18 28 69 48		1976	Soundings track 200m contour only
755006 003B	USN00	50,000	Punta Matasola to Rio Jura	18 08 71 50 18 24 70 30		1975	Soundings track 100%200m contours

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

PAGE # 9

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
755006 003A	USN00	50,000	Rio Juna to Punta Avarena	18 08 71 45 18 24 70 45	1975	Soundings track 200m contour only
765006 003B	USN00	50,000	Punta Avarena to Cayo Pisaje	17 50 71 20 18 10 71 00	1976	200m contour only- some gaps
765006 003A	USN00	50,000	Enriquillo to Cabo Seata	17 35 71 30 17 54 71 10	1976	200m contour only- extensive gaps
755006 001A	USN00	50,000	Cabo Seata to Los Frailes	17 21 71 44 17 40 71 25	1975	Survey of I. Alto Vela & Los Frailes
755006 001B	USN00	50,000	N. of Cabo Seata to Haitian Border	17 40 71 45 18 00 71 30	1975	Soundings from 12m to 1745m

LARGE SCALE CHARTS (S=10,000 or 5,000)
Harbour and River Entrances

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
755006 -A:004	USN00	50,000	Puerto Manzanilla	19 42 71 46 19 43 71 44	1977	Deepest sounding =164m
765006 004SD2	USN00	10,000	Bahia de Manzan- illo	19 43 71 48 19 46 71 44	1977	Deepest sounding =352m
755006 004SD1	USN00	10,000	Punta Grandajisla de Cabra	19 51 71 42 19 55 71 38	1977	Deepest sounding =16.5m
755006 -A:005	USN00	5,000	Puerto Plata	19 47 70 43 19 49 70 41	1977	Deepest sounding =31m

Chart#s 765006 sheets 011 to 021 are in Bahia de Samana
No soundings are deeper than 50m except on sheet#021

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
765006 021	USN00	10,000	Punta Chiva to Punta Cacao	19 08 69 16 19 12 69 11	1977	
765006 020	USN00	10,000	Punta Cacao to Punta Gorda	19 08 69 19 19 12 69 15	1977	
765006 012	USN00	5,000	Santa Barbara de Samana	19 10 69 30 19 13 69 18	1977	Harbor Approaches
756006 019	USN00	10,000	Punta Carenero to offshore Honduras	19 07 69 23 19 11 69 18	1977	

TABLE 1
List of Coastal Charts of the DOMINICAN REPUBLIC

PAGE # 10

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
765006 017	USN00	10,000	Offshore, Honduras to Punta Manale	19 07 69 26 19 11 69 22	1977	
765006 011	USN00	5,000	Las Charreras	19 10 69 27 19 12 69 46	1977	
765006 016	USN00	10,000	Punta Manale to Punta Los Corrales	19 08 69 30 19 12 69 26	1977	
765006 015	USN00	10,000	Punta Corrales to Punta Cocos	19 09 69 33 69 12 69 30	1977	
765006 014	USN00	10,000	Punta Cocos to Sanchez	19 10 69 37 19 13 69 33	1977	
765006 018	USN00	10,000	Sabana de la Mar	19 04 69 23 19 07 69 19	1977	

The following Charts are Harbour Approaches
and River Mouth Approaches

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
755006 -R:003	USN00	10,000	Rio Soco	18 24 69 14 18 27 69 10	1977	
755006 -R:002	USN00	10,000	San Pedro de Macoris	18 24 69 20 18 27 69 16	1977	
755006 -R:001	USN00	10,000	Enriauillo	17 52 71 15 17 56 71 11	1977	

US DEPARTMENT OF DEFENSE- US ARMY TOPOGRAPHIC COMMAND
JOINT OPERATIONS GRAPHIC (AIR) MAPS (S=250,000)

Used for Coastline, descriptions, Place names and approximate distance to
200m (100Fm on Maps) contour when these were not available from other sources
Progressing clockwise from North-coast border with Haiti

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
NE19-1	USDOD	250,000	Pepillo Solcedo to Sosua	19 00 72 00 20 00 70 30	Oct 1977	Compiled in 1970
NE19-2	USDOD	250,000	Punta Cabarete to Punta Hicaco	19 00 70 30 20 00 69 00	Oct 1977	Compiled in 1970
NE19-7	USDOD	250,000	Capitan to Villas de Mar	18 00 69 25 19 00 67 50	Sept 1977	Compiled in 1970
NE19-6	USDOD	250,000	Villas del Mar Pta. Martin Garcia	18 00 71 00 19 00 69 25	Sept 1977	Compiled in 1970

TABLE 1

PAGE # 11

List of Coastal Charts of the DOMINICAN REPUBLIC

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
NE19-5	USDOD	250,000	Barahona to Pedernales	17 30 72 00 19 00 71 00	Sept 1977	Compiled in 1970

SPECIAL CHART-prepared by Julian Cooley, University of Southern
Mississippi/US Naval Ocean Research and Development Activity

CHART NO.	AGENCY	SCALE(S) (1:S)	REGION	BOUNDED BY LAT. LONG.	DATE	REMARKS
SC-1	NORDA	543,564	Southern margin Hispaniola/Mona P.	16 00 72 00 20 00 67 30	1978	Contoured in meters

SMALL-SCALE CHARTS range from 1:1,000,000 to 1:614,000, and cover areas which contain all of Hispaniola and neighboring countries.

MEDIUM-SCALE CHARTS, from 1:200,000 to 1:100,000, are arranged going clockwise around the coastline, starting on the north coast border with Haiti; all subsequent charts in Table 1 are arranged in this manner.

LARGE-SCALE CHARTS, having scales ranging from 1:100,000 to 1:20,000, include all the U.S. Army Corps of Engineers maps that contain coastline.

LARGE-SCALE—HARBOUR APPROACHES (scales <1:20,000) describe harbour, river-mouth and bay entrances and other regions where hazards to navigation exist.

Following these are the U.S. Navy smooth-sheets, arranged under MEDIUM (1:150,000), LARGE (1:50,000) and LARGE—HARBOUR & RIVER ENTRANCES (scales 1:19,000 and 1:5,000).

Finally, the U.S. Department of Defense maps (scale 1:250,000) are listed.

1.4 Selection of Charts for Use in Coastal Survey

We decided to survey the proximity of deep water to the shore around the entire Dominican Republic coastline, rather than selecting specific regions (at this time the USNOO smooth-sheets had not been delivered). The criteria for selection of a suitable chart series were: uniformity of scale-size, ease of measuring distance along the grids, coverage of all the coastline, coastal features and geographic localities named, and a maximum number of soundings to roughly identify promising regions. We selected DMAHC MEDIUM-SCALE

charts of the 25000 and 26000 series, scale sizes approximately 1:146,000. Eight of these charts cover the coastline (see Fig. 2).

Figures 3 through 9 are modifications of the DMAHC charts listed in Table 2-A (the original chart borders have been compressed to eliminate unnecessary expanses of ocean and land area and the chart titles have been reversed to follow our convention of examining the coastline progressing clockwise, starting at the north coast). Chart #26141 has not been reproduced as the locations in the Dominican Republic are almost completely covered by adjacent chart #25801. The chart numbers used in this report (see Table 2-A) appear in large letters on each figure. The locations are numbered around the coastline. Each location can be referred to as a combination of this chart number and the location number (e.g., 3:15 = chart #3, location #15).

Additional information on feature and place naming came from the U.S. Department of Defense and U.S. Army Corps of Engineers maps and from various atlases.

1.5 Marking Locations Along the Coastline

Starting on the north coast of the Haitian border (Pepillo Salcedo and the mouth of Rio Dajabon) and moving in a clockwise direction, a map reader was used to follow the coastline and measure off an exact length. The length chosen was two nautical miles (3.7 km), or two minutes of latitude measured on the nearest vertical grid. This has the effect of stretching out the coastline into a straight line for ease of graphically representing distance to offshore bathymetric contours. To a limited extent, embayments were also included and some of these will have no direct line to deep water. The locations were

TABLE 2-A. SELECTED CHARTS OF THE DOMINICAN REPUBLIC COASTLINE

DMAHC CHART #	CHART # USED IN THIS REPORT	REGION	
		FROM	TO
26141	1	Ile de la Tortue [Haiti]	Monte Cristi
25801	2	Monte Cristi	Cabo Macoris
25761	3	Cabo Macoris	Cabo Semana
25722	4	Cabo Semana	Cabo Engano
25271	5	Cabo Engano	Isla Saona
25849	6	Isla Saona	Santo Domingo
25842	7	Santo Domingo	Barahona
25841	8	Barahona	Baie de Jacmel [Haiti]

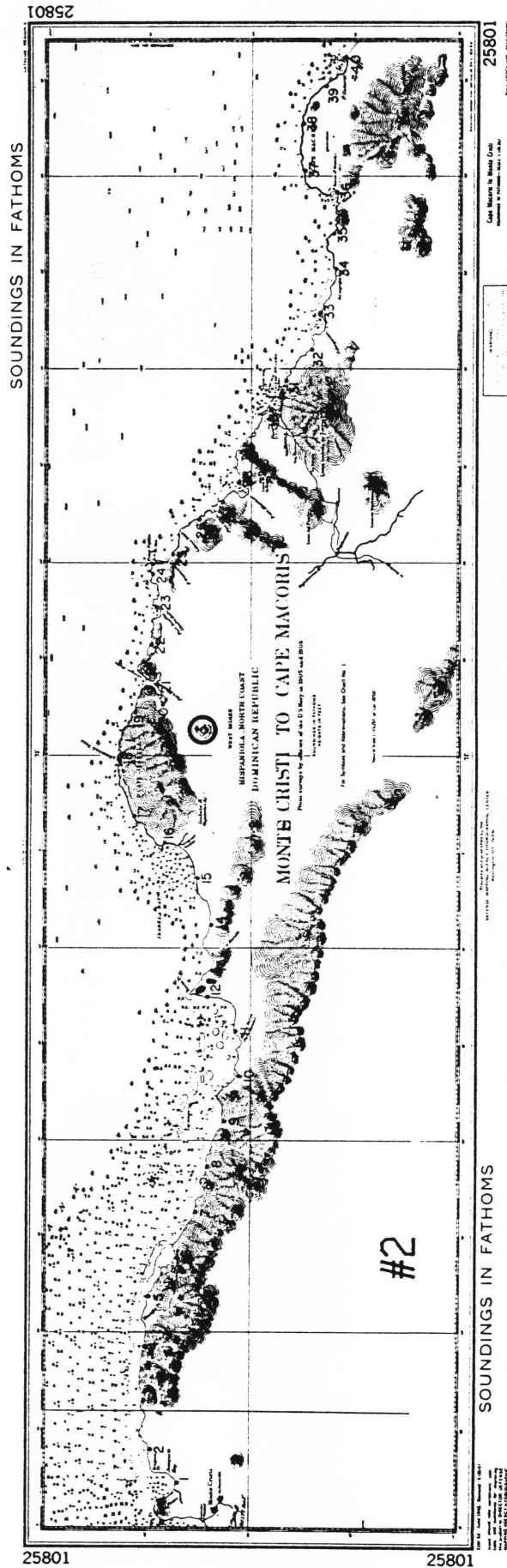
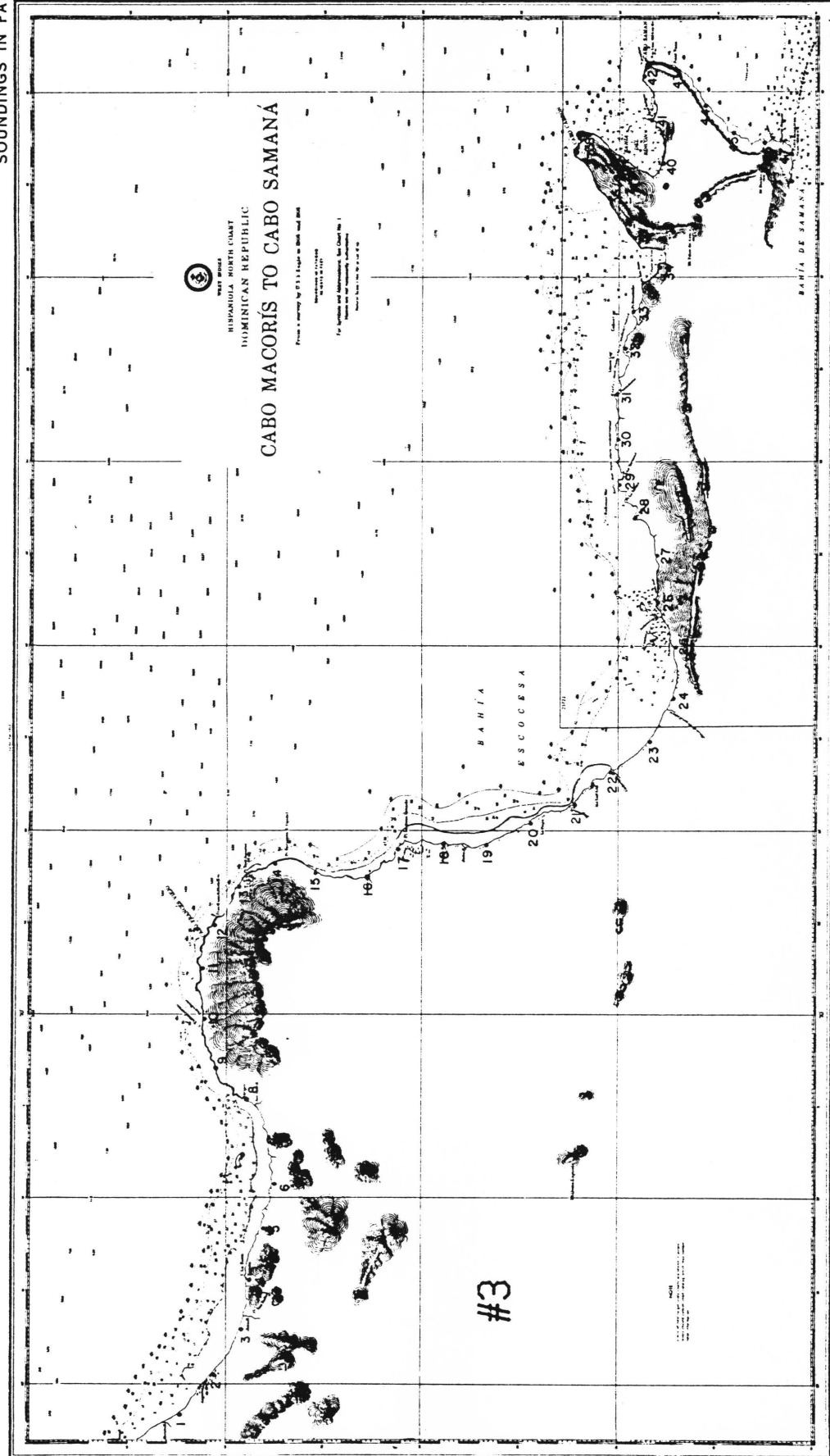


fig 3 Dominican Republic - North Coast

SOUNDINGS IN FATHOMS

25761

25761



SOUNDINGS IN FATHOMS

25761

fig4 Dominican Republic - North Coast

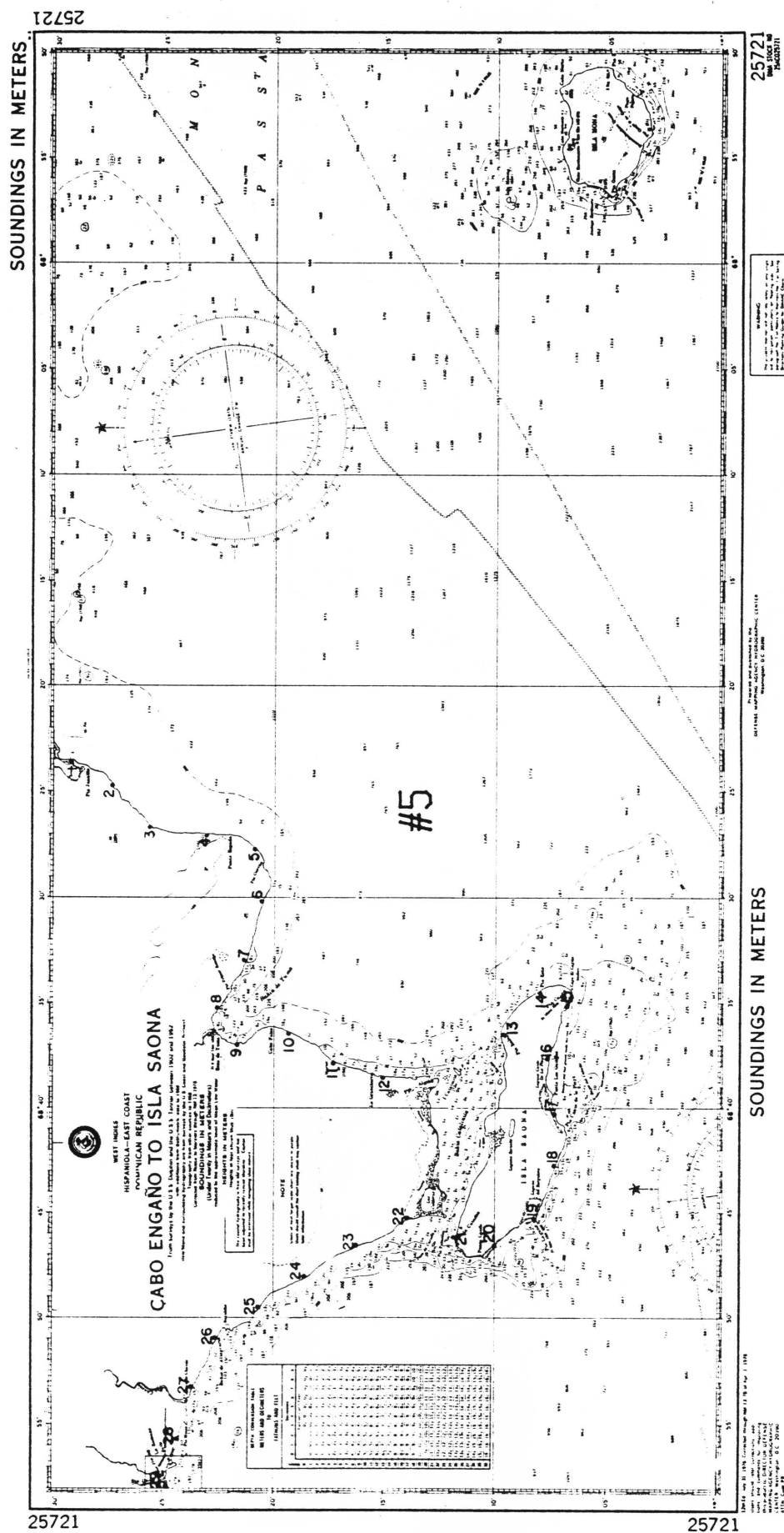


fig 6 Dominican Republic - East & South Coasts

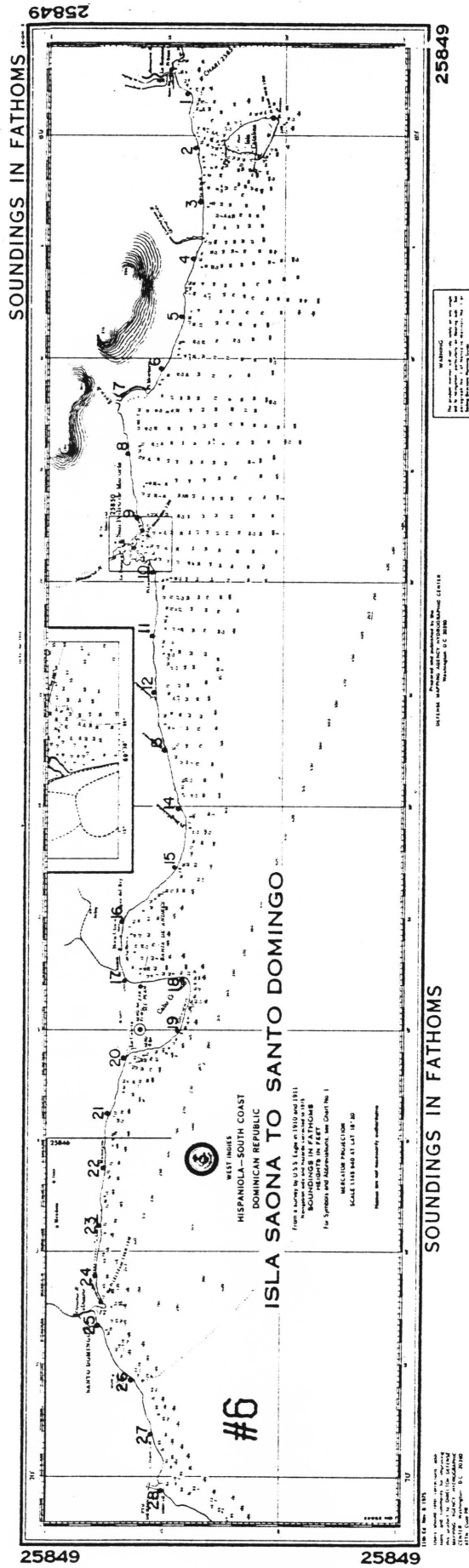


fig 7 Dominican Republic South Coast

SOUNDINGS IN FATHOMS

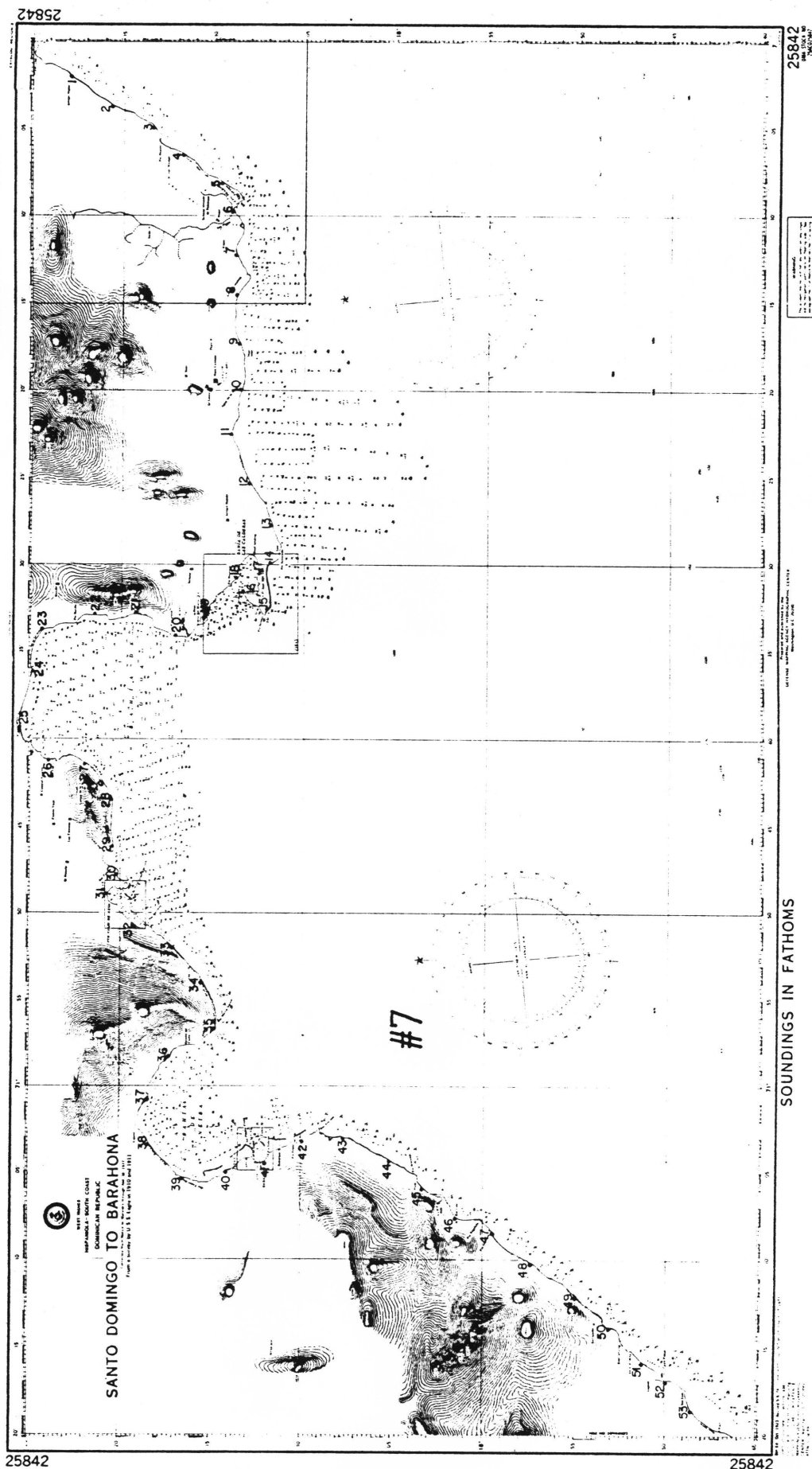


fig 8 Dominican Republic - South Coast



numbered starting at #1 in the direction of travel. Each chart has its own set of location numbers starting at #1. The unique location number is a combination of chart # (see Table 2-A) and location #, used on subsequent figures and tables.

1.6 Measuring Distance from Shore to 200 m and 1000 m Contours

In their article on hypsometry of the ocean basins, Menard and Smith (1966) show that the change in slope of the ocean floor delineating the break between the continental shelf and the slope occurs at approximately 200 m for all ocean-basin provinces. Most navigational charts (historically using fathoms as the unit of depth) are contoured at the 100 fm line. This is because water depths less than 100 fm usually signal the shallow continental shelves where hazards to navigation exist. Most survey work that is done for sailing direction and nautical chart work concentrate their sounding traverses at the 100 fm (or in the case of the Dominican Republic survey, 200 m) line. We have chosen 200 m as one of the depth intervals to study and consider it synonymous with the shelf/slope break. The other depth interval studied here is 1000 m. This was used because it is a depth frequently cited as the optimal depth for an Ocean Thermal Energy Conversion (OTEC) plant (U.S. Department of Energy, 1978), it is well below the main oceanic thermocline, and it is frequently at the steepest part of the continental shelf.

1.6.1 The USNOO Smooth Sheets

Although the DMAHC charts were used to site the locations used in this report, the smooth sheets provided all the distances from shore to the 200 m and 1000 m contours. In 1975, 1976 and 1977, the USNS HARKNESS (T-AGS 32) made a geodetic and hydrographic

survey of the Dominican Republic (NAVOCEANO Archive #755006, 765006). The smooth sheets obtained from these surveys and used in this report are on two scales, 1:150,000 and 1:50,000. Two series of sheets were produced: series 755006 and 765006. Figure 10 shows the location of the sheets (refer also to Table 1, pp. 7-10). The smaller-scale charts are surveyed by HARKNESS itself, but because of the large size of the vessel (length 118.9 m; Janes, 1974), inshore work had to be done by Hydrographic Survey Launches (HSL's) carried aboard HARKNESS. The 1:50,000-scale sheets are surveyed by the HSL's. These sheets, in the areas of interest to us, delineate the 200 m contour only, usually by making a series of short traverses normal to the trend of the contours until the position of the 200 m depth is well defined. The depth recorders carried on the HSL's had a depth limitation of 400 m. The 1:150,000 sheets, surveyed by HARKNESS, came inshore only to the extent of defining the 1000 m contour. The gap between the 1:150,000 ship work and the 1:50,000 boat work, frequently mentioned in the Archives as the "inshore parallel survey area", sometimes appears as a discontinuity in areal coverage, especially in regions of steep shoaling that are of particular interest to the present study. Despite these limitations, the HARKNESS survey is by far the most accurate and comprehensive survey done of Dominican Republic waters.

The smooth sheets as received by us were copied onto Mylar plastic film on a 1:1 reproduction size. Latitude and longitude registration marks, military grid marks and some soundings are reproduced by computer plot. Because of some trouble with HARKNESS data acquisition system (Hydrographic Data Acquisition System—HDAS) and an inoperative

fig 10 Dominican Republic, showing outline of USN00 smooth sheets
Series 765006 (1:50,000 & 1:150,000 only)

Boat Data Acquisition System (BDAS) many of the soundings have been manually plotted on the smooth sheets. All contouring (200 m, 1000 m, 2000 m, and 4000 m contours) had been done by hand. Several of the 1:150,000 sheets had no contours drawn so we did the contouring on these sheets. Coastal outlines appear on both 1:150,000 and 1:50,000 sheets but was generally done in pencil and was quite faint on our Mylar reproductions. The coastline on the 1:50,000 scale appears to have been taken from the U.S. Army Corps of Engineers maps (Table 1, pp. 2-5). Geodetic reference stations are shown and an occasional place name is marked. On some of the smooth sheets pencilled notes indicate discrepancies between HARKNESS's shoreline locations and previously located shorelines.

1.6.2 Method

The locations on charts #1-8 (Figs. 3-9; Table 2-A) were transferred to the smooth-sheet coastlines using the USACE maps, the DMAHC charts, geodetic survey locations and latitude and longitude as reference points. The distances to the 200 m and 100 m contours were measured using a compass and converting to kilometers via degrees of latitude measured off on the smooth-sheet grid (a template was made to facilitate this process). The latitudes covered (17° to 20° North) vary from 110.663 km per degree at 17° to 11.699 km at 20°. One minute of latitude varies from 1844.4 m to 1844.9 m, a difference of only 0.5 m. Consequently, only one template was needed.

The closest distance to each contour from the shore point was measured. This is not necessarily normal to either the coastline or the contour. In some cases there will be no direct line to the contours.

In other instances no soundings are given on the smooth-sheets. This is particularly so for the east coast where there are no smooth sheets. Although some soundings (for the 100 m and 100 fm contours) are to be found on other charts, most of these regions have extensive shallow banks offshore and are not of interest to this study. Figure 11 illustrates the measuring techniques on a hypothetical coastline.

1.7 Sorting and Tabulation of Distances from Shore to 200 m and 1000 m Contours

The distances from shore to the 200 m and 1000 m bathymetric contours were stored on magnetic cartridge tape and disk, using a Hewlett-Packard 9825-A desk-top computer (see Appendix for computer programs used in this study). The data were then sorted, tabulated and plotted under various categories:

- geographically along the coastline;
- by distance from shore to the 200 m and 1000 m isobaths;
- by gradient of bathymetric slope;
- by type of physical feature of the coastline;
- alphabetically by place name.

1.7.1 Data Sorted Geographically Along the Coastline

Table 2 lists the distances to shore of the 200 m and 1000 m contours by location number, starting at the Haitian border on the north coast and moving clockwise around the coastline. The place-names are taken from the DMAHC charts and the USACE maps where these were available. Generally, the names are those of geographical coastal features that appear on navigational charts (capes, headlands, bays, harbours, islands, rivers, etc.).

LOC#	DIST-200m	DIST-1000m
1	3.0	<8.0
2	3.8	NSG
3	NDL	NDL
4	1.6	NSG
5	1.9	2.7

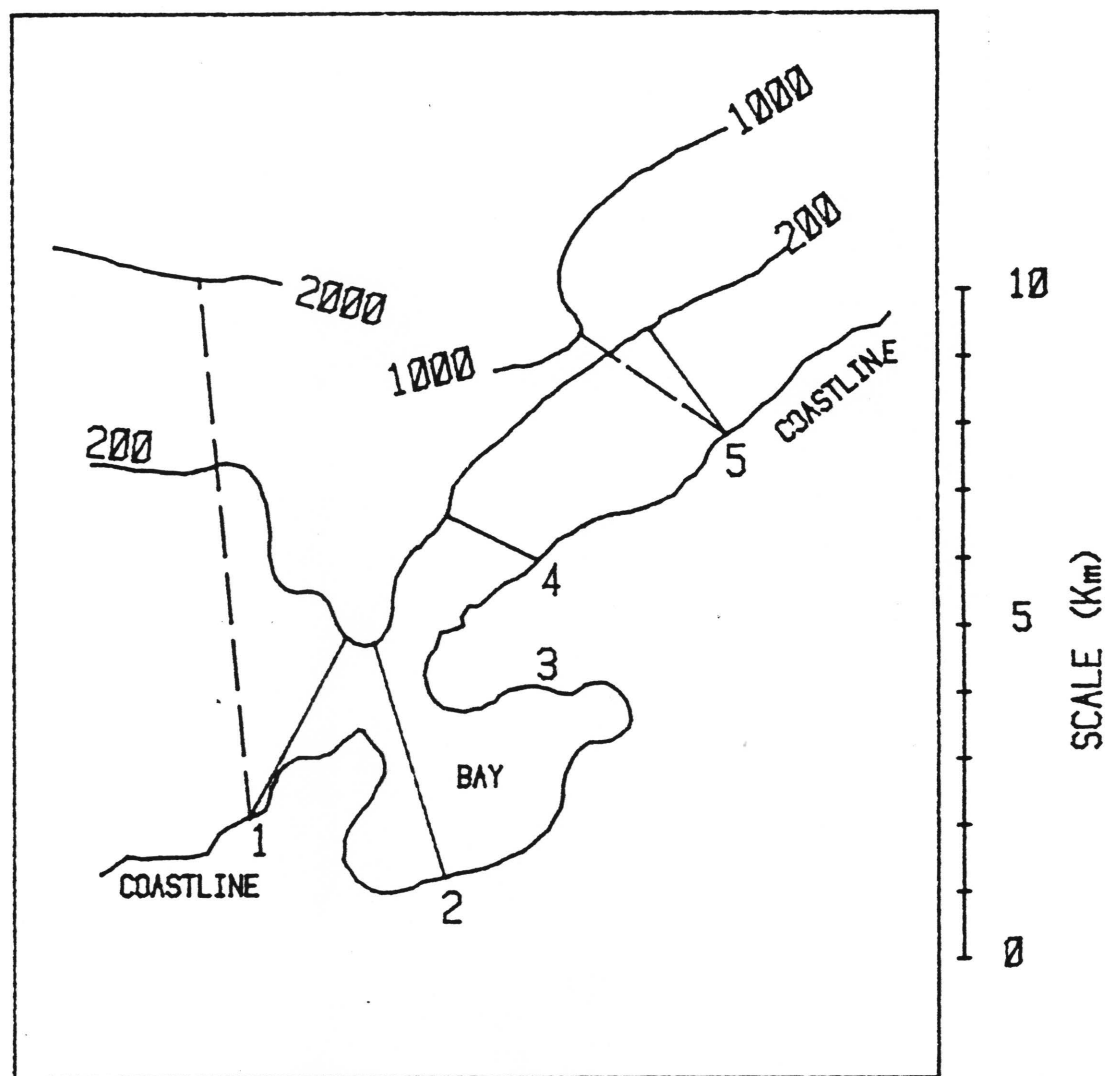


fig 11 HYPOTHETICAL COASTLINE ILLUSTRATING
TECHNIQUES USED TO MEASURE DISTANCES
FROM SHORE TO SELECTED ISOBATHS

TABLE 2

PAGE # 1

DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

EXPLANATIONS:

LOC# Numbered ref. on appropriate fig. in text
 PLACE NAME Locations are 2 nautical mi(3.7km) apart, measured along coastlin
 Name of nearest City or Physical feature as shown on charts
 -May be blank
 DIST (200m) Distance to 200m depth contour, in kilometers, or appropri. remark
 DIST(1000m) Distance to 1000m depth contour, in kilometers or appropri. remark
 "<15.0"=distance to closest sounding on chart that exceeds 1000m
 "NDL"=No Direct Line to 1000m soundings; i.e. point is on
 an embayment; "NSG"=No Soundings Given; "OC"=Off Chart
 SHORELINE Brief description of shoreline characteristics from
 DMAHC Chart#1(Bowditch, 1977) or other remarks

CHART#25141 ILE de la TORTUE(HAITI) to MONTE CRISTI

Listing begins at the Haiti/Dominican Republic border

NOTE-"*" = Nearest water of 1000m is in Haitian waters

LOC#	PLACE NAME	DISTANCE TO CONTOUR 200m	1000m	SHORELINE
1: 1	Rio Dajabon	NSG	NDL	River mouth
1: 2	Estero Salza	NSG	NDL	Low-lying
1: 3	Barriera de Vaca	NSG	NDL	Offshore island
1: 4		NSG	NDL	Embayment-mangroves
1: 5	Punta Manzanillo	NSG	NDL	Flat-mangroves
1: 6	Punta Icacos	NSG	27.1	" "
1: 7	Punta Yuna	NSG	23.0	" "
1: 8		NSG	24.3	" "
1: 9	Rio Yaque del Norte	19.3	22.2	" "
1:10	Bahia de Monte Cristi	17.1	20.0	Dock, buildings
1:11	Punta Granja	12.6	16.5	Bluff-El Morro de M. Cristi

CHART#25001 MONTE CRISTI to CABO MACORIS

NOTE-Locations 1 to 11 border the Banco de Monte Cristi

-(<2mi)=Location is <2 nautical miles from previous location

LOC#	PLACE NAME	DISTANCE TO CONTOUR 200m	1000m	SHORELINE
2: 1	Bahia de Jicacoquito	13.3	15.3	Flat, sandy shoal
2: 2		10.3	12.9	Mountains
2: 3		9.2	12.2	Mountains
2: 4	Punta Manela	9.3	14.3	Flat, mountains inland
2: 5	Puerto Salina Chica	9.6	12.0	Mills, mountains inland
2: 6		8.6	12.3	Sandy shoal, Mountains
2: 7		7.8	12.2	" "
2: 8		7.5	12.3	" "
2: 9		6.6	13.1	Flat, mountains inland
2:10	Puerto Juanita	7.2	12.3	Flat, marshy
2:11	Near Punta Rucia	6.2	11.2	Faces West-Banco de M.C.
2:12	Punta de Buren(<2mi)	3.4	8.5	Coral reef
2:13	Punta Estero Honda(<2mi)	1.4	9.5	Coral, sandy beach
2:14	Playa Pozo Piedra	1.2	11.0	Beach, mangroves, mountains
2:15	Playa la Pozo Marisosta	3.7	13.8	Beach, subj. to inundation
2:16	La Isabela	4.1	13.1	Town, river mouth
2:17	Punta Cabo Isabela	3.0	7.3	Cliffs, wooded headland

TABLE 2
DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

PAGE # 2

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
2:17	Punta Cabo Isabela	3.0	7.8	Cliffs, wooded headland
2:18		2.0	5.1	Cliffs
2:19	Luperon	1.1	4.8	Port city
2:20	Cano Quintano	NDL	NDL	Harbor entrance
2:21		1.9	5.6	Flat
2:22	Puerto Souffle	1.1	4.8	Port city
2:23	Punta Patilla	1.4	4.6	Offshore wreck
2:24	P. Guzmancito	1.2	3.6	River
2:25	Punta Cabras	2.5	5.0	Cliffs
2:26	Puerto la Isla	1.6	6.4	Cable area, sandy
2:27	Bahia de Maimon	2.3	NDL	Cable area, steep
2:28		3.2	3.2	Mountains
2:29	Puerto Plato	2.6	6.6	Low-lying, dock
2:30		2.3	6.3	Sandy, cable buoys
2:31		3.0	6.4	Flat coastline
2:32	Punta Bergantin	2.9	7.7	Sandy, buildings
2:33	Rio Conarejos	2.2	6.8	River mouth
2:34		2.0	6.5	Mountains, cliffs
2:35	Puerto Sosua	1.2	7.0	Port city
2:36	Cabo Macoris	1.9	8.7	Cliffs, plantation
2:37	Cabo Macoris	2.4	7.7	Cliffs, plantation
2:38	Puerto Cabaret	1.5	6.0	Cliffs
2:39	Punta Cabaret	1.5	7.0	Anchorage

CHART#25751-CABO MACORIS to CABO SEMANA

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
3: 1	Rio Yasica	5.0	13.3	River mouth
3: 2	Laguna de Ori	5.1	13.6	Lagoon, marsh
3: 3	Rio Joba	5.3	12.4	River, flat, sandy
3: 4	La Ermita	4.9	10.6	Sandy, offshore
3: 5		5.4	12.2	Sandy, mountain
3: 6		4.9	13.7	Breakers
3: 7		3.9	12.2	Mountains
3: 8	Grieri	3.1	9.3	Cliffs, sandy offshore
3: 9		1.9	5.5	Cliffs
3:10	Cabo Tutinfierno	1.8	6.0	Cable area, sandy
3:11		1.5	5.8	Cliffs, mountains
3:12	Cabo Frances Viejo	1.2	4.8	Cliffs, mountains
3:13	Punta Tres Amores	1.3	4.9	Sandy, palm trees
3:14	Punta Savaneta	1.7	5.6	Cliffs
3:15		1.5	10.0	Low-lying, sandy
3:16	Rio Salado	2.2	12.9	River, offshore island
3:17	Punta Laguna Grande	1.8	12.4	Marsh
3:18	Rio Sajon	4.1	12.8	River mouth, sandy
3:19		3.9	11.3	Sandy offshore
3:20	La Playa	2.8	10.9	Buildings, sandy
3:21	Rio Nagua	1.5	10.8	Sandy offshore
3:22	Rio Colorado	4.3	11.6	Flat, low-lying
3:23		5.5	14.4	Flat, few buildings
3:24	Boca de Gran Estero	6.5	15.1	Flat, cable area
3:25	Punta Arena	4.5	13.0	Breakers
3:26	Puerta Jackson	2.6	10.4	Bluff

TABLE 2

PAGE # 3

DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
3:26	Puerta Jackson	2.6	10.4	Bluff
3:27		4.2	10.1	Low-lying coastline
3:28	Punta Bonita	4.0	8.5	Rocks offshore
3:29	Las Terenas	3.5	9.1	Reefs
3:30		4.0	9.4	Reefs, river
3:31	Punta Pescadores	4.4	10.0	Low-lying, reefs
3:32	Punta Lanza	5.4	9.8	Mountain, reefs
3:33	Punta Ermitano	7.7	<11.0	Offshore island, reefs
3:34	Puerto del Valle	11.1	<13.9	Cliffs, mountains
3:35		9.0	10.5	Cliffs, mountains
3:36		5.2	6.9	Cliffs, mountains
3:37		3.4	4.6	
3:38	Cabo Cabron	NSG	4.0	Cliffs, mountain
3:39	Bahia del Rincon	NSG	13.4	Cliffs, mountains
3:40	Playa de Rincon	NSG	<12.0	Breakers, palm trees
3:41	Punta las Galeras	NSG	<10.4	Sunken rocks
3:42	Punta El Cabito	NSG	< 5.5	Reefs, breakers
3:43	Punta Vaca	< 1.1	< 4.4	Low ridges
3:44	Puerta Guayacan	< 0.5	< 4.3	Low-lying
3:45	Punta La Playuela	< 1.0	5.5	Low-lying
3:46	Puerta de Dioso	< 1.3	6.8	Breakers
3:47	Punta Balandra	NSG	8.1	Sandy offshore

CHART#25722-CABO SAMANA to CABO ENGANO

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
4: 1	Punta Cacao	NSG	NSG	Flat
4: 2	Bahia Carenero	NSG	NSG	Flat, low-lying
4: 3	Punta la Bandera	NSG	NSG	Offshore island
4: 4	Punta Pascuala	NSG	NSG	Mountains

Between LOC# 4:5 the coastline follows the Bahia de Samana.
All offshore soundings are less than 30m

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
4: 5	Punta Capitan	NSG	25.0	Coral, palm trees
4: 6	Las Canitas	NSG	24.7	Coral, mountains
4: 7	Punta Masua	NSG	22.0	Low-lying, palm trees
4: 8	La Bocana	NSG	23.4	Offshore island, coral
4: 9	Punta Miguel	NDL	NDL	Bay, coral bank
4:10	Bahia de la Gina	NDL	NDL	Low-lying
4:11	Punta Manale	NSG	18.1	dangerous breakers
4:12	Punta Jallan	NSG	21.5	Dangerous breakers
4:13	El Morro Gordo	NSG	22.1	Cliff, rocks, breakers
4:14	Rio Jovero	NSG	21.6	Sunken rocks
4:15	Punta Jicaco	NDL		Sunken rocks, breakers
4:16	Puerto Jicaco	<12.5	18.3	Sunken rocks, breakers
4:17	Punta Rey	10.9	17.5	Sunken rocks, breakers
4:18	Cabo San Rafael	9.3	19.0	Low-lying, sunken rocks

TABLE 2
DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
4:18	Cabo San Rafael	9.8	18.0	Low-lying, sunken rocks
4:19	Rio Cedra	10.0	17.1	Flat, sunken rocks
4:20	Punta Limon	8.7	13.9	Flat, low-lying
4:21		7.2	11.7	Flat, washed rocks
4:22	Punta Nisibon	4.9	9.9	River, flat, low-lying
4:23		5.7	10.7	Flat
4:24		5.5	12.2	Flat
4:25		6.0	<14.4	Flat, low-lying
4:26				Low-lying
4:27	Rio Maimon			Sunken rocks, river
4:28	El Infiernito			Offshore island
4:29	El Macao			Flat
4:30	Punta Macao			Cove, flat
4:31	Ranchitos Anchorage			Flat
4:32				Sunken rocks, flat shore
4:33	Barbaro Anchorage			Offshore wreckage
4:34	Cabeza de Toro			Flat, offshore wreck
4:35				Flat, wreck, rocks
4:36	Cabo Ensano			Cliffs, wreck, rocks
4:37	Cabo Ensano			Flat, low-lying, wreck
4:38	Punta Easle			Low white cliffs
4:39	Punta Cana			Low, wooded, wreck

CHART#25721-CABO ENGANO to ISLA SAONA

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
5: 1	Punta Juanillo			Swamp, vegetation
5: 2				Flat
5: 3				Flat
5: 4	Punta Espada			Sloping coastline
5: 5	Punta Cueva			Flat
5: 6				Flat
5: 7	Bahia de Yuma			Low-lying
5: 8	Boca de Yuma			Anchorage
5: 9	Boca de Yuma			Low-lying, sandy bottom
5:10	Cabo Falso			Flat
5:11	Martel			Low coast
5:12	La Grancharra			Flat
5:13	Punta Balaju			Sunken rocks, wrecks
5:14	Punta Esta			Low coast, breakers
5:15	Punta Cana			vegetation, breakers
5:16	Punta Los Guiesos			Breakers, foul ground
5:17	Pta Canto de la Playa	4.5	19.7	Breakers, wreck, foul and
5:18		3.2	17.1	Low coast
5:19	Punta Laguna	3.5	17.7	Low coast, vegetation
5:20	Punta Cacon	2.4	18.2	Low coast, vegetation
5:21	Punta Catuano	3.0	20.0	Low coast, vegetation
5:22	Paso de Catuan	3.0	23.5	Swamp
5:23		1.9	23.2	Flat
5:24		1.8	24.0	Flat
5:25		2.4	24.5	Low coast
5:26	Bahia de Altaeracia	2.4	25.2	Low coast, rocks
5:27	Boca de Chavon	3.7	25.0	Flat, river mouth

TABLE 2
DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

PAGE # 5

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
5:27	Boca de Chavon	3.7	25.0	Flat, river mouth
5:28	Punta Minas	5.0	24.0	Low coast
5:29	Rio Dulce	< 1.5	24.0	Low, rocks, river mouth

CHART#25849-ISLA SAONA to SANTO DOMINGO

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
6: 1	La Romana	< 1.0	23.0	Low-lying, sandy
6: 2		< 6.3	22.3	Offshore island, cliffs
6: 3		5.0	20.5	Cliffs
6: 4		7.3	20.4	Low, sandy coast
6: 5		7.7	20.4	Low coast
6: 6	Punta Mortero	8.8	21.3	Low coast
6: 7	Rio Soco	12.2	24.3	Cliffs, sandy river mth
6: 8		12.5	22.3	Low coast
6: 9	San Pedro de Macoris	10.8	20.2	Port city
6:10	Punta Laurentina	7.8	15.7	Sandy offshore
6:11		6.5	13.5	Sandy offshore
6:12	Juandolio	4.8	11.8	Buildings, sandy coast
6:13	Guayacanes	4.0	11.1	Buildings, low coast
6:14	Punta Maeddalena	2.9	8.4	Low, sandy coast
6:15		2.0	7.2	Flat
6:16	Bahia de Andres	NSG	10.5	Sandy shore
6:17	Andres	NSG	9.3	Offshore island
6:18	Cabo Caucedo	1.4	5.1	Cliffs
6:19		NSG	4.4	Cliffs
6:20	La Calata	3.6	7.8	Port city
6:21		1.8	9.2	Flat
6:22	Mameyito	1.1	9.0	Buildings
6:23	Los Frailes	0.6	9.7	Buildings, rocky coast
6:24		0.9	12.3	Rocky coast
6:25	Santo Domingo	1.3	14.4	Port city
6:26		1.2	15.5	Cliffs
6:27		1.0	16.0	Rocky coast, cliffs

CHART#25842-SANTO DOMINGO to BARAHONA

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
7: 1	Arroyo Nigua	1.6	18.0	Flat, sandy
7: 2		1.0	19.0	Flat, sandy
7: 3	Punta Najayo	1.3	20.5	Flat, sandy
7: 4	Arroyo Najayo	1.7	23.0	Low, rocky
7: 5	Punta Palenque	2.4	23.8	Shoal water, buildings
7: 6	Puerto Palenque	3.0	24.8	Port city
7: 7	Arroyo Catalina	5.6	21.9	Flat
7: 8		6.7	19.9	Flat
7: 9		5.0	18.5	Shoal waters
7:10	Agua de la Estancia	6.5	17.0	Low and flat
7:11		<14.7	17.7	Stream mouth

TABLE 2
DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

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LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
7:11		< 14.7	17.7	Stream mouth
7:12		13.5	16.5	Wreck, flat coast
7:13		8.5	11.3	Low, flat
7:14	Punta Sandanilla	< 6.0	7.9	Low and sandy
7:15	Punta Salinas	< 2.0	4.0	Flat and sandy
7:16	Punta Calderas	NSG	6.4	Flat and rocky
7:17	Bahia de las Calderas	NDL	NDL	Boat landing
7:18	Punta Matasola	NDL	NDL	Foul ground
7:19	Punta Ocoa	NSG	7.4	Rocks, foul water
7:20	Rio Ocoa	0.6	9.0	Landing place, river
7:21		3.5	19.3	Yellow cliffs
7:22	Punta Hatillo	7.7	10.8	Flat
7:23	Playa de Caracoles	12.4	23.3	Beach
7:24	Bahia de Ocoa	13.7	23.6	Anchorage, palm trees
7:25	Puerto Tortuguero	15.2	22.8	Port city
7:26	Rio Via	14.0	24.4	Sandy, flat
7:27	Punta Vieja	10.1	16.2	Cliffs, mountains
7:28		6.7	12.5	Cliffs, mountains
7:29	Rio Jura	7.7	10.2	Flat, sandy
7:30	Rio Tabara	3.1	10.2	Flat
7:31	Puerto Viejo de Azua	5.9	11.4	Breakers, foul water
7:32	Puerto Viejo de Azua	3.0	9.4	Offshore islands
7:33		2.6	6.6	Cliffs, foul water
7:34		1.6	4.2	Cliffs, mountains
7:35	Punta Martin Garcia	1.3	3.2	Cliffs
7:36	Bahia de Neiba	4.2	7.6	Sandy
7:37	Bahia de Neiba	3.2	9.4	Vegetation, sw. islands
7:38	Otra Banda	2.7	10.6	Foul ground, lagoon
7:39	Rio Yaque del Sur	3.6	10.5	Foul ground
7:40	Bahia de Neiba	4.6	8.3	Coral, breakers
7:41	Barahona	4.1	7.2	Offshore island, breakers
7:42	Punta Prieta	2.4	5.3	Coral, rocks
7:43		1.2	< 3.3	Cliffs, stony
7:44		1.2	< 3.3	Stony shore
7:45	Punta Musundi	0.6	< 4.3	Huts, sandy
7:46	Rio Cito	0.9	< 4.8	River, building
7:47	Punta Capitulo	1.2	4.6	Stony, cliffs
7:48		1.4	3.2	Flat, buildings
7:49		0.9	3.0	Cliffs
7:50		1.6	4.5	Cliffs, stony
7:51		< 2.0	< 5.9	Breakers, low, rocky
7:52	Cayo Pisaje	3.0	< 6.6	Offshore island, lagoon
7:53	Playa Ineslea	NSG	< 7.6	Foul ground

CHART#25841-SARAHONA to HAITI

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
8: 1	Playa Ineslea	< 2.8	< 8.2	Foul ground, breakers
8: 2	Cabo Moneon	2.2	< 8.9	Cliffs, rocks, wreck
8: 3		2.5	< 7.5	Rocky, cliffs
8: 4		2.4	< 5.1	Sunken rock, sandy
8: 5	Conspic Loma	2.5	< 5.7	Steep coast
8: 6	Cabo Seata	< 4.6	5.2	Steep coast (bluff)

TABLE 2

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DOMINICAN REPUBLIC: Distances from Shore to the 200m & 1000m Contours
Listed by location along shore, moving clockwise around coast

LOC#	PLACE NAME	DISTANCE TO CONTOUR		SHORELINE
		200m	1000m	
8: 6	Cabo Beata	< 4.6	5.2	Steep coast (bluff)
8: 7	Canal de la Beata	8.8	10.1	Sandy, vegetation
8: 8	Canal de la Beata	7.0	14.1	Sandy, flat
8: 9		7.6	21.3	Flat, sandy
8:10	Punta Acecho	8.2	19.1	Cliffs
8:11		6.2	16.9	Cliffs
8:12	Asigero Axul	2.6	13.0	Stony, cliff
8:13	Cabo Falso	< 1.4	13.3	Bluff
8:14	Cabo Falso	< 2.5	5.6	Cliffs
8:15	Baie de Adujas	1.4	7.2	Sandy, cliffs
8:16	Ensenada de los Aquilas	0.8	8.8	Sandy, flat
8:17	Punta de las Aquilas	2.0	7.7	Red cliffs
8:18	Cabo Rojo	1.6	7.4	Red cliffs
8:19	Anse Joseph	2.3	9.2	Flat, sandy, dock
8:20	Anse Trou Jacob	< 5.0	10.0	Sandy, jungle
8:21	Punta Cafirien	3.8	10.8	Flat, sandy
8:22	Rio Pedernales	4.9	13.2	Cliffs, flat, sandy

All place-names are in Spanish. Some of the locations do not have an appropriate name on the maps and charts and these have been left blank. Names of towns appear when they coincide with one of the locations selected. No attention has been paid to demographic significance of population centers, in fact, some larger inland towns and cities are not listed. The names are limited to coastal places.

It was noted that significant differences in geographical names occur between the DMAHC, USACE and USDOD charts and maps. We have selected what appears to be the currently used name, consulting the Sailing Directions (DMAHC, 1977) and atlases. Spelling differences are frequently found. Cassell's (1960) Spanish Dictionary was used as reference.

A brief shoreline description of each location is given in Table 2; these are primarily of the sort useful to navigators and were obtained from the charts and maps using DMAHC chart #1 (DMAHC, 1977) and U.S. Department of Commerce (1963); where possible, the more recent maps (USACE and USDOD) were used to supplement this information.

On our chart #1 most of the distances are to contours located in Haitian waters. In some instances, where gaps are found in the smooth-sheet data, the distances are listed as, for example, <8.5. This means that a known sounding, deeper than the one needed, is to be found 8.5 km from shore, therefore the sounding in question is less than 8.5 km from shore.

The same information in Table 2 is given in graphic form in Figure 12. The red trace is the distance to the 200 m contour, the green trace is distance to the 1000 m contour. The place-names are printed starting at the distance that the 1000 m contour is found offshore. Where there

were no soundings given (NSG) or no direct line (NDL), the names appear at a distance of 11 km and there will be gaps in the red and/or green traces. Those distances marked <x km are plotted at x km.

Starting at the north coast border with Haiti, brief descriptions of each section of the near-shore bathymetry follow:

The first four locations in Manzanillo Bay, although no soundings are given in the smooth sheets, are close to deep water (<200 m), but do not reach 1000 m depth for many kilometers. All of the deep water encountered is probably in Haitian coastal-zone territory (Ocean Yearbook, 1978).

The extensive Banco de Monte Cristi separates deep water from the coast until the vicinity of Bahia Isabela. While the 200 m line is about 1 km from shore off Playa Poza Piedra, the 1000 m contour is found 10 km away. This is in the Barrancon quadrangle of the USACE maps (sheet #5975I). The adjacent quadrangle (Luperon, sheet #6075IV) has both contours close to shore and the whole of this section of the coast, from the northernmost point of the Dominican Republic, Cabo Isabel[a], eastwards to Punta Cabaret[e], has a narrow shelf and steep offshore slopes. Between Punta Cabaret[e] and Rio San Juan, a region of mudflats, exposed and sunken rocks and coral extends offshore and the 200 m contour is approximately 5 km from the coast. The 1000 m contour is 10-15 km offshore.

The broad headland that forms Cabo Frances Viejo and Cabo Tres Amarras [Amares] is another stretch of coastline where both 200 m and 1000 m contours are found close to shore. From here to the tip of the Semana Peninsula at Cabo Cabron, the 200 m contour is found progressively

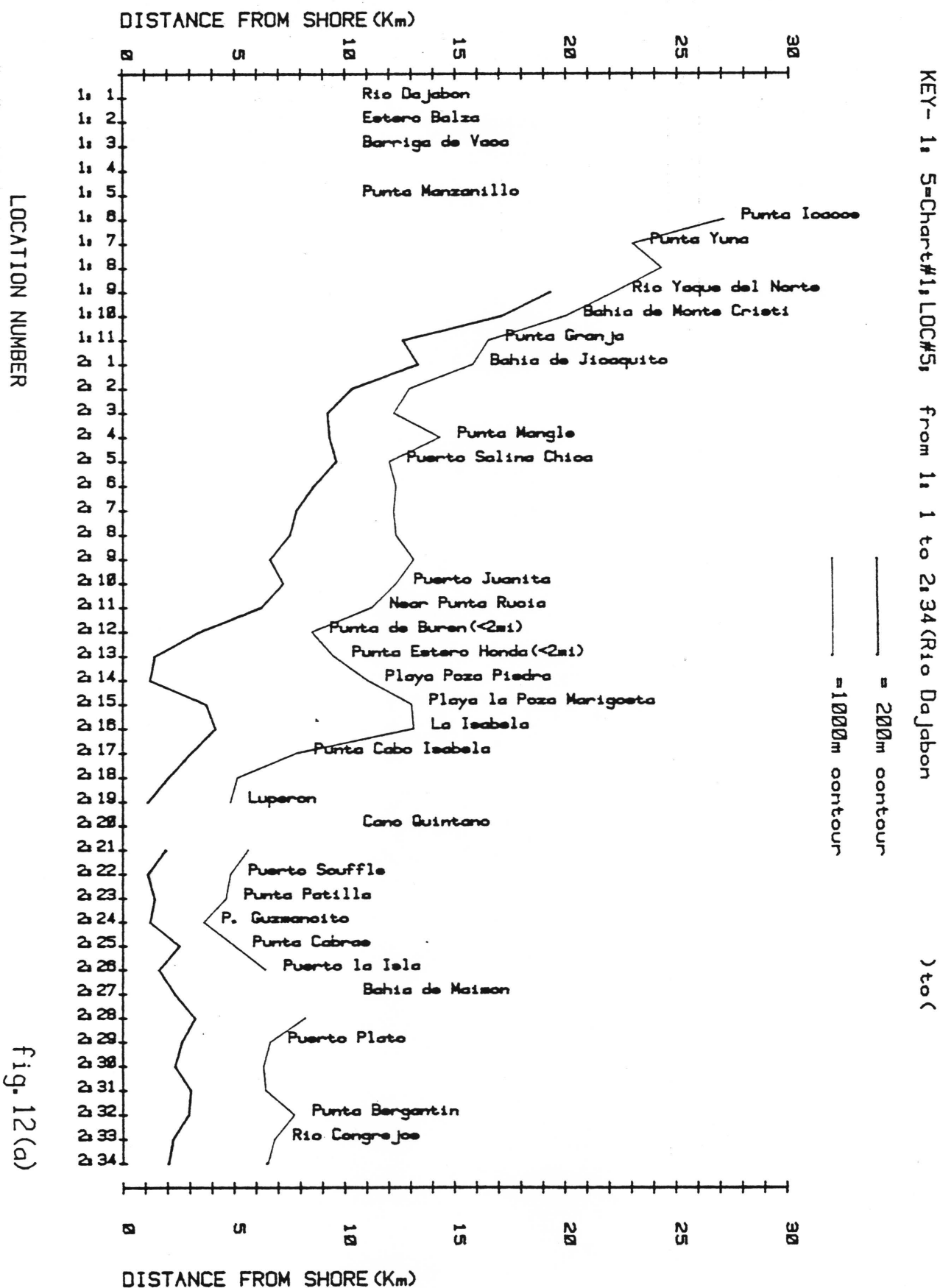


fig. 12(a)

Distance of 200 & 1000m contours from shore-Moving clockwise around coast

NORTH COAST -

Chart#2(25801) & Chart#3(27561)

KEY- 1: 5=Chart#1; LOC#5; from 2:36 to 3:41(Cabo Macoris

) to(Punta las Galeras

)

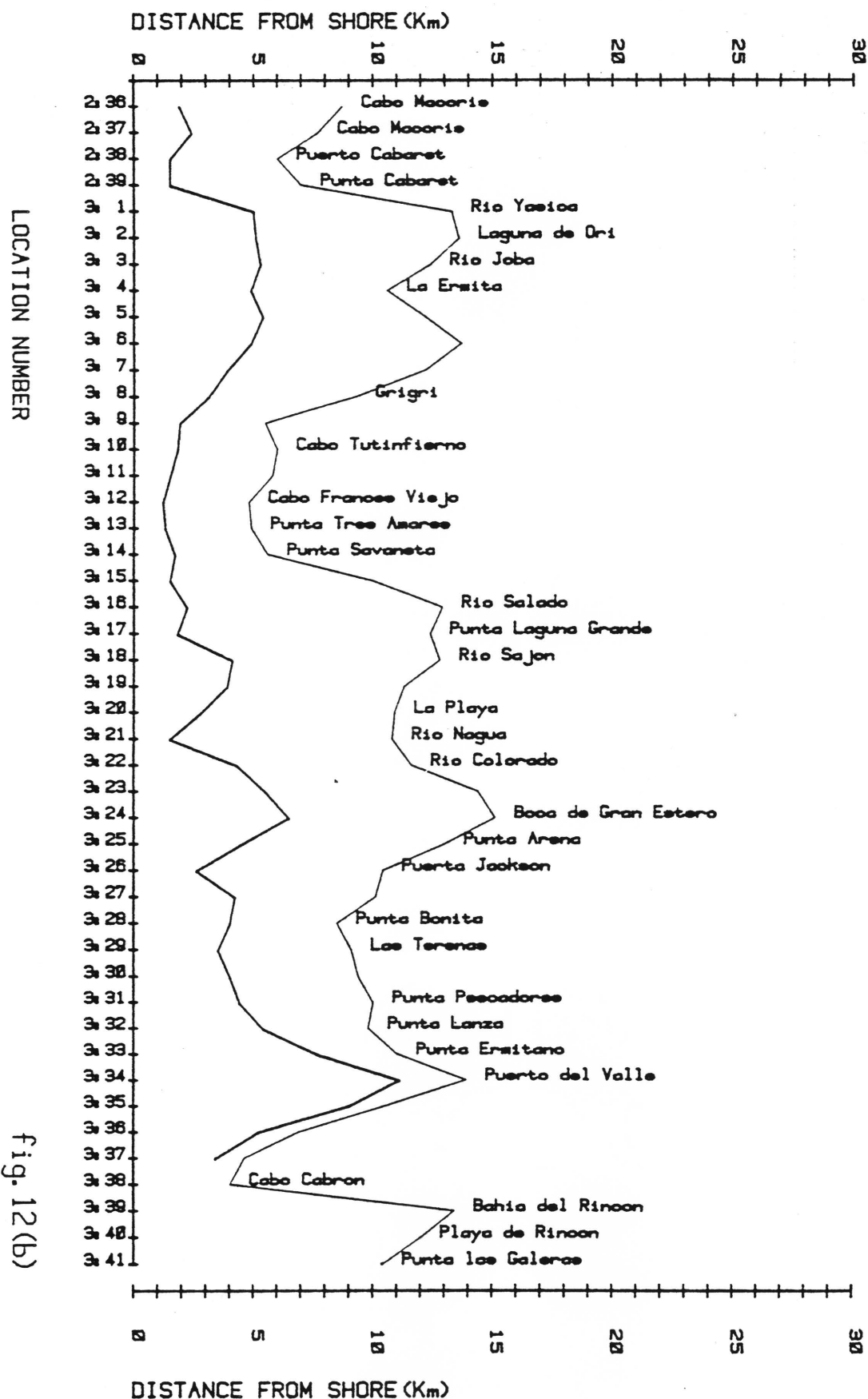


fig. 12(b)

farther from shore while the 1000 m contour moves rapidly seaward as one progresses eastwards, until at Rio Salado it is >13 km from shore. Two locations on the Semana Peninsula, Cabo Cabron and Cabo de Semana, have steep offshore gradients, making them potentially interesting to this study. This region is in the Las Galeras quadrangle (#6373I) of the USACE maps.

Beyond Punta Balandra the shoreline follows the deeply indented Bahia de Semana. Water in this bay is all shallower than 50 m and the shoreline bordering it has not been studied here. Table 2 and Figure 12 pick up again at Punta Capitan. From here to beyond Punta Nisibon (at location 4:26), both contours are far offshore, although at Punta Nisibon the 1000 m contour comes to within 9 km of shore.

Beyond Punta Nisibon, from Rio Maimon to Punta Los Guiegos on the south coast of Isla Saona, there is no coverage on the smooth sheets. The offshore waters from the entrance to Bahia de Semana to the easternmost tip of Hispaniola, Cabo Engano, are very rocky with a comparatively wide shelf and many sunken coral reefs. Many wrecked ships are to be found on this coast, particularly in the Cabo Engano area. A shallow bank, with depths of <100 m, extends from the eastern tip all the way to the Mona Passage (more than 30 km offshore). South of Cabo San Rafael to Isla Saona, deep water is again found closer to shore, with the 1000 m contour perhaps reaching within 10 km of shore, particularly in Bahia to Yuma and off Bahia Catalinita.

From Isla Saona to La Romana along the south shore the shelf is narrow with 200 m depth reached less than 5 km from shore (at La Romana, 200 m is <1 km from shore). However, beyond the shelf-break the slope

Distance of 200 & 1000m contours from shore-Moving clockwise around coast
NORTH COAST -

KEY- 1: 5=Chart#1, LOC#5, from 3:42 to 4:39(Punta El Cabito) to(Punta Cana

Chart#3(25761) & Chart#4(25722)

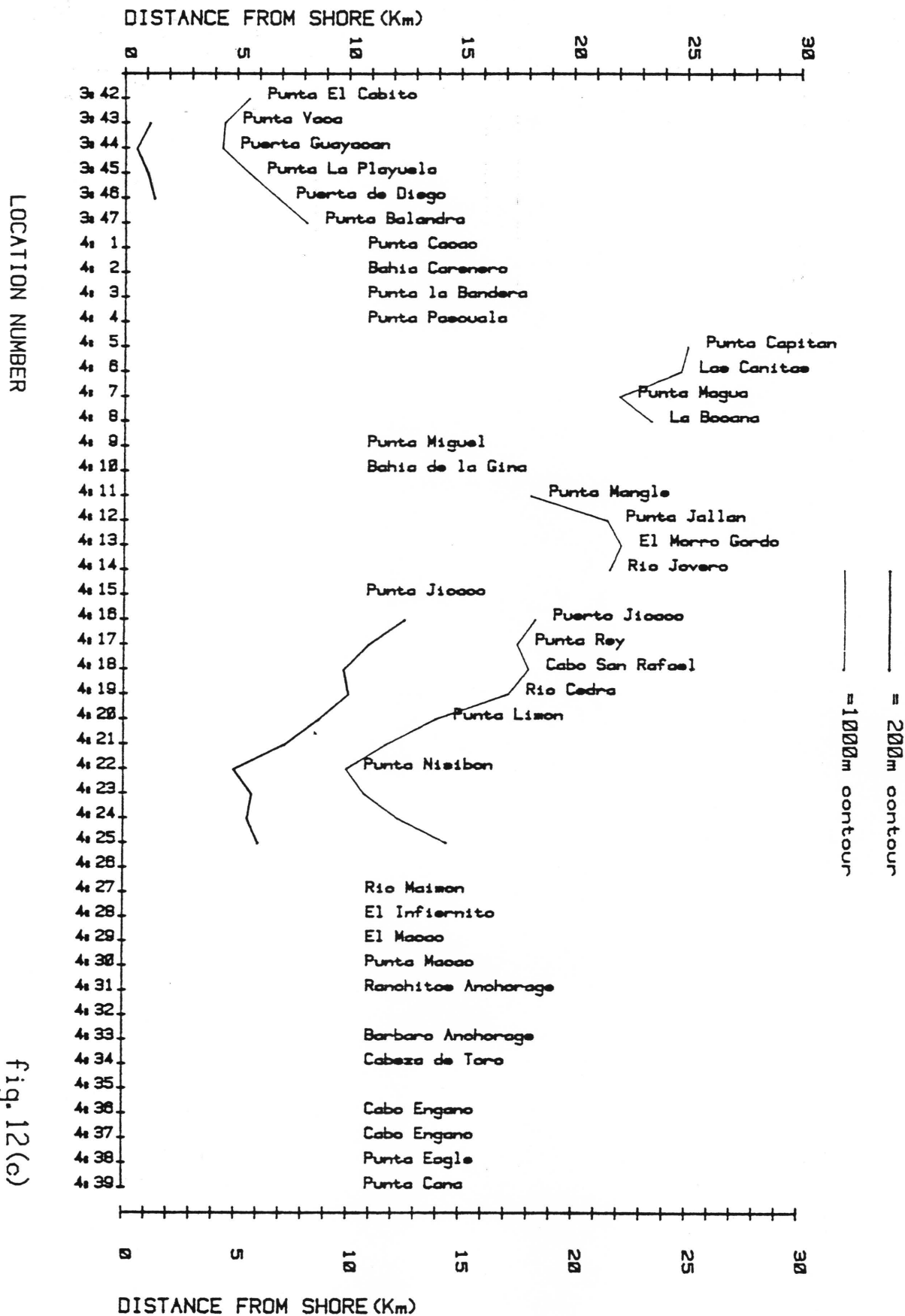


fig. 12(c)

Distance of 200 & 1000m contours from shore-Moving clockwise around coast
EAST & SOUTH COASTS-
Chart#5(25721) & Chart#6(25849)

KEY- 1: 5=Chart#1, LOC#5; from 5: 1 to 6: 16(Punta Juanillo

) to (Bahia de Andres

LOCATION NUMBER

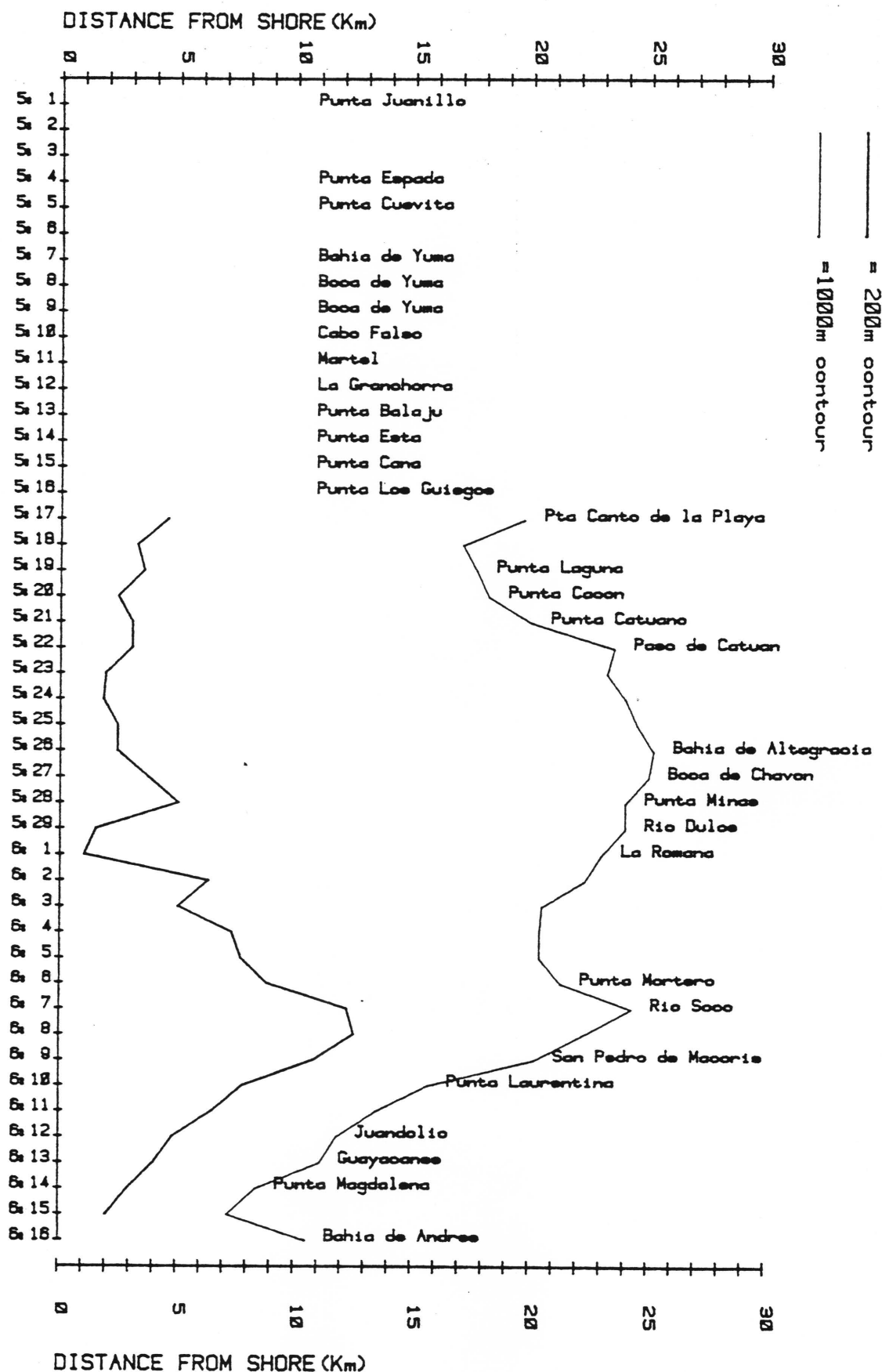


fig. 12(D)

is much more gradual and 1000 m water is found between 17 and 25 km offshore.

Westward of Isla Catalina, the insular shelf is much broader, reaching its widest opposite Rio Soco near San Pedro de Macoris. West of Rio Soco, however, the offshore gradient steepens and between Puerta Magdalena and Santo Domingo International Airport (the Las Americas International), the 1000 m contour is less than 10 km off the coast. Near Cabo [Punta] Caucedo the 1000 m contour is 4.4 km offshore. All along the Bahia de Santo Domingo to Punta Palenque there is again a very narrow shelf (at Los Frailes the 200 m depth is only 600 m from shore), but 1000 m water is as far as 25 km away at Punta Palenque.

The shelf widens considerably between Punta Palenque and Punta Salinas and again at Bahia de Ocoa. However, a short strip of coastline between Punta Salinas and the town of Palmar de Ocoa separating these two regions is one of the more promising of the regions along the coastline for the proximity of deep water to shore. This is the Sabana Buey quadrangle (#6070I of the USACE maps). Another very narrow strip of coastline at Punta Martin Garcia is also promising (200 m contour is 1.2 km and 1000 m contour is 3.2 km from shore).

The Bahia de Neiba which the Rio Yacque del Sur empties into is comparatively shallow, but starting at Punta Prieta, just south of the city of Barahona, the shelf is narrower than any other section of the Dominican Republic coastline. This narrow shelf, with a steeply sloping sea floor bottom gradient, stretches to the southernmost tip of Hispaniola at Cabo Beata (and Isla Beata). Between La Cienaga and San Rafael, and again in the vicinity of Enriquillo, the 1000 m contour is

Distance of 200 & 1000m contours from shore-Moving clockwise around coast
 SOUTH COAST-
 : Chart#6(25849) & Chart#7(25842)

KEY- 1: 5=Chart#1, LOC#5, from 6:17 to 7:34(Andree)

) to (

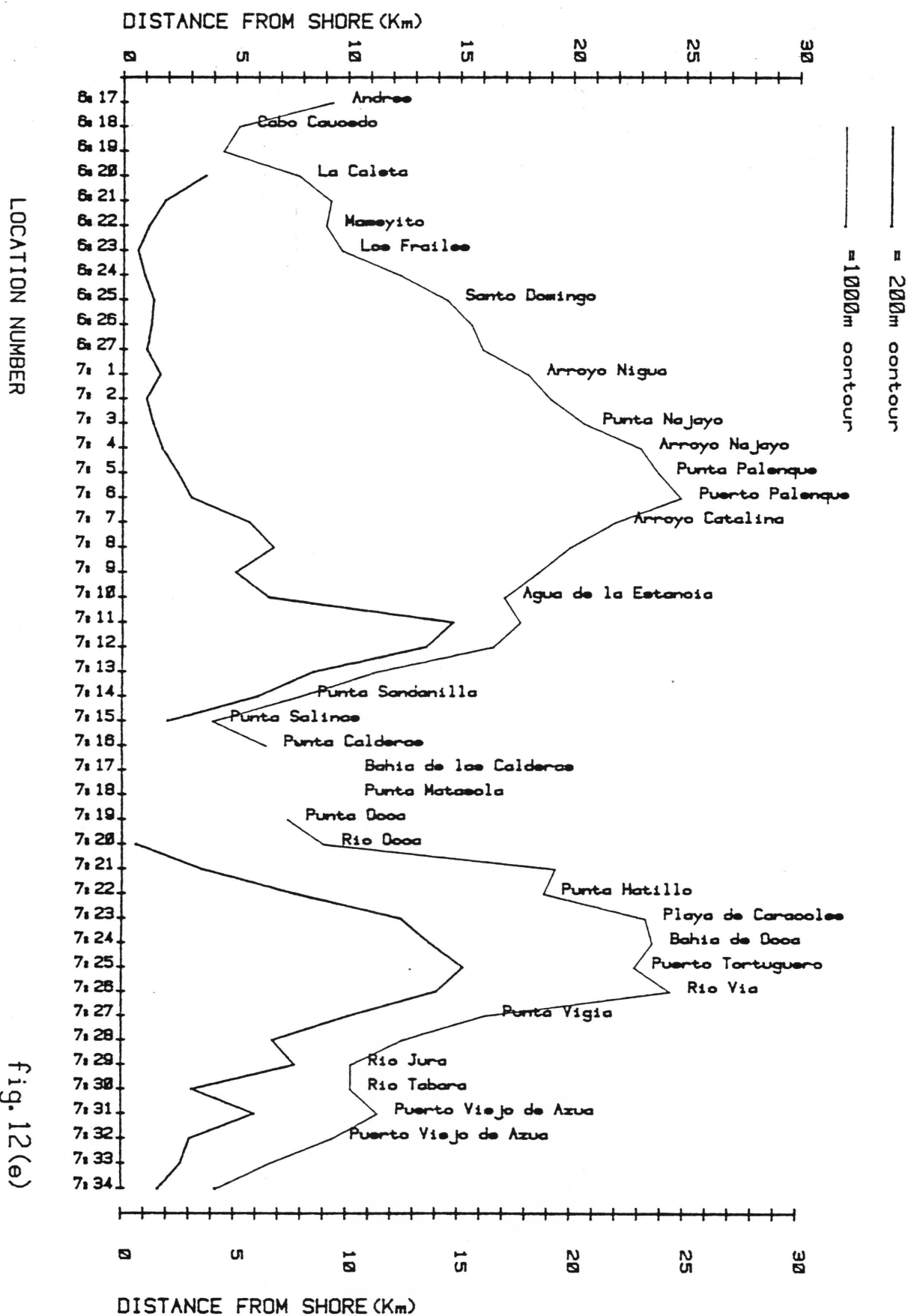


fig. 12(e)

closer to shore than at any other place in the Dominican Republic.¹

The offshore islands, Isla Beata and Isla Alto Velo, put a considerable distance between the mainland and 1000 m deep water at the southern tip of the Dominican Republic. On Isla Beata, however, in the northern end of the island, by an existing electrical power plant, deep water can be found close to shore. From this point to the southern coast border with Haiti at Pedernales, one section of the coastline (at Cabo Falso) has both 200 m and 1000 m water close to shore. Along the rest of the coast, while there is a narrow shelf, the 1000 m contour is found from 5 to 13 km offshore.

1.7.2 Data Sorted by Distance to Shore from 200 m and 1000 m Isobaths

1.7.2.1 Distance to the 200 m Contour

Table 3 was prepared by searching the data at each location and sorting in order of increasing distance from shore to the 200 m contour. Program "Nsort" was used to do this. Figure 13 presents the same data graphically and was prepared using program "Coast2".

The major feature of the offshore topography brought out by Figure 13 is the great variability in the width of the slope compared to the width of the shelf. Adjacent points in Figure 13 have been joined on the graph, but this has no physical meaning. It serves to show how the

¹ Water of 1000 m, closer to shore than 3 km, was found in certain locations when we constructed bathymetric charts of this region.

Distance of 200 & 1000m contours from shore-Moving clockwise around coast

SOUTH COAST -

Chart#7 (25842) & Chart#8 (25841)

KEY- 1. 5=Chart#1, LOC#5, from 7:35 to 22(Punta Martin Garcia) to (Zzo Pedernales)

— = 200m contour
— = 1000m contour

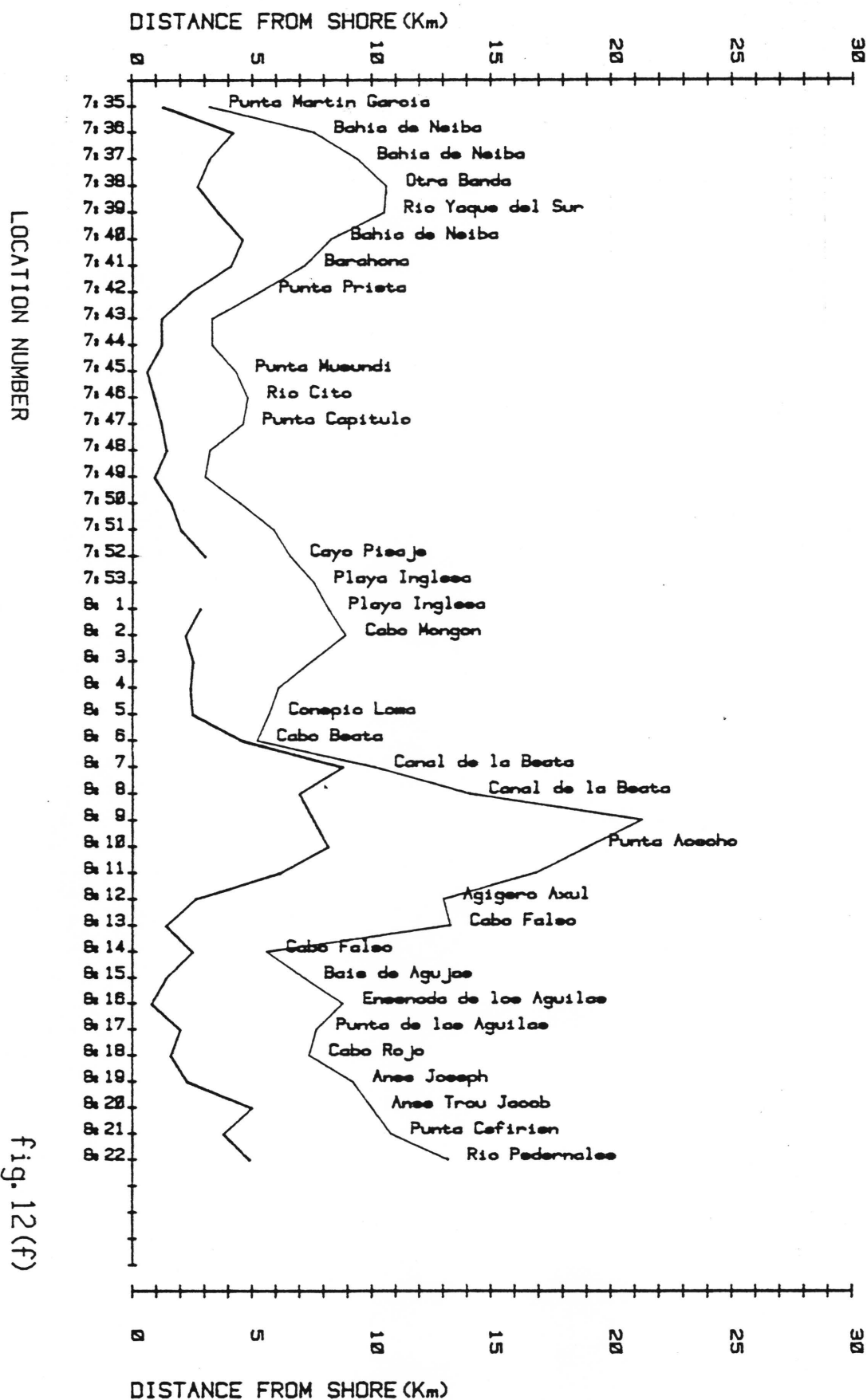


fig. 12(f)

TABLE 3
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 200m contour

DIST.-200m	PLACE NAME	CHART	LOC#	DIST.-1000m
< 0.5	Puerta Guayacan	3	44	< 4.3
0.5	Punta Musundi	7	45	< 4.3
0.6	Rio Ocoa	7	20	9.0
0.6	Los Frailes	6	23	9.7
0.8	Ensenada de los Aguilas	8	16	8.8
0.9		7	49	3.0
0.9	Rio Cito	7	46	< 4.8
0.9		6	24	12.3
< 1.0	Punta La Playuela	3	45	5.5
< 1.0	La Romana	6	1	23.0
1.0		6	27	16.0
1.0		7	2	19.0
< 1.1	Punta Vaca	3	43	< 4.4
1.1	Puerto Souffle	2	22	4.8
1.1	Luperon	2	19	4.8
1.1	Mameyito	6	22	9.0
1.2		7	44	< 3.3
1.2		7	43	< 3.3
1.2	P. Guzmancito	2	24	3.6
1.2	Punta Capitulo	7	47	4.6
1.2	Cabo Frances Viejo	3	12	4.8
1.2	Puerto Sosua	2	35	7.0
1.2	Playa Poza Piedra	2	14	11.0
1.2		6	26	15.5
1.3	Punta Martin Garcia	7	35	3.2
1.3	Punta Tres Amores	3	13	4.9
< 1.3	Puerta de Diego	3	46	6.8
1.3	Santo Domingo	6	25	14.4
1.3	Punta Najayo	7	3	20.5
1.4		7	48	3.3
1.4	Punta Patilla	2	23	4.6
1.4	Cabo Caucedo	6	18	5.1
1.4	Baie de Reujas	8	15	7.2
1.4	Punta Estero Honda(<2mi)	2	13	9.5
< 1.4	Cabo Falso	8	13	13.3
1.5		3	11	5.8
1.5	Puerto Cabaret	2	38	6.0
1.5	Punta Cabaret	2	39	7.0
1.5		3	15	10.0
1.5	Rio Nagua	3	21	10.8
< 1.5	Rio Dulce	6	29	24.0
1.5		7	34	4.2
1.5		7	50	4.5
1.5	Puerto la Isla	2	26	6.4
1.5	Cabo Rojo	8	18	7.4
1.5	Arroyo Nigua	7	1	13.0
1.7	Punta Savaneta	3	14	5.6
1.7	Arroyo Najayo	7	4	23.0
1.8	Cabo Tutinfierno	3	10	6.0
1.8		6	21	9.2
1.8	Punta Laguna Grande	3	17	13.4
1.8		5	24	24.0
1.9		3	9	5.5
1.9		2	21	5.6
1.9	Cabo Macoris	2	36	8.7
1.9		5	23	23.2
< 2.0	Punta Salinas	7	15	4.0

TABLE 3
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 200m contour

PAGE # 2

DIST.-200m	PLACE NAME	CHART	LOC#	DIST.-1000m
2.0		2	18	5.1
< 2.0		7	51	< 5.9
2.0		2	34	6.5
2.0		6	15	7.2
2.0	Punta de las Aguilas	8	17	7.7
2.2	Rio Conarejos	2	33	8.8
2.2	Cabo Monson	8	2	< 8.9
2.2	Rio Salado	3	16	12.9
2.3		2	30	6.3
2.3	Anse Joseph	8	19	9.2
2.3	Bahia de Maimon	2	27	NDL
2.4	Punta Prieta	7	42	5.3
2.4		8	4	< 6.1
2.4	Cabo Macoris	2	37	7.7
2.4	Punta Cacon	5	20	13.2
2.4	Punta Palenque	7	5	23.8
2.4		5	25	24.5
2.4	Bahia de Altaeracia	5	26	25.2
2.5	Punta Cabras	2	25	5.0
< 2.5	Cabo Falso	8	14	5.6
2.5	Conspic Loma	8	5	< 5.7
2.5		8	3	< 7.5
2.6		7	33	6.6
2.6	Puerto Plato	2	29	6.6
2.6	Puerto Jackson	3	26	10.4
2.6	Asigero Axul	8	12	13.0
2.7	Otra Banda	7	38	10.6
< 2.8	Playa Inglesa	8	1	< 8.2
2.8	La Playa	3	20	10.9
2.9	Punta Sergeantin	2	32	7.7
2.9	Punta Magdalena	6	14	8.4
3.0		2	31	6.4
3.0	Cayo Pisaje	7	52	< 6.6
3.0	Punta Cabo Isabela	2	17	7.3
3.0	Puerto Viejo de Azua	7	32	9.4
3.0	Punta Catuano	5	21	20.0
3.0	Paso de Catuan	5	22	23.5
3.0	Puerto Palenque	7	6	24.8
3.1	Gisari	3	8	9.3
3.1	Rio Tabara	7	30	10.2
3.2		2	28	8.2
3.2	Bahia de Neiba	7	37	9.4
3.2		5	18	17.1
3.4		3	37	4.6
3.4	Punta de Suren(<2mi)	2	12	8.5
3.5	Las Terenas	3	29	9.1
3.5	Punta Laguna	5	19	17.7
3.5		7	21	19.3
3.6	La Caleta	6	20	7.8
3.6	Rio Yaque del Sur	7	39	10.5
3.7	Playa la Poza Mariabota	2	15	13.0
3.7	Boca de Chavon	5	27	25.0
3.8	Punta Defirien	8	21	10.8
3.9		3	19	11.3
3.9		3	7	12.2
4.0	Punta Sonita	3	28	8.5
4.0		3	30	9.4

TABLE 3

PAGE # 3

DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 200m contour

DIST.-200m	PLACE NAME	CHART	LOC#	DIST.-1000m
4.0	Guayacanes	6	13	11.1
4.1	Barahona	7	41	7.2
4.1	Rio Sajon	3	13	12.8
4.1	La Isabela	2	16	13.1
4.2	Bahia de Neiba	7	35	7.6
4.2		3	27	10.1
4.3	Rio Colorado	3	22	11.6
4.4	Punta Pescadores	3	31	10.0
4.5	Punta Arena	3	25	13.0
4.5	Pta Canto de la Playa	5	17	19.7
< 4.6	Cabo Beata	8	6	5.2
4.6	Bahia de Neiba	7	40	8.3
4.8	Juandolio	6	12	11.3
4.9	Punta Nisibon	4	22	9.9
4.9	La Ermita	3	4	10.6
4.9	Rio Pedernales	8	22	13.2
4.9		3	6	13.7
< 5.0	Anse Trou Jacob	8	20	10.0
5.0	Rio Yasica	3	1	13.3
5.0		7	9	10.5
5.0		6	3	20.5
5.0	Punta Minas	5	28	24.0
5.1	Laguna de Ori	3	2	13.6
5.2		3	36	6.9
5.3	Rio Joba	3	3	12.4
5.4	Punta Lanza	3	32	9.8
5.4		3	5	12.2
5.5		4	24	12.2
5.5		3	23	14.4
5.6	Arroyo Catalina	7	7	21.9
5.7		4	23	10.7
5.9	Puerto Viejo de Azua	7	31	11.4
< 6.0	Punta Sandanilla	7	14	7.9
6.0		4	25	<14.4
6.2	Near Punta Rucia	2	11	11.2
6.2		8	11	16.9
< 6.3		6	2	22.3
6.3		6	11	13.5
6.3	Boca de Gran Estero	3	24	15.1
6.5	Agua de la Estancia	7	10	17.0
6.6		2	9	13.1
6.7		7	28	12.5
6.7		7	3	19.9
7.0	Canal de la Beata	8	8	14.1
7.2		4	21	11.7
7.2	Puerto Juanita	2	10	12.3
7.3		6	4	20.4
7.3		2	8	12.3
7.5		8	9	21.3
7.7	Rio Jura	7	29	10.2
7.7	Punta Ermitano	3	33	<11.0
7.7	Punta Hatillo	7	22	10.8
7.7		6	5	20.4
7.8		2	7	12.2
7.8	Punta Laurentina	6	10	15.7

TABLE 3
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 200m contour

PAGE # 4

DIST.-200m	PLACE NAME	CHART	LOC#	DIST.-1000m
8.2	Punta Acacho	8	10	19.1
8.5		7	13	11.3
8.6		2	6	12.3
8.7	Punta Limon	4	20	13.9
8.8	Canal de la Beata	8	7	10.1
8.8	Punta Mortero	6	6	21.3
9.0		3	35	10.5
9.2		2	3	12.2
9.3	Punta Manale	2	4	14.3
9.6	Puerto Salina Chica	2	5	12.0
9.8	Cabo San Rafael	4	18	18.0
10.0	Rio Cedra	4	19	17.1
10.1	Punta Visia	7	27	16.2
10.3		2	2	12.9
10.8	San Pedro de Macoris	6	9	20.2
10.9	Punta Rey	4	17	17.5
11.1	Puerto del Valle	3	34	<13.9
12.2	Rio Soco	6	7	24.3
12.4	Playa de Caracoles	7	23	23.3
<12.5	Puerto Jicaco	4	16	18.3
12.5		6	8	22.3
12.6	Punta Granja	1	11	16.5
13.3	Bahia de Jicauito	2	1	15.8
13.5		7	12	16.5
13.7	Bahia de Ocoa	7	24	23.6
14.0	Rio Via	7	26	24.4
<14.7		7	11	17.7
15.2	Puerto Tortuguero	7	25	22.8
17.1	Bahia de Monte Cristi	1	10	20.0
19.3	Rio Yaque del Norte	1	9	22.2
NDL	Punta Matasola	7	18	NDL
NDL	Bahia de las Calderas	7	17	NDL
NDL	Punta Jicaco	4	15	NDL
NDL	Bahia de la Gina	4	10	NDL
NDL	Punta Miguel	4	9	NDL
NDL	Cano Quintano	2	20	NDL
NSG	Cabo Cabron	3	38	4.0
NSG		6	19	4.4
NSG	Punta El Cabito	3	42	< 5.5
NSG	Punta Calderas	7	16	6.4
NSG	Punta Ocoa	7	19	7.4
NSG	Playa Inelesa	7	53	< 7.6
NSG	Punta Balandra	3	47	8.1
NSG	Andres	6	17	9.3
NSG	Punta Manzanillo	1	5	NDL
NSG		1	4	NDL
NSG	Barriada de Vaca	1	3	NDL
NSG	Estero Salza	1	2	NDL
NSG	Rio Dajabon	1	1	NDL

TABLE 3
 DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
 Listed by increasing distance of the 200m contour

DIST.-200m	PLACE NAME	CHART	LOC#	DIST.-1000m
NSG	Punta Pascuala	4	4	NSG
NSG	Punta la Bandera	4	3	NSG
NSG	Bahia Carenero	4	2	NSG
NSG	Punta Cacao	4	1	NSG
NSG	Punta las Galeras	3	41	<10.4
NSG	Bahia de Andres	6	16	10.5
NSG	Playa de Rincon	3	40	<12.0
NSG	Bahia del Rincon	3	39	13.4
NSG	Punta Manale	4	11	18.1
NSG	Punta Jallan	4	12	21.5
NSG	Rio Jovero	4	14	21.6
NSG	Punta Masua	4	7	22.0
NSG	El Morro Gordo	4	13	22.1
NSG	Punta Yuna	1	7	23.0
NSG	La Bocana	4	8	23.4
NSG		1	8	24.3
NSG	Las Canitas	4	6	24.7
NSG	Punta Capitan	4	5	25.0
NSG	Punta Icacos	1	6	27.1

Distance of 200m & 1000m contours from shore-by increasing dist. of 200m contour
 KEY- 1: 5=Chart#1; Location#5;

From 0.5Km to 1.6Km

— = 200m contour
 — = 1000m contour

LOCATION NUMBER

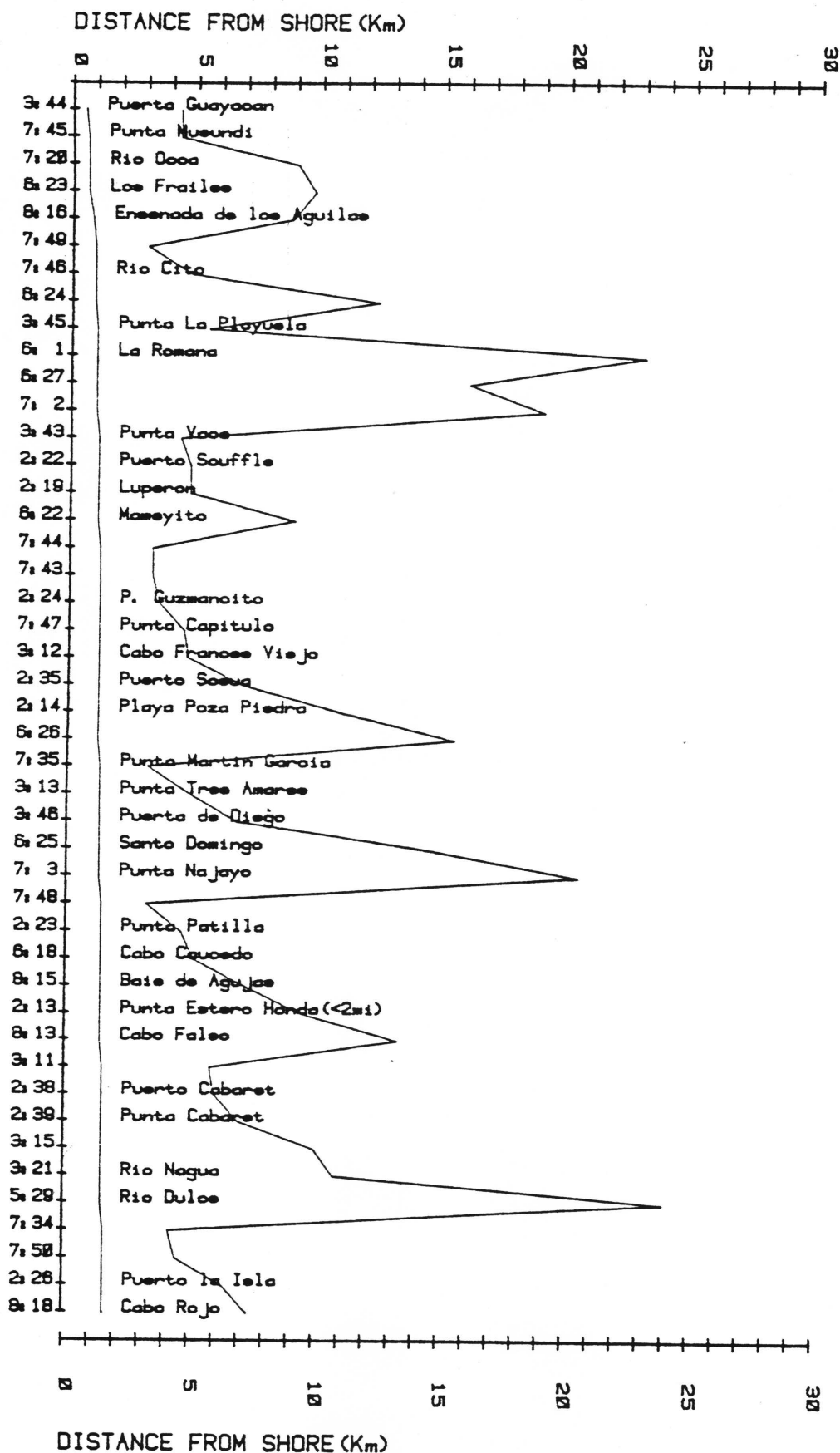


fig. 13(a)

Distance of 200m & 1000m contours from shore-by increasing dist. of 200m contour
 KEY- 1: 5=Chart#1; Location#5;
 From 1.7Km to 3.0Km

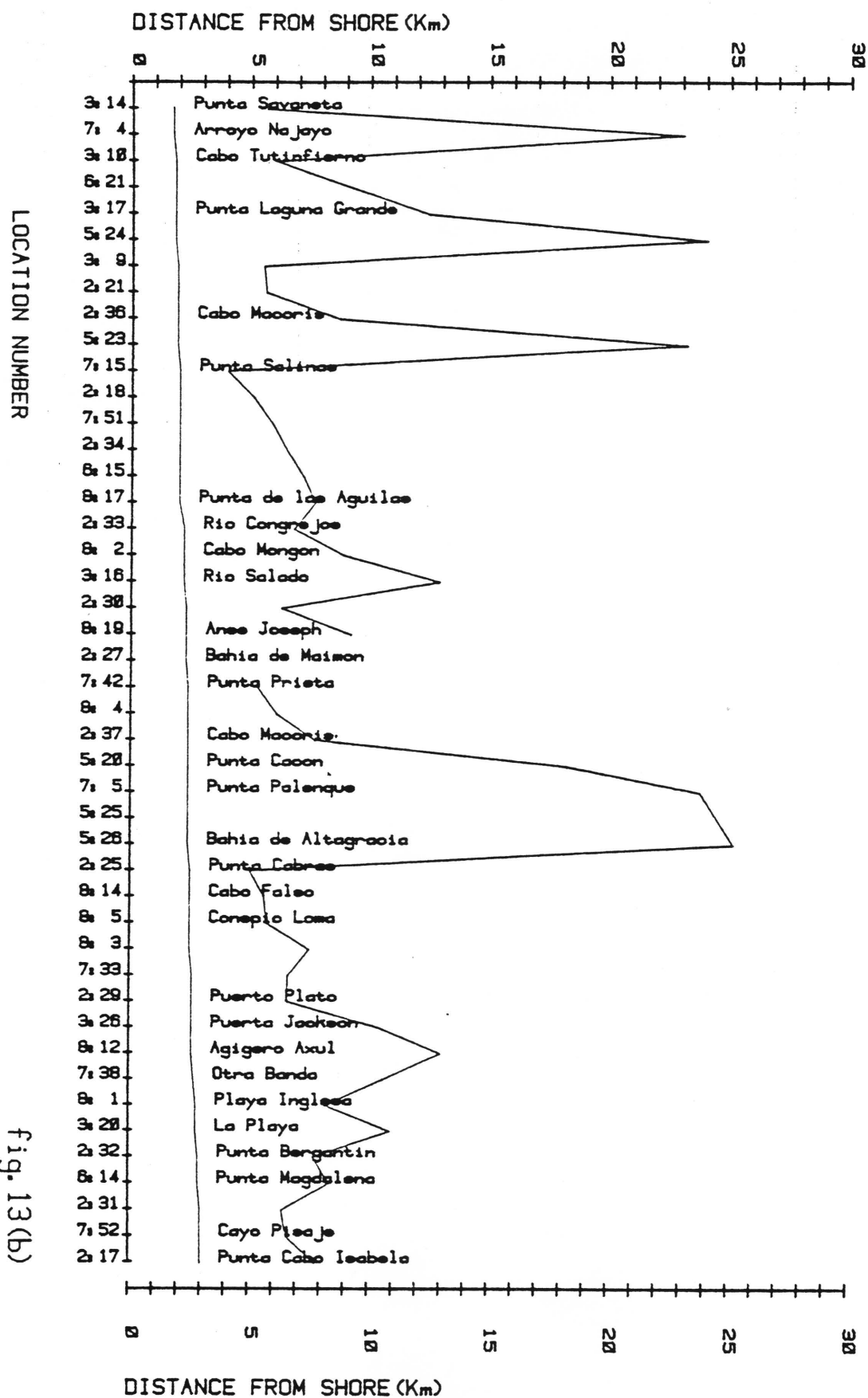


fig. 13(b)

Distance of 200m & 1000m contours from shore-by increasing dist. of 200m contour
 KEY- 1, 5=Chart#1, Location#5;
 From 3.0Km to 5.0Km

LOCATION NUMBER

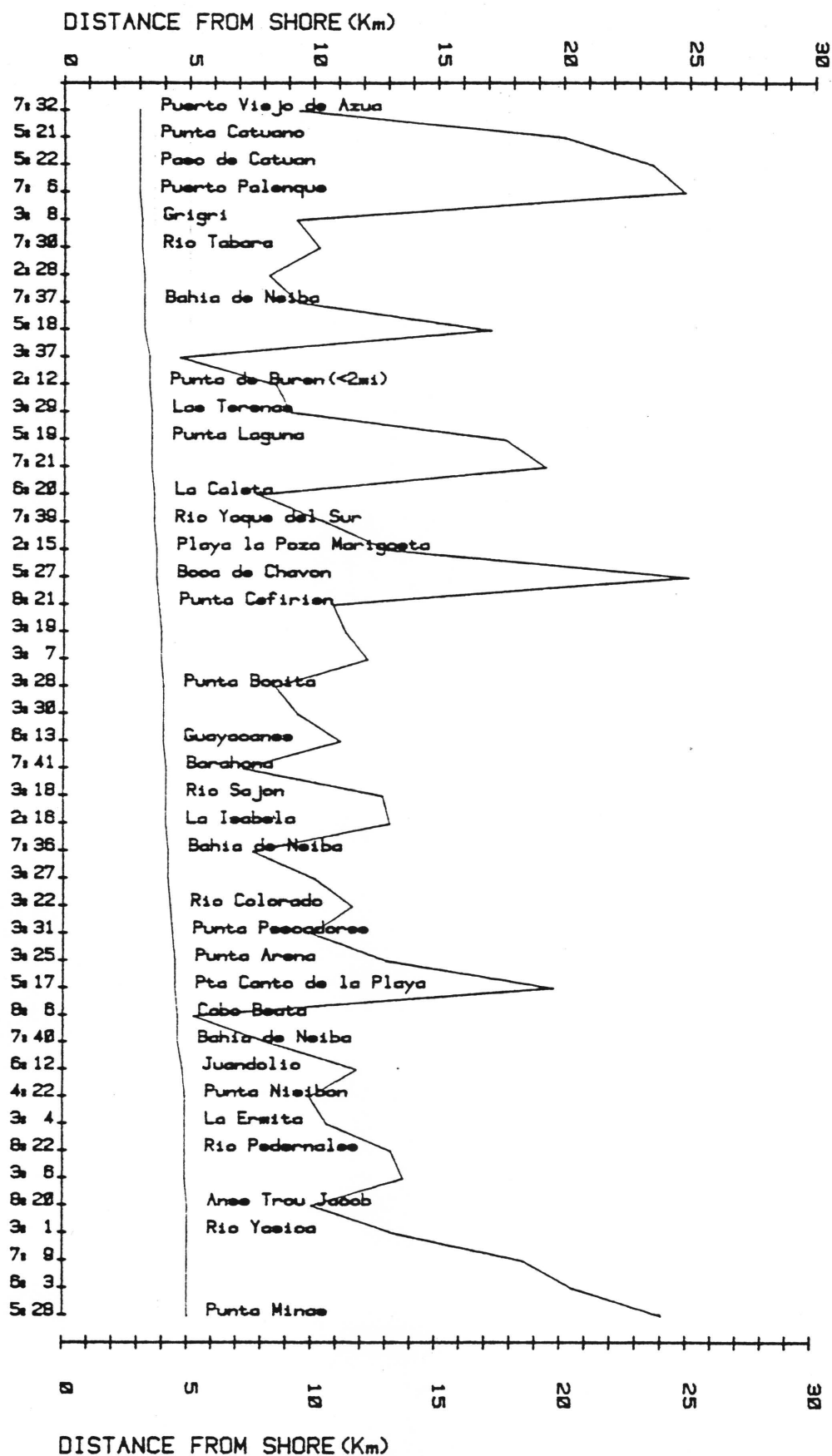


fig. 13(c)

Distance of 200m & 1000m contours from shore-by increasing dist. of 200m contour
 KEY- 1: 5=Chart#1, Location#5,

From 10.0Km to 19.3Km

— = 200m contour
 — = 1000m contour

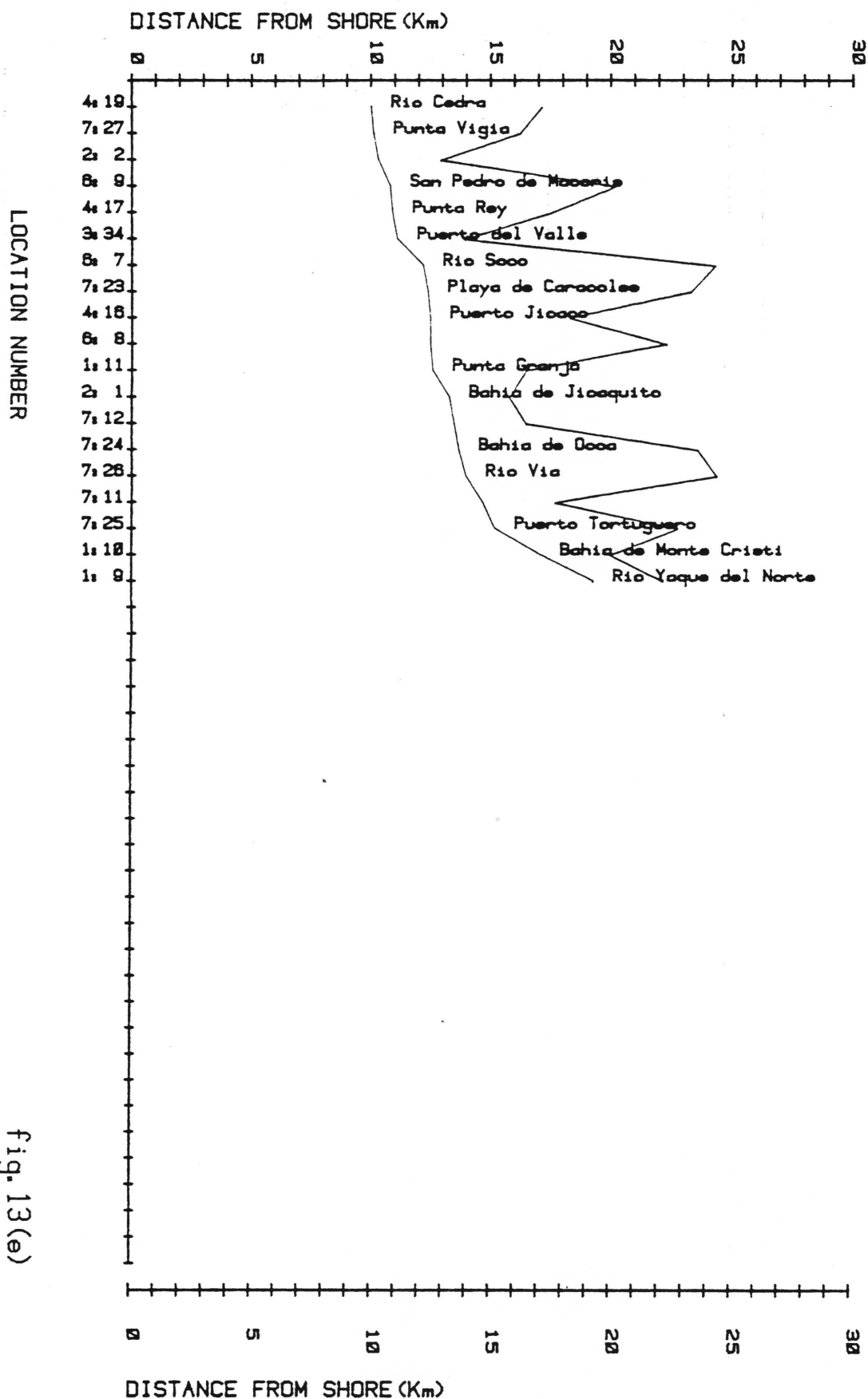


fig. 13(e)

distance from shore to the 1000 m contour varies in such a way that when the 200 m contour is close to shore (see Figure 13, pages 1 & 2), 1000 m is found anywhere from 3 to 25 km from shore. This discrepancy diminishes as the 200 m contour is found further from shore (Figure 13, pages 3-5) and illustrates the nature of the continental margin surrounding the Dominican Republic. Frequently, the wider the continental shelf, the steeper is the ensuing slope.

The 200 m contour is closest to shore at Puerta Guayacan on the Semana Peninsula where it is less than 500 m from land and farthest at Rio Yacque del Norte, adjacent to the Banco de Monte Cristi where it is 19.3 km offshore.

1.7.2.2 Distance to the 1000 m Contour

Table 4 and Figure 14 were prepared using programs "Nsort" and "Coast1" to sort the data at each location in order of increasing distance to the 1000 m contour.

Water 1000 m deep is found three kilometers from shore¹ near Caledon (Enriquillo) and 27 km offshore opposite the Banco de Monte Cristi at Punta Icacos.

1.7.3 Data Sorted by Gradient of Bathymetric Slope

We make some assumptions about the width of the continental shelf surrounding the Dominican Republic (Menard and Smith, 1966) and have assumed that the 200 m contour is approximately at the shelf/slope break. Then the distance between the coastline and the

¹Water of 1000 m, closer to shore than 3 km, was found in certain locations when we constructed bathymetric charts of these regions.

TABLE 4
DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 1000m contour

PAGE # 1

DIST.-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
3.0		7	49	0.9
3.2	Punta Martin Garcia	7	35	1.3
3.2		7	48	1.4
3.3		7	44	1.2
3.3		7	43	1.2
3.6	P. Guzmancito	2	24	1.2
4.0	Punta Salinas	7	15	< 2.0
4.0	Cabo Cabron	3	38	NSG
4.2		7	34	1.6
4.3	Puerta Guayacan	3	44	< 0.5
4.3	Punta Musundi	7	45	0.6
4.4	Punta Vaca	3	43	< 1.1
4.4		6	19	NSG
4.5		7	50	1.6
4.6	Punta Capitulo	7	47	1.2
4.6	Punta Patilla	2	23	1.4
4.6		3	37	3.4
4.8	Rio Cito	7	46	0.9
4.8	Puerto Souffle	2	22	1.1
4.8	Luperon	2	19	1.1
4.8	Cabo Frances Viejo	3	12	1.2
4.9	Punta Tres Amores	3	13	1.3
5.0	Punta Cabras	2	25	2.5
5.1	Cabo Caucedo	6	18	1.4
5.1		2	18	2.0
5.2	Cabo Beata	8	6	< 4.6
5.3	Punta Prieta	7	42	2.4
5.5	Punta La Playuela	3	45	< 1.0
5.5		3	9	1.9
5.5	Punta El Cabito	3	42	NSG
5.6	Punta Savaneta	3	14	1.7
5.6		2	21	1.9
5.6	Cabo Falso	8	14	< 2.5
5.7	Conspic Loma	8	5	2.5
5.8		3	11	1.5
5.9		7	51	< 2.0
6.0	Puerto Cabaret	2	38	1.5
6.0	Cabo Tutinfierno	3	10	1.3
6.1		8	4	2.4
6.3		2	30	2.3
6.4	Puerto la Isla	2	26	1.6
6.4		2	31	3.0
6.4	Punta Calderas	7	16	NSG
6.5		2	34	2.0
6.6		7	33	2.6
6.6	Puerto Plato	2	29	2.6
6.6	Cayo Pisaje	7	52	3.0
6.8	Puerta de Diego	3	46	< 1.3
6.8	Rio Conarejos	2	33	2.2
6.9		3	36	5.2
7.0	Puerto Sosua	2	35	1.2
7.0	Punta Cabaret	2	39	1.5
7.2	Baie de Anejas	3	15	1.4
7.2		6	15	2.0
7.2	Barahona	7	41	4.1

TABLE 4
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 1000m contour

PAGE # 2

DIST.-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
7.4	Cabo Rojo	8	18	1.6
7.4	Punta Ocoa	7	19	NSG
7.5		8	3	2.5
7.6	Bahia de Neiba	7	36	4.2
7.6	Playa Inglesa	7	53	NSG
7.7	Punta de las Aguilas	8	17	2.0
7.7	Cabo Macoris	2	37	2.4
7.7	Punta Sersantin	2	32	2.9
7.8	Punta Cabo Isabela	2	17	3.0
7.8	La Caleta	6	20	3.6
7.9	Punta Sandanilla	7	14	< 5.0
8.1	Punta Balandra	3	47	NSG
8.2	Playa Inglesa	8	1	< 2.8
8.2		2	28	3.2
8.3	Bahia de Neiba	7	40	4.6
8.4	Punta Magdalena	6	14	2.9
8.5	Punta de Buren(<2mi)	2	12	3.4
8.5	Punta Bonita	3	28	4.0
8.7	Cabo Macoris	2	36	1.9
8.8	Ensenada de los Aguilas	8	16	0.8
8.9	Cabo Monzon	8	2	2.2
9.0	Rio Ocoa	7	20	0.6
9.0	Mamevito	6	22	1.1
9.1	Las Terenas	3	29	3.5
9.2		6	21	1.8
9.2	Anse Joseph	8	19	2.3
9.3	Grisari	3	8	3.1
9.3	Andres	6	17	NSG
9.4	Puerto Viejo de Azua	7	32	3.0
9.4	Bahia de Neiba	7	37	3.2
9.4		3	30	4.0
9.5	Punta Estero Honda(<2mi)	2	13	1.4
9.7	Los Frailes	6	23	0.6
9.8	Punta Lanza	3	32	5.4
9.9	Punta Nisibon	4	22	4.9
10.0		3	15	1.5
10.0	Punta Pescadores	3	31	4.4
10.0	Anse Trou Jacob	8	20	< 5.0
10.1		3	27	4.2
10.1	Canal de la Beata	8	7	0.8
10.2	Rio Tabara	7	30	3.1
10.2	Rio Jura	7	29	7.7
10.4	Puerta Jackson	3	26	2.6
10.4	Punta las Galeras	3	41	NSG
10.5	Rio Yaque del Sur	7	39	3.6
10.5		3	35	9.0
10.5	Bahia de Andres	6	16	NSG
10.5	Otra Banda	7	38	2.7
10.6	La Ermita	3	4	4.9
10.7		4	23	5.7
10.8	Rio Nagua	3	21	1.5
10.8	Punta Cefirien	8	21	3.8
10.9	La Playa	3	30	2.8
11.0	Playa Poza Piedra	2	14	1.2
11.0	Punta Ermitano	3	33	7.7

TABLE 4

PAGE # 3

DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
 Listed by increasing distance of the 1000m contour

DIST.-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
11.1	Guayacanes	6	13	4.0
11.2	Near Punta Rucia	2	11	6.2
11.3		3	19	3.9
11.3		7	13	8.5
11.4	Puerto Viejo de Azua	7	31	5.9
11.6	Rio Colorado	3	22	4.3
11.7		4	21	7.2
11.8	Juandolio	6	12	4.8
12.0	Puerto Salina Chica	2	5	9.6
12.0	Playa de Rincon	3	40	NSG
12.2		3	7	3.9
12.2		3	5	5.4
12.2		4	24	5.5
12.2		2	7	7.8
12.2		2	3	9.2
12.3		6	24	0.9
12.3	Puerto Juanita	2	10	7.2
12.3		2	8	7.5
12.3		2	6	8.6
12.4	Punta Lasuna Grande	3	17	1.8
12.4	Rio Joba	3	3	5.3
12.5		7	28	6.7
12.8	Rio Sajon	3	18	4.1
12.9	Rio Salado	3	16	2.2
12.9		2	2	10.3
13.0	Reisero Axul	8	12	2.6
13.0	Playa la Poza Marisosta	2	15	3.7
13.0	Punta Arena	3	25	4.5
13.1	La Isabela	2	16	4.1
13.1		2	9	6.6
13.2	Rio Pedernales	8	22	4.9
13.3	Cabo Falso	8	13	< 1.4
13.3	Rio Yastica	3	1	5.0
13.4	Bahia del Rincon	3	39	NSG
13.5		6	11	6.5
13.6	Lasuna de Ori	3	2	5.1
13.7		3	6	4.9
13.9	Puerto del Valle	3	34	11.1
13.9	Punta Limon	4	20	8.7
14.1	Canal de la Beata	8	8	7.0
14.3	Punta Manale	2	4	9.3
14.4	Santo Domingo	6	25	1.3
14.4		3	23	5.5
14.4		4	25	6.0
15.1	Boca de Gran Estero	3	24	6.5
15.5		6	26	1.2
15.7	Punta Laurentina	6	10	7.8
15.8	Bahia de Jicauito	2	1	13.3
16.0		6	27	1.0
16.2	Punta Vieja	7	27	10.1
16.5	Punta Granja	1	11	12.6
16.5		7	12	13.5
16.9		8	11	6.2

TABLE 4
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 1000m contour

PAGE # 4

DIST.-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
17.0	Agu de la Estancia	7	10	6.5
17.1		5	18	3.2
17.1	Rio Cedra	4	19	10.0
17.5	Punta Rey	4	17	10.9
17.7	Punta Lasuna	5	19	3.5
17.7		7	11	<14.7
18.0	Arroyo Nigua	7	1	1.6
18.0	Cabo San Rafael	4	18	9.8
18.1	Punta Mangle	4	11	NSG
18.2	Punta Cacaon	5	20	2.4
18.3	Puerto Jicaco	4	16	<12.5
18.5		7	9	5.0
18.8	Punta Hatillo	7	22	7.7
19.0		7	2	1.0
19.1	Punta Acecho	8	10	8.2
19.3		7	21	3.5
19.7	Pta Canto de la Playa	5	17	4.5
19.9		7	8	6.7
20.0	Punta Catuano	5	21	3.0
20.0	Bahia de Monte Cristi	1	10	17.1
20.2	San Pedro de Macoris	6	9	10.8
20.4		6	4	7.3
20.4		6	5	7.7
20.5	Punta Najayo	7	3	1.3
20.5		6	3	5.0
21.3		8	9	7.6
21.3	Punta Mortero	6	6	3.8
21.5	Punta Jallan	4	12	NSG
21.6	Rio Jovero	4	14	NSG
21.9	Arroyo Catalina	7	7	5.6
22.0	Punta Magua	4	7	NSG
22.1	El Morro Gordo	4	13	NSG
22.2	Rio Yaque del Norte	1	9	19.3
22.3		6	2	< 6.3
22.3		6	8	12.5
22.8	Puerto Tortuguero	7	25	15.2
23.0	Punta Yuna	1	7	NSG
23.0	La Romana	6	1	< 1.0
23.0	Arroyo Najayo	7	4	1.7
23.2		5	23	1.9
23.3	Playa de Caracoles	7	23	12.4
23.4	La Bocana	4	8	NSG
23.5	Paso de Catuan	5	22	3.0
23.6	Bahia de Ocra	7	24	13.7
23.8	Punta Palenque	7	5	2.4
24.0	Rio Dulce	5	29	< 1.5
24.0		5	24	1.8
24.0	Punta Minas	5	28	5.0
24.3		1	8	NSG
24.3	Rio Soco	6	7	12.2
24.4	Rio Via	7	26	14.0
24.5		5	25	2.4

TABLE 4

PAGE # 5

DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by increasing distance of the 1000m contour

DIST.-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
24.7	Las Canitas	4	6	NSG
24.8	Puerto Palenque	7	6	3.0
25.0	Boca de Chavon	5	27	3.7
25.0	Punta Capitan	4	5	NSG
25.2	Bahia de Altaeracia	5	26	2.4
27.1	Punta Icacos	1	6	NSG
NDL	Bahia de Maimon	2	27	2.3
NDL	Punta Matasola	7	18	NDL
NDL	Bahia de las Calderas	7	17	NDL
NDL	Punta Jicaco	4	15	NDL
NDL	Bahia de la Gina	4	10	NDL
NDL	Punta Miguel	4	9	NDL
NDL	Cano Quintano	2	20	NDL
NDL	Punta Manzanillo	1	5	NSG
NDL		1	4	NSG
NDL	Barrisa de Vaca	1	3	NSG
NDL	Estero Balza	1	2	NSG
NDL	Rio Dajabon	1	1	NSG
NSG	Punta Pascuala	4	4	NSG
NSG	Punta la Bandera	4	3	NSG
NSG	Bahia Carenero	4	2	NSG
NSG	Punta Cacao	4	1	NSG

Distance of 200 & 1000m contours from shore-by increasing dist. of 1000m contour
 KEY- 1: 5=Chart#1, Location#5;
 From 3.0Km to 6.5Km

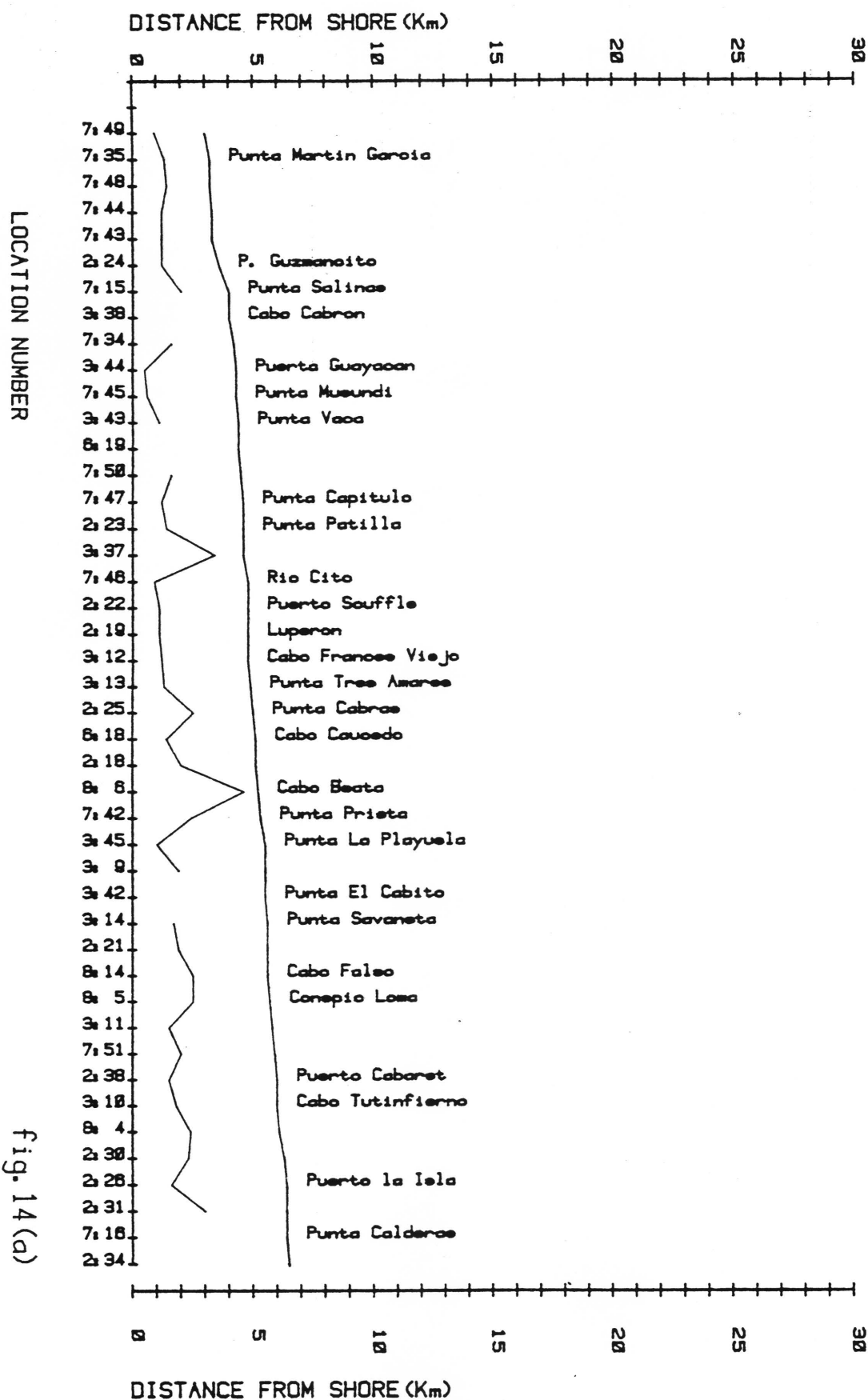


fig. 14(a)

Distance of 200 & 1000m contours from shore-by increasing dist. of 1000m contour
 KEY- 1: 5=Chart#1; Location#5
 From 6.6Km to 9.9Km

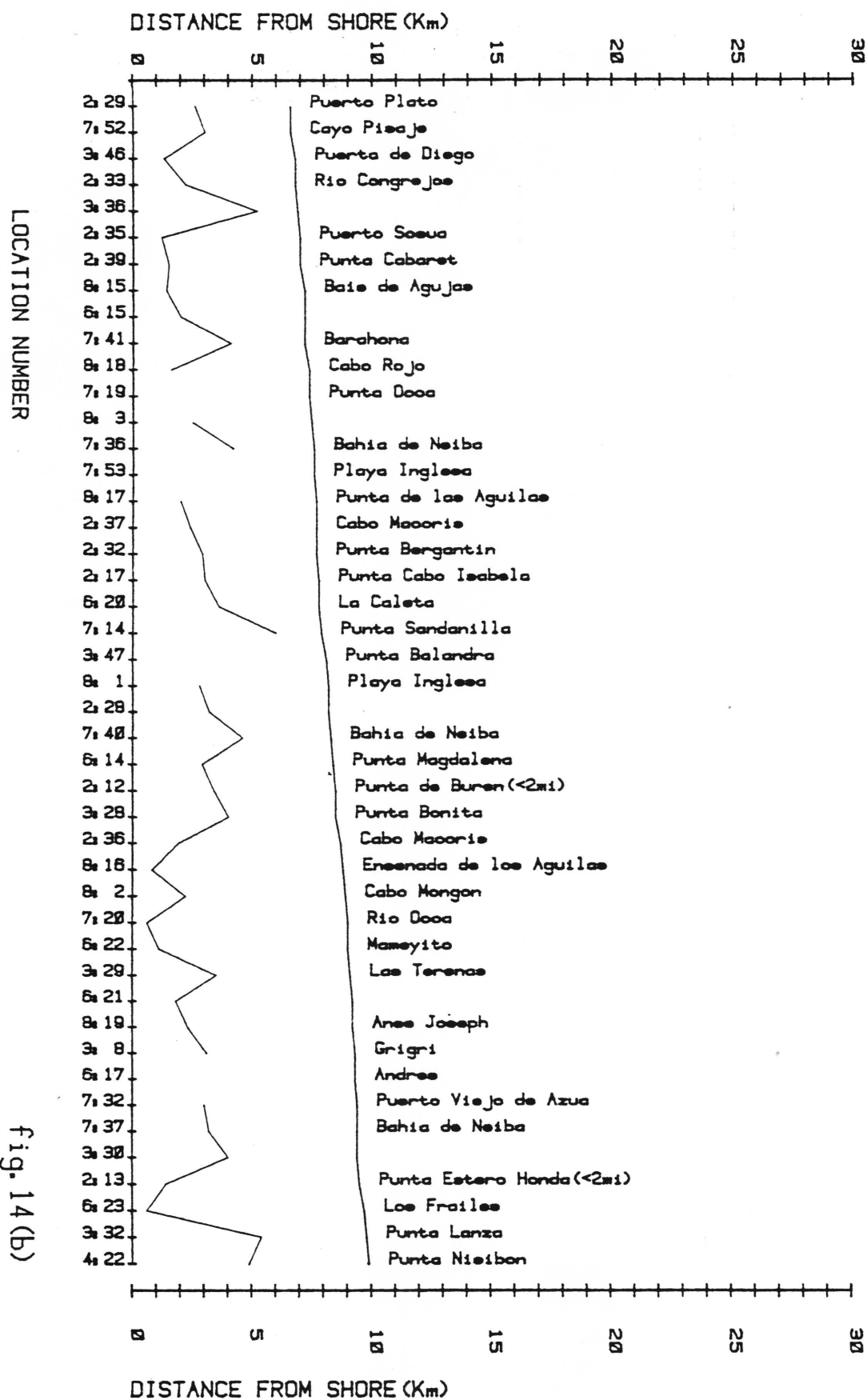


fig. 14 (b)

Distance of 200 & 1000m contours from shore-by increasing dist. of 1000m contour
 KEY- 1: 5=Chart#1; Location#5,
 From 10.0Km to 12.9Km

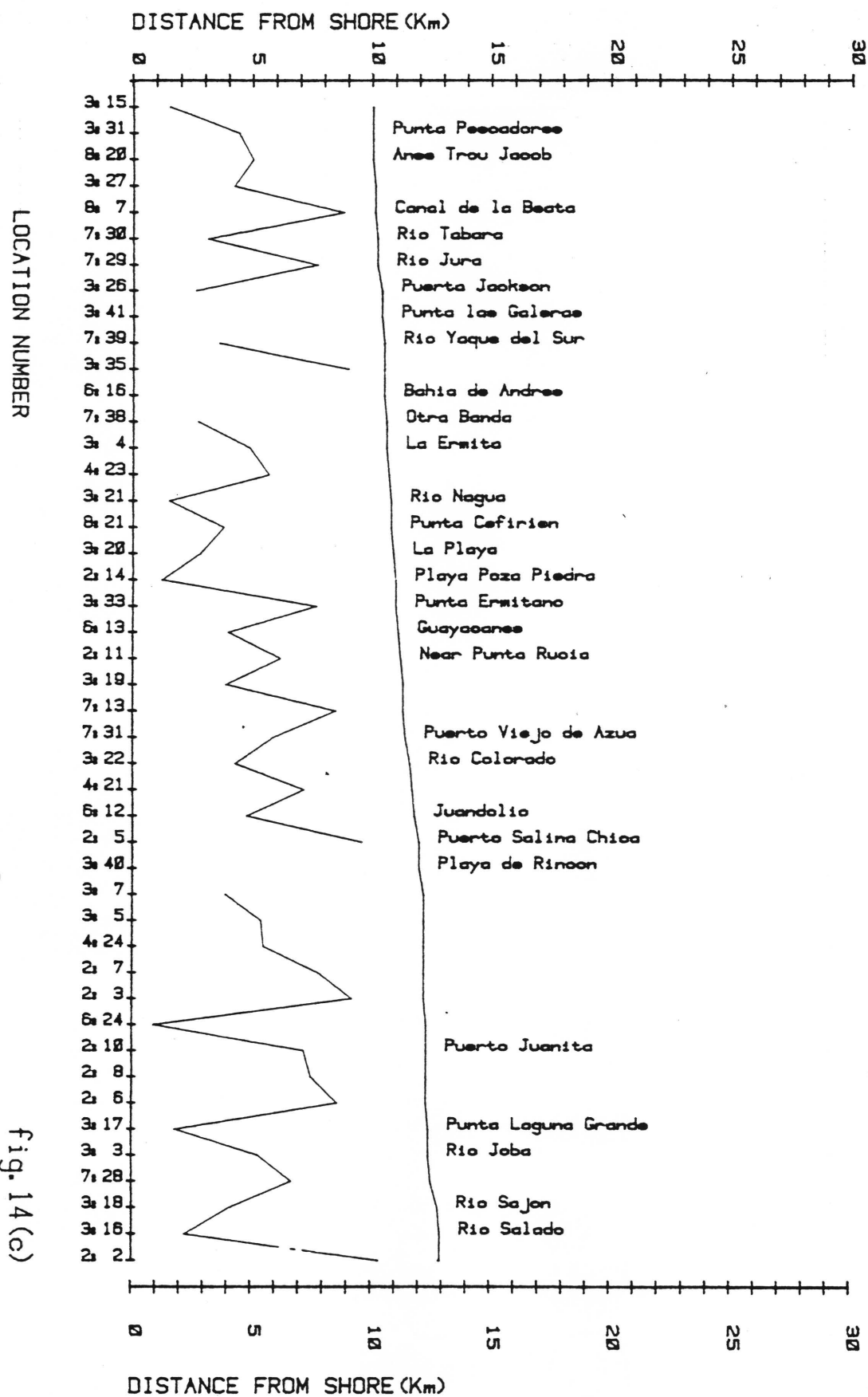


fig. 14(c)

Distance of 200 & 1000m contours from shore-by increasing dist. of 1000m contour
 KEY- 1: 5=Chart#1, Location#5
 From 12.2Km to 17.0Km

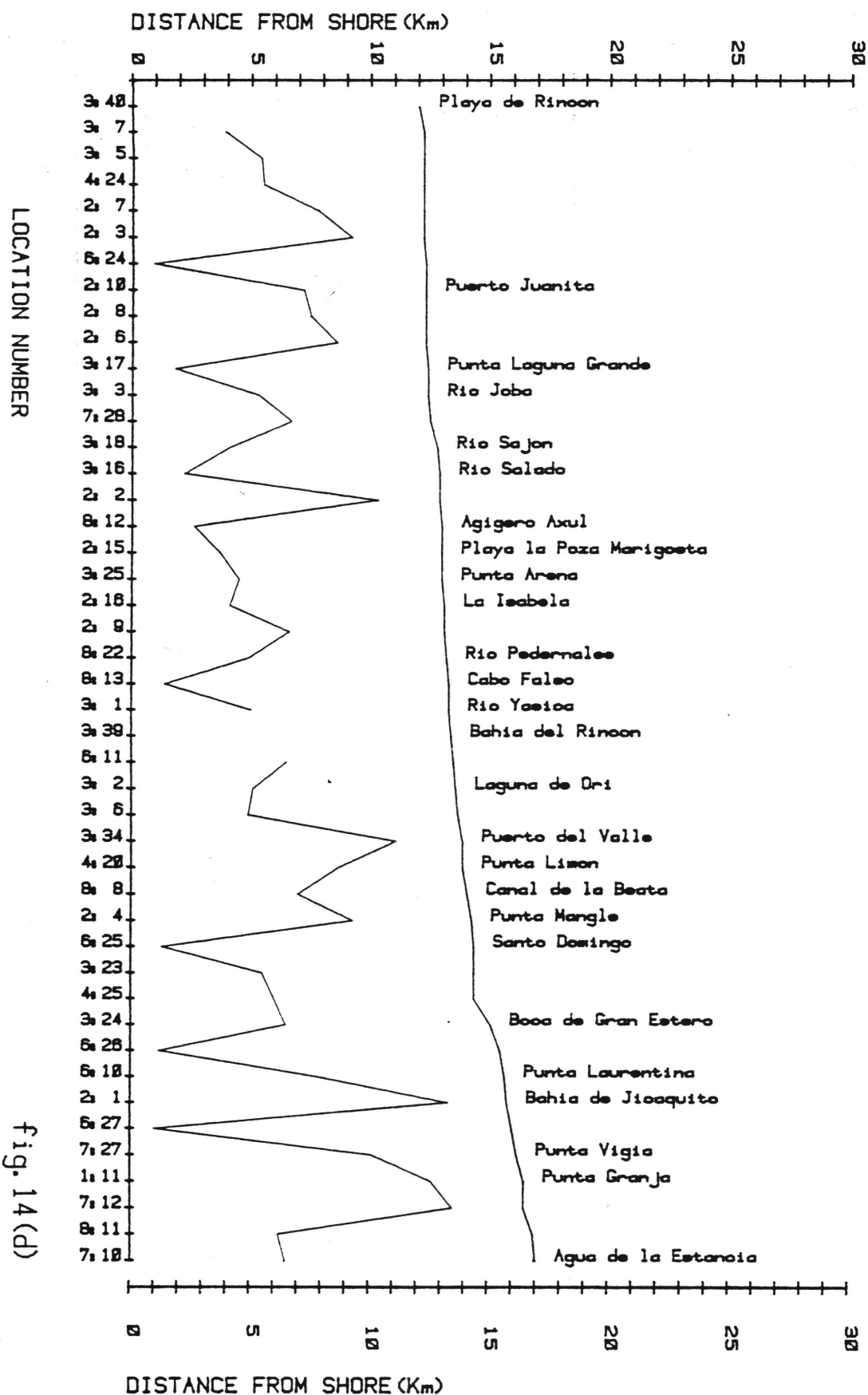


fig. 14(d)

Distance of 200 & 1000m contours from shore-by increasing dist. of 1000m contour
 KEY- 1: 5=Chart#1, Location#5;
 From 17.1km to 24.0km

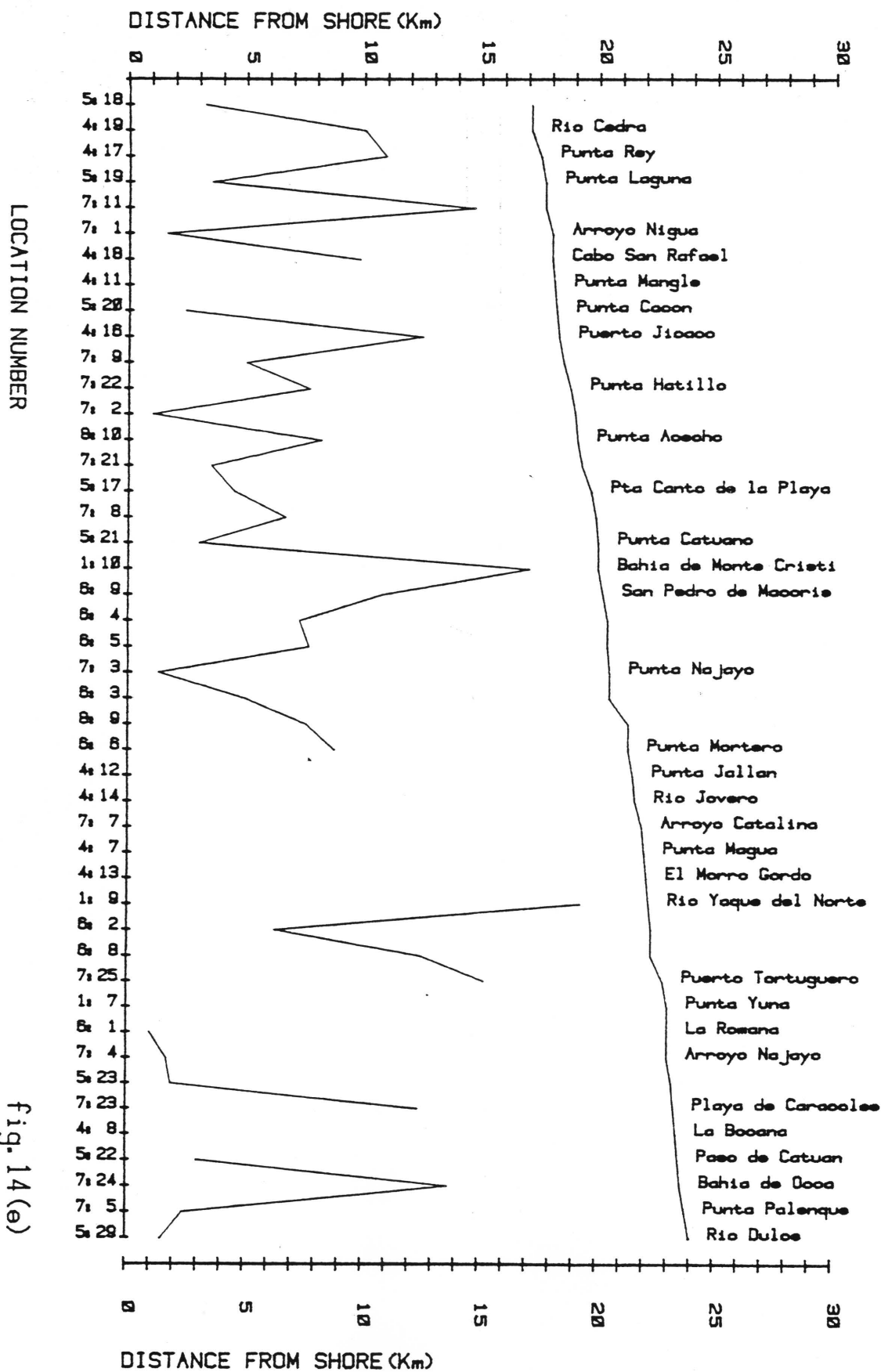


fig. 14(e)

Distance of 200 & 1000m contours from shore-by increasing dist. of 1000m contour
 KEY- 1: 5=Chart#1, Location#5, From 24.0Km to 27.1Km

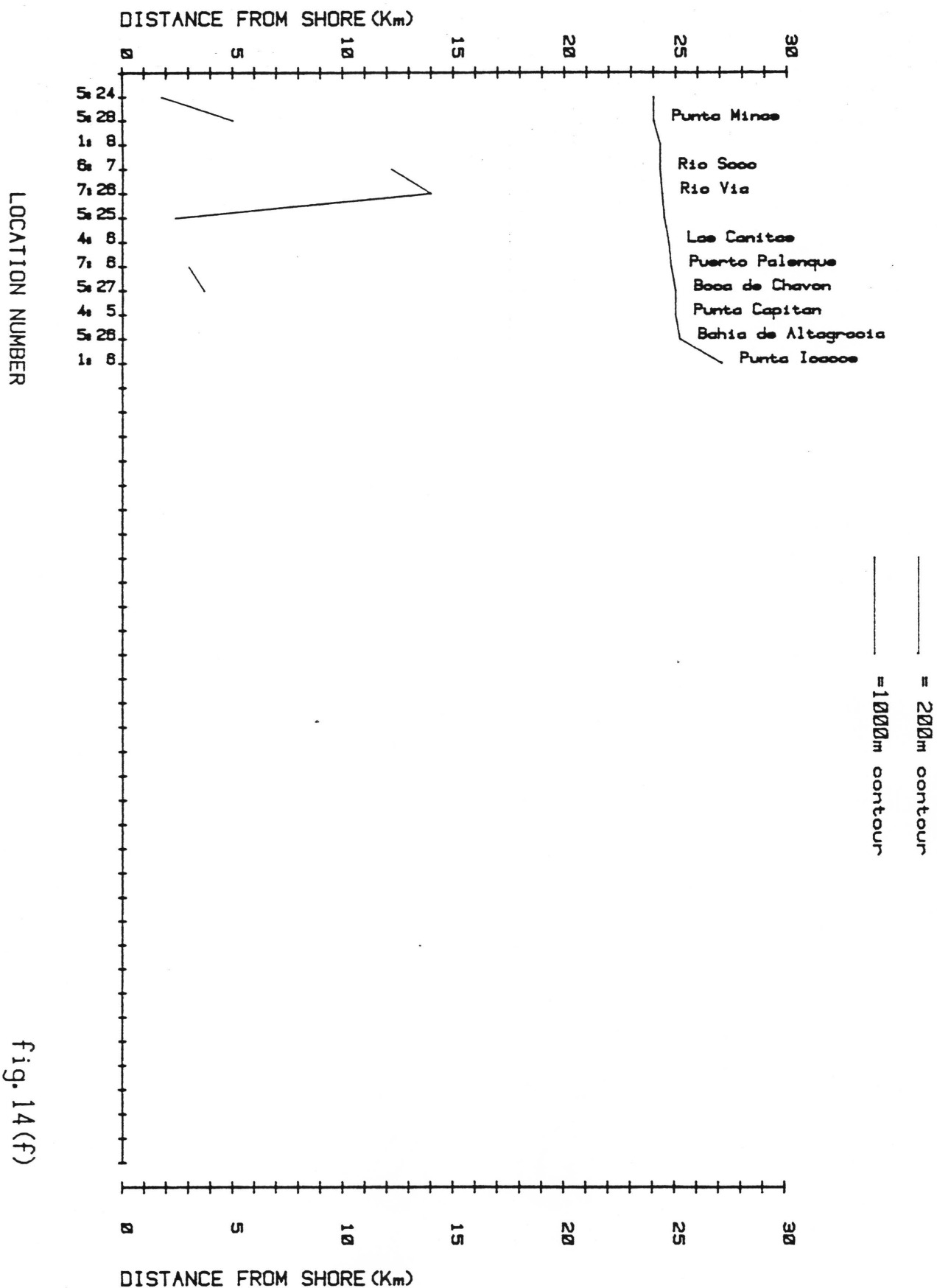


fig. 14(f)

200 m contour is the width of the shelf and the gradient between the 200 m contour and the 1000 m contour is the gradient of the slope. It must be stressed that these are approximations only, but do serve to illustrate the nature and variability of the near-shore submarine topography of the Dominican Republic.

1.7.3.1 Gradient of the Continental Slope

Table 5 and Figure 15 show that the steepest gradients are in excess of 1000 m (depth) per 1 km horizontal distance (or greater than a 45° slope). In only a few places are such steep slopes found; gradients between 1300 m/km and 300 m/km are found off Cabo Cabron, from Barahona to Canal de la Beata and near Cabo Isabel[a]. The steepest gradient of all is found at Cabo Beata (1333 m/km). Some of the steeper slopes are found off the shallow Banco de Monte Cristi, while the least gradients (50-35 m/km) are found off Santo Domingo where the 200 m contour is very close to shore. The average distance between the 200 m and 1000 m contours is 7.6 km and the average gradient of the slope is 165 m/km.

1.7.3.2 Gradient of the Continental Shelf

In Figure 16 the red vertical lines show the distance from shore to the 200 m contour, i.e., the approximate width of the shelf. This width varies from <0.5 km at Puerto Guayacan off the Semana Peninsula to 19.3 km at Rio Yacque del Norte opposite the Banco de Monte Cristi. The average width is 4.5 km; the gradients vary from 400 m/km to 10 m/km at the above locations with a mean value of 81 m/km. Place-names on Figure 16 are located starting at the distance of the 1000 m contour from shore. Where no place-names are known, a

TABLE 5
DOMINICAN REPUBLIC: Gradients of the Continental slope
Listed by decreasing gradient (between 200 & 1000m contours)

PAGE # 1

GRADIENT (m/Km) 200-1000m	DISTANCE	PLACE NAME	CHART	LOC#	DIST.-200m
1333.3	0.6	Cabo Beata	8	6	< 4.6
656.7	1.2		3	37	3.4
615.4	1.3	Canal de la Beata	8	7	3.8
533.3	1.5		3	35	9.0
470.6	1.7		3	36	5.2
444.4	1.8		7	48	1.4
421.1	1.9	Punta Martin Garcia	7	35	1.3
421.1	1.9	Punta Sandanilla	7	14	< 6.0
400.0	2.0	Punta Salinas	7	15	< 2.0
381.0	2.1		7	49	0.9
381.0	2.1		7	44	1.2
381.0	2.1		7	43	1.2
333.3	2.4	P. Guzmancito	2	24	1.2
333.3	2.4	Puerto Salina Chica	2	5	9.6
320.0	2.5	Punta Cabras	2	25	2.5
320.0	2.5	Rio Jura	7	29	7.7
320.0	2.5	Bahia de Jicauito	2	1	13.3
307.7	2.6		7	34	1.6
307.7	2.6		2	2	10.3
285.7	2.8		7	13	8.5
285.7	2.8	Puerto del Valle	3	34	11.1
275.9	2.9		7	50	1.6
275.9	2.9	Punta Prieta	7	42	2.4
275.9	2.9	Bahia de Monte Cristi	1	10	17.1
275.9	2.9	Rio Yaque del Norte	1	9	19.3
266.7	3.0		2	3	9.2
266.7	3.0		7	12	13.5
266.7	3.0		7	11	< 14.7
258.1	3.1		2	18	2.0
258.1	3.1	Cabo Falso	8	14	< 2.5
258.1	3.1	Barahona	7	41	4.1
250.0	3.2	Punta Patilla	2	23	1.4
250.0	3.2	Consejo Loma	8	5	2.5
242.4	3.3	Punta Vaca	3	43	< 1.1
242.4	3.3	Punta Ermitano	3	33	7.7
235.3	3.4	Punta Capitulo	7	47	1.2
235.3	3.4		2	31	3.0
235.3	3.4	Bahia de Neiba	7	36	4.2
222.2	3.6	Cabo Frances Viejo	3	12	1.2
222.2	3.6	Punta Tres Amores	3	13	1.3
222.2	3.6		3	9	1.9
222.2	3.6	Cayo Pisaje	7	52	3.0
216.2	3.7	Punta Musundi	7	45	0.6
216.2	3.7	Puerto Souffle	2	22	1.1
216.2	3.7	Luperon	2	19	1.1
216.2	3.7	Cabo Caucedo	6	18	1.4
216.2	3.7		2	21	1.9
216.2	3.7		8	4	2.4
216.2	3.7	Bahia de Neiba	7	40	4.6
216.2	3.7		2	6	8.6
210.5	3.8	Puerta Guayacan	3	44	< 0.5
205.1	3.9	Rio Cito	7	46	0.9

TABLE 5
DOMINICAN REPUBLIC; Gradients of the Continental slope
Listed by decreasing gradient (between 200 & 1000m contours)

PAGE # 2

GRADIENT (m/Km)	DISTANCE 200-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
205.1	3.9	Punta Savaneta	3	14	1.7
205.1	3.9		7	51	< 2.0
205.1	3.9	Punta Granja	1	11	12.6
200.0	4.0		2	30	2.3
200.0	4.0		7	33	2.6
200.0	4.0	Puerto Plato	2	29	2.6
190.5	4.2	Cabo Tutinfierno	3	10	1.8
190.5	4.2	La Caleta	6	20	3.6
186.0	4.3		3	11	1.5
181.8	4.4	Punta Lanza	3	32	5.4
181.8	4.4		2	7	7.8
177.8	4.5	Punta La Playuela	3	45	< 1.0
177.8	4.5	Puerto Cabaret	2	38	1.5
177.8	4.5		2	34	2.0
177.8	4.5	Punta Bonita	3	28	4.0
177.8	4.5		4	21	7.2
173.9	4.6	Rio Congrejos	2	33	2.2
166.7	4.8	Puerto la Isla	2	26	1.6
166.7	4.8	Punta Bersantin	2	32	2.9
166.7	4.8	Punta Cabo Isabela	2	17	3.0
166.7	4.8		2	8	7.5
160.0	5.0		8	3	2.5
160.0	5.0		2	28	3.2
160.0	5.0	Punta Nisibon	4	22	4.9
160.0	5.0	Anse Trou Jacob	8	20	< 5.0
160.0	5.0		4	23	5.7
160.0	5.0	Near Punta Rucia	2	11	6.2
160.0	5.0	Punta Manale	2	4	9.3
156.9	5.1	Punta de Buren(<2mi)	2	12	3.4
156.9	5.1	Puerto Juanita	2	10	7.2
153.8	5.2		6	15	2.0
153.8	5.2	Punta Linon	4	20	8.7
150.9	5.3	Cabo Macoris	2	37	2.4
148.1	5.4	Playa Inglesa	8	1	< 2.8
148.1	5.4		3	30	4.0
145.5	5.5	Puerta de Diego	3	46	< 1.3
145.5	5.5	Punta Cabaret	2	39	1.5
145.5	5.5	Punta Magdalena	6	14	2.9
145.5	5.5	Puerto Viejo de Azua	7	31	5.9
142.9	5.6	Las Terenas	3	29	3.5
142.9	5.6	Punta Pescadores	3	31	4.4
140.4	5.7	Punta de las Aguilas	8	17	2.0
140.4	5.7	La Ermita	3	4	4.9
137.9	5.8	Puerto Sosua	2	35	1.2
137.9	5.8	Baie de Anejas	8	15	1.4
137.9	5.8	Cabo Rojo	8	18	1.6
137.9	5.8		7	28	6.7
137.9	5.8	Puerto Jicaco	4	16	< 12.5
135.6	5.9		3	27	4.2
131.1	6.1	Punta Vieja	7	27	10.1
129.0	6.2	Grieri	3	8	3.1
129.0	6.2	Bahia de Neiba	7	37	3.2
125.0	6.4	Puerto Viejo de Azua	7	32	3.0
123.1	6.5		2	9	6.6
121.2	6.6	Punta Rey	4	17	10.9
119.4	6.7	Cabo Monzon	8	2	2.2
119.4	6.7		4	24	5.5

TABLE 5
DOMINICAN REPUBLIC: Gradients of the Continental slope
Listed by decreasing gradient (between 200 & 1000m contours)

PAGE # 3

GRADIENT (m/Km)	DISTANCE 200-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
117.6	6.8	Cabo Macoris	2	36	1.9
117.6	6.8		3	5	5.4
115.9	6.9	Anse Joseph	8	19	2.3
115.9	6.9	Rio Yaque del Sur	7	39	3.6
114.3	7.0	Punta Cefirien	8	21	3.8
114.3	7.0	Juandolio	6	12	4.8
114.3	7.0		6	11	6.5
112.7	7.1	Rio Tabara	7	30	3.1
112.7	7.1	Guayacanes	6	13	4.0
112.7	7.1	Rio Joba	3	3	5.3
112.7	7.1	Canal de la Beata	8	8	7.0
112.7	7.1	Rio Cedra	4	19	10.0
109.6	7.3	Rio Colorado	3	22	4.3
108.1	7.4		6	21	1.9
108.1	7.4		3	19	3.9
105.3	7.6	Puerto Tortuguero	7	25	15.2
102.6	7.8	Puerta Jackson	3	26	2.6
101.3	7.9	Mamevito	6	22	1.1
101.3	7.9	Otra Banda	7	39	2.7
101.3	7.9	Punta Laurentina	6	10	7.8
100.0	8.0	Ensenada de los Aguilas	8	16	0.8
98.8	8.1	Punta Estero Honda(<2mi)	2	13	1.4
98.8	8.1	La Playa	3	20	2.8
97.6	8.2	Cabo San Rafael	4	18	9.8
96.4	8.3		3	7	3.9
96.4	8.3	Rio Pedernales	8	22	4.9
96.4	8.3	Rio Yasica	3	1	5.0
95.2	8.4	Rio Ocoa	7	20	0.6
95.2	8.4		4	25	6.0
94.1	8.5		3	15	1.5
94.1	8.5	Punta Arena	3	25	4.6
94.1	8.5	Laguna de Ori	3	2	5.1
93.0	8.6	Boca de Gran Estero	3	24	6.5
92.0	8.7	Rio Sajon	3	18	4.1
90.9	8.8		3	6	4.9
89.9	8.9		3	23	5.5
88.9	9.0	La Isabela	2	16	4.1
87.9	9.1	Los Frailes	6	23	0.6
86.0	9.3	Rio Nasua	3	21	1.5
86.0	9.3	Playa la Poza Mariesta	2	15	3.7
85.1	9.4	San Pedro de Macoris	6	9	10.8
81.6	9.8	Playa Poza Piedra	2	14	1.2
81.6	9.8		6	8	12.5
80.8	9.9	Bahia de Ocoa	7	24	13.7
76.9	10.4	Asigero Axul	3	12	2.6
76.9	10.4	Rio Via	7	26	14.0
76.2	10.5	Agua de la Estancia	7	10	6.5
75.5	10.6	Punta Laguna Grande	3	17	1.8
74.8	10.7	Rio Salado	3	16	2.2
74.8	10.7		8	11	6.2
73.4	10.9	Punta Acecho	3	10	8.2
73.4	10.9	Playa de Caracoles	7	23	12.4
72.1	11.1	Punta Hatillo	7	22	7.7
70.2	11.4		6	24	0.9
67.2	11.9	Cabo Falso	8	13	< 1.4
66.1	12.1	Rio Soco	6	7	12.2
64.0	12.5	Punta Mortero	6	6	8.8

TABLE 5
DOMINICAN REPUBLIC: Gradients of the Continental slope
Listed by decreasing gradient (between 200 & 1000m contours)

GRADIENT (m/Km)	DISTANCE 200-1000m	PLACE NAME	CHART	LOC#	DIST.-200m
63.0	12.7		6	5	7.7
61.1	13.1	Santo Domingo	6	25	1.3
61.1	13.1		6	4	7.3
60.6	13.2		7	8	6.7
59.3	13.5		7	9	5.0
58.4	13.7		8	9	7.6
57.6	13.9		5	18	3.2
56.3	14.2	Punta Lasuna	5	19	3.5
55.9	14.3		6	26	1.2
53.3	15.0		6	27	1.0
52.6	15.2	Pta Canto de la Playa	5	17	4.5
51.6	15.5		6	3	5.0
50.6	15.8	Punta Cacon	5	20	2.4
50.6	15.8		7	21	3.5
50.0	16.0		6	2	< 6.3
49.1	16.3	Arroyo Catalina	7	7	5.6
48.8	16.4	Arroyo Nigua	7	1	1.6
47.1	17.0	Punta Catuano	5	21	3.0
44.4	18.0		7	2	1.0
42.1	19.0	Punta Minas	5	28	5.0
41.7	19.2	Punta Najayo	7	3	1.3
39.0	20.5	Paso de Catuan	5	22	3.0
37.6	21.3	Arroyo Najayo	7	4	1.7
37.6	21.3		5	23	1.9
37.6	21.3	Boca de Chavon	5	27	3.7
37.4	21.4	Punta Palenque	7	5	2.4
36.7	21.8	Puerto Palenque	7	6	3.0
36.4	22.0	La Romana	6	1	< 1.0
36.2	22.1		5	25	2.4
36.0	22.2		5	24	1.8
35.6	22.5	Rio Dulce	5	29	< 1.5
35.1	22.8	Bahia de Altavracia	5	26	2.4

Gradient of Continental Slope-arranged by decreasing gradient (200-1000m)

KEY: 1: 5=Chart#1; Location#5;

From 1333 meters/Km to 216 meters/Km

I = Distance between 200m & 1000m contour (located at distance of 200m contour from shore)
 — = Gradient of slope (meters/Km)

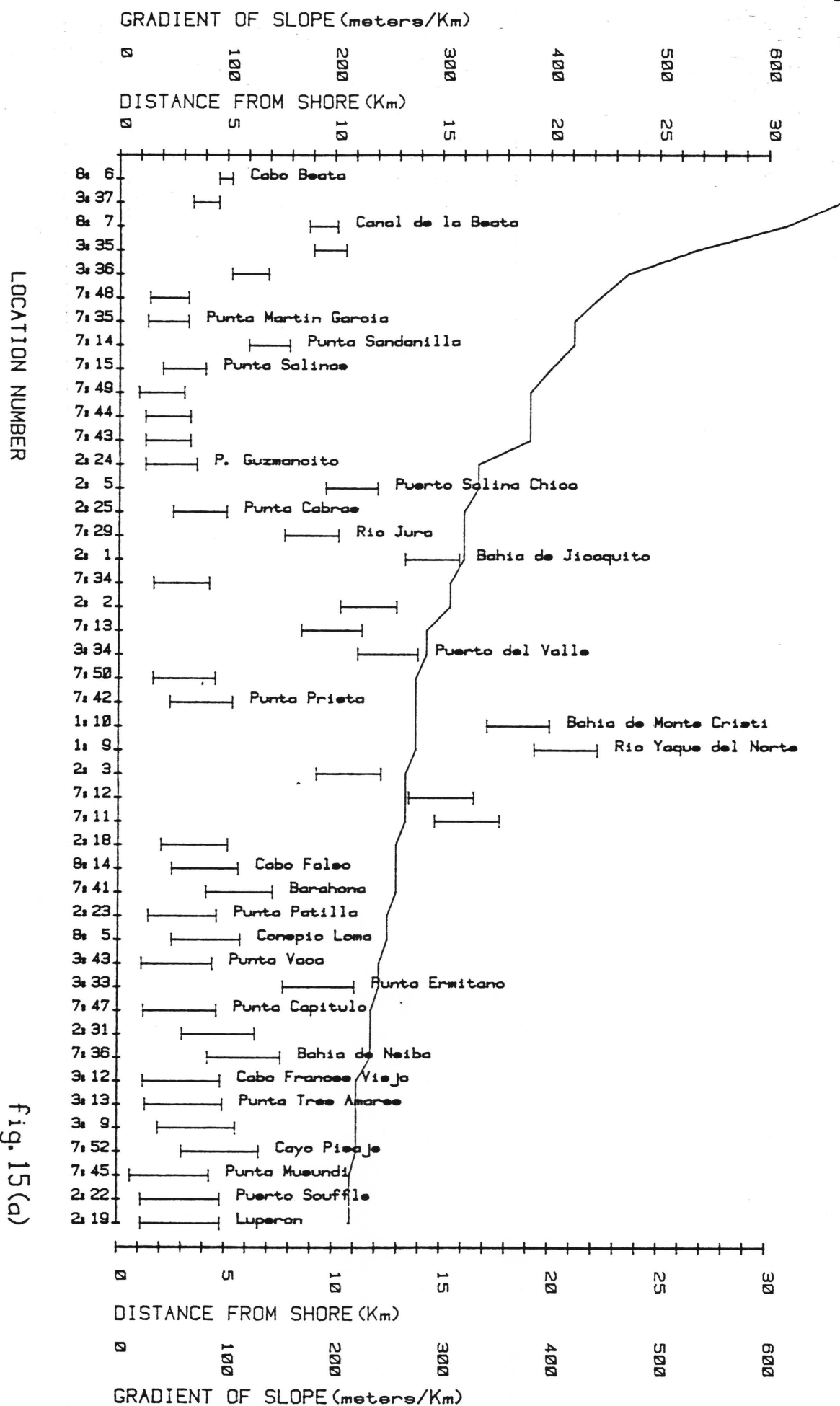


fig. 15(a)

Gradient of Continental Slope-arranged by decreasing gradient (200-1000m)

KEY- 1: 5=Chart#1; Location#5;

From 216 meters/Km to 145 meters/Km

— = Distance between 200m & 1000m contour (located at distance of 200m contour from shore)
 — = Gradient of slope (meters/Km)

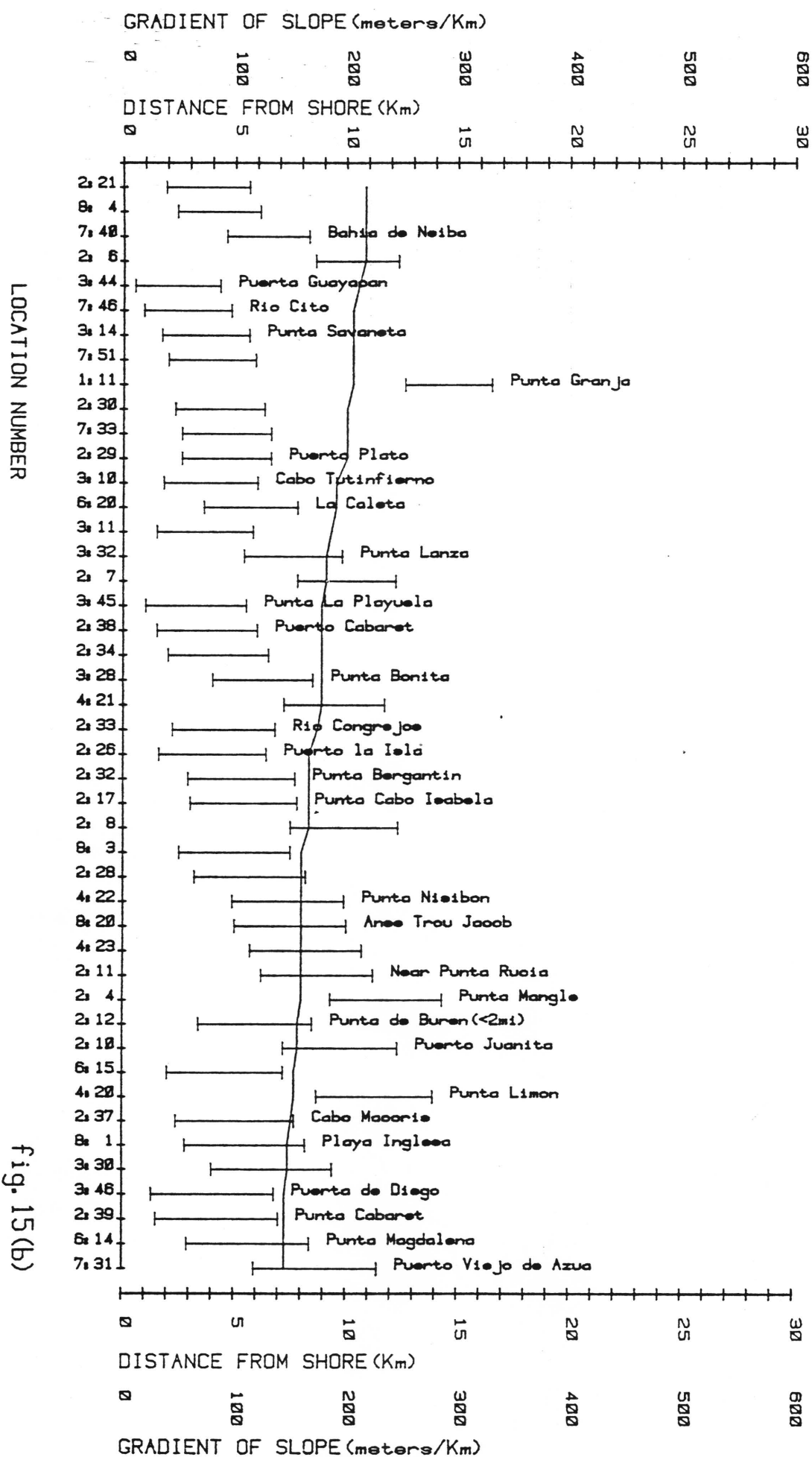


fig. 15(b)

Gradient of Continental Slope-arranged by decreasing gradient (200-1000m)

KEY- 1: 5=Chart#1, Location#5;

From 143 meters/Km to 96 meters/Km

— =Distance between 200m & 1000m contour (located at distance of 200m contour from shore)
 — =Gradient of slope (meters/Km)

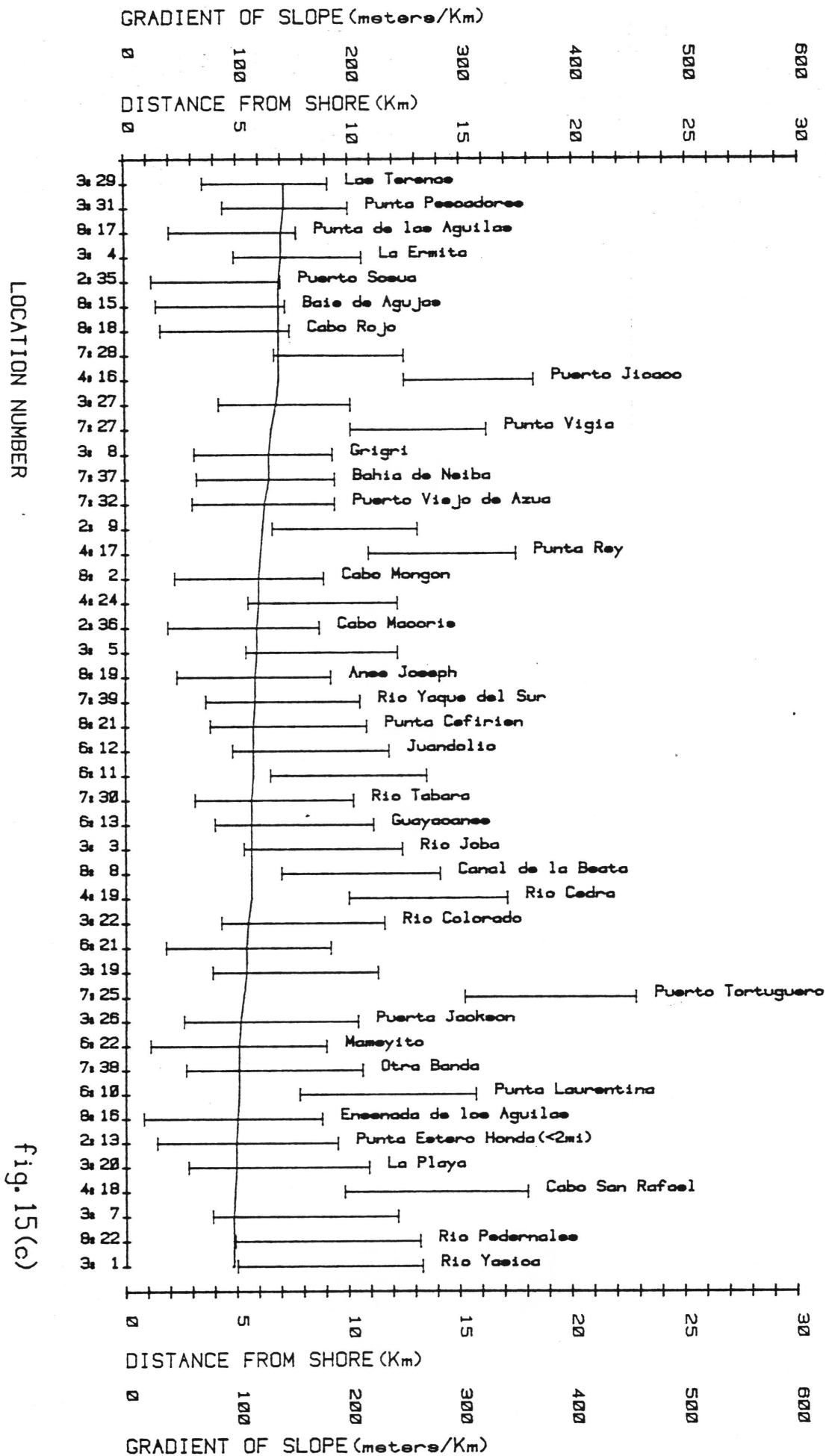


fig. 15(c)

Gradient of Continental Slope-arranged by decreasing gradient (200-1000m)

KEY- 1: 5=Chart#1; Location#5;

From 49 meters/Km to 35 meters/Km

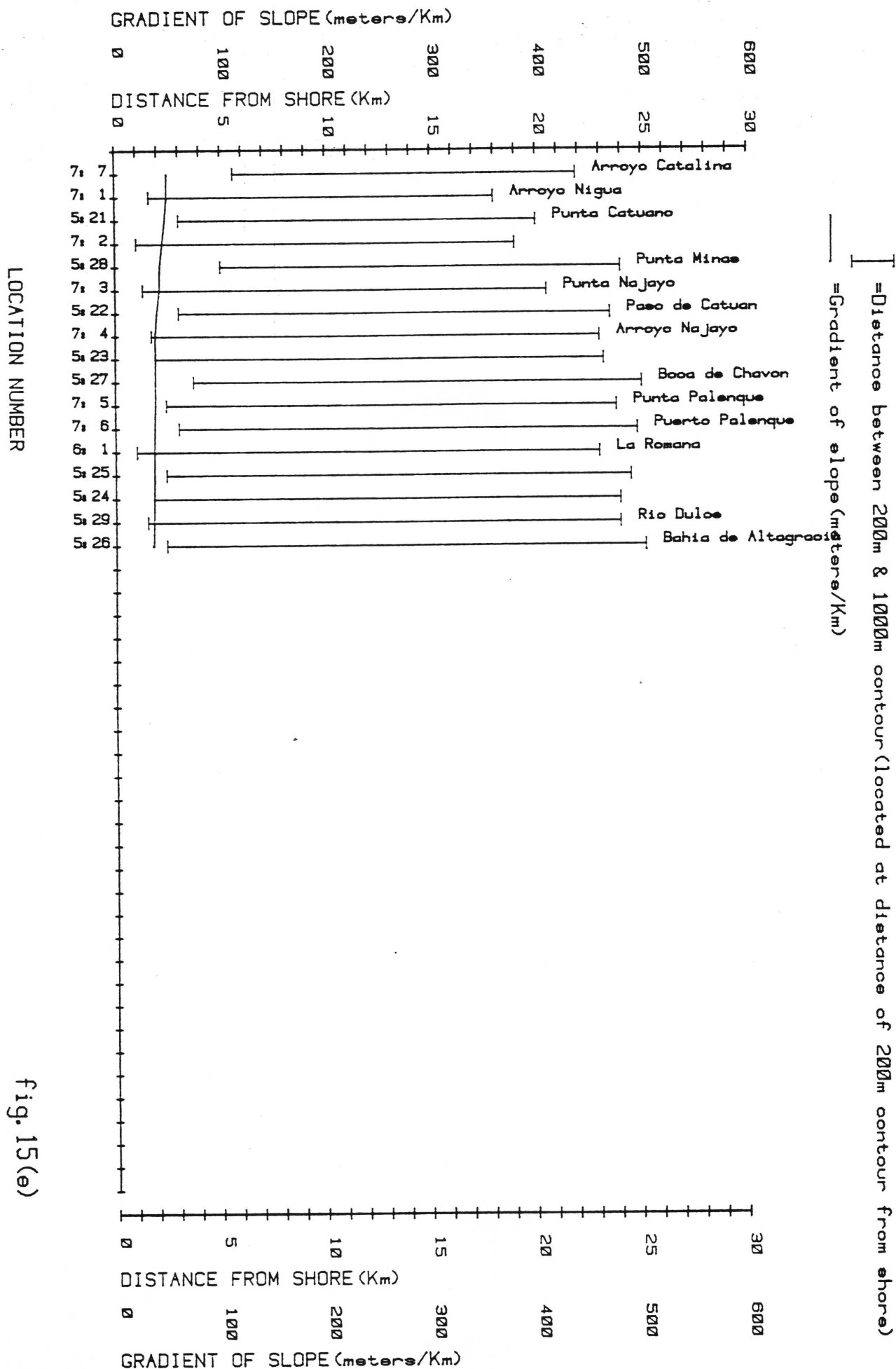


fig. 15(e)

short horizontal black bar shows the location offshore of 1000 m depth. Therefore, the gap between the bar representing the shelf width and the place name is the width of the slope. With increasing shelf width, the width of the slope varies considerably until the wider parts of the shelf are reached when the slope-width becomes much more consistent.

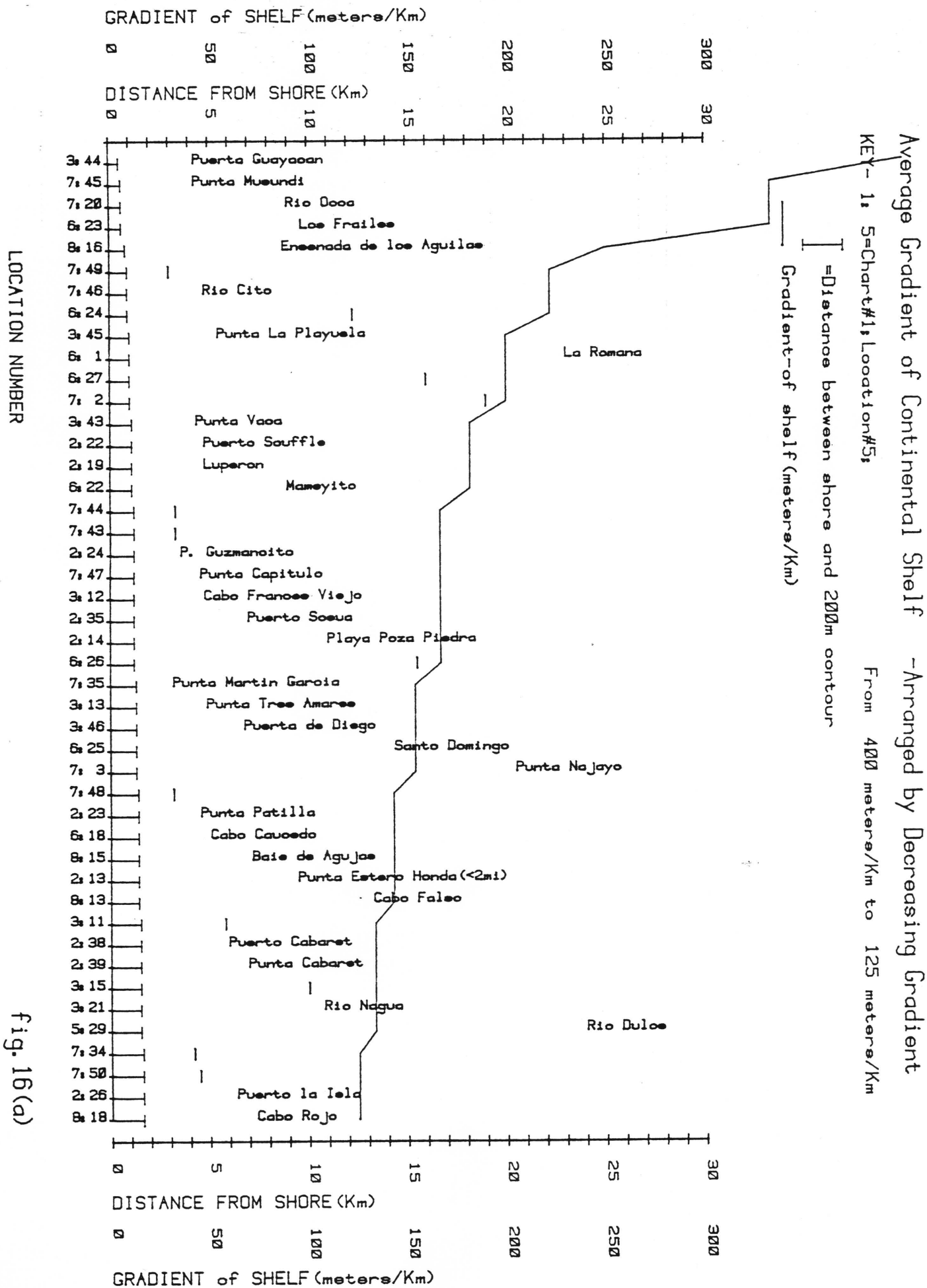
1.7.3.3 Average Gradient to the 1000 m Contour

The average gradient of the shelf and slope (i.e., the gradient of the ocean floor slope from the coastline to 1000 m) is shown in Figure 17. The red bars show the width of the slope and the gap between the graph base-line and the red bar is the width of the shelf. The distance to the 1000 m contour varies from 3 km to 27.1 km with an average of 12.5 km. The sea-floor gradients to 1000 m vary from 333 m/km to 37 m/km with a mean of 106.8 km.

The steepest average gradients to deep water are found along the south coast, from Barahona to Cabo Beata, followed by Cabo Isabela and Cabo Semana.

1.7.4 Data Sorted by Geographical Coastline Features

Table 6 was prepared using program "Asort3" by taking the coastline descriptions and sorting these in alphabetical order. It is an experimental sort only, to see if such classification of coastline types can be related to offshore bathymetry in any way suitable for this type of study. This classification suffers from (a) the descriptions' aptness to coastal navigation and not physiography; (b) our lack of direct familiarity with the Dominican Republic coastline and geographic regions.



Average Gradient of Continental Shelf - Arranged by Decreasing Gradient
 KEY- 1: 5=Chart#1; Location#5;
 From 118 meters/Km to 67 meters/Km

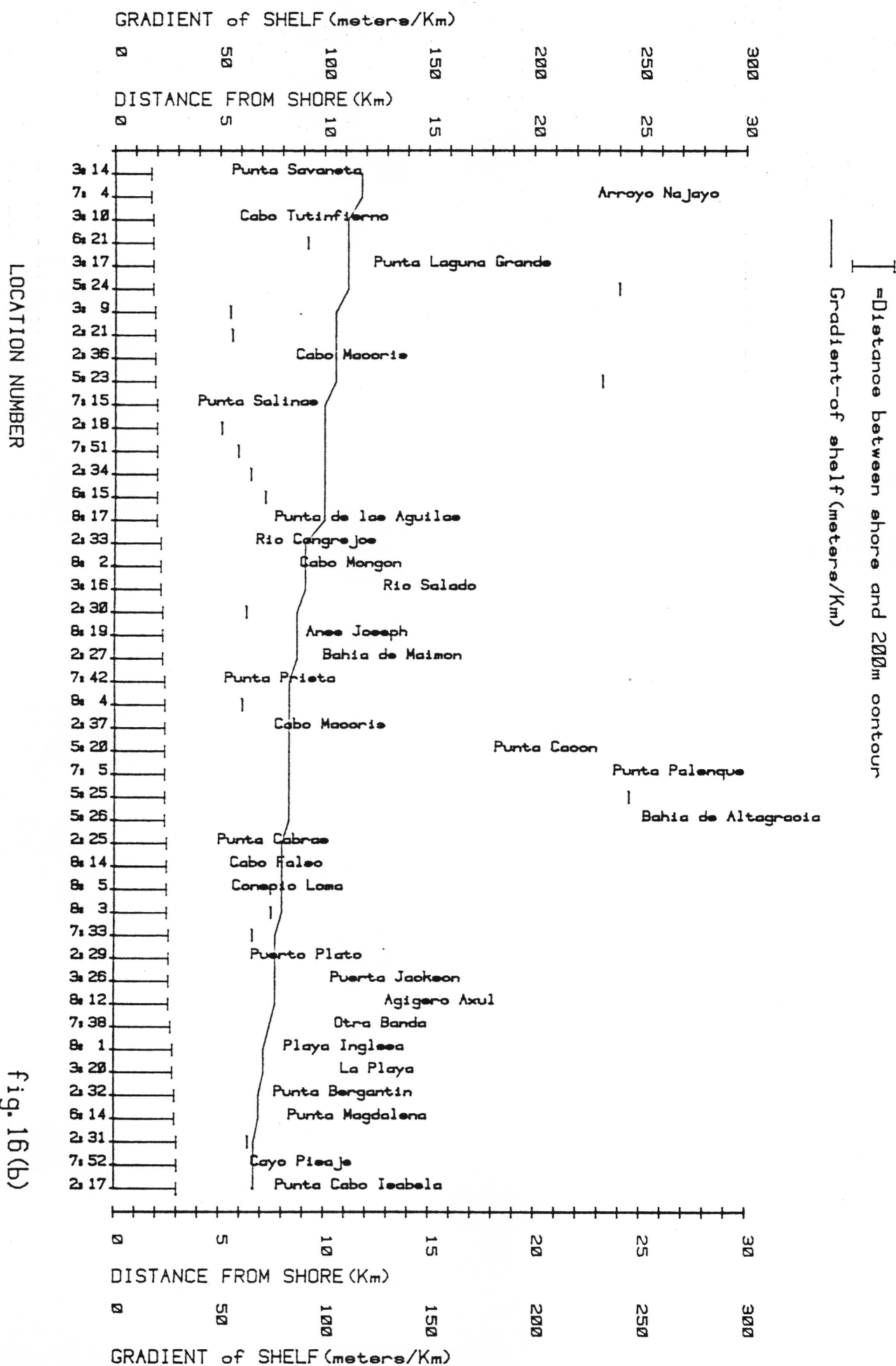


fig. 16(b)

Average Gradient of Continental Shelf - Arranged by Decreasing Gradient
 KEY- 1, 5=Chart#1; Location#5; From 67 meters/Km to 40 meters/Km

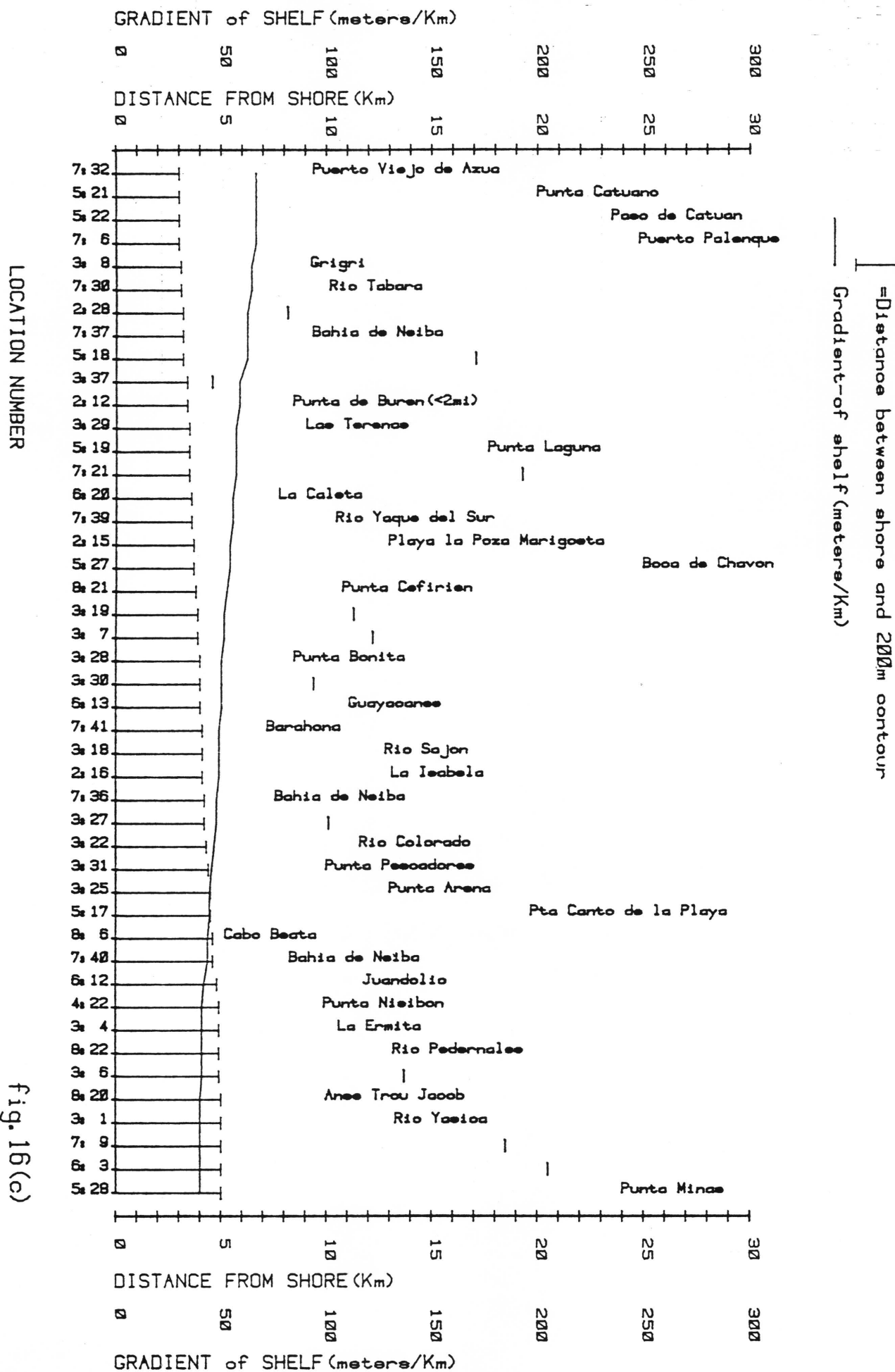
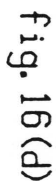


fig. 16(c)



Average Gradient of Continental Shelf - Arranged by Decreasing Gradient
 KEY- 1: 5=Chart#1; Location#5;
 From 20 meters/Km to 10 meters/Km

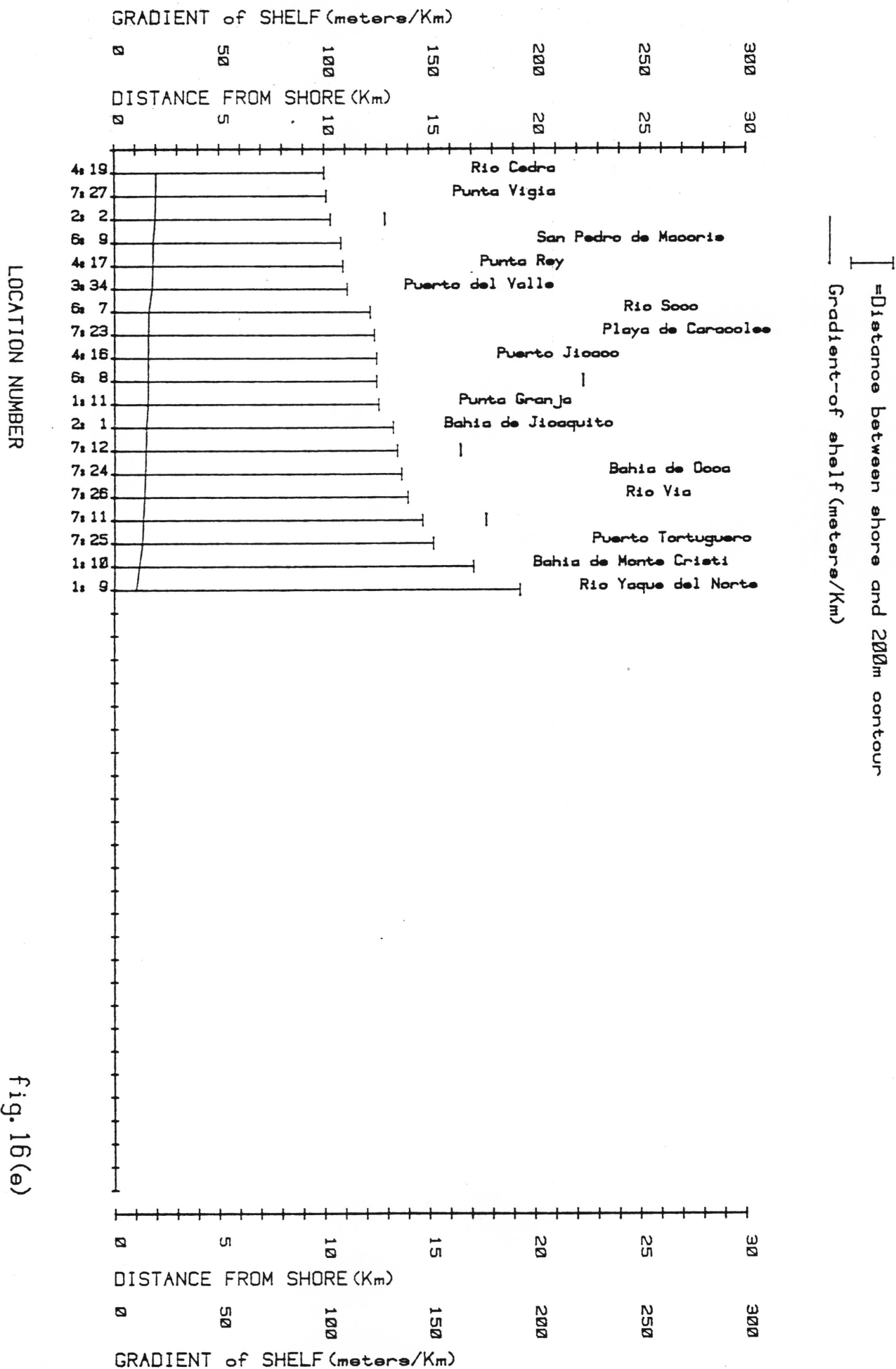
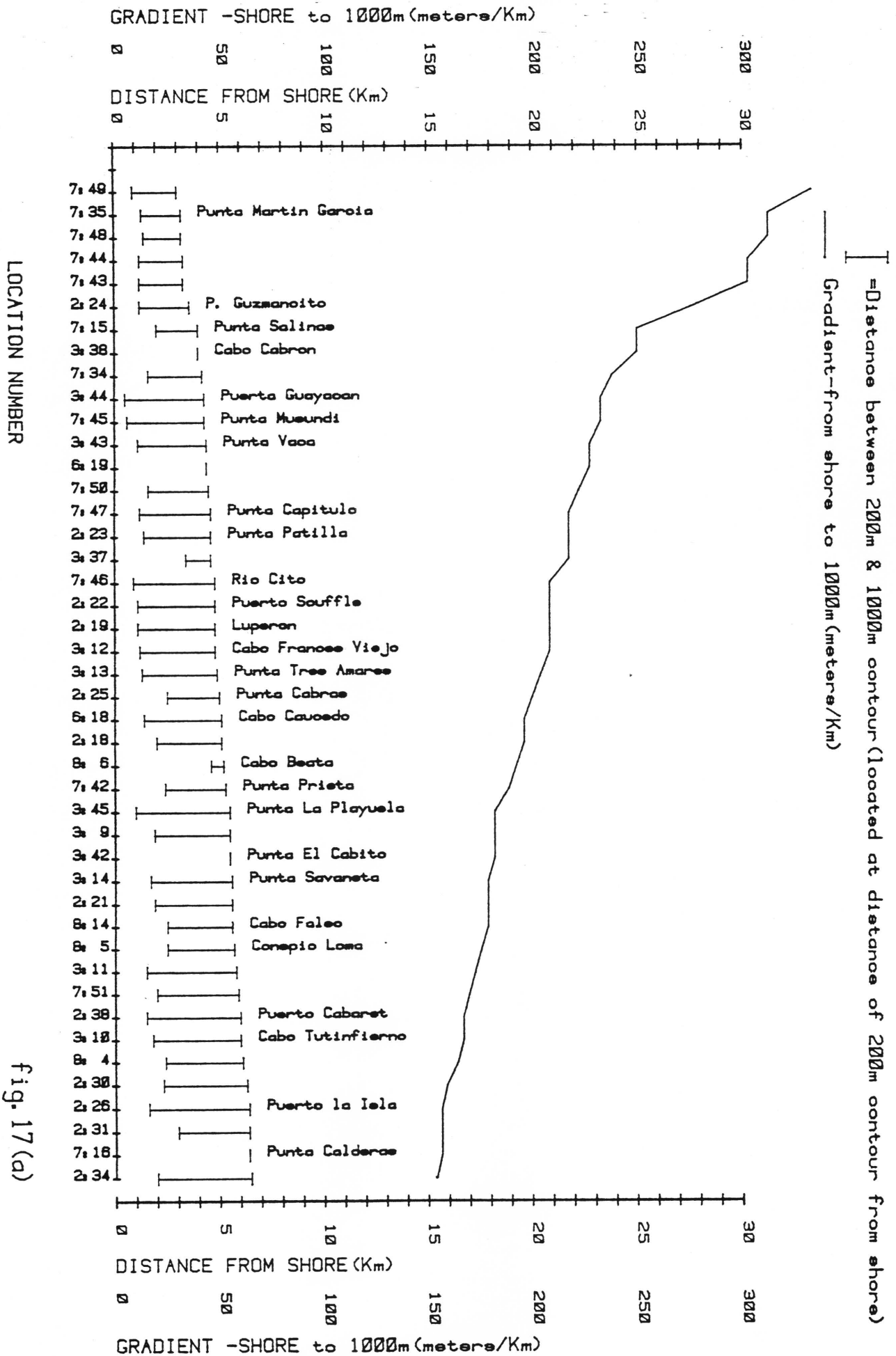


fig. 16(e)

Average Gradient from Coastline to 1000m-Arranged by Decreasing Gradient

KEY- 1=Chart#1 Location#5;

From 333 meters/Km to 154 meters/Km



Average Gradient from Coastline to 1000m-Arranged by Decreasing Gradient

KEY- 1: 5=Chart#1; Location#5;

From 152 meters/Km to 101 meters/Km

— Distance between 200m & 1000m contour (located at distance of 200m contour from shore)
 — Gradient-from shore to 1000m (meters/Km)

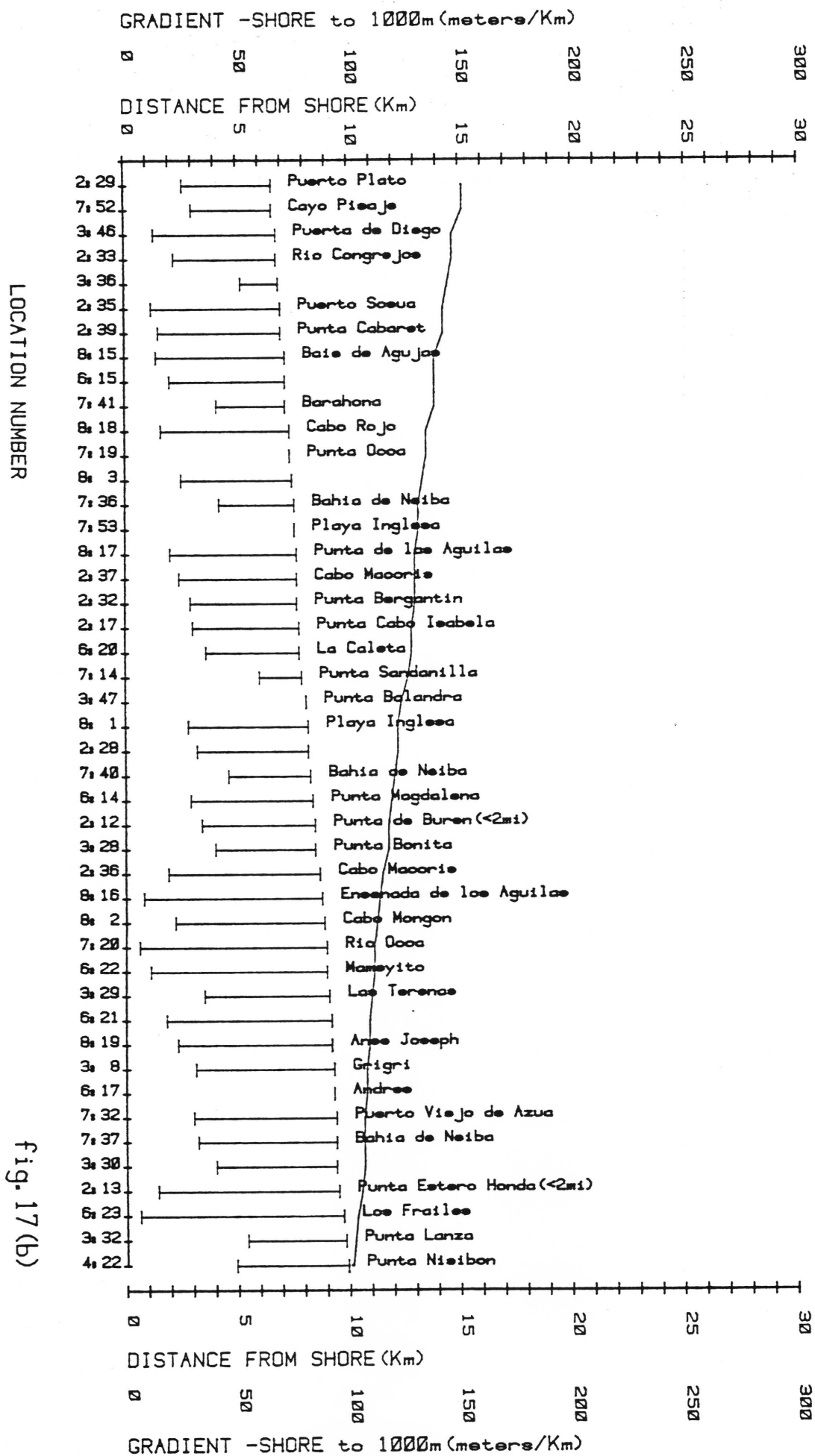


fig. 17 (b)

Average Gradient from Coastline to 1000m-Arranged by Decreasing Gradient
 KEY- 1: 5=Chart#1; Location#5;
 From 100 meters/Km to 78 meters/Km

— Distance between 200m & 1000m contour (located at distance of 200m contour from shore)
 — Gradient-from shore to 1000m (meters/Km)

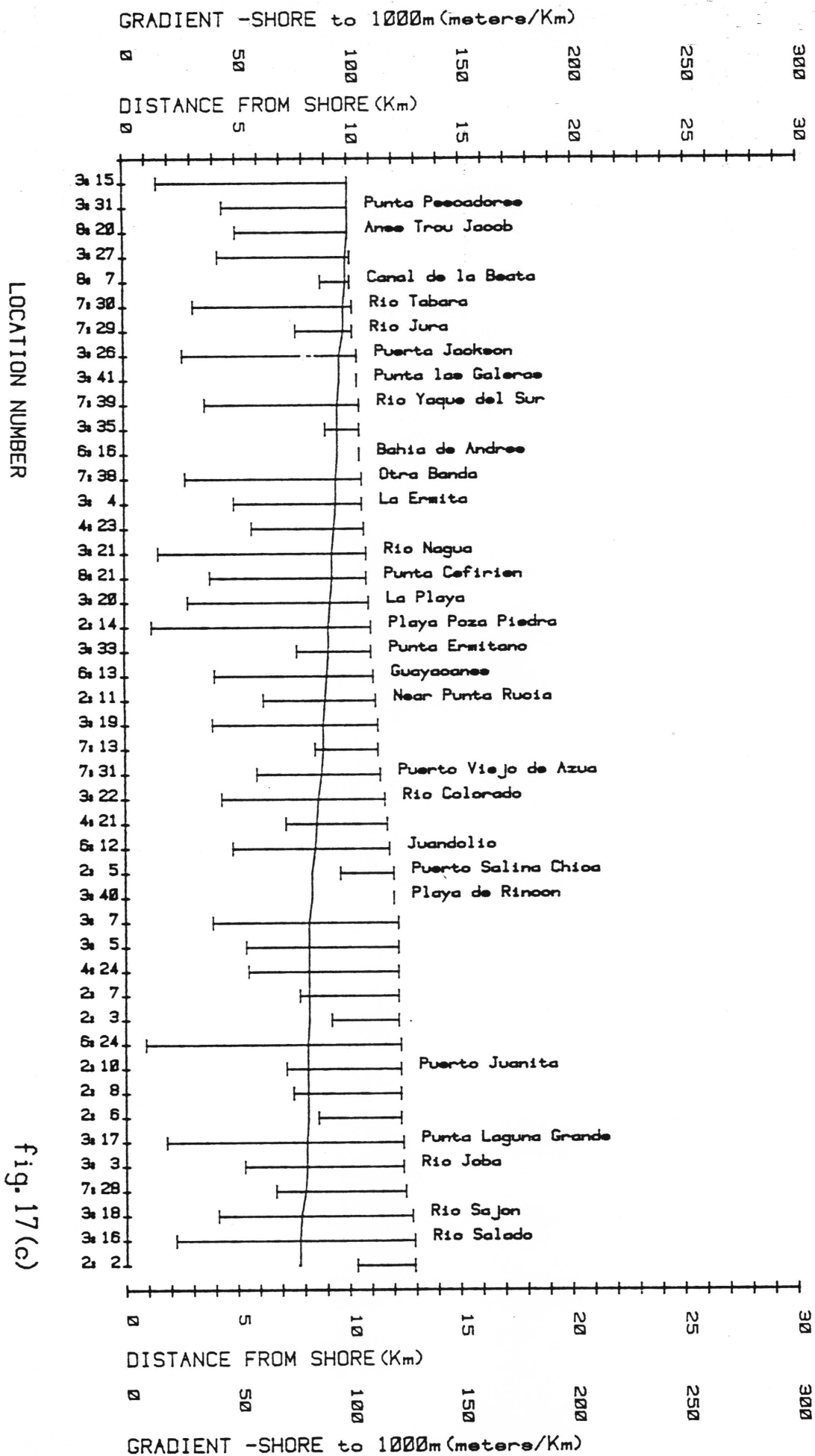


fig. 17(c)

Average Gradient from Coastline to 1000m-Arranged by Decreasing Gradient
 KEY- 1: 5=Chart#1; Location#5;
 From 83 meters/Km to 59 meters/Km

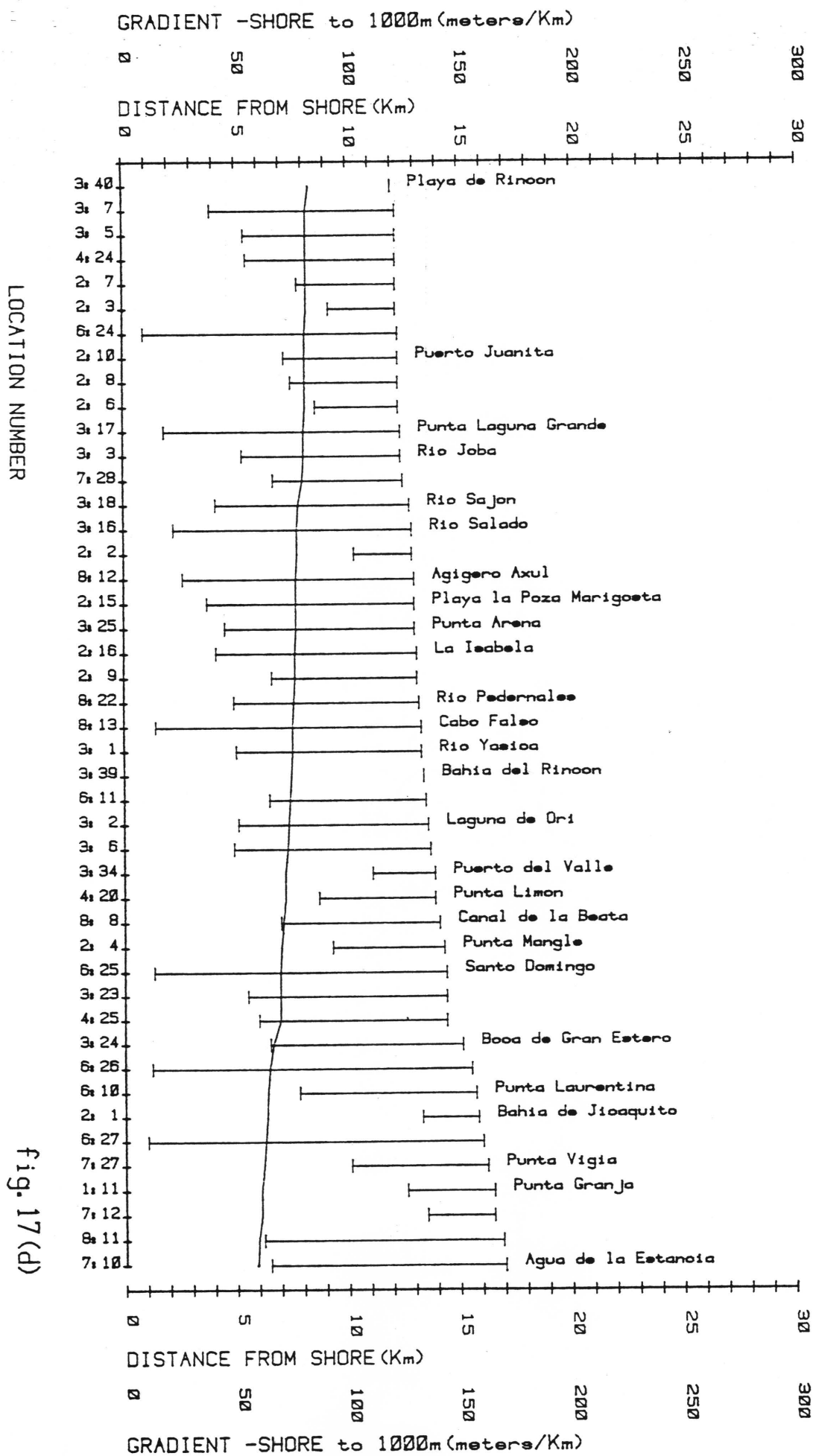


fig. 17(d)

Average Gradient from Coastline to 1000m-Arranged by Decreasing Gradient

KEY- 1: 5=Chart#1; Location#5;

From 58 meters/Km to 42 meters/Km

Distance between 200m & 1000m contour (located at distance of 200m contour from shore)
 Gradient-from shore to 1000m (meters/Km)

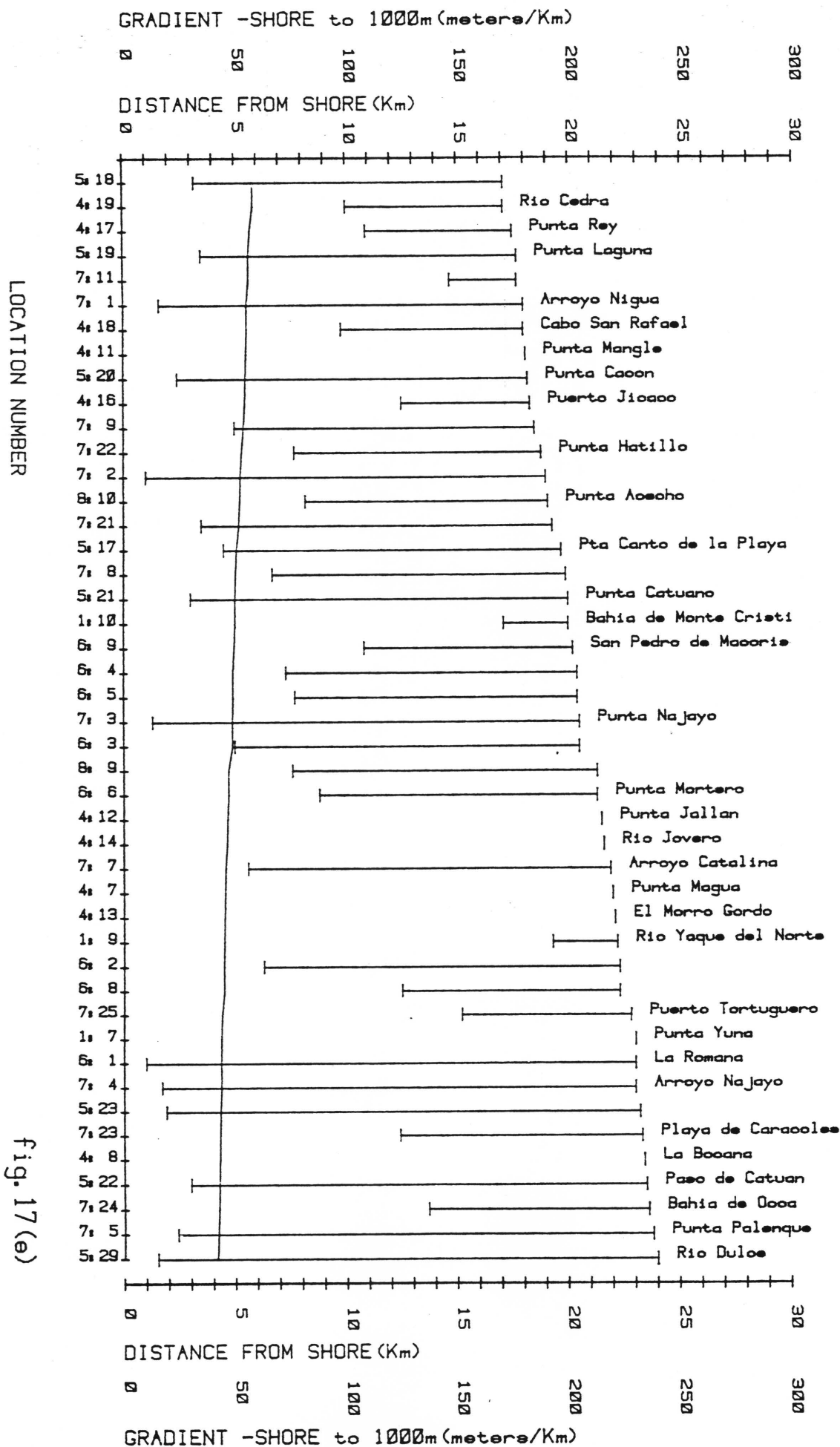


fig. 17(e)

Average Gradient from Coastline to 1000m-Arranged by Decreasing Gradient

KEY- 1: 5=Chart#1; Location#5;

From 42 meters/Km to 37 meters/Km

=Distance between 200m & 1000m contour (located at distance of 200m contour from shore)

Gradient-from shore to 1000m(meters/Km)

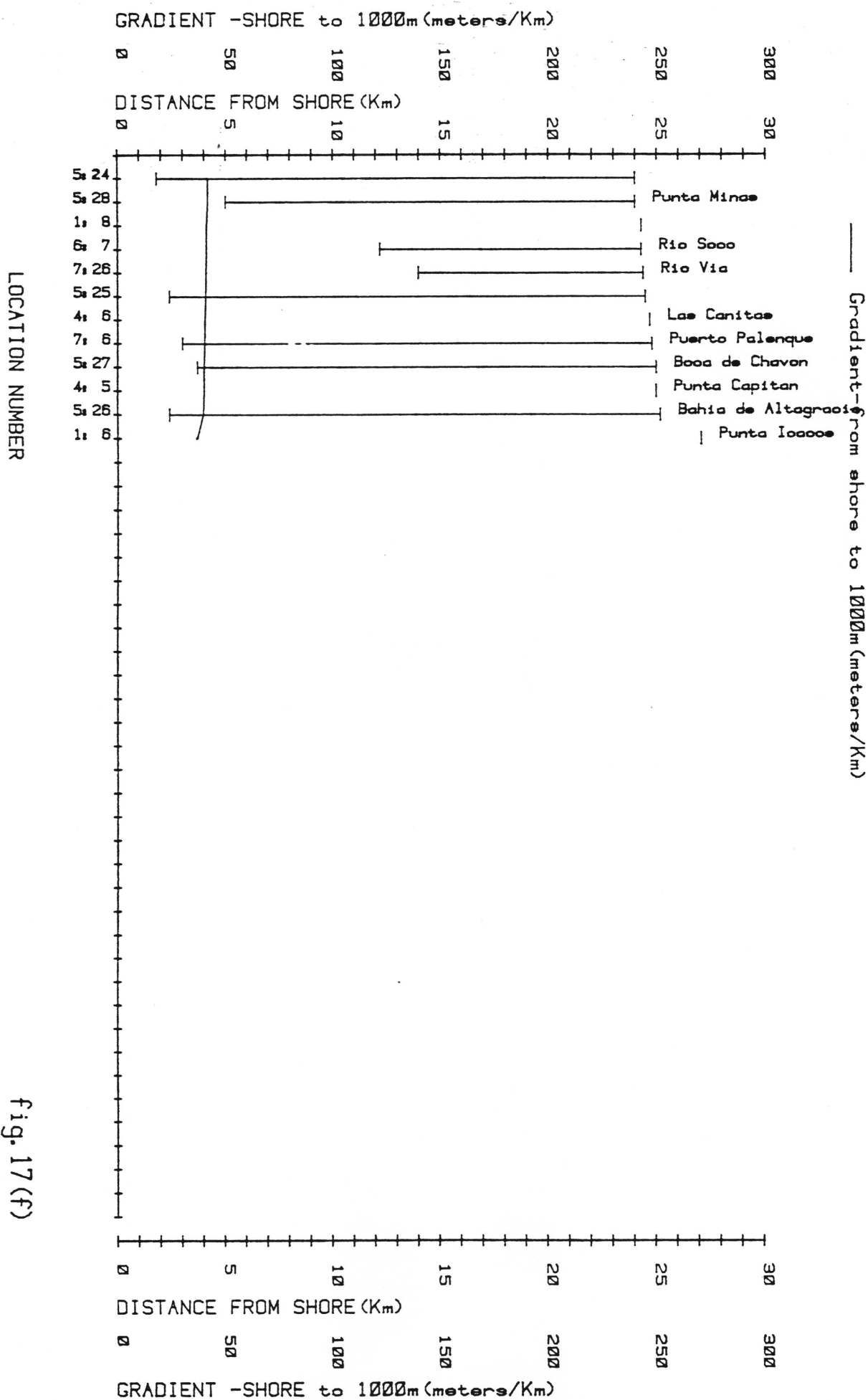


fig. 17(f)

TABLE 6
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by coast line feature

PAGE # 1

COAST LINE FEATURE	CHART	LOC#	DIST.-200m	DIST.-1000m
Anchorage	2	39	1.5	7.0
Anchorage	5	8		
Anchorage, palm trees	7	24	13.7	23.6
Anchorage, sandy		22		
Bay, coral bank	4	9	NDL	NDL
Beach	7	23	12.4	23.3
Beach, mangroves, mountains	2	14	1.2	11.0
Beach, subj. to inundation	2	15	3.7	13.0
Bluff	3	26	2.6	10.4
Bluff	3	13	< 1.4	13.3
Bluff-El Morro de M. Cristi	1	11	12.6	16.5
Boat landing	7	17	NDL	NDL
Breakers	3	6	4.9	13.7
Breakers	3	25	4.5	13.0
Breakers	3	46	< 1.3	6.8
Breakers, foul ground	5	16		
Breakers, foul water	7	31	5.9	11.4
Breakers, low, rocky	7	51	< 2.0	5.9
Breakers, palm trees	3	40	NSG	12.0
Breakers, wreck, foul ard	5	17	4.5	19.7
Buildings	6	22	1.1	9.0
Buildings, low coast	6	13	4.0	11.1
Buildings, rocky coast	6	23	0.6	9.7
Buildings, sandy	3	20	2.8	10.9
Buildings, sandy coast	6	12	4.8	11.8
Cable area, sandy	2	26	1.6	6.4
Cable area, sandy	3	10	1.3	6.0
Cable area, steep	2	27	2.3	NDL
Cliff, rocks, breakers	4	13	NSG	22.1
Cliffs	2	18	2.0	5.1
Cliffs	2	25	2.5	5.0
Cliffs	2	38	1.5	6.0
Cliffs	3	9	1.9	5.5
Cliffs	3	14	1.7	5.6
Cliffs	6	3	5.0	20.5
Cliffs	6	18	1.4	5.1
Cliffs	6	19	NSG	4.4
Cliffs	6	26	1.2	15.5
Cliffs	7	35	1.3	3.2
Cliffs	7	49	0.9	3.0
Cliffs	8	10	0.2	19.1
Cliffs	8	11	6.2	16.9
Cliffs	8	14	< 2.5	5.5
Cliffs, flat, sandy	8	22	4.9	13.2
Cliffs, foul water	7	33	2.6	6.6
Cliffs, mountain	3	38	NSG	4.0
Cliffs, mountains	3	11	1.5	5.8
Cliffs, mountains	3	12	1.2	4.0
Cliffs, mountains	3	34	11.1	13.9
Cliffs, mountains	3	35	9.0	10.5
Cliffs, mountains	3	36	5.2	6.9
Cliffs, mountains	3	39	NSG	13.4
Cliffs, mountains	7	27	10.1	16.2
Cliffs, mountains	7	28	6.7	12.5
Cliffs, mountains	7	34	1.6	4.2
Cliffs, plantation	2	36	1.9	8.7

TABLE 6
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by coast line feature

PAGE # 2

COAST LINE FEATURE	CHART	LOC#	DIST.-200m	DIST.-1000m
Cliffs,plantation	2	37	2.4	7.7
Cliffs,rocks,wreck	8	2	2.2	8.9
Cliffs,sandy offshore	3	8	3.1	9.3
Cliffs,sandy river mth.	6	7	12.2	24.3
Cliffs,stone	7	43	1.2	3.3
Cliffs,stone	7	50	1.6	4.5
Cliffs,wooded headland	2	17	3.0	7.8
Cliffs,wreck,rocks	4	36		
Coral reef	2	12	3.4	8.5
Coral,breakers	7	48	4.6	8.3
Coral,mountains	4	6	NSG	24.7
Coral,palm trees	4	5	NSG	25.0
Coral,rocks	7	42	2.4	5.3
Coral,sandy beach	2	13	1.4	9.5
Cove,flat	4	30		
dangerous breakers	4	11	NSG	18.1
Dangerous breakers	4	12	NSG	21.5
Dock,buildings	1	10	17.1	20.0
Embayment-mangroves	1	4	NSG	NDL
Faces West-Banco de M.C.	2	11	6.2	11.2
Flat		15		
Flat	2	21	1.9	5.6
Flat	4	1	NSG	NSG
Flat	4	23	5.7	10.7
Flat	4	24	5.5	12.2
Flat	4	29		
Flat	4	31		
Flat	5	2		
Flat	5	3		
Flat	5	5		
Flat	5	6		
Flat	5	10		
Flat	5	12		
Flat	5	23	1.9	23.2
Flat	5	24	1.8	24.0
Flat	6	15	2.0	7.2
Flat	6	21	1.8	9.2
Flat	7	7	5.6	21.9
Flat	7	8	6.7	19.9
Flat	7	22	7.7	18.8
Flat	7	30	3.1	10.2
Flat and rocky	7	16	NSG	6.4
Flat and sandy	7	15	2.0	4.0
Flat coastline	2	31	3.0	6.4
Flat,awashed rocks	4	21	7.2	11.7
Flat,buildings	7	48	1.4	3.2
Flat,cable area	3	24	6.5	15.1
Flat,few buildings	3	23	5.5	14.4
Flat,low-lying	3	22	4.3	11.6
Flat,low-lying	4	2	NSG	NSG
Flat,low-lying	4	20	8.7	13.9
Flat,low-lying	4	25	6.0	14.4
Flat,low-lying,wreck	4	37		
Flat,marshy	2	10	7.2	12.3
Flat,mountains inland	2	4	9.3	14.3

TABLE 6

PAGE # 3

DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
Listed by coast line feature

COAST LINE FEATURE	CHART	LOC#	DIST.-200m	DIST.-1000m
Flat, mountains inland	2	9	6.6	13.1
Flat, offshore wreck	4	34		
Flat, river mouth	5	27	3.7	25.0
Flat, sandy	7	1	1.6	18.0
Flat, sandy	7	2	1.0	19.0
Flat, sandy	7	3	1.3	20.5
Flat, sandy	7	29	7.7	10.2
Flat, sandy	8	9	7.6	21.3
Flat, sandy	8	21	3.8	10.8
Flat, sandy shoal	2	1	13.3	15.8
Flat, sandy, dock	8	19	2.3	9.2
Flat, sunken rocks	4	19	10.0	17.1
Flat, wreck, rocks	4	35		
Flat-mangroves	1	5	NSG	NDL
Flat-Mangroves	1	6	NSG	27.1
Flat-mangroves	1	7	NSG	23.0
Flat-mangroves	1	8	NSG	24.3
Flat-mangroves	1	9	19.3	22.2
Foul ground	7	18	NDL	NDL
Foul ground	7	39	3.6	10.5
Foul ground	7	53	NSG	7.6
Foul ground, breakers	8	1	< 2.8	8.2
Foul ground, lagoon	7	38	2.7	10.6
Harbar entrance	2	20	NDL	NDL
Huts, sandy	7	45	0.6	4.3
Lagoon, marsh	3	2	5.1	13.6
Landing place, river	7	20	0.6	9.0
Low and flat	7	10	6.5	17.0
Low and sandy	7	14	< 6.0	7.9
Low coast	5	11		
Low coast	5	18	3.2	17.1
Low coast	5	25	2.4	24.5
Low coast	5	28	5.0	24.0
Low coast	6	5	7.7	20.4
Low coast	6	6	8.8	21.3
Low coast	6	8	12.5	22.3
Low coast, breakers	5	14		
Low coast, rocks	5	26	2.4	25.2
Low coast, vegetation	5	19	3.5	17.7
Low coast, vegetation	5	20	2.4	18.2
Low coast, vegetation	5	21	3.0	20.0
Low ridges	3	43	< 1.1	4.4
Low white cliffs	4	38		
Low, flat	7	13	8.5	11.3
Low, rocks, river mouth	5	29	< 1.5	24.0
Low, rocky	7	4	1.7	23.0
Low, sandy coast		14		
Low, sandy coast	6	4	7.3	20.4
Low, sandy coast	6	14	2.9	8.4
Low, wooded, wreck	4	39		
Low-lying	1	2	NSG	NDL
Low-lying	3	44	< 0.5	4.3
Low-lying	3	45	< 1.0	5.5
Low-lying	4	10	NDL	NDL
Low-lying	4	26		
Low-lying	5	7		
Low-lying coastline	3	27	4.2	10.1

TABLE 6
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by coast line feature

PAGE # 4

COAST LINE FEATURE	CHART	LOC#	DIST.-200m	DIST.-1000m
Low-lying, dock	2	29	2.6	6.6
Low-lying, palm trees	4	7	NSG	22.0
Low-lying, reefs	3	31	4.4	10.0
Low-lying, sandy	3	15	1.5	10.0
Low-lying, sandy	5	1	< 1.0	23.0
Low-lying, sandy bottom	5	9		
Low-lying, sunken rocks	4	18	9.8	18.0
Marsh	3	17	1.8	12.4
Mills, mountains inland	2	5	9.6	12.0
Mountain, reefs	3	32	5.4	9.8
Mountains	2	2	10.3	12.9
Mountains	2	3	9.2	12.2
Mountains	2	28	3.2	8.2
Mountains	3	7	3.9	12.2
Mountains	4	4	NSG	NSG
Mountains, cliffs	2	34	2.0	6.5
Offshore island		17		
Offshore island	1	3	NSG	NDL
Offshore island	4	3	NSG	NSG
Offshore island	4	28		
Offshore island	6	17	NSG	9.3
Offshore island, breakers	7	41	4.1	7.2
Offshore island, cliffs	6	2	< 6.3	22.3
Offshore island, coral	4	8	NSG	23.4
Offshore island, lagoon	7	52	3.0	6.6
Offshore island, reefs	3	33	7.7	11.0
Offshore islands	7	32	3.0	9.4
Offshore wreck	2	23	1.4	4.6
Offshore wreckage	4	33		
Port city	2	19	1.1	4.8
Port city	2	22	1.1	4.8
Port city	2	35	1.2	7.0
Port city	6	9	10.8	20.2
Port city	6	20	3.6	7.8
Port city	6	25	1.3	14.4
Port city	7	6	3.0	24.8
Port city	7	25	15.2	22.8
Red cliffs	8	17	2.0	7.7
Red cliffs	8	18	1.6	7.4
Reefs	3	29	3.5	9.1
Reefs, breakers	3	42	NSG	5.5
Reefs, river	3	30	4.0	9.4
River	2	24	1.2	3.6
River mouth	1	1	NSG	NDL
River mouth	2	33	2.2	6.8
River mouth	3	1	5.0	13.3
River mouth, sandy	3	18	4.1	12.8
River, building	7	46	0.9	4.8
River, flat, low-lying	4	22	4.9	9.9
River, flat, sandy	3	3	5.3	12.4
River, offshore island	3	16	2.2	12.9
Rocks offshore	3	28	4.0	8.5
Rocks, foul water	7	19	NSG	7.4
Rocky coast	6	24	0.9	12.3
Rocky coast, cliffs	6	27	1.0	16.0

TABLE 6

PAGE # 5

DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed by coast line feature

COAST LINE FEATURE	CHART	LOC#	DIST.-200m	DIST.-1000m
Rocky,cliffs	8	3	2.5	7.5
Sandy	7	36	4.2	7.6
Sandy offshore	3	4	4.9	10.6
Sandy offshore	3	19	3.9	11.3
Sandy offshore	3	21	1.5	10.8
Sandy offshore	3	47	NSG	8.1
Sandy offshore	6	10	7.8	15.7
Sandy offshore	6	11	6.5	13.5
Sandy shoal,Mountains	2	6	8.6	12.3
Sandy shoal,Mountains	2	7	7.8	12.2
Sandy shoal,Mountains	2	8	7.5	12.3
Sandy shore		16		
Sandy shore	6	16	NSG	10.5
Sandy,buildings	2	32	2.9	7.7
Sandy,cable buoys	2	30	2.3	6.3
Sandy,cliffs	8	15	1.4	7.2
Sandy,flat	7	26	14.0	24.4
Sandy,flat	8	8	7.0	14.1
Sandy,flat	8	16	0.8	8.8
Sandy,jungle	8	20	< 5.0	10.0
Sandy,mountain	3	5	5.4	12.2
Sandy,palm trees	3	13	1.3	4.9
Sandy,vegetation	8	7	8.8	10.1
Shoal water,buildings	7	5	2.4	23.8
Shoal waters	7	9	5.0	18.5
Sloping coastline	5	4		
Steep coast	8	5	2.5	5.7
Steep coast(bluff)	8	6	< 4.6	5.2
Stony shore	7	44	1.2	3.3
Stony,cliff	8	12	2.6	13.0
Stony,cliffs	7	47	1.2	4.6
Stream mouth	7	11	<14.7	17.7
Sunken rock,sandy	8	4	2.4	6.1
Sunken rocks	3	41	NSG	10.4
Sunken rocks	4	14	NSG	21.6
Sunken rocks,breakers	4	15	NDL	NDL
Sunken rocks,breakers	4	16	<12.5	18.3
Sunken rocks,breakers	4	17	10.9	17.5
Sunken rocks,flat shore	4	32		
Sunken rocks,river	4	27		
Sunken rocks,wrecks	5	13		
Swamp	5	22	3.0	23.5
Swamp,vegetation	5	1		
Town,river mouth	2	16	4.1	13.1
vegetation,breakers	5	15		
Vegetation,sm.islands	7	37	3.2	9.4
Wreck,flat coast	7	12	13.5	16.5
Yellow cliffs	7	21	3.5	19.3

1.7.5 Data Sorted Alphabetically by Place-Name

For use as a cross-reference and index of place-names the data were sorted alphabetically (Table 7 and Figure 18) using programs "Asort2" and "CoastA". As noted before, place-name spelling may be at variance with those currently in use in the Dominican Republic.

TABLE 7
DOMINICAN REPUBLIC: Distances from shore to the 200m & 1000m Contours
Listed Alphabetically

PAGE # 1

PLACE NAME	CHART	LOC#	DIST.-200m	DIST.-1000m
Agisero Axul	8	12	2.6	13.0
Agua de la Estancia	7	10	6.5	17.0
Andres	6	17	NSG	9.3
Anse Joseph	8	19	2.3	9.2
Anse Trou Jacob	8	20	< 5.0	10.0
Arroyo Catalina	7	7	5.6	21.9
Arroyo Najayo	7	4	1.7	23.0
Arroyo Nisua	7	1	1.6	18.0
Bahia Carenero	4	2	NSG	NSG
Bahia de Altaeracia	5	26	2.4	25.2
Bahia de Andres	6	16	NSG	10.5
Bahia de Jicauito	2	1	13.3	15.8
Bahia de la Gina	4	10	NDL	NDL
Bahia de las Calderas	7	17	NDL	NDL
Bahia de Maimon	2	27	2.3	NDL
Bahia de Monte Cristi	1	10	17.1	20.0
Bahia de Neiba	7	40	4.6	8.3
Bahia de Neiba	7	37	3.2	9.4
Bahia de Neiba	7	36	4.2	7.6
Bahia de Ocoa	7	24	13.7	23.6
Bahia de Yuma	5	7		
Bahia del Rincon	3	39	NSG	13.4
Baie de Aguas	8	15	1.4	7.2
Barahona	7	41	4.1	7.2
Barbaro Anchorage	4	33		
Barraza de Vaca	1	3	NSG	NDL
Boca de Chavon	5	27	3.7	25.0
Boca de Gran Estero	3	24	6.5	15.1
Boca de Yuma	5	9		
Boca de Yuma	5	8		
Cabeza de Toro	4	34		
Cabo Beata	8	6	< 4.6	5.2
Cabo Cabron	3	38	NSG	4.0
Cabo Caucedo	6	18	1.4	5.1
Cabo Engano	4	37		
Cabo Engano	4	36		
Cabo Falso	8	14	< 2.5	5.6
Cabo Falso	8	13	< 1.4	13.3
Cabo Falso	5	10		
Cabo Frances Viejo	3	12	1.2	4.8
Cabo Macoris	2	37	2.4	7.7
Cabo Macoris	2	36	1.9	8.7
Cabo Moneon	8	2	2.2	8.9
Cabo Rojo	8	18	1.6	7.4
Cabo San Rafael	4	18	9.8	18.0
Cabo Tutinfierno	3	10	1.8	6.0
Canal de la Beata	8	8	7.0	14.1
Canal de la Beata	8	7	8.8	10.1
Cano Quintano	2	20	NDL	NDL
Cayo Pisaje	7	52	3.0	5.6
Conspic Loma	8	5	2.5	5.7
El Infiernito	4	28		
El Macao	4	29		
El Morro Gordo	4	13	NSG	22.1
Ensenada de los Aguilas	8	16	0.8	8.8

TABLE 7
DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
Listed Alphabetically

PAGE # 2

PLACE NAME	CHART	LOC#	DIST.-200m	DIST.-1000m
Estero Balza	1	2	NSG	NDL
Griseri	3	8	3.1	9.3
Guayacanes	6	13	4.0	11.1
Juandolio	6	12	4.8	11.8
La Bocana	4	8	NSG	23.4
La Caleta	6	20	3.6	7.8
La Ermita	3	4	4.9	10.6
La Granchorra	5	12		
La Isabela	2	16	4.1	13.1
La Playa	3	20	2.8	10.9
La Romana	6	1	< 1.0	23.0
Laguna de Ori	3	2	5.1	13.6
Las Canitas	4	6	NSG	24.7
Las Terenas	3	29	3.5	9.1
Los Frailes	6	23	0.6	9.7
Luperon	2	19	1.1	4.8
Mameyito	6	22	1.1	9.0
Martel	5	11		
Near Punta Rucia	2	11	6.2	11.2
Otra Banda	7	38	2.7	10.6
P. Guzmancito	2	24	1.2	3.6
Paso de Catuan	5	22	3.0	23.5
Playa de Caracoles	7	23	12.4	23.3
Playa de Rincon	3	40	NSG	12.0
Playa Inglesa	8	1	< 2.8	8.2
Playa Inglesa	7	53	NSG	7.6
Playa la Poza Mariagosa	2	15	3.7	13.0
Playa Poza Piedra	2	14	1.2	11.0
Pta Canto de la Playa	5	17	4.5	19.7
Puerta de Diego	3	46	< 1.3	6.8
Puerta Guayacan	3	44	< 0.5	4.3
Puerta Jackson	3	26	2.6	10.4
Puerto Cabaret	2	38	1.5	6.0
Puerto del Valle	3	34	11.1	13.9
Puerto Jicaco	4	16	< 12.5	18.3
Puerto Juanita	2	10	7.2	12.3
Puerto la Isla	2	26	1.6	6.4
Puerto Palenque	7	6	3.0	24.8
Puerto Plato	2	29	2.6	6.6
Puerto Salina Chica	2	5	9.6	12.0
Puerto Sosua	2	35	1.2	7.0
Puerto Souffle	2	22	1.1	4.8
Puerto Tortuguero	7	25	15.2	22.8
Puerto Viejo de Azua	7	32	3.0	9.4
Puerto Viejo de Azua	7	31	5.9	11.4
Punta Acecho	8	10	8.2	19.1
Punta Arena	3	25	4.5	13.0
Punta Balaju	5	13		
Punta Balandra	3	47	NSG	8.1
Punta Bersantin	2	32	2.9	7.7
Punta Bonita	3	28	4.0	8.5
Punta Cabaret	2	39	1.5	7.0

TABLE 7
DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
Listed Alphabetically

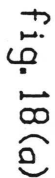
PLACE NAME	CHART	LOC#	DIST.-200m	DIST.-1000m
Punta Cabo Isabela	2	17	3.0	7.8
Punta Cabras	2	25	2.5	5.0
Punta Cacao	4	1	NSG	NSG
Punta Cacon	5	20	2.4	18.2
Punta Calderas	7	16	NSG	6.4
Punta Cana	5	15		
Punta Cana	4	39		
Punta Capitan	4	5	NSG	25.0
Punta Capitulo	7	47	1.2	4.6
Punta Catuano	5	21	3.0	20.0
Punta Cefirien	8	21	3.8	10.8
Punta Cueva	5	5		
Punta de Buren(<2mi)	2	12	3.4	8.5
Punta de las Aguilas	8	17	2.0	7.7
Punta Eagle	4	38		
Punta El Cabito	3	42	NSG	5.5
Punta Ermitano	3	33	7.7	11.0
Punta Espada	5	4		
Punta Esta	5	14		
Punta Estero Honda(<2mi)	2	13	1.4	9.5
Punta Granja	1	11	12.6	16.5
Punta Hatillo	7	22	7.7	18.8
Punta Icacos	1	6	NSG	27.1
Punta Jallan	4	12	NSG	21.5
Punta Jicaco	4	15	NDL	NDL
Punta Juanillo	5	1		
Punta la Bandera	4	3	NSG	NSG
Punta La Playuela	3	45	< 1.0	5.5
Punta Laguna	5	19	3.5	17.7
Punta Laguna Grande	3	17	1.8	12.4
Punta Lanza	3	32	5.4	9.8
Punta las Galeras	3	41	NSG	10.4
Punta Laurentina	6	10	7.8	15.7
Punta Limon	4	20	8.7	13.9
Punta Los Güiegos	5	16		
Punta Macao	4	30		
Punta Magdalena	6	14	2.9	8.4
Punta Maigua	4	7	NSG	22.0
Punta Mangla	4	11	NSG	18.1
Punta Mangla	2	4	9.3	14.3
Punta Manzanillo	1	5	NSG	NDL
Punta Martin Garcia	7	35	1.3	3.2
Punta Matasola	7	18	NDL	NDL
Punta Miguel	4	9	NDL	NDL
Punta Minas	5	28	5.0	24.0
Punta Mortero	6	6	8.8	21.3
Punta Musundi	7	45	0.6	4.3
Punta Najayo	7	3	1.3	20.5
Punta Nisibon	4	22	4.9	9.9
Punta Ocoa	7	19	NSG	7.4
Punta Palenque	7	5	2.4	23.8
Punta Pascuala	4	4	NSG	NSG
Punta Patilla	2	23	1.4	4.6
Punta Pescadores	3	31	4.4	10.0
Punta Prieta	7	42	2.4	5.3
Punta Rey	4	17	10.9	17.5
Punta Salinas	7	15	< 2.0	4.0
Punta Sandanilla	7	14	< 6.0	7.9
Punta Savaneta	3	14	1.7	5.6

TABLE 7

PAGE # 4

DOMINICAN REPUBLIC; Distances from shore to the 200m & 1000m Contours
Listed Alphabetically

PLACE NAME	CHART	LOC#	DIST.-200m	DIST.-1000m
Punta Tres Amores	3	13	1.3	4.9
Punta Vaca	3	43	< 1.1	4.4
Punta Visia	7	27	10.1	16.2
Punta Yuna	1	7	NSG	23.0
Ranchitos Anchorage	4	31		
Rio Cedra	4	19	10.0	17.1
Rio Cito	7	46	0.9	4.8
Rio Colorado	3	22	4.3	11.6
Rio Concheros	2	33	2.2	6.8
Rio Dajabon	1	1	NSG	NDL
Rio Dulce	5	29	< 1.5	24.0
Rio Joba	3	3	5.3	12.4
Rio Jovero	4	14	NSG	21.6
Rio Jura	7	29	7.7	10.2
Rio Maimon	4	27		
Rio Masua	3	21	1.5	10.8
Rio Ocoa	7	20	0.6	9.0
Rio Pedernales	8	22	4.9	13.2
Rio Sajon	3	18	4.1	12.8
Rio Salado	3	16	2.2	12.9
Rio Soco	6	7	12.2	24.3
Rio Tabara	7	30	3.1	10.2
Rio Via	7	26	14.0	24.4
Rio Yaque del Norte	1	9	19.3	22.2
Rio Yaque del Sur	7	39	3.6	10.5
Rio Yasica	3	1	5.0	13.3
San Pedro de Macoris	6	9	10.8	20.2
Santo Domingo	6	25	1.3	14.4
Santo Domingo	6	25	1.3	14.4



Distance of 200m and 1000m contours from shore- Alphabetically by place name
 KEY- 1: 5=Chart#1; Location#5; from Canal de la Beata to Puerto Juanita

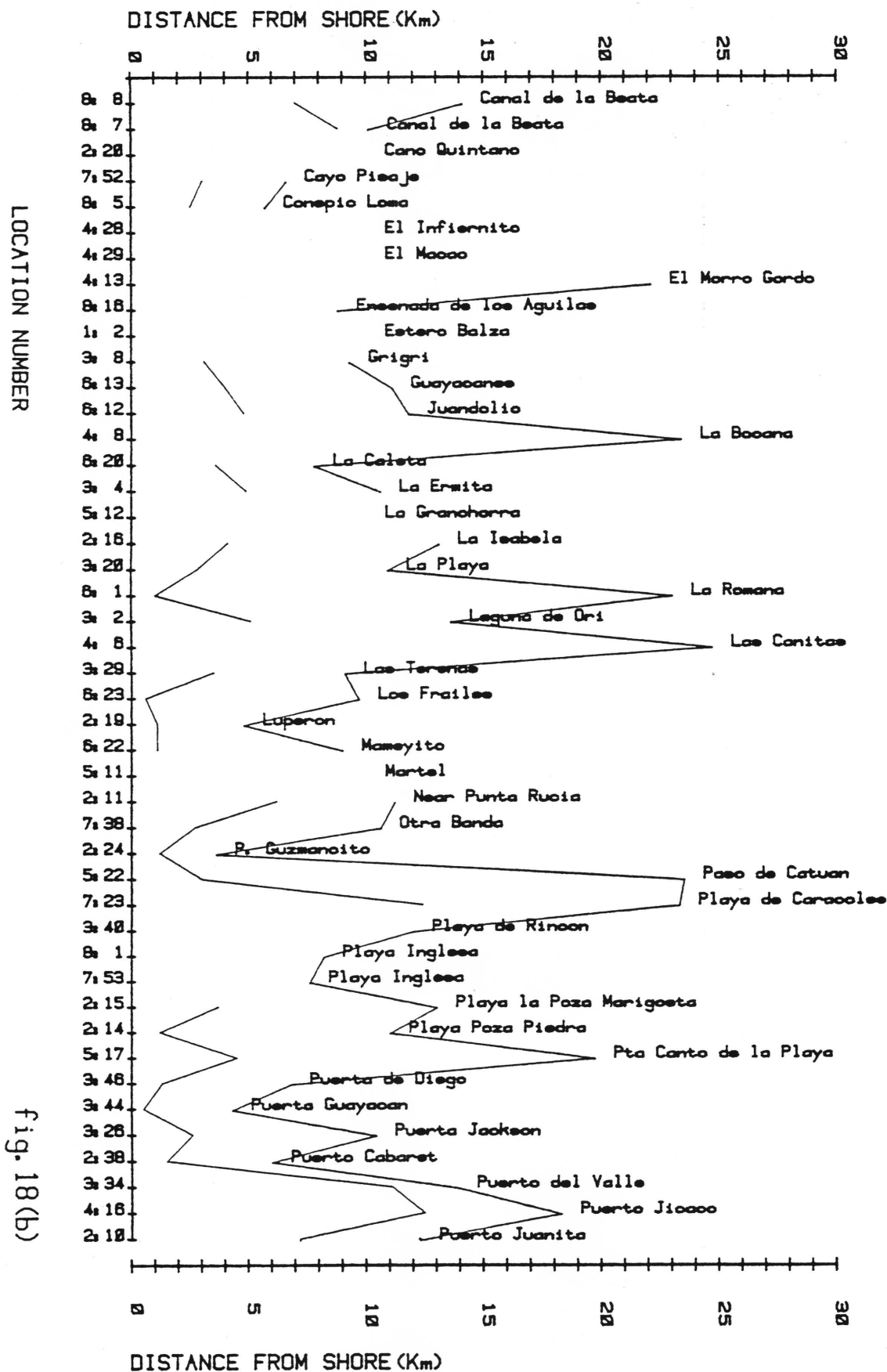


fig. 18(b)

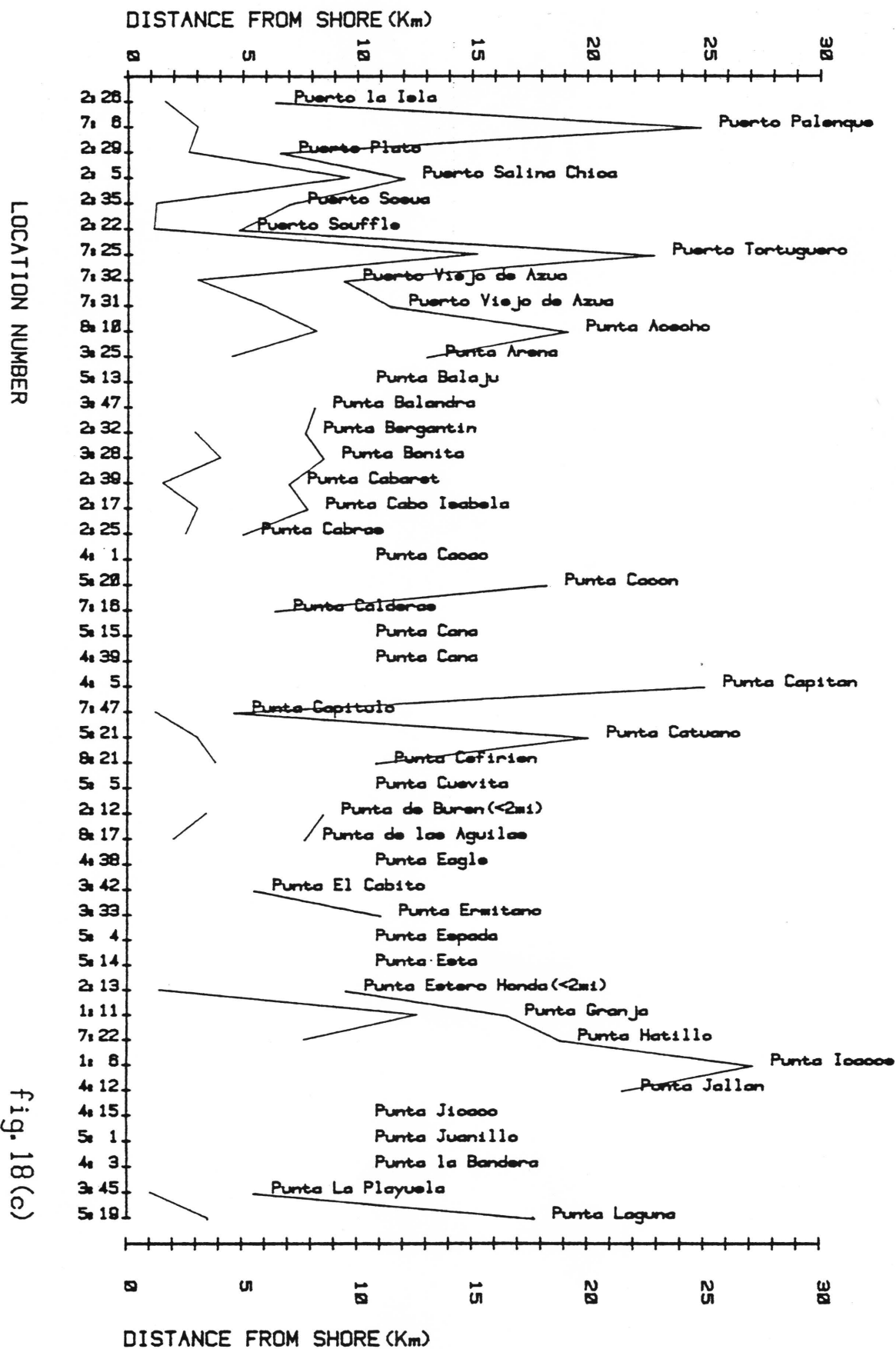


fig. 18(c)

Distance of 200m and 1000m contours from shore- Alphabetically by place name
 KEY- 1: 5=Chart#1; Location#5; from Punta Laguna Grande to Rio Maimon

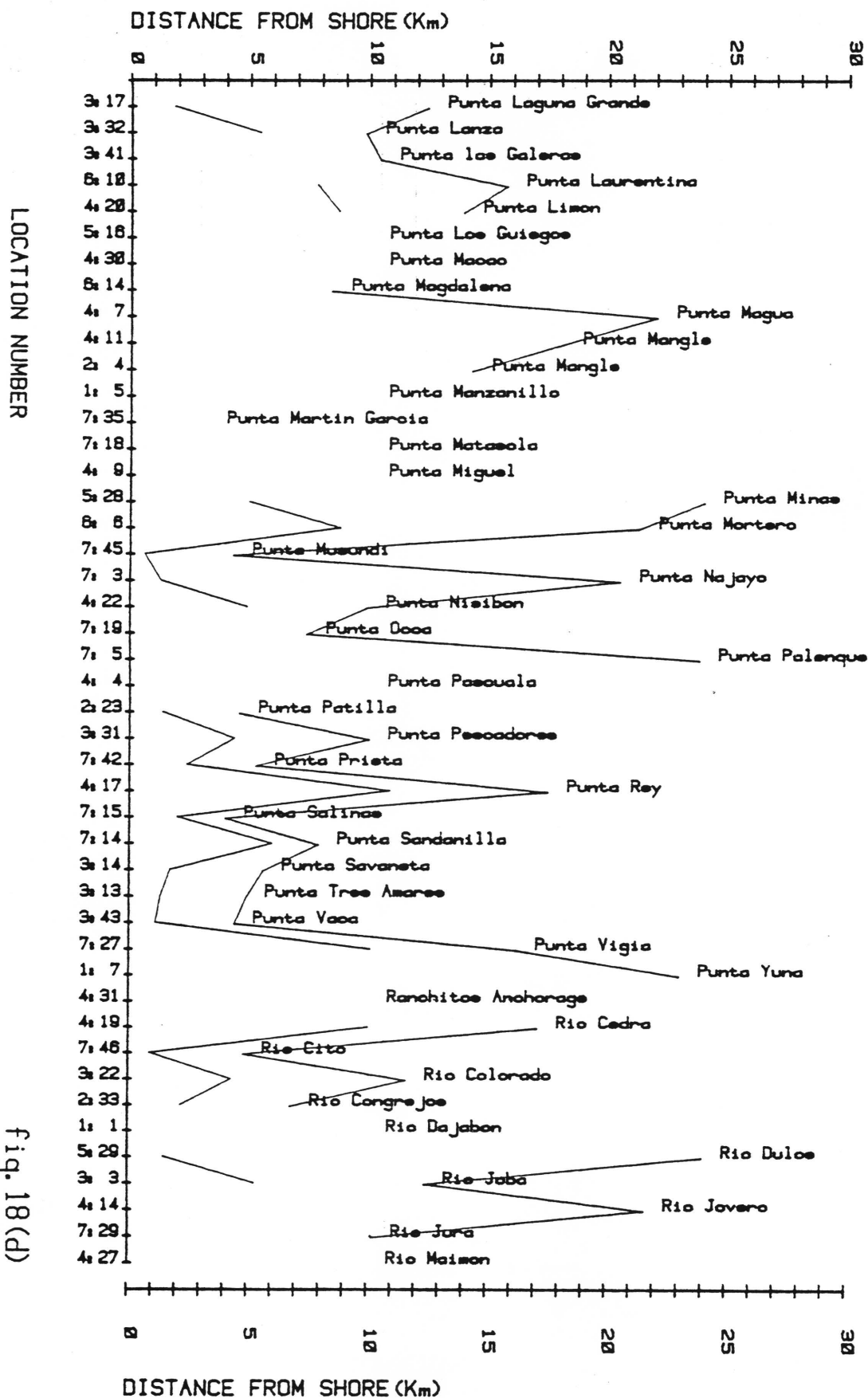


fig. 18 (D)

Distance of 200m and 1000m contours from shore- Alphabetically by place name
 KEY- 1: 5=Chart#1; Location#5; from Rio Nagua to Santo Domingo

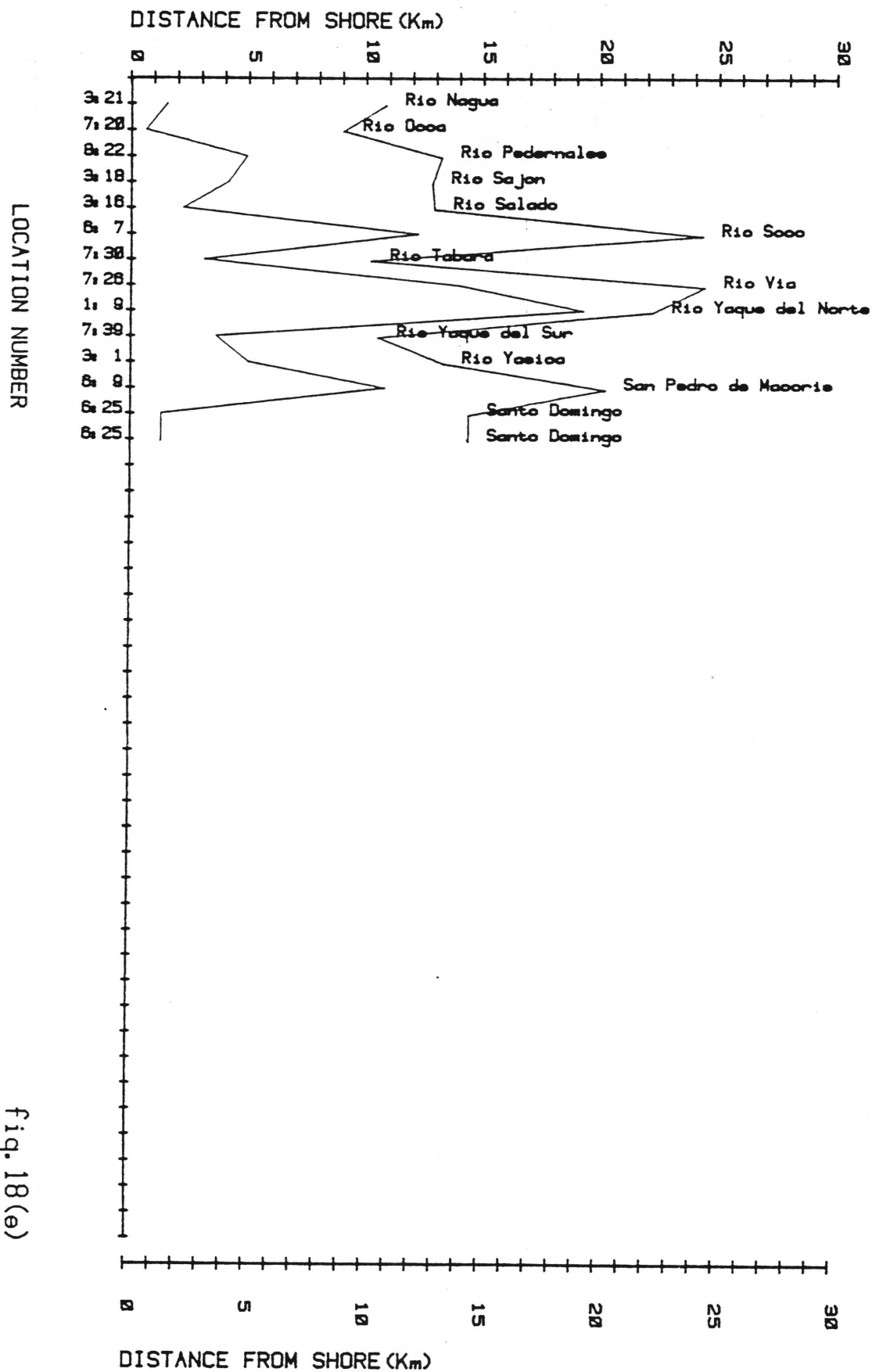


fig. 18(e)

2 Construction of New Bathymetric Charts

2.1 Selection of Sites for Closer Study

From the preliminary study and sorting of the data it was found that three areas along the Dominican Republic coastline have narrow continental shelves and steep slopes. These are: (a) on the north coast from Estero Hondo to the eastern part of Cabo Isabela; (b) on the eastern side of the Semana Peninsula from Cabo Semana to Punta Balandra, and especially (c) on the south coast from Punta Prieta to Cabo Beata. In addition, promising sites are at Cabo Cabron, off Punta Salina and at Cabo Falso.

Taking areas of the same size as the USACE quadrangles (10 minutes of latitude by 15 minutes of longitude), bathymetric charts were constructed. Eight of these areas were chosen (see Table 8).

2.2 Construction of the Charts

Firstly, the contouring of the appropriate USN00 smooth sheets was completed for the following depths: 40, 200, 400, 600, 800, 1000, 1250, 1500, 1750 and 2000 meters. This was done directly on our Mylar copies of the smooth sheets. As previously mentioned, the 200 m contour is surveyed primarily on the 1:50,000 boat-sheet scale, while deeper soundings are taken and plotted on a 1:150,000 scale. Despite the detailed coverage of the HARKNESS surveys, gaps do exist in the data and these were left as blank spaces or hatched lines where the distances between known soundings were short.

Secondly, blue-line copies, 1:1 size, were made from the Mylar base-map plots. Coastline outlines were intensified and added where necessary using a light-table and the USACE maps (coastline information

TABLE 8. AREAS SELECTED FOR CLOSER STUDY

FIGURE #	EQUIVALENT USACE QUADRANGLE		TABLE 1, PAGE #
	NUMBER	NAME	
19	59751	Barrancon	2
20	60754	Luperon	2
21	63731	Las Galeras	3
22	60704	Sabana Buey	4
23	59702	La Cienaga	5
24	59691	Enriquillo	5
25	59693	Oviedo	5
26	56891	Isla Beata	5

was only put on the 1:50,000 scale boat sheets.

Each 10-minute of latitude x 15-minute of longitude section of the boat sheets was cut in half to allow digitizing of the information using a Hewlett-Packard 9872A plotter (the platten is 10"x16" on this plotter). Latitude and longitude marks were carefully preserved for accurate position registration. Using the program "DigDR" (see Appendix), the coastline and contours were digitized, as were place-name locations. Both halves of the 1:50,000-scale sheets were digitized, followed by the appropriate area on the 1:150,000-scale sheets. Registration was keyed to latitude and longitude and not coastline. Data in the form of X and Y coordinates and a pen attitude were stored on files on a flexible disk.

The plots reproduced in Figures 19-26 were produced using program "DRplot" (see Appendix). The final scale (only on the original of this report with colored plots) is 1:100,000.

The accuracy of the data in Figures 19-26 may be affected by (a) adjusting of scale size: the boat-scale charts have been reduced from 1:50,000 to 1:100,000 scale, thus diminishing digitizing errors while the ship-scale sheets have been enlarged from 1:150,000 to 1:100,000 thus emphasizing any errors; (b) uncertainties about shoreline location: see previous notes; (c) interpretation of contours: soundings appear on the smooth sheets as a series of numbers following a cruise track. No dot or mark indicates the exact location of the sounding. All of the contouring done on the smooth sheets has been done by hand. Frequently, artificial discontinuities appear in the contouring already done, due to the contourer avoiding a number (as if

that number were a real entity on the ocean floor rather than indicative of a point reading). We have attempted to smooth out these artifacts but do not know where the actual sounding point is meant to appear in relationship to the number.

Additionally, the parallel shore survey technique presents a problem, especially near steep slopes. The survey vessel parallels the shore line (and generally the trend of the isobaths) coming as close to shallow water as is reasonably safe. Boat soundings closer to shore and ship surveys offshore tend to run traverses normal to the bathymetric trends. This produces problems that can best be illustrated by an example: two parallel lines of soundings are made, the nearshore line has soundings <1000 m while the offshore line is >1000 m; the 1000 m contour does not cross either line. The only contour that can be drawn is a smooth, parallel line between the two ship's tracklines. This will not show any small-scale meanderings in the 1000 m isobath. Yet when the 1000 m depth is crossed by either of the tracklines, the tendency is to put a sharp discontinuity in the contour to cross the trackline. In reality the trend of the isobath may be very gradual in relationship to the direction of the trackline.

It is superior to cross the isobaths as nearly normal as possible and so have several places off the coast where each isobath is crossed by the ship's tracklines. The result of these uncertainties is to give erratic-looking contour lines, some straight and parallel, while adjacent isobaths may be meandering. This is particularly so in the Barahona - Isla Beata region (Figures 23-26).

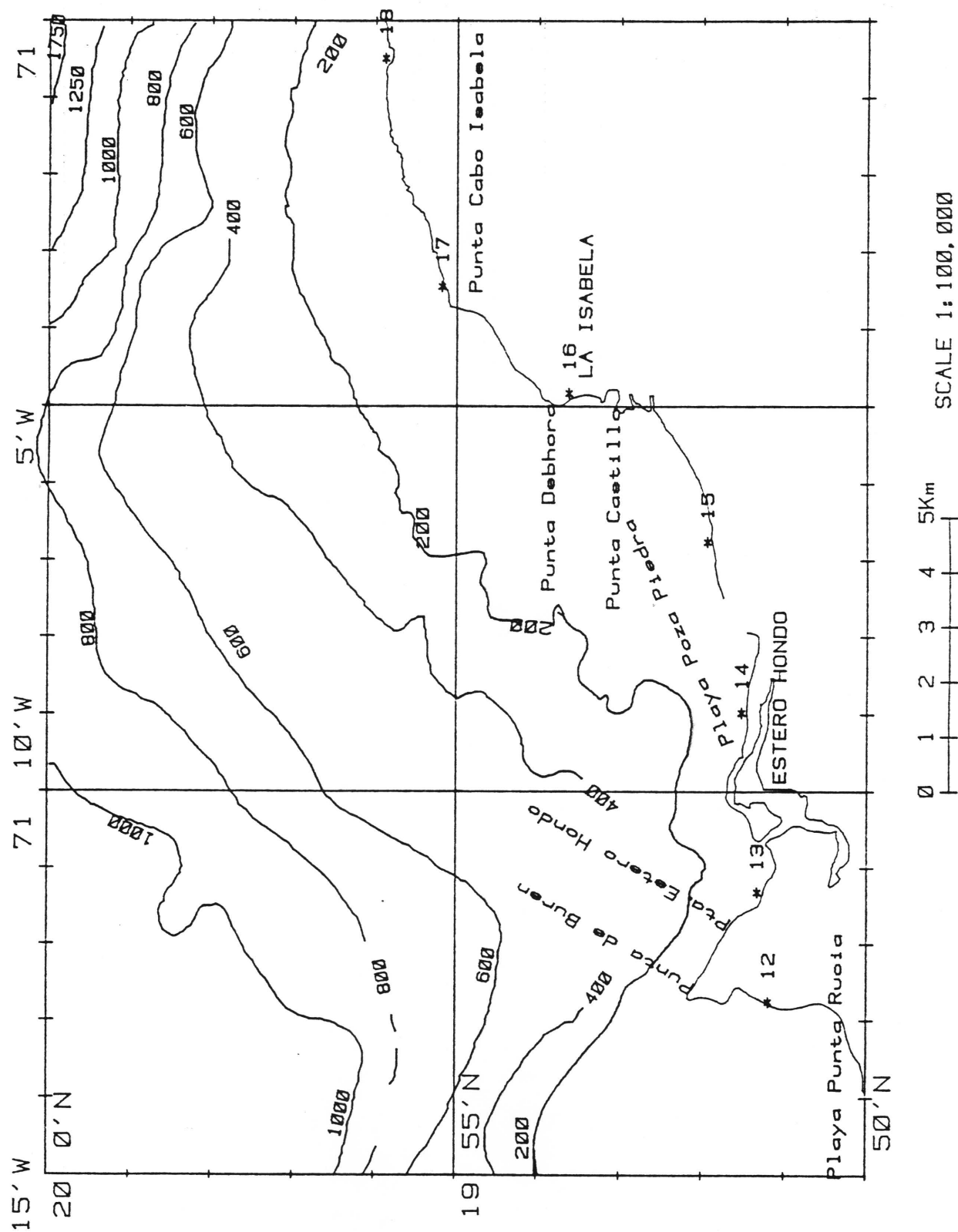
2.3 Description of Charts

2.3.1 Barrancon (Fig. 19)

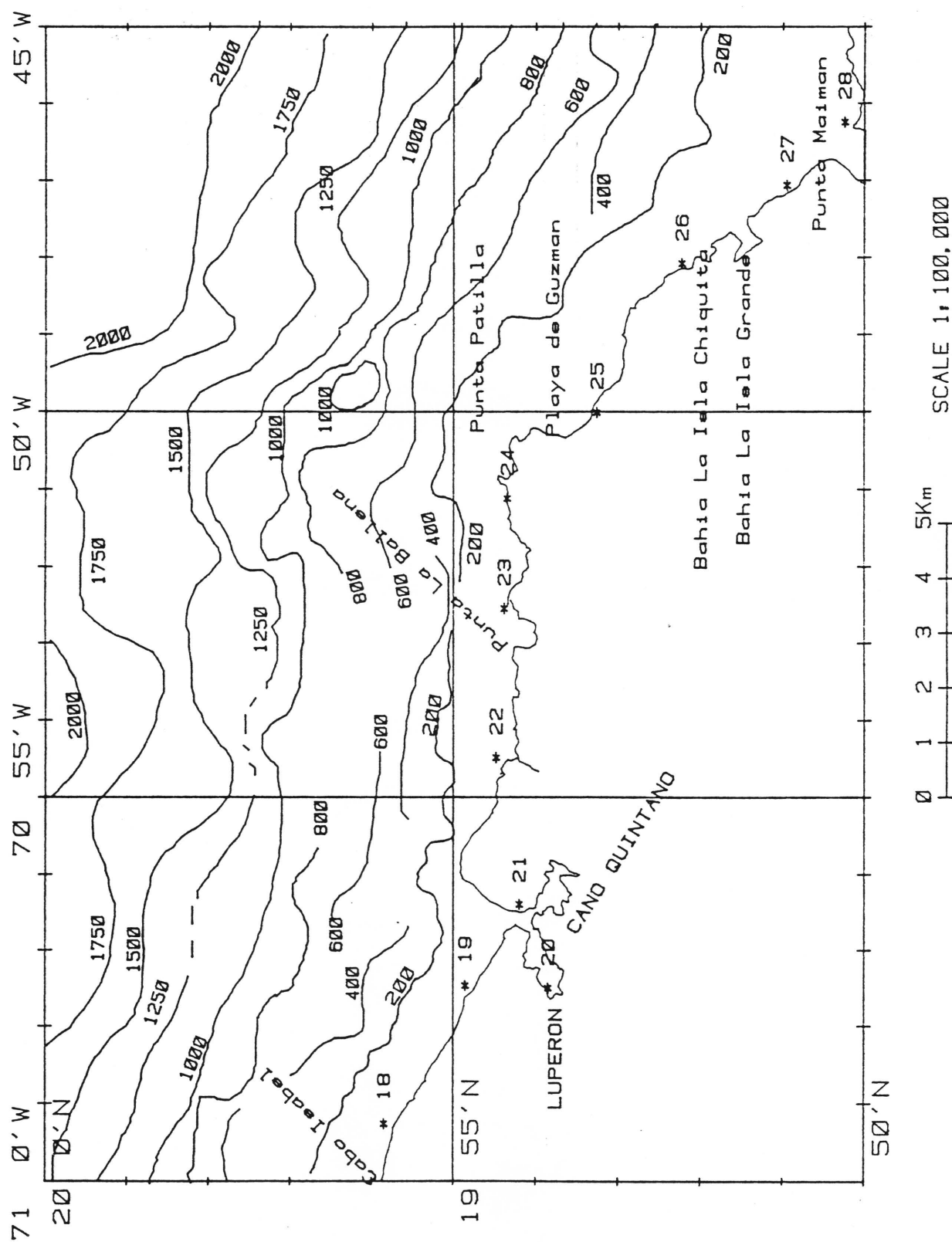
Although the 200 m contour is only 500 m from shore between Punta de Buren and Punta Estero Hondo, 1000 m water is 6 km away at its closest. On the eastern edge of the quadrangle, 1000 m depths are found 4.3 km from shore near location #2:18. The only major road on the coast is at La Isabela, where the 1000 m contour is 8.6 km from shore.

2.3.2 Luperon (Fig. 20)

This quadrangle joins on to the previous one. The offshore bathymetry is more complex to the east of Cabo Isabel[a] and more favorable for deep water close to shore. The 1000 m isobath is found 3.8 km from shore at Cabo Isabel[a], 3.25 km between locations 2:21 and 2:22 and only 2.6 km from Punta Patillo where a small isolated "basin" of water deeper than 1000 m is found. Note: Some of the distances to the 1000 m contour will be less than the shortest distances noted in the previous figures and tables. This is because of the greater accuracy obtained by digitizing the smooth sheets used in this section than was possible to obtain by measuring offshore on the 1:150,000 ship-survey sheets, as was done in the previous section. Also, some of the places where deep water is closest to shore are between locations selected for the preliminary survey, e.g., between locations 2:21 and 2:22, 200 m water comes as close as 0.3 km to shore. The existing road at Balneario Playa Grande near Luperon is 4.2 km from 1000 m water depth, while the closest road to Punta Patilla is 4.5 km from the deep water.



Detailed Bathymetry of the BARRANCON Quadrangle



Detailed Bathymetry of the LUPERON Quadrangle

fig. 20

2.3.3 Las Galeras (Fig. 21)

At both horns of the Semana Peninsula, Cabo Cabron and Cabo Semana, steep slopes are found close to shore (see Fig. 2 for overview). Cabo Cabron is not included in the Las Galeras quadrangle, but at location 3:43, 1000 m depth is only 2.1 km from shore. No roads are near this location and the topography rises steeply to Loma El Fronton (altitude 256 m) opposite location #3:43.

2.3.4 Sabana Buey (Fig. 22)

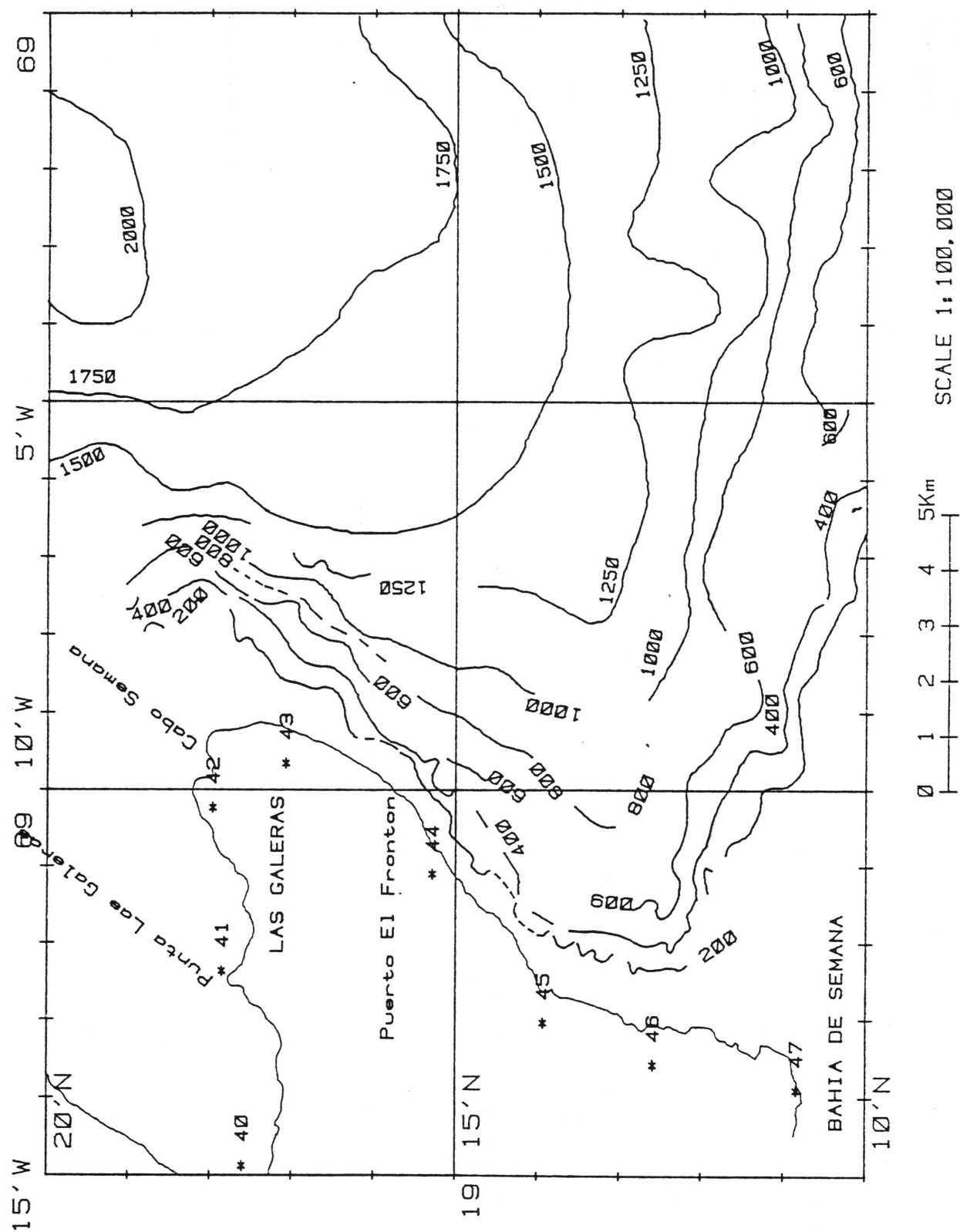
At the mouth of the Rio Ocoa the 200 m contour is 400 m offshore. However, to the west and north of Palmar de Ocoa, the Bahia de Ocoa is broad and shallow, and deeper water is found much farther from shore. At Punta Salinas the 1000 m contour is closer to shore than anywhere else in this quadrangle and is 4.3 km away. Roads lead to the towns of Palmar de Ocoa and Las Salinas.

2.3.5 La Cienaga (Fig. 23)

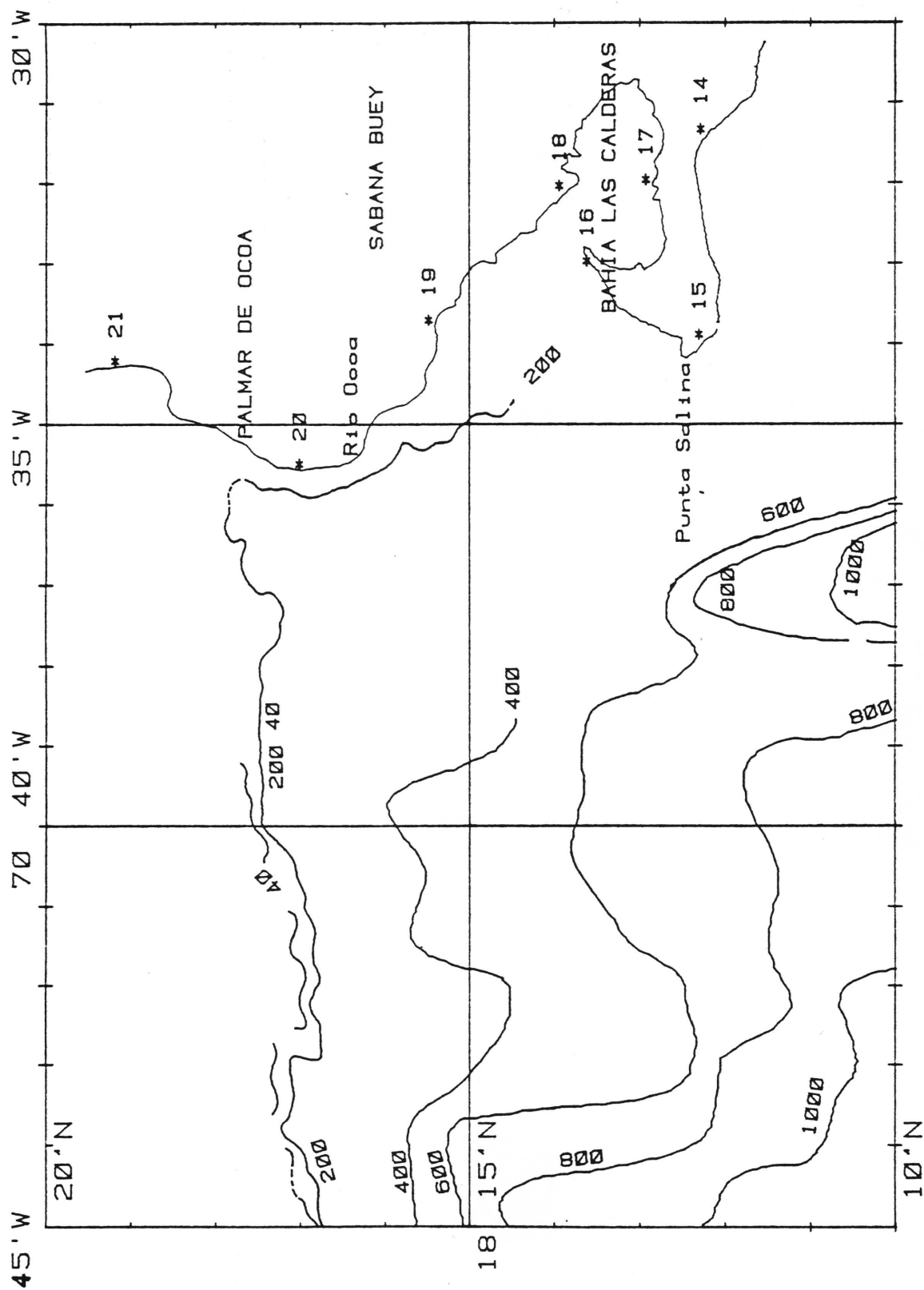
This and the following three quadrangles are adjacent to each other. Steep offshore gradients and several submarine canyon-like depressions bring deep water closer to shore here than anywhere else in the Dominican Republic. In this quadrangle the 1000 m contour is everywhere <3.0 km from shore, but between the towns of La Cienaga and San Rafael it is 1.2 km (1,200 m) offshore at the head of a small canyon. A road runs down the length of the coast here; 12 km inland the mountains rise to about 1,700 m.

2.3.6 Enriquillo (Fig. 24)

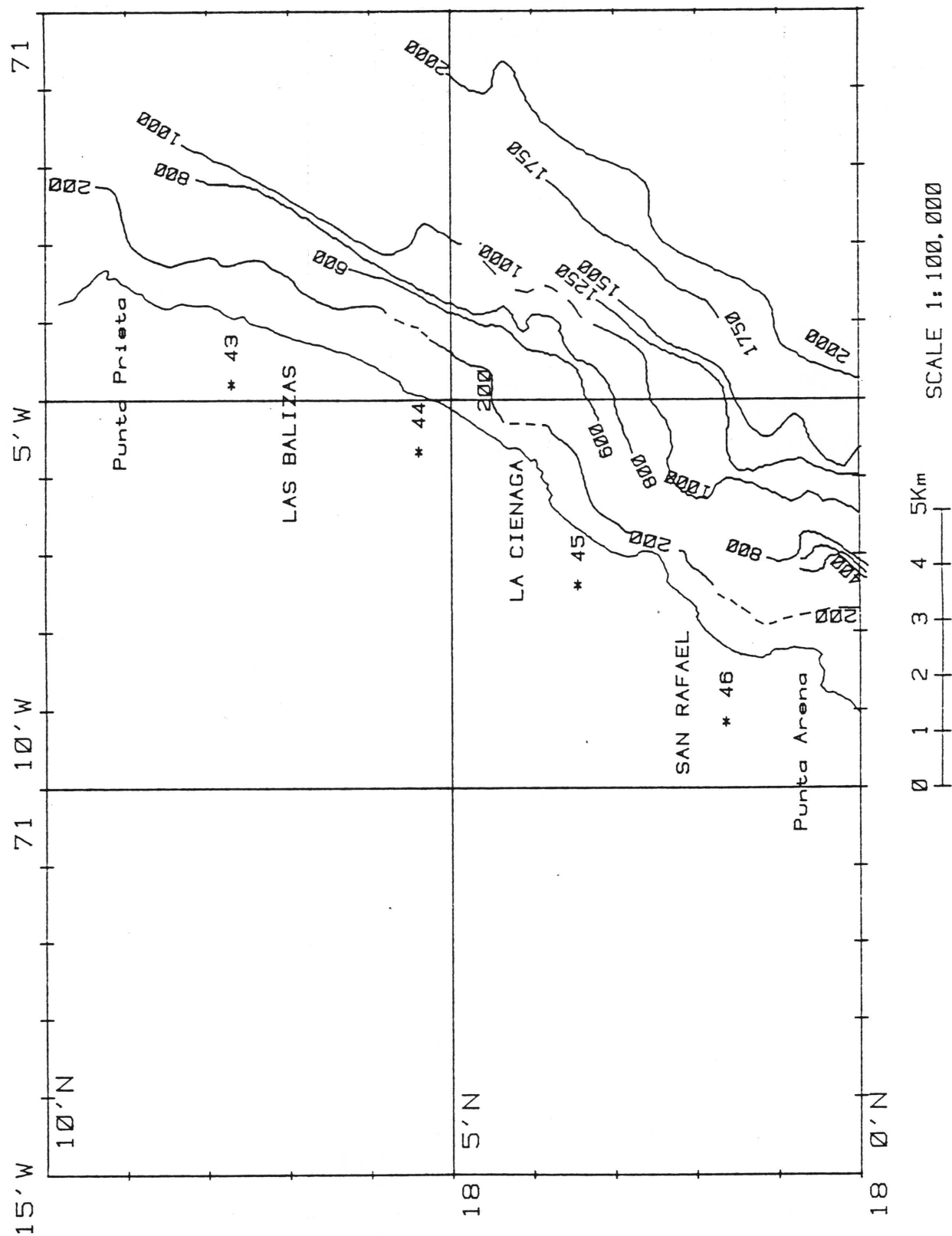
Again the 1000 m isobath is within 3.5 km from shore along the length of this coastline. The 1000 m contour comes to



Detailed Bathymetry of the LAS GALERAS Quadrangle fig. 21

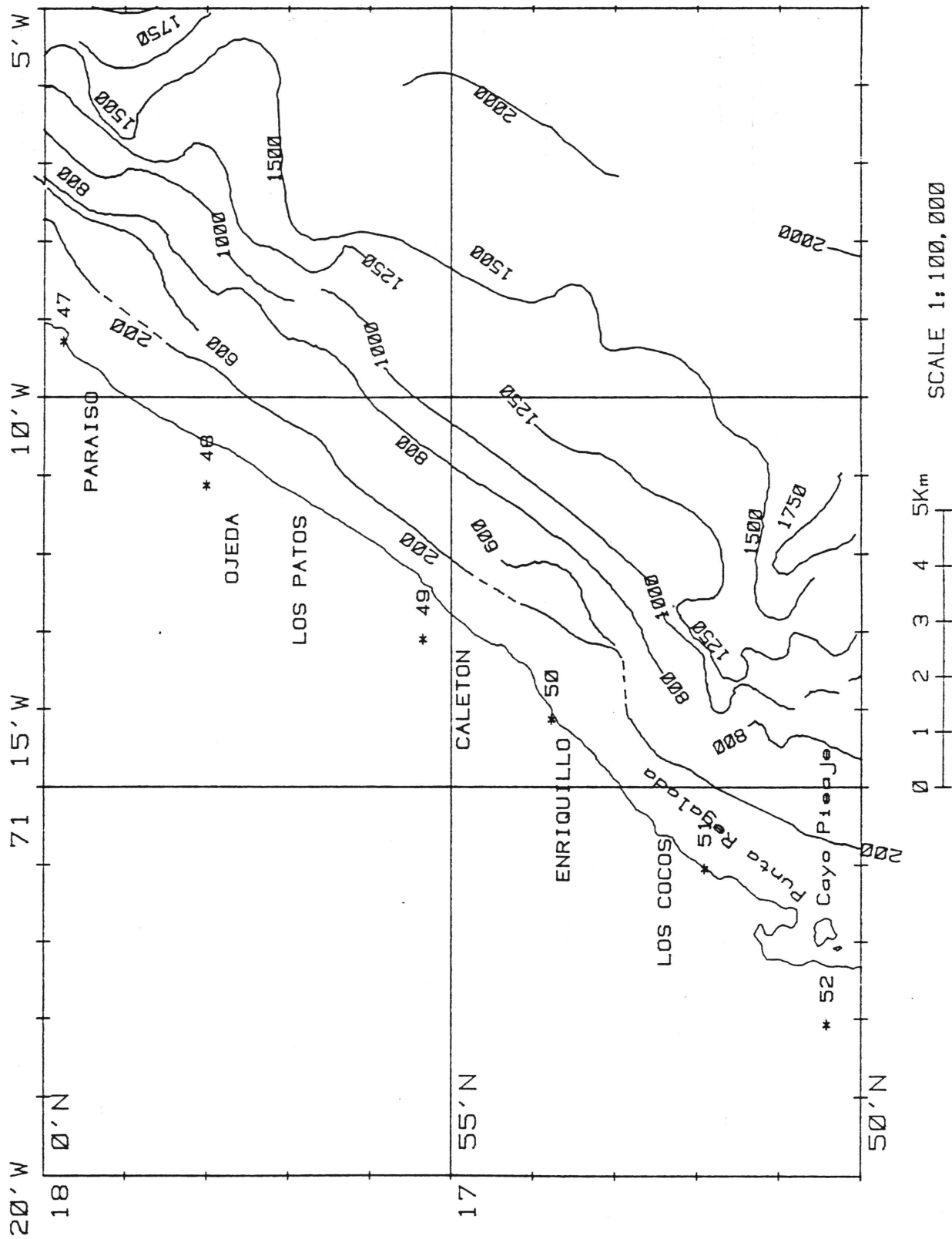


Detailed Bathymetry of the SABANA BUEY Quadrangle fig. 22



Detailed Bathymetry of the LA CIENAGA Quadrangle

fig. 23



Detailed Bathymetry of the ENRIQUILLO Quadrangle

fig. 24

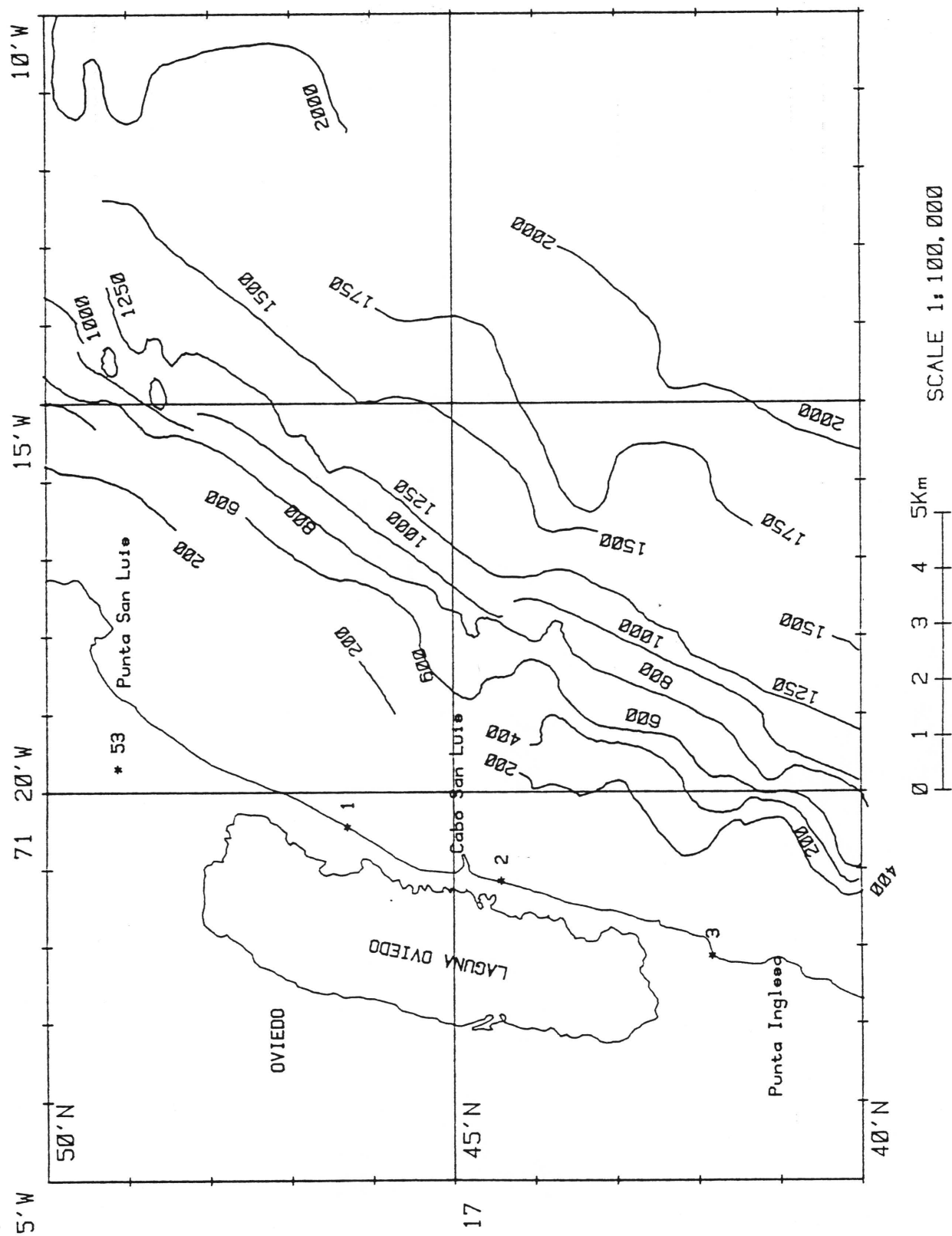
within 2.2 km from shore at the head of the Enriquillo Canyon (Emery & Uchupi 1972). At the same location, 1750 m depths are found only 4.6 km from shore. Enriquillo is a small town on the coastal highway with an airstrip near Los Cocos. Inland the terrain is mountainous, but to the south flattens out into a coastal plain.

2.3.7 Oviedo (Fig. 25)

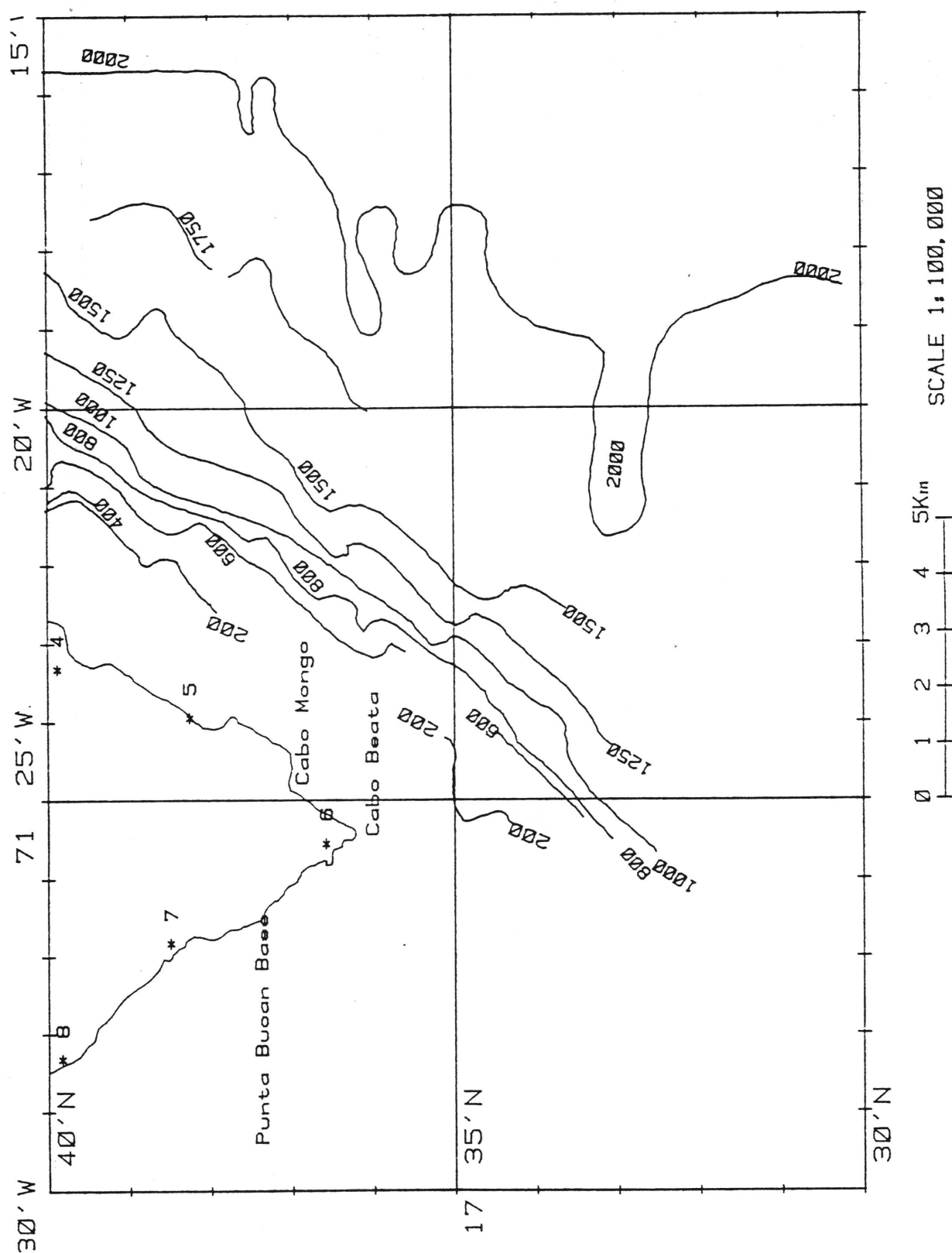
The 1000 m contour varies between 3.5 km to 5 km offshore in this section, with the closest being opposite Punta Inglesa. Another canyon-like feature is found opposite Cabo San Luis but the survey is not complete here and all contours are not well-delineated. The coastal highway branches inland at the northern end of Laguna Oviedo and was under construction as of 1970. The coast is flat with extensive mangroves and a narrow beach bordering the coastal side of Laguna Oviedo.

2.3.8 Isla Beata (Fig. 26)

Isla Beata is not included in our illustration of this quadrangle, although deep water is quite close to parts of the eastern side of the island. From the mainland, 1000 m is only 3 km offshore near location 8:4 and 3.1 km away from Cabo Mongo. No roads or towns are shown on the maps for this region.



Detailed Bathymetry of the OVIEDO Quadrangle



Detailed Bathymetry of the ISLA BEATA Quadrangle fig. 26

III. HYDROGRAPHY

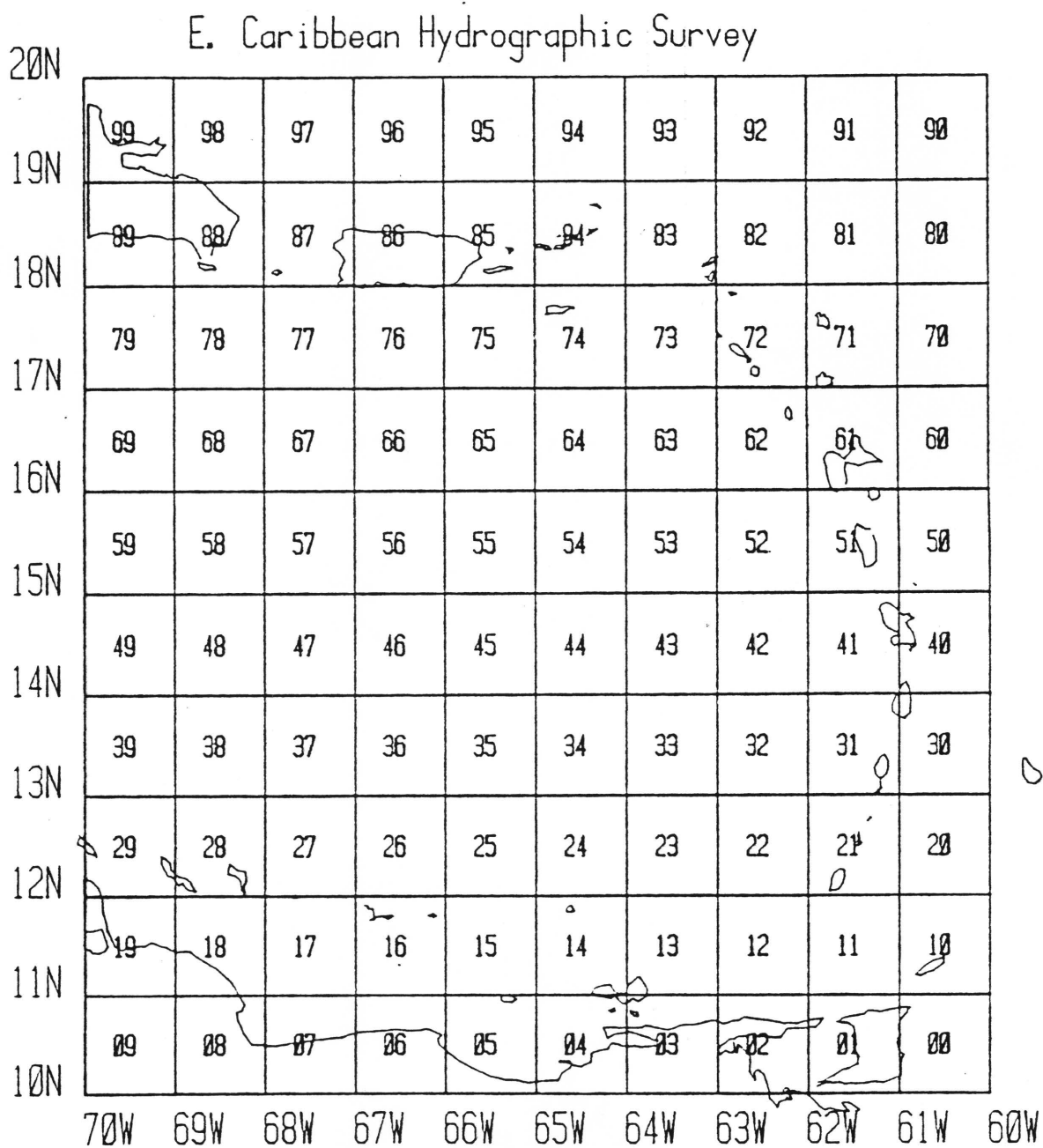
1. Survey of Existing Hydrographic Data

While no systematic survey of available hydrographic data was done, some previous work done by the author is of interest to the planning of an OTEC or "artificial upwelling" project in the Dominican Republic. The following is a synopsis of a study of the ocean-temperature structure in the eastern Caribbean.

1.1 Method

For the purpose of archiving oceanographic data, the world has been divided into numbered 10° latitude x 10° longitude squares. NODC uses the "Modified Canadian Square" (MCS) system rather than the older, more familiar "Marsden Square". Each 10° square is divided into one hundred 1° squares numbered by taking the last digit of the latitude and longitude, e.g., 1° square #12 would be 11°N x 62°W . MCS #1008 (which encompasses the eastern Caribbean, the coast of Venezuela, part of Hispaniola, Puerto Rico, the outer Antilles and part of the Atlantic Ocean) was chosen for a more detailed ΔT study. MCS #1008 is bordered by 10°N - 20°N and 60°W - 70°W (Fig. 27). This region has some of the most promising OTEC sites in the world.

Using temperature vertical array summary printouts obtained from NODC, the average temperatures at the surface, 250 m, 500 m and 1000 m for each month in each 1° square bordering a coastline were entered into the computer (see Appendix). All data in each 1° square were averaged to give a yearly mean temperature and ΔT at these four levels.



Modified Canadian Square #1008 (10 degree square)

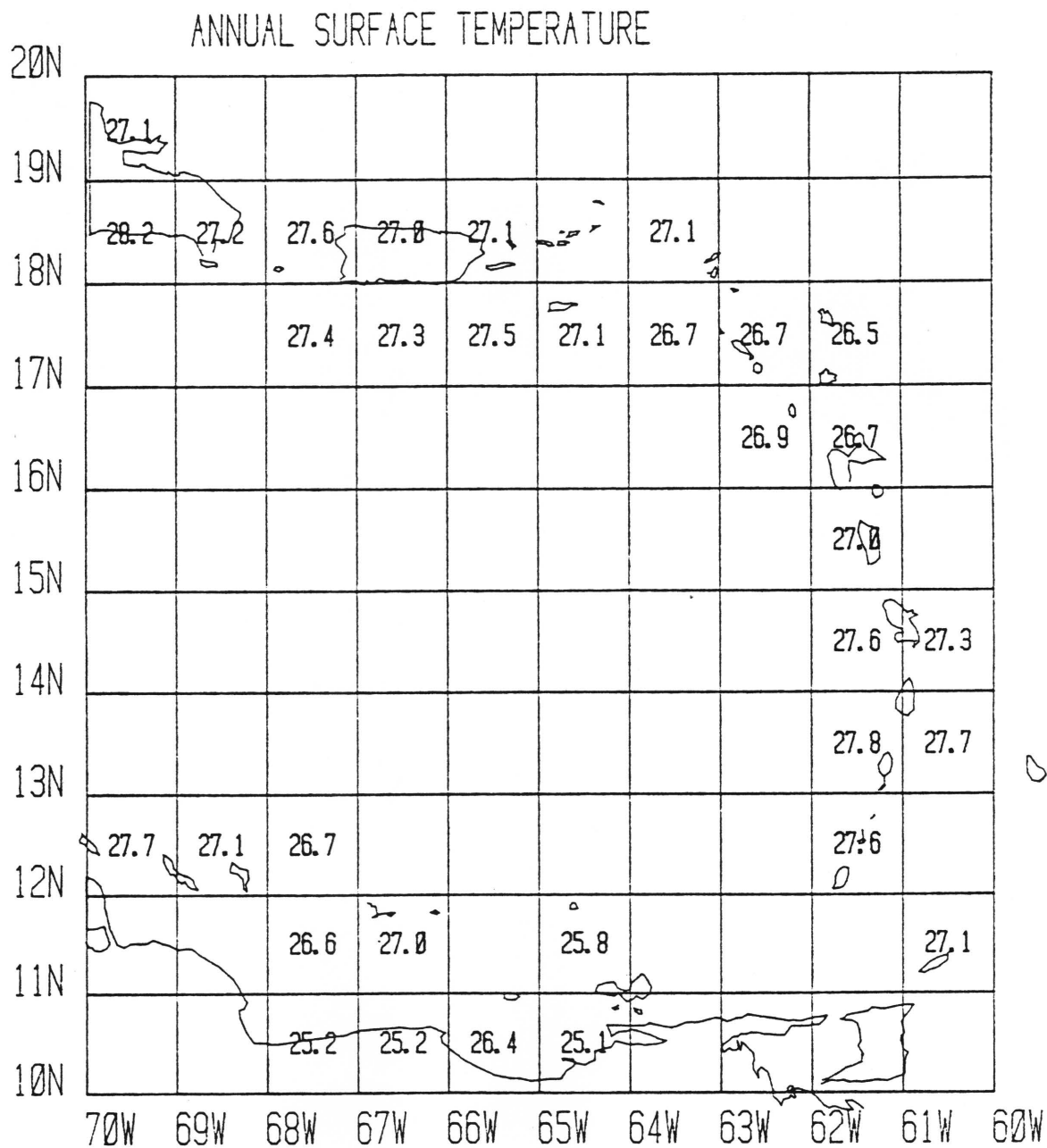
Showing system of numbering of 1 degree squares

fig 27

1.2 Oceanography of the Eastern Caribbean Related to OTEC

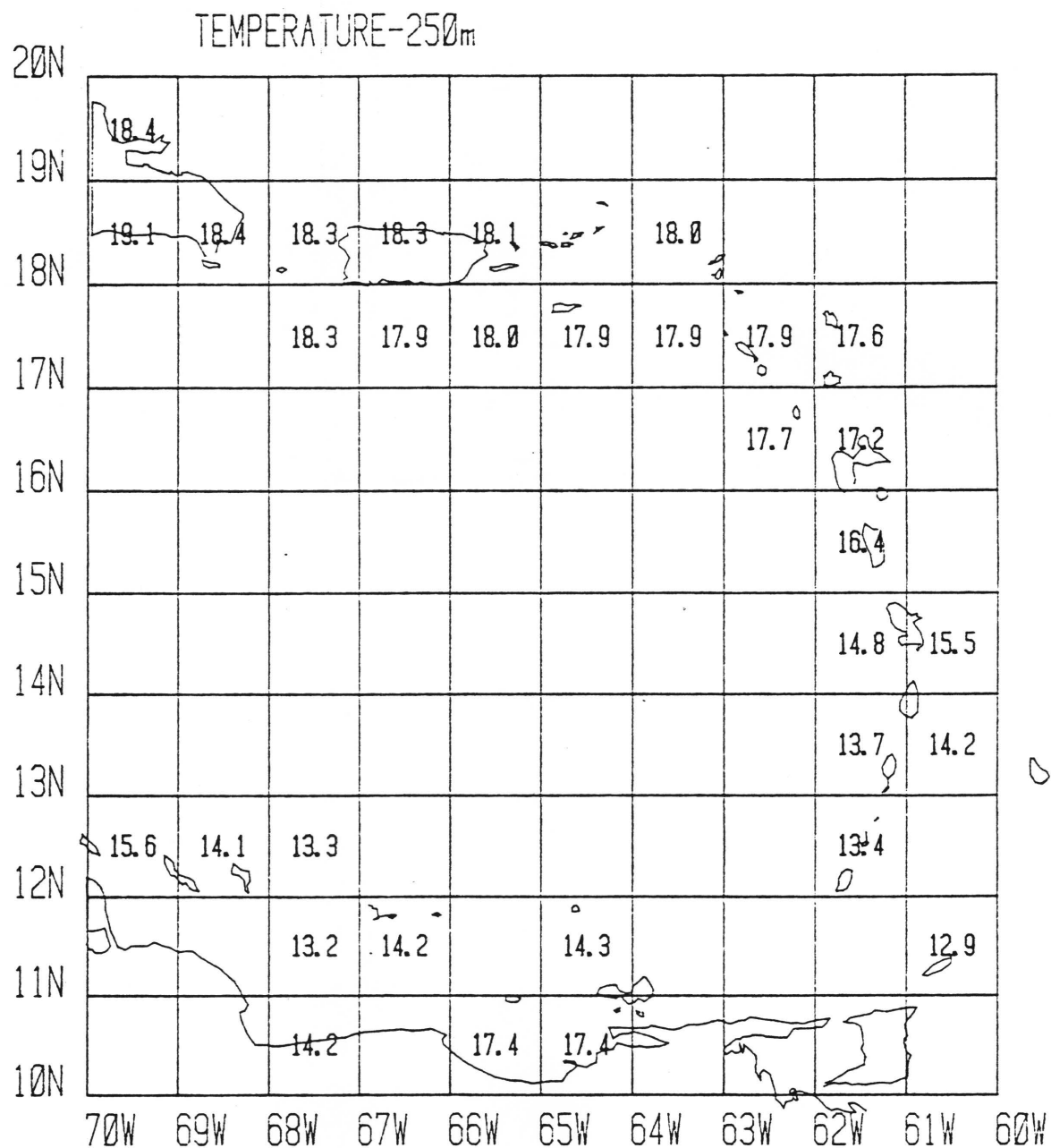
Several features of the oceanographic regime in this part of the Caribbean are readily apparent by examining Figure 27(a-d). Average annual surface temperature (Fig. 27a) varies from 25.1°C to 28.2°C, with a tendency for the lower temperatures to fall along the northern coast of Venezuela and the highest to be in the Windward Islands. The overall average annual surface temperature = 26.34°C (S.D. = 0.74°C). Eliminating the northern coast of South America for reasons given later, average surface temperature = 27.23°C (S.D. = 0.41°C) and can be considered constant over the Caribbean island region. At 250 m, however (Fig. 27b), a considerable range in temperatures occurs—from 12.9°C around Tobago to 19.1°C on the southern coast of Hispaniola—a range of 6.2°C. Note the remarkably constant values from 16°N northwards of around 18°C. This is due to the penetration into the Caribbean of the "18° water" which is formed in the northern Sargasso Sea in winter when isothermal 18° water can be up to 500 m thick (Worthington, 1959, 1976). This far south, the "core" of the 18° water is about 250 m.

The seemingly paradoxical situation, where colder water is found closer to the equator, is due to the considerable influence of Antarctic Intermediate Water (AAIW) flowing north into the Caribbean (Wüst, 1964). At 500 m (Fig. 27c), the south-to-north temperature difference is still 6.2°C, ranging from 7.3°C to 13.5°C as the effects of the 18° water in the north are still felt at this depth. At 1000 m (Fig. 27d), however, AAIW dominates the entire region and the temperature varies from 4.8°C to 6.3°C, only 1.5°C difference.



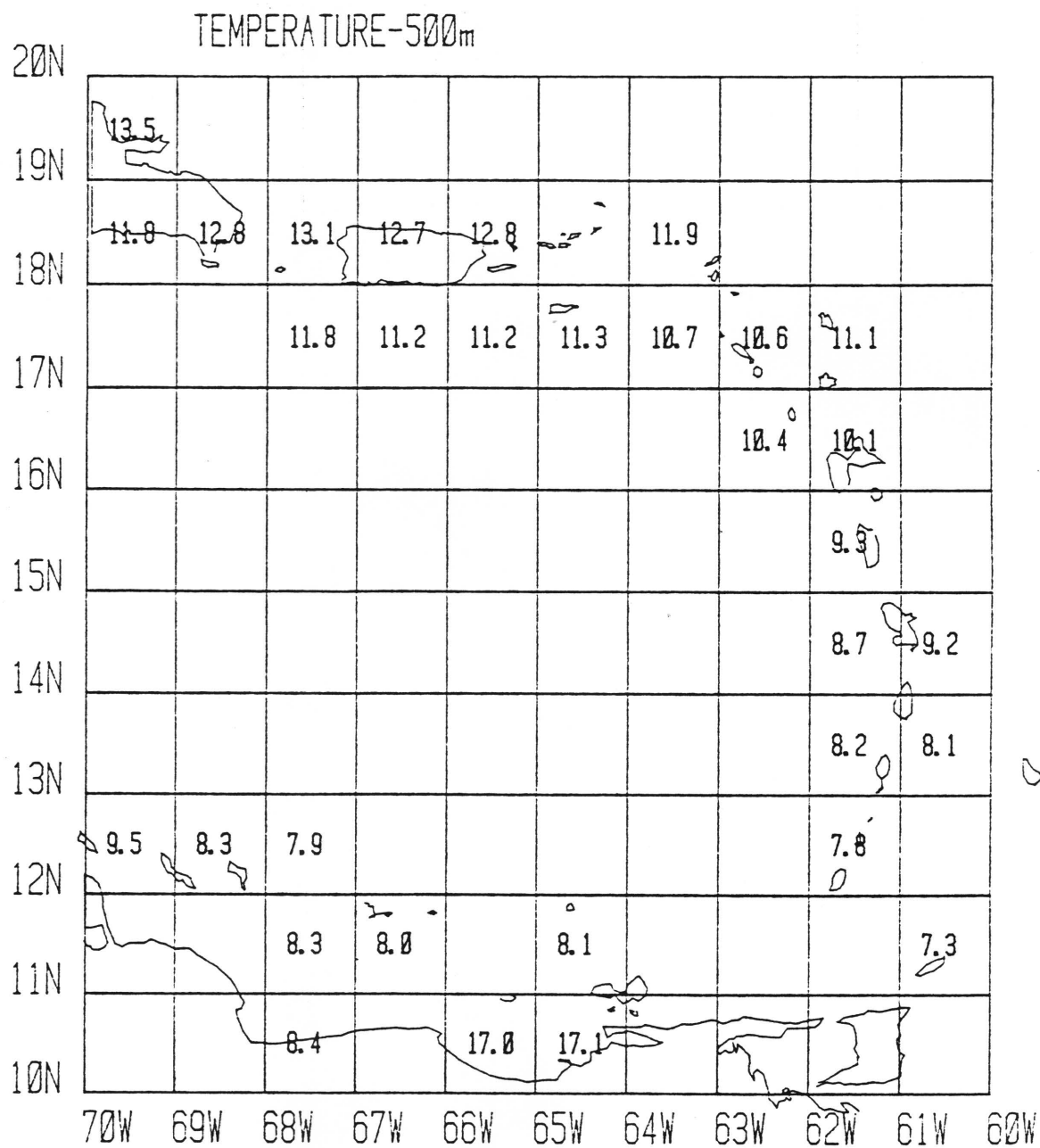
Average annual coastal temperatures
in each 1 deg. square

fig. 27(a)



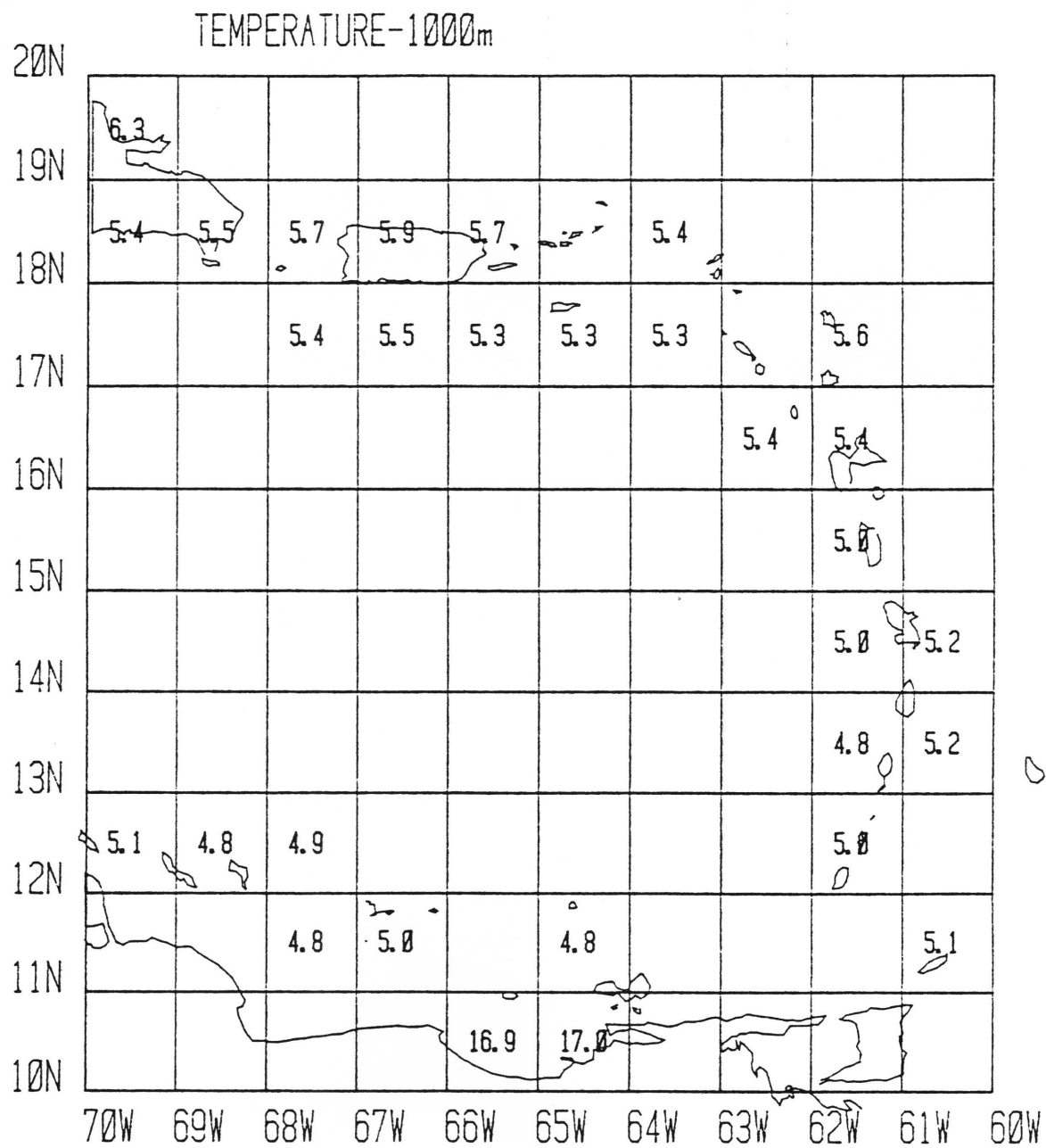
Average annual coastal temperatures
in each 1 deg. square

fig. 27 (b)



Average annual coastal temperatures
in each 1 deg. square

fig. 27(c)



Average annual coastal temperatures
in each 1 deg. square

fig. 27(d)

In adjacent squares 04 and 05, the temperature varies little from 17.0°C at 250 m, 500 m or 1000 m. This is due to the underlying Cariaco Trench, a unique (for the Caribbean) anoxic basin first studied by Richards and Vacarro (1956) and accounting for most of the 343 stations in these squares.

1.3 Vertical Temperature Differences, ΔT

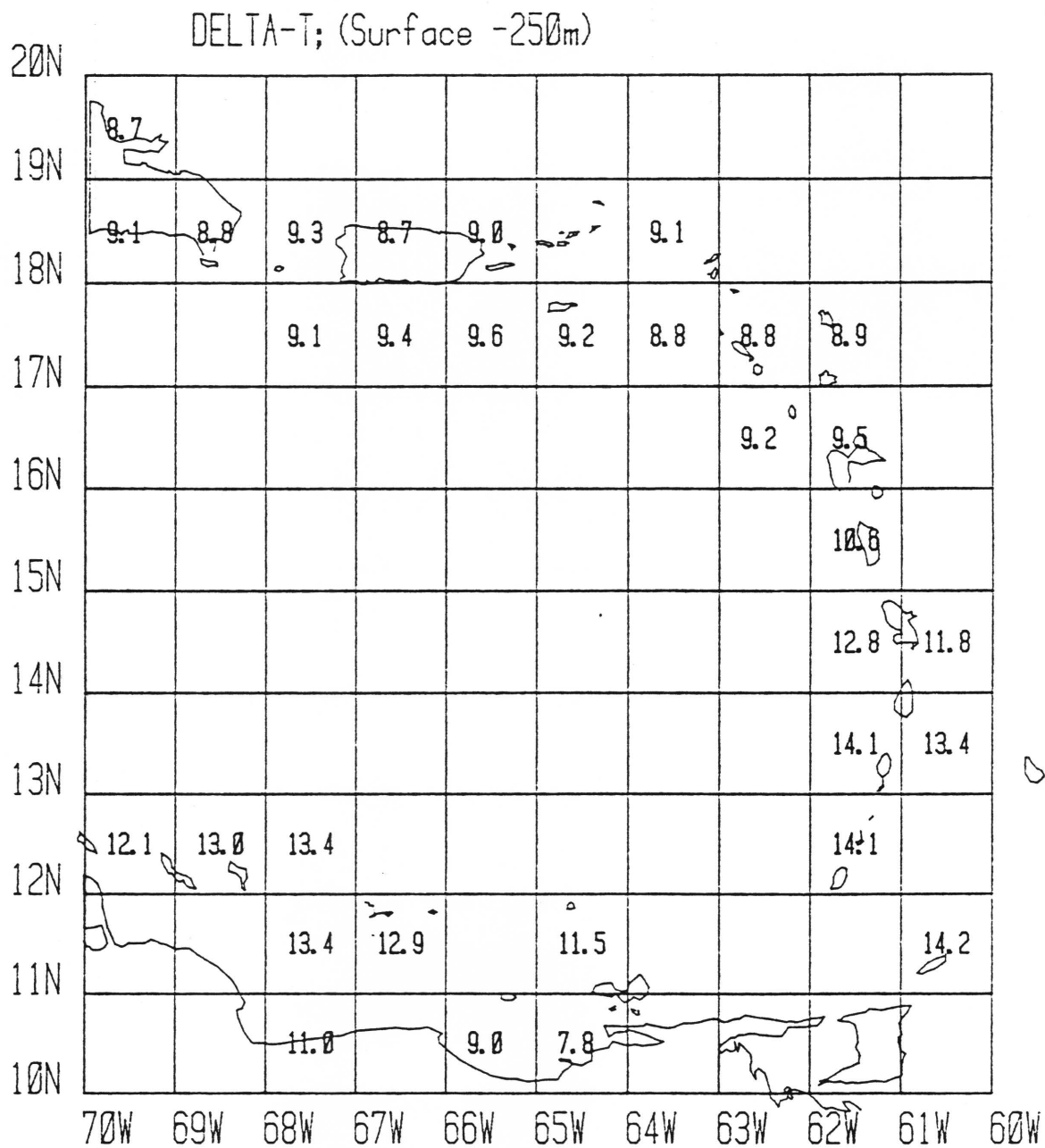
ΔT (Fig. 28a-c), because of the mainly constant surface temperature, varies as the temperature of the intermediate waters varies. At 250 m, ΔT is as high as 14.2°C around Tobago and, ignoring the anomalous Cariaco Trench, as low as 8.7°C off northern Hispaniola and Puerto Rico (Fig. 28a). At 500 m (Fig. 28b), the desired ΔT of 20°C is just about reached (19.9°C) around Tobago, while, for example, off St. Croix ΔT is 15.9°C, and 13.6°C off northern Hispaniola.

At 1000 m (Fig. 28c), the much more uniform temperature of AAIW (1000 m is near the core of this water) results in a uniform ΔT , everywhere greater than the desired 20°C (except over the Cariaco Trench).

ΔT , at 1000 m, varies from 20.9 to 22.9°C, with the lower ΔT being in the mostly Atlantic Ocean region off Barbuda and Antigua and the highest ΔT to the Caribbean side of St. Vincent and St. Lucia.

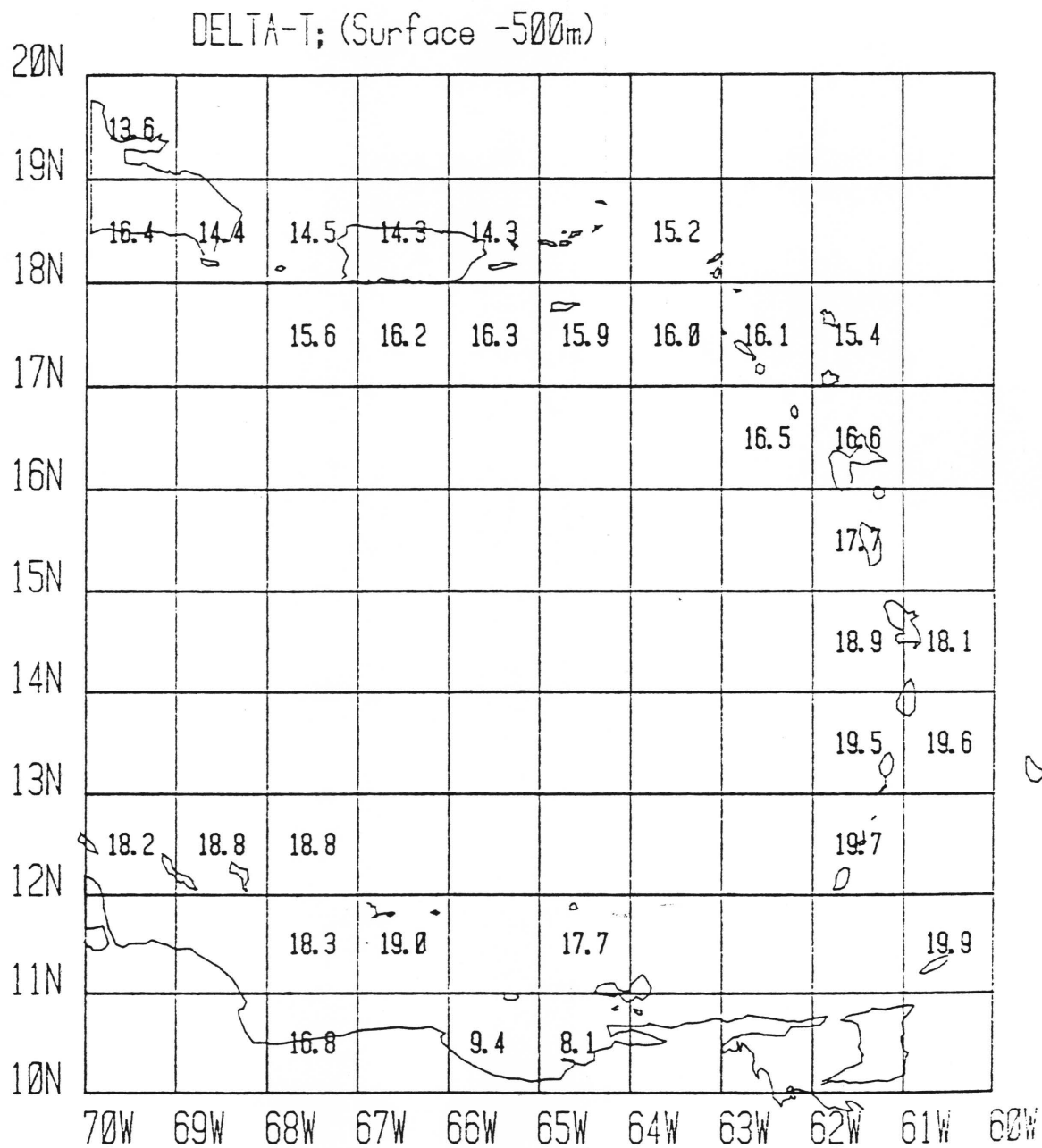
While these differences are quite small, they may be significant for OTEC siting in the Dominican Republic; the closer to the surface that a suitable ΔT can be found year-round then the shorter the cold-water pipe will be. In this region, there is a significant difference between the waters off the Lesser Antilles Islands, for example, than those off the Dominican Republic.

An indication of this difference, which we have previously called



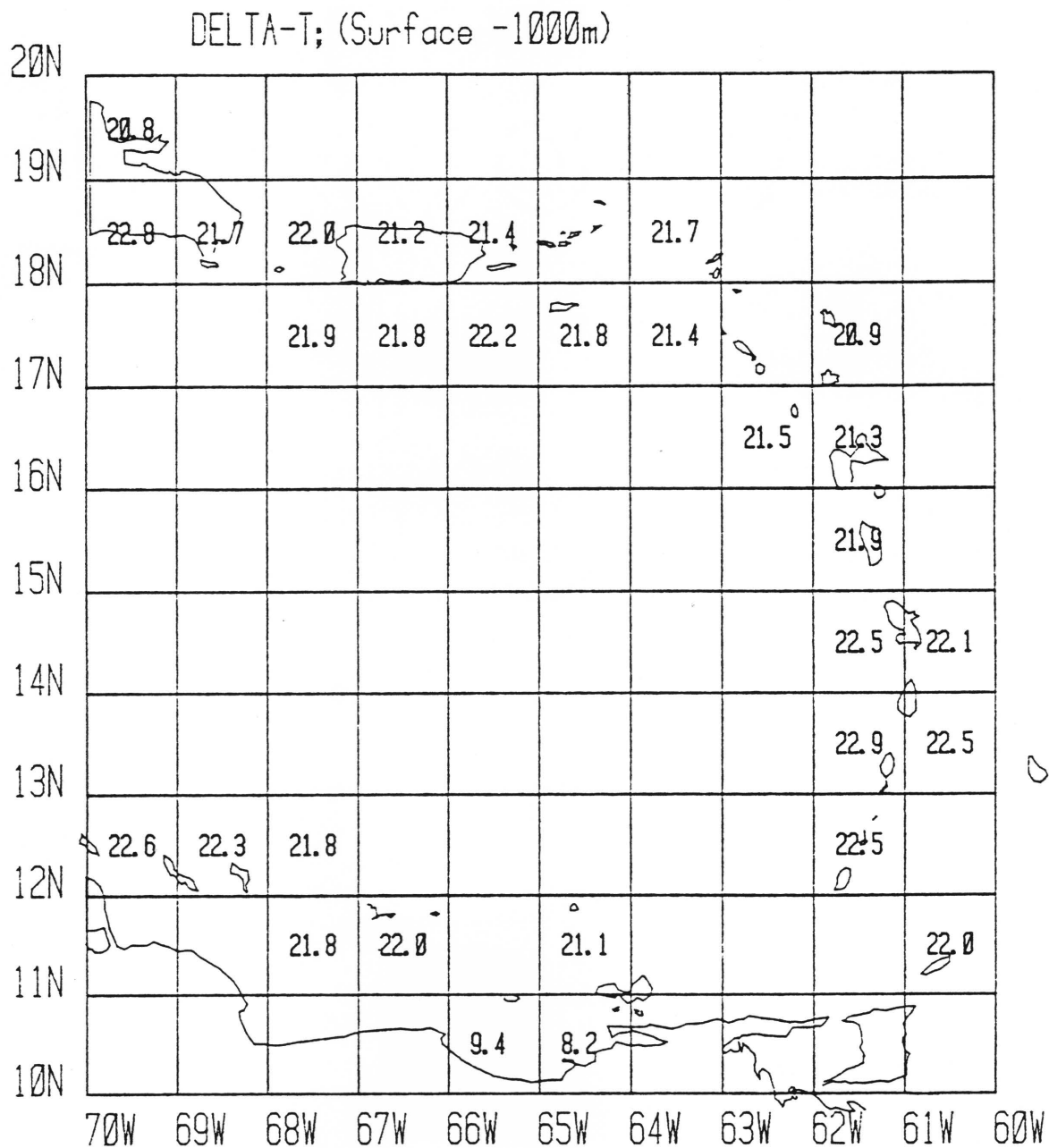
Average annual coastal temperature
difference between surface and deep water

fig. 28(a)



Average annual coastal temperature
difference between surface and deep water

fig. 28(b)



Average annual coastal temperature
difference between surface and deep water

fig. 28(c)

the "pseudogradient", has been computed here for the two contrasting regions. Taking the average annual temperature data in squares 99 (North Coast, Dominican Republic) and 10 (Tobago), ΔT between the surface and each standard hydrographic depth was divided by that depth to give the pseudogradient $\frac{d(\Delta T)}{dz}$ in $^{\circ}\text{C}$ per meter. The pseudogradient for square 10 (Fig. 29a) increases rapidly to $.072^{\circ}\text{C}/\text{m}$ at 200 m, then decreases at a slower rate to 1400 m—the deepest observation in square 10. For square 99, the pseudogradient also reaches a maximum at 200 m, but only at $0.039^{\circ}\text{C}/\text{m}$. Both curves approach each other asymptotically at about 1100 m. Pseudogradient is the rate-of-change of the temperature difference with depth between surface water and water pumped into a pipe being lowered through the water column. In this sense, it is a pseudogradient and not directly related to the in situ temperature gradient ($-\frac{dT}{dz}$). The in situ gradient in the water column (Fig. 29b) is more sensitive to changes in the temperature field as a function of depth, but it is the way in which ΔT changes the deeper a pipe penetrates the water column that is of interest to OTEC technological requirements.

The magnitude of $\frac{d(\Delta T)}{dz}$ and the depth of its inflection point may be useful indices to judge OTEC site suitability. Of course, plotting ΔT as a function of depth readily shows the difference between the two 1° squares in this region (Fig. 28c) and directly shows the depths of the water producing desirable ΔT s.

The significance of this for the suitability of sites for OTEC or similar projects in the Dominican Republic is that, while in other parts of the Caribbean, pipelines need only be 400-500 m long to reach

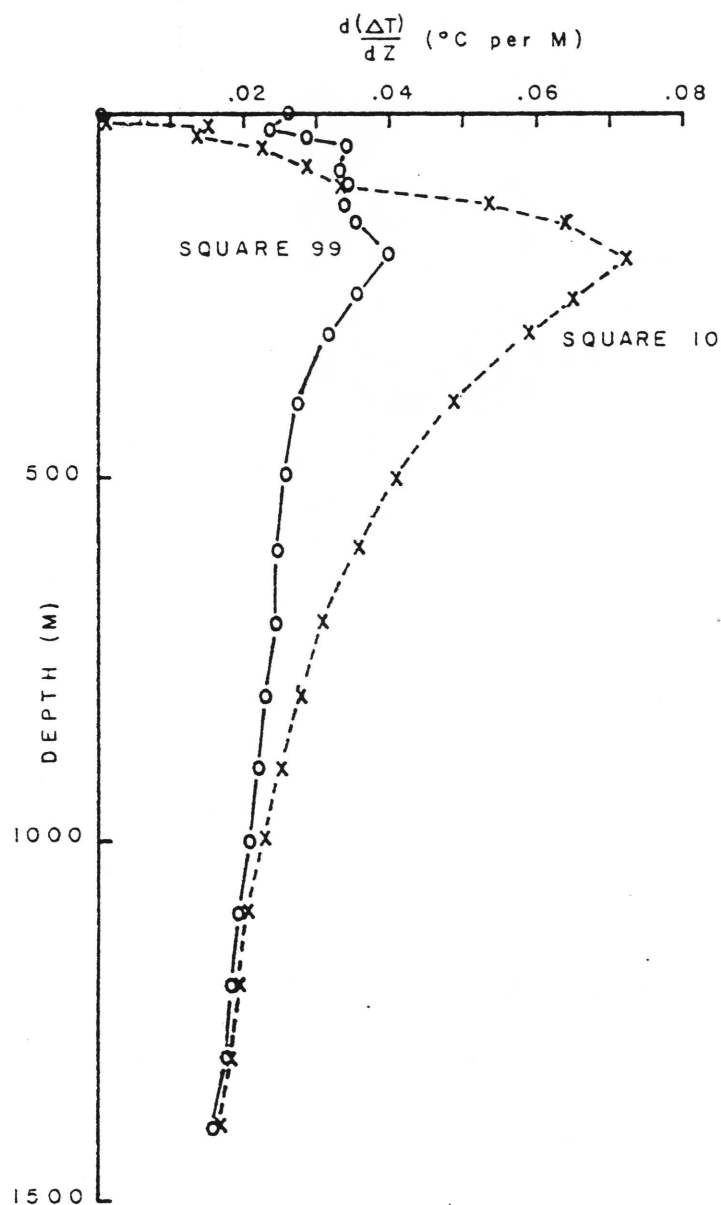


Figure 29a Vertical temperature structure in two contrasting regions of the Caribbean; the waters surrounding the Island of Tobago (square 10) and off the north coast of Hispaniola (square 99):
 (A) "Pseudogradient" $\frac{d(\Delta T)}{dz}$ (see text)

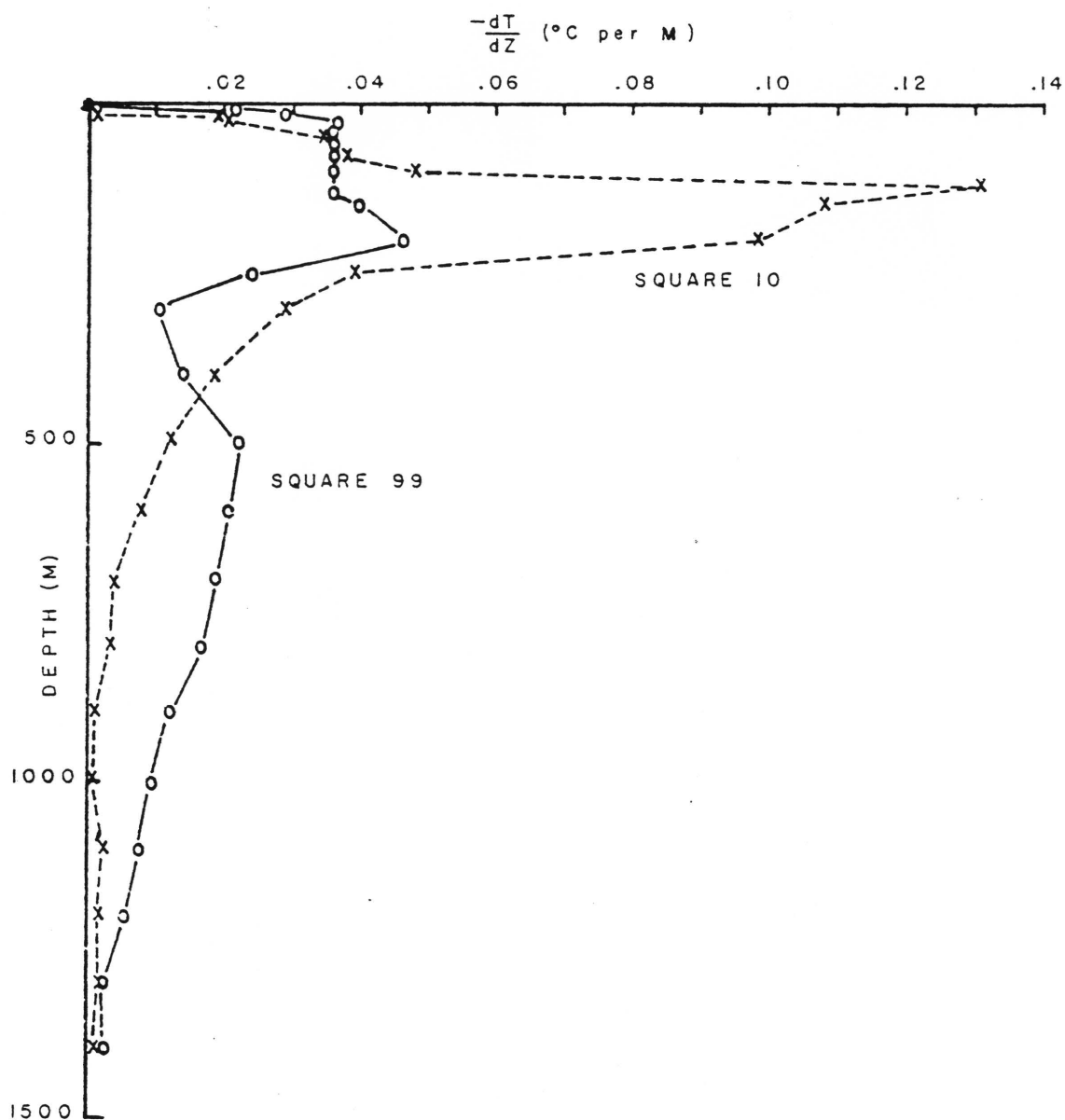


Figure 29b Vertical temperature structure in two contrasting regions of the Caribbean; the waters surrounding the Island of Tobago (square 10) and off the north coast of Hispaniola (square 99): (B) In-situ temperature gradient $-\frac{dT}{dZ}$

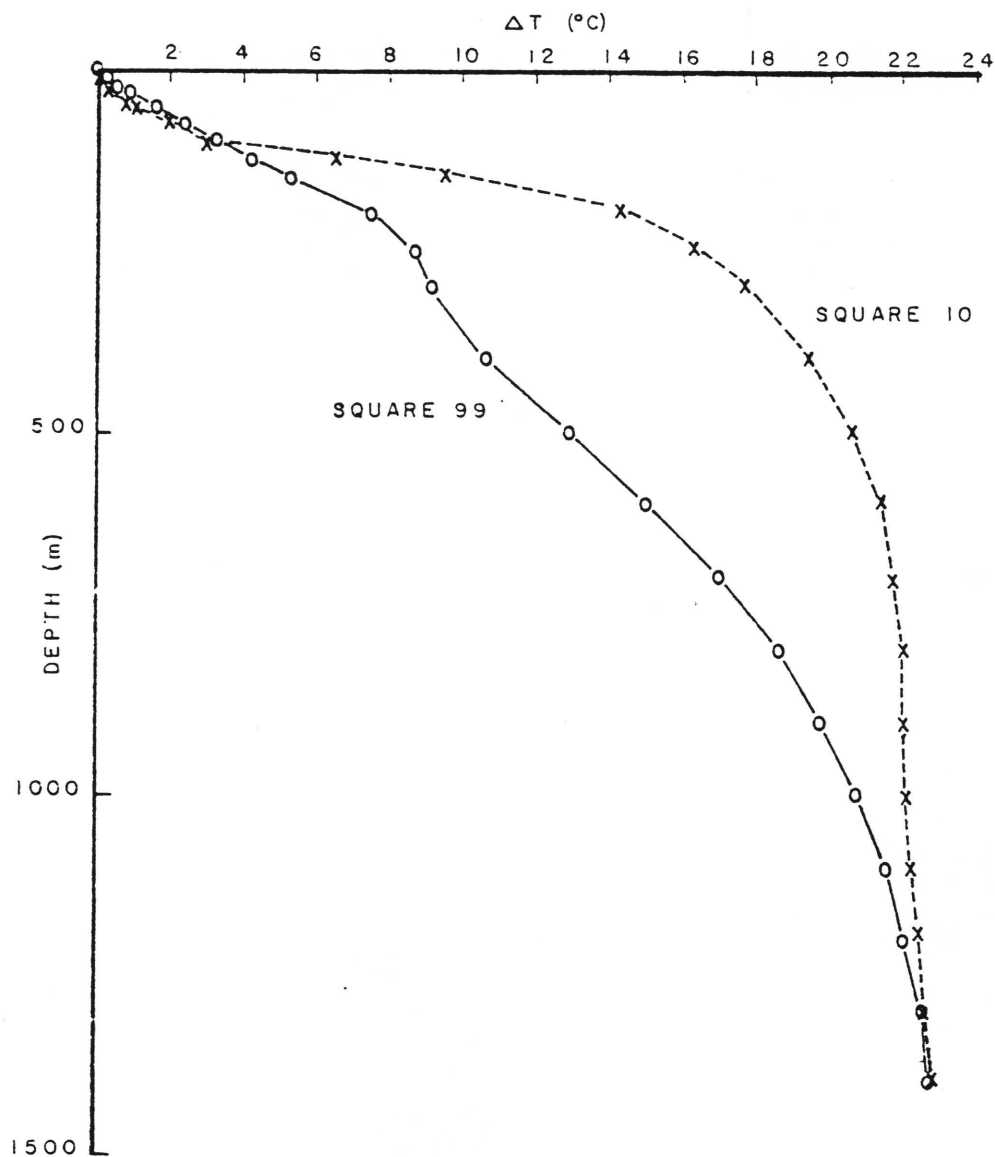


Figure 29c Vertical temperature structure in two contrasting regions of the Caribbean; the waters surrounding the Island of Tobago (square 10) and off the north coast of Hispaniola (square 99): (C) ΔT plotted as a function of depth.

deep waters with an annual ΔT of 20°C , on Hispaniola, depths of about 1000 m must be reached before $\Delta T = 20^{\circ}\text{C}$ is attainable. Therefore, it is essential to identify all sites where 1000 m water is close to shore to make such projects feasible.

It should be added that the same situation is true of all of the islands of the Greater Antilles. Also, very few hydrographic station data from Dominican Republic waters are in the NODC archives. Potential OTEC sites should be well surveyed for year-round temperature, salinity and nutrient variations as adequate data does not now exist.

IV. CONCLUSIONS

The closest point on the coastline of the Dominican Republic to water of 1000 m depth is between the towns of La Cienaga and San Rafael in the Provincia de Barahona. The distance here is 1.2 km to the 1000 m isobath. At this location the average annual surface temperature is 28.2°C (based upon only a few data points in the NODC archives), while difference in temperature between the surface and 1000 m is 22.0°C. Several other places along the Barahona and Pedernales coasts have distances to 1000 m of 3 km or less.

The next closest is at location 3:43 near Cabo Semana where 1000 m is 2.1 km from shore. At Punta Patillo, 1000 m water is 2.6 km from shore. Other possible sites are at Cabo Falso and points north. The rugged topography near some of the sites and lack of nearby roads and towns may be problematical in OTEC siting.

It is recommended that local, intense surveys of some of these areas be done using small coastal research vessels and shore stations. The vessels should be capable of measuring depths accurately over the ranges 50 to 3000 m to adequately survey the region and fill in the "HARKNESS gap". The same or another vessel should undertake an annual thermal-structure survey in one or more of these regions.

The existing HARKNESS data could be more thoroughly and accurately analyzed than was possible here by obtaining the original data on digital magnetic tape.

LITERATURE CITED

- British Admiralty (1979) Catalog of Admiralty Charts and Other Hydrographic Publications, Hydrographer of the Navy, Taunton, 1979; 160 pp.
- Defense Mapping Agency (1975) Catalog of Nautical Charts, Region 2, 13th Edition, PUB 1-N, Defense Mapping Agency Hydrographic Center, Washington, D.C. 20390; 48 pp.
- Defense Mapping Agency (1976) Sailing Directions (En Route) for the Caribbean Sea, PUB 144, Defense Mapping Agency Hydrographic Center, Washington, D.C. 20390; 467 pp.
- Defense Mapping Agency (1977a) Catalog of Nautical Charts, Numerical Listing of Charts and Publications, 10th Edition, PUB 1-N-L, Defense Mapping Agency Hydrographic Center, Washington, D.C. 20390; 101 pp.
- Defense Mapping Agency (1977b) American Practical Navigator (Bowditch), PUB 9, Defense Mapping Agency Hydrographic Center, Washington, D.C. 20390, vol. 1, 1386 pp; vol. 2, 716 pp.
- Defense Mapping Agency (1978) Catalog of Nautical Charts, Miscellaneous and Special Purpose Navigational Charts, Sheets and Tables, 5th Edition, PUB 1-N-A, Defense Mapping Agency Hydrographic Center, Washington, D.C. 20390; 59 pp.
- Cassell's Spanish Dictionary, E.A. Peers, J.V. Barragan, F.A. Vinyals & J.A. Mora (Eds.), Funk & Wagnalls Co.: New York (1960); 1477 pp.
- Emery, K.O. and E. Uchupi (1972) Western North Atlantic Ocean: Topography, Rocks, Structure, Water, Life and Sediments, Am. Assn. Petr. Geol., Tulsa, OK; 532 pp + map.

- Heezen, B.C. and M. Tharp (1968) Physiographic Diagram of the North Atlantic Ocean, Geol. Soc. Amer., map, Boulder, CO.
- Heezen, B.C. and M. Tharp (1971) Physiographic Diagram of the Equatorial Atlantic Ocean, Geol. Soc. Amer., map, Boulder, CO.
- Hunt, L.M. and D.G. Groves, Eds. (1965) A Glossary of Ocean Science and Undersea Technology Terms, Compass Publications, Inc.: Arlington, Va.; 173 pp.
- Jane's (1974) Jane's Ocean Technology, R.L. Trillo (Ed.), Franklin Watts Inc.: New York; 344 pp.
- Menard, H.W. and S.M. Smith (1966) Hypsometry of ocean basin provinces. J. Geophys. Res., 71, 4305.
- Mitchell, H.C. (1948) Definition of Terms Used in Geodetic and Other Surveys, U.S. Coast & Geodetic Survey, Spec. Pub. No. 242, Washington, D.C.: U.S. Govt. Print. Office; 87 pp.
- National Geographic Atlas of the World (1963) M.B. Grosvenor (Ed.), J.M. Darley (Cart.), National Geographic Society, Washington, D.C.; 300 pp.
- NOAA (1974) Users Guide to NODC's Data Services, Key to Oceanographic Records Documentation #1, U.S. Department of Commerce, National Oceanic & Atmospheric Administration, Environmental Data Service, Washington, D.C.; 72 pp.
- NOAA (1976) Computer Programs in Marine Science, Key to Oceanographic Records Documentation #5, U.S. Department of Commerce, National Oceanic & Atmospheric Administration, Environmental Data Service, Washington, D.C.; 225 pp.

Ocean Yearbook (1978) E.M. Borgese and N. Ginsburg (Eds.), Univ.

Chicago Press: Chicago; 890 pp.

Richards, F.A. and R.F. Vaccaro (1956) The Cariaco Trench, an anaerobic basin in the Caribbean Sea. Deep-Sea Res., 3, 214-218.

Robinson, A.H. and R.D. Sale (1969) Elements of Cartography, 3rd Edition, John Wiley & Sons, Inc.: New York; 415 pp.

Times Atlas of the World (1977) Times Newspapers, Ltd., London and Houghton-Mifflin Co.: Boston; 224 pp.

Talwani, M. and W.C. Pitman III, Eds. (1977) Island Arcs, Deep-sea Trenches, and Back-arc Basins. Am. Geophys. Union; 379 pp.

U.S. Army Topographic Command (1969) Undersea Features Gazetteer No. 111, U.S. Army Topographic Command, Geographic Names Division, Washington, D.C. 20315; 142 pp.

U.S. Department of Commerce (1963) Nautical Chart Manual, 6th Edition, PUB 83-1, U.S. Department of Commerce, Coast & Geodetic Survey, U.S. Govt. Print. Office, Washington, D.C. 20402; 213 pp.

U.S. Department of Energy (1978) Large-Scale Distribution of OTEC Thermal Resource; Two maps prepared by Ocean Data Systems, Inc., under Contract ET-78-C-01-2898, U.S. Department of Energy, Washington, D.C.

U.S. Naval Oceanographic Office (1966) Glossary of Oceanographic Terms, SP-35, U.S. Naval Oceanographic Office, Washington, D.C. 20390; 204 pp.

U.S. Naval Oceanographic Office (1976) The Dominican Republic Survey, Archive #755006.

U.S. Naval Oceanographic Office (1977) The Dominican Republic Survey, Archive #765006.

- Walton-Smith, F.G., Ed. (1974) Handbook of Marine Science, Vol. I, CRC Press: Cleveland, Ohio; 627 pp.
- Worthington, L.V. (1959) The 18° water in the Sargasso Sea. Deep-Sea Res., 5, 297-305.
- Worthington, L.V. (1976) On the North Atlantic Circulation. The Johns Hopkins Oceanographic Studies, No. 6, The Johns Hopkins University Press: Baltimore; 110 pp.
- Wüst, G. (1963) On the stratification and the circulation in the cold water sphere of the Antillean-Caribbean basins. Deep-Sea Res., 10, 165-187.

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APPENDIX

Computer Programs Used in Preparing This Report

Because of the volume of data handled, the length of tables and plots presented and the extensive use of data-sorting techniques, a computer was used to aid in preparation of much of this report.

The computer used was a Hewlett-Packard Model 9825-A desk-top calculator with 6,844 bytes of read-write memory. In addition to the built-in magnetic data-tape cartridge, two flexible disk drives (Model 9885), a thermal printer (Model 9866-B) and 4-pen plotter (Model 9872-A) were used.

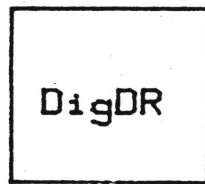
Table A-1 is a list of the programs written and used for this project and Figure A-1 shows symbols used in flow diagrams presented here.

PROGRAM DESCRIPTION

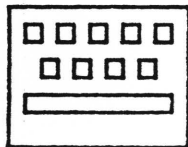
Alist Lists alphabetically sorted INDOTEC place name locations
Alist1 Lists alphabetically sorted INDOTEC feature name locations
Asort2 Sorts locations along coastline alphabetically by place name
Asort3 Sorts Coastal features alphabetically
C1000G Plots INDOTEC bathymetric data in order of decreasing gradient to 1000m
CHART1 lists charts of Dominican Republic
Coast1 Plots INDOTEC bathymetric data along coastline from N. coast, clockwise
Coast2 Plots INDOTEC bathymetric data along coastline by distance to 200m iso
Coast3 Plots INDOTEC bathymetric data along coastline by dist. to 1000m isoba
CoastA Plots INDOTEC locations along coastline alphabetically by place name
CoastG Plots INDOTEC bathymetric data sorted by gradient of Cont. Slope
CSHLFG Plots INDOTEC Continental Shelf data-in order of decr. gradient
DisDR Digitizes coastlines and isobaths for constructing bathymetric charts
DRplot Plots bathymetric charts of sections of coastline
Glist Lists INDOTEC locations, sorted by gradient of Continental Slope
Gsort Sorts INDOTEC bathymetric data by gradient of slope(200-100m)
Nlist1 Lists numerically sorted INDOTEC locations-200m
Nlist2 Lists numerically sorted INDOTEC locations-1000m
Nsort Sorts INDOTEC bathymetric data numerically by increasing distance to is
SHORE1 Lists distances from shore to 200 & 1000m contours
TDDC Tabulates Distance along shoreline vs Distance to a Depth Contour
THCD Tabulates Hydrographic Chart Data
Tplot Plots temperatures and delta-T's in each 1 deg. square of a 10 deg. sq.
Transf Transfers INDOTEC data from tape to disk file

fig A-1

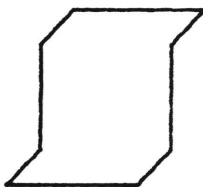
SYMBOLS USED IN FLOW DIAGRAMS



=PROGRAM [NAME]



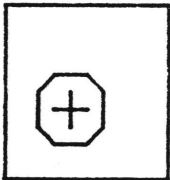
=KEYBOARD entry



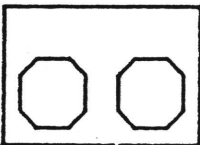
=PRINTER output



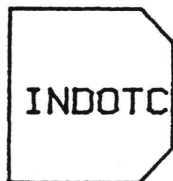
=PLOTTER output



=DIGITIZER



=TAPE (CARTRIDGE) I/O



=DISK (FLEXIBLE) I/O [file name]



=Data flow

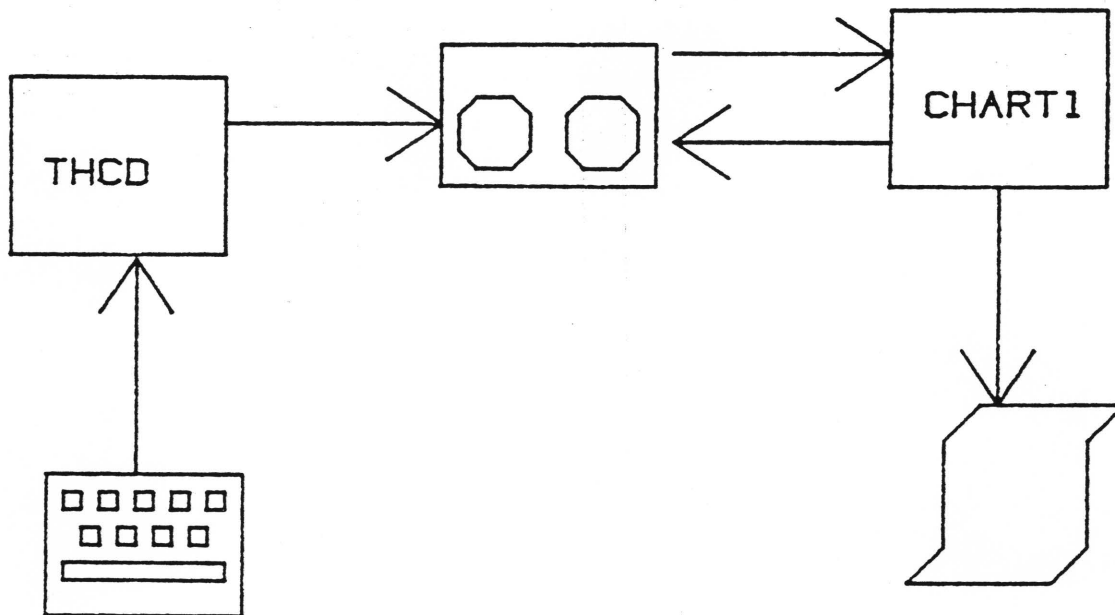


fig A-2 ENTERING, STORING and LISTING CHART
INFORMATION


```

0: "THCD":
1: "Tabulates Hydrographic Chart Data":
2: dim A$(2,80)
3: "START":
4: trk 1:dsp "File#?" :ent "",N
5: "New chart":
6: ent " 1 to load;CONTINUE to edit",L
7: if fl=1:eto "EDIT"
8: for I=1 to 2
9: for J=1 to 80
10: " "+A$(I,J)
11: next J
12: next I
13: if L=1:eto "LOAD"
14: "HEADER":
15: dsp "one line of header info." :ent "",A$(1,1,80)
16: dsp "one line of header info." :ent "",A$(2,1,80) : "1 "+A$(2,80,80)
17: rcf N,A$:eto "START"
18: "EDIT":
19: ent "File#?",N:ldf N,A$
20: dsp A$(1):sto
21: "LOAD":
22: ent "Chart#?",A$(1,2,6)
23: ent "Agency#?",A$(1,8,12)
24: ent "Scale#?",A$(1,14,22)
25: ent "Region#?",A$(1,24,42)
26: ent "Latitude#?",A$(1,44,48)
27: ent "Longitude#?",A$(1,50,54)
28: ent "Date#?",A$(1,56,61)
29: ent "Remarks#?",A$(1,63,80)
30: ent "Region#?",A$(2,24,42)
31: ent "Latitude#?",A$(2,44,48)
32: ent "Longitude#?",A$(2,50,54)
33: ent "Year#?",A$(2,56,59)
34: ent "Remarks#?",A$(2,63,80)
35: rcf N,A$:N+1=N
36: eto "New chart"
37: end
#15780

```

```

0: "CHART1":
1: "Lists Charts of Dominican Republic":
2: dim A$(2,80),B$(160),C$(2,80)
3: trk 1:0→P
4: for I=1 to 80:" "+C$(1,I);next I
5: for I=1 to 80:" "+C$(2,I);next I
6: for I=1 to 160:" "+B$(I);next I
7: " CHART AGENCY SCALE(S) REGION"→B$(1,29)
8: "BOUNDED BY DATE REMARKS"→B$(44,70)
9: " NO. (1:S)"→B$(81,99);"LAT. LONG."→B$(124,134)
10: for I=0 to 166
11: ldf I,A$
12: if I=0;A$(1)→C$(2);"TABLE 1"→C$(1,1,7);"PAGE #"→C$(1,70,75);eto "PAGE"
13: if fl=1 and A$(2,80,80)#"1";eto "HEAD"
14: "NEXT":
15: if A$(2,80,80)="#"1";fnt c30;wrt 6,A$(1);fnt c79;wrt 6,A$(2,1,79);jmp 2
16: M+2→M;fnt c30;wrt 6,A$(1);wrt 6,A$(2)
17: if A$(2,80,80)="#"1";M+2→M;wrt 6," ";eto "LOOP"
18: sfa 1
19: if M>=63;eto "PAGE"
20: eto "LOOP"
21: "PAGE":
22: for Q=1 to 8;wrt 6," ";next Q;0→M
23: fxd 0;str(P+1+P)→C$(1,76,80);wrt 6,C$(1);if I#0;wrt 6,C$(2)
24: "HEAD":
25: if I=0;jmp 2
26: fnt c30;wrt 6," ";wrt 6,B$(1,80);wrt 6,B$(81,160);wrt 6," ";M+4→M
27: cfa 1
28: if M=4;eto "LOOP"
29: eto "NEXT"
30: "LOOP":
31: if M>=63;eto "PAGE"
32: next I
33: end
*19036

```

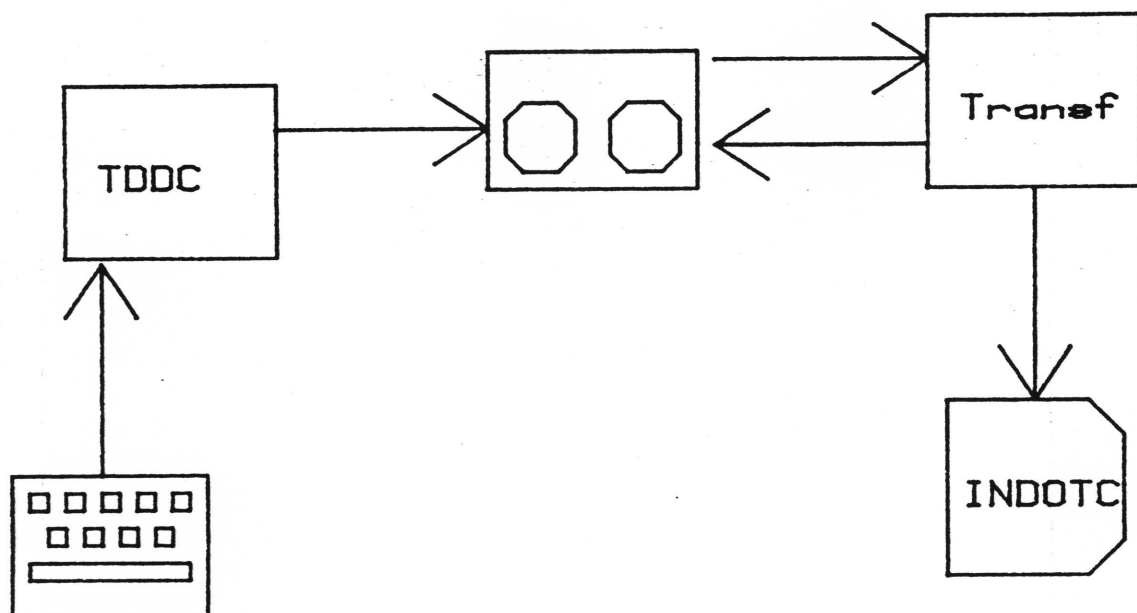


fig A-3 ENTERING, STORING and LISTING DISTANCES
FROM SHORE TO the 200 and 1000m ISOBATHS

```

0: "TDDC":
1: "Tabulates Distance along shoreline vs Distance to a Depth Contour":
2: dim A$(80)
3: "START":
4: trk 0:dsp "File#?":ent "",N
5: "New chart":
6: ent " 1 to load;CONTINUE to edit",L
7: if f1=13:eto "EDIT"
8: for J=1 to 80
9: " "+A$(J,J)
10: next J
11: if L=1:eto "LOAD"
12: if L=3:dsp N:sto :eto "LOAD"
13: "HEADER":
14: dsp "one line of header info.":ent "",A$(1,80):" "+A$(80,80)
15: rcf N,A$:ert N+1:eto "START"
16: "EDIT":
17: ent "File#?",N:ldf N,A$
18: dsp A$:sto
19: "LOAD":
20: ent "Entry#?",A$(1,4)
21: ent "Place Name#?",A$(6,29)
22: ent "Distance to 200m?",A$(34,38)
23: ent "Distance to 1000m?",A$(45,49)
24: ent "Shoreline Description?",A$(52,80)
25: trk 0:rcf N,A$:N+1+N:ert N
26: eto "New chart"
27: end.
*27791

```

```
0: "Transf":  
1: "Transfers INDOTEC data from tape to disk file":  
2: dim A$(80)  
3: asen "INDOTC",1,0  
4: for I=5 to 302  
5: ldf I,A$;if A$(80,80)="1";goto "LOOP"  
6: sprt 1,A$  
7: "LOOP":  
8: next I  
9: end  
*25587
```

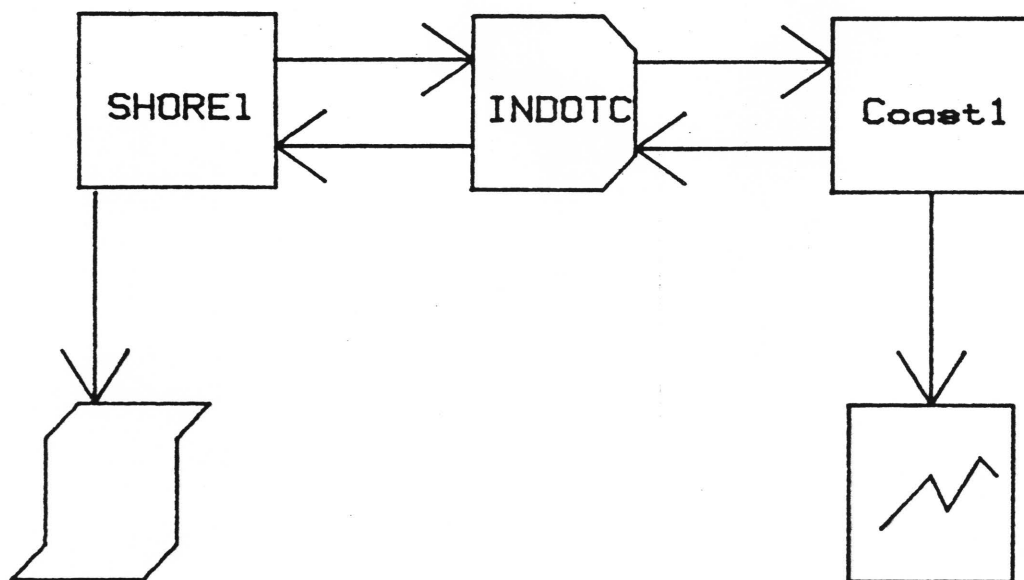


fig A-4 LISTING and PLOTTING DISTANCES
FROM SHORE to the 200 and 1000m ISOBATHS
PROGRESSING CLOCKWISE AROUND COASTLINE

```

0: "SHORE1":
1: "Lists distances from shore of 200 & 1000m contours":
2: dim A$(80),B$(160),C$(3,80)
3: "Listed by location along shore,"->C$(3,1,31]
4: " moving clockwise around coast"->C$(3,32,68]
5: "                "->C$(3,69,80]
6: trk 0;0+P
7: for J=1 to 2
8: for I=1 to 80;" ">C$(J,I,I];next I
9: next J
10: for I=1 to 160;" ">B$(I,I];next I
11: " LOC# PLACE NAME                ">B$(1,30]
12: "DISTANCE TO CONTOUR SHORELINE    ">B$(32,65]
13: "200m          1000m">B$(116,140]
14: for I=5 to 302
15: ldf I,A$
16: if I#5;jmp 2
17: A$[1]>C$(2,1,68];"TABLE 2">C$(1,1,7];"PAGE #">C$(1,79,75];eto "PAGE"
18: if fl#1=0 and A$[80,80]="I";for Q=1 to 3;wrt 6," ";M+1-M;next Q
19: if fl#1 and A$[80,80]#"I";eto "HEAD"
20: "NEXT":
21: if I=5;jmp 2
22: fmt c80;wrt 6,A$[1,79];M+1-M
23: if A$[80,80]#"I";eto "LOOP"
24: sfs 1
25: if M>=64;eto "PAGE"
26: eto "LOOP"
27: "PAGE":
28: for Q=1 to 3;wrt 6," ";next Q;0+M
29: fxd 0;istr(P+1+P)>C$(1,76,80];for J=1 to 3;wrt 6,C$(J);next J;M+3+M
30: "HEAD":
31: if I=5;jmp 2
32: wrt 6," ";iwr 6,B$(1,80];wrt 6,B$(81,160];wrt 6," ";M+4+M
33: cfs 1
34: if M=4;eto "LOOP"
35: eto "NEXT"
36: "LOOP":
37: if M>=64;eto "PAGE"
38: next I
39: end
*17813

```

```

0: "Coast1":
1: "Plots INDOTEC bathymetric data along coastline":
2: "Starting at North coast boorder with Haiti going west":
3: dim A$(80),B$(80),C$(30),D$(30),E$(80)
4: "Distance of 200 & 1000m contours from shore-">B$(1,44)
5: "Moving clockwise around coast">B$(45,80)
6: wrt 705,"IP1777,1383,12178,7659"
7: -44+K/10+D
8: for J=1 to 6
9: pen# 4;wrt 705,"DF";scl 0,45,0,30;stp
10: fxd 0;fax 0,1,0,45
11: K+45+K;plt 0,0,1;0+X+Y;pen# 1
12: for L=1 to 3
13: 36+P;if L>=2;47+P;5+A;D+B
14: P-1+Q;P+2+R
15: asen "INDOTC",1,0;if J=1;jmp 2
16: for I=1 to K;read 1,A$;next I
17: for N=1 to 45
18: sread 1,A$;0+F;if J<=5;sto 34
19: if N=1 and L=1;A$(1,30)+C$
20: if N=45 and L=1;A$(1,30)+D$
21: if A$(6,6)="2";sto "NO MORE"
22: if L=3;sto "ANNOTATE"
23: if A$(P,P)="N" or A$(P,P)=" ";sf=1;str(10)+A$(Q,R);sto "LOOP"
24: 2+M;if N=1;1+M
25: if fl=1;1+M;cf=1
26: pen# L;plt N,val(A$(Q,R)),M;N+X;val(A$(Q,R))+Y;sto "LOOP"
27: "ANNOTATE":
28: if A$(P,P)="N" or A$(P,P)=" ";str(10)+A$(Q,R)
29: csiz 1.5,1.5,.6,90
30: pen# 4
31: plt N,val(A$(Q,R)),1;lbl " ",A$(6,30);plt N,-2,1;lbl A$(1,4);A+5+A
32: "LOOP":
33: on end 1,"NO MORE"
34: next N
35: "NO MORE":
36: if L=1;A$(1,30)+D$
37: next L
38: if J<=5;sto 55
39: csiz 1.5,2,1,0;B+D
40: 46+E;if F=1;47+E
41: pen# 4;fax E,1,0,30;for I=0 to 30 by 5;plt E+1,I,1;lbl I;next I
42: fax 0,1,0,30,5
43: plt 0,40,1;csiz 3,2,.6,0;lbl B$
44: csiz 2,1.5,.6,0
45: ent "Coastline description?",E$;plt 0,38,1;lbl E$
46: pen# 4;plt 0,36,1;lbl "KEY- 1: 5=Chart#1;LOC#5";lbl " from "
47: lbl C$(1,4)," to ",D$(1,4),"(",C$(6,30),")to(",D$(6,30),")"
48: plt 5,-5,1;lbl "LOCATION NUMBER"
49: csiz 2,1.5,.6,90
50: for F=-2 to E+4 by E+6;plt F,0,1;lbl "DISTANCE FROM SHORE(Km)";next F
51: csiz 2,1.5,.6,0
52: plt 7,34,1;lbl "= 200m contour";pen# 1;plt 2,34,1;plt 2,34,2
53: plt 6,34,2;pen# 4;plt 7,32,1;lbl "=1000m contour"
54: pen# 2;plt 2,32,1;plt 2,32,2;plt 6,32,2
55: next J
56: "END":
57: end
*11984

```

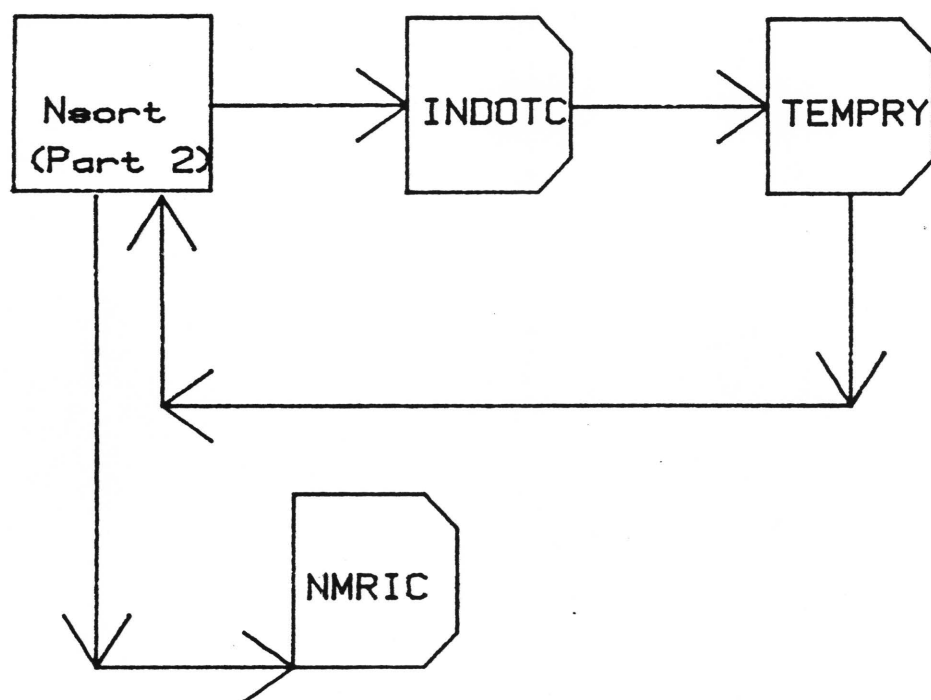
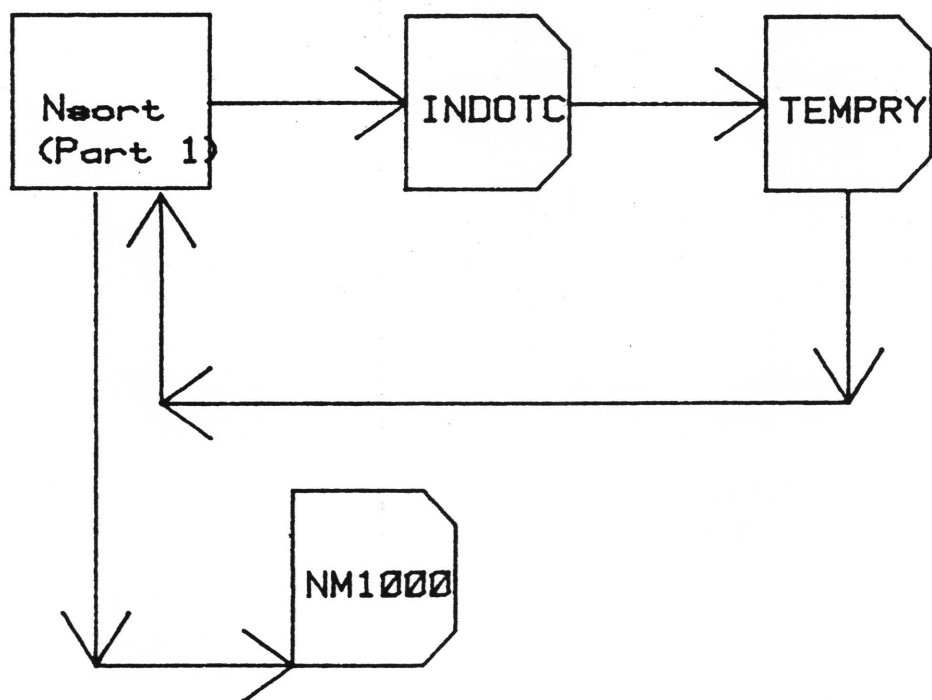



fig 5 NUMERICAL SORTING OF DISTANCE TO 1) 1000m ISOBATH
2) 200m ISOBATH

```

0: "Nsort":
1: "Sorts INDOTEC bathymetric data numerically-1000m":
2: dim A$(80),B$(80)
3: copy "INDOTC",0,"TEMPRY",0
4: asen "NUMRIC",2,0;asen "NM1000",3,0
5: asen "TEMPRY",1,0
6: for I=1 to 80;"Z"=B$(I,I);next I
7: for N=1 to 272
8: sread 1,A$;if A$(49,49)=char(32);eto "LOP"
9: if cap(A$(46,49))>cap(B$(46,49));eto "LOP"
10: if cap(A$(46,49))#cap(B$(46,49));eto 14
11: if cap(A$(45,49))<cap(B$(45,49));eto "LOP"
12: if cap(A$(35,38))>cap(B$(35,38));eto "LOP"
13: A$=B$;N=M;eto "LOP"
14: A$=B$;N=M
15: "LOP":
16: next N
17: if B$(45,49)="ZZZZZ";eto "ENDD"
18: fmt c80;wrt 6,B$;sprt 3,B$;"ZZZZZZZZZZZZZZZZZZ"=B$(34,49]
19: asen "TEMPRY",1,0;for N=1 to M-1;sread 1,A$;next N
20: sprt 1,B$,"ens"
21: eto 5
22: "ENDD":
23: "Sorts INDOTEC bathymetric data numerically-200m":
24: copy "INDOTC",0,"TEMPRY",0
25: asen "NUMRIC",2,0
26: asen "TEMPRY",1,0
27: for I=1 to 80;"Z"=B$(I,I);next I
28: for N=1 to 272
29: sread 1,A$;if A$(38,38)=char(32);eto "LOOP"
30: if cap(A$(35,38))>cap(B$(35,38));eto "LOOP"
31: if cap(A$(35,38))#cap(B$(35,38));eto 35
32: if cap(A$(34,38))<cap(B$(34,38));eto "LOOP"
33: if cap(A$(46,49))>cap(B$(46,49));eto "LOOP"
34: A$=B$;N=M;eto "LOOP"
35: A$=B$;N=M
36: "LOOP":
37: next N
38: if B$(34,34)=char(31);"<"=B$(34,34]
39: if B$(34,38)="ZZZZZ";eto "END"
40: fmt c80;wrt 6,B$;sprt 2,B$;"ZZZZZZZZZZZZZZZZZZ"=B$(34,49]
41: asen "TEMPRY",1,0;for N=1 to M-1;sread 1,A$;next N
42: sprt 1,B$,"ens"
43: eto 26
44: "END":
45: end
*23900

```

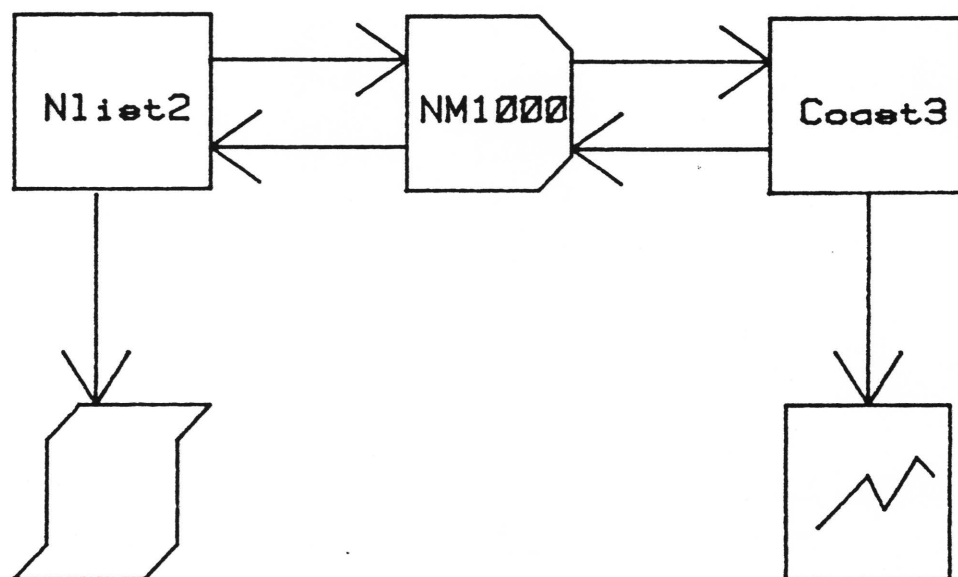
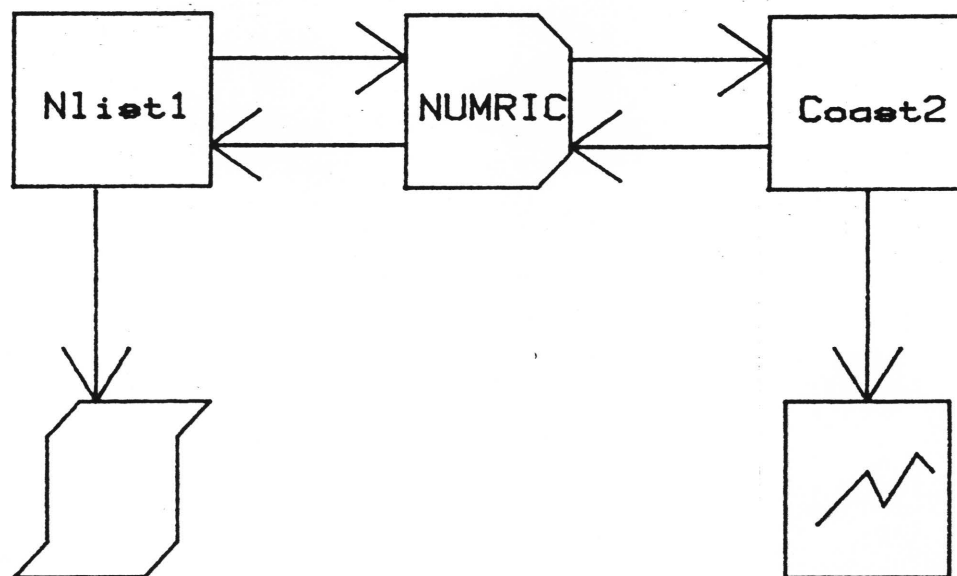


fig A-6 LISTING and PLOTTING OF DATA SORTED NUMER-
 -ICALLY BY INCREASING DISTANCE TO a) 200m
 b) 1000m

```

0: "Nlist1":
1: "Lists numerically sorted INDOTEC locations-200m":
2: dim A$(80),B$(80),C$(3,80)
3: for I=1 to 80: " "B$(I,I);next I
4: "PLACE NAME " "B$(17,41)
5: "CHART "B$(42,47);" LOC# "B$(48,55);" DIST.-200m "B$(3,14)
6: "DIST.-1000m"B$(58,68)
7: for J=1 to 3
8: for I=1 to 80: " "C$(J,I,I);next I
9: next J
10: "TABLE 3"+C$(1,1,7);"PAGE #"+C$(1,70,75)
11: "DOMINICAN REPUBLIC; Distances from shore to"+C$(2,1,43)
12: " the 200m & 1000m Contours"+C$(2,44,69)
13: "Listed by increasing distance of the 200m contour"+C$(3,1,50)
14: cfs 0;-1+Q;63+N
15: asan "NUMRIC",1,0
16: "READ":
17: on end 1,"END";if fl=0;on end 1,"ENDD"
18: sread 1,A$
19: if fl=0;eto "TESTN"
20: if A$(36,36)="N";eto "READ"
21: jmp 5
22: "TESTN":
23: if A$(36,36)="#N";eto "READ"
24: if Q=19;20+Q;wrt 6," ";N+1+N
25: N+1+N;jmp 2
26: N+1+N;int(val(A$(35,38))>R;if R#Q;wrt 6," ";N+1+N;R>Q
27: if N<63;jmp 3
28: fxd 0;str(P+1+P)+C$(1,76,80);fmt c80;for I=1 to 8;wrt 6," ";next I
29: for I=1 to 3;wrt 6,C$(I);next I;fmt c68;wrt 6," ";wrt 6,B$(1,68);4+N
30: fmt 8x,c5,3x,c25,4x,c1,5x,c2,10x,c5
31: wrt 6,A$(34,38),A$(5,30),A$(1,1),A$(3,4),A$(45,49)
32: eto "READ"
33: "END":
34: sfs 0
35: eto 15
36: "ENDD":
37: end
*4081

```

```

0: "Coast2":
1: "Plots INDOTEC bathymetric data along coastline":
2: dim A$(30),B$(30)
3: "Distance of 200m & 1000m contours from shore-">B$(1,45]
4: "by increasing dist. of 200m contour">B$(46,80]
5: wrt 705,"IP1777,1383,12178,7659"
6: -44->K;0->D
7: for J=1 to 6
8: pen# 4;wrt 705,"DF";iscl 0,45,0,30;stp
9: fxd 0;xax 0,1,0,45
10: K+45->K;plt 0,0,1;0->X->Y;pen# 1
11: 0->S->T
12: for L=1 to 3
13: 36->P;if L=2;47->P;5->A;D->B
14: if L=3;36->P;5->A;D->B
15: P-1->Q;P+2->R
16: asen "NUMRIC",1,0;if J=1;jmp 2
17: for I=1 to K;read 1,A$;next I
18: for N=1 to 45
19: sread 1,A$;0->F;if A$(36,36)="N" or A$(36,36)=" ";jmp 0
20: if L=3;sto "ANNOTATE"
21: if A$(P,P)="N" or A$(P,P)=" ";isfs 1;str(10)->A$(Q,R);sto "LOOP"
22: 2->M;if N=1;1->M
23: if S=0;val(A$(35,38))->S
24: val(A$(35,38))->T;if f1=1;1->M;cf= 1
25: pen# L;plt N,val(A$(Q,R)),M;N->X;val(A$(Q,R))->Y;sto "LOOP"
26: "ANNOTATE":
27: if A$(P,P)="N" or A$(P,P)=" ";istr(10)->A$(Q,R]
28: csiz 1.5,1.5,.6,90
29: pen# 4
30: plt N,val(A$(Q,R)),1;1;lbl " ",A$(6,30);plt N,-2,1;1;lbl A$(1,4);A+5->A
31: "LOOP":
32: on end 1,"NO MORE"
33: next N
34: "NO MORE":
35: if L=1;val(A$(35,38))->T
36: next L
37: csiz 1.5,2,1,0;B->D
38: 46->E;if F=1;47->E
39: pen# 4;yax E,1,0,30;for I=0 to 30 by 5;plt E+1,I,1;1;lbl I;next I
40: yax 0,1,0,30,5
41: plt 0,40,1;csiz 3,2,.6,0;1;lbl B$
42: csiz 2,1.5,.6,0
43: pen# 4;plt 0,38,1;1;lbl "KEY- 1: 5=Chart#1;Location#5";ifxd 1
44: 1;lbl " From ",S,"Km to ",T,"Km"
45: plt 5,-5,1;1;lbl "LOCATION NUMBER"
46: csiz 2,1.5,.6,90
47: for F=-2 to E+4 by E+5;plt F,0,1;1;lbl "DISTANCE FROM SHORE(Km)";next F
48: csiz 2,1.5,.6,0
49: plt 25,36,1;1;lbl "= 200m contour";pen# 1;plt 20,36,1;plt 20,36,2
50: plt 24,36,2;pen# 4;plt 25,34,1;1;lbl "=1000m contour"
51: pen# 2;plt 20,34,1;plt 20,34,2;plt 24,34,2
52: next J
53: "END":
54: end
*2567

```

```

0: "Nlist2":
1: "Lists numerically sorted INDOPEC locations-1000m":
2: dim A$(80),B$(80),C$(3,80)
3: for I=1 to 80: " "B$(I,1);next I
4: "PLACE NAME " "B$(17,41)
5: "CHART "B$(43,48);" LOC# "B$(49,56);" DIST.-1000m "B$(3,15)
6: "DIST.-200m" "B$(59,68)
7: for J=1 to 3
8: for I=1 to 80: " "C$(J,I,I);next I
9: next J
10: "TABLE 4" "C$(1,1,7);"PAGE #" "C$(1,70,75)
11: "DOMINICAN REPUBLIC; Distances from shore to" "C$(2,1,43)
12: " the 200m & 1000m Contours" "C$(2,44,69)
13: "Listed by increasing distance of the 1000m contour" "C$(3,1,51)
14: cfs 0;0+Q;63+N
15: asen "NM1000",1,0
16: "READ":
17: on end 1,"END";if fl=0;on end 1,"ENDD"
18: sread 1,A$;if Q=0;1+Q;sto "READ"
19: if fl=0;sto "TESTN"
20: if A$(47,47)="N";sto "READ"
21: jmp 5
22: "TESTN":
23: if A$(47,47)="#N";sto "READ"
24: if Q=27;28+Q;wrt 6," ";N+1+N
25: N+1+N;jmp 2
26: N+1+N;if int(val(A$(46,49)))*Q;int(val(A$(46,49)))+Q;wrt 6," ";N+1+N
27: if N<63;jmp 3
28: fxd 0;istr(P+1+P)+C$(1,76,80);fmt c80;for I=1 to 8;wrt 6," ";next I
29: for I=1 to 3;wrt 6,C$(I);next I;fmt c68;wrt 6," ";wrt 6,B$(1,68);4+N
30: fmt 9x,c5,3x,c25,4x,c1,5x,c2,9x,c5
31: wrt 6,A$(46,49),A$(6,30),A$(1,1),A$(3,4),A$(34,38)
32: sto "READ"
33: "END":
34: sfs 0
35: sto 15
36: "ENDD":
37: end
*30719

```

```

0: "Coast3":
1: "Plots INDOTEC bathymetric data along coastline":
2: dim A$(80),B$(80)
3: "Distance of 200 & 1000m contours from shore-">B$(1,44]
4: "by increasing dist. of 1000m contour">B$(45,80]
5: wrt 705,"IP1777,1383,12178,7659"
6: -44->K;0->D
7: for J=1 to 6
8: pen# 4;wrt 705,"DF";iscl 0,45,0,30;istp
9: fxd 0;ixax 0,1,0,45
10: K+45->K;elt 0,0,1;0->X->Y;pen# 1
11: 0->S->T
12: for L=1 to 3
13: 36->P;if L=2;47->P;5->A;D->B
14: P-1->Q;P+2->R
15: asen "NM1000",1,0;if J=1;jmp 2
16: for I=1 to K;isread 1,A$;next I
17: for N=1 to 45
18: sread 1,A$;0->F;if A$(47,47)="N" or A$(47,47)=" ";jmp 0
19: if J=1 and N=1;sto "LOOP"
20: if L=3;sto "ANNOTATE"
21: if A$(P,P)="N" or A$(P,P)=" ";ifs 1;str(10)->A$(Q,R);sto "LOOP"
22: 2->M;if N=1;1->M
23: if N=2 and J=1;1->M
24: if S=0;val(A$(46,49))->S
25: val(A$(46,49))->T;if f1;1;1->M;ofs 1
26: pen# L;elt N;val(A$(Q,R)),M;N->X;val(A$(Q,R))->Y;sto "LOOP"
27: "ANNOTATE":
28: if A$(P,P)="N" or A$(P,P)=" ";str(10)->A$(Q,R)
29: csiz 1.5,1.5,.6,90
30: pen# 4
31: elt N;val(A$(Q,R)),1;lbl " ",A$(6,30);elt N,-2,1;lbl A$(1,4);A+5->A
32: "LOOP":
33: on end 1,"NO MORE"
34: next N
35: "NO MORE":
36: if L=1;val(A$(46,49))->T
37: next L
38: csiz 1.5,2,1,0;B->D
39: 46->E;if F=1;47->E
40: pen# 4;ixax E,1,0,30;for I=0 to 30 by 5;elt E+1,1,1;lbl I;next I
41: yax 0,1,0,30,5
42: elt 0,40,1;csiz 3,2,.5,0;lbl B$
43: csiz 2,1.5,.6,0
44: pen# 4;elt 0,38,1;lbl "KEY- 1: 5=Chart#1;Location#5;";fxd 1
45: lbl " From ",S,"Km to",T,"Km"
46: elt 5,-5,1;lbl "LOCATION NUMBER"
47: csiz 2,1.5,.6,90
48: for F=-2 to E+4 by E+6;elt F,0,1;lbl "DISTANCE FROM SHORE(Km)";next F
49: csiz 2,1.5,.6,0
50: elt 25,36,1;lbl "= 200m contour";pen# 1;elt 20,36,1;elt 20,36,2
51: elt 24,36,2;pen# 4;elt 25,34,1;lbl "=1000m contour"
52: pen# 2;elt 20,34,1;elt 20,34,2;elt 24,34,2
53: next J
54: "END":
55: end
*18436

```

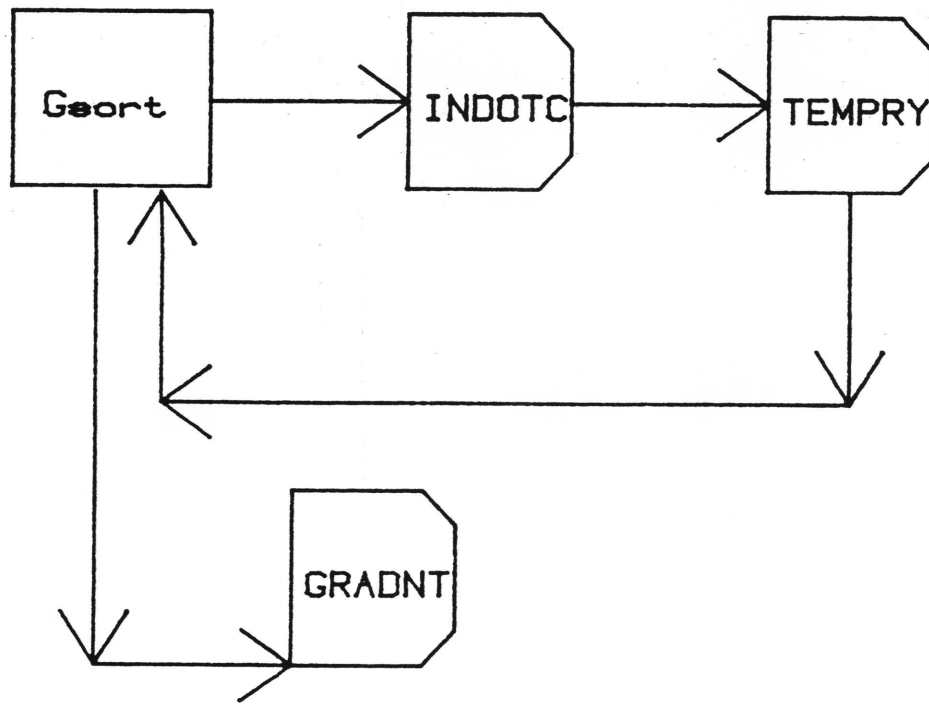


fig A-7 SORTING of DATA by GRADIENT
of CONTINENTAL SLOPE (BETWEEN 200 & 100m)


```

0: "Gsort":
1: "Sorts INDOTEC bathymetric data by gradient of slope from 200 to 1000m":
2: dim A$(80),B$(80)
3: copy "INDOTC",0,"TEMPRY",0
4: open "GRADNT",2,0
5: open "TEMPRY",1,0
6: for I=1 to 80:"Z"+B$(I,I);next I;"99999"+B$(52,56)
7: for N=1 to 272
8: sread 1,A$;if A$(49,49)=char(32) or B$(38,38)=char(32);eto "LOP"
9: if A$(47,47)="N" or A$(36,36)="N";eto "LOP"
10: if A$(47,47)="Z" or A$(36,36)="Z";eto "LOP"
11: fxd 1;str(val(A$(46,49))-val(A$(35,38)))+A$(52,56)
12: if val(A$(52,56))>val(B$(52,56));eto "LOP"
13: if val(A$(52,56))=val(B$(52,56));eto 16
14: if cap(A$(35,38))>cap(B$(35,38));eto "LOP"
15: A$+B$;N+M;eto "LOP"
16: A$+B$;N+M
17: "LOP":
18: next N
19: if B$(52,56)="99999";eto "ENDD"
20: fmt c80;wrt 6,B$;sert 2,B$;"ZZZZZZZZZZZZZZZZZZZZ99999"+B$(34,56)
21: open "TEMPRY",1,0;for N=1 to M-1;sread 1,A$;next N
22: sert 1,B$,"ens"
23: eto 5
24: end
*24171

```

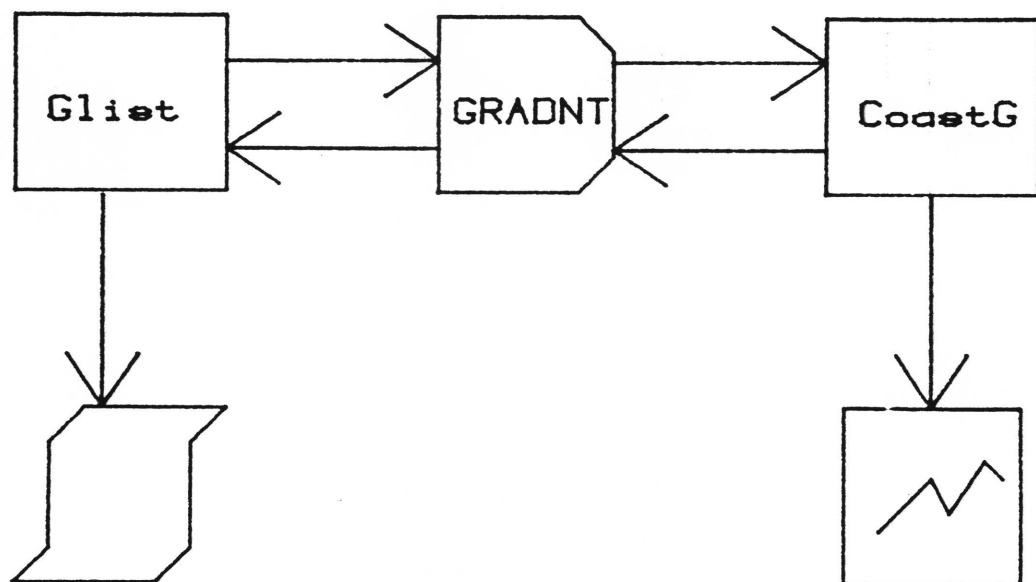


fig A-8 LISTING and PLOTTING of DATA SORTED
by DECREASING GRADIENT of the CONTINENTAL
SLOPE (BETWEEN 200 & 1000m)

```

0: "Glist":
1: "Lists INDOTEC locations, sorted by gradient of Continental Slope":
2: dim A$(80),B$(2,80),C$(3,80)
3: for I=1 to 2:for J=1 to 80:" ">B$(I,J):next J:next I
4: "GRADIENT">B$(1,1,8):" DISTANCE">B$(1,9,18)
5: "PLACE NAME">B$(1,21,30)
6: " CHART ">B$(1,47,53):" LOC# ">B$(1,54,61):" DIST.-200m ">B$(1,62,73)
7: "(m/Km)">B$(2,3,8):" 200-1000m">B$(2,9,19)
8: for J=1 to 3
9: for I=1 to 80:" ">C$(J,I,1):next I
10: next J
11: "DOMINICAN REPUBLIC; Gradients of the Contin">C$(2,1,43)
12: "ental slope">C$(2,44,54)
13: "TABLE 5">C$(1,1,7):"PAGE #">C$(1,70,75)
14: "Listed by decreasing gradient(between 200 & 1000m contours)">C$(3,1,59)
15: 99>H
16: open "GRADNT",1,0
17: 64>A:63>N
18: "READ":
19: on end 1,"END"
20: sread 1,A$(N+1+N:800/val(A$(52,56))>G
21: if N<63:jmp 4
22: fxd 0:istr(P+1>P)>C$(1,76,80):fmt c80:for I=1 to 8:wrt 6," " :next I
23: for I=1 to 3:wrt 6,C$(I):next I:fmt c71:wrt 6," "
24: for I=1 to 2:fmt c80:wrt 6,B$(I):next I:5>N
25: if int(G/100)=H:jmp 2
26: fmt c80:wrt 6," " :N+1+N:int(G/100)+H
27: fmt f8.1:6x,c5,x,c25:6x,c1:5x,c2:8x,c5,
28: wrt 6,G,A$(52,56),A$(6,30),A$(1,1),A$(3,4),A$(34,38)
29: ato "READ"
30: "END":
31: end
*25931

```

```

0: "CoastG":
1: "Plots INDO'EC bathymetric data along coastline":
2: dim A$(30),B$(30)
3: "Gradient of Continental Slope-arranged by dec"+B$(1,45)
4: "rearing gradient (200-1000m)"+B$(46,30)
5: wrt 705,"IP,777,1383,12178,7659"
6: -44+K;0+D
7: for J=1 to 6
8: pen# 4;wrt 705,"DF";scl 0,45,0,30;stp
9: fxd 0;xax 0 1,0,45
10: K+45+K;plt 0,0,1;pen# 1
11: 0+S+T
12: for L=1 to 3
13: 36+P;if L=3;47+P;5+A;D+B
14: if L=3;47+P;5+A;D+B
15: P-1+Q;P+2+R
16: asen "GRADNT",1,0;if J=1;jmp 2
17: for I=1 to K;sread 1,A$;next I
18: for N=1 to 45
19: sread 1,A$ 0+F
20: if L=3;sto "ANNOTATE"
21: pen# L;if 0=0;800/val(A$(52,56))+S
22: 800/val(A$(52,56))+T
23: if L#2;jmp 3
24: if N=1;plt N,T/20,1
25: plt N,T/20 2;sto "LOOP"
26: val(A$(35,38))+X;val(A$(46,49))+Y;plt N-.25,X,1;plt N+.25,X,2
27: plt N,X,1;plt N,Y,2;plt N-.25,Y,1;plt N+.25,Y,2
28: sto "LOOP"
29: "ANNOTATE"
30: if A$(P,P)="N" or A$(P,P)=" " ;str(10)+A$(Q,R)
31: csiz 1.5,1 5,.6,90
32: pen# 4
33: plt N, val(A$(Q,R)),1;lbl " ",A$(6,30);plt N,-2,1;lbl A$(1,4);A+5+A
34: "LOOP":
35: on end 1,"NO MORE"
36: next N
37: "NO MORE":
38: if L=1;800/val(A$(52,56))+T
39: next L
40: csiz 1.5,2 1,0;B+D
41: 46+E;if F=3;47+E
42: yax E,1,0,30;pen# 1;for I=0 to 30 by 5;plt E+.5,I,1;lbl I;next I
43: pen# 2;for I=0 to 30 by 5;plt E+3.5,I,1;lbl I#20;next I
44: pen# 4;yax 0,1,0,30
45: pen# 1;for I=0 to 30 by 5;plt -2,I,1;lbl I;next I
46: pen# 2;for I=0 to 30 by 5;plt -5,I,1;lbl 20I;next I
47: pen# 4;plt 0,40,1;csiz 3,2,.6,0;lbl B$
48: csiz 2,1.5 .6,0
49: pen# 4;plt 0,38,1;lbl "KEY- 1: 5=Chart#1;Location#5:";fxd 0
50: lbl " From ",G," meters/Km to ",I," meters/Km"
51: plt 5,-5,1 lbl "LOCATION NUMBER"
52: csiz 2,1.5 .6,90
53: for F=-2 to E+4 by E+5
54: pen# 1;plt F,0,1;lbl "DISTANCE FROM SHORE(Km)"
55: F+3.5+G;if F=-2;F-3.5+G
56: pen# 2;plt G,0,1;lbl "GRADIENT OF SLOPE(meters/Km)"
57: next F
58: pen# 4
59: csiz 2,1.5 .6,0
60: plt 6,36,1 lbl "Distance between 200m & 1000m contour"
61: lbl "(located at distance of 200m contour from shore)"
62: pen# 1;plt 4.75,35,1;plt 5.25,35,2;plt 5.35,1;plt 5.37,2;plt 4.75,37,1
63: plt 5.25,37,2
64: plt 5.25,37,2;pen# 4;plt 6,34,1;lbl "Gradient of slope(meters/Km)"
65: pen# 2;plt 3,34,1;plt 3,34,2;plt 5,34,2
66: next J
67: "END":
68: end
*24174

```

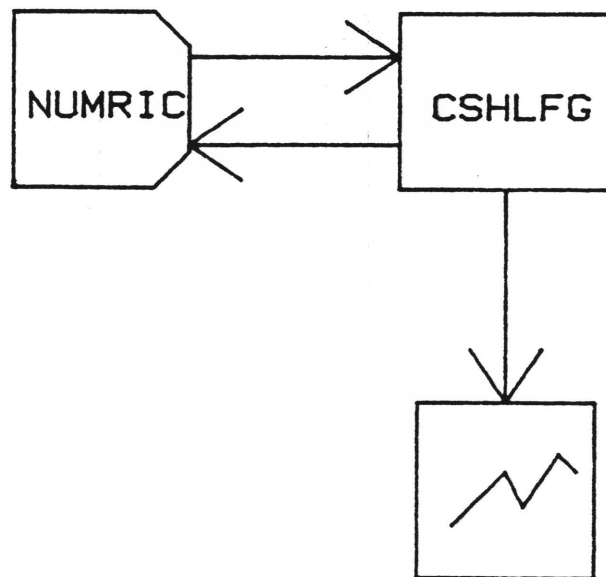
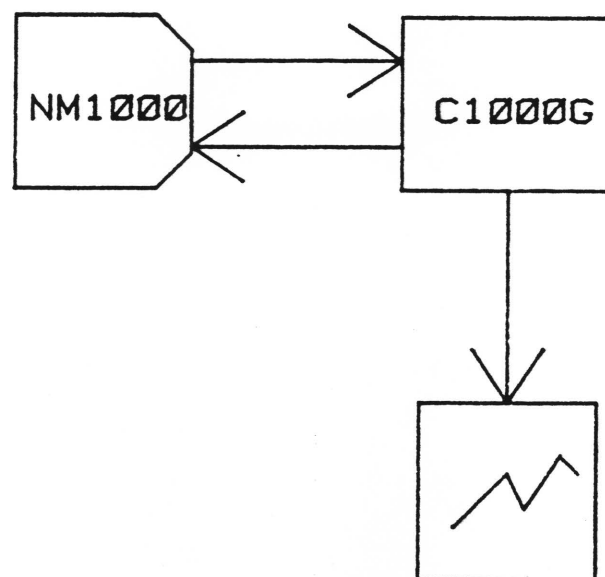


fig A-9 PLOTTING OF DATA SORTED by
DECREASING GRADIENT of (above) CONT. SHELF
(below) SHORE to 1000m



```

0: "CSHLFG":
1: "Plots INDOTEC Continental Shelf data-by decreasing gradient ":
2: dim A$(80),B$(80)
3: "Average Gradient of Continental Shelf -Arranged by Dec"+B$(1,56)
4: "reasing Gradient "+B$(57,73)
5: wrt 705,"IP1777,1383,12178,7659"
6: -44+K/10+D
7: for J=1 to 6
8: pen# 4:wrt 705,"DF":isc1 0,45,0,30:stp
9: fxd 0:fax 0,1,0,45
10: K+45+K/10:lt 0,0,1:pen# 1
11: 0+3+T
12: for L=1 to 3
13: 36+P:if L=2:47+P:5+A:D=8
14: if L=3:47+P:5+A:D=8
15: P-1+0:P+3+R
16: asen "NUMRIC",1,0:if J=1:jmp 2
17: for I=1 to K:read 1,A$:next I
18: for N=1 to 45
19: sread 1,A$:0+F:if A$(36,36)="N" or A$(36,36)=" ":jmp 0
20: if L=3:sto "ANNOTATE"
21: pen# L:if S=0:200/val(A$(35,38))+S
22: 200/val(A$(35,38))+T
23: if L#2:jmp 3
24: if N=1:lt N,T/10,1
25: lt N,T/10,2:sto "LOOP"
26: val(A$(35,38))+X:lt N,0,1:lt N,X,2:lt N-.25,X,1:lt N+.25,X,2
27: sto "LOOP"
28: "ANNOTATE":
29: if A$(P,P)="N" or A$(P,P)=" ":istr(10)+A$(Q,R)
30: csiz 1.5,1.5,.6,90
31: pen# 4
32: lt N,-2,1:lbl A$(1,4):A+5+A
33: if A$(47,47)="N" or A$(47,47)=" ":val(A$(35,38))+X:jmp 2
34: val(A$(46,49))+X
35: if A$(6,6)="#" :lt N,X,1:lbl A$(6,30):sto "LOOP"
36: lt N-.25,X,1:lt N+.25,X,2
37: "LOOP":
38: on end 1,"NO MORE"
39: next N
40: "NO MORE":
41: if L=1:1000/val(A$(46,49))+T
42: next L
43: csiz 1.5,2,1,0:6+D
44: 46+E:if F=1:47+E
45: yax E,1,0,30:pen# 1:for I=0 to 30 by 5:lt E+.5,I,1:lbl I:next I
46: pen# 2:for I=0 to 30 by 5:lt E+3.5,I,1:lbl I+10:next I
47: pen# 4:yax 0,1,0,30
48: pen# 1:for I=0 to 30 by 5:lt -2,I,1:lbl I:next I
49: pen# 2:for I=0 to 30 by 5:lt -5,I,1:lbl I+10:next I
50: pen# 4:lt 0,40,1:csiz 3,2,.6,0:lbl B$
51: csiz 2,1.5,.6,0
52: pen# 4:lt 0,38,1:lbl "KEY- 1: S=Chart#1:Location#5:":fxd 0
53: lbl " From ".S," meters/Km to ".T," meters/Km"
54: lt 5,-5,1:lbl "LOCATION NUMBER"
55: csiz 2,1.5,.6,90
56: for F=-2 to E+4 by E+5
57: pen# 1:lt F,0,1:lbl "DISTANCE FROM SHORE(Km)"
58: F+3.5+G:if F=-2:F-3.5+G
59: pen# 2:lt G,0,1:lbl "GRADIENT of SHELF(meters/Km)"
60: next F
61: pen# 4
62: csiz 2,1.5,.6,0
63: lt 5,36,1:lbl "Distance between shore and 200m contour"
64: pen# 1:lt 4.75,35,1:lt 5.25,35,2:lt 5.35,1:lt 5.37,2:lt 4.75,37,1
65: lt 5.25,37,2
66: lt 5.25,37,2:pen# 4:lt 5.34,1
67: lbl "Gradient of shelf(meters/Km)"
68: pen# 2:lt 3.34,1:lt 3.34,2:lt 5.34,2
69: next J
70: "END":
71: end
*32398

```

```

0: "C1000G":
1: "Plots INDOTEC bathymetric data by decreasing gradient to 1000m ":
2: dim A$(30),B$(30)
3: "Average Gradient from Coastline to 1000m-Arranged by Dec"+B$(1,56)
4: "Reason Gradient "+B$(57,73)
5: wrt 705,"IP1777,1383,12178,7659"
6: -44+K/10+D
7: for J=1 to 5
8: pen# 4:wrw 705,"DF":sl 0.45,0.30:sta
9: fxd 0:xax 0.1,0.45
10: K+45+K/10:sl 0.0,1:pen# 1
11: 0+S+T
12: for L=1 to 3
13: 36+P:if L=2:47+P:5+A:D+8
14: if L=3:47+P:5+A:D+8
15: P-1+Q:P+2+R
16: asen "NM1000",1,0:if J=1:jmp 2
17: for I=1 to K:read 1:A$:next I
18: for N=1 to 45
19: sread 1,A$:0-F:if J=1 and N=1:eto "LOOP"
20: if A$(47,47)="N" or A$(47,47)=" ":jmp -1
21: if L=3:eto "ANNOTATE"
22: pen# L:if S=0:1000/val(A$(46,49))+S
23: 1000/val(A$(46,49))+T
24: if L#2:jmp 4
25: if N=1:sl N,T/10,1
26: if N=2 and J=1:sl N,T/10,1
27: sl N,T/10,2:eto "LOOP"
28: val(A$(46,49))+Y
29: if A$(36,36)="N" or A$(36,36)=" ":sl N-.25,Y,1:sl N+.25,Y,2:eto "LOOP"
30: val(A$(36,36))+X:sl N-.25,X,1:sl N+.25,X,2
31: sl N,X,1:sl N,Y,2:sl N-.25,Y,1:sl N+.25,Y,2
32: eto "LOOP"
33: "ANNOTATE":
34: if A$(P,P)="N" or A$(P,P)=" ":str(10)+A$(Q,R)
35: csiz 1.5,1.5,.6,90
36: pen# 4
37: sl N,-2,1:lbl A$(1,4):A+5+A
38: if A$(6,6)="#" ":sl N,val(A$(Q,R)),1:lbl " ",A$(6,30)
39: "LOOP":
40: on end 1:"NO MORE"
41: next N
42: "NO MORE":
43: if L=1:1000/val(A$(46,49))+T
44: next L
45: csiz 1.5,2,1,0:8+D
46: 46+E:if F=1:47+E
47: yax E,1,0.30:pen# 1:for I=0 to 30 by 5:sl E+.5,I,1:lbl I:next I
48: pen# 2:for I=0 to 30 by 5:sl E+3.5,I,1:lbl I=10:next I
49: pen# 4:yax 0,1,0.30
50: pen# 1:for I=0 to 30 by 5:sl -2,I,1:lbl I:next I
51: pen# 2:for I=0 to 30 by 5:sl -5,I,1:lbl 10I:next I
52: pen# 4:sl 0,40,1:csiz 3,2,.6,0:lbl B$
53: csiz 2,1.5,.6,0
54: pen# 4:sl 0,30,1:lbl "KEY- 1: S=Chart#1:Location#5:"fxd 0
55: lbl " From ",S," meters/Km to ",T," meters/Km"
56: sl 5,-5,1:lbl "LOCATION NUMBER"
57: csiz 2,1.5,.6,90
58: for F=-2 to E+4 by E+5
59: pen# 1:sl F,0,1:lbl "DISTANCE FROM SHORE(Km)"
60: F+3.5+G:if F=-2:F-3.5+G
61: pen# 2:sl G,0,1:lbl "GRADIENT -SHORE to 1000m(meters/Km)"
62: next F
63: pen# 4
64: csiz 2,1.5,.6,0
65: sl 6,36,1:lbl "="Distance between 200m & 1000m contour"
66: lbl "(located at distance of 200m contour from shore)"
67: pen# 1:sl 4.75,35,1:sl 5.25,35,2:sl 5.35,1:sl 5.37,2:sl 4.75,37,1
68: sl 5.25,37,2
69: sl 5.25,37,2:pen# 4:sl 5.34,1
70: lbl "Gradient-from shore to 1000m(meters/Km)"
71: pen# 2:sl 3.34,1:sl 3.34,2:sl 5.34,2
72: next J
73: "END":
74: end
+28873

```

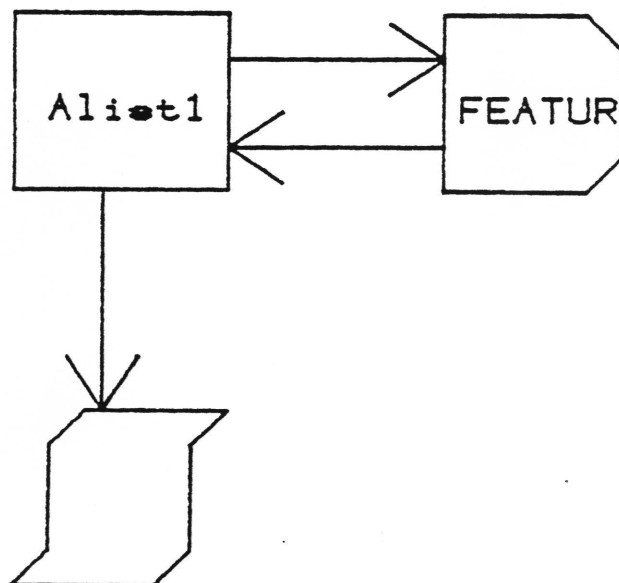
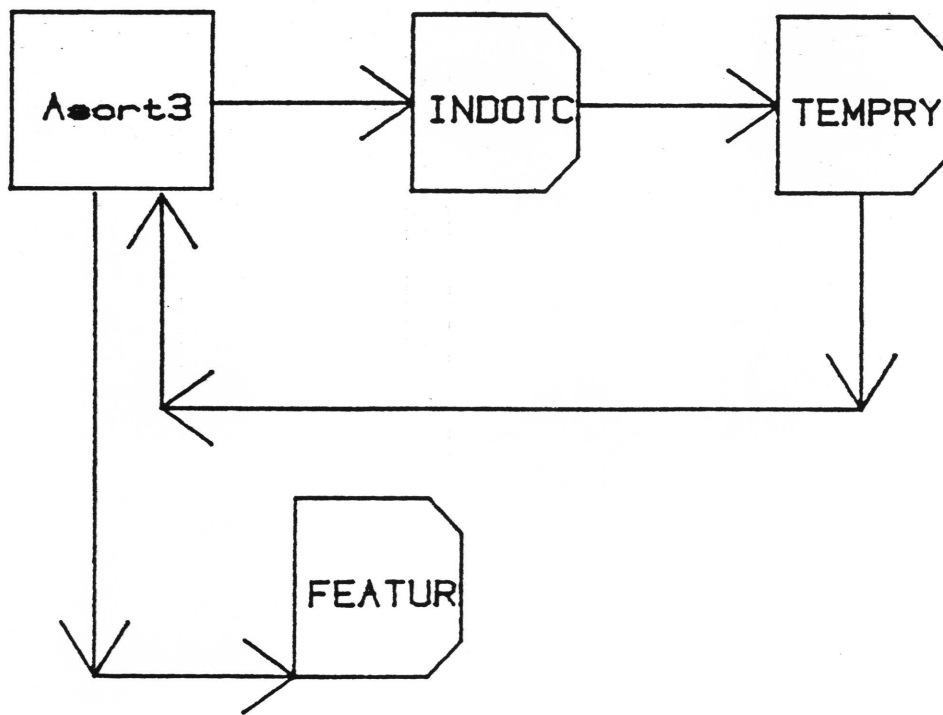


fig A-10 SORTING and LISTING of DATA
by COASTAL FEATURE (ALPHABETICALLY)


```

0: "Asort3":
1: "Sorts Coastal FEATURES alphabetically":
2: "Slower version of Asort but much longer":
3: dim A$(80),B$(80)
4: copy "INDOTC",0,"TEMPRY",0
5: asen "FEATUR",2,0
6: asen "TEMPRY",1,0
7: for I=1 to 80:Z"->B$(I,I):next I
8: for N=1 to 272
9: sread 1,A$:if A$(52,52)=char(32):jmp 3
10: if cap(A$(52,80))>cap(B$(52,80)):jmp 2
11: A$+B$:N+M
12: next N
13: if B$(52,53)="ZZ":eto "END"
14: fmt c29,c51:wrt 6,B$(52,80),B$(1,51):sprt 2,B$:"ZZ"->B$(52,53)
15: asen "TEMPRY",1,0:for N=1 to M-1:sread 1,A$:next N
16: sprt 1,B$,"ens"
17: eto 6
18: "END":
19: end
#26785

```

```

0: "Alist1":
1: "Lists alphabetically sorted INDOTEC locations":
2: dim A$(80),B$(80),C$(3,80)
3: "COAST LINE FEATURE" ">B$(1,29)
4: "CHART ">B$(30,35); " LOC# ">B$(36,43); " DIST.-200m ">B$(44,55)
5: " DIST.-1000m">B$(56,68]
6: for J=1 to 3
7: for I=1 to 80; " ">C$(J,I);next I
8: next J
9: "DOMINICAN REPUBLIC; Distances from shore to">C$(2,1,43]
10: " to the 200m & 1000m Contours">C$(2,44,72]
11: "TABLE 6">C$(1,1,71); "PAGE #">C$(1,70,75]
12: "Listed by coast line feature">C$(3,1,28]
13: asen "FEATUR",1,0
14: 64>A;63>N
15: "READ":
16: on end 1,"END"
17: sread 1,A$;N+1>N
18: if N<63;jmp 3
19: fxd 0;str(P+1>P)>C$(1,76,80];fmt c80;for I=1 to 8;wrt 6," ";next I
20: for I=1 to 3;wrt 6,C$(I);next I;fmt c68;wrt 6," ";wrt 6,B$;4>N
21: if A$(52,52)=char(A);jmp 3
22: A+1>A; if A$(52,52)#char(A);jmp 0
23: fmt c80;wrt 6," ";N+1>N
24: fmt c29,4x,c1,5x,c2,8x,c5,9x,c5
25: wrt 6,A$(52,80),A$(1,1),A$(3,4),A$(34,38),A$(46,49]
26: sto "READ"
27: "END":
28: end
*19633

```

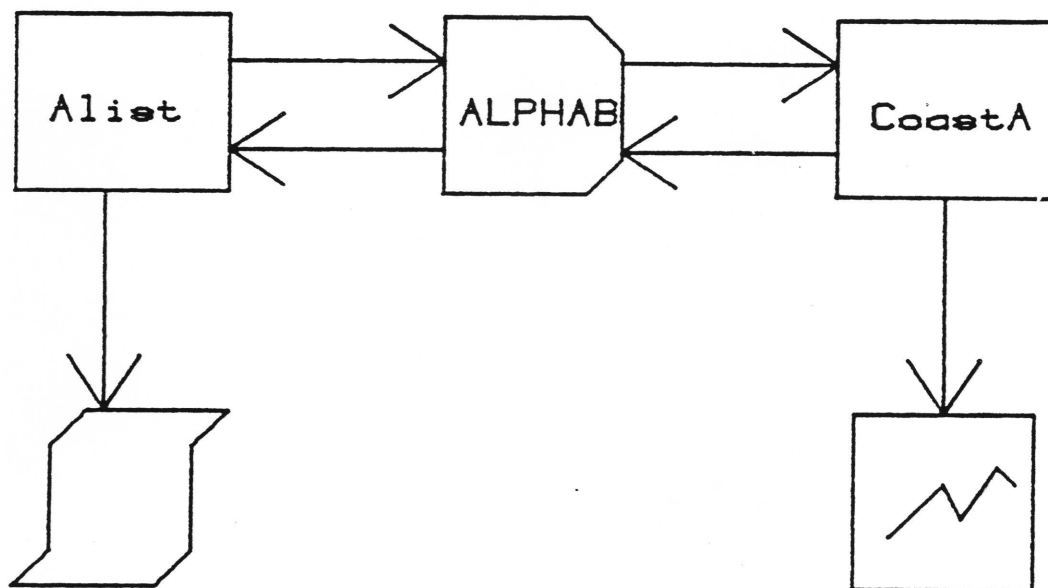
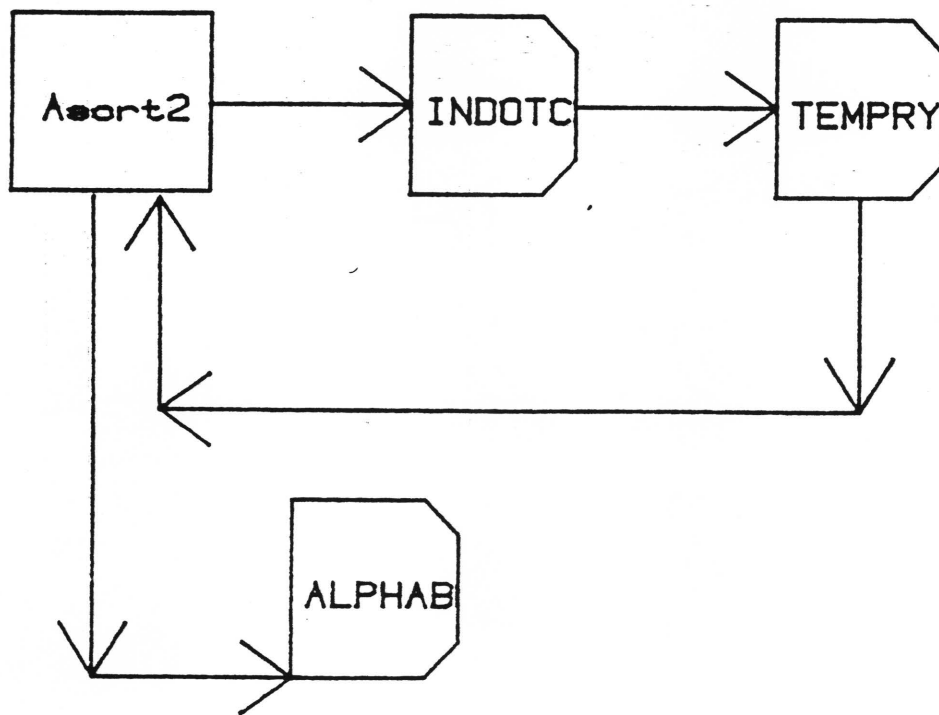


fig A-11 SORTING, LISTING and PLOTTING of DATA
ALPHABETICALLY by PLACE NAME

```

0: "Asort2":
1: "Slower version of Asort but much longer":
2: dim A$(80),B$(80)
3: asen "ALPHAB",2,0
4: asen "INDOTC",1,0
5: "ZZZZZZZ"+B$(1,7)
6: for N=1 to 272
7: sread 1,A$;if A$(6,6)=char(32);jmp 3
8: if cap(A$(6,30))>cap(B$(6,30));jmp 2
9: A$+B$;N+M
10: next N
11: if B$(6,7)="ZZ";eto "END"
12: fmt c80;wrt 6,B$;sprt 2,B$;"ZZ"+B$(6,7)
13: asen "INDOTC",1,0;for N=1 to M-1;sread 1,A$;next N
14: sprt 1,B$,"ens"
15: eto 4
16: "END":
17: end
*6782

```

```

0: "Alist":
1: "Lists alphabetically sorted INDOPEC locations":
2: dim A$(80),B$(80),C$(3,80)
3: "    PLACE NAME           ">B$(1,29)
4: "CHART ">B$(30,35); " LOC# ">B$(36,43); " DIST.-200m ">B$(44,55)
5: "    DIST.-1000m">B$(56,68)
6: for J=1 to 3
7: for I=1 to 80; " ">C$(J,I,I);next I
8: next J
9: "DOMINICAN REPUBLIC; Distances from shore to">C$(2,1,43)
10: " to the 200m & 1000m Contours">C$(2,44,72)
11: "TABLE 5">C$(1,1,7); "PAGE #">C$(1,70,75)
12: "Listed Alphabetically">C$(3,1,19)
13: asen "ALPHAB",1,0
14: 64>A;63>N
15: "READ":
16: on end 1,"END"
17: sread 1,A$;N+1>N
18: if N<63;jmp 3
19: fxd 0;istr(P+1>P)>C$(1,76,80);fmt c80;for I=1 to 8;wrt 6," ">next I
20: for I=1 to 3;wrt 6,C$(I,I);next I;fmt c68;wrt 6," ">wrt 6,B$;4>N
21: if A$(6,6)=char(A);jmp 3
22: A+1>A;if A$(6,6)#char(A);jmp 0
23: fmt c80;wrt 6," ">;N+1>N
24: fmt 4x,c25,4x,c1,5x,c2,8x,c5,9x,c5
25: wrt 6,A$(5,30),A$(1,1),A$(3,4),A$(34,38),A$(46,49)
26: goto "READ"
27: "END":
28: end
+13326

```

```

0: "CoastA":
1: "Plots INDOTEC bathymetric data along coastline":
2: dim A$(801,8$(80),C$(25),D$(25)
3: "Distance of 200m and 1000m contours from shore-">B$(1,47]
4: " Alphabetically by place name " >B$(48,80]
5: wrt 705,"IP1777,1383,12178,7659"
6: -44->K;0->D
7: for J=1 to 5
8: pen# 4;wrt 705,"DF";scl 0,45,0,30;stp
9: fxd 0;fax 0,1,0,45
10: K+45->K;elt 0,0,1;0->X->Y;pen# 1
11: for L=1 to 3
12: 36->P;if L>=2;47->P;5->A;D->B
13: P-1->Q;P+2->R
14: asen "ALPHAB",1,0;if J=1;jmp 2
15: for I=1 to K;read 1,A$;next I
16: for N=1 to 45
17: sread 1,A$;0->F
18: if N=1 and L=1;A$(6,30)->C$
19: if N=45 and L=1;A$(6,30)->D$
20: if L=3;sto "ANNOTATE"
21: if A$(P,P)="N" or A$(P,P)=" ";sfa 1;str(10)->A$(Q,R);sto "LOOP"
22: 2->M;if N=1;1->M
23: if f1=1;1->M;cf= 1
24: pen# L;elt N, val(A$(Q,R)),M;N->X;val(A$(Q,R))->Y;sto "LOOP"
25: "ANNOTATE":
26: if A$(P,P)="N" or A$(P,P)=" ";str(10)->A$(Q,R)
27: csiz 1.5,1.5,.6,90
28: pen# 4
29: elt N, val(A$(Q,R)),1;lbl " ",A$(6,30);elt N,-2,1;lbl A$(1,4);A+5->A
30: "LOOP":
31: on end 1,"NO MORE"
32: next N
33: "NO MORE":
34: if L=1;A$(6,30)->D$
35: next L
36: csiz 1.5,2,1,0;B->D
37: 46->E;if F=1;47->E
38: pen# 4;fax E,1,0,30;for I=0 to 30 by 5;elt E+1,I,1;lbl I;next I
39: fax 0,1,0,30.5
40: elt 0,40,1;csiz 3,2,.6,0;lbl B$
41: csiz 2,1.5,.6,0
42: pen# 4;elt 0,38,1;lbl "KEY- 1: 5=Chart#1;Location#5;";lbl " from ",C$
43: lbl " to ",D$
44: elt 5,-5,1;lbl "LOCATION NUMBER"
45: csiz 2,1.5,.6,90
46: for F=-2 to E+4 by E+6;elt F,0,1;lbl "DISTANCE FROM SHORE(Km)";next F
47: csiz 2,1.5,.6,0
48: elt 25,36,1;lbl "= 200m contour";pen# 1;elt 20,36,1;elt 20,36,2
49: elt 24,36,2;pen# 4;elt 25,34,1;lbl "=1000m contour"
50: pen# 2;elt 20,34,1;elt 20,34,2;elt 24,34,2
51: next J
52: "END":
53: end
*312

```

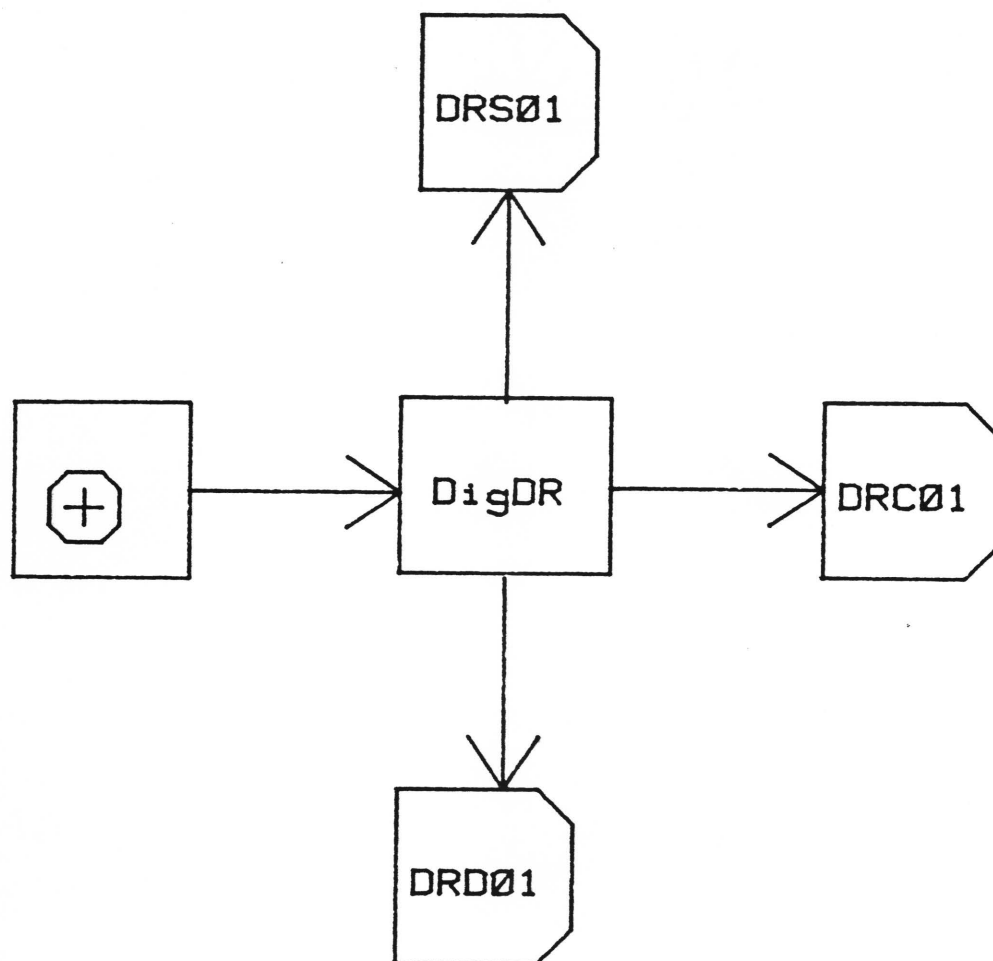


fig A-12 DIGITIZING of SMOOTH SHEETS

for CONSTRUCTION of BATHYMETRIC CHARTS
of SELECTED COASTAL REGIONS

```

0: "Di=DR":
1: dim A$(5),X(10),Y(10),P(10),D(10),B$(5,25)
2: files *:1,*:1,*:1;"DRC0">A$(1,4);ent "CHART NUMBER?",A$(5,5)
3: asen A$,1,1;"S">A$(3,3);asen A$,2,1;"D">A$(3,3);asen A$,3,1
4: pen# 2
5: for K=1 to 3
6: for I=1 to 10;D(I);next I
7: ent "ENTER NEXT FILE #",N
8: if N#1;eto "CONTINUE"
9: "HEADER":
10: ent "LOWER LEFT;LAT.(degrees)",X(1)
11: ent "LOWER LEFT;LAT.(minutes)",X(2)
12: ent "LOWER LEFT;LONG.(degrees)",X(5)
13: ent "LOWER LEFT;LONG.(minutes)",X(6)
14: ent "UPPER RIGHT;LAT.(degrees)",X(3)
15: ent "UPPER RIGHT;LAT.(minutes)",X(4)
16: ent "UPPER RIGHT;LONG.(degrees)",X(7)
17: ent "UPPER RIGHT;LONG.(minutes)",X(8)
18: ent "If coastline,enter 1; if not,0",Y(1)
19: ent "Number of contours digitized",M;M>Y(2)
20: fxd 0
21: for I=3 to M+2;dsp "Depth of contour ",I-2;ent "",Y(I);next I
22: for I=3 to M+2;Y(I)>D(I-2);next I;0>M
23: wrt 705,"OP";red 705,P(1),P(2),P(3),P(4)
24: esb "PRINT"
25: rpt K,N,X(*),Y(*),P(*)
26: if Y(1)=1;fmt /,/,"COASTLINE",/;wrt 6;jmp 2
27: fmt /,/,"CONTOUR";wrt 6,Y(3);M+1>M
28: "CONTINUE":
29: pclr;sc1 0,100,0,100
30: "LOOP":
31: for I=1 to 10
32: dia X(I),Y(I),P(I)
33: next I
34: N+1>N
35: esb "PRINT"
36: rpt K,N,X(*),Y(*),P(*)
37: if X(10)=0 and Y(10)=0;M+1>M;if DCM=0;jmp 4
38: if X(10)#0 and Y(10)#0;eto "LOOP"
39: fmt /,/,"CONTOUR";wrt 6,DCM
40: eto "LOOP"
41: "Store Location numbers":
42: ent "Number of Locations?",J
43: for I=1 to 10;0>X(I)+Y(I)+P(I);next I
44: if J=0;rpt K,N+1+N,X(*),Y(*),P(*);eto "NAMES"
45: J>X(1)
46: for I=2 to J+1;ent "LOC#?",P(I);dia X(I),Y(I);next I
47: rpt K,N+1+N,X(*),Y(*),P(*)
48: "NAMES":
49: ent "Numbr of place names?",J
50: for I=1 to 10;0>X(I)+Y(I)+P(I);next I
51: if J=0;rpt K,N+1+N,X(*),Y(*),P(*);eto "END"
52: J>X(1)
53: for I=2 to J+1;ent "Name?",B$(I-1);dia X(I),Y(I);next I
54: rpt K,N+1+N,X(*),Y(*),P(*)
55: rpt K,N+1+N,B$
56: "END":
57: next K
58: end
59: "PRINT":
60: -1>J
61: for I=1 to 5
62: J+2>J
63: fmt 1,3f9.2,4x,3f9.2,5x,f3.0
64: wrt 6,1,X(J),Y(J),P(J),X(J+1),Y(J+1),P(J+1),N
65: next I
66: fmt /;wrt 6;ret
*30101

```

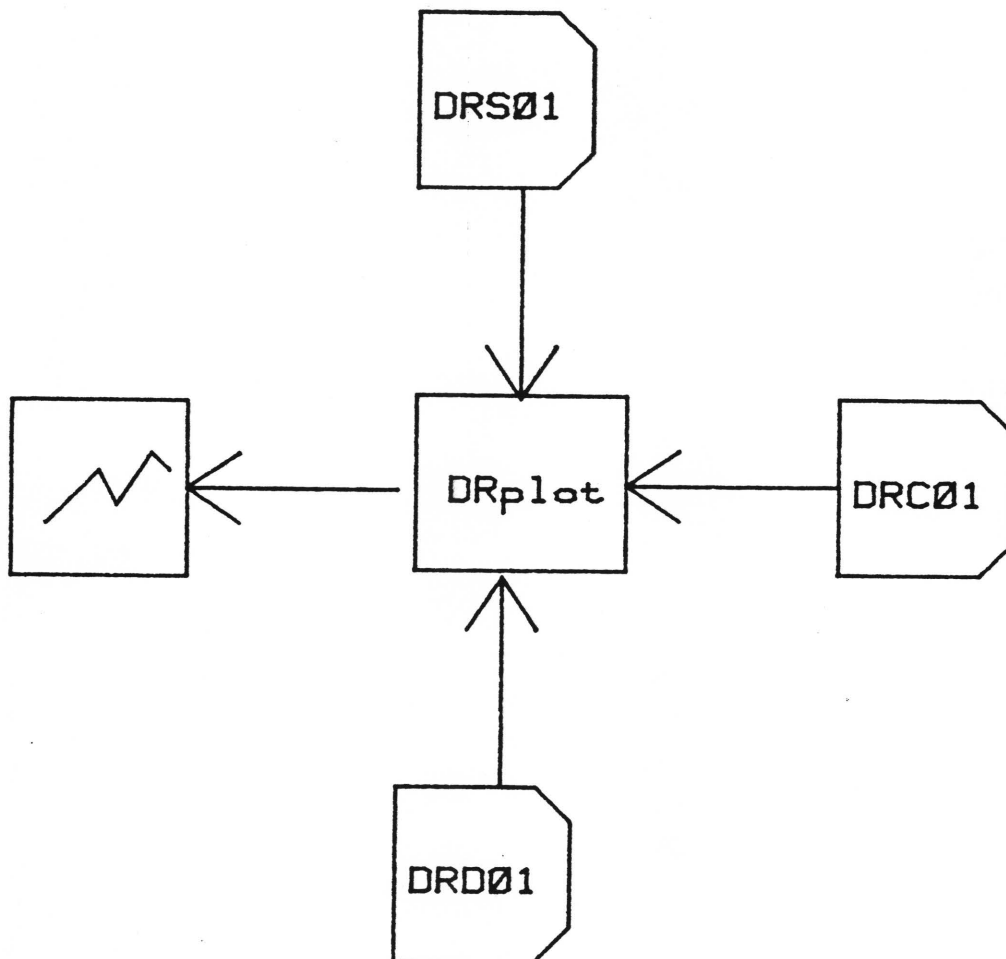



fig A-13 PLOTTING of BATHYMETRIC CHARTS
of SELECTED COASTAL REGIONS

```

0: "DRplot":
1: "Plots bathymetric contours and shoreline of sections":
2: "of the Dominican Republic coastline":
3: dim A$(5),X(10),Y(10),P(10),B$(5,25),C$(29),C(10)
4: files *:*:1,*:1,*:1:"DRC0">A$(1,4):ent "ENTER CHART NUMBER",A$(5,5)
5: "Name correct disk files":
6: asen A$,1,1;"S">A$(3,3):asen A$,2,1;"D">A$(3,3):asen A$,3,1
7: pen# 3
8: for K=1 to 3
9: 0=N:for I=1 to 10:0=C(I):next I:0=F+H
10: N+1=N:rread K,N,X(*),Y(*),P(*)
11: Y(2)=G:for I=1 to G:Y(I+2)=C(I):next I:if Y(1)=1:1=F
12: if K=2:ofs 0,-200:eto "PLOT"
13: if K=3:wrt 705,"OP":red 705,r1,r2,r3,r4
14: if K=1:eto "SCALES"
15: "Adjusts scale from 150,000 to 100,000":
16: str(r1)+C$(3,8):str(r2-2(r4-r2))+C$(10,15):str(r3+(r3-r1)/2)+C$(17,22)
17: str(r3+(r3-r1)/4)+C$(17,22)
18: str(r4)+C$(24,29):wrt 705,C$:scl 0,100,0,100:eto "PLOT"
19: sto
20: "SCALES":
21: "IP">C$(1,2):fxd 0
22: P(3)+1000-P(1)+P(3):1000+P(1):P(4)+4300-P(2)+P(4):4300+P(2)
23: wrt 6,P(1),P(2),P(3),P(4)
24: wrt 6,P(1),P(2),P(3),P(4)
25: str(P(1))+C$(3,8):", ">C$(9,9):str(P(4)-(P(4)-P(2))/2)+C$(10,15)
26: ", ">C$(16,16):str(P(1)+(P(3)-P(1))/2)+C$(17,22):", ">C$(23,23)
27: str(P(4))+C$(24,29)
28: wrt 705,C$
29: scl X(1)+X(2)/60,X(3)+X(4)/60,X(5)+X(6)/60,X(7)+X(8)/60
30: "Draw grid":
31: wrt 705,"TL1,1"
32: yax X(1)+X(2)/60,1/60,X(5)+X(6)/60-5/60,X(5)+X(6)/60+10/60
33: yax X(1)+X(2)/60-5/60,5/60,X(5)+X(6)/60-5/60,X(5)+X(6)/60+10/60
34: yax X(1)+X(2)/60-10/60,1/60,X(5)+X(6)/60-5/60,X(5)+X(6)/60+10/60
35: yax X(5)+X(6)/60-5/60,1/60,X(1)+X(2)/60-10/60,X(1)+X(2)/60
36: yax X(5)+X(6)/60,5/60,X(1)+X(2)/60-10/60,X(1)+X(2)/60
37: yax X(5)+X(6)/60+5/60,5/60,X(1)+X(2)/60-10/60,X(1)+X(2)/60
38: yax X(5)+X(6)/60+10/60,1/60,X(1)+X(2)/60-10/60,X(1)+X(2)/60
39: "Annotate Y axis":
40: X(5)+X(6)/60+15/60+B:X(1)+X(2)/60+A
41: X(6)+15+X(6):if X(6)>=60:X(5)+1+X(5):X(6)-60+X(6)
42: csiz 4,2,1,90
43: for I=1 to 4
44: B-5/60+B:plt A+.2/60,B+1/60,1
45: X(6)-5+X(6):if X(6)<0:X(5)-1+X(5):X(6)+60+X(6)
46: if I=2 or X(6)=0:lbl X(5),"",X(6),"W":jmp 2
47: lbl X(6),"W"
48: next I
49: "annotate X axis":
50: B+15/60+B:X(1)+X(2)/60-15/60+A
51: X(2)-15+X(2):if X(2)<0:X(1)-1+X(1):X(2)+60+X(2)
52: for I=1 to 3
53: A+5/60+A:plt A-.3/60,B-.1/60,1
54: X(2)+5+X(2):if X(2)>=60:X(1)+1+X(1):X(2)-60+X(2)
55: lbl X(2),"N"
56: if I=2 or X(2)=0:plt A-.3/60,B+.8/60,1:lbl X(1)
57: next I
58: pen# 1
59: scl 0,100,0,100:if F=1:pen# 4
60: "PLOT":
61: if F=1:pen# 4
62: rread K,N+1+N,X(*),Y(*),P(*)
63: if N=1:plt X(1),Y(1),1
64: for I=1 to 10
65: if X(I)=0 and Y(I)=0:jmp 5
66: plt X(I),Y(I),P(I)+1
67: X(I)+X(I):Y(I)+Y
68: next I
69: sto "PLOT"

```

```

71: if F=1;0→F;H+1→H;pen# 1;eto "PLOT"
72: H+1→H;if C[H]#0;eto "PLOT"
73: if K=3;jmp 11
74: rread K,N+1→N,X[*],Y[*],P[*];if X[1]=0;jmp 2
75: pen# 1;for I=2 to X[1]+1;elt X[I],Y[I],1;lbl "+",P[I];next I
76: rread K,N+1→N,X[*],Y[*];if X[1]=0;jmp 3
77: rread K,N+1→N,B$
78: pen# 1
79: for I=2 to X[1]+1
80: 90→A
81: elt X[I],Y[I],1;ent "Angle?",A
82: csiz 3,2,1,A;lbl B$(I-1)
83: next I
84: pen# 1;csiz 3,2,1,90;if K=3;csiz 1,1,1,90
85: for I=1 to 3
86: if C[I]=0;eto "END"
87: ent "# of labels?",B;if F1=13;jmp 7
88: for J=1 to B
89: dsp C[I];sto
90: 90→A;ent "Angle?",A;csiz 3,2,1,A
91: if K=3;csiz 1,1,1,A
92: lbl C[I];90→A
93: next J
94: next I
95: "END":
96: next K
97: pen# 3; yax 110,4.745,33.333,33.333+5*4.745
98: 27→J;csiz 1.2,1,1,90
99: fxd 0;for I=0 to 5;elt 103,J+4.745+J,1;lbl I;next I;lbl "Km"
100: elt 110,66.667,1;lbl "SCALE 1:100,000"
101: end

```

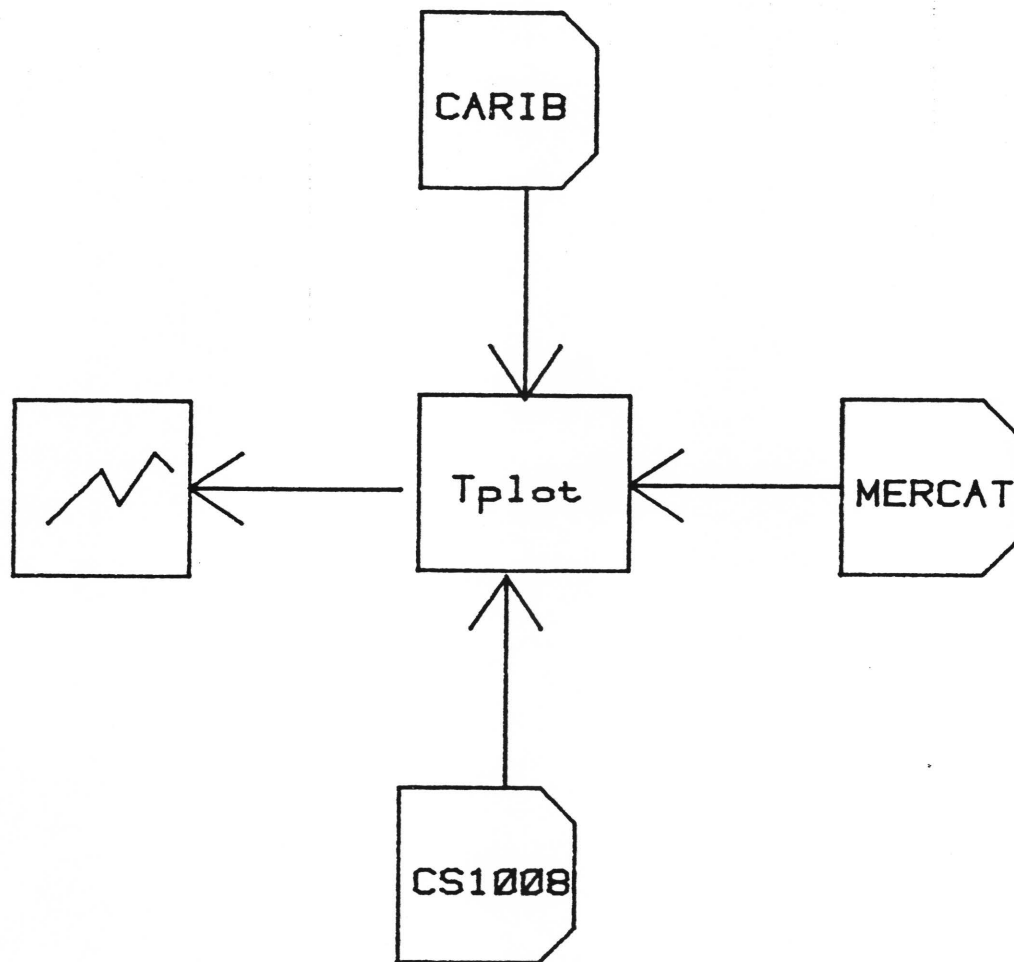


fig A-14 PLOTTING of AVERAGE TEMPERATURES and DELTA-
by 1 DEG. SQUARE WITHIN a 10 DEG. SQUARE

```

0: "Mercatr":
1: dim A$(6),X(10),Y(10),P(10),B(160),A(81),B$(50),C$(29)
2: for I=1 to 29: " "C$(I,1);next I
3: "IP"=C$(1,2);", "C$(9,9)+C$(16,16)+C$(23,23)
4: dim D(100),T(4)
5: files MERCAT
6: for L=1 to 31
7: sread 1,A(L)
8: next L
9: ent W,E,S,N;abs(E-W)+G
10: E-W+D;if D<=0;D+360+D;W+D+E
11: 0+B(1);S+A
12: for J=2 to N-S+1
13: A+1+B
14: if abs(A)-abs(B)<=0;B(J-1)+A(int(abs(B)))>B(J);jmp 2
15: B(J-1)+A(int(abs(A)))>B(J)
16: B+A
17: next J
18: files *,CS1000;ent "ENTER 6-CHARACTER FILE NAME",A$
19: "Adjust scale for Mercator projection":
20: wrt 705,"OP";ired 705,r1,r2,r3,r4;stp
21: 0+F;for I=S to N;A(I)+F+F;next I;F/G+F
22: r2+(r3-r1)*F+r4;fxd 0
23: str(r1)+C$(3,8);str(r2)+C$(10,15);str(r3)+C$(17,22);str(r4)+C$(24,29)
24: wrt 705,C$
25: "LOOP":
26: pclr;scl 0,10,S,S+B(N-S+1)
27: 0+J
28: ent "0 TO PLOT TEMPS,1 FOR DELTAS",r1
29: for P=1 to 100
30: if J#0;sto "PLOT"
31: if r1=1 and P<26;sto "PLOT"
32: pen# 3
33: wrt 705,"TL100"
34: for L=2 to N-S+1
35: yax 0,B(L)-B(L-1),S+B(L-1),S+B(L)
36: next L
37: xax S,1,0,10
38: csiz 2,1.5,2/3,0;fxd 1
39: ent "LABEL",B$;plt 1,S+B(11),1;csiz 3,1.5,2/3,0;clt 1,.5;lbl B$;" "+B$
40: plt -1,S-.5,1
41: for I=1 to 11
42: plt I-1,S-.5,1;clt -1,0;fxd 0;lbl W-I+1,"W"
43: next I
44: for I=1 to 11
45: plt -1,S+B(I),1
46: clt 0,0;fxd 0;lbl S+I-1,"N"
47: next I
48: asen A$,1
49: scl 0,100,0,100
50: pen# 4
51: for L=1 to 250
52: if type(1)=3;jmp 6
53: rread 1,L,X[*],Y[*],P[*]
54: for I=1 to 10
55: plt X(I),Y(I),P(I)+1
56: next I
57: next L
58: pclr;scl 0,10,S,S+B(N-S+1)
59: "PLOT":
60: pen# 2
61: csiz 2,1.5,2/3,0;fxd 1
62: sread 2,T[*]
63: for K=1 to 4
64: J+1+J
65: if T(K)=0;sto "END"
66: if P<26 and r1=1;T(K)+D(J);sto "END"
67: int(J/10)+Y;J-int(J/10)*10+X
68: if P>25 and r1=1;D(J)-T(K)+T(K)
69: plt 9-X,S+B(Y+1),1
70: clt 1,1;lbl T(K)
71: "END":
72: next K
73: if J=100;0+J;sto
74: next P
75: sto "LOOP"
76: end
*9850

```