

PUB. 153
SAILING DIRECTIONS
(ENROUTE)



WEST COASTS OF MEXICO
AND CENTRAL AMERICA



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Preface

Pub. 153, Sailing Directions (Enroute) West Coasts of Mexico and Central America, Sixteenth Edition, 2013, is issued for use in conjunction with Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia. Companion volumes are Pubs. 154, 155, 157, 158, 159.

Digital Nautical Charts 13 and 14 provide electronic chart coverage for the area covered by this publication.

This publication has been corrected to 13 April 2013, including Notice to Mariners No. 15 of 2013.

Explanatory Remarks

Sailing Directions are published by the National Geospatial-Intelligence Agency (NGA), under the authority of Department of Defense Directive 5105.40, dated 12 December 1988, and pursuant to the authority contained in U. S. Code Title 10, Sections 2791 and 2792 and Title 44, Section 1336. Sailing Directions, covering the harbors, coasts, and waters of the world, provide information that cannot be shown graphically on nautical charts and is not readily available elsewhere.

Sailing Directions (Enroute) include detailed coastal and port approach information which supplements the largest scale chart produced by the National Geospatial-Intelligence Agency. This publication is divided into geographic areas called "Sectors."

Bearings.—Bearings are true, and are expressed in degrees from 000° (north) to 360°, measured clockwise. General bearings are expressed by initial letters of points of the compass (e.g. N, NNE, NE, etc.). Adjective and adverb endings have been discarded. Wherever precise bearings are intended degrees are used.

Charts.—Reference to charts made throughout this publication refer to both the paper chart and the Digital Nautical Chart (DNC).

Coastal Features.—It is assumed that the majority of ships have radar. Available coastal descriptions and views, useful for radar and visual piloting are included in geographic sequence in each Sector.

Corrective Information.—Users should refer corrections, additions, and comments to NGA's Maritime Operations Desk, as follows:

1. Toll free: 1-800-362-6289
2. Commercial: 571-557-5455
3. DSN: 547-5455
4. DNC web site: <http://dnc.nga.mil/NGAPortal/DNC.portal>
5. Maritime Domain web site: <http://msi.nga.mil/NGAPortal/MSI.portal>
6. E-mail: navsafety@nga.mil
7. Mailing address: Maritime Safety Office
National Geospatial-Intelligence Agency
Mail Stop N64-SH
7500 Geoint Drive
Springfield VA 22150-7500

New editions of Sailing Directions are corrected through the

date of the publication shown above. Important information to amend material in the publication is available as a Publication Data Update (PDU) from the NGA Maritime Domain web site.

NGA Maritime Domain Website
<http://msi.nga.mil/NGAPortal/MSI.portal>

Courses.—Courses are true, and are expressed in the same manner as bearings. The directives "steer" and "make good" a course mean, without exception, to proceed from a point of origin along a track having the identical meridional angle as the designated course. Vessels following the directives must allow for every influence tending to cause deviation from such track, and navigate so that the designated course is continuously being made good.

Currents.—Current directions are the true directions toward which currents set.

Dangers.—As a rule outer dangers are fully described, but inner dangers which are well-charted are, for the most part, omitted. Numerous offshore dangers, grouped together, are mentioned only in general terms. Dangers adjacent to a coastal passage or fairway are described.

Distances.—Distances are expressed in nautical miles of 1 minute of latitude. Distances of less than 1 mile are expressed in meters, or tenths of miles.

Geographic Names.—Geographic names are generally those used by the nation having sovereignty. Names in parentheses following another name are alternate names that may appear on some charts. In general, alternate names are quoted only in the principal description of the place. Diacritical marks, such as accents, cedillas, and circumflexes, which are related to specific letters in certain foreign languages, are not used in the interest of typographical simplicity. Geographic names or their spellings do not necessarily reflect recognition of the political status of an area by the United States Government.

Heights.—Heights are referred to the plane of reference used for that purpose on the charts and are expressed in meters.

Index-Gazetteer.—Navigational features and place names are listed alphabetically in the back of the book. The approximate position, along with the Sector and paragraph numbers (e.g. 1.1), facilitate location in the text.

Internet Links.—This publication provides internet links to web sites concerned with maritime navigational safety, including but not limited to, Federal government sites, foreign Hydrographic Offices, and foreign public/private port facilities. NGA makes no claims, promises, or guarantees concerning the accuracy, completeness, or adequacy of the contents of the web sites and expressly disclaims any liability for errors and omissions of these web sites.

Light and Fog Signals.—Lights and fog signals are not described, and light sectors are not usually defined. The Light Lists should be consulted for complete information.

Ports.—Directions for entering ports are depicted where appropriate by means of chartlets, sketches, and photos, which facilitate positive identification of landmarks and navigational aids. These chartlets and sketches are not always to scale, however, and should be used only as a general informational guide

in conjunction with the best scale chart. Specific port facilities are omitted from the standard format. They are tabulated in Pub. 150, World Port Index.

Radio Navigational Aids.—Radio navigational aids are not described in detail. Publication No. 117 Radio Navigational Aids and NOAA Publication, Selected Worldwide Marine Broadcasts, should be consulted.

Soundings.—Soundings are referred to the datum of the charts and are expressed in meters.

Special Warnings.—A Special Warning may be in force for the geographic area covered by this publication. Special Warnings are printed in the weekly Notice to Mariners upon promulgation and are reprinted annually in Notice to Mariners No. 1. A listing of Special Warnings currently in force is printed in each weekly Notice to Mariners, Section III, Broadcast Warnings, along with the notice number of promulgation. Special Warnings are also available on the Maritime Division web site.

Wind Directions.—Wind directions are the true directions from which winds blow.

Reference List

The principal sources examined in the preparation of this publication were:

British Hydrographic Department Sailing Directions.

Various port handbooks.

Reports from United States Naval and merchant vessels and various shipping companies.

Other U.S. Government publications, reports, and documents.

Charts, light lists, tide and current tables, and other documents in possession of the Agency.

Internet sites, as follows:

1. Baja California Sur, Ports of
<http://www.bajaport.com>
2. Braswell Shipyard, Panama
<http://www.shipping-pages.com/braswell>
3. J. Ray McDermott, S.A.
<http://www.jraymcdermott.com>

Conversion Tables

Feet to Meters

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

Fathoms to Meters

Fathoms	0	1	2	3	4	5	6	7	8	9
0	0.00	1.83	3.66	5.49	7.32	9.14	10.97	12.80	14.63	16.46
10	18.29	20.12	21.95	23.77	25.60	27.43	29.26	31.09	32.92	34.75
20	36.58	38.40	40.23	42.06	43.89	45.72	47.55	49.38	51.21	53.03
30	54.86	56.69	58.52	60.35	62.18	64.01	65.84	67.67	69.49	71.32
40	73.15	74.98	76.81	78.64	80.47	82.30	84.12	85.95	87.78	89.61
50	91.44	93.27	95.10	96.93	98.75	100.58	102.41	104.24	106.07	107.90
60	109.73	111.56	113.39	115.21	117.04	118.87	120.70	122.53	124.36	126.19
70	128.02	129.85	131.67	133.50	135.33	137.16	138.99	140.82	142.65	144.47
80	146.30	148.13	149.96	151.79	153.62	155.45	157.28	159.11	160.93	162.76
90	164.59	166.42	168.25	170.08	171.91	173.74	175.56	177.39	179.22	181.05

Meters to Feet

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

Meters to Fathoms

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	0.55	1.09	1.64	2.19	2.73	3.28	3.83	4.37	4.92
10	5.47	6.01	6.56	7.11	7.66	8.20	8.75	9.30	9.84	10.39
20	10.94	11.48	12.03	12.58	13.12	13.67	14.22	14.76	15.31	15.86
30	16.40	16.95	17.50	18.04	18.59	19.14	19.68	20.23	20.78	21.33
40	21.87	22.42	22.97	23.51	24.06	24.61	25.15	25.70	26.25	26.79
50	27.34	27.89	28.43	28.98	29.53	30.07	30.62	31.17	31.71	32.26
60	32.81	33.36	33.90	34.45	35.00	35.54	36.09	36.64	37.18	37.73
70	38.28	38.82	39.37	39.92	40.46	41.01	41.56	42.10	42.65	43.20
80	43.74	44.29	44.84	45.38	45.93	46.48	47.03	47.57	48.12	48.67
90	49.21	49.76	50.31	50.85	51.40	51.95	52.49	53.04	53.59	54.13

Abbreviations

The following abbreviations may be used in the text:

Units

°C	degree(s) Centigrade	km	kilometer(s)
cm	centimeter(s)	m	meter(s)
cu.m.	cubic meter(s)	mb	millibars
dwt	deadweight tons	MHz	megahertz
FEU	forty-foot equivalent units	mm	millimeter(s)
grt	gross registered tons	nrt	net registered tons
kHz	kilohertz	TEU	twenty-foot equivalent units

Directions

N	north	S	south
NNE	northnortheast	SSW	southsouthwest
NE	northeast	SW	southwest
ENE	eastnortheast	WSW	westsouthwest
E	east	W	west
ESE	eastsoutheast	WNW	westnorthwest
SE	southeast	NW	northwest
SSE	southsoutheast	NNW	northnorthwest

Vessel types

LASH	Lighter Aboard Ship	ro-ro	Roll-on Roll-off
LNG	Liquified Natural Gas	ULCC	Ultra Large Crude Carrier
LPG	Liquified Petroleum Gas	VLCC	Very Large Crude Carrier
OBO	Ore/Bulk/Oil		

Time

ETA	estimated time of arrival	GMT	Greenwich Mean Time
ETD	estimated time of departure	UTC	Coordinated Universal Time

Water level

MSL	mean sea level	LWS	low water springs
HW	high water	MHWN	mean high water neaps
LW	low water	MHWS	mean high water springs
MHW	mean high water	MLWN	mean low water neaps
MLW	mean low water	MLWS	mean low water springs
HWN	high water neaps	HAT	highest astronomical tide
HWS	high water springs	LAT	lowest astronomical tide
LWN	low water neaps		

Communications

D/F	direction finder	MF	medium frequency
R/T	radiotelephone	HF	high frequency
GMDSS	Global Maritime Distress and Safety System	VHF	very high frequency
LF	low frequency	UHF	ultra high frequency

Navigation

LANBY	Large Automatic Navigation Buoy	SBM	Single Buoy Mooring
NAVSAT	Navigation Satellite	SPM	Single Point Mooring
ODAS	Ocean Data Acquisition System	TSS	Traffic Separation Scheme
CBM	Conventional Buoy Mooring System	VTC	Vessel Traffic Center
MBM	Multi-Buoy Mooring System	VTS	Vessel Traffic Service

Miscellaneous

AIS	Automatic Identification System	MMSI	Maritime Mobile Service Identity Code
COLREGS	Collision Regulations	No./Nos.	Number/Numbers
IALA	International Association of Lighthouse Authorities	PA	Position approximate
		PD	Position doubtful

The following abbreviations may be used in the text:

IHO International Hydrographic Organization

IMO International Maritime Organization

loa length overall

Pub.

SOLAS

St./Ste.

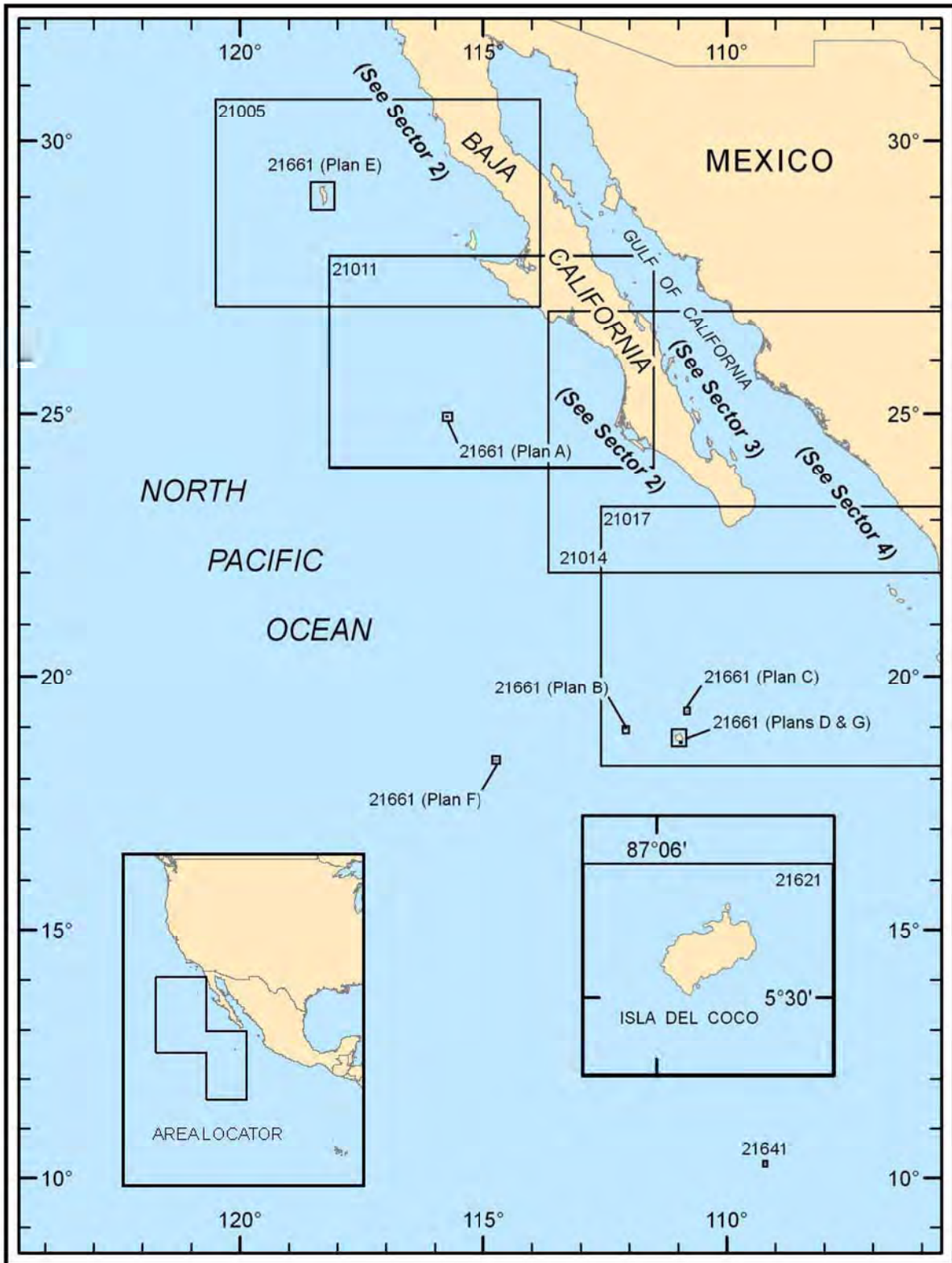
Publication

International Convention for
Safety of Life at Sea

Saint/Sainte

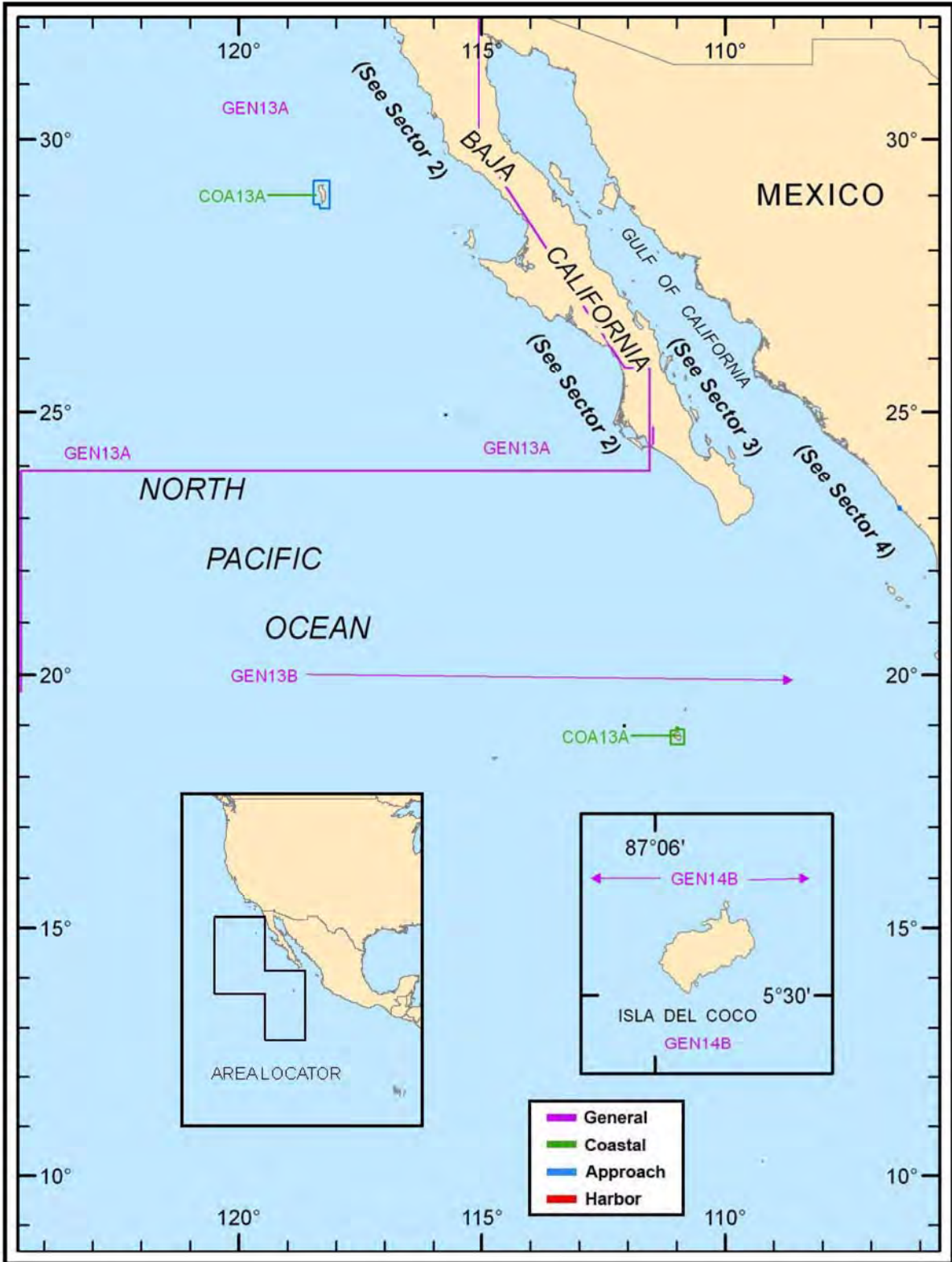
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Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 1 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 13 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 1 — DNC LIBRARY INFORMATION

SECTOR 1

OFF-LYING ISLANDS—WEST COAST OF MEXICO AND CENTRAL AMERICA

Plan.—This sector describes the islands and shoals lying off the W coasts of Mexico and Central America. The descriptive sequence is SE.

Tanner Bank

1.1 Tanner Bank (32°42'N., 119°09'W.), about 13 miles long and 5.5 miles wide, extends in a NW-SE direction. It has a least known depth of 16.4m which is marked close N by a buoy.

Cortes Bank (32°30'N., 119°11'W.), about 24 miles long and 6.5 miles wide, extends in a NW-SE direction. This bank lies about 5 miles S of Tanner Bank and parallel to it. The irregular bottom of the bank is hard and consists of white sand and broken shells with fine coral in the SE part. An increased swell is usually noticeable in the vicinity of this bank.

Bishop Rock (32°27'N., 119°08'W.), awash, lies on the SE side of Cortes Bank and is marked by a lighted buoy. The sea usually breaks over this danger even in moderate weather. Several shallow shoal patches and a wreck, with a depth of 1m, lie in the vicinity of this rock.

The current setting in the vicinity of Cortes Bank is variable in direction and attains a rate of 1 to 2 knots.

Caution.—A disused chemical munitions dumping area, the limits of which may best be seen on the chart, lies 60 miles SE of Cortes Bank.

Isla de Guadalupe

1.2 Isla de Guadalupe (29°02'N., 118°17'W.) lies about 140 miles off the coast of Baja California and is under the sovereignty of Mexico. It is about 20 miles long, 7 miles wide, and very radar conspicuous.

The island consists of a chain of high volcanic mountain ridges which rises to a height of 1,295m near its N end. The shores are high, bold, and rugged.

The S part of the island is barren, but there are fertile valleys and trees in the N part. The mountain peaks are obscured by clouds for the greater part of the year, but when visible, they can be seen at distances of up to 60 miles. When viewed from the E, the S side of the island appears lower than the N side. The coasts generally consist of rocky bluffs with detached rocks fronting some of them.

Two high and prominent islets lie within 2 miles S of the SW end of the island. Elsewhere, the other islets found fringing the coasts are very small.

Punta del Norte, off which discolored water has been observed, is the N extremity of the island.

Anchorage can be taken by small craft close inshore within a small cove lying on the E side of Isla de Guadalupe, 1.5 miles S of Punta del Norte. The bottom consists of gravel with no weeds. This anchorage is not exposed to the violent winds that descend from the hills at the other roadsteads. A light is shown from a metal pyramid, 12m high, standing in the vicinity of this

cove.

Anchorage can be taken within a cove lying on the W side of the island, 6 miles N of its SW extremity. However, this cove is exposed to the heavy swell from the NW and is not recommended. A light is shown from a metal tower, 12m high, standing on the headland at the N side of this cove. Anchorage can also be taken within a cove lying on the S coast of the island, 1 mile E of its SW extremity. A light is shown from a metal pyramid, 12m high, standing in the vicinity of the W side of this cove.

Rocas Alijos (Escollos Alijos) (24°58'N., 115°46'W.), a dangerous group of above and below-water rocks, lies about 190 miles W of Cabo San Lazaro. The group consists of three principal rocks and numerous smaller ones which, when seen from a distance, give the appearance of a ship under sail. South Rock, the largest of the group, is 34m high. Vessels should give this danger a wide berth.

Rosa Bank (26°13'N., 115°00'W.), with a least depth of 502m, lies about 83 miles NNE of Rocas Alijos.

Islas Revillagigedo

1.3 Islas Revillagigedo, a group of four islands, consists of Isla Socorro, Isla San Benedicto, Isla Clarion, and Isla Roca Partida. These islands, which are under the sovereignty of Mexico, are all formed by volcanic origin. The current in the vicinity of the islands usually sets in a S direction and attains a rate of 0.5 to 1 knot.

Isla Socorro (18°48'N., 110°59'W.), the largest island of the group, rises abruptly from the sea to a summit, 1,130m high. When viewed from seaward, this island has a barren and desolate appearance. Its surface is broken by furrows, small craters, and numerous ravines. The island is covered by a dense growth of cactus and sage with some grass, but the vegetation in general is of a low order. There are lava outcrops in places and lava lines the walls of many of the ravines.

Cabo Regla, the S extremity of the island, consists of a rocky bluff which is surmounted by a hill, 76m high. A small cove, with a rocky beach, lies about 0.5 mile E of the point and a village, with a church, stands on its W side. Two beacons form a range which leads to a boat landing at the head of the cove.

Bahia Braithwaite (Bahia Braulia), entered 0.5 mile NE of the small cove, provides sheltered anchorage, from all except S and E winds, from December to June. Vessels can anchor, in depths of 18 to 20m, sand and shell with rock in places, about 0.3 mile off-shore, with the highest peak of the island bearing 335°. This bay can be identified by a rocky beach at its head.

Bahia Cornwallis, entered NW of Cabo Regla, provides shelter from June to December, but vessels must anchor close inshore. The anchorage lies off the first of two white coral beaches to the W of Cabo Regla. Large vessels can anchor, in a depth of 15m, within Caleta Binner, a cove, which lies in the SE part of the bay.

Ensenada Grayson (Caleta Grayson), an inlet, lies 3 miles

NW of Cabo Regla and is the location of a freshwater spring. The site is marked by the letter W over an inverted arrow cut into the face of the cliff. Several shallow rocks lie in the approach to this inlet.

Cabo Pearce, the E extremity of Isla Socorro, is dominated by a tableland which stands about 1 mile inland and is 305m high. It is reported that volcanic activity has formed new shoals in this vicinity and towards Bahia Braithwaite, the rock-fringed E extremity of the island. Vessels should navigate with caution.

Cabo Middleton, the N extremity of the island, consists of a low peninsula which is connected to the shore by a neck of sand. Rock Islets, two detached above-water rocks, lie about 1 mile offshore, 1 mile ENE of this point. It is reported that breakers have been sighted extending up to about 0.8 mile W from these rocks.

Anchorage can be taken by small craft within a deep and sheltered bight located at the E side of the cape. A bight located at the W side should be avoided due to several detached rocks lying in the entrance.

Cape Henslow, located 5 miles SW of Cabo Middleton, is the outer extremity of a small peninsula. This cape consists of vertical cliffs, 30m high. Oneal Rock (Piedra Oneal), steep-to and 13m high, lies about 1 mile NNW of the cape and is marked by breakers on its NW and SE sides.

Punta Tosca, the W extremity of Isla Socorro, is located 2.3 miles S of Cape Henslow.

1.4 Isla San Benedicto (19°19'N., 110°49'W.), a barren and rocky island, lies 27 miles NNE of Isla Socorro and has two prominent peaks. The tallest peak is 297m high and rises near the S part of the island. When seen from a distance, these two peaks often appear as two distinct islets.

Good anchorage can be taken off a small shingle beach located about midway along the E side of the island.

Three small but high detached rocks lie within 0.2 mile of the W side of the island. A detached rock, with a least depth of 3m, lies about 0.8 mile W of the N extremity of the island.

A shoal, with a depth of 28m, was reported (1963) to lie about 15 miles N of Isla San Benedicto.

Isla Roca Partida (18°59'N., 112°04'W.), a barren and steep-to rock, is 33m high and lies 62 miles W of Isla Socorro. It consists of two white pinnacle rocks which connected by a ridge, 6m high. When viewed from a distance, this rock resembles a jury-rigged vessel.

Isla Clarion (18°21'N., 114°44'W.), the westernmost island of the group, lies 214 miles W of Isla Socorro and has three prominent peaks. The westernmost and tallest peak is 335m high. The coasts are backed by perpendicular cliffs, 24 to 183m high, with the exception of the middle part of the S coast in the vicinity of the Bahia Azufre.

Roca Monumento, 61m high, lies 0.2 mile off the NW extremity of the island. This prominent rock is formed by a square base surmounted by a column which consists of alternate layers of red and white conglomerate.

A rocky shoal, with a least depth of 5.5m, was reported (1933) to lie about 0.8 mile NE of the rock. A detached rock, 7.6m high, lies about 0.2 mile offshore, 1.3 miles E of the rock.

Bahia Azufre (Sulphur Bay), indenting the S side of the island, provides shelter during N winds. Vessels should anchor, in a depth of 22m, about 0.3 mile from the shore of this bay. A

strong W set has been experienced at this anchorage. During moderate weather, boats can land on the sandy beach at the W side of this bay, but no attempt should be made to land elsewhere on the island.

A light is shown from a metal tower, 14m high, standing on the E entrance point of Bahia Azufre.

The section of coast between Roca Piramide, lying off the SE extremity of the island, and Bahia Azufre, is fronted by foul ground which extends up to 0.3 mile offshore in places and breaks.

A rock, with a depth of less than 1.8m, was reported (1958) to lie about 0.4 mile E of the NE extremity of Isla Clarion.

Shamada Seamount (16°53'N., 117°30'W.), with a depth of 28m, lies about 190 miles SW of Isla Clarion.

Ile Clipperton

1.5 Ile Clipperton (10°17'N., 109°13'W.), which is under the sovereignty of France, lies about 640 miles SSW of Cabo Corrientes (20°24'N., 105°43'W.). This dangerous atoll consists of a low coral ring of varying width which encloses a lagoon filled with stagnant water. Two openings that formerly led into the lagoon are now closed.

The atoll is mostly 1.5 to 4.5m high, but Rocher Clipperton, a prominent formation, is 20m high and rises on the SE side. From a distance, this rock resembles a sail, but on closer approach it has the appearance of an immense castle. A shoal, with a depth of 9m, is reported to lie about 1 mile WSW of this formation.

A derelict hut, with a mast, was reported (1976) to stand near the middle of the NE side of the atoll. A rock lies close offshore, about 0.5 mile E of this hut.

Soundings give little warning when approaching the atoll from any direction. A high, breaking surf pounds the coral reef that encircles the atoll and, at times, completely sweeps across it into the lagoon.

Anchorage can be taken, in depths of 37 to 82m, about 250m from the reef at the NE side of the atoll, with Rocher Clipperton bearing between 177° and 190°. The bottom is coral with good holding ground, but heavy squalls from between N and ENE are frequent and vessels at such times should be prepared to quickly leave this anchorage.

In the vicinity of the atoll, the flood current normally sets E and the ebb current sets W, but the strength and duration of these currents depends largely upon the wind.

1.6 Ville de Toulouse Rock (11°16'N., 116°44'W.), the existence of which is doubtful, was reported (1871) to lie about 450 miles W of Ile Clipperton. A vessel, with a draft of 4.6m, struck a sunken rock in this locality.

Oceana Bank (8°24'N., 115°25'W.), existence doubtful, was reported (1871) to lie about 385 miles WSW of Ile Clipperton. It has a least depth of 115m and is marked by discolored water.

Germaine Bank (5°00'N., 107°35'W.), existence doubtful, was reported (1916) to lie 315 miles SSE of Ile Clipperton and to have a depth of 20m. Depths of 22m, 40m, and 109m, have been reported to lie 10 miles SSW, 10 miles NW, and 40 miles W, respectively, of this bank.

A shoal, with a depth of 10m, was reported to lie about 350 miles SSW of Oceana Bank in approximate position 2°49.0'N,

116°30.5'W.

Isla del Coco

1.7 Isla del Coco (Cocos Island) (5°32'N., 87°04'W.), which is designated a national park and is administered by Costa Rica, is about 4 miles long, 2 miles wide, and radar conspicuous. Cerro Iglesias, the summit, is 671m high and rises in the SW part of the island.

The coasts are fringed by numerous islets and rocks, which extend up to 0.8 mile offshore in places, and are indented by many small bays and coves. The shores are mostly formed by steep cliffs; a heavy surf usually breaks all around the island.

In the vicinity of the island, the ebb tidal current sets E and the flood current sets W, with the latter being the weaker. The currents running off the island are strong and irregular, but generally set NE and attain rates of up to 2 knots.

A shoal, with a depth of 30m, was reported (1987) to lie about 10 miles NE of the island.

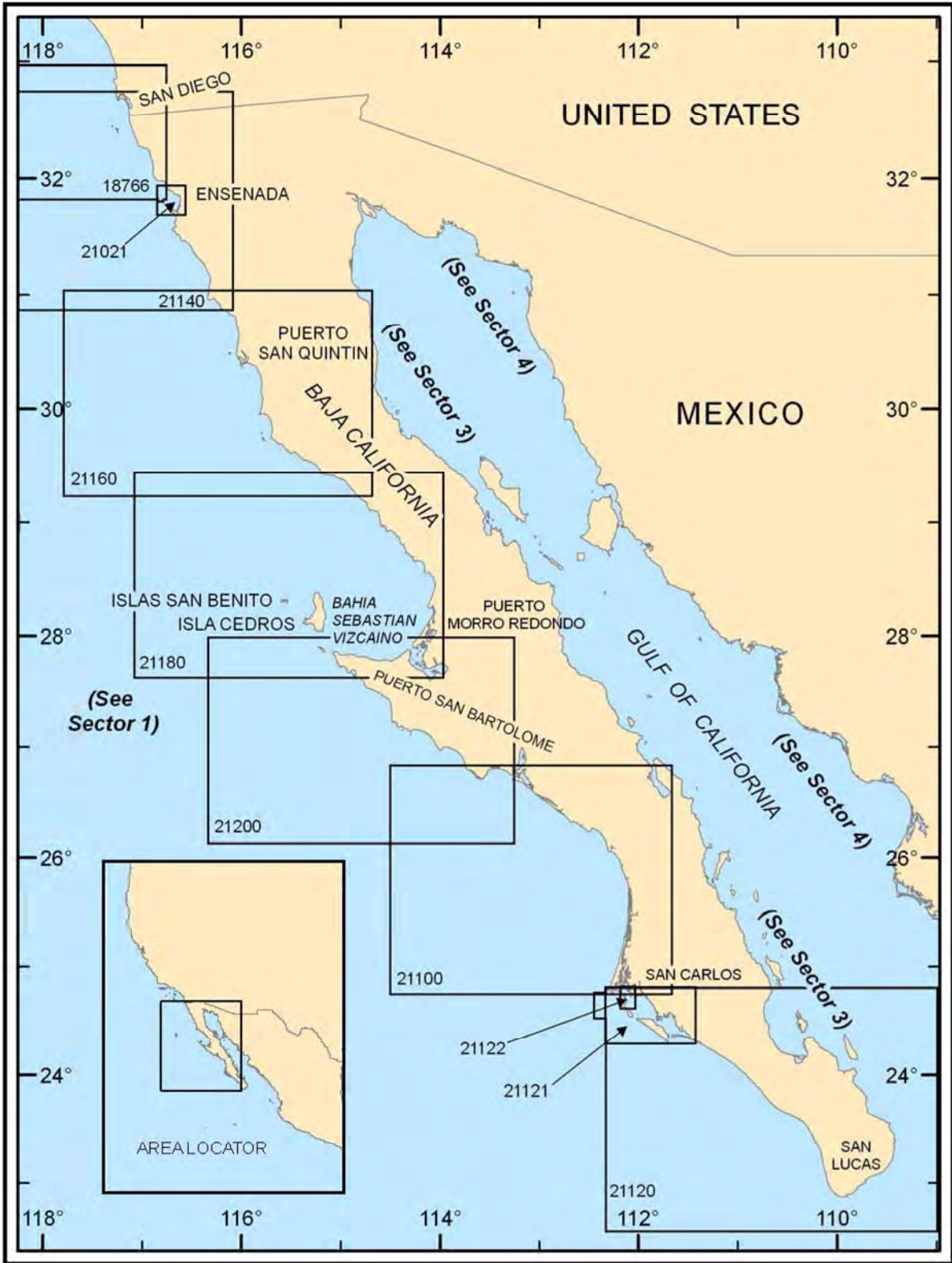
A rock, about 2m high, is reported (1947) to lie about 1 mile WSW of Cabo Dampier, the S extremity of the island. Islas

Dos Amigas, consisting of two islets, lies at the edge of the foul ground, 1.8 miles WNW of Cabo Dampier.

Bahia de Chatham (5°33'N., 87°03'W.), located on the NE side of the island, is surrounded by high cliffs. Foul ground extends up to about 0.3 mile seaward from the head of the bay. Isote Ulloa, 56m high, lies 0.3 mile E of Punta Pacheco, the E entrance point of the bay. Vessels can anchor during good weather, in a depth of 26m, with this islet bearing 119° and well open of Punta Pacheco. Vessels can also anchor, in a depth of 13m, about 300m off the SE shore of the bay. The bottom is coral and sand with poor holding ground and the anchorage is unsafe with onshore winds.

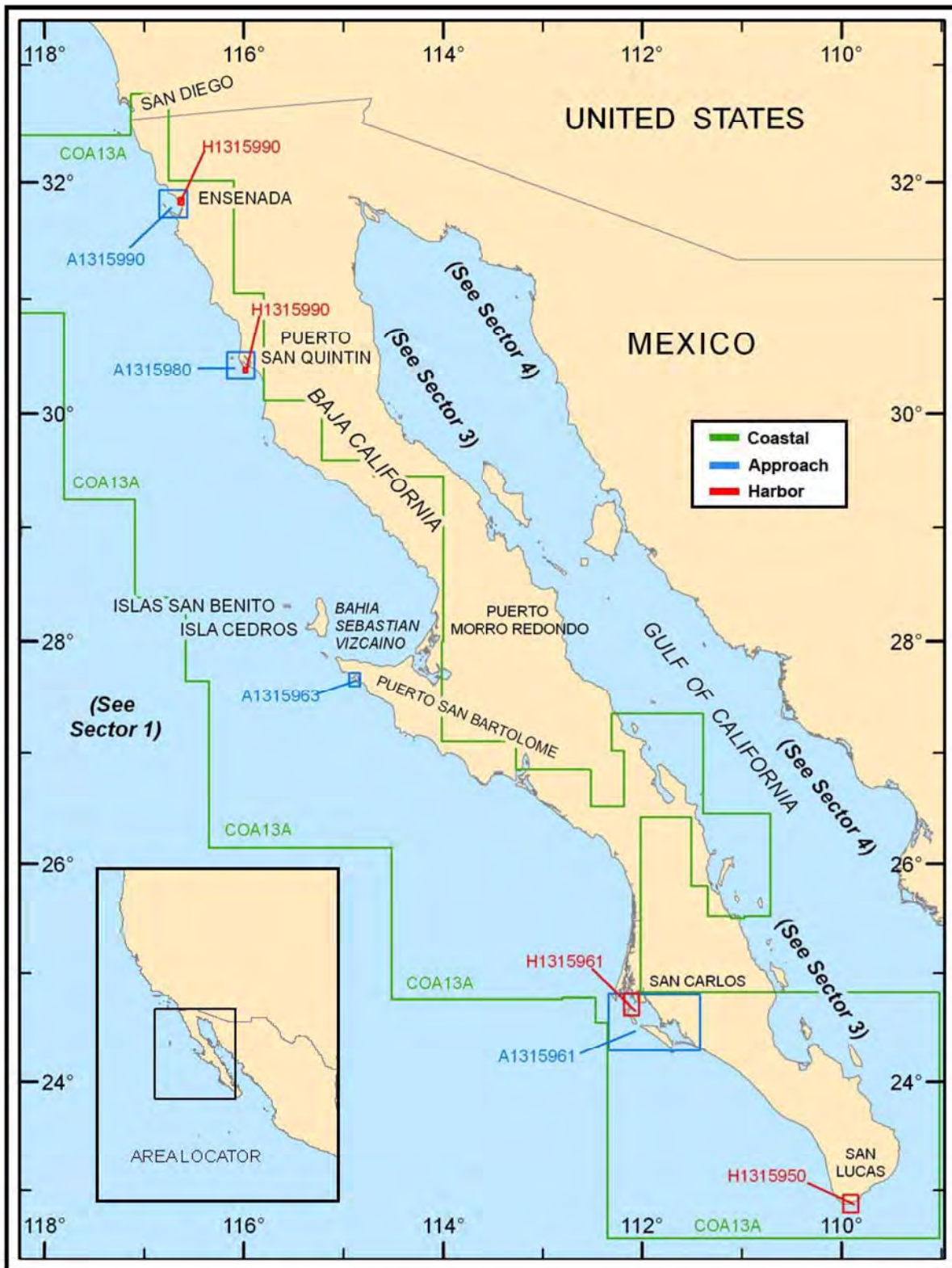
Bahia de Wafer, located on the NW side of the island, is mostly foul and does not provide as good an anchorage as Bahia de Chatham. This bay has general depths of less than 5.5m extending almost to the line of the entrance points.

The N coast extending between Bahia de Chatham and Bahia de Wafer is backed by high, steep cliffs. Isla Manuelita, 104m high, lies close N of Punta Agujas, the N extremity of the island.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 2 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 13 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 2 — DNC LIBRARY INFORMATION

SECTOR 2

MEXICO—WEST COAST OF BAJA CALIFORNIA

Plan.—This sector describes the W coast of Baja California, with adjacent islands, from the United States boundary line to Cabo Falso. The descriptive sequence is SE.

General Remarks

2.1 Winds—Weather.—The prevailing winds along this coast are NW and may be said to blow steadily from that direction for about 8 months of the year. During November, December, January, and February, winds from SE to SW are frequent, with occasional moderate SE gales. These gales are often accompanied by considerable rain. During December and January, heavy winds, which blow from a direction between N and NE, are likely to occur and usually last for 1 to 3 days.

The weather during the greater part of the year is clear and pleasant. Rains are most frequent between May and October. Fogs may occur in all seasons, but mostly during the summer months, setting in at night or in the early morning and clearing by 1000. South of Isla Cedros, there is less fog and the weather clears earlier than to the N. Between Boca de las Animas and Bahia Magdalena, fogs are very frequent during the late fall and winter. These fogs usually form over the lagoons and small bays. They are blown seaward in the early morning by the land breeze and shoreward again by the sea breeze, clearing by about noon.

Tides—Currents.—The currents in the vicinity of this coast set in the direction of the prevailing winds and attain rates of 0.5 to 1 knot. Near the land, the influence of the tides is also felt and an E set should be guarded against at all times. Between Punta Abreojos and Bahia Magdalena, vessels frequently experience during the winter a NW current, with a rate of 0.7 to 1 knot, at a distance of 15 to 25 miles from the shore.

Caution.—Vessels are warned against the effect of the tidal currents, especially spring floods, setting across the mouths of the lagoons.

Boundary Monument to Ensenada

2.2 Boundary Monument (32°32'N., 117°07'W.), a white marble obelisk, stands near the shore at the edge of a low tableland and marks the international boundary between the United States of America and Mexico. It is 6m high and clearly visible from seaward. A stone mound, which marks a second point on the boundary, is situated 1 mile E of the monument. A conspicuous bull ring stadium stands close ESE of the monument.

Tijuana Light is shown from a tower, 22m high, standing in the vicinity of the monument. An aeronautical light is shown from a structure standing 6 miles ESE of the monument.

A dangerous wreck is reported to lie about 4.5 miles W of the Boundary Monument.

Islas Los Coronados (32°25'N., 117°15'W.), a group of four rocky islets, lies about 10 miles SW of the Boundary Monument.



Tijuana Light and Bull Ring



Tijuana Light

Sur Coronado, the southernmost and largest islet of the group, rises to a summit, 205m high, at its S end. When viewed

from the N or S, this islet appears to be wedge-shaped. Puerto Cueva, a small cove, lies near the NE point of the islet and provides shelter for fishing vessels. A light is shown from a tower, 10m high, standing in the vicinity of this cove. A racon is situated at the light.



Islas Los Coronados Light

Kelp extends up to about 2.5 miles SSE from the S end of this islet. A light is shown from a tower, 6m high, standing on the S extremity and a shoal, with a depth of 16.5m, has been reported to lie about 2 miles SSE of it.

Norte Coronado, the northernmost islet, lies 2.8 miles NW of the N extremity of Sur Coronado. It is 142m high and barren. The other two islets of the group lie close W of the N part of Sur Coronado. A deep passage leads between Norte Coronado and the other islets, but it is encumbered by patches of kelp and is not recommended.

The passage leading between the group and the mainland has depths of 26 to 37m and is clear and safe.

Anchorage, well sheltered from the prevailing winds, can be taken, in a depth of 15m, sand, off the middle of the E side of Sur Coronado.

Caution.—Two dangerous wrecks are located NNE of Islas Los Coronados in the following positions:

- a. 32°32'11"N, 117°12'34"W.
- b. 32°29'36"N, 117°13'42"W.

2.3 Rosarito Oil Terminal (32°22'N., 117°06'W.) (World Port Index No. 15995), with offshore berths, lies 11 miles S of the Boundary Monument, in the vicinity of the mouth of the Rio Rosarito.

Depths—Limitations.—The port consists of two offshore berths operated by PEMEX. One berth is a CBM arrangement formed by five mooring buoys, with a single-berth SBM located close N of the CBM. The berths are used for the discharge of petroleum products. Berth limitations are given in the accompanying table titled **Rosarito Oil Terminal—Berth Limitations**.

Aspect.—A conspicuous radio tower stands close N of the mouth of the Rio Rosarito. A conspicuous power station is situated 2.3 miles NNW of the river mouth and four gray chimneys, each 45m high, stand in its vicinity. A prominent tank farm is situated close N of the power station; a group of radio masts stands 1.5 miles N of it.

Rosarito Oil Terminal—Berth Limitations				
Berth	Depth alongside	Max. vessel size	Max. vessel length	Max. draft (HW)
CBM1	15.24m	45,000 dwt	210m	10.36m
SBM	24.38m	60,000 dwt	240m	15.2m

A lighted buoy is moored off the CBM while a light is displayed from the SBM.

Pilotage.—Pilotage is compulsory for all foreign vessels and Mexican vessels over 500 grt. Pilots will board about 1 mile WNW of the SBM as shown on the chart, and will remain on board during all discharging operations. In bad weather, vessels may be advised to proceed to Ensenada where pilots will board at a distance of not less than 3 miles from the breakwater.

Regulations.—Mooring and unmooring for the SBM can be accomplished at anytime while it is restricted to daylight only for the CBM berth.

The vessel's ETA should be advised through PEMEX or the vessel's agents 72 hours, 24 hours, and 12 hours prior to expected arrival. The following information should be included on all ETA messages:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

Vessels then use VHF channel 16 to contact the port upon arrival.

Contact Information.—See the accompanying table titled **Rosarito—Contact Information**.

Rosarito—Contact Information	
Pilots	
VHF	VHF channel 9
Telephone	521-661-6122749
Facsimile	521-661-6122444
Harbormaster	
VHF	VHF channel 16
Telephone	521-661-6122371
Facsimile	521-661-6120538
PEMEX	
Call sign	XIB83
VHF	VHF channel 9

Rosarito—Contact Information

RT frequency	8690 kHz
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Anchorage.—A designated anchorage for tankers is situated adjacent W of the restricted area surrounding the offshore berths as best seen on the chart.

Caution.—During the summer, the berths are exposed to the prevailing W or NW swell, which may be heavy, and vessels must keep their engines available at short notice. Cargo operations are generally suspended when the swell reaches a height of 3m.

The terminal lies within a restricted area extending offshore between 32°20'N and 32°23'N, as best seen on the chart.

2.4 Punta Descano (32°16'N., 117°02'W.) is located 16.5 miles SSE of Boundary Monument; the coast between is backed inland by a range of prominent, high mountains. This point is formed by a bluff surmounted by a hill, 112m high.

Bahia Descano (32°14'N., 116°58'W.), open and exposed, lies between Punta Descano and Punta Mezquite, 8.5 miles SE. It is of no commercial importance, but provides anchorage for small coasters. Pilon de Azucar (Sugarloaf Rock), an above-water rock, is located about 4 miles SE of Punta Descano. It lies in the central part of the bay and is the only off-lying danger. A settlement, which may be identified by some sand hills close N of it, is situated 2 miles N of Punta Mezquite. Small vessels sometimes anchor, in depths of 15 to 27m, off this settlement, but local knowledge is advised.

Punta Salsipuedes (32°03'N., 116°54'W.), low and poorly defined, is located 7 miles S of Punta Mezquite and 11 miles NW of Punta San Miguel, the N entrance point of Bahía Todos Santos.

2.5 Energia Costa Azul (ECA) LNG Terminal (La Jovita) (31°59'N., 116°51'W.) is located about 15 miles NW of Ensenada. The terminal is able to accommodate LNG carriers with a capacity of 70,000 to 200,000m³.

ECA LNG Terminal Home Page

<http://eca.sempralng.com>

Depths—Limitations.—The terminal has a single berth aligned 304.5°-124.5° and protected by a detached breakwater 648m in length. The depth alongside the berth is 15m. Vessels up to 330m loa, 52m beam, and a draft of 13m can be accommodated.

A second berth is planned for Phase 2 construction.

Pilotage.—Pilotage is compulsory. Pilots board either N or S of the terminal depending on prevailing weather conditions, as follows:

1. North boarding position—31°59'30"N, 116°54'30"W.
2. South boarding position—31°56'30"N, 116°52'00"W.

The pilot can be contacted through VHF channels 09 or 16.

Regulations.—The ETA should be provided with Notice of Arrival through the Shipper Portal on the ECA Terminal Home Page. This portal requires a login using a pre-established username and password. For vessels unable to access this internet portal, notice of arrival should be given via e-mail or facsimile.

Automatic Identification System (AIS) equipment is required to be operating during all times a vessel is within the terminal area.

Vessels will be provided with UHF equipment for use during cargo transfer operations.

All communications between the vessel and the terminal will be conducted in English.

Contact Information.—The terminal can be contacted on VHF channel 16 or 69.

The harbor master can be contacted, as follows:

1. VHF: VHF channels 14 and 16
2. Telephone: 521-646-1740528
3. Facsimile: 521-646-1757176

The terminal operator can be contacted, as follows:

1. Telephone: 521-646-2222900
2. Facsimile: 521-646-2222909
3. E-mail: info@energicostaazul.com.mx

Anchorage.—Anchoring in the vicinity of the terminal is not recommended due to the exposed nature of the coast and depth of water. Vessels requiring anchor should use Bahía de Todos Santos.

2.6 Bahía Todos Santos (31°49'N., 116°42'W.), open to the W, is entered between Punta San Miguel and Cabo Punta Banda, 8 miles S.

Punta San Miguel is bold and 46m high. A light is shown from a tower, 5m high, standing on the point. The N coast of the bay between this point and Punta del Morro, 4.5 miles SE, is backed by bold cliffs, 15 to 30m high, and fronted by kelp which extends up to 1.5 miles offshore in places. A light is shown from a tower, 6m high, standing on Punta del Morro. A shoal, with a depth of 4.6m, lies about 1.2 miles SW of this light.



Punta San Miguel Light

Puerto El Sauzal, protected by breakwaters, is a small harbor lying 2 miles ESE of Punta San Miquel. Several prominent ranch buildings stand in the vicinity of this harbor; the entrance is indicated by a lighted range.



El Sauzal Front Range Light



El Sauzal Rear Range Light

Punta Ensenada (31°51'N., 116°39'W.) is a steep promon-

tory, 113m high, located 1.7 miles ESE of Punta del Morro.

Islas de Todos Santos (31°51'N., 116°39'W.), consisting of two barren islets, lies in the W entrance of the bay, 3.5 miles NW of Cabo Punta Banda. The islets are surrounded by kelp and fringed by rocks, but deep and wide passages lie on either side of them. The S islet is high; the N islet is low and flat. A light is shown from a prominent tower, 30m high, standing in the N part of the N islet. A racon is located at this light. Another light is shown from a tower, 7m high, standing on the S extremity of the S islet.

Bajo San Miguel, a detached shoal patch, lies about 2.5 miles N of the N islet. It has a least depth of 5.5m and is surrounded by kelp.

The S side of the bay is formed by a promontory which is faced by cliffs, 12 to 43m high. From the root of this promontory, the SE shore of the bay extends NNE and is fringed by a sandy beach. Estero Punta Banda, the mouth of an extensive lagoon, lies at the SE side of the bay and is obstructed by a bank on which the sea breaks continuously.

Ensenada (31°52'N., 116°38'W.)

World Port Index No. 15990

2.7 Ensenada provides berthing for cargo and cruise vessels. There are also facilities for fishing vessels and yachts, along with a naval base and ship repair facilities. The main exports are cotton, grain, and cement with fertilizers as the main imported cargo.

Ensenada Home Page

<http://eca.puertoensenada.com.mx/english>

Winds—Weather.—The prevailing winds are from the NW and SW. Haze is reported to be common within the bay.

Tides—Currents.—The tides rise about 1.6m at springs and 1.1m at neaps.

Depths—Limitations.—The harbor is protected from the W by a breakwater, 1,800m long, which extends SE from Punta Ensenada. It is also protected from the S by another breakwater, extending 600m WSW from the shore, then bending SSW for another 380m.

The port is approached from the S from the pilot boarding position through a channel, 1,600m in length, marked by buoys and dredged to a depth of 16.25m. The channel leads through the opening, 300m wide, between the breakwaters to a turning basin inside the harbor. The turning basin, with a radius of 225m and depths of 15.25m, is located close SE of the container terminal.

The International Container Terminal is attached to the center part of the E side of the breakwater protecting the harbor from the W. The terminal is 300m in length and can accommodate vessels up to 320m in length, with maximum draft of 15.2m. An extension of this terminal to the SE is 186m long and can accommodate smaller vessels with maximum drafts of 10m. Bulk grain, cattle, steel, and timber can also be handled at this terminal.

Muelle de Cabotage, for coasters, is located close NW of the container terminal along the breakwater. It is 446m in length



Ensenada Harbor



Ensenada Petroleum Terminal

and accommodates vessels with a maximum draft of 7m.

The fishing pier for large fishing trawlers extends SE from the shore close E of Muelle de Cabotage and has two berths available. Berth No. 240 is 480m in length; Berth No. 90 is 180m in length. Both sides of the pier have depths of 7m along side and will handle trawlers up to 70m in length and a maximum draft of 5.5m. Close NE of the fishing pier is a shipyard with a drydock; continuing to the E are many smaller fishing piers for small fishing craft.

The Baja Naval Marina is located in the NE part of the harbor close SE of the small fishing piers.

The Cruise Terminal is located on the E shore of the harbor directly across from the container terminal and has two berths (No. 1 and No. 2). Berth No. 1 is 163m long and Berth No. 2 is

185m long and both handle vessels with maximum drafts of 10m.

The Naval Base, with a pier extending WNW from the shore, is located close SE of the cruise terminal.

Close SE from the Naval Base is the Cemex Terminal, for loading cement, and the Bulk Minerals Terminal. The Cemex Terminal has two berths and the Bulk Minerals Terminal has three berths, with total length of 290m. All berths at both the Cemex terminal and the Bulk Minerals Terminal can accommodate vessels with a maximum draft of 6m.

The Ensenada Petroleum Terminal is located on the N side of the breakwater protecting the harbor from the S.

Aspect.—A light is shown from a conical tower, 12m high, standing at the head of the W breakwater. Another light is shown on a metal framework tower, 7m high, from the head of the breakwater protecting the harbor from the S. An aeronautical radiobeacon is situated 1.3 miles E of the head of the W breakwater. An airport is situated about 3 miles S of the harbor.

Pilotage.—Pilotage is compulsory. Pilots board SW of the harbor entrance in position 31°49.5'N, 116°38.5'W.

Regulations.—The ETA should be sent 72 hours, 24 hours, and 12 hours before arrival during office hours. Office hours are from 0900 to 1400, Monday through Friday and 1000 to 1300 on Saturday, all local time. All ETA messages should include the following:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

Contact Information.—See the accompanying table titled **Ensenada—Contact Information**.

Anchorage.—Good anchorage can be taken, in depths of 6 to 18m, sand and mud, within the bight lying about 4 miles E of Cabo Punta Banda, in the S part of Bahia Todos Santos. During S gales, this anchorage is considered to be the best along the coast. In suitable weather, vessels can anchor, in depths of 11 to 18m, to the S of the W breakwater head.

Ensenada—Contact Information	
Pilots	
VHF	VHF channel 9
Telephone	521-646-1772067
Facsimile	521-646-1763950
E-mail	pilotens@telnor.net
Port Authority	
Telephone	521-646-1782860
	521-646-1782775
Facsimile	521-646-1740370
E-mail	marketing@apiensenada.com.mx
Harbormaster	
VHF	VHF channels 14 and 16
Telephone	521-646-1740528

Ensenada—Contact Information	
Facsimile	521-646-1757176
Ensenada International Terminal	
Telephone	521-646-178801
	521-646-178802
	521-646-178803
Facsimile	521-646-178804
	521-646-178808

Ensenada to Islas San Benito

2.8 Cabo Punta Banda (31°44'N., 116°45'W.), the S entrance point of Bahía Todos Santos, is a bold headland located at the outer end of a long and narrow promontory. A light is shown from a tower, 6m high, standing on this point. A chain of rocky shoals extends about 1 mile NW from the point.



Punta Banda Light

Banda Peak, 389m high, rises 1 mile SE of the point and forms an excellent landmark from the S.

Caution.—A marine farm has been established NE of Cabo Punta Banda. Since small craft are expected to be operating in this area to service the nets, mariners are required to stay clear of this area. The marine farm occupies two areas adjacent to each other and are bounded by lines joining the following positions:

- 31°45'21"N, 116°43'08"W.
- 31°45'01"N, 116°43'21"W.
- 31°45'08"N, 116°43'46"W.
- 31°45'35"N, 116°43'46"W.

and

- 31°45'01"N, 116°42'31"W.
- 31°44'45"N, 116°42'37"W.
- 31°45'01"N, 116°43'21"W.
- 31°45'17"N, 116°43'05"W.

2.9 Punta Santo Tomas (31°33'N., 116°42'W.), located 12 miles SSE of Cabo Punta Banda, is the low outer extremity of a square-shaped headland. This headland rises close inland to Bluff Peak, which has a prominent summit, 442m high. Vessels should stay at least 0.5 mile from the point and both sides of the headland as they are surrounded by kelp.

Rocas de la Soledad, a group of above-water rocks, lies about 1.3 miles W of Punta Santo Tomas. This group, which consists of rocks up to 6m high, is steep-to, surrounded by kelp, and may safely be passed on either side.

Anchorage can be taken, in depths of 11 to 18m, within a small bight lying close SE of Punta Santo Tomas. This bight is sheltered from the prevailing wind and a river flows into its S part during the winter.

Punta San Jose (31°28'N., 116°36'W.) is located 7 miles SE of Punta Santo Tomas. A light is shown from a tower, 10m high, standing on this point.

Punta Colnett (30°58'N., 116°20'W.) is located 40 miles SE of Punta Santo Tomas. The coast between is backed by a succession of broken bluffs and sandy beaches with high mountain ranges rising inland. Most dangers lie within 1 mile of the shore. The point consists of a remarkable semicircular headland with perpendicular sides which rises to a high plateau. It is visible for a considerable distance from both the N and S and is very radar conspicuous. A light is shown from a metal tower, 11m high, standing on the point.

Anchorage, well-sheltered from the prevailing winds, can be taken, in depths of 11 to 17m, sand, within a bay lying close SE of the point, abreast a remarkable gorge. However, this anchorage is subject to heavy squalls which sweep down from the cliffs without warning.

Caution.—A detached shoal, with a depth of 5m, was reported (1991) to lie about 21 miles WSW of Punta Colnett.

2.10 Bahía de San Ramon (30°46'N., 116°04'W.) is exposed and lies between Punta Colnett and the coastal cliffs standing opposite Isla de San Martín, 32 miles SSE. The land extending along the shore of the bay is lower than that to the N of Punta Colnett. Between Punta Colnett and the mouth of the Arroyo Santo Domingo, 19 miles SSE, the coast consists of sandy hills and bluffs, with fields of kelp extending up to 4 miles offshore in places. A lagoon backs the mouth of the river. To the S of the mouth of the Arroyo Santo Domingo, the coast of the bay is low and is backed by a sandy plain which extends to the high land of the interior.

La Encantada (Montana Calamajue) (30°46'N., 115°21'W.), the highest mountain of Baja California, is whitish in appearance and rises 37 miles E of Bahía de San Ramon. Its summit is 3,086m high, has a jagged appearance, and is snow-capped during the winter and spring. This mountain has been reported to be visible on a clear day from a distance of over 100 miles seaward.

2.11 Isla San Martín (30°29'N., 116°07'W.), surrounded

by kelp, is almost circular in shape and formed of volcanic origin. Two prominent high peaks stand near the center of the island, with the southernmost being the main crater. A light is shown from a metal tower, 12m high, standing on the W extremity of the island.

Caleta Hassler, a small and sheltered cove, lies on the E side of the island and is formed by a sandspit. It provides shelter for small craft with local knowledge. The passage lying between the island and the mainland coast is deep and clear of dangers. Large vessels can anchor off the SE side of the island.

Roca Ben (30°26'N., 116°07'W.), a dangerous and steep-to rock, lies 2.5 miles S of Isla San Martin and occasionally breaks. A small shoal patch, with a depth of 11.9m, was reported (1929) to lie about 2 miles SW of this rock.

A dangerous rock was reported (1964) to lie in approximate position 6.5 miles S of Roca Ben. Breakers and discolored water were reported (1914) to occur in the vicinity of this rock.

2.12 Cabo San Quintin (30°21'N., 115°52'W.), the outer extremity of a long and narrow peninsula, forms the N entrance point of Bahía de San Quintin.

Bahía de San Quintin (30°18'N., 115°52'W.), entered S of Cabo San Quintin, is fringed by a low, sandy beach and backed by hills, up to 90m high. It is spacious and provides good shelter from the prevailing winds, but a long swell usually rolls in and makes the bay an uncomfortable anchorage. Vessels of moderate draft can anchor in the N part of this bay, outside of the bar at the entrance to Puerto San Quintin.

Puerto San Quintin, a large and shallow inlet, is entered between Punta Entrada, located 0.5 mile NNE of Cabo San Quintin, and Punta Azufre, 2 miles N. Punta Entrada is a low, rocky point; a light is shown from a pyramid, 6m high, standing in its vicinity. Punta Azufre is a low, sandy point and a light is shown from a framework tower, 10m high, standing on it. The entrance is encumbered by a bar and several shoals, which dry in places. A narrow and tortuous channel, which is marked by buoys and beacons, leads into the inlet, but local knowledge is required. The bar is reported to have a depth of 3m at HW. The city of San Quintin is situated along the E side of the inlet.

Five prominent peaks rise along the W side of the inlet. Cerro Kenton, the tallest, is 267m high. These peaks are reported to appear as islands from seaward.

2.13 Punta Baja (29°57'N., 115°49'W.), consisting of a sandy cliff, is located 27 miles SSE of Cabo San Quintin. It is 9m high, fronted by a kelp-covered reef, and forms the N entrance point of Bahía del Rosario. A light is shown from a metal pyramid, 8m high, standing on this point.

Bahía del Rosario, entered SE of the point, is backed by sandy bluffs and hills of moderate height. It is much encumbered by kelp and shallow water extends up to about 0.5 mile offshore. However, good anchorage can be taken by vessels with local knowledge, in a depth of 9m, sand, within the bay.

Picacho San Vicente rises 3 miles inland, E of the central part of this bay. This isolated peak is 461m high and very prominent. A conspicuous white spot has been observed on the hills, 4.5 miles ENE of Punta Baja.

A large field of kelp extends S from Bahía del Rosario toward Isla de San Jeronimo; numerous shallow patches lie within it. One such patch, with a depth of 5.5m, lies 4 miles SSE of

Punta Baja and the sea occasionally breaks over it. A lane of open water, about 1 mile wide, lies between the S end of the field and Isla San Jeronimo.

Isla San Jeronimo (Isla San Geronimo) (29°48'N., 115°48'W.), marked by a light and a racon, lies 9 miles SSE of Punta Baja. This island is 40m high, barren, and fringed by detached rocks. An above-water rock lies at the outer extremity of a reef, which extends about 0.4 mile SW from the island, and the sea breaks heavily over it.

Anchorage can be taken by vessels with local knowledge, in a depth of 13m, sand, off the E side of the island. The roadstead is sheltered from the prevailing wind, but an uncomfortable swell may be experienced at times. It is recommended that vessels approach the anchorage from the S of the island and depart to the N of it.

Arrecife Sacramento, an extensive steep-to reef, lies between 2.5 and 4.5 miles SSE of Isla San Jeronimo. Several awash and above-water rocks, on which the sea constantly breaks, lie on this reef.

A depth of 45m was reported (1981) to lie about 38 miles WSW of Isla San Jeronimo.

Punta San Antonio (29°45'N., 115°42'W.), a low and cliffy point, is located 13 miles SE of Punta Baja. Shoals, marked by kelp, extend up to about 0.8 mile W of this point.

2.14 Punta Canoas (29°26'N., 115°12'W.), formed by a sharp and perpendicular cliff, is located 33 miles SE of Punta San Antonio. The coast between consists of sand bluffs, 15 to 20m high. The point is 68m high and is backed by high hills. A rock, with a depth of 1.5m, was reported (1930) to lie about 0.3 mile SW of this point.

Punta San Carlos is located 20 miles NW of Punta Canoas. This point is fronted by a shoal area, with depths of 11 to 16m, which extends up to about 5 miles offshore and is marked by kelp.

Puerto de Santa Catarina (29°31'N., 115°16'W.), lying 7 miles NW of Punta Canoas, is an open roadstead from which locally mined ore is sometimes loaded from lighters. Vessels can anchor, in a depth of 9m, with good holding ground. The bottom consists of mud, sand, and boulders.

Pico Sombrero rises 2 miles inland, 6 miles NW of the roadstead. This peak is 560m high and forms an excellent landmark.

San Jose (29°16'N., 114°53'W.), near the mouth of a river, is situated 18 miles SE of Punta Canoas. A light is shown from a tower, 10m high, standing on the S side of the river entrance. Roca Acme, a rocky islet, lies about 0.3 mile off the river mouth. It is 6m high and surrounded by kelp. Sheltered anchorage can be found, in a depth of 11m, close S of this islet.

Between Punta Canoas and Punta Maria, 46 miles SE, the coast is backed by three distinctive ranges of mountains, with peaks up to 900m high.

Punta Blanca, a sandy bluff, is located 14 miles SE of San Jose and is fronted by several detached rocks which lie up to 0.5 mile offshore. A light is shown from a metal pyramid, 6m high, standing on this point.

Punta Maria (28°56'N., 114°33'W.), a low and rocky point, may be identified by a sand mound, 20m high, standing 0.5 mile N of it.

Punta Cono, a steep and double pointed headland, is located

4 miles NW of Punta Maria. A prominent red-colored hill, 51m high, rises close N of this point.

2.15 Bahia Sebastian Vizcaino (28°15'N., 114°38'W.), an extensive body of water with depths of over 90m in its central part, is entered between Punta Maria and the N end of Isla Cedros, 48 miles SW. With the exception of the fringing shoals, which lie within 5 miles of the shore, there are no off-lying dangers. The E shore of the bay is generally low, sandy, and marshy with high mountain ranges rising in the interior. Between Punta Maria and Morro Santo Domingo, 46 miles SSE, the shore is indented by several small, open inlets which are of little importance. Anchorage can be taken within some of these inlets, but a heavy swell is usually experienced.

Punta Negra, located 9.5 miles SE of Punta Maria, is a dark, rocky point from which the land rises steeply. A light is shown from a tower, 10m high, standing on this point.

Punta Santa Rosario, located 11 miles SE of Punta Negra, is the sharp outer extremity of a tableland that extends several miles inland. An islet lies 0.3 mile offshore, about 0.8 mile N of this point. A sandy spit, on which the sea breaks, connects the islet to the shore. A prominent building is reported to stand on the E side of this islet.

Morro Santo Domingo (Morro Laguna) (28°15'N., 114°07'W.), located 15 miles SSE of Punta Santa Rosario, is a dark-colored headland of volcanic origin. It is conspicuous and appears as an island when first seen from any distance. A light is shown from a tower, 10m high, standing on the point.

Puerto de Santo Domingo, a small bay, lies close SE of Morro Santo Domingo. Anchorage may be obtained, sheltered from the prevailing winds, in depths of 6 to 15m, sand, within the outer part of this bay.

The coast to the S and E of Morro Santo Domingo is indented by three large lagoons, Manuela Laguna, Estero de San Jose (Laguna del Guerrero Negro), and Laguna Ojo de Liebre (Scammon Lagoon). Only the latter lagoon has any commercial importance. Salt was previously shipped from a facility at a place called Puerto Venustiano Carranza within Estero de San Jose, but the operation has been transferred to a terminal situated on the SE side of Isla Cedros.

Laguna Ojo de Liebre (Scammon Lagoon) (27°54'N., 114°18'W.), the southernmost and by far the largest lagoon, is studded with low islets and numerous sandy bars. The outermost bar, over which the sea sometimes breaks heavily, lies 6.5 miles N of the entrance and is reported to have a depth of 7.3m, but is subject to continuous change. The channel leading over this bar is about 0.5 mile long, 0.3 mile wide, and marked by a buoy. Within the bar, depths of 6 to 16m lie within the main channel. It is reported that vessels with drafts of 5.5m have crossed the bar and entered the lagoon, but no attempt should be made to transit this area without local knowledge.

A detached shoal patch, with a depth of 3.6m lies about 5.5 miles offshore, 19 miles SW of Morro Santa Domingo.

2.16 Punta Eugenia (27°51'N., 115°05'W.), a dark and rocky projection, is fronted by reefs. A light is shown from a tower, 7m high, standing on this point. Monte Eugenio, a conspicuous hill, rises 6 miles SSE of the point and is 210m high.

Punta Falsa, a steep and rocky point, is located 1.5 miles NE of Punta Eugenia and a dangerous reef lies about 0.5 mile N of

it. A rock, awash, lies near the center of this reef and the sea breaks heavily over it.

Isla Natividad (27°52'N., 115°10'W.), fringed by rocks and kelp, lies 4 miles W of Punta Eugenia and is separated from it by Canal de Dewey. This island is barren and hilly with a peak, 150m high, rising near its center. A light is shown from a prominent tower, with a dwelling, standing in the N part. A group of buildings and a tall steel mast are situated at the SE end of the island, but are reported to be visible only from the S.



Isla Natividad Light

Roca Lowry, a rocky shoal, has a least depth of 2.3m and lies about 1.8 miles ESE of the S end of Isla Natividad. A shoal patch, with a depth of 10m, lies about 1.3 miles S of this rocky shoal. Another rocky shoal, with a depth of 7.6m, lies about 1.5 miles SW of the S end of the island. A dangerous wreck is reported to lie 0.8 mile offshore, about 1.8 miles NW of the S end of the island. A rock, with a depth of less than 1.8m, lies about 0.9 mile seaward of the middle of the W side of the island. Roca Maria, above-water, lies on a reef which extends 0.5 mile W from the NW end of the island.

Canal de Dewey (27°52'N., 115°07'W.), lying between Isla Natividad and Punta Eugenia, is 4 miles wide and can be safely navigated with caution. The W side of this passage should be avoided because of patches of foul ground and irregular depths. A clear passage, about 1 mile wide, lies at the E side of the passage, 1.5 miles offshore. This passage is mostly used by coasters and its sides are usually marked by kelp. A strong current is reported to set through this channel during springs.

2.17 Canal de Keller (Canal Kellett) (27°58'N., 115°13'W.) leads between the N end of Isla Natividad and Isla Cedros. This passage is 8 miles wide and deep. It is clear of dangers, but a bank, with depths of less than 18.3m, extends up to about 2.5 miles S from the S end of Isla Cedros. A shoal patch, with a depth of 9.1m, lies near the S edge of this kelp-covered bank, about 5.3 miles N of the N end of Isla Natividad. Vessels using this passage are advised to favor the S side.

Isla Cedros (28°11'N., 115°13'W.) is formed of volcanic origin and consists of a series of high and irregular peaks. This island is mostly barren in its S part, but is wooded in its N part. Cerro de Cedros, the summit of the island, is 1,204m high and rises in its S part. In clear weather, the island has been reported visible from a distance of 60 miles.

The crests and W slopes of the peaks rising in the N part of the island are covered with cedar and pine trees, some of which attain heights of 18 to 21m.

Punta Morro Redondo (28°03'N., 115°11'W.), the SE extremity of the island, is formed by a rocky cliff, 9m high, and

fronted by rocks, which extend up to 0.6 mile S from it. A light is shown from a metal tower, 8m high, standing on a hill that surmounts the point.



Punta Morro Light

Between Puerto Morro Redondo and the N end of the island, the E coast is generally steep-to, free of kelp, and rises abruptly inland to high peaks. A light is shown from a tower, 6m high, standing on Punta Norte, the NE extremity of the island. Good and sheltered anchorage can be taken by vessels with local knowledge close SE of a point lying 3 miles SSE of the light.

Anchorage, sheltered from the prevailing winds, can be taken by vessels with local knowledge, in a depth of 13m, within Bahía del Sudeste, which lies close W of Punta Morro Redondo.

Caution.—A local magnetic anomaly, which increased the variation by 24°, was reported to exist along the E side of the island, about 2.7 miles N of Puerto Morro Redondo.

2.18 Puerto Morro Redondo (28°03'N., 115°08'W.) (World Port Index No. 15975), a salt loading terminal, lies 1 mile N of Punta Morro Redondo.

Depths—Limitations.—The main loading facility consists of a T-head pier and several mooring buoys. The berth at the head of the pier is formed by several steel dolphins and wood facings. The main berthing face of the pier is 209m long and has a depth of 16.4m alongside. A fixed loader stands at the center of the pier and vessels must be shifted along the berth in order to fill the various hatches. A second berth projects from the N side of the base of the pier and is capable of handling vessels as large as 6,500 dwt. Close NW of the T-head pier is another pier with two berths for vessels up to 6,500 dwt and depths of 6.1m to 12.2m alongside.

Aspect.—The terminal is well illuminated at night. A conspicuous salt stock pile stands near the root of the pier.

The E coast of Isla Cedros is steep-to and free from kelp. At the N end of the island, the detached rocks are not as numerous or as far offshore as on the W side of the island.

Pilotage.—Pilotage is compulsory for all vessels and is available at any time. Pilots will board 1 mile E of the pier.

Pilots and the port can be contacted as follows:

1. VHF: VHF channels 12 and 16
2. Telephone: 521-616-1585399
3. Facsimile: 521-616-1585390

Anchorage.—Anchorage can be taken by vessels awaiting a berth, in a depth of 37m, mud, about 0.7 mile NE of the pier head. Good holding ground will also be found, in depths of 35 to 64m, lying 1 to 3 miles N of the berth, with the loading tower in line with Morro Redondo Light.

Caution.—Deep-draft vessels should avoid using Canal de Keller and approach the terminal from the N.

Numerous small boats will need to be avoided by vessels maneuvering in and out of the port.

2.19 Cabo San Augustin (28°05'N., 115°22'W.), the SW extremity of Isla Cedros, rises abruptly inland to Cerro San Augustin, a prominent peak, 241m high. A reef, on which the sea breaks in heavy weather, extends 1 mile SW from the cape and kelp usually extends up to 1 mile SW from it. A conspicuous reddish-colored above-water rock lies in the vicinity of a reef about 1 mile offshore, 3 miles N of the cape.

Bahía del Sur (South Bay), entered close SE of the cape, provides good anchorage, in depths of 11 to 27m, to vessels with local knowledge. However, numerous rocks and kelp fields lie off the NW and SE shores of the bay and must be avoided.

The W coast of Isla Cedros is mostly formed by lines of steep cliffs. A heavy surf usually breaks along this side of the island and numerous kelp fields front the shore.

2.20 Islas San Benito (28°19'N., 115°34'W.), consisting of three barren islands, lies 15 miles NW of Isla Cedros and is surrounded by rocks and patches of kelp.

Benito del Oeste is the westernmost and largest island of the group. It is 202m high and appears as a plateau with a mound rising near the center. A light is shown from a tower, 213m high, standing in the S part of this island. A light is shown from a prominent tower with a dwelling, 130m high, standing near the NW extremity of the island. A racon is situated at this light.

Rocas Pinaculo, two steep-to rocks, lie 1 mile W of Benito del Oeste. Benito del Centro and Benito del Este, the other two islands, lie close E of Benito del Oeste and are separated by Canal de Peck. This latter passage is narrow and deep, but should be used only by vessels with local knowledge. Benito del Este can be distinguished by four well-defined hills. Benito del Centro is low and flat with a hill, 25m high, rising near its E end.

Caution.—Depths considerably less than charted are reported to exist in an area lying 1 mile E of Benito del Este.

Breakers and depths of 16 to 31m, which may best be seen on the chart, have been reported to exist within 11 miles of Islas San Benito.

Islas San Benito to Cabo San Lazero

2.21 Punta Rompiente (27°44'N., 115°00'W.), a steep and rocky headland, is located 8.8 miles SSE of Punta San Eugenio. A conspicuous mountain, 303m high, rises 3.8 miles NE of this point. This mountain shows two distinct peaks when viewed from the S and three distinct peaks when viewed from the W or N.

A shoal, with a depth of 7.3m, lies about 1.5 miles WNW of this point.

Anchorage, sheltered from the prevailing wind, can be obtained in the bay E of Punta Rompiente.

Bahia Tortugas (27°40'N., 114°53'W.), a nearly circular and well-sheltered bay, forms an excellent harbor of refuge. It is entered between Punta Kelp, located 6 miles SE of Punta Rompiente, and Cabo Tortolo, 1.8 miles SE. The entrance channel, which is about 0.8 mile wide, leads between several dangers extending from the entrance points. It is encumbered by numerous shoals and should not be transited without local knowledge.

Monte Bartolome, 265m high, is prominent and rises close N of Punta Kelp, the N entrance point. A light is shown from a framework tower, 10m high, standing on the E side of this latter point.

Foul ground, with numerous rocky patches, exists NW of the N entrance. Mariners should use caution when transiting this area.

Cabo Tortolo, the S entrance point, is the low, rocky NW extremity of a high and narrow promontory. Several rocks, some above-water, lie on a reef, over which the sea breaks heavily, that extends 1 mile NNW from the cape. Roca Azufre, the outermost prominent rock, lies 0.6 mile NNW of the cape. This rock has two dark projecting horns that contrast markedly with its overall light color. A light is shown from a tower, 10m high, standing on Roca Atano which lies close SSE of Roca Azufre.

Anchorage can be taken anywhere within the entrance, but the N part of the bay is somewhat exposed to the ocean swell. The best anchorage lies, in a depth of 11m, on the E side of the reef extending from Cabo Tortolo, which acts as a natural breakwater.

A pier, 45m long, fronts a settlement, Puerto San Bartolome at the NW side of the bay and has depths of 3 to 3.7m alongside its outer end. Several factory buildings and a conspicuous chimney stand in the vicinity of this pier.

2.22 Punta San Pablo (27°13'N., 114°29'W.), a dark and slate-colored bluff, is located 34 miles SE of Cabo Tortolo. The intervening coast is indented by Bahia de Thurloe and Bahia de San Cristobal. Both of these bays are exposed and have no commercial importance. Punta San Pablo is closely backed by a prominent hill and fronted by a reef, which extends up to about 0.5 mile S. A detached shoal, with a depth of 18.3m, lies about 12 miles NW of this point.

Caution.—It was reported (1986) that an obstruction, with a depth of 16.4m, lies about 16.5 miles NW of Punta San Pablo. Air bubbles have also been reported in this vicinity.

It was reported (1953) that a shoal, with a depth of 16.4m, lies about 23 miles WNW of Punta San Pablo.

Depths, which are considerably less than those charted, and areas of discolored water have been reported to lie up to 15

miles seaward of Bahia de San Cristobal.

2.23 Punta San Roque (27°09'N., 114°22'W.), 15m high, is located 3.7 miles SE of Punta San Pablo. This point is formed by a light-colored bluff which is fronted by foul ground and backed by a hill.

Vessels with local knowledge can anchor, in depths of 18 to 27m, within Bahia San Pablo which is free of dangers and is entered between Punta San Pablo and Punta San Roque.

Isla San Roque (27°09'N., 114°22'W.), a rugged island, lies 1.8 miles offshore, 3 miles SE of Punta San Roque. The passage leading between this island and the coast is foul and should not be attempted. A light is shown from a framework tower, 11m high, standing on the W side of this island.

A current, which sets E and attains a rate of 4 to 5 knots, has been reported to occur off Isla San Roque.

Punta Asuncion (27°08'N., 114°18'W.), located 7.5 miles SE of Punta San Roque, is a low, narrow, and sandy point with a conical mound, 20m high, rising at its outer end.

Isla Asuncion (27°06'N., 114°17'W.), a barren island, is located 1 mile S of the point and is connected to it by a shallow bank on which several above-water rocks lie. The island is surrounded by detached rocks and kelp. The sea breaks heavily over the shallow bank and the rocks lying in the vicinity of the point.

A light is shown from the island on a tower, 9m high.

A detached shoal, with a depth of 10.9m, lies about 3 miles SE of Isla Asuncion.

2.24 Punta San Hipolito (26°58'N., 114°00'W.), located 13 miles ESE of Punta Asuncion, is a low rocky point backed by barren hills, 15 to 30m high. The sea breaks over a reef, which extends up to about 0.5 mile S from this point. A light is shown from a tower, 10m high, standing on the point.

Table Mountain, 410m high, rises 6 miles N of the point. It has a distinctive flat top and is very conspicuous.

Anchorage can be taken, in a depth of 9m, about 0.5 mile from the shore of Bahia San Hipolito which is entered close E of Punta San Hipolito.

A rocky shoal, with a depth of 6.4m, lies about 1.5 miles offshore, 4 miles NW of Punta San Hipolito.

Punta Abrejos (26°42'N., 113°34'W.), low and sandy, lies 28 miles ESE of Punta San Hipolito. A detached hill, 95m high, rises 3 miles N of the point and is very conspicuous from seaward. A light is shown from a conspicuous pyramidal tower with a dwelling, 20m high, standing 2.5 miles N of the point. Another light is shown from a metal framework tower, 6m high, standing 1.5 miles ENE of the point. A light is also shown from a metal tower standing on the reef which extends up to 0.5 mile S from the point.

Roca Ballen, over which the sea breaks heavily, lies about 2 mile offshore, 4 miles W of the point. Bajos Wright, consisting of several rocks, lies centered 1 mile SSE of the point.

Caution.—Due to the numerous rocks and shoals lying within 1.5 miles S and 5.5 miles WSW of Punta Abrejos, vessels should give this point a wide berth.

2.25 Bahia de Ballenas (26°44'N., 113°24'W.), an open bay with regular depths shoaling gradually to its head, is entered between Punta Abrejos and Punta Malcomb (Punta Hol-

combe), 16 miles E. The shores of the bay are extremely low and sandy, except for a few bluffs at the W side. In winter, this bay is frequented by whales.

Laguna La Escondido, which is accessible only by small craft, lies near the head of the bay and its entrance is fronted by a shallow bank.

Laguna San Ignacio, a large and shallow body of water, is entered at the E side of the bay and extends 16 miles N. Extensive shoals, which partly dry, extend from the entrance points and form a bar about 1.8 miles SW of Punta Malcomb. This bar, which is about 0.4 mile wide, has a depth of 5.7m and the channel leading through it is plainly marked by breakers. Close within the bar, the depths increase, but the channel narrows. Above the entrance, only a tortuous and shallow channel leads to the head of the lagoon.

In good weather, anchorage can be taken, in a depth of 9m, outside the entrance of the lagoon, about 2.5 miles W of Punta Malcomb, but local knowledge is advised.

Caution.—Vessels should not attempt to cross the bar, which is subject to frequent and sudden changes, without local knowledge. It was reported (1982) that depths within the channel were less than charted.

2.26 Punta Santo Domingo (26°19'N., 112°40'W.), located 40 miles SE of Punta Malcomb, consists of a conspicuous dark cliff. This cliff is 52m high, vertical, and is backed by a tableland, 120m high. Monte Thetis, a very conspicuous peak, is 1,776m high and rises 35 miles NNE of the point. Its S slope is very abrupt and forms a gap in the mountain range.

Punta San Juanico (26°02'N., 112°17'W.), 15m high, is located 26 miles SE of Punta Santo Domingo. The coast between is characterized by steep-to bold cliffs rising inland to high mountain ranges.

Bahia San Juanito, a small indentation, lies about midway between these points and provides very good anchorage, sheltered from the prevailing winds. Punta Pequena, the W entrance point, is rocky, 8m high, and rises close inland to a hill, 18m high. A light is shown from a framework tower, 8m high, standing on this point. Vessels with local knowledge can anchor, in depths up to 9m, to the NE of the light. A settlement stands along the N side of the indentation.

Laguna San Juanico lies close E of Punta San Juanico and its entrance is fronted by a narrow and very shallow bar.

Uncle Sam Bank (25°37'N., 113°23'W.), with a least depth of 66m, lies about 64 miles SW of Punta San Juanico.

Caution.—When approaching from the S, vessels should not confuse Punta Pequena with Punta San Juanico, which are very similar in appearance.

Several shoals, with depths of 14.6 to 28m, have been reported (1939 to 2012) to lie within about 15 miles NE of Uncle Sam Bank and may best be seen on the chart. Another group of shoals, with depths of 20 to 29m, have been reported (1942 and 1985) to lie about 35 miles NE of Uncle Sam Bank. The M/V Sapphire Princess has reported (2012) a new shoal area of 43m located about 20 miles NNE of Uncle Sam Bank as well as another shoal area of 37m located N of the same bank.

2.27 The coast extending between Punta San Juanico and Cabo San Lazaro, 77 miles S, is backed inland by high mountain ranges in the N part and rolling plains in the S part.

Boca de San Andreceta lies 16.5 miles SSE of Punta San Juanico; a light is shown from the vicinity of its entrance.

Boca de las Animas, lying 25 miles SSE of Punta San Juanico, is the northernmost of three entrances leading into a series of interconnected lagoons. A light is shown from a structure standing 4.5 miles S of this entrance. The lagoons extend S to Bahia Magdalena and lie nearly parallel with the coast. They are separated from the sea by narrow strips of sand. The entrances are fronted by shallow bars and are available only to small craft with local knowledge.

Boca de Soledad, the southernmost and deepest of the three entrances, lies 24 miles S of Boca de las Animas and is marked on either side by a ridge of sandy hills, 15 to 30m high. A frequently changing shoal, over which the sea breaks, extends about 3 miles seaward from the N side of this entrance.

Lights are shown from structures standing in the vicinity of the entrance and about 5 miles S of the entrance.

Winds—Weather.—Between Boca de las Animas and Bahia Magdalena, a complete change in the weather appears to occur. During the fall and early winter months, fogs are frequently formed over the lagoons and the bay. They are blown seaward by the E wind in the early morning, but are driven back over the land when the sea breeze arises, generally lifting about noon. Warm weather and light SW and NW winds, which are accompanied by remarkable smooth seas, generally prevail during these months.

2.28 Cabo San Lazaro (24°48'N., 112°19'W.), located 30 miles SSW of Boca de Soledad, is the NW extremity of a conspicuous headland. This cape, which is faced by rocky cliffs, often appears as an island when first sighted. Monte San Lazaro, the summit of the headland, is 390m high and stands close SE of the cape. A light is shown from a tower with a dwelling, 7m high, standing on the cape. A racon is situated at the light.

A stranded wreck lies 3.8 miles NNE of the cape and has been reported to be radar conspicuous.

The currents off the cape set mainly SE and attain rates of up to 1.5 knots.

Caution.—**Thetis Bank** (24°56'N., 112°36'W.), with a depth of 34m, lies about 18 miles WNW of Cabo San Lazaro. The bottom in this vicinity is very uneven with many jagged rocks and less depths than charted may exist. A depth of 11.9m was reported (1923) to lie on this bank. A depth of 11m was reported (1992) to lie about

A shoal, with a depth of 18.3m, was reported (1964) to lie about 12 miles NW of Thetis Bank.

2.29 Petrel Bank (24°38'N., 112°47'W.) lies 21 miles SSW of Thetis Bank and is composed of fine, gray sand. This bank has depths of 18 and 73m, but it has not been thoroughly examined and may extend to the SE.

Isolated depths of 10.9m were reported to lie (1955) about 15.5 miles W and (1972) about 14.5 miles WSW, respectively, of Cabo San Lazaro.

A depth of 55m was reported (1983) to lie about 8.5 miles W of Cabo San Lazaro.

Cabo San Lazaro to Cabo Falso

2.30 Bahia Santa Maria (24°44'N., 112°13'W.), a cres-

cent-shaped indentation, is entered between Punta Hughes, located 3 miles SE of Cabo San Lazaro, and Cabo Corso (Cabo Dorso), 8 miles SE. A light is shown SE of Cabo Corso in position 24°38'29"N., 112°09'20"W.

The shores of this indentation are backed by low, sandy ridges and dunes. Anchorage, protected from the prevailing wind, can be taken, in depths of 9 to 14m, sand, between 0.5 and 0.8 mile from the shore, in the NW part. A stranded wreck was reported (1975) to lie about 1.5 miles NE of Punta Hughes.

Bahia Magdalena (24°32'N., 112°02'W.), an extensive body of water, is entered between Punta Entrada, located 9 miles SE of Cabo Corso, and Punta Redonda, 2.5 miles SE. A navigable channel connects the SE part of this bay with Bahia Almejas. A series of lagoons, which can be entered from the NW part of this bay, extends up to about 60 miles N. The N and E shores of the bay are low, barren, and fringed by shoals which extend up to 2 miles seaward in places. The entrances of the lagoons in the NW part are encumbered by extensive shoals and sand bars through which several channels, with depths of 4 to 15m, lead.

The W side of the bay is protected by a high and narrow peninsula which is connected at its N end by a low neck to the mainland. The S side of the bay is protected by Isla Santa Margarita, of which Punta Redonda is the NW extremity.

A deep and clear passage, about 2 miles wide, leads into the bay and passes between the reefs extending from both entrance points. A rock, which uncovers at low water, exists S of Punta Delgada, in the vicinity of position 24°40'N, 112°07'W.

2.31 Punta Entrada (24°32'N., 112°04'W.), the NW entrance point of the bay, is fringed by reefs, on which the sea breaks, and surmounted by a dome-shaped hill, 61m high. Roca Vela (Sail Rock), a prominent above-water pinnacle rock, stands close SE of the point.

Monte Isabel, 360m high, rises 3.3 miles NW of Punta Entrada, and is very conspicuous from seaward.

A dangerous wreck lies in an approximate position about 6.8 miles NE of Punta Entrada.

Punta Redonda (24°31'N., 112°01'W.), the SE entrance point of the bay, consists of a rocky headland, 30m high, above which the land rises steeply to a height of 300m. A reef, on which the sea breaks heavily, extends about 0.8 mile W from this headland and a rock, awash, lies at its outer end. A light is shown from a pyramid tower, 5m high, standing on the point. It is reported that this light structure is difficult to identify when approaching from the N, but is easily distinguished from the S.

White Bluff, a conspicuous white cliff, is located 5 miles SE of the point and is 60m high.

Tides—Currents.—The tidal currents in the entrance of Bahia Magdalena attain rates of 1 to 2 knots and cause tide rips. The general direction of the tidal currents in the W part of the bay is NNW or SSE. In Man of War Cove, the general direction of the tidal currents is N and S. In the E part of the bay, the flood current usually sets more to the W and the ebb current more to the S.

Anchorage.—Anchorage can be taken almost anywhere within Bahia Magdalena in suitable depths. The best anchorage for all seasons is in a depth of 16m about 0.5 mile E of the pier at Puerto Magdalena. Vessels may also anchor farther offshore, in a depth of 24m.

During the winter, with a S wind, which is not often the case, good anchorage can be obtained in the S part of the bay and leeward of Isla Santa Margarita.

2.32 Man of War Cove (Caleta del Acorazado) (24°38'N., 112°07'W.), a small indentation, is entered on the W side of Bahia Magdalena and N of Punta Entrada. It has ample depths in the S and central parts, but is encumbered by shoals, with depths of less than 5m, in the N and W parts.

Puerto Magdalena, a small fishing village, is situated at the head of this indentation and is of no commercial significance. A pier, 18m long, fronts the village and has a depth of 2.4m alongside. It was reported (1995) that this pier is in poor condition.

Puerto de San Carlos (24°47'N., 112°07'W.), a small grain-loading facility, also handles imports of fish as well as chemicals for use in the production of fertilizer. San Carlos is situated on the NW side of Bahia Magdalena and can also accommodate cruise vessels.

Tides—Currents.—Tides rise about 1.7m at springs and 0.5m at neaps. Tidal currents can reach a maximum of 3 knots in the entrance channel.

Depths—Limitations.—San Carlos is approached from the S passing between Punta Redonda and Punta Entrada and then through an entrance channel commencing about 6.5 miles N. Care should be taken to remain close to the middle of the opening between Punta Redonda and Punta Entrada as there are numerous shoals extending up to 0.5 mile seaward of both points.

The entrance channel is marked by buoys, 180m wide, and 12 miles long, with least depth of 9.14m. The buoys marking the entrance channel may be moved to align with changes in the channel depths.

The berthing facilities consist of a L-shaped multipurpose international pier, 102m long and 13m wide, with depths alongside of 12.1m. Dolphins at both ends of the pier extend the length to 204m. Cruise ships can also be handled at the pier. A concrete quay, 280m in length, with depths alongside of 10.5m, serves as a tanker berth for the electrical supplier of the region, the Federal Commission of Electricity. Tankers up to 200m in length with a maximum draft of 10.66m can be accommodated at the quay.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt but is available only during daylight hours. Pilots will board off the S entrance to the entrance channel, about 6.5 miles NNW of Punta Entrada, which is marked by a lighted buoy.

Regulations.—The vessel's ETA should be sent 72 hours, 48 hours, 24 hours, and 12 hours before arrival during office hours. All ETA messages should include the following:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

San Carlos—Contact Information	
Pilots	
Telephone	521-612-1222160
E-mail	capbuelna@hotmail.com

San Carlos—Contact Information	
Port Authority (handled through La Paz)	
Telephone	521-612-1227777
Facsimile	521-612-1227778
E-mail	apibcs@prodigy.net.mx
Harbormaster	
VHF	VHF channel 16
Telephone	521-612-1360198

Contact Information.—See the accompanying table titled **San Carlos—Contact Information**.

2.33 Canal de la Gaviota (Marcy Channel) (24°30'N., 111°49'W.) is the narrow and deep passage which connects the SE part of Bahía Magdalena with the NW part of Bahía Almejas. The fairway is indicated by lighted ranges and has a depth of 22m. During the ebb current, the shoal banks lying along the sides of the passage are clearly marked by heavy breakers, even though the sea is smooth and the swell barely perceptible.

Bahía Almejas (24°28'N., 111°42'W.) is a large, enclosed body of water which is protected on its seaward side by Isla Santa Margarita. The mainland shore is mostly low and barren. The bay is deep in its central part, but extensive shoals lie in its N, E, and SE parts.

Canal de Rehusa (Rehusa Channel), mostly encumbered by shoals, leads into the bay from the S and is entered close E of the SE end of Isla Santa Margarita. The currents setting through this channel are very strong. They cause tide rips and render navigation unsuitable for anything but small boats.

2.34 Isla Santa Margarita (24°27'N., 111°50'W.) is high at both ends, but low in the middle. From a distance, the low part of this island appears as an opening which has sometimes been mistaken for the entrance to Bahía Magdalena.

Monte Santa Margarita, 566m high, forms the summit of the island and rises in the SE part. Las Hermanas (The Sisters), two high and prominent peaks, stand 7 miles NW of the S extremity of the island.

Puerto Alcatraz, a fishing village, is situated in the S part of a small cove lying on the S side of Punta Cisne, the NE extremity of the island. A pier, 90 to 120m long, fronts a canning factory at the village and has depths of 3 to 9.4m alongside.

Puerto Cortes, a small Mexican naval base, is situated 2 miles SE of Puerto Alcatraz. A main pier, 290m long, extends from the shore and has depths of 5.7 to 9.4m alongside its outer end. There are also facilities for small craft. Anchorage, with good protection from SE winds, can be taken off the base in convenient depths over a bottom of sand with good holding ground.

Punta Tosca (Cabo Tosca) (24°18'N., 111°43'W.), the SE extremity of Isla Santa Margarita, is a bold, rocky, and prominent point. A reef, on which the sea breaks with great force, extends about 0.5 mile S from this point. A light is shown from a tower with a dwelling, 12m high, standing on the point.

Caution.—An obstruction was reported (1941) to lie about 1.5 miles S of Punta Tosca.

A shoal, with a depth of 14.6m, was reported (1979) to lie about 23 miles SW of Punta Tosca.

A shoal, with a depth of 5.8m, was reported (1952) to lie about 20 miles SE of Punta Tosca.

Several unconfirmed shoal depths of 10 to 27.5m were reported (1960) to exist in the vicinity of a position lying 30 miles SSE of Punta Tosca.

Several unconfirmed shoal depths, of which the least was 10m, were reported (1969) to exist in the vicinity of a position lying 13 miles S of Punta Tosca.

2.35 Punta Marquez (23°57'N., 110°52'W.), a low and rocky point, is located 50 miles ESE of Punta Tosca; sandy bluffs rise on each side of it. Isolated plateaus, 150 to 180m high, stand between 7 and 11 miles E of this point. A light is shown from a metal tower, 12m high, standing on the point.

The mouth of Arroyo Conejo, marked by a light, lies 10.5 miles NW of Punta Marquez.

Punta Lobos (23°25'N., 110°14'W.) is the NW extremity of Los Lobos, a high, rocky, and wide promontory. During moderate weather, anchorage can be taken, in depths of 13 to 18m, sand, about 0.3 mile offshore, 0.5 mile N of the point.

Todos Santos Light is shown from a tower, 10m high, standing in the vicinity of a town, 2 miles NNW of Punta Lobos.

The coast extending between Punta Tosca and Punta Lobos is mostly low, sandy, and barren, with few distinguishing features. Inland, the terrain rises gradually to moderately-high hills in the N part, but shifts abruptly to sharp and clearly defined mountain ranges in the S part.

Cerro el Picacho and Cerro la Aguja, the summits of the Sierra de la Laguna range, rise 15 miles NE of Punta Lobos and are 1,960 and 1,983m high, respectively. Both of these peaks are conspicuous and appear as two steep-faced cliffs from the SW.

Sierra de San Lazaro, a very conspicuous peak, stands 28 miles SE of Punta Lobos and is 1,558m high.



Cabo Falso

2.36 Punta Gasparino (23°16'N., 110°09'W.), formed by a rocky bluff, is located 10 miles SSE of Punta Lobos. This point is 23m high and is fronted by numerous rocks. Palmar, a small settlement, stands within a large grove of palm trees close N of the point and 1.5 miles inland.

Punta de la Tinaja (23°06'N., 110°07'W.), located 9 miles S of Punta Gasparino, is a rocky bluff, 22m high, which is closely backed by a steep hill, 165m high.

Punta San Cristobal (22°56'N., 110°04'W.), a bold bluff, is located 10.8 miles SSE of Punta de la Tinaja and is 60 to 90m high. The coast between Punta de la Tinaja and this point is bold and steep-to. To the S of the point, the terrain consists of a sandy beach backed by white bluffs.

2.37 Cabo Falso (22°52'N., 109°58'W.), the southernmost extremity of Baja California, is located 17 miles SE of Punta de la Tinaja. It is fringed by rocks and consists of a steep-to bluff, 15m high. Cerro Las Tetas (The Paps), a conical hill with a double summit, rises close N of the cape. This hill is 212m high; a conspicuous sand slide stands close E of it. A light is shown from a tower, 6m high, standing on Las Tetas. A racon

is situated at the light.

A disused light tower stands 0.5 mile from the light.

Caution.—Banco San Jaime, with a least depth of 9.1m (reported 1948), lies centered 19 miles W of Cabo Falso.

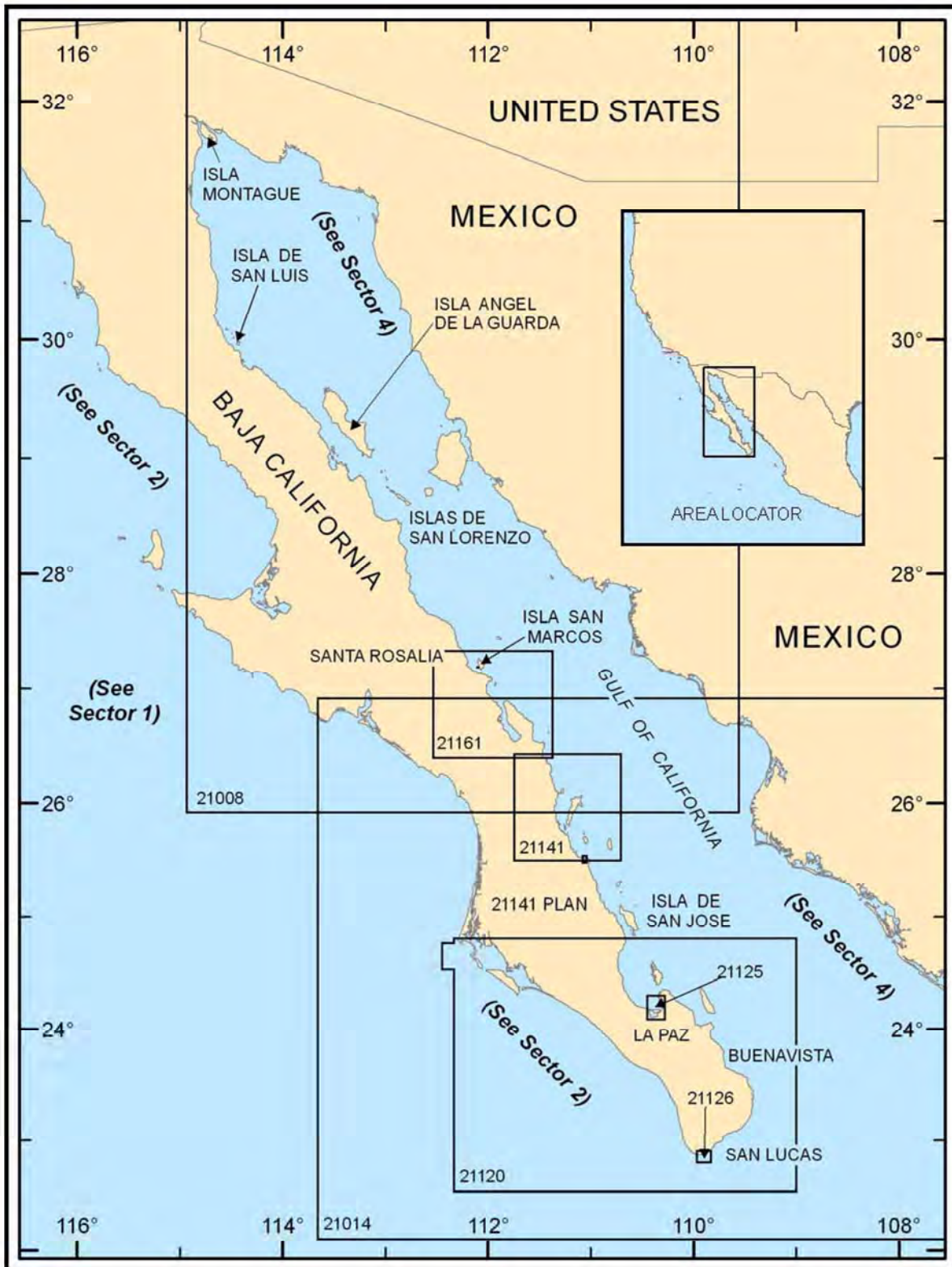
Banco Golden Gate, with a least depth of 11m (reported 1992), lies centered 20 miles NW of Cabo Falso.

Banco Morgan, with a least depth of 8m (reported 1985), lies centered 48 miles W of Punta Lobos. A shoal area, with a least depth of 5.5m (reported 1985), lies centered 10 miles E of this bank.

Banco Lusitania, with a least depth of 7.3m (reported 1968), lies centered 35 miles WNW of Banco Morgan.

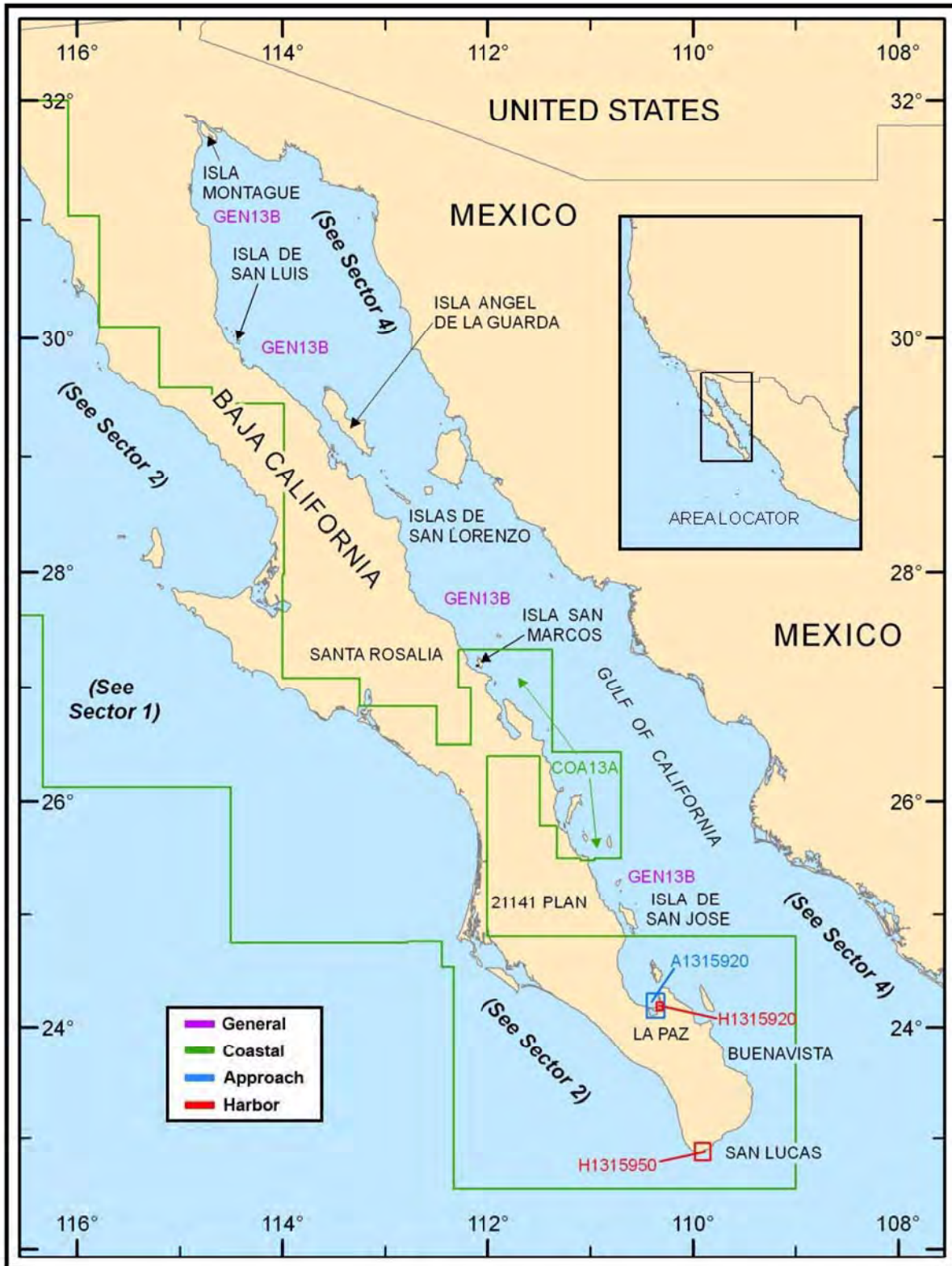
In an area, 20 to 35 miles wide, extending between a position lying about 20 miles WSW of Cabo Falso and a position lying about 40 miles SW of Punta Tosca, there are many banks and dangerous shoal patches, with depths as shallow as 6m, which rise steeply from deep water.

This area must be navigated with extreme caution as many other shoals may exist which are not yet charted. The positions of the various reported banks and shoal patches may best be seen on the chart.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 3 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 13 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 3 — DNC LIBRARY INFORMATION

SECTOR 3

MEXICO—EAST COAST OF BAJA CALIFORNIA

Plan.—This sector describes the E coast of Baja California with adjacent islands, from Cabo Falso to the Rio Colorado. The descriptive sequence is NW.

General Remarks

3.1 Winds—Weather.—During the greater part of the year, the weather along this coast is fair and pleasant, the heat of the day in the summer months being made tolerable by the cool nights. The scarcity of rain is compensated by, in some degree, frequent heavy dews. During the winter months, the NW winds pass over the snow-covered peaks and considerably reduce the temperature in the N part of the gulf.

The year is divided into a dry and a rainy season, but the change from one season to the other occurs at varying times. During the dry season, the weather is always fine, the winds blowing in the daytime regularly from between NW and W. At night, these winds are replaced by a light breeze from off the land or a calm. Although the rainy season is said to last from May to November, in reality very little rain falls during this period in Lower California and the land is mostly dry and hot. The rains, except in the S part of the peninsula, occur mostly in the winter months. Summer rains are almost unknown to the N of Isla del Carmen.

Between November and May, the prevailing winds in the gulf are NW. The winds during the remainder of the year are mostly SE. Moderate NW gales, lasting 2 to 3 days, are frequent in the upper part of the gulf during December, January, and February. In the lower part of the gulf, SE gales may be expected during the rainy season, May to November.

A local hurricane, known as El Cordonazo, blows with great violence in the gulf, but there is normally an interval of several years between these storms. The hurricanes occur near the end of the rainy season and are always from between SE and SW. They are of short duration, but have tremendous force and are accompanied by lightning.

Tides—Currents.—In the middle of the gulf, the current normally sets SE, but it is weak and is greatly influenced by the tides. Between Cabo Falso and Isla de la Toruga, the currents are very erratic and dangerous, especially off Isla de la Carmen where there is an inshore set of more than 1 knot. Between Isla de la Toruga and Santa Rosalia, the currents are variable, but attain rates of up to 3 knots at times.

Off Cabo San Lucas, a strong W set may be experienced. Along the shores of the gulf, the rates and directions of the tidal currents depend greatly on the prevailing winds. Towards the head of the gulf, the tidal currents increase in strength and may attain rates of 5 to 6 knots off the mouth of the Rio Colorado.

The tidal range, while being practically normal at the entrance to the gulf, increases rapidly N of 29°N. This is especially true within the channels lying between the islands and the mainland. At the N end of the gulf, the tidal range, which is affected by the seasons and the discharge from the Rio Colo-

rado, varies between 3.6 and 9.1m. At times, this tidal range causes rocks, reefs, and other dangers to be concealed. Unlike the ocean, there is no swell and usually no sea which would mark these hidden dangers by breakers.

Bioluminescence within the gulf usually appears as large glowing patches. The masses of dinoflagellates causing this curious phenomenon, when viewed in daylight, appear as patches of red-colored water. This bioluminescence mostly occurs during spring and autumn, but can be seen throughout the whole year.

Caution.—The yellow-colored sea snake (*Pelamis*) has been reported to exist in the coastal waters, especially the river mouths, of the gulf. These snakes can inject extremely potent venom when they bite.

Cabo Falso to Bahia de La Paz

3.2 Cabo Falso (22°52'N., 109°58'W.), the southernmost extremity of Baja California, is marked by a light, which is equipped with a racon, and is fully described in paragraph 2.37.

Cabo San Lucas (22°52'N., 109°53'W.), the outer extremity of a rocky peninsula, is located 4 miles E of Cabo Falso and fronted by two prominent detached rocks. The W rock is 89m high, rounded, and pierced at sea level. The E rock is 68m high and has perpendicular sides. Several other rocks, up to 37m high, fringe the cape.

Bahia San Lucas (22°53'N., 109°53'W.), lying N of Cabo San Lucas, provides good anchorage during NW winds, but is unsafe from July to September when strong SE winds are frequent. The best anchorage is in depths of 11 to 22m, mud and sand, within the NW part of the bay, but care is necessary as the edge of the bank is very steep.

The spring tidal rise is 1.5m.

At the head of the bay is the town of San Lucas, an international resort and major port-of-call for cruise vessels. The town is better known as Cabo San Lucas on numerous brochures and cruise ship schedules. San Lucas is fronted by a small harbor protected by two small breakwaters. The entrance is marked by a lighted range and can be entered without the use of a pilot. It is reported that the front range structure is partially obscured by a hotel.

San Lucas harbor can accommodate berthing for up to six tenders and has quays for additional berthing on the S and W sides. Cruise ships anchor outside the harbor entrance and ferry passengers to and from the terminal via tenders. Three private marinas within the harbor accommodate many fishing vessels, yachts, and sail boats.

Depths within the harbor range from 0.6 to 7.0m. However it was reported (2011) that the harbor can only accommodate vessels with maximum drafts of 6m.

Anchorage.—Four designated anchorages, located outside the harbor ENE of the N breakwater, are used mostly for cruise ships. These anchorage areas are all in sand and numbered



San Lucas—Approach



Aerial view of San Lucas Harbor and the head of Bahia San Lucas

from 1 through 4 with Area No. 1 being the closest (about 0.7 mile) to the marina and Area No. 4 being the farthest away from the marina (about 1.7 miles). The areas are centered on the following positions:

1. Area No. 1— $22^{\circ}53'04.03''\text{N}$, $109^{\circ}53'54.00''\text{W}$.
2. Area No. 2— $22^{\circ}53'07.27''\text{N}$, $109^{\circ}53'30.09''\text{W}$.
3. Area No. 3— $22^{\circ}53'17.47''\text{N}$, $109^{\circ}53'01.89''\text{W}$.

4. Area No. 4— $22^{\circ}53'19.73''\text{N}$, $109^{\circ}52'45.48''\text{W}$.

Caution.—A dangerous rock, with a depth of 2.5m, lies in the entrance to the harbor in position $22^{\circ}52'53''\text{N}$, $109^{\circ}54'22.8''\text{W}$.

A dangerous wreck lies in a position close SE of the S breakwater.

Vessels heading N to San Lucas from S of Cabo San Lucas

should note that Cerro Las Tetas, previously described in paragraph 2.37, is no longer visible once the vessel is abeam of Cabo San Lucas.

Many small craft, including fishing vessels and pleasure craft, and large cruise ships, are encountered in San Lucas harbor and its approaches.

3.3 Cabeza Ballena (22°54'N., 109°50'W.), a rocky and dark gray point, is located 3.5 miles ENE of Cabo San Lucas. This point rises almost vertically to a height of 57m and immediately behind it the land rises to a height of 365m. A conspicuous cone-shaped rock rises from the shore close W of this point. A light is shown from a concrete tower, 10m high, standing on the point and a tower, marked by a red light, stands 1 mile NW of it.

Between Cabeza Ballena and Punta Palmilla, 9.5 miles NE, the coast remains steep-to with no off-lying dangers. Cerro Colorado, a red hill, rises close to the shore, 1.5 miles SW of Punta Palmilla. This hill is 133m high and is an excellent landmark when viewed from seaward.

It is reported that a white hotel, with very distinguishable lights, stands on Punta Palmilla.

3.4 Bahia San Jose del Cabo (23°03'N., 109°39'W.) is entered between Punta Palmilla and Punta Gorda, 9 miles NE. This open bay is fringed by steep, sandy beaches on which the sea breaks heavily.

Sierra de San Lazaro, 1,558m high, rises to a prominent peak 13 miles NW of the central part of the bay.

San Jose del Cabo (23°03'N., 109°41'W.) stands near the mouth of the Rio San Jose, 3 miles NE of Punta Palmilla. A conspicuous cathedral, with a factory and a chimney standing 0.5 mile W of it, is situated in this town. A prominent custom house, with a striped roof, stands near the shore, close W of the chimney. A light is shown from a tower with a dwelling, 10m high, standing 1.5 miles E of the cathedral.

Anchorage can be taken almost anywhere within the bay, in depths of 11 to 18m, about 0.3 to 0.5 mile from the shore. However, an area lying close S of the custom house, where a deep gully approaches the coast, should be avoided. Considerable swell sets into the bay, especially from May to October, and makes anchoring extremely uncomfortable.

Vessels at anchor can work cargo from lighters, but it was reported (1983) that such operations were no longer carried out.

Punta Gorda (23°05'N., 109°36'W.), a round and rocky bluff, is 15m high and fringed by numerous detached rocks. A prominent flat-topped hill, 95m high, rises 0.5 mile W of this point. A shoal, with a depth of 5.5m, lies about 0.3 mile SE of the point.

Banco Gorda de Adentro (Inner Gorda Bank), with a least depth of 14.6m (1949), lies about 5 miles SE of Punta Gorda.

Banco Gorda de Afuera (Outer Gorda Bank), with a least depth of 62m, lies about 7 miles SE of Punta Gorda.

The coast between Punta Gorda and Los Frailes, 21 miles NNE, is fairly low and rocky without any intermediate prominent points that can be recognized from any distance. Inland, the land rises gradually to the mountain ranges of the interior.

A stranded wreck lies 4.5 miles NE of Punta Gorda.

Boca del Tule lies at the N side of a bold and rocky bluff, 9

miles S of Los Frailes. A light is shown from a framework tower, 10m high, standing in the vicinity of this river mouth.

A dangerous rock was reported to lie about 1.2 miles offshore, about 5 miles S of Los Frailes.

Los Frailes (23°23'N., 109°25'W.) consists of a bold and whitish-colored headland, 125m high, closely backed by a hill, 230m high.

Anchorage, with local knowledge, can be taken, in a depth of 16m, rocky bottom, within Bahia Frailes, which lies close S of Los Frailes and is protected from N winds.

Cabo Pulmo (23°27'N., 109°25'W.), located 4 miles N of Los Frailes, is a rocky headland, 15 to 23m high. A hill, 250m high, rises close inland of this cape and forms the E end of a mountain range which has peaks over 600m high. A small boat harbor lies on the S side of the cape.

Several rocks have been reported to lie up to about 1 mile seaward of the cape. A shoal, about 1 mile long, lies 0.7 mile offshore, about 2 miles N of the cape. It has a least depth of 1.8m and breaks.

Caution.—The coast in the vicinity of Cabo Pulmo should be given a berth of at least 2 miles when passing.

3.5 Punta Arena (23°33'N., 109°28'W.) is low and sandy. A light is shown from a tower with a dwelling, 10m high, standing on the point.

The sea breaks heavily in the vicinity of this point; vessels should give it a berth of at least 0.5 mile when passing.

Anchorage, during N winds, can be taken, in depths up to 18m, sand, about 1 mile S of the outer end of the point.

Bahia de las Palmas (23°41'N., 109°38'W.) is entered between Punta Colorada, located 3 miles NW of Punta Arena, and Punta Pescadores, 16 miles NW. This bay is exposed and the village of Buena Vista is situated at its head, 10 miles WNW of Punta Colorada. Anchorage can be taken off this village, but care should be taken when approaching as the depths decrease very rapidly.

Punta Pescadero, the N entrance point, is bold, rocky, and reddish in color. Due to the rocky and irregular bottom in the vicinity of this point, vessels should not approach within 1 mile.

3.6 Bahia de los Muertos (23°56'N., 109°48'W.), a wide and exposed indentation, is entered between Punta Pescadero and Punta Perico, 15 miles NNW. The high land backing the shore of this bay rises to El Palmar, a prominent peak, which is 1,097m high and stands 9 miles WNW of Punta Pescadero.

Anchorage can be taken within the S part of the bay, in depths of 11 to 18m, sand, about 0.5 mile offshore.

Punta Perico, the N entrance point, consists of a steep-to and whitish bluff which rises abruptly inland to a hill, 190m high.

Ensenada de los Muertos, a small cove, lies at the N end of Bahia de los Muertos and provides good anchorage to vessels with local knowledge, in a depth of 15m. The cove offers complete protection from N winds and seas; a small cargo loading facility, with a warehouse, is situated here. This facility lies within the jurisdiction of the port authorities at La Paz and cargo vessels are required to give prior notice of arrival.

Punta Arena de la Ventana (24°03'N., 109°49'W.), low and sandy, is located 2 miles NW of Punta Perico. A light is shown from a round tower, 10m high, standing on this point.

Bahia la Ventana (24°05'N., 109°56'W.), crescent-shaped and deep, is entered between Punta Arena de la Ventana and Punta Gorda, 12 miles NW. The S shore of this bay is low, whereas the W shore rises inland to a mountain range. North El Mulato, 1,167 high, and South El Mulato, 1,263m high, are the two tallest peaks of this range and rise about 7 miles SW of Punta Gorda. A light is shown from a metal framework tower, 11m high, standing on the W side of the bay, 3.5 miles S of Punta Gorda.

Anchorage can be taken, in depths of 9 to 15m, in almost any part, but it is reported that the bay is sometimes frequented by vessels engaged in pearl fishing.

3.7 Isla Cerralvo (Isla Cerralbo) (24°15'N., 109°52'W.), barren and rocky, is separated from the mainland by Canal de Cerralvo, a wide and deep passage. Both sides of this island, which rises to several high peaks, consist of bold, rocky bluffs with gravel beaches between them. The island is of volcanic origin and has a summit, 771m high.

Piedras Gordas (24°09'N., 109°51'W.), fronted by a reef, is the SW extremity of the island. A light is shown from a metal tower, 11m high, standing on this point.

A light is shown from a metal tower, 7m high, standing on the SE extremity of the island, 3.2 miles ESE of Piedras Gordas. Roca Montana, a shoal patch, has a depth of only 1.2m and lies about 0.8 mile S of the light.

Arrecife de la Foca (Islote Reina), consisting of a group of rocks, lies 4 miles NW of the N extremity of the island. A light is shown from a metal tower, 7m high, standing on this group. The passage separating the group from the N end of Isla Cerralvo is believed to be clear of dangers, but the rocks should be passed at a safe distance. Tidal currents in this passage have been reported to sometimes attain rates of 2.5 knots.

Punta Santa Cruz (24°19'N., 110°05'W.) projects slightly from the coast 5 miles NW of Punta Gorda. A shoal, with a depth of 29m, was reported (1983) to lie about 2 miles ENE of this point. A large, white rock, 15m high, lies at the outer end of a sandy spit which extends 0.5 mile from the shore, 4.5 miles NW of the point.

Punta Coyote, a low point, is located 12 miles NW of Punta Santa Cruz. The coast between is generally bold and rocky with occasional sandy beaches. Inland, the terrain is mountainous and hilly.

Punta San Lorenzo (24°20'N., 110°20'W.), located 5.5 miles W of Punta Coyote, is the NW extremity of the peninsula which forms the E shore of Bahía de La Paz and the S side of Canal de San Lorenzo. A pinnacle rock, with a depth of 13m, lies about 0.8 mile WNW of this point.

Canal de San Lorenzo (24°23'N., 110°18'W.) is the passage separating the N side of the mainland peninsula from the S side of Isla del Espiritu Santo. It is restricted to a width of about 0.5 mile, as defined by the 11m curve, and has mid-channel depths of 11.8 to 19.5m.

Scout Shoal, which is rocky and composed chiefly of loose stones, has a least depth of 2.7m and lies 2 miles NE of Punta San Lorenzo.

Arrecife de San Lorenzo, lying 1 mile NNW of Scout Shoal, is a rocky ledge with a least depth of 2.7m. A wreck, with a depth of 9.8m, lies 1 mile E of this ledge. Swanee Rocks, with a least depth of 1.2m, lie 0.5 mile NE of the ledge.

The tidal currents in Canal de San Lorenzo are strong, sometimes attaining rates of up to 2.5 knots, and, from October to February, even as much as 3 knots.

Caution.—Passage between the shoals and the adjacent shores of Canal de San Lorenzo is possible for small vessels, but is not recommended.

The dangers fringing the fairway of Canal de San Lorenzo are marked by lighted beacons and buoys, but the latter are frequently missing.

3.8 Isla del Espiritu Santo (24°28'N., 110°20'W.) is of volcanic origin and has several prominent peaks. The summit of this large island is 595m high and rises in the N part. With the exception of the shoals extending S into Canal de San Lorenzo and several small islets lying close off its W side, this island is steep-to within 1 mile of the shore. Punta Lobos, a rocky and high point, forms the E extremity of the island. A light is shown from a metal tower, 9m high, standing close SW of this point.

Isla la Partida, 335m high, lies close N of Isla del Espiritu Santo from which it is now separated by a narrow, shallow channel.

Isla Ballena, barren and rocky, lies close W of the NW part of Isla del Espiritu Santo. A light is shown from a metal framework tower, 7m high, standing at the SE end of this islet.

Punta Dispensa, a rocky bluff, forms the SW extremity of Isla del Espiritu Santo. A prominent red mound, 65m high, rises 0.3 mile N of this point and consists of lumps of lava.

Los Islotes (24°36'N., 110°24'W.), consisting of three flat and steep-to islets, lies about 0.5 mile N of the N extremity of Isla la Partida. A light is shown from a framework tower, 11m high, standing on the largest islet, which is 15m high.

Caution.—A depth of 13.4m has been reported (2002) to lie about 8 miles NE of Los Islotes.

3.9 Bahía de La Paz (24°21'N., 110°30'W.), the largest bay on the W side of the Gulf of California, is sheltered on its E side by a peninsula and several islands and on its W side by the mainland coast. It is deep and clear of dangers, except at the head where depths of less than 5m lie up to 1 mile offshore in places. The bay can be entered from the E through Canal de San Lorenzo or from the N through the wide passage lying between Los Islotes and Cabeza del Mechudo, 19.5 miles NW.

Roca Lobos (24°17'N., 110°21'W.), 4m high, lies 0.5 mile offshore, 2.3 miles SSW of Punta San Lorenzo. It is steep-to on the W side and fringed by foul ground on the E side. A light is shown from a framework tower, 9m high, standing on this rock.

Isla San Juan Nepomuceno (24°16'N., 110°20'W.), a steep island, lies 2 miles S of Roca Lobos and is connected at its N end to the mainland by a causeway. A road runs along the causeway and an airfield is situated on the island. Two ruined piers extend from the E side of the island near its S end. A shoal, with a depth of 7.3m, lies 0.3 mile S of the S end of the island and a lighted buoy marks the 5m curve in this vicinity.

Bahía de Pichilingue (24°16'N., 110°20'W.), a small and sheltered bay, lies on the E side of Isla San Juan Nepomuceno. Although small in extent, this bay forms one of the best protected harbors on the coast and is used extensively as an anchorage by vessels too large to enter Puerto de La Paz. The

port handles cruise vessels, container, bulk, and general cargo.

Depths—Limitations.—The port facilities are located at the head of the bay, which is entered between the S end of the island and the mainland through an entrance channel, 1 mile in length, marked by lighted buoys, with a depth of 11m. It has been reported that navigation within the channel is difficult whenever winds exceed Force 5, especially if they are blowing from the E or NE.

Muelle de Pesca, a fuel jetty, is 85m in length with depths of 6m alongside, is situated on the W side of the bay. Close N of this jetty is the fishing quay, with wharves 250m in length and depths alongside of 5.7m to 6.0m.

Muelle SCT, in the N part of the bay, is a multi-purpose quay with facilities for general cargo, bulk, container, and passenger vessels. It consists of a berth, 200m long, with a depth of 10m alongside.

Terminal Transbordador, a ro-ro ferry terminal, which consists of two ramps and a lifting platform for the loading and unloading of vehicles, is situated in the NE part of the bay. There are three berths at this terminal. Berth No. 1 is 87m long, Berth No. 2 is 139m long, and Berth No. 3 is 74m long. All berths have depths alongside of 7m.

Muelle Universidad, an L-shaped jetty, is 120m long and situated about 0.3 mile SE of the ferry terminal.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt and is available at any time. The pilot will board vicinity of the entrance buoy to Bahia Pichilingue in position 24°15'19"N, 110°19'37"W.

Regulations.—The vessel's ETA should be sent 48 hours and 24 hours before arrival. The following information should be included on all ETA messages:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.
6. Number of passengers on board.

Contact Information.—See the accompanying table titled **Bahia de Pichilingue—Contact Information.**

Bahia de Pichilingue—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	521-612-1253490
E-mail	pilotosdepuerto@hotmail.com
Port Authority	
Telephone	521-612-1227777
Facsimile	521-612-1227778
E-mail	apibcs@prodigy.net.mx
Harbormaster	
VHF	VHF channel 16

Anchorage.—Anchorage is available S of Punta Colorado about 0.5 mile W of Punta Prieta, in depths of 12 to 18m.

Caution.—There is a works in progress area located in the N

part of Bahia Pichilingue bounded by lines joining the following positions:

- a. 24°16'20"N, 110°19'29"W.
- b. 24°16'19"N, 110°19'35"W.
- c. 24°16'27"N, 110°19'35"W.
- d. 24°16'27"N, 110°19'38"W.
- e. 24°16'31"N, 110°19'37"W.
- f. 24°16'30"N, 110°19'32"W.
- g. 24°16'30"N, 110°19'34"W.
- h. 24°16'26"N, 110°19'32"W.
- i. 24°16'24"N, 110°19'31"W.
- j. 24°16'22"N, 110°19'30"W.
- k. 24°16'21"N, 110°19'29"W.
- l. 24°16'24"N, 110°19'27"W.
- m. 24°16'20"N, 110°19'29"W.

3.10 Punta Prieta (24°13'N., 110°18'W.), a vertical and dark bluff located 2.5 miles SSE of the S end of Isla San Juan Nepomuceno, is fronted by a rocky shoal which extends up to about 0.3 mile SW. Monte Santa Maria, a prominent hill, is 473m high and rises 3 miles ENE of the point. A light is shown from a masonry tower on a dwelling, 30m high, standing on the point.

A tank farm and a prominent power station are situated on Punta Prieta. An outfall pipeline, marked by a lighted buoy, extends about 0.2 mile seaward from the shore fronting the power station.

A T-head pier, used for bunkering, extends from the shore on the S side of Punta Prieta. It has a berth, 40m long, with a depth of 8m alongside.

Caution.—ODAS buoys have been placed SE of Punta Prieta in the following positions:

- a. 24°13'02"N, 110°19'07"W.
- b. 24°13'05"N, 110°18'13"W.
- c. 24°13'06"N, 110°18'05"W.
- d. 24°13'01"N, 110°18'02"W.

Puerto de La Paz (24°10'N., 110°19'W.)

World Port Index No. 15920

3.11 Puerto de La Paz, the largest and most important harbor on the E side of Baja California, lies 3.5 miles S of Punta Prieta, and can provide alongside berthing as well as serve as a lighterage port for vessels too large for the berthing accommodations.

Winds—Weather.—Winds from the SE and SW are fairly regular within Bahia de La Paz for the greater part of the year, but NW winds predominate from November to May. These winds, which blow from about 0900 to 1600, are succeeded toward evening by S winds that last all night. Calms are frequent during the spring and summer months.

The climate is hot and dry and hurricanes sometimes occur between September and November.

Tides—Currents.—Tides rise about 0.9m at springs and 0.6m at neaps, but are influenced by the wind.

The tidal currents within the harbor usually attain rates of 2 knots, but are greatly influenced by the wind. A current with a rate of 6 knots has been experienced off the pier which fronts the city.

Depths—Limitations.—Canal de La Paz, the entrance channel, is entered 0.4 mile ESE of Punta Prieta. It is 3.5 miles long and extends close inshore between the mainland and the E side of a large, shallow spit. The port area lies in the entrance to Ensenada de La Paz, a large and shallow lagoon. Vessels not exceeding 100m in length and 3.9m draft can enter at any stage of the tide, but vessels exceeding 100m in length are not permitted to enter the channel. It is not recommended to enter the channel at night.

Muelle de Pemex, a T-headed bunker pier at Punta Prieta, has a length of 105m and depths alongside of 9.8m. Mooring buoys are placed approximately 130m S of the jetty to assist in berthing.

A cement pier, located 0.3 mile E of Muelle de Pemex, has an alongside depth of about 5m. Mooring buoys placed for assistance with berthing.

A marina, protected by a breakwater, is situated on the E side of the channel (24°11'N., 110°18'13"W.).

The Inner Harbor has the following facilities:

1. A fishing dock, 91m in length and a width of 3m used only for fishing vessels.
2. Muelle Fiscal, a T-headed pier, fronts the city and is used for passenger vessels only. The jetty is 66m in length with a length of 22m on either side of the head, allowing vessels up to 80m in length and maximum draft of 5.6m to berth at the head.

Extensive reclamation, E of the range line at the entrance to Canal de La Paz, forms a new peninsula extending NW from the coastline at latitude 24°12.9'N, to the vicinity of latitude 24°13.1'N with a jetty extending approximately 200m W.

Vessels too large to enter the harbor usually anchor within Bahía de Pichilique and work cargo using lighters.

Aspect.—The city is situated on flat land, but the cathedral and several other buildings, which are prominent from seaward, stand on a low tableland behind it.

Canal de La Paz, the entrance channel, is marked by lighted buoys and lighted ranges, which may best be seen on the chart.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt and is available at any time; however, it is not advisable to attempt to enter the channel after dark. The pilot will board S of Punta Prieta in position 24°13'00"N, 110°18'31"W.

Regulations.—The vessel's ETA should be sent 48 hours and 24 hours before arrival. The following information should be included on all ETA messages:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.
6. Number of passengers on board.

Contact Information.—See the accompanying table titled **Puerto de la Paz—Contact Information.**

Puerto de la Paz—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	521-612-1253490
Facsimile	521-612-1253490

Puerto de la Paz—Contact Information	
E-mail	pilotosdepuerto@prodigy.net.mx
Port Authority	
Telephone	521-612-1227777
Facsimile	521-612-1227778
E-mail	apibcs@prodigy.net.mx
Harbormaster	
VHF	VHF channel 16
Telephone	521-612-1224037
Facsimile	521-612-1220243

Anchorage.—Vessels awaiting a pilot can anchor, in depths of 12 to 18m, to the S of Punta Prieta. The anchorage farther SW is exposed and subject to swells. Anchorage is available within the harbor, in depths of 5 to 7m, mud, about 0.5 mile SW of Muelle Fiscal.

Anchoring is prohibited within an area 2.5 miles N of Punta Prieta, 1.25 miles wide, extending 3 miles from shore.

Anchoring is also prohibited in the harbor off the N end of Muelle Fiscal.

Caution.—The alignment of the lighted ranges does not accurately indicate the centerline of the fairway and caution must be used.

A dangerous wreck, which may best be seen on the chart, lies in the S part of the port area and is marked by a lighted buoy.

3.12 El Mogote (24°11'N., 110°19'W.), a low and sandy peninsula, fronts the N side of Ensenada de La Paz, the shallow lagoon, which forms the inner part of Puerto de La Paz.

The coast between El Mogote and Punta Coyote, 27 miles NW, is low and sandy for the first 12 miles. The remaining part is backed by a long tableland, 150 to 300m high, and faced with cliffs, 15 to 30m high.

Punta Coyote (Punta de los Reyes) (24°28'N., 110°42'W.), 46m high, is a perpendicular, white, and rocky bluff. A prominent dark peak, 436m high, rises 5.5 miles S of this point.

San Juan de la Costa (24°23'N., 110°42'W.) (World Port Index No. 15915), a small port complex, lies 2.8 miles S of Punta Coyote. It is used exclusively for the export of phosphates and is administered from Puerto de La Paz.

Depths—Limitations.—A T-head jetty, which is exposed to E winds, extends 0.2 mile from the shore. It has a berthing face, 184m long, with a depth of 10.1m alongside. Vessels of up to 40,000 dwt and 9.7m draft can be accommodated.

Aspect.—A light is shown from a metal truncated tower, 7m high, standing near the complex.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF through La Paz and board between 1 and 2 miles E of the pier. Berthing can only be carried out in calm weather.

Anchorage.—Anchorage can be taken, over a bottom of sand, SE of a lighted buoy, which is moored about 1 mile SE of the berth.

3.13 Cabeza del Mechudo (24°47'N., 110°40'W.), the W

entrance point of Bahía de La Paz, is located 20 miles N of Punta Coyote. It is formed by a bold, perpendicular cliff, 91m high, and surmounted by a dome-shaped hill, 229m high. Cerro de Mechudo, the only prominent peak in this vicinity, is 1,119m high and rises 3.5 miles W of this point.

Bahía de La Paz to Bahía Concepción

3.14 Punta San Everisto (24°55'N., 110°42'W.), 40m high, is a rocky headland which projects 1 mile from the coast, 7 miles NNW of Cabeza del Mechudo. A light is shown from a framework tower, 9m high, standing on this point.

Vessels with local knowledge can anchor, in depths of 9 to 11m, within a cove which is entered close S of the point.

Punta Nopolo (25°01'N., 110°46'W.), a rocky cliff, is located 7 miles NNW of Punta San Everisto and has a peak, 481m high, rising close behind it. The coast between is high and precipitous.

Canal de San Jose (25°00'N., 110°43'W.), a deep channel, separates Isla San Francisco and Isla San Jose from the coast. It can be used to avoid the heavy seas found outside the islands, but at night or in thick weather, vessels should favor the W side, which is free of off-lying dangers. The currents setting through this channel attain rates of 1 to 3 knots.

3.15 Isla San Jose (24°58'N., 110°38'W.), an island of volcanic origin, rises to a conspicuous summit, 633m high, near the center. A prominent and sharp peak, 426m high, rises 1.8 miles S of the N extremity of the island.



Punta San Jose Light

Punta Colorado is located 2.5 miles NW of Punta Roja, the prominent E extremity of the island. A light is shown from a framework tower, 11m high, standing on this point. Punta de los Ostiones is located on the W coast of the island, 4 miles S of its N extremity. A light is shown from a framework tower, 9m high, standing on this point.

The S coast of the island consists mostly of a sandy beach which extends W to form a low and sandy spit. Bahía Amorta-

jada is entered between this sandy spit, which forms the SW extremity of the island, and Punta Salinas, 4 miles NW. A large lagoon lies on the S side of this bay. Well protected anchorage can be taken, in a depth of 13m, within the S part of the bay or, in depths of 11 to 22m, within the N part of the bay and S of Punta Salinas.

With the exception of the N extremity, which is fringed by a reef extending up to 0.3 mile offshore, the remaining coast of the island is mostly steep-to.

3.16 Isla San Francisco (24°49'N., 110°35'W.) lies 1.5 miles S of the SW extremity of Isla de San Jose and several above-water rocks front its W and NW sides. The SE extremity of the island is formed by a headland, 90m high, which is connected to the shore by a low and sandy neck. Anchorage with local knowledge can be taken, in depths of 9 to 18m, off a sandy beach lying close W of this point. A light is shown from a truncated tower, 9m high, standing on the N part of the island; a second light stands about 1 mile NW.

Las Animas (25°07'N., 110°31'W.), a group of islets and rocks, lies about 10 miles E of the N extremity of Isla San Jose. The tallest islet is 27m high. A light is shown from a metal framework tower, 9m high, standing on the group.

Isla de San Diego (25°11'N., 110°42'W.) lies about 5.5 miles N of the N extremity of Isla San Jose. A light is shown from a framework tower, 9m high, standing on this island. A reef, on which the sea usually breaks, extends up to about 0.8 mile seaward from the SW extremity of the island and a rock, awash, lies at its outer end. A shoal, with a depth of 5.5m, is reported to lie about 0.5 mile SW of the outer end of the reef.

Isla Santa Cruz (25°16'N., 110°43'W.), lying 3.5 miles N of Isla San Diego, is barren and 457m high. A light is shown from a metal framework tower, 9m high, standing on the S side of the island.

Caution.—The channel lying between Isla San Diego and Isla Santa Cruz has not been fully examined and should be used only with great care.

3.17 The coast between Punta Nopolo and Punta San Telmo, 19 miles NNW, is backed by a range of mountains. A prominent broken, rocky cliff, 91 to 150m high, projects from the general line of the coast 2 miles N of Punta Nopolo and is known as Los Burros.

Punta Dolores, a similar projection, is located 3 miles N of Los Burros. Bahía de Dolores lies N of this point and is marked on its N side by a prominent red-colored bluff.

Isla Habana (25°08'N., 110°52'W.), 27m high and whitened by guano, lies about 1.5 miles offshore in the vicinity of Bahía de Dolores. The channel leading between this islet and the mainland has depths of 18 to 31m.

Punta San Telmo (25°17'N., 110°57'W.), a sharp point, is 9m high and fronted by detached rocks. It is marked by red-dish-colored bluffs on either side. A prominent table mountain, 875m high, rises 6.5 miles W of this point.

Punta San Marcial (25°30'N., 111°01'W.), located 14.5 miles NNW of Punta San Telmo, is formed by a rocky cliff and closely backed SW by a peak, 345m high. It is fronted by above and below-water dangers and should be given a berth of at least 2.5 miles.

San Marcial Rock (25°33'N., 111°01'W.) lies about 1.5

miles NNE of Punta San Marcial. A light is shown from a metal tower, 9m high, standing on this rock.

3.18 Isla Santa Catalina (25°39'N., 110°47'W.), 470m high, lies 13.5 miles ENE of Punta San Marcial and has a prominent summit. No close examination has been made of this island, but its coast is reported to be mostly steep-to. A light is shown from a metal framework tower, 11m high, standing on the S extremity of the island.

An isolated shoal, with a depth of 33m, is reported to lie about 6 miles S of Isla Santa Catalina.

Isla Monserrate (25°40'N., 111°42'W.), high and steep, lies 12 miles W of Isla Santa Catalina and 8 miles N of Punta San Marcial. Its shores are generally steep-to, but several above and below-water dangers extend up to 0.2 mile offshore in places. A light is shown from a framework tower, 10m high, standing on the SW side of the island.

Las Galeras, consisting of two rocky islets about 0.3 mile apart, lies 1.7 miles N of Isla Monserrate and is marked by a light.

A dangerous rock, 0.3m high, lies about 1.3 miles N of Las Galeras and is surrounded by foul ground.

3.19 Bahia Agua Verde (25°31'N., 111°05'W.), entered 2.5 miles W of Punta San Marcial, provides anchorage in fine weather to vessels with local knowledge. Punta San Pasquel, the W entrance point of the bay, is a rocky bluff, 103m high. Solitaria, 35m high, is a large, white, and prominent rock which lies about 0.3 mile NE of the point.

Punta San Cosme, located 4 miles NW of Bahia Agua Verde, is formed by a rocky cliff which rises abruptly to a hill, 69m high. A rocky shoal, with a depth of 1.8m, lies about 0.3 mile off the E side of this point. Two sharp and prominent twin peaks, 1,161m high, stand 4 miles SW of the point.

A group of above-water rocks lies about 1.3 miles N of Punta San Cosme. Roca San Cosme, the westernmost and largest, is 23m high; Roca San Damien, the easternmost, is 14m high. The passage leading between this group and the mainland should not be attempted without local knowledge.

Punta Candeleros (25°43'N., 111°14'W.), 15m high, is located 11 miles NW of Punta San Cosme and consists of a prominent, steep-to bluff with the land rising abruptly close behind it. The point is marked by a light.

White Rock (Roca Blanca), a high rock surrounded by several smaller rocks, lies about 4 miles SE of this point. The passage lying between this rock and the mainland is clear.

Isla Danzante Primero (25°46'N., 111°14'W.), lying 2.5 miles NNW of Punta Candeleros, is high and barren. This island is divided into two parts, 0.5 mile from its N end, by a foul and shallow channel. Lights are shown from the N part of the island and from the NE and S extremities of the S part.

The channel leading between Punta Candeleros, on the mainland, and Isla Danzante Primero is encumbered by several above and below-water dangers and should be avoided by vessels without local knowledge.

Punta Coyote (25°49'N., 111°18'W.), located 7 miles NW of Punta Candeleros, is a bluff headland, 23m high, fronting the outer end of a peninsula, which is joined to the mainland by a narrow and sandy isthmus. A light is shown from a framework tower, 7m high, standing on the point.

Puerto Escondido (25°48'N., 111°18'W.), a landlocked harbor, lies at the NW side of a small bay, which is entered close W of Punta Coyote, and protected on its E side by the peninsula. Punta Coyote is a bluff headland, 23m in height, that conceals the entrance to the harbor. The entrance is 25m wide with depths of 2.9m over the bar. A natural breakwater, made up of rocks and 20m in length, lies within the inner harbor; it is marked by a light at its head.

A T-head jetty, for small cruise vessels and recreational craft, extends E from the W side of the bay and has a berthing face, 62m long, with depths of 8m alongside.

Pilots are not available and local knowledge is required for entry. The harbormaster can be contacted on VHF channel 16. The Port Authority for this port is located in La Paz and can be contacted, as follows:

1. Telephone: 521-612-122777
2. Facsimile: 521-612-122778
3. E-mail: apibcs@prodigy.net.mx

Anchorage for small boats is available near the entrance to the harbor while anchorage for larger vessels can be taken in the outer harbor.

3.20 Isla Carmen (25°58'N., 111°10'W.), a large island of volcanic origin, is marked by a range of prominent peaks along its entire length. The tallest peak is 479m high and rises 6.5 miles SW of the NE end of the island. The E and W coasts of the island, with the exception of Bahia Salinas, consist mostly of steep bluffs. The numerous other small indentations found along the coast are exposed and have no commercial importance.

A light is shown from a truncated tower, 10m high, standing on Punta Arena, the SW extremity of the island.

Punta Baja, the S extremity of the island, is fronted by a shallow, gravel spit which extends up to about 0.3 mile seaward.

The channel leading between the S end of Isla Carmen and Isla Danzante Primero is free from dangers and vessels bound for Loreto from the S frequently use this passage.

Bahia Salinas lies at the NE side of the island and is entered 6 miles SSW of the NE extremity. It provides good anchorage, in a depth of 10m, sand over heavy mud, with excellent holding ground and is protected from all winds except those from between SE and SSW. Occasional squalls may be experienced in August and September. Local knowledge is recommended.

A large salt pond lies close N of the head of the bay and is separated from it by a shingle beach. An abandoned settlement is situated on the beach. A disused pier, formerly used for loading salt into lighters, fronts the settlement and has a depth of 5.5m alongside its head. A bank extends W from the E entrance point of the bay and should be given a wide berth.

Punta Lobos, the NE extremity of the island, is fronted by detached rocks. The point is formed by a rocky headland, 38m high, which is connected to the island by a low and narrow stretch of land. A light is shown from a round tower, 12m high, standing near this point.

Caution.—A dangerous rock, with a depth of 1.3m, lies about 2.8 miles SE of Punta Baja. An extensive shoal, with a depth of 11m, was reported (1965) to lie centered 1.4 miles WSW of this rock.

It has been reported (1995) that Isla Carmen lies 1 mile E of

its charted position.

3.21 Punta Nopolo (25°55'N., 111°21'W.), located 7 miles NNW of Punta Coyote, is a bold and rocky bluff, 23m high. Inland from this point, the land rises to several high mountains which form the S section of the Sierra de la Giganta. Cerro Giganta, the tallest peak of this range, is 1,766m high and stands 17 miles NW of the point. Pilon de Parras (Sugarloaf), another conspicuous peak of this range, rises 8.8 miles NW of the point and is 1,120m high.

Loreto (26°01'N., 111°21'W.), a small loading port, lies 5.5 miles N of Punta Nopolo. The small town, which includes a mission built in 1697, stands on the banks of a river and is a tourist center. A prominent tower, formerly a lighthouse, stands close E of the town.

Vessels work cargo from lighters at the anchorage. A small basin formed by breakwaters is used for small craft. No pilots are available for Loreto. The harbor master can be contacted on VHF channel 16. The port authority at Puerto de La Paz acts for this port. See paragraph 3.11 for contact details.

Good anchorage can be taken, by vessels with local knowledge, in depths of up to 15m, about 0.5 mile offshore, but a heavy sea is raised when NE winds blow with any force. Good anchorage can also be taken, in depths of 6 to 13m, within 0.5 mile of the beach extending 4 miles N of the town.

3.22 Isla Coronado (26°07'N., 111°17'W.), 282m high, lies 2.5 miles offshore, 7 miles NNE of Loreto. A low spit, composed of sand and stone, extends about 0.8 mile seaward from the SW extremity of the island. The remaining coasts consist of steep, rocky bluffs. During SE winds, excellent anchorage can be taken by vessels with local knowledge on the N side of the spit. A light is shown from a metal tower, 12m high, standing on the SE extremity of the island.

A low islet lies midway between the W side of the island and the mainland. The passages leading W and E of this islet have depths of 5.5m and 8m, respectively, but should only be used by small vessels.

Caution.—It has been reported (1995) that Isla Coronado lies 1 mile E of its charted position.

3.23 Punta Mangles (26°17'N., 111°23'W.), located 11 miles NW of Isla Coronado, is surmounted by a hill, 30m high, and is the S extremity of a series of cliffs, which are 60 to 90m high and composed of various colors. A mountain, 721m high, rises 3 miles W of the point and has a conspicuous double peak. Good anchorage, sheltered from NW winds, can be taken, in depths of 9 to 16m, about 0.5 mile offshore to the S of the point.

A group of rocks, awash, lies about 1 mile offshore, 2.3 miles SSE of Punta Mangles.

The coast between Punta Mangles and Punta Pulpito, 14.5 miles N, is mostly steep-to and backed by rocky bluffs. The shore is fronted by several detached rocks and islets which lie up to 0.5 mile seaward in places. The small coves indenting this section of the coast are exposed and are of little commercial importance.

Punta Mercenarios, located 4.5 miles N of Punta Mangles, consists of a rocky cliff, composed of dark sandstone, which is surmounted by a red conical hill, 158m high.

Punta Pulpito (26°31'N., 111°27'W.), a bold headland, is 140m high and forms the extremity of a peninsula which is connected to the mainland by a low, narrow neck. A triple peak, 500m high, stands 3.7 miles SW of this point and is conspicuous from seaward.

Excellent shelter from NW winds can be taken by vessels with local knowledge within Fondeadero del Pulpito, a small bay lying S of Punta Pulpito. However, the tidal currents have been reported to be strong in this vicinity. Anchorage should be obtained, in depths of 9 to 18m, about 0.3 mile offshore.

Bahia de San Nicolas is entered between Punta Pulpito and Punta Santa Teresa, 10 miles NNW, and several streams flow into its S part. A light is shown from a truncated tower, 7m high, standing on Punta Santa Teresa and a prominent peak, 291m high, rises 1 mile SW of it.

Caution.—It has been reported (1995) that Punta Santa Teresa lies 1 mile E of its charted position.

Isla Ildefonso (26°38'N., 111°26'W.), 118m high, is a steep-to and barren island which lies 6 miles N of Punta Pulpito. A light is shown from a truncated tower, 10m high, standing on the N extremity of the island and a reef extends up to about 0.2 mile N of it.

Caution.—It has been reported (1995) that Isla Ildefonso lies 1 mile E of its charted position.

3.24 Punta Colorado (26°44'N., 111°38'W.), a high and reddish-colored bluff, is located 4.5 miles NW of Punta Santa Teresa. Pico Colorado, a prominent peak, is 490m high and rises 4 miles W of the point. Another prominent whitish-colored peak, 742m high, rises 5.5 miles NW of the point.

Punta Concepcion (26°54'N., 111°51'W.), 9m high, is a poorly-defined point located 15 miles NW of Punta Colorado. It is the outer extremity of a peninsula which forms the E side of Bahia Concepcion. Between Punta Colorado and this point, reefs and shoals extend up to 0.5 mile offshore and off-lying patches of red-colored water are frequently observed.

Bahia Concepcion (26°40'N., 111°50'W.) is entered between Punta Aguja, located 2 miles SW of Punta Concepcion, and Punta Gallito, 3.2 miles W. It is narrow, fairly deep throughout, and extends about 22 miles SSE. This bay provides good shelter for vessels with local knowledge.

A light is shown from a truncated tower, 15m high, standing in the vicinity of Punta Aguja and a prominent radio tower is situated 2.7 miles SSW of Punta Gallito.

Depths of only 5.2m have been reported to exist in the entrance to the bay and a rock, with a depth of 5.5m, was reported to lie about 1 mile NE of Punta Gallito, but a careful search for this latter danger proved unsuccessful.

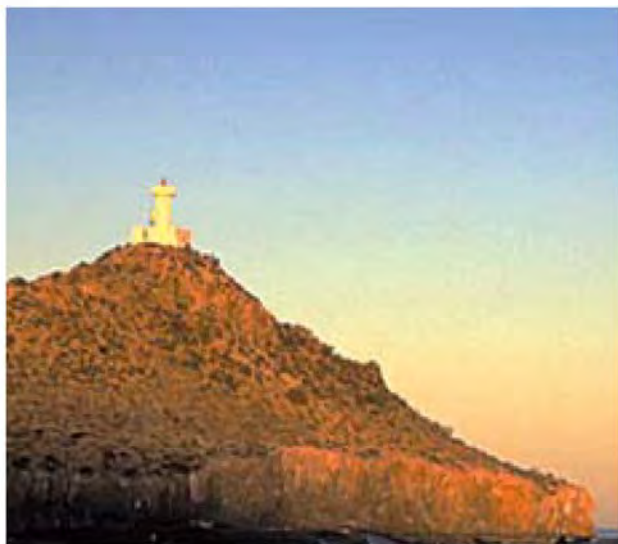
The E shore of the bay consists of sandy beaches backed by gradually rising land in the interior. It is mostly fronted by a bank which extends 0.2 to 0.7 mile seaward. The shore at the head of the bay, which is known as La Pasajera, is low, sandy, and fronted by a bank extending up to 0.5 mile seaward. The W shore of the bay is very irregular, being marked by several high bluffs with intervening bights and sandy beaches.

Ensenada de Coyote (Coyote Bay) lies on the W side of the bay, 9 miles S of the entrance, and is encumbered by several small islets, reefs, and rocks. This inlet has not been thoroughly surveyed.

During good weather, anchorage can be taken in suitable depths almost anywhere within the bay, but local knowledge is required. With NW gales, a heavy sea sets into the bay and anchorage may be taken in the lee of one of the islets lying within Ensenada de Coyote.

Bahia Concepcion to Punta San Francisquito

3.25 Punta Sombrerito (26°54'N., 111°58'W.) is located 2.5 miles NW of Punta Gallito and at the N side of the mouth of the Rio Santa Rosalia. It consists of a high rock, shaped like a pyramid, standing on a round base. A light is shown from a square tower with a signal station, 12m high, standing near the point.



Punta Sombrerito Light

Pico Colorado, 255m high, rises 1.2 miles W of the point and its reddish-colored peak is conspicuous. Mulege, a town, stands on the banks of the river, 2 miles above the mouth.

Fondeadero de Mulege, an anchorage roadstead, lies between Punta Sombrerito and Punta Prieta, 0.8 mile N. Vessels with local knowledge can anchor, in depths of 9 to 11m, about 0.5 mile offshore. However, this anchorage is very dangerous with strong NW winds.

Caution.—A rock, with a depth of 0.9m, was reported (1972) to lie in the roadstead anchorage about 0.5 mile ENE of Punta Sombrerito.

3.26 Bahia de Santa Ines (27°00'N., 111°59'W.), an exposed and crescent-shaped indentation, lies between Punta Prieta and Punta Santa Ines, 9 miles N, and is backed by low, sandy shores. The S part of the bay has depths of 9m close inshore, but the N part is shallow.

A prominent monument stands close to the shore in the central part of the bay and marks the S boundary of the Santa Magdalena Plains. These plains, which extend inland from the N part of the bay, are dry, barren, covered with rocks, and several miles wide. The remains of an extensive irrigation aqueduct can still be seen on the N edge of the plains.

Punta Santa Ines, the N entrance point, is a low and rocky point, which is surmounted by a small hill. A light is shown from a truncated tower, 15m high, standing near this point. Las Barracas, consisting of several conspicuous table-topped hills, rises in the vicinity of the point.

Anchorage can be taken by vessels with local knowledge, in depths of 7 to 8m, about 0.5 mile offshore, in the lee of Punta Santa Ines.

3.27 Islas de Santa Ines (27°02'N., 111°55'W.), consisting of three small islets surrounded by shoals and rocks, lies centered 3 miles SE of Punta Santa Ines. The passages leading between the islets and the point should not be attempted without local knowledge. Lights are shown from structures, 15m high, standing on the two southernmost islets.

The coast between Punta Santa Ines and Punta Santa Agueda, 22.5 miles NW, is low and steep-to. Dangers fringing this section of the coast lie within 0.5 mile of the shore.

Punta Chivato, a low point, is located 1.8 miles NNW of Punta Santa Ines and fronted by several detached rocks up to 8m high. A light is shown from a structure, 15m high, standing on the point.

Isla Tortuga (27°26'N., 111°53'W.), 310m high, lies about 22 miles ENE of Punta Santa Agueda. It is hilly, barren, and steep-to. A light is shown from a metal tower, 9m high, standing on the S side of the island and a light is shown from a truncated tower, 9m high, standing on the N side.

3.28 Isla San Marcos (27°11'N., 112°06'W.) (World Port Index No. 15880), high and barren, is located with its S part lying 2.5 miles offshore. The currents in the vicinity of the island are variable, setting principally in accordance with the tides, and attain rates of up to 2 knots.

Shoal banks, with several above-water rocks, extend up to about 1.3 miles seaward from the S extremity of the island and up to 0.5 mile seaward from the N extremity. Lights are shown from structures standing near the N and NW extremities of the island.

A T-headed pier, 366 long, extends seaward from the W side of the island, 1.3 miles N of the S extremity, and is used to load gypsum. It provides a berthing face, 137m long, with a depth of 12.8m alongside.

Vessels of up to 45,200 dwt, 207m in length, and 9.7m draft can be accommodated.

Pilotage is compulsory. Pilots can be contacted by VHF and usually board from a launch off the pier.

Anchorage can be taken, in depths of 15 to 18m, sand, about 0.5 mile W of the pier.

Caution.—It has been reported (1995) that Isla San Marcos lies 1 mile E of its charted position.

3.29 Puerto de Santa Rosalia (27°20'N., 112°17'W.) (World Port Index No. 15870), a small port, in poor condition, handling general cargo, lies 2.3 miles NW of Punta Santa Agueda and consists of an artificial harbor enclosed by breakwaters. The harbor provides good shelter from high winds from all directions.

Winds—Weather.—During the summer, the heat is reported to be excessive while during the winter months (November through March) prevailing winds will be from the NW.



San Marcos Pier



Santa Rosalia Harbor

Tides—Currents.—Tides rise about 1.6m at springs and 1.5m at neaps.

Depths—Limitations.—The harbor is entered from the SE between two breakwaters through an opening that is 128m wide. Shoals A Lighted Buoy marks the extent of the shoal water on the W side of the E breakwater. As the opening between the breakwaters is approached, depths decrease from 37m about 0.25 mile away to approximately 10m midway between the heads of the breakwaters. The navigable width of the opening between the breakwaters is only about 80m due to a shoal

extending from the E breakwater. There are depths of 5m to 9m in the E part of the harbor, but the W part is very shallow.

Four berths available within the harbor; see the accompanying table titled **Santa Rosalia—Berth Characteristics** for further information.

Aspect.—Lights are shown from structures standing at the heads of each breakwater. Two prominent chimneys are situated at the smelting works close N of the town. At night, the glare of the furnaces and the lights of the town is conspicuous.

Range lights lead to the harbor entrance.

Santa Rosalia—Berth Characteristics			
Berth	Berth Length	Berth Width	Depth
Fishing and Fuel Dock	65m	5.4m	7.9m
Ferry Dock	80m	4.2m	5.4m
Cargo Dock	76m	10.0m	4.0m
Tourist Dock	84m	10.0m	9.0m

Pilotage.—Pilotage is compulsory and is normally available between 0800 and 1800 local time. If pilots required outside of these hours an advance request has to be made. Pilots will board off the entrance to the harbor.

Regulations.—The vessel's ETA should be sent 72 hours, 24 hours, and 12 hours before arrival during office hours. The following information should be included on all ETA messages:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel LOA, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

Contact Information.—See accompanying table titled **Santa Rosalia—Contact Information.**

Santa Rosalia—Contact Information	
Pilots	
Telephone	521-615-1522830
Facsimile	521-615-1522830
E-mail	snppsr@prodigy.net.mx
Harbormaster	
VHF	VHF channel 16
Telephone	521-612-1521000
Port Authority (handled through La Paz)	
Telephone	521-612-1227777
Facsimile	521-612-1227778
E-mail	abics@prodigy.net.mx

Anchorage.—Vessels can anchor outside the harbor, in depths of 13 to 24m, good holding ground, close inshore. A sea is usually raised at the anchorage by the prevailing NW wind, but it is not considered dangerous. During bad weather the best anchorage for small vessels is close N of the harbor on the approach alignment, in depths of 15m.

Directions.—Vessels bound for this port are recommended to first make for Isla de la Tortuga and then steer towards the harbor entrance.

3.30 Caleta Santa Maria (27°26'N., 112°20'W.), a small cove, lies 6 miles NNW of Puerto de Santa Rosalia and is ex-

posed to SE winds. The middle of this cove provides anchorage for vessels with local knowledge, in depths of 9 to 11m, about 0.3 mile offshore.

A bulk gypsum terminal is situated in the N part of the cove. The berth consists of dolphins located at the head of a pier extending SE from the shore. There are depths of 10 to 18m alongside. Vessels up to 70,000 dwt, with a maximum length of 205m, can be accommodated. Range lights, in line bearing about 280°, stand on the shore about 1 mile SSW of the root of the pier. Pilots come from Puerto de Santa Rosalia and board about 1 mile E of the pier.

A prominent monument stands on the coast, 5 miles N of the cove. Las Tres Virgenes, three prominent mountain peaks, stand 14 miles inland from the monument. The southernmost and tallest peak is 1,995m high.

Cabo Virgenes, 61m high, is located 8 miles NNW of Caleta Santa Maria. It consists of a rocky cliff backed by high land. A light is shown from a tower, 10m high, standing on this cape.

Punta Santa Ana, located 11 miles NW of Cabo Virgenes, is steep and closely backed by hills, up to 120m high.

Bahia Santa Ana (27°39'N., 112°34'W.), a very deep indentation, is entered close W of Punta Santa Ana and provides sheltered anchorage to vessels, with local knowledge, from SE winds.

Punta Trinidad (27°48'N., 112°43'W.), 76m high, is a prominent headland located 13.5 miles NW of Punta Santa Ana. The coast between is steep-to, within 0.5 mile of the shore, and is backed by high bluffs.

Cerro Pico Doble, with conspicuous twin peaks, is 716m high and rises 8.5 miles SW of Punta Trinidad.

Punta San Carlos is located 12 miles N of Punta Trinidad. This low point may be identified by a sharp peak, 1,367m high, standing 12 miles WSW of it. Between Punta Trinidad and this point, numerous patches of reddish-colored water have been observed off the coast.

Between Punta San Carlos and Punta Santa Teresa, 26 miles N, the coast consists of alternating bluffs and sandy beaches. Several small, detached above-water rocks front the shore and lie up to 0.7 mile seaward in places.

3.31 Cabo San Miguel (28°12'N., 112°48'W.), located 24 miles NW of Punta Trinidad, is a bold bluff, 46m high. A conspicuous group of mountains, up to 1,068m high, stands 5 miles W of this cape.

Punta Santa Teresa, 12m high, is located 13 miles NNW of Cabo San Miguel. This rocky bluff is surmounted by a hill, 173m high.

A prominent sharp peak, 1,907m high, stands 32 miles W of Punta Santa Teresa and is clearly visible from seaward.

Bahia de Santa Teresa, which is entered close S of Punta Santa Teresa, provides shelter from NW winds. Vessels can anchor, in depths of up to 18m, within the N part of the bay.

Punta San Gabriel, located 1.3 miles N of Punta Santa Teresa, is a bluff, 14m high, which stands at the NE extremity of a prominent headland. The ebb current is reported to attain a rate of 4 knots at times off this point.

Bahia San Francisquito is entered between Punta San Gabriel and a point, 1.5 miles WNW, and provides shelter from the prevailing NW and SE winds. Protected anchorage can be taken within the SW part of the bay, in depths of 9 to 10m, about

0.3 mile from a sandy beach.

Punta San Francisquito (28°28'N., 112°55'W.), a low and rocky bluff, is located 3 miles NW of Punta San Gabriel.

Punta San Francisquito to Punta Bluff

3.32 Bahia de San Rafael (28°29'N., 113°02'W.) is entered between Punta San Francisquito and a point, 16 miles NW. This large and open bay provides good shelter from S winds, but the depths increase rapidly offshore.

Punta de las Animas (28°49'N., 113°14'W.), 23 to 40m high, is located 28 miles NW of Punta San Francisquito and fronted by several detached rocks. Several steep and reddish-colored hills, 90 to 150m high, rise abruptly behind this point and some mountains, over 600m high, stand close inland of them.

Bahia de las Animas is entered between Punta de las Animas and a rocky bluff, 6.5 miles WNW. An islet, 6m high, lies 0.5 mile N of the latter bluff and is connected to it by a rocky shoal. The mouth of a lagoon and several small islets lie in the SW part of the bay. Good anchorage can be taken by vessels with local knowledge, in depths of 11 to 22m, within the S part of the bay. However, vessels should not approach within 0.8 mile of the mouth of the lagoon.

3.33 Bahia de los Angeles (28°55'N., 113°31'W.), lying 11 miles NW of Bahia de las Animas, is almost completely landlocked. It is protected from the N and NE by several islands and islets which are intersected by three deep, safe passages. Vessels without local knowledge should not attempt to enter this bay.

The shores of the bay mostly consist of sandy beaches with one or two rocky bluffs. Montana de Cumbre Redonda (Round Top), 1,048m high, rises on the SW side of the bay, 8 miles W of the E entrance point, and is conspicuous.

The S passage, which is believed to be deep and safe, lies between Punta La Harradura (Roja), a reddish-colored bluff located at the E side of the bay, and Islas Los Gemelitos, two small islets, lying 0.3 mile N. Another deep and safe passage, about 0.5 mile wide, lies between Islas Los Gemelitos and Isla Cabeza de Caballo, a larger islet, which is 69m high and surmounted by a stone monument. A group of islets, 27 to 38m high, lies 2 miles NW of Isla Cabeza de Caballo, but the intervening passage is encumbered by rocks and is not recommended.

The N passage, about 1 mile wide, is deep and safe, but intricate to navigate. It is entered between Isla Smith, the northernmost islet fronting the bay, and a narrow neck of land projecting SE from the mainland at the W side. Isla Smith is 474m high at its NW end and is flat-topped.

Anchorage can be taken, in a depth of 15m, off the entrance to a small cove which lies on the W side of the bay, 3.5 miles NE of Montana de Cumbre Redonda.

Caution.—Strong local winds are reported to prevail out of the canyons on the W side of the bay. These winds may be felt up to a distance of 6 miles offshore. At times, the winds are preceded by a rolling cloud, known as Elephantes, which resembles the trunk of an elephant.

miles NW of the N entrance point of Bahia de las Animas, is low, sandy, and closely backed by hills that rise towards the coastal range. Anchorage can be taken by vessels with local knowledge, in a depth of 18m, within Bahia de los Remedios, which is entered close S of the point.

Punta Bluff (29°33'N., 113°59'W.), a bold point, is 30m high and located 26 miles NW of Punta Remedios. The coast between consists of an almost unbroken succession of rocky bluffs, 15 to 35m high, which rises to the coastal range close inland.

Sharp Peak, 972m high, rises 6.5 miles WSW of Punta Bluff and is conspicuous. Double Peak, 1,658m high, stands 9 miles S of Sharp Peak and is also conspicuous.

Off-lying Islands

3.35 A chain of islands, consisting of several small and one large island, lies off the coast between Punta San Francisquito and Punta Bluff. This chain is separated from the mainland by Canal de Salsipuedes, in the S part, and by Canal de Ballenas, in the N part.

Isla de San Lorenzo (28°38'N., 112°51'W.), a barren island of volcanic origin, rises to a height of 485m near its S end. A light is shown from a tower, 9m high, standing near the S extremity.

Isla las Animas lies close NW of the N end of Isla de San Lorenzo and is separated from it by a narrow boat passage. A white rock, 6m high, lies close offshore, 1.2 miles E of the NW extremity of this island.

Isla de Salsipuedes, 114m high, lies close NW of Isla las Animas and is separated from it by a channel that has not been examined. A rock, awash, is reported to lie in the middle of the channel.

Isla Raza, a small island, lies 4 miles N of Isla de Salsipuedes. It has been whitened by the deposits of sea birds and is fringed by rocks. A reef fronts the SE end of the island and should be given a wide berth. Anchorage can be taken by vessels with local knowledge, in depths of 9 to 15m, about 0.3 mile S of the island. Roca Raza, 22m high, is a small white rock lying about 1 mile NW of Isla Raza. A steep-to rock, awash, lies off its SW side.

3.36 Isla Partida (28°52'N., 113°02'W.) lies 4.5 miles NW of Isla Raza. This island rises to two peaks, each about 120m high, which are separated by a narrow strip of land. An islet, 23m high, lies 0.3 mile off the E side of the island. Anchorage, sheltered from NW winds, can be taken about midway between the island and the islet.

Roca Blanca, 53m high, lies 0.6 mile N of Isla Partida. A reef extends about 0.3 mile N from Roca Blanca and a rock, 0.6m high, lies at its outer end.

Canal de Salsipuedes, the passage lying between the above islands and the mainland to the W, is wide and clear with great depths, but a very strong current is usually encountered, especially with an ebb tide and NW winds.

Caution.—The currents in the vicinity of Isla San Lorenzo and Roca Blanca are very strong and sometimes cause heavy tide rips.

3.34 Punta Remedios (29°15'N., 113°38'W.), located 13

3.37 Isla Angel de la Guarda (29°17'N., 113°25'W.), 41

miles long, is a high, rocky, barren, and uninhabited island located with its S extremity lying 9 miles NW of Isla Partida. A range of mountains, 900 to 1,300m high, spans the entire length of the island and has a comparatively low ridge in its central part.

Punta Acantilado (29°34'N., 113°33'W.), the E end of a rocky headland, is 220m high and forms the N extremity of the island. A light is shown from a metal tower, 14m high, standing on this point. Another light is shown from a structure, 14m high, standing on the S extremity of the island.

Isla Estanque, 122m high, lies close off a sharp point located on the S side of the island, 4.5 miles NNE of the S extremity. The narrow passage lying between this islet and the mainland is encumbered by a reef which dries in places. Isla Estanque is fringed by above and below-water rocks.

Punta Rocosa is a bold headland, 159m high, located 12 miles N of Isla Estanque. It lies at the NE end of a spur of the central mountain range. Anchorage can be taken in the S part of the open bay lying between Isla Estanque and this headland. Anchorage, with some protection from NW winds, can also be taken, in depths of 9 to 15m, close S of the headland.

Puerto Refugio, a sheltered roadstead, indents the N part of the island and lies between Punta Acantilado and several adjacent islets. It consists of two harbors, which are connected by a narrow channel. Both harbors are easily accessible and provide good well-sheltered anchorage to vessels with local knowledge. The channel leading between the harbors has a depth of 7.3m, but should be used only by small craft.

Isla Granito, 86m high, fronts the E harbor and lies 2 miles NW of Punta Acantilado. A light is shown from the SE end of this islet. Isla Mejia, 261m high and barren, lies 0.5 mile N of the NW extremity of Isla Angel de la Guarda and forms the N side of the W harbor. Another islet, 76m high, lies between the E end of Isla Mejia and the main island to which it is connected by a reef. This islet separates the two harbors, except for a narrow channel. Piedra Blanca, a steep-to and jagged white rock, is 12m high and lies near the center of the E harbor. Anchorage can be taken in the E harbor, in a depth of 10m, about 0.7 mile S of Piedra Blanca. Anchorage can also be taken, in depths of 14 to 22m, S of Isla Granito, but the bottom is mostly rocky. The best anchorage lies in a depth of 11m, sand and shell, in the middle of the W harbor and SW of the SE extremity of Isla Mejia.

Caution.—The strong ebb tidal current is reported to attain a rate of 5 knots in the vicinity of Isla Estanque.

3.38 Canal de Ballenas (29°00'N., 113°23'W.), a deep and clear channel, lies between the W side of Isla Angel de la Guarda and the mainland. Winds from the NW sometimes blow through this passage with great force, raising a heavy sea against which small vessels may have difficulty in making headway. The currents within the channel are also strong, with rates of up to 3 knots having been experienced.

Punta Bluff to the Rio Colorado

3.39 Punta Final (29°46'N., 114°16'W.), located 20 miles NW of Punta Bluff, is a rocky headland with low land extending SW from it. The intervening coast is generally high, steep-to, and rocky. Good anchorage can be taken by vessels with lo-

cal knowledge, in a depth of 16m, within Bahía de Calamajue, which lies 14 miles NW of Punta Bluff. A conspicuous red-colored hill rises behind the sandy beach at the head of this bay.

Bahía San Luis Gonzaga (29°47'N., 114°20'W.), an open bay, lies close W of Punta Final and provides shelter to vessels with local knowledge. Vessels should anchor, in a depth of 14m, about 0.5 mile offshore.

3.40 Punta Willard (29°50'N., 114°24'W.), 56m high, is located 8 miles WNW of Punta Final. A small island lies close SE of this point and a light is shown from a structure, 7m high, standing on its E side. Another light is shown from a structure, 12m high, standing about 1.5 miles NW of the point.

Willard Bay, lying close SW of the small island, has depths of 9 to 18m and provides sheltered anchorage to vessels with local knowledge. A lagoon lying near the head is separated from the bay by a narrow strip of sand.

A chain, which consists of three fairly high islets, several above and below-water rocks, and a number of reefs, extends up to 8 miles NNW from Isla de San Luis. A light is shown from a round tower, 10m high, standing on Isla Miramar, the northernmost islet, which rises to a height of 191m.

Isla San Luis (29°58'N., 114°25'W.), a high island of volcanic origin, lies 3 miles offshore, 12 miles NW of Punta Final. A light is shown from a tower, 10m high, standing on this island. A low, sandy spit, with shallow water lying up to 0.5 mile off both its sides, extends about 1.2 miles seaward from the SW end of the island. Good anchorage can be taken on either side of this spit, but care should be taken to avoid the shallow water. A clear channel, about 1.2 miles wide, leads between the W side of this island and the mainland.

A large rock, 23m high, lies about 1 mile offshore, 5 miles NW of Isla Miramar.

3.41 Punta San Fermin (30°25'N., 114°38'W.), low and sandy, is located 37 miles NNW of Punta Willard. This point is poorly defined, but Rugged Peak, 1,040m high and prominent, rises 11 miles W of it. A light is shown from a metal tower, 12m high, standing near the point.

The coast between Punta San Fermin and Punta Diggs, 27 miles N, is low and sandy. The coastal range, with peaks up to 305m high, stands a few miles inland.

A shoal, with a least depth of 0.3m, was reported (1971) to lie about 6.5 miles SE of Punta Diggs.

Punta Estrella is located 3.5 miles N of Punta Diggs. A light is shown from a round tower, 10m high, standing near this point. A light is also shown from a structure standing about 10 miles S of Punta Diggs.

Punta San Felipe (31°03'N., 114°49'W.), a rocky headland, is located 13 miles N of Punta Diggs and a dark hill, 286m high, rises close behind it. A light is shown from a prominent round tower with a dwelling, 22m high, standing near this point.

Bahía San Felipe, lying close S of the point, provides shelter from NW winds, but the depths are shallow, being less than 5.5m up to 1 mile offshore. A quay, protected by breakwaters, is situated in the bay and a lighted range indicates the approach to it.



San Felipe Harbor

3.42 La Encantada (Montana Calamajue) (31°00'N., 115°22'W.), the tallest mountain in Baja California, is 3,086m high and rises 28 miles W of Punta San Felipe. This mountain has a whitish appearance with a jagged summit and is very conspicuous.

Roca Consag (31°07'N., 114°29'W.), a small and high islet, lies 18.5 miles E of Punta San Felipe. It has been whitened by the deposits of sea birds and resembles a sailing ship. A light is shown from a round tower, 6m high, standing on this islet.

Several detached rocks, up to 8m high, lie up to 0.5 mile W of this islet.

Caution.—The tidal currents cause heavy tide rips to occur in the vicinity of Roca Consag.

The Rio Colorado

3.43 Punta Sargento (31°38'N., 114°46'W.), located 37 miles N of Punta San Felipe, is a low point backed by gradually rising plains. A light is shown from a structure, 9m high, close N of the point. Extensive drying flats and banks extend up to 6 miles seaward from the shore in the vicinity of the point.



San Felipe Light

The entrance of the Rio Colorado, which extends up to 1,700 miles inland, may be considered to lie between Punta Sargento, on the W side, and Punta Bajo, 27 miles ESE. The inner part of this entrance is fronted by Isla Montague, Isla Pelicano, Isla Gore, and several drying mud flats. The islands are all subject to flooding at HWS or during freshets. A light is shown from a metal tower, 11m high, standing on Isla Montague.

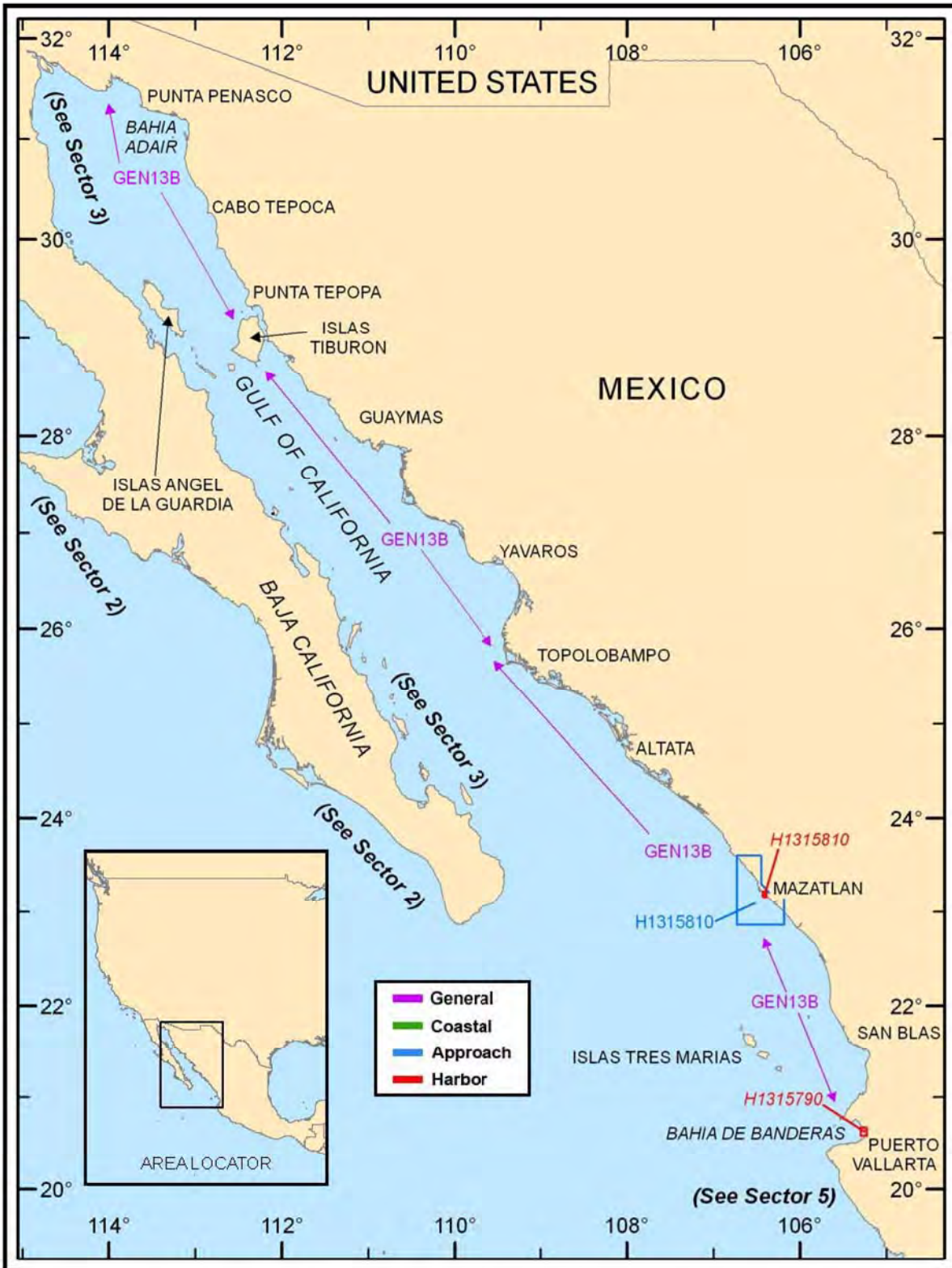
The main entrance channel of the river leads close E of the islands and has a depth of 4.6m as far NW as Philips Point, 25 miles above the mouth. Above this point, the channel becomes narrow and tortuous, and navigation is more difficult.

The mud flats lying in the mouth of the river are constantly shifting and under no circumstances should vessels attempt to use the passages separating them without local knowledge. The river should be entered on the first of the flood tide and departure should be taken on the last of the ebb. The tidal currents run very strongly and attain rates of up to 6 knots at springs. There is no slack water and tidal bores are known to occur at or near the time of springs in the vicinity of Philips Point. The influence of the tides is felt as far as La Bomba, the head of navigation, about 22 miles above Philips Point.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 4 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 13 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 4 — DNC LIBRARY INFORMATION

SECTOR 4

WEST COAST OF MEXICO—GULF OF CALIFORNIA

Plan.—This sector describes the W coast of Mexico and adjacent islands on the E side of the Gulf of California, from the Rio Colorada to Cabo Corrientes. The descriptive sequence is SE.

The Rio Colorada to Guaymas

4.1 Punta Bajo (Punta Baja) (31°33'N., 114°19'W.), the E entrance point of the Rio Colorada, is low, sandy, and fronted by shoal ground extending up to 0.5 mile offshore. A bare sand hill, 91m high, rises immediately behind this point.

Colina de la Direccion (31°47'N., 114°30'W.) rises behind a slight projection of the beach, 9 miles NW of Punta Bajo. This hill is 170m high and may be easily identified by a growth of bushes at its foot.

Bahia de Adair (31°29'N., 113°50'W.), a wide and deep indentation, is filled with dangerous shifting shoals and should not be entered even by the smallest coaster. A lagoon, fronted by drying sand spits, opens into the NW part and a low plain stretches far into the interior from the shore.

A light is shown from Punta Borrascosa, the NW entrance point of Bahia de Adair. Cerro Pinacate, the northernmost summit of a mountain range standing in the interior, is 1,291m high and rises 25 miles NE of the central part of the bay.

Punta Choya, the E entrance point of the bay, is bold and rocky. Cerro Plano (Flat Hill), a conspicuous dark and isolated hill, is 130m high and stands 4.5 miles NNE of the point.

Bahia de Punta Penasco (31°18'N., 113°37'W.) is entered between Roca del Toro (Punta Choya) and Punta Penasco, 5.5 miles ESE. It is small, open, fringed by foul ground extending up to 0.5 mile offshore, and backed by a sandy beach.

4.2 Puerto Penasco (31°19'N., 113°35'W.) (World Port Index No. 15860), a small loading port with limited facilities, lies at the head of the bay. A small finger pier, with a depth of 4.9m alongside, extends from the shore abreast the town and is served by a spur of the Southern Pacific Railway. A lighted range, bearing 116°, is shown from two pyramidal metal towers standing at the port.

Anchorage can be taken, sheltered from NW winds, in depths of 9 to 11m, on a line joining the entrance points of the bay.

Bahia de San Jorge (31°08'N., 113°08'W.) lies between Punta Penasco and a low, sandy peninsula, 27 miles SE. Behind the low and sandy shores of the bay are plains that extend inland to the foot of the mountains. A dangerous bank, with depths of 0.9 to 1.8m, extends 3 miles W from the peninsula and the passage leading between its outer edge and Isla San Jorge has depths of 7.3 to 12.8m. Shoal ground extends 1 to 3 miles seaward near the head of the bay. At HW, small vessels may enter a lagoon, which lies 6 miles E of Punta Penasco.

4.3 Isla San Jorge (31°01'N., 113°16'W.), a barren and rocky islet, lies 7 miles WSW of the S entrance point of Bahia

de San Jorge and is marked by a light. Foul ground extends up to 1 mile NW from this islet. Anchorage can be taken, in a depth of 6m, to the N of the islet.

The coast between Bahia de San Jorge and Cabo Tepoca, 49 miles SSE, is low, sandy, and backed by sand hills. Depths of less than 5.5m lie between 0.5 and 1 mile from the shore.

The **Rio de la Concepcion** (30°30'N., 113°00'W.) is a river that is noticeable by a gap in the sand hills, through which it breaks in the wet season. A light is shown at the river mouth, which is fronted by an extensive bank. The N extremity of the coastal range of mountains in this vicinity can be viewed from close S of the river.

The coast between the mouth of the Rio de la Concepcion and Cabo Tepoca, 17 miles SSE, consists of low sand dunes.

Cabo Tepoca (30°16'N., 125°53'W.), 91m high and reddish in color, is backed by a group of hills. This cape is fringed by sunken rocks and marked by a light. Pico Tienda de Campana, 746m high, and Monte Plano, 480m high, rise 9 miles ESE and 6 miles ENE, respectively, of the cape. These hills are prominent and very similar in appearance when viewed from the S, both being square-shouldered with a sharp peak in the center.

Bahia Tepoca, lying close E of Cabo Tepoca, provides good anchorage, sheltered from NW winds, in a depth of 9m, about 0.5 mile offshore.

Monte Obscuro, another prominent landmark, rises 9 miles NNW of the cape. This mountain first appears as a dark, red, and flat-topped island, then later as a bluff rising to the W.

Cabo Lobos (29°54'N., 112°45'W.), 214m high, is located 23 miles SSE of Cabo Tepoca and marked by a light. This rocky headland is backed by a group of hills and fringed by sunken rocks. Cerro Lobos, 361m high, stands close to the coast 3 miles N of this cape and a prominent peak, 501m high, stands 6 miles N of it.

Anchorage, sheltered from NW winds, can be taken, in depths of 14 to 15m, about 0.5 mile offshore within the bight lying E of Cabo Lobos.

4.4 Puerto Libertad (29°54'N., 112°40'W.) (World Port Index No. 15976), fronting a power station, consists of a pier, formed by dolphins. It is connected to the shore by a catwalk, 900m long, and provides a berth which can accommodate tankers of up to 60,000 dwt and 12.8m draft.

Pilots are available and board at Guaymas. It is reported that a racon is situated at the pier.

It is reported that good anchorage can be taken, in a depth of 50m, about 0.8 mile SW or NW of the pier.

Cabo Tepopa (29°23'N., 112°25'W.), located 36 miles SSE of Cabo Lobos, is a bold, rocky headland backed by a group of hills. Cerro Tepopa, the tallest hill is 566m high and rises close inland. The intervening coast between the two points consists of sandy beaches, with occasional rocky bluffs, which are backed by a coastal range. A light is shown from the mouth of the Rio San Ignacio, 9 miles N of Cabo Tepopa.

Punta Sargento (29°38'N., 112°46'W.), located 7 miles SE

of Cabo Tepopa, is formed by a barren, rocky hill. It is connected to the mainland, on the N side, by a narrow isthmus which covers at HWS.

Anchorage can be taken, in a depth of 13m, about 0.5 mile offshore within the small bight lying close W of the point. The small bay lying close E of the point is shoal and should be avoided.

4.5 Isla Patos (29°16'N., 112°27'W.), small and steep-to, rises to a height of 84m on its NW side. This island is marked by a light and has been whitened by the deposits of sea birds. During NW winds, anchorage can be taken, in a depth of 9m, sand, off the S side of the island. Shoals front a low point located at the SW side of the island and vessels should not approach within 0.3 mile of the coast in this vicinity.

Isla Tiburon (29°00'N., 112°21'W.), the largest island in the Gulf of California, is bold and rugged with peaks 328 to 1,218m high. The summit of the island stands in the central part. Canal del Infiernillo, which lies between the E side of the island and the mainland, is obstructed by numerous shoals in its N part and should be avoided, even by very small vessels.

The E coast of the island is generally low and sandy up to within 5.5 miles of its SE extremity. The coast extending S of this point is backed by steep, rocky bluffs.

The SE extremity consists of a high headland located at the outer end of a narrow peninsula on which there are two hills separated by a strip of low land. Anchorage can be taken by vessels with local knowledge, in a depth of 9m, within the bight lying N of the peninsula.

A sandy beach extends 3 miles WSW and fringes the shore between the SE extremity of the island and Punta Monumento, the S extremity.

Punta Risco Colorada, a sharp and rocky point of reddish-color, is located 2.5 miles WNW of Punta Monumento. Good anchorage can be taken, in a depth of 9m, about 0.3 mile offshore within the bay lying between the two points.

Punta Willard (28°53'N., 112°35'W.), the W extremity of the island, is 105m high and marked by a light. White Rock (La Predra Blanca), 9m high, lies close offshore, 3.8 miles ESE of this point.

The coast extending N between Punta Willard and the NW extremity of the island is generally steep and is backed by mountains which rise abruptly from it.

Bahia Agua Dulce (29°12'N., 112°24'W.), entered close E of the NW extremity of the island, provides anchorage, in depths of 9 to 11m, about 0.7 mile offshore.

4.6 Isla Turners, a small and barren island, lies 1.2 miles SE of Punta Monumento. It is marked by a light and is 167m high. Roca de la Foca, 46m high, lies about midway between this island and the point. The passage leading N of the rock has a depth of 9m, but should not be attempted without local knowledge.

Isla San Esteban (28°42'N., 112°35'W.), 540m high in the center, lies 9 miles S of Punta Willard. It is barren, rocky, and fronted by shoals and rocks, which extend up to 0.8 mile seaward in places. The channels leading E and W of this island are deep and clear of dangers.

Isla San Pedro Martir (28°22'N., 112°20'W.), 321m high, lies 22 miles S of Punta Monumento. This island is high, bar-

ren, and mostly steep-to.

Punta Granito (28°59'N., 112°10'W.), located 21 miles SSE of Punta Sargento, is low, sandy, and fringed by shoals which extend up to 0.8 mile seaward on its S side. This point marks the E side of the S entrance to Canal del Infiernillo.

Punta Kino (28°45'N., 111°58'W.), a conspicuous point, is located 17.5 miles SE of Punta Chueca (Punta San Miguel) and backed by a group of hills, up to 406m high.

Bahia Kino, which is mostly shallow, lies between this point and a dark bluff, 53m high, 7.5 miles NNW. Anchorage within this bay can only be taken by small vessels. Isla Pelicano, 165m high, lies at the outer edge of a shoal bank which extends 1 mile seaward from the N side of the bay.

The coast between Punta Kino and Estero de Tastiola, 35 miles SE, is low, sandy, and known locally as San Juan Bautista Flats (Llanuras de San Juan Batista). The Rio de la Poza divides into several branches in the vicinity of this stretch of coast and disappears into the flats during the dry season. During the rainy season, the flats are covered and the overflow of sand is carried out into the gulf, creating extensive shoals.

4.7 Punta Baja (28°28'N., 111°42'W.), which is marked by a light, is a low sandy point extending 1 mile from the general line of the coast, 22 miles SE of Punta Kino. A sand spit, with depths of less than 5.5m, extends up to about 4 miles SW from the point. This spit is reported (1994) to be extending further to the W and SW. A detached shoal patch, with a depth of 9.1m, lies about 10.5 miles WNW of the outer end of the sand spit and it is reported that less depths than charted probably lie between this patch and the spit.

Anchorage can be taken by vessels with local knowledge, in depths up to 11m, off the outer end of the shoal ground, which extends about 1 mile seaward from the entrance of Estero de Tastiola.

Cerro Bocana (Morro Colorada), located 5 miles SE of Estero de Tastiola, is a conspicuous and reddish-colored headland, 231m high.

Las Piedras Blancas, a group of three white rocks located about 1.5 miles apart, lies 0.8 mile offshore, between Punta Lesna (28°13'N., 111°24'W.), which is marked by a light, and Punta Blanca, 5.5 miles SE. The largest rock of the group is 18m high; the others are 4m high.

4.8 Punta San Pedro (28°03'N., 111°16'W.), 160m high, is a bold and rocky headland located 22 miles SW of Estero de Tastiola. This headland forms the NW entrance point of Bahia de San Pedro, a small and sheltered bay. Anchorage, sheltered from NW winds, can be taken by vessels with local knowledge, in a depth of 9m, about midway between the entrance points of this bay.

Isla de San Pedro Nolasco, a barren and steep-to island, lies 8 miles SW of Punta San Pedro. It is 326m high and marked by a light.

Punta San Antonio (27°57'N., 111°07'W.), a low and rocky point, lying 10 miles SW of Punta San Pedro, is backed by hills of moderate elevation. Las Tetas de Cabra, two remarkable peaks, rise to an elevation of 498m about 0.5 mile E of the point and are excellent landmarks.

Isleta Venado, a steep and rocky islet about 46m high, is the largest and outermost of three islets, known as Los Algodones,

which lie within 1.5 miles of the coast about the same distance NW of Punta San Antonio.

Punta Doble (27°55'N., 111°06'W.), located 1.5 miles SE of Punta San Antonio, is the S extremity of a headland, 75 to 100m high, which projects about 1 mile S from the general line of the coast. Isla de Santa Catalina, a rock, is 45m high and lies close to the coast, about 0.2 mile N of this point. Punta San Guillermo, which is marked by a light, is a rocky point that projects from the E side of the headland.

Bahia de San Carlos (27°56'N., 111°04'W.) forms a small, landlocked harbor which is entered 2 miles E of Punta Doble. This harbor, which is a resort area, provides shelter for small vessels with local knowledge. Care should be taken as several islets lie off the entrance and two dangerous wrecks lie in the inner part. There are depths of 6 to 13m in the approaches, but only depths of 1 to 3m in the harbor. A light is shown from the vicinity of the entrance.

4.9 Ensenada San Francisco (27°55'N., 111°01'W.), a large and open bay, is of little importance. Ensenada de Bocochibampo, a small bay, is entered at the E side of Ensenada San Francisco and provides anchorage, in depths of 15 to 18m, within its entrance. Care should be taken as the depths decrease rapidly toward the head of this bay. Anchorage can also be taken, in depths of 7 to 8m, about 0.5 mile offshore within the NE corner of the bay.

Cerro de Bocochibampo, with two prominent peaks, is 500m high and rises on the N side of the Ensenada de Bocochibampo.

Between Ensenada de Bocochibampo and Cabo Arco, 3 miles S, the coast is fronted by several above-water rocks and islets which lie up to 0.3 mile offshore.

Cabo Arco (27°52'N., 110°57'W.) is a high and rocky bluff with a hill, 250m high, rising close behind it.

Cabo Haro (27°50'N., 110°53'W.), a prominent rocky and steep-to headland, is located 3.8 miles ESE of Cabo Arco. A hill, joined to the mainland by a narrow isthmus, rises on the W side of this cape and is 111m high. A light is shown from the cape.

Punta Narizon (27°52'N., 110°53'W.), a prominent point, is located 1 mile NNE of Cabo Haro. It is composed of high, rocky bluffs which rise inland to Cerro Narizon, a peak, 274m high. Bahia Catalina, entered 0.5 mile N of the point, is a small and well-protected cove which provides shelter for small craft in depths of 6 to 15m.

Isla San Vicente (27°53'N., 110°52'W.), lying 0.8 mile NE of Bahia Catalina, is separated from the mainland by a narrow, shallow channel. A shoal, with a depth of 6.4m, was reported (1980) to lie about 0.2 mile E of the NE extremity of this islet.

Isla Pitahaya, a high and rocky island, lies 0.3 mile NW of Isla San Vicente.

Caution.—Less water than charted was reported (1985) to lie in the vicinity of Cabo Haro.

4.10 Isla de Pajaros (27°53'N., 110°50'W.), a long and rocky island, lies 0.8 mile NE of Isla San Vicente and rises to a height of 90m near its SE side. This island forms the E side of the entrance to Bahia de Guaymas and is connected to the S side of Playa de las Dolores, a long and narrow peninsula, by a shallow bank. Isla Morrito, a small and rocky island, is con-

nected to the W end of the peninsula. A light is shown from a structure standing on the SW extremity of Isla de Pajaros.



Isla de Pajaros Light

Bahia de Guaymas (27°55'N., 110°52'W.), within which lies the port of Guaymas, is entered between Isla San Vicente and Isla de Pajaros.

Guaymas (27°55'N., 110°55'W.)

World Port Index No. 15850

4.11 Guaymas, the largest and most important port within the Gulf of California and is primarily an import/export center for agricultural equipment and cotton. Guaymas consists of an outer, a middle, and an inner harbor. The inner harbor lies off to the west of the middle harbor.

The E part of this inlet is occupied by a large and shallow area known as La Laguna, which is separated from Estero del Rancho to the N by a railroad embankment. The port facilities are sheltered by the high hills to the N and W and by the islands to the S.

Port of Guaymas Home Page

<http://www.puertodeguaymas.com>



Guaymas (middle) Harbor

Winds—Weather.—The prevailing winds are from the W in the spring, from the S in the summer, and from the NW during the rest of the year. Violent storms of relatively short dura-

tion, known locally as Chubascos, occur during the months of July, August, and September. Storms of similar character occur in October and usually last for several days.

Generally, the prevailing winds and weather found along the E side of the Gulf of California are very similar to those encountered along the W side. Information regarding the currents along this coast is rather meager and somewhat contradictory. The currents probably depend almost entirely upon the winds. The currents setting between Guaymas and Cabo Corrientes are strong and irregular during the rainy season, between May and November. Currents setting N are frequently encountered during this season, but currents setting S normally predominate. Tide rips are often observed along the edges of the shoals that lie off the coast.

Fog is occasionally encountered in the vicinity of the port, but it is usually of a short duration, seldom lasting for more than 8 hours. Mirages are quite common and instances of peculiar refraction have been reported.

Depths—Limitations.—The entrance channel is 2,500m in length with depths of 13m currently being dredged to 11.8m within the middle harbor.

The outer harbor, which provides anchorage, is protected by Isla de Pajaros and is the deepest part of the port. A fishing harbor is located in the harbor adjacent to Isla Pitahaya.

The middle harbor can be entered, by vessels from the S between Isla Morrito and Punta Baja, and extends NNW with all the main berths and tanker terminals at its head. See the follow-

ing table titled **Guaymas—Berth Characteristics** for details.

The inner harbor can be entered by only small craft. Isla Almagre Grande separates the middle harbor from the inner harbor. Most of the inner harbor is encumbered by shoal patches with depths of less than 3.5m. There are approximately 30 berths having lengths of up to 95m and alongside depths of 3 to 5m; facilities include a shipyard and a naval zone.

Aspect.—Upon close approach to the port, the cathedral standing in the town, with two yellow steeples, is conspicuous. Numerous towers, several tanks, and a water tower are all prominent. A large grain silo standing next to a tower on Muelle Sur Wharf is reported to be very conspicuous. An outer lighted fairway buoy marks the approach channel. The fairway is marked by buoys and indicated by lighted ranges which may best be seen on the chart.

Pilotage.—Pilotage is compulsory; three port pilots available for this purpose between the hours of 0800 and 1800 local time. However, arrangements for a pilot outside of these hours can be made if necessary, but it is generally advised to wait until daylight to enter the port.

Pilots will board S of Isla de Pajaros Light in position 27°52'08"N, 110°50'42"W as shown on the chart. A special anchorage area, best seen on the chart and designated for this purpose, is located close E and S of the pilot boarding position. A mooring buoy has been placed within this area at position 27°52'00"N, 110°50'40"W.

Guaymas—Berth Characteristics			
Berth	Length	Depths	Cargo type handled
Banda Este			
M1	297m	3.0m	Containers
M2	200m	11.0m	Multi-purpose
M3	177m	11.0m	Multi-purpose
M4	200m	11.0m	Multi-purpose
Banda Sur			
M5	175m	13.0m	Bulk cargo
M6	175m	13.0m	Cement
Ardilla Wharf	110m	6.7m	Multipurpose
PEMEX Tanker Berths			
Espignón—East	230m	—	Discharge of clean products—See Note 1
Espignón—West	230m	—	Discharge of clean products—See Note 1
Marginal Berth	120m	—	Petrochemicals—See Note 2
Other Berths			
CEMEX	155m	10.97m	Cement
Ro-ro	65m	—	Vehicles
Notes:			
1. Both PEMEX berths can accommodate tankers up to 60,000 dwt and maximum draft of 9.14m at LW with no beam restrictions.			
2. Tankers up to 30,000 dwt with maximum draft of 9.14m at LW and maximum beam of 7.31m can be accommodated at this berth.			

Regulations.—The vessel's ETA should be sent 72 hours, 24 hours, and 12 hours before arrival during office hours. Office hours are from 0900 to 1400, Monday through Friday, and 1000 to 1300 on Saturday, all local time. All ETA messages should include the following:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

Contact Information.—See accompanying table titled **Guaymas—Contact Information.**

Guaymas—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone:	521-622-2224876
Facsimile	521-622-2224876
E-mail	delgys@gys.megared.net.mx
Port Authority	
VHF	VHF channels 13 and 16
Telephone	521-622-2222250
	521-622-2225360
	521-622-2243443
Facsimile	521-622-2222250
E-mail	apiguay@apiguay.com.mx
Harbormaster	
Telephone:	521-622-2243500
Facsimile	521-622-2222696
PEMEX Oil Terminal	
Call sign	Pemex Operations
VHF	VHF channels 9 and 12

Anchorage.—Good anchorage can be taken, in depths of 10 to 26m, fine sand, in vicinity of the outer fairway lighted buoy. The best anchorage for the middle and inner harbor is 0.5 mile W of Isla Morrito, in depths of 7m, good holding ground.

Caution.—The coast between Cabo Haro and Punta Bajo should be given a wide berth.

It has been reported that the color of the buoys marking the fairway may be affected by bird droppings and the shapes distorted by sunbathing seals.

It is also reported that deposits of silt accumulate between the mouth of Viejo Yaqui and the entrance to Bahía de Guaymas, 11 miles W. Vessels navigating inshore should approach this part of the coast with caution.

Guaymas to Topolobampo

4.12 The coast between Isla de Pajaros and Cerro Yacicoris, 12 miles E, is composed of a low and sandy beach known

as El Cochore.

Cerro Yacicoris (27°50'N., 110°37'W.), a conical hill, is 115m high and stands on the W side of the entrance to the Rio Viejo Yaqui, a large and shallow inlet, which is navigable only by boats. Cerro Cochis (Cerro Tordillo), a prominent hill, is 166m high and rises 4 miles WNW of Cerro Yacicoris.

Bacatete (28°00'N., 110°22'W.), a prominent peak, is 1,019m high and stands 16 miles ENE of the mouth of the Rio Viejo Yaqui.

The **Rio Yaqui** (27°37'N., 110°37'W.) flows into the sea through three outlets, which from a short distance look like lagoons. A sand bank, which breaks, fronts these outlets and extends up to 2 miles offshore. A light is shown from a tower standing 3 mile S of the entrance to the Rio Yaqui.

Baroyeca, a prominent mountain, is 1,005m high and rises 48 miles E of the Rio Yaqui.

Punta Lobos (27°20'N., 110°38'W.), located 17 miles S of the Rio Yaqui, is a low and sandy island, which is separated from the mainland by a lagoon. A light, equipped with a racon, is shown from the point. Monte Verdi, a conspicuous green mound, is 23m high and rises 2 miles from the W end of the island.

Vessels are advised to pass at least 10 miles seaward of this point because of reported extensive shoaling to the W and NW of it. Strong variable currents are often encountered in the vicinity of Isla Lobos and fog is fairly common.

A light is shown from a structure standing 5 miles NE of Punta Lobo, at the mouth of Estero Lobos.

4.13 Estero de Huivuilay (Bahía Tovari) (27°01'N., 109°58'W.) is an extensive lagoon which is fronted by several low and narrow islands extending up to about 15 miles NW and S of it. The channel leading into this shallow lagoon is about 0.5 mile wide, but is available only to small craft with local knowledge.

During fine weather, anchorage can be taken anywhere along the coast between Estero de Huivuilay and Punta Lobos, but vessels should stay about 3 miles offshore and keep in depths of over 11m.

Punta Arboleda (26°47'N., 109°52'W.), marked by a light, is located at the S end of an island which is separated from the mainland by the lagoon. The only trees found in this vicinity stand on the island and are an excellent landmark.

Estero de Sante Lugarda, which is obstructed by a shallow bar, lies 4 miles SE of Punta Arboleda and forms an entrance of the lagoon into which the Rio Mayo discharges.

Punta Rosa (26°40'N., 109°41'W.), a low and reddish-colored point, is located 11 miles SE of Punta Arboleda and marked by a light. The intervening coast consists of a low, sandy beach backed by yellowish sand dunes, 15 to 25m high. Good shelter can be taken within Bahía de Santa Barbara which lies close E of Punta Rosa. Anchorage can be obtained, in a depth of 13m, about 1 mile offshore, but the bay is entirely exposed to SW winds.

Puerto de Yavaros (26°41'N., 109°30'W.), a small harbor, lies within an enclosed bay which is entered between Punta Yavaros and Punta Lobera, the E extremity of Isla Lobera. A light is shown from the N side of this bay. The approach channel is protected by a stone breakwater which extends about 2 miles SSE from a position 0.6 mile WSW of the E extremity of

Isla Lobera. The narrow fairway leading E of this breakwater is reported (1964) to have a least depth of 2.4m on the bar. Within the bar, the depths increase and the channel narrows. A berthing facility at Yavaros has sufficient depths alongside and can be used by any vessel able to enter. A small wharf for the use of fishing vessels fronts the town. Pilotage is compulsory. Anchorage can be taken close outside the bar, in a depth of 18m, good holding ground.

4.14 Estero de Agiabampo (26°19'N., 109°16'W.), the entrance to an extensive lagoon, lies 27 miles SE of Puerto de Yavaros. The intervening coast is low, sandy, and covered with bushes. Pico de Alamos, a sharp and prominent peak, is 1,791m high and rises 31 miles ENE of Puerto de Yavaros. The entrance is difficult to identify and is obstructed by shoals and sand bars which extend up to 1 mile offshore. A light is shown from the S side of the entrance. The lagoon is accessible only to small craft with local knowledge. Observation Hill, a sand dune surmounted by a wooden cross, stands opposite the S end of the sand bar and serves as an aid when entering. A current, with a rate of 2 to 3 knots, is usually experienced in the vicinity of the bar and local knowledge is required. Anchorage can be taken, in a depth of 12m, about 1.8 miles offshore and W of Observation Hill.

Punta Ahome (25°56'N., 109°27'W.), the N entrance point of the Rio Fuerte, is located 25 miles SSW of Estero de Ahome. It is a low, sandy point which projects 1 mile from the general line of the coast. The river can only be used by small craft with local knowledge. Cerro del Cocodrilo, a prominent flat-topped hill, is 126m high and stands 6 miles NE of the point. Sierra de San Pablo, 617m high, rises 19 miles E of the point.

Punta San Ignacio (25°36'N., 109°23'W.), a low point, is located at the S end of a small, sandy island lying 19 miles S of Punta Ahome. The intervening coast is fronted by Isla de las Piedras and Isla de la Lechuguilla, which are both backed by an extensive lagoon with low, marshy land extending along its E side.

A dangerous breaking shoal extends up to 3 miles offshore in the vicinity of Punta San Ignacio. Vessels should give this area a wide berth as the shoal has been reported to have extended farther SE.

Isla de Santa Maria, a low island, lies close E of Punta San Ignacio. Its shore consists of a steep beach backed by a range of sand dunes, 15 to 30m high. Good anchorage, protected

from NW winds, can be taken, in depths of 11 to 13m, within Bahía de San Ignacio, which indents the S coast of the island.

4.15 Farallon de San Ignacio (25°27'N., 109°24'W.), 142m high, lies 10 miles S of Punta San Ignacio. This island is barren, white-colored, and marked by a light. A few detached rocks lie close off the N side, but elsewhere the island is steep-to.

Bahía de Topolobampo (25°33'N., 109°09'W.), an extensive inlet, is entered between Punta Santa Maria, located on the E end of Isla de Santa Maria, and Punta Copas, 2.5 miles E. The town of Topolobampo stands along its N shore.

It was reported (1994) that Punta Santa Maria shows only at LW and that Punta Copas is receding to the SE.

Cerro Partido, 78m high, lies 2 miles ESE of Punta Copas and is marked by a light. A prominent bald-faced cliff stands close S of the summit of this hill. Monte San Carlos, 249m high, rises 4 miles NE of Cerro Partido and is the tallest peak on the S side of the bay. Cerro Babiri Chico, 76m high and round, stands on the N side of the bay, 2.3 miles NNE of Punta Copas. A white church, with an illuminated cross, stands on its summit. Joroba del Camello, 273m high, is the tallest peak on the N side of the bay. Three conspicuous oil tanks are situated in the town.

The greater part of the bay is obstructed by shallow flats. Several narrow, winding channels lead through these flats to the town, 6 miles above the entrance. Above the town, the bay opens out into Bahía de Ohuira (Bahía San Carlos), an extensive and shallow lagoon of no commercial importance.

Topolobampo (25°36'N., 109°04'W.)

World Port Index No. 15830

4.16 Topolobampo lies on the coast of the Gulf of California, at the confluence of the Ohuira Bay and the Topolobampo Bay. The port serves the city of Los Mochis which stands 12 miles inland. There are private facilities for general cargo, container, bulk, LPG, oil, and ferry vessels.

Winds—Weather.—During March and April, NW winds prevail and raise a breaking sea over the bar. The climate is predominantly dry and warm with a mean annual temperature of 22°C. The rainy season usually begins at the end of June and is said to be variable in duration.

Topolobampo—Berth Characteristics			
Berth	Length	Depths	Remarks
API	99m	9.5m	General cargo
API	240m	12.0m	Containers
API	150m	6.5m	Ferry dock
Sematur	62m	9.0m	Ferry dock
Transoceanic Dock	135m	11.0m	Passengers and dry bulk. Maximum draft allowed is 10m
Cemex Dock	70m	4.0m	Dry bulk
Fishing Dock Coop	60m	3.6m	Fishing dock
East Fishing Dock	170m	4.0m	Fishing dock

Topolobampo—Berth Characteristics			
Berth	Length	Depths	Remarks
North Fishing Dock	210m	4.0m	Fishing dock
Muelle Espigon	77m	4.0m	Fishing products
Fish Wharf	20m	3.0m	Fishing products
Propetopo Dock	39m	7.0m	Fishing products
Propetopo Dock No. 1	80m	6.5m	Fishing products
Propetopo Dock No. 2	57m	8.5m	Fishing products
PEMEX Tanker Berths			
North side	210m	15.0m	Petroleum products, LPG, and ammonia—See Note
South side	215m	15.0m	Petroleum products, LPG, and ammonia—See Note
Note. —Both PEMEX berths are located on either side of a finger pier and can accommodate tankers up to 43,700 dwt, 32m in width, and a maximum draft of 13.5m at HW.			



Topolobampo Harbor

Tides—Currents.—Tides rise about 1m at springs and 0.3m at neaps.

Strong E currents have been experienced in the vicinity of Bahia de Topolobampo and should be allowed for when making the approach. Strong currents also set across the bar and through the entrance channels.

Depths—Limitations.—The entrance channel is nearly 13.8 miles long, with a width of 200m and depths of 12m. An outer fairway lighted buoy is moored 3 miles S of Punta Santa Maria and marks the entrance to the narrow buoyed channel, varying between 0.1 mile and 0.5 mile in width and extending through Bahia de Topolobampo to Bahia San Carlos for 10 miles leading over the bar. Within the bar, the depths increase gradually and range from 18 to 31m in places.

A turning basin, with a depth of 12m and a radius of 225m, fronts the container dock.

Numerous berths available in the port are described in the table titled **Topolobampo—Berth Characteristics**.

Berthing and unberthing is carried out only during daylight hours and only at HW if vessel is at full draft.

Aspect.—A light is shown from a point on the S side of the bay, 4.5 miles SSW of Topolobampo. Three conspicuous oil tanks are situated in the town and a prominent white church

stands close SW of them. The entrance fairway is indicated by lighted ranges.

Pilotage.—Pilotage is compulsory for vessels larger than 3,000 grt and is available 24 hours. The pilot boards in the vicinity of Fairway Lighted Buoy (25°30'34"N., 109°12'49"W.).

Regulations.—The vessel's ETA should be sent to the harbor master, during office hours, 72 hours, 48 hours, 24 hours, and 12 hours. Office hours are from 0800 to 1700, local time. All ETA messages should include the following:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

Contact Information.—See the accompanying table titled **Topolobampo—Contact Information**.

Topolobampo—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	521-668-8620375
Facsimile	521-668-8620375
E-mail	snpptopo@prodigy.net.mx
Harbormaster	
VHF	VHF channel 16
Telephone	521-668-8620128
Facsimile	521-668-8620588
Port Authority	
Telephone	521-668-8620127
Facsimile	521-668-8620037
E-mail	apitopo@apitopo.com.mx

Anchorage.—Outer anchorage may be obtained about 1 mile SW of Fairway Lighted Buoy. Good anchorage is avail-

able outside the shoal, with depths of 20m, and in two areas inside the shoals sheltered from all winds, in depths of 13m, sand, although ships may pass close by and swinging room is limited.

Topolobampo to Mazatlan

4.17 Isla de San Ignacio (25°25'N., 108°55'W.), low and sandy, is the westernmost of the series of islands that front the coast between Topolobampo and the Rio Sinaloa, 40 miles ESE. The W end of this island lies 8.5 miles SE of Punta Copas and an extensive breaking shoal extends 2.5 miles W from it.

The peaks of Sierra de Navachista, up to 457m high, rise behind the lagoon which separates the island from the mainland. Isla Macapule, a large island lying close E, is separated from Isla de San Ignacio by a narrow, shoal passage leading into the lagoon. A light is shown from the W end of this island. Isla de Vinorama, a small and sandy islet, lies on the E side of the passage. Vessels should not attempt to use this passage without local knowledge.

The Rio Sinaloa, a river of no commercial importance, discharges into the sea through the passage, E of Isla Macapule. The discolored water discharged from this river can be seen for some distance offshore.

4.18 Estero de Playa Colorada (25°11'N., 108°23'W.), a shallow passage, lies 24 miles ESE of the E end of Isla de San Ignacio and leads into Estero Altamura, the next lagoon to the SE. It is fronted by shoals extending up to 3 miles offshore on which the sea constantly breaks. A light is shown from a structure standing on Punta Colorada and Yameto Light is shown from a structure standing on Bajos de Santa Maria, SE of the point. The depth on the bar, which fronts the passage, is subject to change and entry should not be attempted without local knowledge. Pilots are usually available at Mazatlan. Anchorage can be taken in depths of 9 to 11m, about 4 to 5 miles offshore, seaward of the bar.

Between Estero de Playa Colorada and Punta Colorada, 28.5 miles SSE, the coast is fronted by Isla Saliaca and Isla de Altamura, both low and sandy. Punta Colorada, the S extremity of the latter island, is a steep, rocky point. The passage leading into the S end of the lagoon lies between this point and Isla Baredito, to the SE. Entry should not be attempted without local knowledge. A shoal, on which the sea breaks heavily, extends across this entrance. A stranded wreck is reported to lie close off Punta Colorada. A light is shown from a structure standing near the N end of Isla Saliaca.

Pico Aguapepa, the westernmost of three prominent peaks, is 457m high and rises 22 miles NE of the N end of Isla Baredito. When bearing NE, this peak forms a good mark for identifying the entrance.

Isla Baredito, formerly separated from the mainland by a lagoon, is low and sandy. A breaking shoal extends about 4 miles SW from the S end of this island.

Isla Lucenilla, the next island to the SE, is low, sandy, and forms the seaward side of Bahia de Altata. The bay formerly served as the port for Culiacan, the capital of the State of Sinaloa, which is situated 32 miles inland. The entrance channel, which crosses a bar at the S end of Isla Lucenilla, is subject to frequent change and should not be attempted without local

knowledge. The village of Altata stands at the N end of the bay and has no facilities for working cargo.

A shoal of considerable extent, with a least known depth of 10m, lies about 12 miles SW of Altata.

Ensenada de Pabellon, the SE extension of Bahia de Altata, is fronted on its seaward side by Peninsula de Lucenilla. This latter body of water has no commercial significance.

The coast between the bar at the S end of Isla Lucenilla and Boca Tavala, 27 miles SE, consists of low, sandy beaches with no off-lying dangers.

4.19 Boca Tavala (24°15'N., 107°28'W.) is the outlet of the Rio San Lorenzo. It is also the entrance to a large lagoon which runs SE for over 30 miles and is enclosed by a narrow strip of land. Sierra de San Sebastian, a high range of mountains, rises inland of the lagoon, 15 to 25 miles from the coast. Pico Chuchamone, 1,507m high, forms the summit of this conspicuous range. A prominent chimney stands 2 miles NW of Boca Tavala and El Dorado Light is shown from a tower standing close E of it.

The **Rio Elota** (23°52'N., 106°58'W.), which becomes a torrent during the rainy season, lies 6 miles NW of Punta San Miguel. The mouth of the river dries during the dry season.

Punta San Miguel (23°48'N., 106°54'W.) is a rocky point fronted by several rocks. Cerro de la Vigas, a prominent and triangular hill, is 280m high and rises 2.5 miles ESE of the point. A rocky bluff is located 4 miles SE of the point; a prominent mound, 38m high, rises close behind it.

The Rio Piaxtla, a small stream, flows into the sea about 7.5 miles SE of Punta San Miguel and 3 miles N of Punta Piaxtla. Punta Piaxtla, marked by a light, is 48m high and the southernmost of two rocky headlands lying about 1 mile apart. Anchorage can be taken in depths of 9 to 11m, about 1 mile offshore, within the bay indenting the coast between the northernmost rocky headland and the mouth of the river.

Between Punta Piaxtla and the entrance to Mazatlan, 35.5 miles SE, the coast is mostly low, sandy, and free from off-lying dangers. Several prominent islands and rocks lie close offshore within 5.5 miles NW of Mazatlan and serve as good landmarks. **Isla Pajaros** (23°15'N., 106°30'W.), the northwesternmost island of the group, lies about 0.5 mile offshore. It is rocky, barren, and 122m high. Uneven and foul ground fronts the NW end of the island. A shoal patch lying about 1 mile N of the N end of the island was reported to break, but it was estimated to have a depth of not less than 9m as a heavy swell was running at the time. Good anchorage can be taken, in a depth of 11m, close NW of the island, but local knowledge is required.

Isla Venados, with Isla Lobos lying close S of it, lies 1 mile SSE of Isla Pajaros. It is barren, rocky, and connected to the mainland by a shoal bank. Bush Peak, the summit of Isla Venados, is 152m high and Cliff Peak, the summit of Isla Lobos, is 91m high.

The coast between Punta Codo, located on the mainland abreast Isla Venados, and Punta Tiburon, 2.5 miles SE, is fronted by an almost continuous sandy beach backed by lagoons. Inland, the terrain is low, flat, and treeless. The S part of this section of coast forms Bahia de Puerto Viejo.

Between Punta Tiburon and Isla Creston, 2 miles S, the coast is backed by high, rugged hills which stand on the W side of a broad peninsula.



Approach to Mazatlan

4.20 Isla Creston (23°11'N., 106°26'W.), which forms the W side of the outer harbor, is 152m high, marked by a light, and is connected to the peninsula by a causeway.

Hermano del Sur and Hermano del Norte, each 46m high, are the most prominent of a group of islets lying 0.8 mile NW of Isla Creston. Roca Tortuga, the outermost danger in this vicinity, is 1.5m high and steep-to.

Piedra Negra, the outermost island in the approach, lies 0.8 mile S of the E breakwater head. It is 2m high, steep-to, and marked by a light. Roca Anegada, a dangerous pinnacle rock, lies about 0.5 mile N of this island.

Isla Chivos (23°11'N., 106°25'W.), a partly-wooded and prominent islet, is 68m high and lies on the E side of the entrance channel, 0.5 mile E of Isla Creston.

Mazatlan (23°12'N., 106°25'W.)

World Port Index No. 15810

4.21 Mazatlan, an important harbor on the Pacific coast between San Diego and Panama, handles general cargo, ro-ro, tankers, and has accommodations for cruise vessels, plus a ferry terminal. The port, a large tourist resort, also serves as the largest fishing port on the Pacific coast of Mexico. The harbor area, lying 1 mile above the entrance, has been extensively reclaimed to provide ample alongside berthing facilities and depths for ocean-going vessels. The channel divides to the N of the harbor, forming two shallow estuaries of no commercial

importance.

Port of Mazatlan Home Page

<http://www.puerto-de-mazatlan.com.mx>

Winds—Weather.—During January to April, the presence of fog is common at the harbor entrance between 0600 and 1000. During July and August, the port is subject to violent squalls from off the land. These squalls are frequently accompanied by thunder and lightning.

Winds known as Chubascos are especially prevalent in May, sometimes reoccurring for several days. Dark clouds form on the mountains soon after midday and at about 1600, the wind from the SW suddenly veers to the ENE. This wind from the ENE often lasts until about 2000 and reaches force 8, sometime forces 10. These storm winds become less frequent toward the end of May, but sometimes occur again at the change of the season in October.

It is very hot during the rainy season, from June to September, but the heat is lowered by frequent showers and a cooling wind at night. During October, the operating of small boats and berthing of vessels may be difficult due to the swell in the harbor.

Tides—Currents.—The current sets W at the entrance, but the tidal effects predominate inside the harbor.

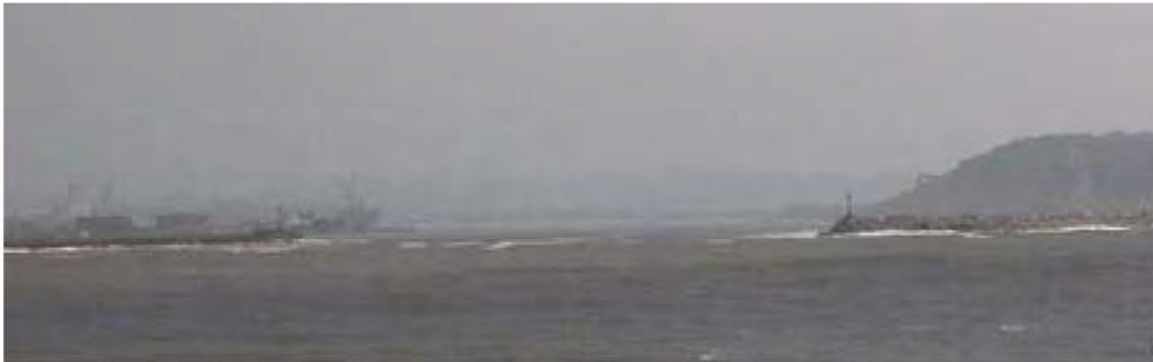
The mean spring range is 1m while the mean neap range is 0.4m. The current in the entrance channel sets S during the ebb and N during the flood. Vessels are recommended to enter the harbor at slack water if intending to use the turning basin. It is reported that the tidal currents can reach a rate of 2 knots.

Mazatlan—Commercial Berth Characteristics

Berth	Length	Depths	Cargo type handled
SEMATUR (two berths)	80m	12m	Ferries and general cargo
Ro-ro (two berths)	—	8.3m	Vehicles
PEMEX	90m	12m	Petroleum
Fiscal Wharf 1	265m	4m	Fishing
Fiscal Wharf 2	206m	8m	Fishing

Mazatlan—Commercial Berth Characteristics			
Berth	Length	Depths	Cargo type handled
Fiscal Wharf 3	160m	12m	General cargo, cars, containers, and cruise vessels
Fiscal Wharf 4	165m	12m	General cargo, cars, containers, and cruise vessels
Fiscal Wharf 5	356m	12m	General cargo, cars, containers, and cruise vessels
Fiscal Wharf 6	144m	12m	General cargo, cars, containers, and cruise vessels

Note.—The PEMEX berth can accommodate tankers up to 45,000 dwt, 201m in length, and maximum draft of 10.6m at HW. Berthing is only allowed during daylight hours.



Mazatlan—Breakwater Entrance



Mazatlan—Passenger berth from S

Depths—Limitations.—The harbor is entered between two short breakwaters, which extend seaward from Isla Creston and Isla Chivos. The access channel is 1,500m in length, with a width of 150m, continuing for another 1,500m within the port, leading up to the commercial berths and a turning circle. The depth in both segments of the channel is 12m. The turning circle has a 250m radius with a depth of 10m. A secondary channel, 1,060m in length with a width of 50m and depth of 7m, leads from the commercial berths NNE to the Muelle de Pesca,

where the Industrial Park and fishing port as well as shipyards are located.

The ferry terminal and ro-ro berths are located on the W side of the channel soon after passing N of the breakwaters. Close N of the ro-ro berths, still along the W side of the channel, is the Cruise Terminal, followed by the PEMEX Oil Jetty, then towards the end of the second channel length are the commercial berths.

A Naval Wharf, located close N of the commercial berths, is



Isla Creston

131m in length, with a depth of 4.5m alongside. The Industrial park provides berthing for fishing vessels along Muelle de Pesca, with a quay length of 1,060m and depths of 5.48m alongside.

See the accompanying table titled **Mazatlan—Commercial Berth Characteristics** for details on the berths in the lower harbor.

Aspect.—Prominent radio towers stand 0.8 mile NNE and 1.5 miles N of Isla Creston Light. A brewery, with a conspicuous tower, stands on the E side of the town, 1.5 miles NNE of the entrance.

Monte Silla, a conspicuous saddle-shaped hill, forms the summit of Isla Piedra. It is 72m high and rises 0.8 mile NNE of Isla Chivos.

The approach channel and entrance fairway are marked by buoys and indicated by lighted ranges. However, the range structures, especially the inner range, are reported (2002) to be difficult to identify at a distance, especially during the morning haze. A dangerous rock lies 1 mile S of the E breakwater.

Pilotage.—Pilotage is compulsory and is available 0800 to 1700 local time. However, special arrangements can be made for night pilotage if required. Vessels should send an ETA 24 hours in advance through their agent. Pilots will board S of Isla Creston in position 23°10'08"N, 106°25'27"W.

Contact Information.—See the accompanying table titled **Mazatlan—Contact Information**.

Anchorage.—Anchorage is designated by the Bar Pilots which in most cases will be outside the breakwaters in an area around Piedra Negra, in depths of 19 to 29m, as best shown on the chart. The holding ground is not good but the best possible place will in the NE part of the designated anchorage area. The entrance to the harbor must be kept clear at all times.

Caution.—It has been recommended (2002) that vessels not enter during periods of low visibility due to the narrowness of the entrance.

Mazatlan—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	521-669-9824701
Facsimile	521-669-9823396

Mazatlan—Contact Information	
E-mail	snppmzt@mzt.megared.net.mx
Port Authority	
Telephone	521-669-9823019
Facsimile	521-669-9823611
E-mail	apimaz@apimazatlan.com.mx
Harbormaster	
Telephone	521-669-9814265
Facsimile	521-669-9812204
Port Control	
Call sign	Mazatlan Port Control
VHF	VHF channels 12, 16, and 20

Mazatlan to Puerto de San Blas

4.22 The coast between Mazatlan and the Rio del Baluarte, 22 miles SE, is generally low and sandy with a growth of bushes and small trees. The Rio Presidio, lying 10 miles SE of Mazatlan, is navigable only by small boats during the dry season. A narrow lagoon parallels the coast between the entrance to this river and the Rio del Baluarte. It is backed, 8 miles inland, by a range of mountains. Cabeza de Caballo, a conspicuous peak, is 603m high and rises near the middle of this range. Pico del Metate, the northernmost peak of the range, is 914m high. It rises 15 miles NNE of the mouth of the Rio Presidio and is very conspicuous from seaward.

The **Rio del Baluarte** (22°48'N., 106°02'W.), like the Rio Presidio, is also navigable only by small boats during the dry season. A light is shown from a structure standing near the mouth of the river. Anchorage can be taken, in depths of 11 to 13m, of the mouth of the Rio del Baluarte, about 2 miles offshore.

Boca Teacapan (22°30'N., 105°45'W.), lying 22.5 miles SE of the Rio del Baluarte, is the outlet of two extensive lagoons. The mouth is marked by a light. A continuously breaking bar fronts the entrance and extends up to about 2 miles offshore. The lagoons are accessible only by small craft. Anchorage can be taken off the entrance, about 0.8 mile seaward of the outer edge of the bar.

A low and slightly projecting point extends from the coast 28 miles S of Boca Teacapan. A lagoon lies parallel along most of this stretch of coast. A light is shown from a structure standing about 3 miles N of this low point. Barra Mexcaltitan lies 18 miles S of the point. The countryside for many miles inland is low and level. Several hills, 275 to 490m high, rise 15 to 20 miles inland from the coast.

4.23 Barra Mexcaltitan (Estero Camichin) (21°47'N., 105°31'W.), the southernmost outlet of a lagoon, can be identified by a small settlement situated on its W bank, just above the entrance. Anchorage can be taken, in depths of 9 to 11m, about 1 mile off this outlet or, in a depth of 11m about 0.5 mile off Estero del Asadero, 7.5 miles SSE. A small shoal fronts the latter entrance. A light has been established in the vicinity of

position 21°46'N, 105°31'W, at the S arm of the lagoon.

Isla Isabel (21°53'N., 105°54'W.) lies 17 miles offshore, 22 miles WNW of Barra Mexcaltitan. This island is 85m high and two prominent white pinnacle rocks stand near its N end.

Caution.—A dangerous wreck has been reported (2011) to lie SE of Isla Isabella in position 21°50'24"N, 105°49'12"W.



Isla Isabel

The **Rio Grande de Santiago** (21°41'N., 105°27'W.) is fronted by a dangerous breaking shoal which extends up to 4 miles seaward. This river discharges into the sea, about 4.5 miles S of Barra Asadero. Piedra Blanca del Mar, a steep-to white rock, lies 5.3 miles WSW of the mouth of the river and is 44m high. This rock serves as a good landmark when approaching from the N or W.

4.24 Islas Tres Marias (21°33'N., 106°30'W.), a group of four islands of volcanic origin, lies within 40 miles SW of Isla Isabel. The W sides of the islands are high and barren, whereas the E sides are generally low and sandy with some vegetation. Isla Maria Cleofas, the southernmost island, is 402m high and surrounded by several detached rocks. A breaking reef extends 2.5 miles E and then 2 miles S from the NE extremity of this island. A yellowish bluff, surmounted by a steep hill, forms the SE extremity of the island. A well-protected lagoon, with a depth of 8.2m in the entrance, lies at the E side of the island. A light is shown from a structure standing on the SE side of the island.

Anchorage, protected from N and NE winds, can be obtained, in a depth of 22m off the SE end of the island.

Isla Maria Magdalena, the next island to the NW, is separat-

ed from Isla Maria Cleofas by a channel, which is 8.5 miles wide and free from dangers. This island is 457m high and has considerable vegetation. A constantly breaking reef, with shallow depths, extends 3 miles SE from a high yellow-colored bluff, which forms the E extremity of the island. The island is fronted by several above-water rocks which lie up to 0.5 mile seaward in places.

Isla Maria Madre, the largest island of the group, is separated from Isla Maria Magdalena by a channel, 4 miles wide, but breakers were reported to extend across its E part. The summit of the island is 616m high and rises in the central part, but a peak standing close SW of it is the most prominent.

A dangerous reef extends about 1 mile N from the NW extremity of the island; a detached rock lies 0.3 mile offshore, 2 miles S of the NW extremity of the island.

A penal settlement is situated about midway along the E side of the island and is fronted by a small mole.

Isla San Juanito, the smallest and northernmost island of the group, is separated from Isla Maria Madre by a channel, which is encumbered by numerous dangers. A prominent white rock, 45m high, lies 1 mile seaward of the SW side of the island. A light is shown from a structure standing on Punta Roca Colorada, the N extremity of the island.

Caution.—The Islas Tres Marias group serves as a prison colony and vessels are advised to keep well clear of the islands in order to avoid interception and detention by Mexican authorities.

4.25 Puerto de San Blas (21°32'N., 105°19'W.) lies along the E bank of a creek which is fronted at its entrance by a drying bar. There are depths of 3.6 to 5.5m over a small area within the bar, but elsewhere the harbor is shallow. Vessels anchor in the roadstead and work cargo from lighters.

The approach channel is indicated by a lighted range. Vigia Hill, 32m high, stands on the S side of the narrow peninsula, which forms the S and W sides of the creek. Castillo de la Entrada, a fort in ruins, stands on the SW side of this peninsula. Foul ground fronts the W side of the peninsula and extends up to 0.3 mile offshore.

A light is shown from a structure standing close W of Castillo de la Entrada.

Piedra Blanca de Tierra, a white rock, lies 1 mile SW of Castillo de la Entrada and is 16m high. It is flanked by two detached rocks, one to the NE and one to the SW. Good anchorage can be taken in the roadstead, in depths of 10 to 11m, about 0.5 mile SSE or in a depth of 8m about 0.5 mile E of this white rock. The anchorage is safe during the dry season and less dangerous than Mazatlan during the rainy season. However, it is advisable to avoid remaining here during the hurricane season, known locally as Cordonazos, which lasts from June to November.

A strong S set is usually experienced along the coast in this vicinity during the greater part of the year.

Puerto de San Blas to Cabo Corrientes

4.26 Punta Camaron (21°30'N., 105°17'W.) is a sharp and bluff point with a ridge of hills terminating close behind it. Several small islets and rocks lie close W of this point. The coast to the S of the point is mountainous, contrasting marked-



Faro de San Blas

ly with the low and sandy plains extending along the coast to the N.

Ensenada de Matenchén (21°30'N., 105°15'W.) is entered between Punta Camaron and Punta Santa Cruz, 5.5 miles SSE. This small, open bay is fringed by a shoal, which extends up to about 0.5 mile offshore in places, and provides excellent anchorage for small craft. Punta Santa Cruz, the S entrance point, consists of high reddish-colored bluffs and is very prominent.

Cerro San Juan (21°27'N., 105°00'W.), 2,301m high, rises 14 miles E of Punta Santa Cruz. This mountain is seldom obscured and resembles a saddle when viewed from the W.

4.27 Punta Los Custodios (21°21'N., 105°16'W.), 9m high, is located 5 miles SSW of Punta Santa Cruz. A river lies close S of this rocky bluff and a rock, 9m high, lies about 3 miles W of it.

Punta Raza, a reddish-colored bluff, is 9m high, marked by a light, and located 18.5 miles S of Punta Los Custodios. The coast between is steep-to with no distinguishing features.

Cerro Compostela, a prominent peak, is 1,300m high and rises 13 miles ENE of Punta Raza.

The coast between Punta Raza and Punta de Mita, 21.5 miles SW, is steep-to and consists of a series of bluffs rising inland to a high range of mountains. Cerro Vallejo, the most prominent peak of this range, is 1,535m high and rises 9 miles SE of Pun-

ta Raza.

Punta de Mita (20°46'N., 105°33'W.), marked by a light, is formed by a low, narrow neck of land, which is surrounded by foul ground extending up to 0.5 mile offshore. A dangerous breaking shoal, with a rock awash on it, lies about 1 mile SSW of the point. The passage lying between the point and this shoal has depths of 5 to 7m. A prominent hill, 138m high, rises 1.5 miles NE of the point.

Good anchorage can be taken, in depths of 9 to 13m, about 1.5 miles E of the point, between 0.5 and 0.7 mile offshore.

A dangerous rock, with a depth of 1m, was reported (1978) to lie about 2.5 miles SSW of Punta de Mita.

Las Tres Marietas (20°41'N., 105°36'W.) is a group of islets, rocks, and shoals, about 5 miles long, lying with its E extremity located 4.2 miles SSW of Punta de Mita. The easternmost and largest islet of this group rises in a series of broken, white cliffs to a flat-topped summit, 55m high. A steep-to rock, 4m high, forms the westernmost danger of this group. A light is shown from a structure standing on Isla Marieta, which lies 1 mile W of the easternmost islet.

Caution.—An underwater rock was reported (1978) to lie in the channel leading between Punta de Mita and Las Tres Marietas.

4.28 Roca Corbetena (20°44'N., 105°51'W.), a steep-to and white-colored rock with a jagged top, lies 17 miles W of Punta de Mita and a rock, awash, lies 0.5 mile W of it. Strong variable currents have been observed in the vicinity of these rocks.

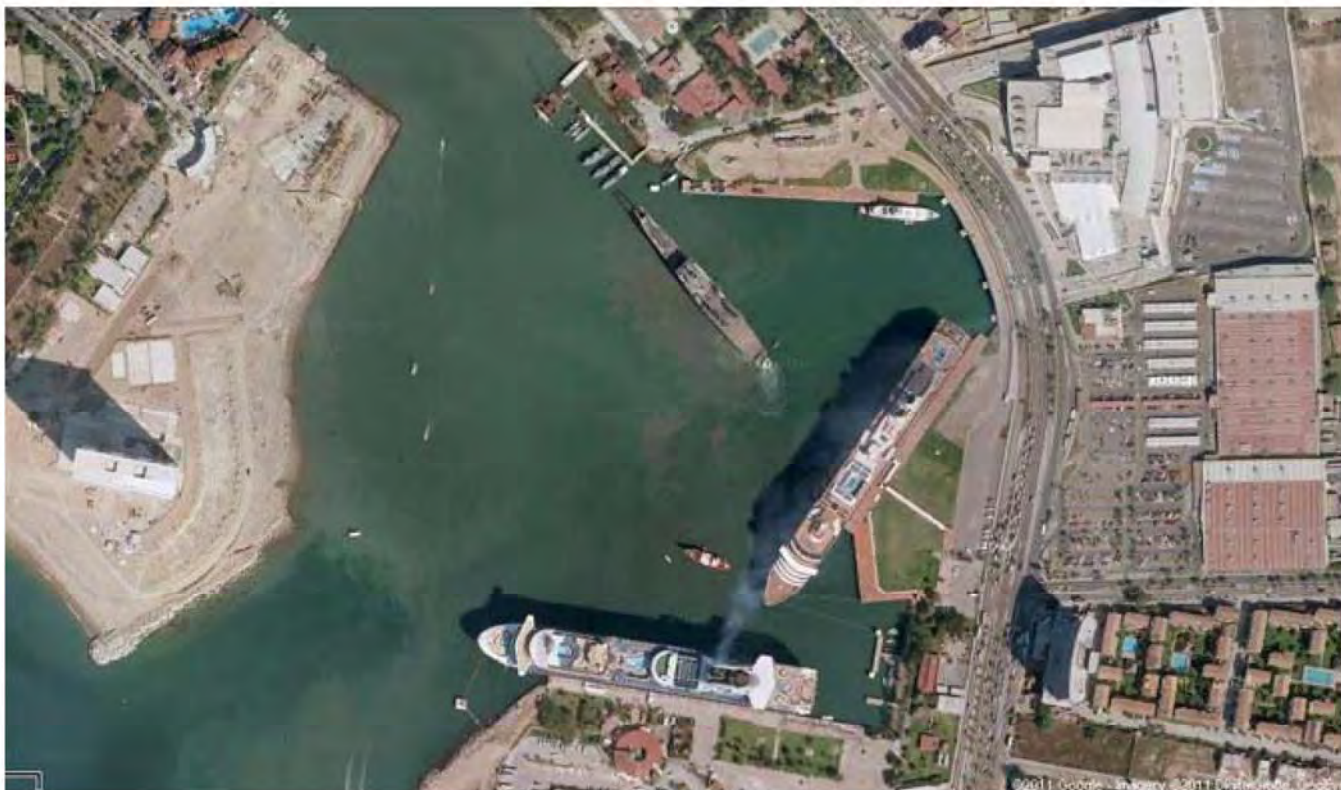
Bahía de Banderas (20°39'N., 105°30'W.) is a deep water bay with plenty of good water until approximately 1.5 miles from shore. Berthing is suitable only for frigates or smaller vessels. The bay is entered between Punta de Mita, on the N side, and Cabo Corrientes, 23 miles SSW. Puerto Vallarta lies at the E end of this large and deep bay.

Punta Montoga (20°44'N., 105°25'W.), located 7.5 miles E of Punta de Mita, is surmounted by a hill, 99m high. The coast extending between this point and the mouth of Estero de Tomates, 7.5 miles SSE, is low and sandy. During NW winds, excellent anchorage can be taken in the bay lying E of the point.

Estero de Tomates (20°40'N., 105°18'W.), into which the Rio Ameca discharges, is fronted by a bar, which breaks and has depths of less than 1m. A roadstead anchorage, where vessels can work cargo from lighters, lies about 0.5 mile SE of the mouth of the estuary. It has a depth of 15m and is marked by a white drum buoy.

The Rio Real (Rio Cuale) flows into the head of the bay, 4.5 miles SSE of Estero de Tomates. Puerto Vallarta lies along the N bank of this river near its mouth.

4.29 Puerto Vallarta (Las Penas) (20°39'N., 105°15'W.) (World Port Index No. 15790) is a well-known tourist resort with a harbor designed mainly for large passenger cruise vessels. There are no facilities alongside available for working cargo. Cargo is worked from the anchorages. The main harbor facilities are situated 2.5 miles N of the town. A major project was completed in 2007 that improved the port facilities by enlarging the two main piers used for cruise vessels and adding one, enabling three of the industry's largest vessels to dock simultaneously. Additional docking facilities were added for



Puerto Vallarta Harbor

smaller vessels.

Winds—Weather.—Generally, winds from the NE predominate. They tend to be calm in mornings and pick up in strength in the late afternoon.

Tides—Currents.—The tidal range within the harbor is 1m.

Depths—Limitations.—The entrance channel is dredged to a depth of 12m and is 183m wide at the narrowest point.

There are three passenger berths, designated No. 1, No. 2, and No. 3. Berth No. 1, the original cruise ship terminal, has been extended and is located along the sea wall close E at the entrance to the harbor. Berth No. 2, situated close N of Berth No. 1, extends at an angle away from shore. Berth No. 3, a new terminal, is located furthest in from the harbor entrance close NNW of Berth No. 2. All berths are capable of handling cruise vessels up to 311m in length. Although it has been reported (2012) that the Port Authority is responsible for maintaining minimum depths of 10m alongside all three berths, depths are as shallow as 9.5m alongside Berth No. 1.

There is a maneuvering area in the center of the harbor, 300m in diameter. However, it has been reported that the renovations to Berth No. 2 and the addition of Berth No. 3 have reduced this maneuvering area so that it is not quite usable all the way out to its designed 300m diameter.

Aspect.—A high white hotel, a prominent radio mast, and a conspicuous church, with a spire and golden dome, are situated in the town. The hills rise abruptly to a height of 305m close E of the town and are prominent. A hotel, with a prominent green



Marina Light

lighted sign, stands 0.8 mile SE of the E side of the harbor. The entrance to the inner harbor is marked by lights. The approach channel is indicated by lighted ranges which may best be seen on the chart. It has been reported (2010) that the visual range is



Puerto Vallarta (looking seaward)

under construction and in line bearing 057°. It has been reported that the entrance to the harbor, as well as the visual range, are difficult to see until a vessel is within 3 miles of the harbor entrance.

Along the N side of the harbor entrance is a breakwater, 250m in length, with a width of 230m.

Pilotage.—Pilotage is compulsory and pilots are available at all times. Pilot will board 1.5 miles outside the harbor near position 20°39'N, 105°15'1"W. The pilot boat is a small white motor boat.



Front Range Light

Regulations.—Vessels should forward their ETA 24 hours prior to arrival and should include the following information:

1. Draft.



Rear Range Light

2. Vessel loa.
3. ETD.

Contact Information.—See the accompanying table titled **Puerto Vallarta—Contact Information.**

Puerto Vallarta—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	521-322-2248243
Facsimile	521-322-2247844
E-mail	snpp@prodigy.net.mx
Harbormaster	
VHF	VHF channel 16
Telephone	521-322-2240427
Facsimile	521-322-2242419
Port Authority	
Telephone	521-322-2241000
Facsimile	521-322-2241350

Anchorage.—Anchorages are established WNW and S of the harbor entrance, as best seen on the chart, with variable depths, and an irregular sand and small gravel bottom.

Caution.—There are works in progress (2012) taking place between Berths No. 1 and No. 2 (20°39'15"N, 105°14'28"W).

A spoil area, depth unknown is located along the shore close N of the breakwater bounded by the shoreline and the following two positions:

- a. 20°39'20.0"N, 105°14'59.7"W
- b. 20°39'15.2"N, 105°14'51.4"W

The inner harbor is usually congested with large cruise liners

and yachts; maneuvering can be difficult.

Charted depths in the outer anchorage areas may be inaccurate due to the constant shifting of the sea bed in this vicinity.

The range structures are reported to be low and difficult to identify during daylight. They may also be obscured at times by yachts and small craft.

4.30 Los Arcos (20°33'N., 105°19'W.), consisting of three rocks, lies close offshore, SW of the Rio Cuarte. The largest rock is 89m high.

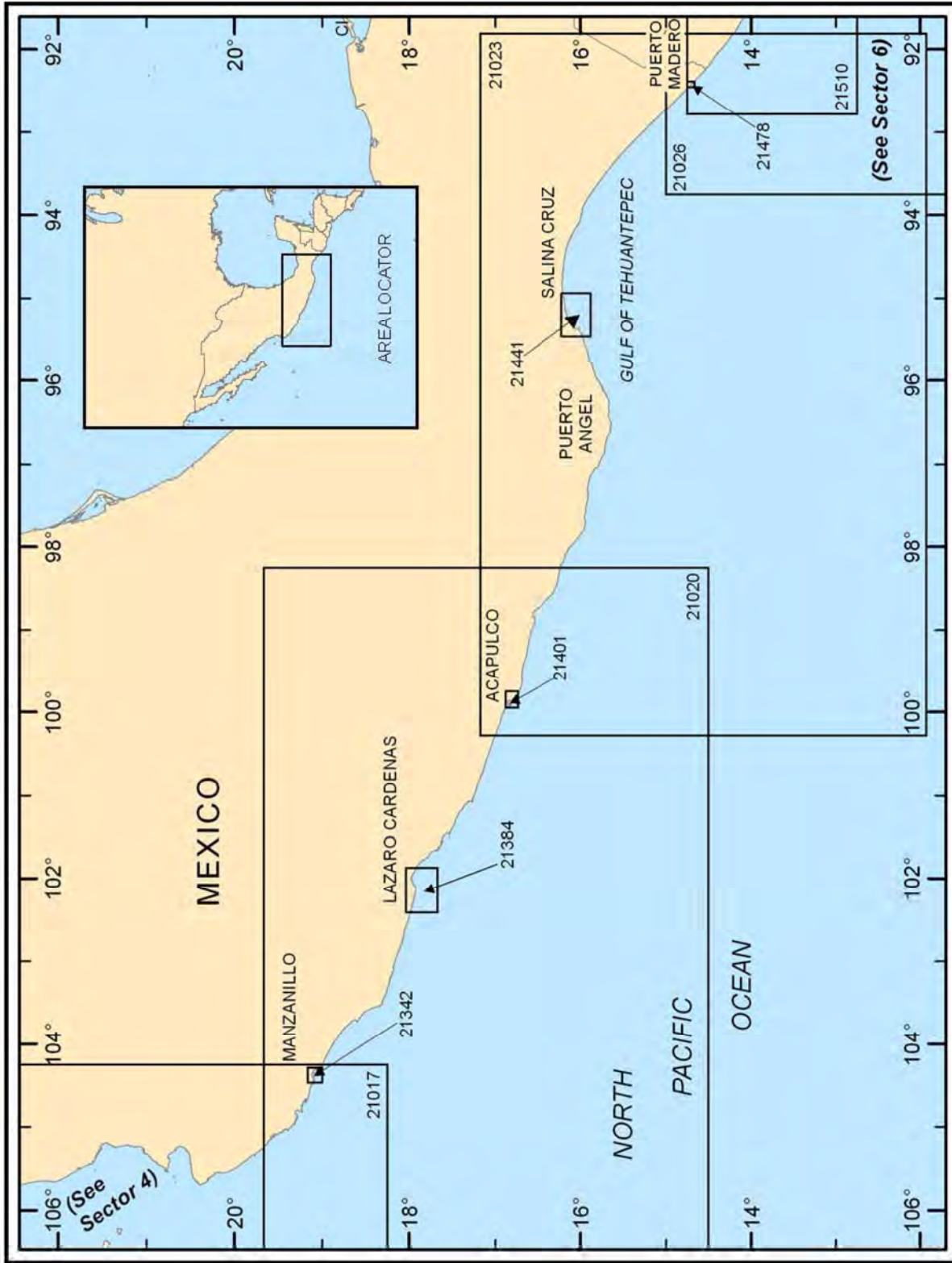
Tecomates (Yelapa), a small coastal village, stands 8.3 miles W of these rocks and is marked by a light. Small vessels, with local knowledge, can obtain anchorage, sheltered from all

winds except those from between NW and NE, in a depth of 27m, off this village.

Punta Chimo (20°28'N., 105°38'W.), a rocky headland, is located 9 miles W of Tecomates and a shoal patch, with a depth of 5.4m, lies about 1.5 miles NE of it. La Iglesia, a white rock, is 12m high and lies close SW of the headland.

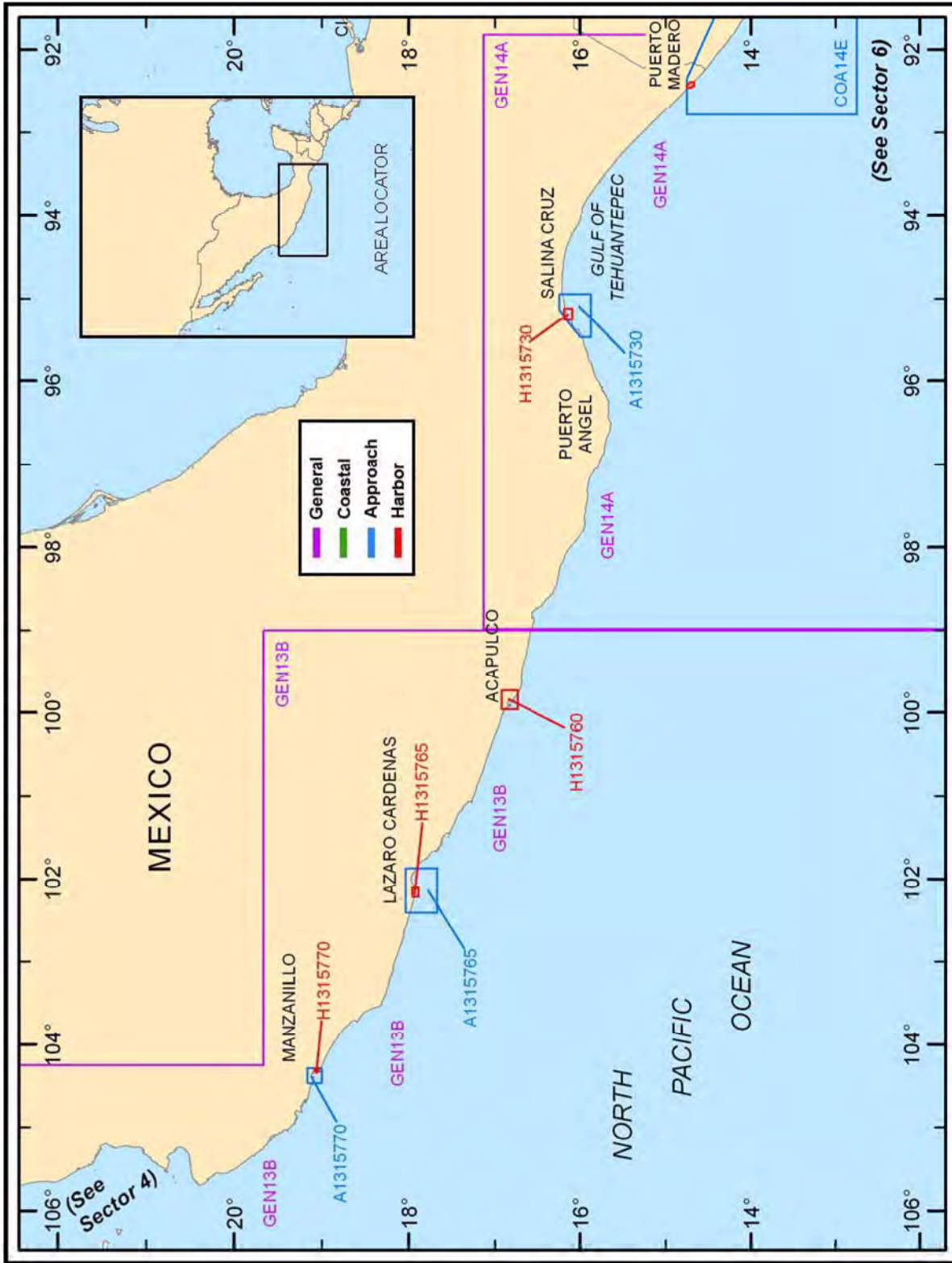
The coast between Punta Chimo and Cabo Corrientes, 7 miles SW, is indented by two small, deep bays of no commercial importance.

Cabo Corrientes (20°24'N., 105°43'W.), marked by a light, is located 6.5 miles S of Bahia de Banderas and is described in paragraph 5.1.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 5 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNCs 13 and 14 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 5 — DNC LIBRARY INFORMATION

SECTOR 5

WEST COAST OF MEXICO—CABO CORRIENTES TO THE RIO SUCHIATE

Plan.—This sector describes the W coast of Mexico and adjacent islands from Cabo Corrientes to the Rio Suchiate. The descriptive sequence is SE.

Cabo Corrientes to Manzanillo

5.1 Cabo Corrientes (20°24'N., 105°43'W.), which derives its name from the currents encountered in the vicinity, is a rocky headland with a flat top, 154m high. It may be identified by a white, rocky patch located on the side of the slope and several reddish-brown rocks lying at the base. The land close behind this cape rises to a height of 610m. The wooded slopes of the mountains in this vicinity are green during the rainy season and dark brown in the dry season. From the S, the cape appears bold and projecting, but it is not so prominent from the N and W. It is also reported to be radar prominent. A light is shown from a stone tower with a dwelling, 15m high, standing on the cape.



Cabo Corrientes Light

Winds—Weather.—During the summer, the current between Cabo Corrientes and Bahia de Manzanillo has a variable rate, but always sets NW along the coast, being stronger near the land than offshore and increasing in strength as the cape is approached. The tidal currents are superimposed on the current off the cape causing the velocity at springs to range from nominal to about 2 knots.

Along the lower Mexican coast, the prevailing direction of the trade winds is NW, tending to parallel the coast. In the Gulf of Tehuantepec, strong N winds, known as “Tehuantepec,” are often encountered during the cooler months. Land and sea breezes are characteristic of the W coast of Mexico. The sea breezes during the day are from the SW quarter. At night, the land breeze blows with less regularity in direction and force.

There are wet and dry seasons along this section of the coast. The rainy season extends from May to November and the balance of the year constitutes the dry season. The yearly rainfall averages 820mm at Manzanillo, 1,300mm at Acapulco, and 1,780mm in the Gulf of Tehuantepec. Much of the rainfall along this coast occurs in the form of thunderstorms or heavy showers which are most frequent in the afternoon. The largest monthly amount of rainfall is recorded in September and is due to the increased activity of tropical disturbances as well as the more N position of the low pressure belt.

Caution.—Between Cabo Corrientes and Puerto Angel, it has been reported that the features along the coast are difficult to identify.

5.2 Punta Ysatan (20°20'N., 105°41'W.), located 3 miles S of Cabo Corrientes, is a grayish, rocky point with a sandy beach on both sides. This point appears to project from the coast and should not be mistaken for Cabo Corrientes.

Rocas Cucharitas (20°18'N., 105°41'W.), a group of low rocks on a beach, lies about 3.5 miles S of Punta Ysatan. A low reef extends up to about 0.3 mile seaward from this group of rocks and forms conspicuous breakers.

Punta Ipala (20°14'N., 105°36'W.), marked by a light, is located 6 miles SE of Rocas Cucharitas and consists of a bold-faced, gray bluff with several above-water rocks lying off its W side. The intervening coast is formed by a white, sandy beach.

Anchorage can be taken by small vessels, in a depth of 9m, within a cove lying on the SE side of the point. This cove provides shelter from all except S and SE winds, but care should be taken to avoid several rocks that lie close off a beach on the W side. Large vessels may anchor, in a depth of 18m, good holding ground, about 0.5 mile offshore and WNW of a white house standing 2 miles SE of the point.

The coast between Punta Ipala and Punta Roca Negra, 32 miles SSE, is steep-to and backed by high, wooded hills in the interior. A pyramid-shaped hill, which is 279m high and easy to identify, rises 3 miles inland, 12 miles SSE of Punta Ipala.

5.3 Punta Roca Negra (19°45'N., 105°20'W.), a low bluff, is located under a peculiar black knob, 200m high, which forms the W extremity of a short range of hills. The black knob is easy to identify and forms a good landmark.

Roca Negra, 14m high, lies about 1 mile W of Punta Roca Negra and is marked by a light. It may be safely passed within 0.3 mile.

The coast between Punta Roca Negra and Punta Rivas, 15.5 miles SE, consists mainly of sandy beaches with a wooded background. A hill, 352m high and radar conspicuous, rises 4 miles NE of Roca Negra. A rocky bluff, which resembles an island when viewed from the W, is located 4.5 miles NW of Punta Rivas.

Bahia Chamela (19°33'N., 105°07'W.) is entered between Punta Rivas and Punta Monte Plano, 5.5 miles SE. Several is-

lands lie within this bay, which provides protected anchorage from November to June. During the remainder of the year, SE and SW gales send heavy seas rolling into the bay.

Two prominent peaks, 1,043m and 1,425m high, rise 11.5 miles and 16 miles ENE, respectively, of Punta Rivas. Gueguenton, the westernmost peak, has a very peculiar shape and can be identified from a great distance during clear weather. A hill, 386m high with yellow bluffs close under it, stands on the S side of the bay, 11.5 miles SE of Punta Rivas. It may be used as a landmark if the mountains are obscured.

Isla Colorado and Isla Passavera, two conspicuous islands, lie 1 mile offshore near the middle of the bay. Isla Passavera, the N island, is 57m high and has prominent perpendicular, white cliffs. Isla Colorado, named for its reddish appearance, is slightly lower than Isla Passavera. Isla Novilla, a small islet, lies close N of Isla Colorado.

Isla Cocinas, a small and round islet, lies 0.7 mile SE of Isla Colorado. Several other small islands lie between this islet and the shore of the bay.

Anchorage can be taken anywhere between Punta Perula, located 0.5 mile E of Punta Rivas, and Isla Passavera. The best anchorage lies, in a depth of 11m, about 0.5 mile offshore in the NW part of the bay. This anchorage is sheltered from all except S winds and better protected against the swell. The village of Chamela is situated at the head of the bay. Small vessels can anchor, in depths of 7 to 9m, close E of Isla Cocinas and about 0.7 mile from the village.

5.4 Punta Farallon (19°24'N., 105°03'W.), marked by a light, is located 8 miles S of Punta Monte Plano and is low and rocky. The intervening coast consists of a series of rocky bluffs. A conspicuous small rocky islet lies close off the point. Anchorage, sheltered from SE winds, can be taken, in a depth of 18m, about 0.2 mile offshore, 0.5 mile N of the point.

The coast between Punta Farallon and Punta Hermanas, 11 miles SE, consists of a sandy beach backed by a lagoon. The entrance to the lagoon lies 2.5 miles NW of Punta Hermanas.

Los Frailes (19°18'N., 104°57'W.) are two prominent needle-shaped rocks. They stand close together, 1 mile offshore, midway between Punta Farallon and Punta Hermanas. These rocks are of moderate height and stand out clearly from the coast. The inner rock has a conspicuous white top and is the sharper of the two.

Roca Tonina, low and steep-to, lies about 1.5 miles W of Punta Hermanas. The passage lying between this rock and the coast is foul.

Isla Pajaros, a square and perpendicular island, lies 0.3 mile SW of Punta Hermanas. It is 46m high, reddish-brown in color, and has a white top. A large, sharp rock lies close off the S side of the island and appears to be part of it.

Punta Hermanas (19°16'N., 104°53'W.) is the outer bluff headland of a peninsula which is connected to the mainland by a narrow and sandy neck. Two prominent high hills stand on the peninsula. Foul ground extends up to 0.5 mile E of the point.

5.5 Bahia de Tenacatita (19°15'N., 104°15'W.) is entered between Punta Hermanas and Cabeza de Navidad, 4.5 miles SE. It is deep, spacious, and provides sheltered anchorage in the inner reaches for vessels of any size.

Roca Centro, 3m high and steep-to, lies about 0.5 mile E of Punta Chubasco, a projecting point, located midway along the W shore of the bay. A rock, with a depth of 1.2m, lies in the middle of the channel leading between Punta Chubasco and Roca Centro. A shoal, with a depth of 7.3m, lies about 0.3 mile N of Roca Centro. Except for these rocks and shoals, all of the other dangers in the bay lie within 0.2 mile of the shore.

Cerro de Navidad (19°13'N., 104°50'W.) is located at the S end of Isla Iglesias, the central and largest of a chain of islets and rocks that extend 0.8 mile S from the coast. This headland, 122m high, is prominent when seen from any direction, but appears wedge-shaped from the S.

During the rainy season, the best anchorage is in a depth of 18m about 0.2 mile from the sandy beach at the head of the bay. During the dry season, the best anchorage is in the NW part of the bay, within Punta Chubasco.

The coast between Cerro de Navidad and Punta Bahia, 6 miles E, is lined by a series of rocky bluffs backed by high, wooded land.

Punta Bahia (19°13'N., 104°44'W.) is a high, white point with a chain of rocks extending about 0.3 mile SE from it.

Volcan de Colima (19°35'N., 103°37'W.) is the W extremity of the volcanic chain that traverses Mexico from E to W. This mountain is 3,847m high and rises 49 miles NE of Manzanillo.

Nevado de Colima (19°32'N., 103°38'W.), an extinct volcano, is 4,265m high and its summit is usually snow covered. This peak can be seen from a considerable distance during clear weather.

5.6 Bahia de Navidad (19°13'N., 104°43'W.) lies between Punta Bahia and Punta Graham. A sandy beach fronts the head of this bay and numerous buildings stand along its shores. Depths decrease from 42m at the entrance to 11m about 0.3 mile offshore.

Punta Graham (19°11'N., 104°42'W.), the S entrance point, is located 2.5 miles SE of Punta Bahia and marked by a light. It is 22m high and, like many other points along this coast, may appear as an island when first sighted. Roca Cono, a high rock of reddish-color, lies close off the W side of the point, but is not easily identified from any distance. A detached rock, 3m high, lies 0.4 mile SW of the point.

During the dry season, sheltered anchorage can be taken, in a depth of 13m, to the NNE of the rocks fronting Punta Bahia. More exposed anchorage can be taken, in a depth of 18m to the ESE of the same rocks. Anchorage in the SE part of the bay is not recommended.

The coast between Punta Graham and Piedra Blanca, 12 miles ESE, is backed by a sandy beach with a lagoon lying behind it. Between Piedra Blanca and Punta Carrizal, 2 miles E, the coast is backed by a series of bluffs fringed by rocks.

A conspicuous airport is situated near the coast, about 12 miles WNW of Manzanillo. By day, a prominent group of low-storied white buildings can be seen standing alone. At night, bright white working lights are shown from the airport area.

5.7 Piedra Blanca (19°06'N., 104°30'W.), a steep-to islet, lies 1 mile offshore. This islet is 79m high and the deposits of sea birds give it a very white and conspicuous appearance. The passage lying between the islet and the rocks fronting the

coast is deep.

Punta Carrizal (19°05'N., 104°27'W.), a bluff point, is marked by a light. A conspicuous high rock and several other detached rocks lie close off its seaward side.

Punta de Juluapan (19°05'N., 104°24'W.) is located 2.5 miles E of Punta Carrizal and two small bays, separated by a high point, lie between them. A group of seven steep-to and detached rocks, 1.5 to 6m high, lies centered 0.5 mile SSE of Punta de Juluapan and is known as Los Frailes. A light is shown from a structure standing on the southeasternmost rock.

Bahia de Santiago (19°06'N., 104°23'W.) is entered between Punta de Juluapan and Punta de Santiago, 2.3 miles E. It provides anchorage, in depths of 14 to 18m, in the W and E parts, about 0.5 mile offshore. The E part of the entrance to the bay contains several dangerous hazards as described here. A prominent islet, fronted by shallow water, lies 260m SW of Punta la Audiencia, a point located close inside the entrance to the bay. Two detached shoals, with depths of 6.4m and 6.7m, are located 0.4 and 0.6 mile, respectively, WSW of Punta la Audiencia. A single detached shoal, with a depth of 5.1m, is located 0.5 mile W of Punta Santiago. Two detached shoals, with depths of 5.5 and 5.9m, lie about midway between the entrance points of the bay; care should be taken to avoid them.

Bahia de Manzanillo (19°04'N., 104°21'W.) is entered between Punta de Santiago and Punta Ojo de Agua, 2.5 miles SE. This bay is fronted by a steep-to and sandy beach at the head, which separates it from Laguna de San Pedrito. Depths in the bay decrease from 48m at the entrance to 10m near the head. The town of Manzanillo stands in the S part of the bay. A small boat harbor, enclosed by breakwaters, lies near Punta Salagua, on the NE side of the peninsula that forms Punta de Santiago. The bay is safe from all winds except those from the W and SW.

Manzanillo (19°03'N., 104°19'W.)

World Port Index No. 15770

5.8 The port of Manzanillo, the largest Mexican port on the Pacific Ocean coast, lies in the SE corner of Bahia de Manzanillo. The port consists of an outer and inner harbor with the inner harbor extending into Laguna de San Pedrito. The outer harbor is known as Polygon 1 and is comprised of a naval wharf, the Pemex Oil Terminal, and the Cruise Terminal just completed and opened in 2010. The outer harbor is protected on the W side by a breakwater that extends 700m NE from the shore. The inner harbor, San Pedrito, known as Polygon 2, is located close E of the outer harbor and is entered between two breakwaters. The North Breakwater, at the E side of the outer harbor, extends 270m WSW from the shore; the South Breakwater extends only about 75m WSW from the shore.

Port of Manzanillo Home Page

<http://www.puertomanzanillo.com.mx>

Winds—Weather.—The rainy season begins in June and ends in November. The dry season usually lasts from December to May.

The outer harbor is safe from all winds except those from the



Manzanillo Outer Harbor



Manzanillo Inner Harbor (San Pedrito)

NE. Prevailing winds are from the NE between March and May, from the S and E between July and October, and from the NW between November and February. Gale strength winds are not frequent unless there is a tropical cyclone in the vicinity. The tropical cyclone season runs from June through November.

Tides—Currents.—The tides rise about 0.7m at springs and at neaps.

Depths—Limitations.—The outer harbor is approached from the S and W by rounding the breakwater, keeping the light to starboard, and from the N, also keeping the breakwater light to starboard. There is no channel for entry into the outer harbor. Access to the inner harbor (San Pedrito) is through an entrance channel, 120m in wide and 570m long, and dredged to a depth of 14m.

The Pemex Oil Terminal, in the outer harbor, has a T-head dolphin jetty, called a marginal berth, attached to the inside of the breakwater, along with Espigon Pier located close S of the marginal berth. Gasoline and fuel oil loading and discharging operations are carried out on the N and S jetties of this pier.



Manzanillo—Northwest Breakwater Light



Manzanillo—West Breakwater and radio masts on summit of Vigia Chichi

The Fiscal Pier is situated close E of Espigon Pier and was used for general cargo operations before the completion of a new cruise terminal at the head of the Fiscal Pier. The cruise terminal extends a short distance straight out from the Fiscal Pier then turns sharply NE to parallel the W breakwater that protects the outer harbor.

Muelle de la Armada, the naval pier, is located close E of the Fiscal Pier.

The inner harbor (San Pedrito) will accommodate general and bulk cargo operations at berths located close E inside the

breakwaters, along with a dedicated container terminal located further inside the inner harbor along the E shore. Farther N within the inner harbor are additional berths for dry bulk cargo operations.

The inner harbor has a depth of at least 14m in all areas with the exception of the turning circles.

Two turning circles are located within the inner harbor. The first turning circle, located close inside the harbor opening S of the range line, has a radius of 225m and a depth of 14m. The second turning circle, located in the N part of the inner harbor,



Manzanillo—PEMEX Pier



Manzanillo LNG Terminal

has a radius of 260m and a depth of 16m.

An LNG terminal and an LPG terminal are located outside

the outer harbor along the coast S of Manzanillo. The Manzanillo LNG terminal (19°00'46"N, 104°15'37"W), operated by the port of Manzanillo, commenced operation in May 2012 but is not expected to be operating at full capacity until sometime in 2013. The Zeta Gas Offshore LPG Terminal, operated by Zeta Gas, operating in depths of about 18m, lies offshore from the coast S of the outer harbor of Manzanillo.

Details of the berthing accommodations in the Outer Harbor and the Inner Harbor (San Pedrito) are displayed in the table titled **Manzanillo—Berthing Facilities**.

Aspect.—A high radio tower stands 1.8 miles NNE of the head of the E breakwater.

Cerro de Juluapan (Table Mountain), a prominent flat-topped peak, is 825m high and rises 7.5 miles NW of the town. Cono del Buque Perdido, a prominent cone-shaped peak, is 464m high and stands about midway between Cerro de Juluapan and the coast to the SW. Vigia Grande, a prominent hill, stands W of Manzanillo. It is 218m high and surmounted by a large, conspicuous white cross.

A stadium lies on the coast 0.5 mile N of San Pedrito. A large power plant lies 1.5 miles S of Manzanillo.

Manzanillo—Berthing Facilities						
Berths	Length	Maximum Vessel			Depth alongside	Remarks
		LOA	Beam	Draft		
Pemex Oil Terminal—Outer Harbor						
Marginal Berth	250m	245m	32.2m	13.7m	15.0m	Fuel oil (see Note)
Espigon (North Berth)	217m	210m	32.2m	12.0m	13.0m	Gasoline (see Note)
Espigon (South Berth)	217m	228m	32.2m	11.0m	11.9m	Gasoline and diesel (see Note)
Polygon 1—Remainder of Outer Harbor						
Fiscal Pier (East Berth)	236m	—	—	8.0m	9.5m	Cruise vessels

Manzanillo—Berthing Facilities						
Berths	Length	Maximum Vessel			Depth alongside	Remarks
		LOA	Beam	Draft		
Fiscal Pier (West Berth)	216m	—	—	8.0m	9.5m	Cruise vessels
Cruise Terminal (attached to head of Fiscal Pier)	60m	—	—	8.0m	11.0m	Cruise vessels
Muelle de la Armada (Naval Pier)	150m	—	—	—	5.2m	
Polygon 2—San Pedrito—Inner Harbor						
Band A (No. 2, No. 3)	450m	—	—	12.0m	13.0m	Cement and general cargo
Band B (No. 4, No. 5, No. 6)	565m	—	—	12.0m	13.0m	Cement, fertilizer, containers, general cargo, and vehicles (ro-ro)
Band C (No. 7, No. 9)	685m	—	—	12.0m	13.0m	Dry bulk, containers, general cargo, and vehicles (ro-ro)
Band C (No. 8)				12.5m	14.0m	
Container Terminals No. 10, No. 11, No. 12, and No. 13	1,050m	—	—	13.0m	14.0m	Containers
TUMI No. 14	300m	—	—	13.0m	14.0m	Minerals and containers
Multipurpose No. 15	300m	—	—	13.0m	14.0m	Containers, general cargo, and vehicles.
Miguel Alman Interior	—	—	—	5.1m	5.8m	
Miguel Alman Center	—	—	—	4.2m	5.0m	
Miguel Alman Forward	—	—	—	3.3m	4.0m	
Note. —Tankers as large as 55,000 dwt can be accommodated at these berths.						

The entrance channel is indicated by a lighted range which may best be seen on the chart.

Pilotage.—Pilotage is compulsory and should be requested 24 hours in advance of arrival. Pilots are available on a routine basis between 0800 and 1800 local time but can be requested at other times if necessary. Pilots will board NW of the outer harbor breakwater in position (19°03'22"N, 104°18'54"W). It is reported (2011) that pilots will also meet the ship shortly after entering the TSS described in Regulations.

Regulations.—Vessels should send their ETA to Manzanillo VTS as described in **Vessel Traffic Service**.

The use of a tug is compulsory when berthing. Three tugs are available in the port.

A TSS has been established in the outer approaches to Manzanillo Harbor and can best be seen on the chart. This TSS is not IMO adopted, however the port authority advises that the principles for the use of the routing system defined in Rule 10 of the International Regulations for Preventing Collisions at Sea (1972) apply. It has been reported (2012) that the maximum speed allowed in the TSS is 7 knots.

A racon-equipped lighted buoy marks the beginning of the TSS in the vicinity of position 19°02.3'N, 104°22.8'W.

Vessel Traffic Service.—A Vessel Traffic Service (VTS) has also been established for the port and is mandatory for vessels over 500 grt.

Vessels must contact Manzanillo VTS 24 hours in advance or upon departure from the previous port if less than 24 hours before expected arrival at Manzanillo and provide the following information:

1. Vessel's name, call sign, nationality, registry, flag, IMO identification number, and vessel type.
2. Vessel position (latitude and longitude), including time of position in local time.
3. Course and speed.
4. Last ten ports of call.
5. ETA at pilot station.
6. Vessel draft, fore and aft in meters.
7. Vessel loa, width, and freeboard, in meters.
8. Description of cargo and pollutants and any dangerous cargo carried.
9. Any deficiencies in charts, publications, vessel navigational aids, equipment or any problems with machinery, communications systems, or GMDSS.
10. Number of crew on board.
11. Weather conditions at time of report.
12. Local agents name.
13. Vessel tonnage to include grt, nrt, and dwt.
14. Vessel's Maritime Mobile Service Identity Code (MMSI) on the Automatic Identification System (AIS).
15. Expiration dates for certificates issued by the Interna-

tional Safety Management Code (under IMO) for International Oil Pollution Prevention (IOPP) and International Ship Security (ISSC).

16. Any information regarding bunkers in port.

When 20 miles away from the sea buoy, vessels must contact the VTS on VHF Channel 13 with the following information:

1. Vessel's name and call sign.
2. Vessel position expressed in latitude and longitude.
3. ETA at the sea buoy.

Upon arrival at the entrance to the TSS, vessels must contact Manzanillo VTS on VHF channel 17 and report the vessel's position.

If vessel anchors, Manzanillo VTS must be contacted via VHF channel 17 and advised of the following information:

1. Vessel's name and call sign.
2. Vessel position expressed in latitude and longitude.
3. Time of anchoring.

Vessel must always monitor VHF channel 16 while in port.

Upon departure from port and exiting the harbor area, vessels must report the following information to Manzanillo VTS on VHF channel 17:

1. The time that the pilot is away.
2. When exiting the TSS area.
3. When 3.5 miles away from the sea buoy including vessel name, call sign and next port of call including ETA at that port.

Vessels equipped with AIS must ensure that system is operational at all times.

Contact Information.—See the accompanying table titled **Manzanillo—Contact Information**.

Anchorage.—There are three designated anchorage areas in Bahía de Manzanillo. These areas can be seen on the chart. The anchorage for small vessels has depths of 15 to 20m and lies closest to the harbor entrance. Vessels with hazardous cargo can anchor in depths of 40 to 50m in the anchorage located farthest W of the harbor entrance; the holding ground is sand and shells. Specific area limits are, as follows:

1. Zone A (For tankers and vessels with dangerous or hazardous cargo)—An area bounded by lines joining the following positions:
 - a. 19°03'59.0"N, 104°22'15.5"W.
 - b. 19°05'09.5"N, 104°22'56.0"W.
 - c. 19°05'09.5"N, 104°21'27.0"W.
 - d. 19°04'25.5"N, 104°21'08.5"W.
2. Zone B (For vessels over 5,000 grt)—An area bounded by lines joining the following positions:
 - a. 19°05'09.5"N, 104°21'27.0"W.
 - b. 19°05'45.0"N, 104°20'00.0"W.
 - c. 19°04'58.5"N, 104°20'00.0"W.
 - d. 19°04'25.5"N, 104°21'08.5"W.
3. Zone C (For vessels under 5,000 grt)—An area bounded by lines joining the following positions:
 - a. 19°05'45.0"N, 104°20'00.0"W.
 - b. 19°04'51.0"N, 104°18'43.0"W.
 - c. 19°04'07.0"N, 104°18'32.0"W.
 - d. 19°04'58.5"N, 104°20'00.0"W.

Temporary anchorage can be taken inside the outer harbor, in depths of 11 to 16m, mud, S of a line extending between the breakwater heads.

There is also an area designated for small craft (private yachts and small fishing vessels), in depths of 10m and less, located close S of the new cruise ship terminal.

Caution.—A dangerous wreck is reported (2006) close off the E berth of the Fiscal Pier in position 19°03'17.1"N, 104°18'49.4"W.

New construction and dredging is taking place (2012) in the NW portion of the Inner Harbor. A restricted area surrounding works in progress has been established N of 19°04'N and W of 104°17'W.

Manzanillo to Lazaro Cardenas

5.9 Punta Campos (19°01'N., 104°21'W.), a bluff headland, is located at the S extremity of the hilly land that extends S from Manzanillo and forms the W shore of Laguna de Cuyutlan. A light is shown from a prominent tower, with adjacent buildings, standing on the point and a conspicuous chimney stands 1.5 miles E of it.

Roca Vela lies close S of the point. This rock is 34m high and appears as a sail from a distance.

The coast between Punta de Campos and Punta Cabeza Negra, 45 miles SE, consists of a gray, sandy beach upon which the sea breaks heavily. A detached and steep-to rock, 1.5m high, lies about 0.5 mile offshore, 18.5 miles NW of Punta Cabeza Negra. It is the only known off-lying danger along this part of the coast.

Manzanillo—Contact Information	
Pilots	
Call sign	Manzanillo Pilots
VHF	VHF channels 6, 12, and 16
Telephone	521-314-3325369
Facsimile	521-314-3320197
E-mail	pilotoszlo@prodigy.net.mx
Harbormaster	
Call sign	Manzanillo Harbour Master
VHF	VHF channels 14 and 16
Telephone	521-314-3320280
Facsimile	521-314-3323470
Port Authority	
Telephone	521-314-3311400
Facsimile	521-314-3311400 (extension 2996)
E-mail	operaciones@apimanzanillo.com.mx
Manzanillo VTS	
Call sign	Manzanillo Traffic
VHF	VHF channels 13, 16, and 17
Telephone	521-314-3326878
Facsimile	521-314-3326878
E-mail	vtsmanzanillo@apimanzanillo.com.mx

Caution.—A spoil ground is established (2011) and centered in position 18°56'24"N, 104°16'06"W.

Punta Cabeza Negra (18°35'N., 103°43'W.), marked by a light, is 170m high and formed by a cliffy and densely-wooded peninsula. When viewed from the SE or the NW, it appears as an island joined to the mainland by a low isthmus. Roca Pelicano, a small white rock, lies close off the NW side of this peninsula and good anchorage can be taken, in a depth of 18m, about 0.5 mile NE of it.

Foul ground extends up to 0.8 mile offshore, about 3 miles ESE of Punta Cabeza Negra.

Punta Tejupan (18°21'N., 103°31'W.) is located 18.5 miles SE of Punta Cabeza Negra and three small islets extend up to 0.8 mile W of it. Vessels with local knowledge can anchor close NW of these islets, but there is little shelter. Foul ground, upon which the sea usually breaks, extends up to about 1.5 miles W from this point.

A prominent table-topped mountain, 1,220m high, rises 4 miles inland, midway between Punta Cabeza Negra and Punta Tejupan.

Punta San Telmo (18°20'N., 103°31'W.), a rocky bluff, is located 2.5 miles SSE of Punta Tejupan. A light is shown from a square tower, 12m high, standing 1.5 miles ESE of this point.

The coast extending for about 3 miles SE of Punta San Telmo consists of a series of rocky bluffs terminating in a sugaroaf rock, 23m high.

Caution.—During the day, both Punta Tejupan and Punta San Telmo can be passed at a distance of 2 miles. However, these points should be given a wide berth at night because of their lowness and the variable currents in this vicinity.

5.10 Piedra Blanca (18°15'N., 103°22'W.), a prominent white rock, is 33m high. It lies close off Punta Piedras Blancas, a bluff, which is located 8 miles SE of Punta San Telmo. This rock, together with the white bluff behind it, forms an excellent landmark.

Bahia de Maruata (18°15'N., 103°21'W.), small and open, lies 0.8 mile E of Piedra Blanca and is used occasionally by vessels. A white beach lines the N shore and four islets lie close off a rocky bluff at the W end of the bay. A prominent wooded and cone-shaped peak, 652m high, stands 3.5 miles N of the bay. Anchorage can be taken, in a depth of 12m, mud, about 0.3 mile offshore.

Paps de Tejupan, two peaks, are about 1,700m high and rise 14 miles NNE of Bahia de Maruata. The N peak is wooded all the way to the top, whereas the other is almost bare. Due to the high mountain ranges rising behind them, these peaks are difficult to identify from some directions.

The coast between Bahia de Maruata and Ensenada de Pichilinguillo, 12 miles ESE, consists of a series of prominent, bold bluffs intersected by a sandy beach, 3.5 miles long. The Rio de Coalcoman enters the sea 7 miles W of Bahia de Maruata. A small stream falls over a cliff 2.5 miles W of Ensenada de Pichilinguillo and leaves a yellowish-white deposit, which is visible from a considerable distance to seaward.

Ensenada de Pichilinguillo (18°12'N., 103°07'W.), an open bay, lies close W of Punta Lizardo and provides anchorage for small coasters. A rocky islet, 30m high, lies 0.8 mile off the W shore of the bay, but is difficult to identify. Anchorage can be taken, in depths of up to 18m, near the entrance. Smaller ves-

sels can obtain better shelter, in depths of 9 to 10m, about 0.3 mile off the sandy beach at the head of the bay.

Punta Lizardo (Punta Iguana) (18°11'N., 103°07'W.), a dark headland, is about 1 mile wide. This point is thickly wooded, 30m high, and several detached rocks lie close off its seaward face.

The coast between Punta Lizardo and Buffadero Bluff, 22.5 miles ESE, consists of a series of bluffs with an unbroken stretch of sandy beach, 13 miles long, in the middle.

5.11 Buffadero Bluff (18°03'N., 102°45'W.), marked by a light, is reddish in color and has a rock lying at its base with a blow hole through which the water spouts. A prominent peak, 440m high, stands 4 miles WNW of the bluff. It descends in a gentle saddle-shaped slope to a knob, 293m high, and then slopes to the shore.

The coast between Buffadero Bluff and Punta Mangrove, 33.5 miles ESE, is backed by several bluffs for the initial 16 miles and then by an unbroken sandy beach for the remaining distance. The Rio Carrizal enters the sea 12 miles E of Buffadero Bluff; the village of Chula is situated 5 miles WNW of its mouth.

Punta Mangrove (Punta Cayacal) (17°55'N., 102°12'W.), a low and round point, is located 33 miles ESE of Buffadero Bluff. It is covered with mangroves and palms, but is difficult to identify. The point is marked by a light and a racon.

The delta of the Rio Balsas extends from Punta Mangrove to Bahia de Petacalco. This river, one of the longest and largest in Mexico, discharges into the sea through three mouths. During the rainy season, the discharge usually discolors the sea surface for up to 10 miles offshore. This discoloration has been observed extending up to 22 miles seaward at times.

Caution.—The depths lying off the delta of the river are very irregular and subject to constant change.

Breakers have been reported to exist about 2.5 miles S and about 2 miles SE of Punta Mangrove.

Lazaro Cardenas (17°56'N., 102°10'W.)

World Port Index No. 15765

5.12 Lazaro Cardenas serves a steel mill and an industrial complex exporting iron plate, steel bars, and phosphate. The port also imports pellets, pig iron, iron scrap, sulphur, phosphate rock, coke, and grain. There is also a container terminal in the port and a naval base along the Rio Balsas.

Lazaro Cardenas Home Page

<http://www.puertolazarocardenas.com.mx>

Winds—Weather.—During the rainy season (July to October), occasional squalls occur.

Depths—Limitations.—All of the port facilities are accessed through an entrance channel with a length of 1,700m, a width of 175m, and a dredged depth of 16.4m. The entrance channel, protected by N and S breakwaters, leads NW into the Ciaboga Basin in the Inner Harbor where there is a turning circle, with a diameter of 700m and a depths of 16.5m at MLLW. The CFE Coal Terminal is located on the NE side of the en-



Lazaro Cardenas

trance channel about midway to the Inner Harbor.

The Rio Balsas is entered by continuing NW from the Ciaboga Basin (Inner Harbor turning basin). The Naval Base is situated along the E side of the river approximately 2 miles upriver.

The Suroeste Canal, also known as the South-West Channel, with depths up to 14m, is entered by turning SW from the Inner Harbor turning basin.

The Industrial Canal, with depths up to 14.5m, is entered by turning NE from the Ciaboga Basin (Inner Harbor turning basin). The entrance to the grain terminal is located on the NW side of this canal approximately 1 mile away from the turning circle. The PEMEX Oil Berths are located about 2 miles up the canal on the SE side. The Industrial Turning Basin, located approximately 5 miles up the Industrial Canal, is 1,250m in diameter with depths of 14m. The North Channel extends NW from the Industrial Turning Basin and has a depth of 12.5m with another turning circle at the end of the channel. The East Channel extends NE from the Industrial Turning Basin with depths of

13.5m.

See the table titled **Lazaro Cardenas—Berth Characteristics** for details on the berths located throughout the different channels within the harbor area.

Aspect.—A light is shown from a cylindrical tower, 40m high, standing near the W side of the entrance channel. A lighted buoy is moored 2 miles S of the light, at the E side of the anchorage area.

The entrance channel is marked by lighted beacons and indicated by a lighted range which may best be seen on the chart.

A large container crane stands in the vicinity of the harbor. From a distance, the industrial complex and the steel mill can be seen above the low land of the delta. At night, industrial flames, smoke, and working lights can be seen from a distance of 25 miles. Several prominent towers are situated close W of the harbor entrance.

Pilotage.—Pilotage is compulsory for all foreign vessels and for all Mexican vessels larger than 500 grt. Pilots will board about 2 miles S of the harbor entrance in the vicinity of the sea buoy as shown on the chart.

Regulations.—The vessel's ETA should be sent 7 days, 5 days, 3 days, 48 hours, and 24 hours before arrival and include the following information:

1. Vessel name, flag, call sign, and port of registry.
2. Vessel loa, gross tonnage, and beam.
3. Number of crew members.
4. Cargo type and quantity.
5. Expected draft on arrival.
6. Last five ports of call.
7. Information on any diseases which may have occurred during the voyage.

Vessels longer than 230m in length can berth or depart only during daylight hours.

Contact Information.—See the accompanying table titled **Lazaro Cardenas—Contact Information**.

Lazaro Cardenas—Berth Characteristics			
Berth	Length	Depths	Remarks
Entrance Canal (Channel)			
CFE Coal Terminal	411m	16.5m	Vessels berthing here are limited to 165,000 dwt
Suroeste (South-West) Canal (Channel)			
Arcelor Mittal Terminal	650m	16.0m	This is the total length of the quay, which is divided into two berths and is the only terminal on the W side of the canal. Metals and bulk minerals. Vessels berthing here are limited to 165,000 dwt.
Fertinal Terminal	497m	14.0m	This is the total length of the quay, which is divided into two berths. Fertilizer. Vessels berthing here are limited to 60,000 dwt.
Container Terminal	280m	12.0m	Containers.
Multipurpose Terminal I	253m	12.0m	Agricultural products and bulk minerals.
Multipurpose Terminal II	253m	12.0m	Vehicles, steel products, and bulk minerals. Vessels berthing here are limited to 80,000 dwt.
Industrial Canal (Channel)			
Grain Terminal	305m	14.0m	Bulk grain. Vessels berthing here are limited to 55,000 dwt.

Lazaro Cardenas—Berth Characteristics			
Berth	Length	Depths	Remarks
Grain Barge Berths	115m	11.0m	Inner barge berths.
Pemex Oil No. 1	236m	14.0m	Tankers berthing here are limited to 60,000 dwt and a draft of 13.1m.
Pemex Oil No. 2	236m	14.0m	
North Canal (Channel)			
LCTPC Terminal 1	600m	16.0m	This is the total length of the quay, which is divided into two berths served by six gantry cranes. Containers.
LCTPC Terminal 2	—	—	Container terminal presently (2013) under construction.
East Canal (Channel)			
EcoMar Ship Scrap Terminal	520m	—	Comprised of one marginal berth and two basin berths.
TPP Bulk Terminal	180m	13.5m	Bulk minerals. Vessels berthing here are limited to 150,000 dwt.

Lazaro Cardenas—Contact Information	
Pilots	
VHF	VHF channel 6
Telephone	521-753-5324588
Facsimile	521-753-5324386
E-mail	pilotolzc@prodigy.net.mx
Port Authority	
Telephone	521-753-5320700
Facsimile	521-753-5372150
E-mail	goperaciones@puertolazarocardenas.com.mx
Harbormaster	
VHF	VHF channel 16
Telephone	521-753-5320199
Facsimile	521-753-5320197

Anchorage.—Vessels may anchor, in depths of about 30m, good holding ground, about 2.25 miles S of the Puerto Lazaro Cardenas Light, as shown on the chart.

Caution.—Depths off the delta are irregular due to the shifting of sand and mud from the river.

Lazaro Cardenas to Acapulco

5.13 Bahia Petacalco (17°59'N., 102°05'W.), an open bay entered NE of Punta Mangrove, has a very uneven, lumpy, and shifting bottom. Vessels should use caution when entering this bay or approaching the shore.

The coast between Bahia de Petacalco and Isla Grande, 29 miles SE, consists of a steep-to and sandy beach. Punta Trancones, the only headland along this stretch, is 165m high and is located 9 miles NW of Isla Grande.

Isla Grande (17°40'N., 101°40'W.), 51m high, is irregularly shaped, covered with brush, and marked by a light. When

viewed from seaward, it appears more like a headland than an island. A rock, with a least depth of 1.5m, lies about 0.6 mile N of the N extremity of the island.

Bahia Isla Grande, lying between Isla Grande and the mainland, is open to the NW. Anchorage can be taken, in depths of 7 to 11m, anywhere within this bay.

Punta Ixtapa (17°40'N., 101°39'W.) is the W extremity of Isla de Apies, a small island, which is 66m high and connected to the mainland by a narrow isthmus at LW. Monte Ixtapa, 220m high, rises 1.3 miles NE of this point.

Islas Blancas, a group of rocks and islets, lies across the central part of Bahia de San Juan de Dios, which is entered close E of Isla de Apies. These dangers, 6 to 46m high, are very prominent. They appear white when the sun shines on them, but brown at other times. Vessels can safely pass within 0.3 mile of the outer dangers of the group.

5.14 Bahia de Zihuatanejo (17°37'N., 101°33'W.), located 6 miles ESE of Punta Ixtapa, forms a small, but excellent harbor. It is easy to enter and deep water lies close off the rocks on either side of the entrance. The bay is open to the SW and a heavy swell often rolls in. The land around the bay, except at its head and along the E shore, rises abruptly from the beach to high, towering peaks. A village stands at the head, but is not visible until well inside the entrance. Anchorage can be taken as convenient, in depths of 11 to 18m, soft mud, with good holding ground.

Roca Negra, 14m high, lies 1 mile S of Punta Garrobo, the E entrance point of the bay. This rock is steep-to on all sides and marked by a light.

Morro de Petatlan (17°32'N., 101°27'W.), 195m high and covered with brush, is connected to the mainland by a low, wooded isthmus.

Bahia de Petatlan (17°35'N., 101°30'W.), lying N of Morro de Petatlan, is sheltered from all winds except those from between SW and NW. Good anchorage can be taken, in depths of 9 to 18m, hard sand, about 0.6 mile N of Punta Gorda, the W extremity of Morro de Petatlan.

Rocas Potoci (White Friars), a group of whitened islets and rocks, lies centered 1.3 miles W of Punta Gorda. A deep pas-

sage, 1 mile wide, leads between the group and the point.

5.15 Punta Japutica (17°23'N., 101°10'W.), located 19 miles SE of Punta Gorda, is low, black, and rocky. The intervening coast consists of an unbroken stretch of sandy beach. The point is easily recognized, being the only rocky projection along this stretch of shore. A prominent patch of bright and clear sand, surrounded by bushes, lies 1 mile E of the point and a large coconut grove stands close E of it. A light is shown from a structure standing near the point.

Breakers have been observed off Punta Japutica during heavy weather.

Morro de Papanoa (17°16'N., 101°03'W.), located 9.5 miles SE of Punta Japutica, is the westernmost of four bluffs which line this stretch of the coast. It is 160m high and densely covered with brush and small trees. Morro de las Animas, a large rock, lies about 0.5 mile offshore, 3 miles N of Punta de Papanoa, the N extremity of Morro de Papanoa.

Bahia de Tequepa, lying N of Morro de Papanoa, provides excellent anchorage, in a depth of 20m, about 0.5 mile from the shore. This bay provides shelter against all winds except those from between SW and NW.

A conspicuous radio mast stands on the summit of Monte Tequepa, 3.5 miles NE of Morro de Papanoa.

The coast between Morro de Papanoa and the entrance of Bahia de Acapulco, 70 miles ESE, consists of an almost continuous stretch of steep-to sandy beach intersected by several small streams which flow into the sea during the rainy season. The land behind the coast is low, but farther inland, it rises progressively higher. A mountain range, with peaks up to 3,660m high, stands 41 miles NNW of Bahia de Acapulco.

Paps de Coyuca (17°24'N., 100°05'W.), formed by two distinct conical peaks of almost equal height, rises 34 miles NNW of Bahia de Acapulco. The peaks stand 1 mile apart and the tallest is 3,229m high.

The mountain peaks form excellent landmarks when visible, but are usually obscured by clouds, especially during the rainy season. At other times, they are clearest in the early morning.

This section of the coast may be safely approached and anchorage can be taken, in depths of 18 to 27m, about 0.5 mile offshore.

5.16 Isla Roqueta (Isla Grifo)(16°49'N., 99°55'W.), 107m high, lies off the W side of the entrance to the bay and is separated from the mainland by Boca Chica, a narrow and clear passage. Punta Coyuca, the W extremity of the island, is fronted by detached rocks on its W side. A tower, 46m high, surmounts the N extremity of the island, 0.5 mile E of Punta Coyuca. Punta Siclata, the S extremity of the island, is located 0.8 mile ESE of Punta Coyuca. A light is shown from a structure standing 0.2 mile NNW of this point. A racon and a signal station are situated at the light.

El Morro, an islet, is 15m high and lies close N of the NE extremity of the island. La Yerbabuena, a rock, lies about 0.3 mile ESE of the islet. It is 2m high and marked by a light. A reef, which breaks, extends about 200m W from this rock and is steep-to on its E side. The passage leading between La Yerbabuena and Isla Roqueta should not be attempted.

Boca Chica, the passage leading N of Isla Roqueta, is deep and clear, but its use by large vessels is prohibited because of



Isla Roqueta Light

the numerous pleasure craft normally encountered in the vicinity. Punta Lorenz, the N entrance point of this passage, is marked by a light. A detached shoal, with a depth of 4m, and a rock, with a depth of 4.9m, lie close SW and about 0.8 mile NNW, respectively, of the light.

5.17 Bahia de Acapulco (16°50'N., 99°53'W.) is considered to be one of the finest harbors on the W coast of Mexico. The high, encircling mountains provide considerable shelter and are visible for a great distance to seaward. The entrance channel, known locally as Boca Grande, has a width of more than 3 miles and provides ample depths for large vessels. Alongside berthing facilities are provided within Bahia de Santa Lucia which lies in the NW part of Bahia de Acapulco. The former bay is entered NW of Punta Grifo, which is located 1 mile NNE of the NE extremity of Isla Roqueta. Las Dos Piedras, formed by two white rocks, is marked by a light and lies off the point which divides the head of Bahia Santa Lucia into two parts.

The head of Bahia de Acapulco, to the E of Bahia Santa Lucia, is fronted by several above-water dangers which lie within 0.3 mile of the shore. Farallon del Obispo, a rocky islet, is 31m high and forms the most prominent danger in this vicinity. It is light gray in color, with dark patches, and is prominent. Several groups of rocks lie close offshore, about 0.5 mile E of Farallon de Obispo, and may best be seen on the chart.

Rocas de San Lorenzo, a chain of rocks, extends 0.3 mile SE from a point on the shore located 0.8 mile WNW of Farallon de Obispo. Roca La Seria, a dangerous rock, and a shoal patch,



Acapulco—Approach to berthing facilities from SE

with a depth of 7.6m, lie 0.5 mile SW and about 0.2 mile SSE, respectively, of the outer end of the chain.

The E side of the bay as far S as Punta Guitarron is steep-to within 0.3 mile of the shore. A wreck, with a depth of 11m, lies about 0.5 mile N of Punta Guitarron. An oil pier is situated 0.4 mile E of Punta Guitarron and has a depth of 4.3m alongside its head. A naval pier, situated close N of the oil pier, is 90m long and has depths of 3.7 to 9m alongside.

Punta Diamante (16°47'N., 99°52'W.), the W extremity of a high promontory, is located 1.5 miles SE of Punta Bruja. It is faced by yellow cliffs and fronted by a reef. The promontory is reported to appear as an island from a distance of about 8 miles to seaward. A rock, with a depth of less than 1.8m, is reported (1952) to lie about 0.4 mile SSW of the point.

Puerto Marques, a small and sheltered inlet, is entered close N of Punta del Diamante. It recedes 1.5 miles E and has general depths of 7 to 36m. All of the dangers within this inlet lie less than 0.3 mile offshore and can easily be avoided.

Acapulco (16°51'N., 99°54'W.)

World Port Index No. 15760

5.18 Acapulco lies within a small bay in the NW part of

Bahia de Santa Lucia, which is in the western part of Bahia de Acapulco. The city is the most popular resort in Mexico and the harbor has facilities for cargo vessels, tankers, and large cruise vessels.

Winds—Weather.—The sea breeze is well defined during the dry season. It usually sets in from the SW at about noon, freshening and becoming more W during the afternoon, but fading to a calm at dusk. Later, there is a land breeze which is more irregular both in direction and force.

The rainy season lasts from June to the end of October. During December and January, the temperature is usually pleasant. However, during the latter part of the dry season, the heat over the land is intense and constant. During the rainy season, winds from the E and SE prevail.

Tides—Currents.—The tides rise 0.6m at springs and 0.3m at neaps.

Off Acapulco and for some distance to the E, the current sets ESE and attains a rate of 0.5 knot to 3 knots.

Depths—Limitations.—The port is entered via Boca Grande, the channel leading between Isla Roqueta and the mainland to the E. Smaller vessels can approach the port through Canal de Boca Chica which leads between Isla Roqueta and the mainland to the N, but large vessels are prohibited from using this approach due to extensive local small vessel traffic.



Acapulco—Approach and Fuerte San Diego (circled)



Acapulco—Lighthouse (circled) on Punta Sirena

The main facilities are situated on the N side of Bahía Santa Lucía. The Fiscal Wharf has two berths, T-1 and T-2, both of which accommodate alongside berthing for multi-purpose vessels and passenger ships up to 295m in length. Berth T-1 is 206m in length, with a depth of 10m alongside; Berth T-2 is 198m in length, with a depth of 9m alongside.

The Commercial Wharf is for coasters and has 150m of berthing, with a depth of 4m alongside. The Fishing Wharf has 173m of berthing, with a depth of 4m alongside. The Naval Pier is 100m in length, with a depth of 5m alongside.

Tanker berths are located in the S part of Bahía de Santa Lucía and consist of a CBM and a wharf attached to a jetty. The CBM can handle tankers up to 20,320 dwt, with a maximum length of 183m and a maximum draft of 8.5m at HW. The jetty can handle tankers up to 180m in length with a maximum draft of 9.14m at HW.

Aspect.—The rocky headlands located on either side of the entrance of Bahía de Acapulco are the only projections to break the long stretch of sandy beach that extends from Morro de Papanoa. Cerro del Corcovado, an excellent landmark when not obscured, is 1,231m high and stands 21 miles ENE of the bay.

Two conspicuous hotels stand near the coast, 2.5 miles E of Punta Diamante. A conspicuous illuminated cross stands on the E side of the bay entrance. A prominent illuminated television mast stands on the crest of the hills, 3.5 miles ENE of the city. A conspicuous radio mast stands on a hill, 0.3 mile W of Punta Grifo. Fuerte San Diego, a prominent fort, surmounts a point located 1 mile NW of Punta Grifo.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt and is available 24 hours. The pilot boarding station is in the entrance to Boca Grande in position 16°48'14"N, 99°53'47"W as shown on the chart.

Regulations.—The vessel's ETA should be sent 72 hours, 24 hours, and 12 hours before arrival during office hours. Office hours are from 0900 to 1400, Monday through Friday and 1000 to 1300 on Saturday, all local time. Final confirmation of ETA should be sent 2 hours before arrival at the pilot station. All ETA messages should include the following:

1. Expected arrival draft.
2. Number and health state of crew.
3. Vessel loa, gross tonnage, and beam.
4. Flag and port of registry.
5. Cargo to be loaded or unloaded.

Contact Information.—See the accompanying table titled **Acapulco—Contact Information.**

Acapulco—Contact Information	
Pilots	
VHIF	VHIF channels 16 and 68
Telephone	521-744-4827631
Facsimile	521-744-4827631
E-mail	snppaca@aca.cableonline.com.mx
Port Authority	
Telephone	521-744-4341710
Facsimile	521-744-4831648
E-mail	contact@apiacapulcoport.com
Harbormaster	
VHF	VHF channels 16 and 68
Telephone	521-744-4822067
Facsimile	521-744-4823175

Anchorage.—Large vessels usually anchor, in depths of 26 to 33m, ESE of Fuerto San Diego. Small vessels usually anchor, in depths of 20 to 24m, about 0.5 mile SSW of Fuerto San Diego, as shown on the chart. The bottom provides good holding ground of sand, mud, and shells.

The quarantine anchorage lies off Punta Grifo, at the entrance to Bahía Santa Lucía.

Anchorage is prohibited in the vicinity of the naval facility at Icos, located in the E part of Bahía de Acapulco, as shown on the chart.

Caution.—It has been reported (1997) that lighted aids to navigation are difficult to see and that many visual aids may be obscured by hills and cliffs.

Acapulco to Bahía de Puerto Angel

5.19 The coast between Punta del Diamante, on the SE side of the approach to Bahía de Acapulco, and Punta de Acamama, 60 miles E, consists of a continuous sandy beach backed by several lagoons.

A low, sandy, and bush covered point, which is marked by heavy breakers, extends from the coast, 16 miles E of Punta del Diamante. The entrance to Laguna Papagayo, into which the Rio Papagayo flows, lies close E of this point. During the rainy season and for some time afterwards, a heavy deposit from the lagoon discolors the water for several miles offshore. Vessels should not approach within 1 mile of the point.

An aeronautical light is shown from a structure standing 5.5 miles ESE of Punta del Diamante.

Nexpa (16°38'N., 99°13'W.), a village, stands 22 miles E of the mouth of the Rio Papagayo. It is situated close W of the mouth of the Rio Nexpa and, although small, is the largest habitation along this stretch of coast. A tall, wooden cross stands close E of the village and is prominent from seaward. A light is shown from a structure standing 1 mile E of the entrance to La-

guna Nexpa.

Punta Acamama (16°32'N., 98°52'W.), located 20 miles E of the mouth of the Rio Nexpa, is a low, rocky point. It is fronted by several detached rocks and marked by a light. A line of heavy breakers, with depths of 7 to 11m at its outer edge, extends up to about 1 mile SE of the point.

Bahía Dulce (16°32'N., 98°50'W.) lies between Punta Acamama and the mouth of the Rio Dulce (Rio Ometepec), 8 miles ESE. The latter river is usable only by small craft and lighters. A village stands near the mouth.

The coast between the Rio Dulce and Morro Maldonado, 14.5 miles SE, consists of an unbroken stretch of sandy beach.

Punta Maldonado (16°20'N., 98°35'W.), a headland, is 2 miles wide, but only projects slightly from the general line of the coast. A light is shown from a prominent structure standing on Punta El Recodo, the NW extremity of this headland. Several white cliffs, up to 61m high, stand about 1 mile E of the headland. They are prominent and are the only such cliffs along this part of the coast.

Close inshore of Punta Maldonado, the flood current sets N and W with the ebb current setting in the opposite directions. The currents attain rates of 0.5 knot to 2 knots. It is reported that the current sets WNW during the rainy season.

Caution.—In the vicinity of Punta Maldonado, forest fires, which usually occur at the end of the dry season, are liable to cause so much smoke as to obscure all the land behind the coastline. This smoke may cause mariners to overestimate their distance from the land. Also, with the rising sun, the shadow cast beyond the line of breakers makes the beach appear farther off than may actually be the case. At this time of the year, it is recommended that vessels pass Punta Maldonado at a distance of not less than 8 miles.

Heavy tide rips have been observed about 6 miles SW of Punta Maldonado.

5.20 Sierra Fuerte (16°38'N., 98°15'W.), a prominent castle-like mountain, has a cone-shaped peak at each end and stands 26 miles NE of Punta Maldonado. The E peak is 1,168m high and the W peak is 1,052m high.

Tartar Shoals (16°18'N., 98°36'W.), a dangerous group of rocky patches, has depths of 2.7 to 8m and lies centered about 2 miles SW of Punta El Recodo. Seaward of this group, the depths are irregular for some distance to the W, but increase rapidly to the S and SW.

The **Rio Verde** (15°58'N., 97°48'W.), the largest river along this section of coast, is obstructed at its mouth by a great quantity of debris and an impassable bar. When seen from the E or W, the land in the vicinity of the river mouth appears as a low, sandy point covered with trees and fringed by heavy breakers. During and after heavy rains, the discharge from the river discolors the water for a considerable distance to seaward.

Punta Galera (15°57'N., 97°41'W.), marked by a light, is located 6 miles E of the mouth of the Rio Verde. It is a bold, barren, isolated, and rocky headland which is connected to the mainland at the W side by a low, narrow strip of land. Laguna de Chacahua is entered close N of the point. A detached rocky shoal, with a depth of 1.8m, lies about 0.3 mile SSE of the point and the sea occasionally breaks on it. A detached reef, with rocks 3 to 5m high, lies about 0.5 mile E of the point.

Bahía de Chacahua lies between Punta Galera and Morro

Hermoso, 7 miles E. The shore of the bay rises to a ridge which is covered with dense undergrowth and stunted trees. Large amounts of debris are deposited in the bay and form uneven and shoal ground to the W of the entrance.

Morro Hermoso is a rounded bluff, 255m high, with a steep, barren, and reddish-colored S face. A light is shown from a structure standing on Cerro Hermoso, which rises behind the bluff. When viewed from the E or W, this bluff appears like an island. Good anchorage can be taken anywhere in Bahía de Chacahua, in depths of 11 to 18m.

5.21 Alcatraz (Piedra Blanca) (15°55'N., 97°21'W.), small and rocky, lies about 0.3 mile offshore. This islet is whitish in color and two above-water rocks lie close E of it. A sharp, rocky bluff, 27m high, rises 1 mile W of the islet.

A detached rock lies 0.5 mile offshore, 3.5 miles W of Alcatraz. It has a depth of 2.7m and the sea occasionally breaks on it.

Two conspicuous points, which resemble piers, project from the coast, 3 miles E of Alcatraz. The Rio Manialtepec flows into the sea about 6 miles E of Alcatraz. The mouth of this river can be recognized by a few huts standing on the beach at the E side of the entrance and a small village situated 1 mile inland.

Acantilados de Escondido (15°51'N., 97°05'W.), located 16 miles E of Alcatraz, consists of several perpendicular, rocky bluffs. These bluffs are grayish in color on their seaward sides and 15 to 30m high. A bright yellow patch located about midway along the bluffs is prominent from the W.

Bahía Escondido (15°50'N., 97°04'W.) is entered between Acantilados de Escondido and Punta Escondido, 3 miles SE. It is open to the SW, but provides excellent anchorage with good holding ground. A light is shown from a structure standing on the W side of the bay. Cerro del Ocote, a conspicuous mountain, is 659m high and stands 5 miles NNE of the bay.

Piedras de la Marina, a group of rocks up to 12m high, lies within the bay, about 1 mile E of Acantilados de Escondido. A rocky shoal, with a depth of 6.4m, lies about 0.2 mile W of the southernmost rock. An obstruction has been reported to lie close SW of this shoal.

Anchorage can be taken, in depths of 18 to 23m, SSW of Piedras de la Marina.

5.22 Punta Sicatela (15°48'N., 97°00'W.), a low and sandy point, is located 2 miles SE of Punta Escondido. It is covered with mangroves and fronted by shallow depths which are usually marked by heavy breakers. The Rio Sicatela flows into the sea close W of the point.

Punta de Rocas projects from the coast, 10 miles E of Punta Sicatela. This point is fronted by shallow depths which are marked by heavy breakers.

The coast between Punta de Rocas and Bahía de Puerto Angel, 20 miles E, consists of a sandy beach, which extends for the first 15 miles. The coast then rises abruptly to a series of high bluffs. The westernmost bluff is 78m high, prominent, and bold. It is covered with dense foliage except on its seaward face, which consists of brown and yellowish rocks.

Roca Blanca (White Rock) (15°39'N., 96°33'W.), a white and rocky islet, lies about 0.4 mile offshore, 2.3 miles W of Bahía de Puerto Angel. Roca Negra (Black Rock), a small rock, lies about 0.3 mile W of Roca Blanca. The small bay lying N

of these rocks is foul and should not be entered.

5.23 Bahía de Puerto Angel (15°39'N., 96°31'W.), a small harbor, provides shelter from November to May to small craft with local knowledge, but is exposed to the S. The bay is entered between a rocky islet, 30m high, lying on the W side and a bold bluff, 88m high, located on the E side.

Bufaderos, a bluff headland, is located 0.2 mile NNW of the E entrance point and forms the W side of a prominent hill, 61m high. A pole beacon, 4m high and surmounted by a white cross, stands on the summit of this hill.

Another islet, 30m high, lies off the W side of the bay and reduces the entrance fairway to a width of about 180m. Anchorage, sheltered from all except S winds, can be taken by small vessels, in depths of 7 to 13m, in the inner part of the bay. Large vessels can anchor in the outer part, in depths of up to 17m. At times, a heavy swell sets into the bay. A large loading platform, with a depth of 4.6m alongside, projects from the E shore of the bay, to the NE of Bufaderos.

A light is shown from a structure standing on Punta Izuca, which is located 0.5 mile W of Bahía de Puerto Angel.

Bahía de Puerto Angel to Puerto de Salina Cruz

5.24 The coast between Bahía de Puerto Angel and Bahía de Sacrificios, 15 miles E, consists of several rocky bluffs with strips of sandy beach between them. Inland, the coast is heavily wooded, but low and flat.

Gulf of Tehuantepec (15°00'N., 92°00'W.) lies S of the Isthmus of Tehuantepec, the narrowest part of Mexico. This gulf contains a great expanse of water and indents the coast between Bahía de Puerto Angel and Barra del Suchiate, 256 miles ESE.

The shores of the gulf are backed by high mountains. Cerro de Leon, 3,139m high, is prominent and rises 30 miles NE of Bahía de Puerto Angel. The mountains decrease from this peak to heights of less than 900m at the head of the gulf. They then increase again to Volcan Tacana, which is 4,064m high and stands 36 miles NNE of Barra del Suchiate.

Tides—Currents.—During the season of strong N winds, the currents in the gulf are influenced by the wind. When a N wind is blowing, the current sets N and E along the W shore and W along the E shore. At other times, the current sets in the opposite directions. This is caused by the violence of the strong N winds which lowers the water at the head of the gulf and produces a flow along each shore to fill the vacancy. When the N winds moderate or cease, the reverse action takes place. The water at the head of the gulf is then forced out along both shores by the return of the water previously forced out by the strong wind. These currents have been observed to extend as far E as Champerico and as far W as the Rio Verde.

Caution.—A designated dumping area lies along the coast and is bounded by lines joining the following positions:

- 13°24'N, 96°16'W.
- 13°24'N, 95°22'W.
- 12°40'N, 96°16'W.
- 12°40'N, 95°22'W.

Authorization to use this area must be granted by the Mexican authorities.

Lesser depths than charted, resulting from heavy silting, may

be encountered in the harbors within the gulf.

5.25 Bahia de Sacrificios (15°41'N., 96°15'W.), a very small and confined bay, is sheltered from the E by Isla Sacrificios and suitable only for small craft. Passage between the island, which is 24m high, and the mainland is not recommended. Foul ground extends up to about 0.4 mile offshore, 1 mile W of the bay.

The coast between Bahia de Sacrificios and Cerro Morro, 70 miles ENE, is fronted by rocky bluffs, which rise close inland to mountain ranges. Detached rocks and reefs front all the points along this stretch and vessels should give them a wide berth.

Isla Cacaluta (15°42'N., 96°10'W.), 67m high, lies 0.2 mile offshore, 4.5 miles E of Isla Sacrificios. The intervening coast consists of a series of high bluffs.

Punta Bufadero (15°43'N., 96°08'W.) projects from the coast 2.3 miles NE of Isla Cacaluta. A light is shown from a prominent framework structure standing on this point. A blow-hole in one of the rocks fronting the point spouts water and produces a sound like a whale that can be heard for a considerable distance in calm weather.

5.26 Puerto Huatulco (Guatulco) (15°43'N., 96°08'W.), a small and confined harbor, is entered between Punta Manzano, located 2.5 miles NE of Isla Cacaluta, and Punta Rosas, 0.4 mile NNE. Huatulco has facilities primarily for use by all passenger cruise vessels.



Huatulco Cruise Ship Terminal

Depths—Limitations—An approach channel, marked by lighted buoys, is initially 640m wide at the seaward end, narrows to 165m in vicinity of Punta Paraiso, then as the pier is approached the width diminishes to less than 100m.

The cruise ship terminal consists of a finger pier, 390m in length, capable of accommodating two vessels at one time with lengths up to 250m and depths of 10m alongside.

Aspect.—Entrance to the harbor is marked by a lighthouse at Punta Bufadero. For vessels approaching from the S, it can be difficult to line up the range for the first inbound leg due to obstruction of the harbor and range line from the coastline. It is suggested that approach to the harbor be made from the SE.

Pilotage.—Pilotage is compulsory and pilots are available at all times. Pilot will board in position 15°44'11"N., 96°06'30"W.

Contact Information.—See the accompanying table titled **Puerto Huatulco—Contact Information.**

Puerto Huatulco—Contact Information	
Pilots	
E-mail	snppdeleghuat@hotmail.com
Harbormaster	
VHF	VHF channel 16
Telephone	521-958-5871674
Facsimile	521-958-5870726
Port Authority	
Telephone	521-958-5871591
Facsimile	521-958-5871356

Anchorage.—The head of the harbor provides small vessels with good anchorage and is protected from SW winds, which occur most often between April and October.

Caution.—Piedra Blanca, a rock, is 27m high and lies 0.2 mile SE of Punta Rosas. A reef, with several rocks barely above-water on it, extends up to about 0.2 mile ENE from Piedra Blanca. The passage lying between this reef and the reef extending from Punta Rosas should not be attempted.

Dangerous rocks are visible offshore from Punta Paraiso which are not shown on most charts.

5.27 Bahia de Santa Cruz (15°44'N., 96°07'W.), lying E of Punta Rosas, provides anchorage as convenient, in depths of 9 to 18m.

Bahia Tangola-Tangola (15°46'N., 96°06'W.), lying E of Bahia de Santa Cruz, is 0.6 mile wide between the entrance points and contains several small, rocky islets. Good anchorage can be taken, with care, in depths of 9 to 18m, sand and shell, in the bay, but a considerable swell sets in from the S.

Isla Tangola-Tangola, lying close off the E entrance point of the bay, is prominent. The top of this island is covered with heavy growth and its outer side consists of a cliff formed by brownish stone.

The land along this stretch of the coast is backed by several ranges of foothills, which rise to the high mountain ranges in the interior. Cerro de Zadan, a bell-shaped mountain, is prominent and reddish in color. It is 1,727m high and stands 12 miles N of Bahia Tangola-Tangola. Cerro de Leon, the tallest peak in this vicinity, is 3,139m high and stands 22 miles NNW of the same bay.

The coast between Bahia de Santa Cruz and Punta Ayutla, 19 miles ENE, consists of a series of headlands fronted by steep cliffs.

5.28 Punta Ayutla (15°52'N., 95°47'W.), a bold and cliffy point, is 30m high and forms the E extremity of Morro Ayutla, a headland, 82m high. A light is shown from a prominent square tower, 14m high, standing on this headland.

Ranger Rock, a detached rocky shoal, has a least depth of 2.7m and lies about 0.5 miles NE of Punta Ayutla.

Bahia Grande, entered close E of Morro Ayutla, is open to

winds from the E and S, but provides safe anchorage in all seasons. The best anchorage lies, in a depth of 13m, in the W part of the bay.

Islas Estrete (15°56'N., 95°36'W.) is a barren, rocky, and white islet lying 12 miles ENE of Punta Ayutla. It is formed by two large rocks, of about equal size, and fringed by several reefs. A deep passage leads between this islet and the mainland.

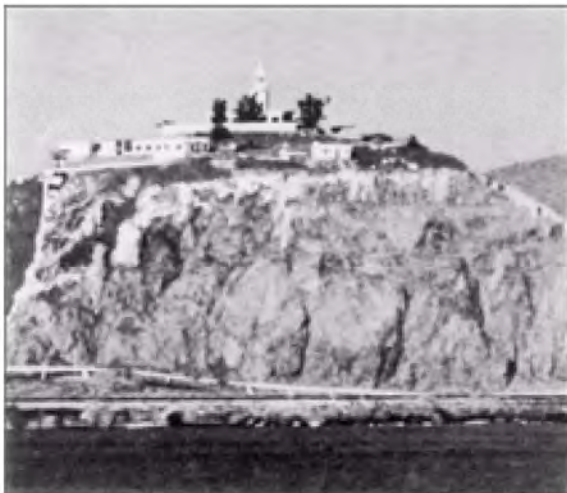
A prominent dome-shaped bluff, with two cone-shaped rocks fronting its base, is located 8 miles E of Isla Estrete. A large rock, awash, lies centered 0.7 mile seaward of this bluff, but the sea seldom breaks on it. Bahia de Bamba, entered close NE of the bluff, is foul and should not be entered.

5.29 Punta Chipehua (16°01'N., 95°22'W.), a prominent headland, is located 13 miles ENE of Isla Estrete. It consists almost entirely of an immense sand dune projecting about 1 mile from the general line of the coast. From the W, this point is conspicuous and appears as a bold, dark cliff with a belt of sand over the top. A conspicuous knife-edged ridge, up to 450m high, rises close behind the point and extends about 0.5 mile NW. It is almost perpendicular on the E side.

Bahia Chipehua (16°03'N., 95°21'W.) is entered between Punta Chipehua and Punta de Guelagichi, 5.5 miles NE, and has a depth of 36m in the entrance. Although this bay is open to winds from between NE and S, it is considered to be a good anchorage in all seasons. A heavy swell often sets into the bay during new and full moons.

There is good holding ground in all parts of the bay, but the best anchorage lies, in depths of 9 to 18m, in the W part, about 1 mile N of Punta Chipehua

Bahia Conejo and Bahia de Salina Marques lie NE of Bahia Chipehua and are separated by Morro de Salina Marques. Cono Hermoso, an isolated and conical hill, is 93m high and stands at the head of Bahia Conejo.



Morro de Salina Marques Light from SW

Morro de Salina Marques (16°10'N., 95°12'W.), a round and rocky projection, has an almost perpendicular cliff rising at its E side. A light is shown from a conspicuous tower with a

dwelling, 14m high, standing on the summit of this projection and a group of tanks is situated close NW of it. A prominent radio mast is also reported to stand on the projection.

Pico Shadani (16°12'N., 95°14'W.), 326m high, rises 3 miles N of the head of Bahia de Salina Marques. A prominent rock, 18m high, surmounts the summit of this hill and resembles a house. Pico Tecuani, 675m high, rises 1.8 miles W of Pico Shadani and is prominent.

5.30 Salina Cruz Offshore Terminal (16°10'N., 95°12'W.) lies in Bahia de Salina Marques and consists of three SPM buoys, which are connected to the shore by submarine pipelines.

No. 1 SBM, 2 miles ENE of Morro de Salina Marques, can handle tankers of up to 60,000 dwt, 242m in length, and a draft of 21.34m.

No. 2 SBM, 1 mile ENE of Morro de Salina Marques, can handle tankers of up to 60,000 dwt, 250m in length, and a draft of 21.95m.

No. 3 SBM, 1.7 miles SE of Morro de Salina Marques, can handle tankers of up to 250,000 dwt, 350m in length, a beam of 55m, and a draft of 21.34m.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt and is available between the hours of 0600 and 1800 local time. Pilots will be arranged through the VTS that operates in the Puerto de Salina Cruz. See paragraph 5.32 for details.

Pilots for the SPMs will board in position 16°08.1'N, 95°12.1'W.

Regulations.—Mooring is only allowed during daylight hours only; however, tankers can depart at any time.

Caution.—A restricted area, with a radius of 600m, is centered around each of the SPMs. Entry into this zone is prohibited without prior permission from VTS Center in Puerto de Salina Cruz. See paragraph 5.32 for details.

5.31 Bahia de Salina Cruz (16°10'N., 95°11'W.), a slight indentation, lies between Morro de Salina and Punta Ventosa, 3 miles E. During the hurricane season (May to October), this bay is exposed to S winds and considerable heavy swells. During November and March, unpredictable and intense N winds, known as Tehuantepecers, blow without warning.

Punta Ventosa (16°10'N., 95°09'W.) consists of a bold and rocky projecting headland, which is surmounted by Cerro Morro, 139m high. Several rocks and small islets front this headland and the coast to the W. The remaining stretch of coast, as far SE as Barra del Suchiate, consists almost entirely of a low and sandy beach backed by a continuous line of shallow lagoons. Between these lagoons and the mountains inland, the terrain is generally low and wooded. A few scattered hills rise from the coastal plain at the head of the gulf, but none are prominent.

The currents in this vicinity are very irregular, both in direction and force. They sometimes set E at rates of 0.5 knot to 2.5 knots, but within 12 hours, they may set as strongly in the opposite direction.

Off Bahia de Sacrificios, the current has been observed to set N and E at a rate of 2 knots during strong N winds.

Cerro Tres Picos (16°11'N., 93°38'W.), 2,422m high, stands 70 miles E of the head of the gulf and can easily be seen in clear weather from a distance of about 90 miles. This peak

appears from a distance as a cone towering above the surrounding mountains. However, from Barra de Tonalá, 21 miles SW, it appears as three peaks, the middle one being the sharpest and highest.

Puerto de Salina Cruz (16°10'N., 95°12'W.)

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5.32 Puerto de Salina Cruz lies in the NW part of Bahía de Salina Cruz. The port consists of an outer and inner harbor fronting the city along with a petroleum port to the W and three SBMs close SW of the petroleum port, which are connected to the shore by submarine pipelines. See paragraph 5.30 for details about the SBMs.

The port has facilities for general cargo, container, bulk, and tanker vessels. In addition, there is a small naval base.

Puerto de Salina Cruz Home Page

<http://www.apisal.com.mx>

Winds—Weather.—In the vicinity of the Gulf of Tehuantepec, which includes Puerto de Salina Cruz, the N winds are particularly strong. These winds, known locally as Tehuantepecers, generally prevail from October through April and at times blow with a force that exceeds force 8. There is less than 1 day per month of such winds from May to September. These winds may last several hours or several days, are liable to raise a high sea, and may be felt up to 100 miles offshore. The onset of these gale force winds may be indicated by a brief periods of rain from arched squall clouds followed by quickly clearing or cloudless skies. The barometer cannot be relied on to give any

prior warning.

Tides—Currents.—The tides rise about 1.1m at springs and 1m at neaps.

The currents in the entrance of the outer harbor are usually weak and variable, but a current has been experienced at times setting W at rates of up to 3 knots.

Depths—Limitations.—The outer harbor is protected by two breakwaters. The E breakwater is 984m in length and the W breakwater is 330m long.

The outer harbor is entered between the breakwaters, which has an opening of approximately 160m between them, through a channel 500m long and 13m in depth. The outer harbor has a turning circle with radius of 200m and a depth of 12m. Three berths located in the outer harbor.

The inner harbor is entered through an access channel from the outer harbor that is 50m wide, with a length of 70m and depths of 10m. The inner harbor has five berths for general cargo and petroleum products.

See the table titled **Salina Cruz—Berth Characteristics** for details about these berths.

A drydock is situated in the NW part of the inner harbor with length of 202m and a width of 24m, capable of accommodating vessels up to 21,000 dwt with drafts as deep as 4.5m.

Aspect.—The entrance channel is indicated by a lighted range, which may best be seen on the chart.

Two prominent radio towers, situated close together, stand on the E side of inner harbor.

Pilotage.—Pilotage is compulsory for all vessels over 500 grt and available between the hours of 0600 and 1800 local time and will be arranged by the VTS operating in this port.

Pilots will board in position 16°09'11"N, 95°11'31"W.

Contact Information.—See the accompanying table titled **Salina Cruz—Contact Information**.

Salina Cruz—Berth Characteristics					
Berth	Length of Berth	Max. LOA	Max. Beam	Max. Draft	Remarks
Inner Harbor					
No. 1	180m	150m	28m	6.7m	General cargo, grain, and sugar
No. 2	150m	180m	28m	8.5m	General cargo, grain, and sugar
No. 3	150m	180m	28m	9.1m	General cargo, grain, and sugar
No. 4	200m	180m	28m	9.4m	Diesel oil, fuel oil, and ammonia
No. 5	200m	180m	28m	8.5m	Diesel oil, fuel oil, and ammonia
Outer Harbor					
No. 6	70m	—	—	4.5m	Used by tugs, supply boats, and small craft
No. 7	277m	197m	32m	8.9m	LPG, jet and fuel oil, and ammonia at T-head jetty
No. 8	275m	197m	32m	9.6m	Container terminal
Tanker Harbor					
No. 9E	250m	230m	32m	12.5m	Product tankers
No. 9W	250m	230m	32m	12.5m	Product tankers

Salina Cruz—Contact Information	
Pilots	
Telephone	521-971-7140200 521-971-7142128
Facsimile	521-971-7142440
E-mail	pilotsalinacruz@prodigy.net.mx
Port Authority	
Telephone	521-971-7141325
Facsimile	521-971-7140014
E-mail	apisc1@prodigy.com.mx
PEMEX	
Call sign	Pemex Operations Oaxaca Radio (XFQ)
VHF	VHF channels 9, 12, 13, 16, and 20
VTS	
Call sign	Salina Cruz Port Vessel Traffic Supervisor
VHF	VHF channel 6

Regulations.—An IMO-adopted Traffic Separation Scheme (TSS) lies in the approaches to the port and may best be seen on the chart. This TSS consists of two parts, as follows:

1. A recommended approach route from the S for vessels over 500 grt arriving at, or leaving, the port of Salina Cruz.
2. A recommended approach route from the SW for tankers proceeding to, or coming from, the SPMs at the offshore terminal.

A Precautionary Area has been established at the junction of these S and SW approach routes.

Berthing is only permitted during daylight hours.

Harbor—Draft Restrictions		
LOA	Draft	
	Fore	Aft
130m to 150m	4.8m	6.7m
150m to 170m	5.4m	7.3m
170m to 185m	5.7m	7.6m
185m to 197m	6.7m	7.9m

A minimum maneuvering draft of 4.2m fore and 6.7m aft is required for vessels arriving and departing the inner harbor, except for the period from October through February, when the port is vulnerable to strong N winds. Due to the inner harbor's restricted size the following minimum draft restrictions are in place during this time:

Vessel Traffic Service.—A Vessel Traffic Service (VTS) has been established for the harbor area and approaches, including tankers berthing at the SPMs discussed in paragraph

5.30, using the Port Vessel Traffic Supervisor to monitor all vessel movement.

All vessels must contact the VTS 1.5 hours before arrival (call sign: Salina Cruz Port Vessel Traffic Supervisor) on VHF channel 6 and advise the following information:

1. ETA.
2. Draft (fore and aft).
3. Last port of call.
4. Bunkers remaining on board.

All tankers intending to load gas or oils must contact PEMEX 1.5 hours prior to arrival on VHF channel 9.

Vessel must contact the VTS when they are within 6 miles from the port, at which time they will be classified as having arrived.

The VTS will provide pilotage instructions, assign anchoring positions, and provide berthing instructions.

All vessels must monitor VHF channel 6 continuously.

Upon departure from any berth the VTS will contact vessels for information as soon as the pilot has disembarked. The following information will be given to the VTS:

1. Draft (fore and aft).
2. Pilot (time of embarking and disembarking).
3. Tugs (alongside or let go).
4. Time when lines were let go.
5. Time when passing breakwater.
6. Next port of call and ETA.
7. Bunkers remaining on board.

The VTS uses radar to monitor the approach of vessels.

Anchorage.—Anchorage can be obtained in the outer harbor, good holding ground, or be taken outside the breakwaters, E of the entrance range, and no closer than 0.5 mile from the coast, with moderate holding ground. Anchorage positions are assigned by the VTS operating in the port.

Caution.—A wave recorder buoy has been placed near the beginning of the lighted range in position 16°09'N, 95°11'W.

The entrance channel is subject to silting, but regular dredging is carried out.

Works are in progress (2011) in an area lying between the container wharf and the breakwater on the outer harbor side.

Puerto de Salina Cruz to the Rio Suchiate

5.33 Bahia Ventosa (16°10'N., 95°08'W.) lies close E of Punta Ventosa. The Rio Tehuantepec flows into the sea 2.3 miles NE of the latter point. Heavy breakers extend up to about 1 mile offshore in the vicinity of the mouth of this river. The city of Tehuantepec stands 10 miles above the river entrance.

The coast between Bahia Ventosa and Boca de San Francisco, 23 miles E, is low, brush covered, and backed by a series of large lagoons. The white dome of the church situated at San Mateo del Mar, about midway along this stretch of coast, and the cupola tower of the church situated at Santa Maria, 7 miles farther E, are conspicuous.

Boca de San Francisco, the entrance leading into the large lagoons, is marked by heavy breakers which extend up to 0.5 mile offshore. A prominent white sand dune, 6m high, stands on a low spit of land, 0.5 mile W of this entrance.

A stranded wreck lies close W of the W entrance point of Boca de San Francisco and is reported to be radar prominent.

The coast between Boca de San Francisco and Barra de



Puerto Arista Light

Tonala consists of a low, sandy beach backed by a large lagoon. Lights are shown from structures standing along the shore 3.5 miles W, 16 miles E, and 35 miles E of Boca de San Francisco

Barra de Tonala (16°00'N., 93°57'W.), a bar, lies 49 miles ESE of Boca de San Francisco and obstructs an entrance leading into the lagoon. It is marked by breakers which extend up to 0.8 mile offshore. Anchorage can be taken, in a depth of 22m, about 0.5 mile seaward of these breakers.

5.34 Puerto Arista (15°56'N., 93°50'W.), a small town, is situated 8 miles ESE of Barra de Tonala and marked by a light.

It was formerly a commercial port for the town of Tonala, 9 miles inland. Anchorage can be taken, in a depth of 18m, seaward of a group of houses with red roofs. The holding ground is good, but vessels often lie broadside to the swell.

Paredones de Soconusco (15°51'N., 93°41'W.), a group of hills, attains a height of 610m and stands 10 miles SE of Puerto Arista. Cerro San Bernardo, 925m high, rises near the N end of this group, 5 miles inland. This mountain and the hills are conspicuous, appearing green in the wet season and brown in the dry season.

The coast between Paredones de Soconusco and Barra de Zachapulco, 61 miles SE, is backed by low, wooded terrain, which rises close inland to a mountain range. Barra de Zachapulco fronts the entrance to a lagoon and is marked by breakers extending up to 0.3 mile offshore. From this entrance, the coast extends 20 miles SE to Barra de San Jose and then 19 miles SE to Puerto Madero.

5.35 Puerto Madero (Chiapas)(14°42'N., 92°27'W.) (World Port Index No. 15710) lies on the SE side of the Gulf de Tehuantepec and serves as the port for the city of Tapachula, which stands 15 miles inland. It also provides extensive fishing facilities.

Depths—Limitations.—The harbor is entered between two parallel rubble breakwaters which lie 340m apart and extend 750m SW from the shore. The entrance fairway is 80m wide and has a controlling depth of 8.5m. The channel leading to the fishing quay has a dredged depth of 7m.

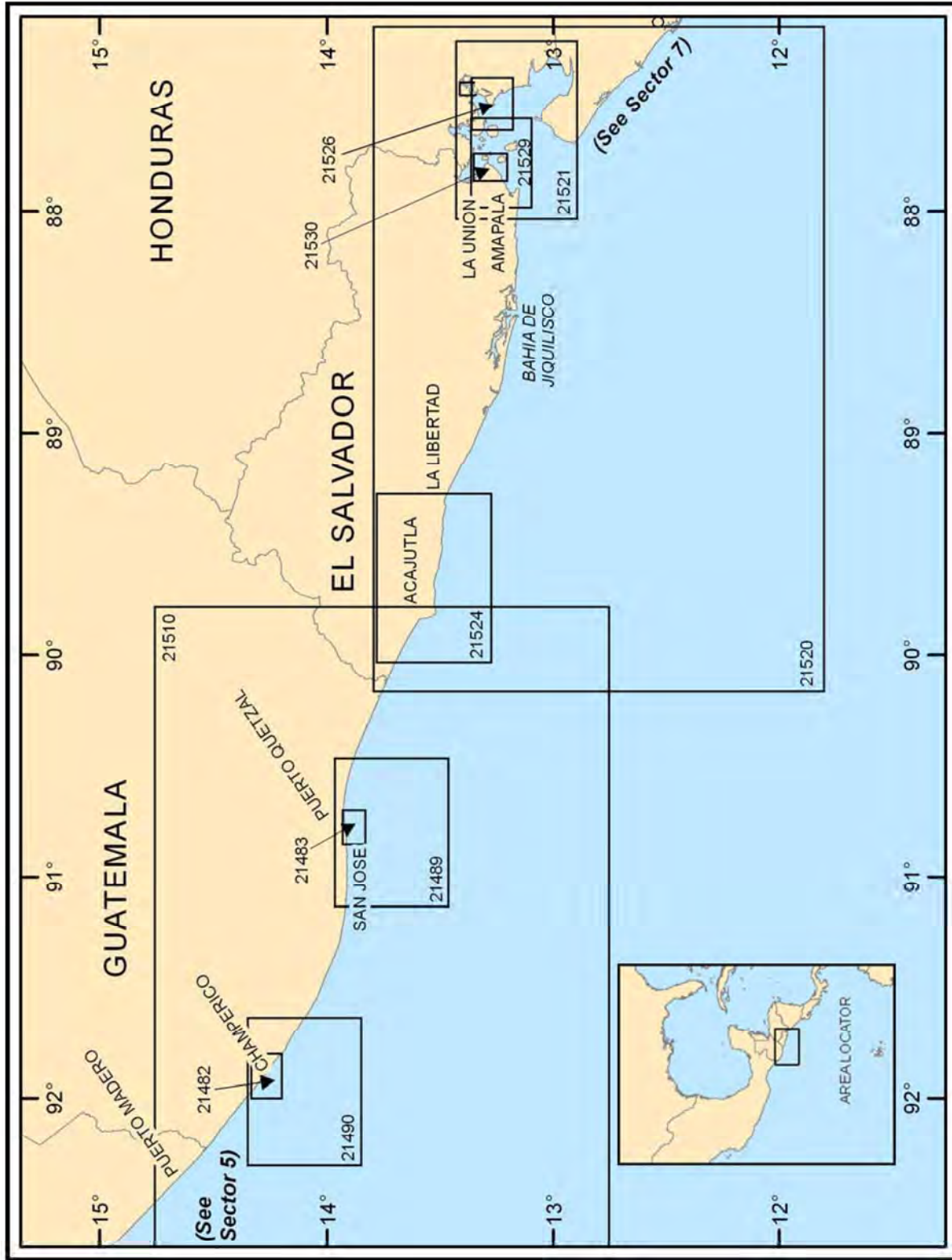
The main commercial quay is 150m long and has a depth of 8.5m alongside. The fishing quay and naval pier have a depth of 7m alongside. Vessels of up to 165m in length, 25m beam, and 8m draft can be accommodated.

Aspect.—The entrance fairway is marked by an outer lighted buoy and indicated by a lighted range. Puerto Madero Light (Chiapas Light) is displayed from close NNW of the root of the W breakwater.

Pilotage.—Pilotage is compulsory. Pilots can be contacted by VHF and board about 0.5 mile off the entrance. Vessels should send an ETA 48 hours and 24 hours in advance.

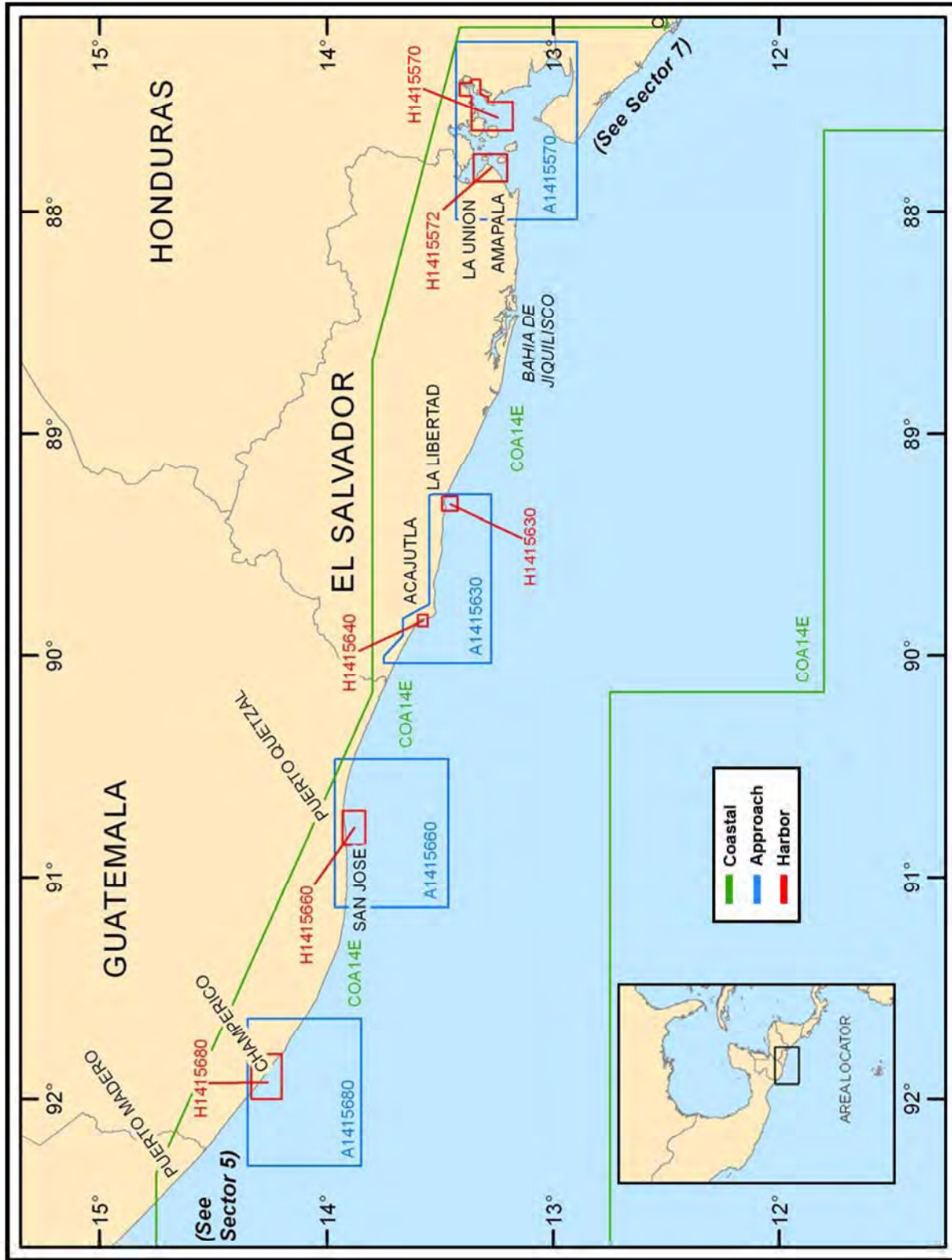
Anchorage.—Anchorage may be obtained, in depths of 12 to 16m, mud with good holding ground, between 0.5 mile and 1.5 miles SSW of the entrance.

The coast between Puerto Madero and the Rio Suchiate, 13 miles SE, is backed by a continuous stretch of lagoon, which is separated from the sea by a narrow strip of land. The Rio Suchiate marks the approximate boundary between Mexico and Guatemala and separates the towns of Tecun Uman, the terminus of the Guatemalan railroad, and Suchiate, 3 miles W.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 6 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 14 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 6 — DNC LIBRARY INFORMATION

SECTOR 6

COASTS OF GUATEMALA, EL SALVADOR, AND HONDURAS, INCLUDING GOLFO DE FONSECA

Plan.—This sector describes the coasts of Guatemala, El Salvador, and Honduras, including Golfo de Fonseca. The descriptive sequence is SE.

General Remarks

6.1 Winds—Weather.—From December to May, the gentle NE trade system predominates with winds usually between NE and NW. From May to November, the equatorial belt of calms lies farther N and winds from the S and W predominate. During this season, land and sea breezes are common, with occasional SW squalls. This period coincides with the rainy season and frequent thunderstorms blow from the W and SW. The violent, local squalls that occur in connection with these thunderstorms are known as “Chubascos.”

Winds from the N are common in the cool season. Along this coast, the wet and dry seasons are well defined. The rainy season lasts from May to November and the remainder of the year constitutes the dry season. In some sections along the middle of this area, a decrease in rainfall occurs for several weeks during the summer. This dry spell is known as the “Veranillo.” Much of the rainfall along this coast occurs in the form of thundershowers.

Tides—Currents.—The current along this part of the coast generally sets W, but its direction is often affected by eddies in local areas. There is evidence that the position of these eddies varies from one year to the next and the regularity of the currents cannot be relied on. Vessels are cautioned to give the points located along the coast a wide berth.

Caution.—It has been reported (1998) that as a result of Hurricane Mitch all marine navigational aids along the Honduran coast have either been destroyed or are unreliable. For further details, local authorities should be consulted.

The Rio Suchiate to Champerico

6.2 The **Rio Suchiate** (14°33'N., 92°14'W.) marks the approximate boundary between Mexico and Guatemala and separates the towns of Tecun Uman, the terminus of the Guatemalan railroad, and Suchiate, 3 miles W.

The **Rio Ocos** (14°31'N., 92°12'W.) discharges into the sea about 10 miles SE of the mouth of the Rio Suchiate. The small village of Ocos is situated on the W side of the entrance and is fronted by a derelict pier. Vessels, with cargo to be landed, usually anchor during the day, in a depth of 9m, close off the village. At night, vessels anchor about 1 to 2 miles offshore.

The coast in this vicinity is subject to frequent changes due to earthquakes and vessels should approach the Rio Ocos with caution.

The coast between the Rio Ocos and Champerico, 19 miles SE, consists of a narrow strip of sandy beach backed by a series of lagoons.

Champerico (14°18'N., 91°56'W.) consists of an open road-

stead. The port is closed to commercial traffic (2013). Cargo that used to be worked here consisted of coffee, cotton, and bananas.

Tides—Currents.—The tide rises about 2.1m at springs and 2m at neaps.

During the dry season (November through April), the current in this vicinity usually sets ESE at a rate of 0.5 knot. However, the current will occasionally set ESE for 3 or 4 days and then set in the opposite direction for the same length of time. From June to August, a WNW current, with a rate of over 0.5 knot, predominates.

Depths—Limitations.—Cargo used to be worked by lighters between vessels anchored in the roadstead and a metal pier, 216m in length. This pier is reported (2013) to be in poor condition, probably from disuse.

Anchorage.—Anchorage can be taken, in a depth of 12m, about 0.9 mile SSW of the head of the pier. It is advisable to anchor farther seaward during extreme surf conditions and during the rainy season, when local storms occur without warning.

Caution.—Heavy rollers, which break in a depth of 7m, occasionally set in from the S during a flat calm at full or new moon.

Champerico to Puerto Quetzal

6.3 San Luis (14°11'N., 91°46'W.) is situated at the mouth of the Rio Samala, 12 miles SE of Champerico. This settlement may be recognized by two large sheds with huts on either side. A reef, which breaks, is reported to lie 2 to 4 miles offshore along the coast for a distance of about 6 miles abeam of the mouth of the river. Shallow depths were reported (1916) to lie seaward of this reef and vessels should give the area a wide berth. A dangerous rock was reported (1912) to lie about 5 miles S of San Luis.

Vessels with local knowledge may anchor off San Luis during the dry season, from November to April, but at other times the anchorage should be avoided.

Sesecapa (Nuevo Venecio) (14°06'N., 91°37'W.), an open roadstead, lies about 10 miles SE of San Luis and is occasionally used by vessels for loading cargo.

San Jeronimo (13°55'N., 91°11'W.), a small village, consists of several huts and one large warehouse. Good anchorage can be taken, in depths of 11 to 15m, off this village during the dry season. Lighters for working cargo can be obtained from either Champerico or San Jose.

6.4 San Jose (13°55'N., 90°50'W.), an open roadstead, with rail service to Guatemala City, which stands 72 miles inland. No alongside berthing facilities are provided.

Depths—Limitations.—Cargo-handling facilities consist of four CBMs arranged in a line fronting the port, in depths of about 15m. Three of the CBMs are devoted to the discharge of oil while one is for loading molasses.

The CBM used for vessels loading molasses are arranged around the head of an old derelict pier extending 274m from shore, with loading taking place through a pipeline at the head of the pier.

The three CBMs used for the discharge of oil are arranged about 1.5 miles W of the molasses CBM. Details of these offshore tanker berths, each consisting of several mooring buoys, are found in the table titled **San Jose—Oil Discharge CBMs**.

San Jose—Oil Discharge CBMs			
Operator	Maximum Vessel		
	LOA	Draft (at HW)	Beam
Esso	186.0m	10.3m	—
Puma Energy	182.9m	11.55m	32.46m
Texaco (OTSA)	228.6m	12.0m	32.3m

Aspect.—Volcano Agua and Volcano Fuego, both conspicuous peaks, rise about 32 miles N of San Jose. Volcano Agua, 3,759m high, is shaped like a perfect cone. Volcano Fuego, 3,841m high, consists of two summits of nearly equal size and appearance. Square Rock, 457m high, stands 25 miles NNW of the town and forms an excellent landmark when the other peaks are obscured by haze.

During hazy weather, the town may be identified by the break in the thick green vegetation. In clear weather, a white warehouse, situated on the beach, and another warehouse, situated on the end of the pier, are prominent. Several oil tanks stand 2 miles W of the pier. A conspicuous water tower is situated 0.5 mile NNW of the pier.

A prominent stranded wreck lies 0.4 mile W of the pier. A light is shown from a structure standing near the outer end of the pier. Another light is shown from the airport tower situated 1 mile NW of the port. An aero radiobeacon is situated 6 miles ENE of the light.

A river mouth lies 5.3 miles W of San Jose and is protected by breakwaters, which are visible from seaward in all weather.

Pilotage.—Pilotage is compulsory. Pilots are requested and available from Puerto Quetzal. See paragraph 6.5 for requesting procedures, contact information, and ETA reporting requirements.

Anchorage.—Vessels must anchor first at the Puerto Quetzal anchorage to gain inbound clearance before proceeding to San Jose. See paragraph 6.5 for details of the anchorages around Puerto Quetzal.

Once at San Jose, anchorage can be taken, in depths of 20m, about 0.6 mile S of the molasses CBM around the head of the derelict pier. The bottom is sandy, but the holding ground is not good. Vessels should not anchor close in to the head of the pier due to the presence of unlit barges moored 0.5 mile SW of the pier head.

Anchorage farther seaward is advisable during extreme surf conditions and during the rainy season when “Chubascos” are liable to occur without warning.

Caution.—A foul ground area lies centered 0.3 mile S of the head of the derelict pier. Numerous anchors and cables are re-

ported to lie within this area.

Three dangerous wrecks lie within 230m of the head of the derelict pier.

Submarine cables are laid along the E side of the anchorage area off the pier head.

During February, March, and April, the port is reported to be difficult to identify at daybreak due to the smoke caused by the burning of brush and vegetation.

Puerto Quetzal (13°55'N., 90°48'W.)

World Port Index No. 15660

6.5 Puerto Quetzal is the principal port of Guatemala on the Pacific coast. It is protected by breakwaters and constructed around a natural lagoon. Main exports are sugar and coffee while imports consist of grain, fertilizers, bulk cement, and containers.

Puerto Quetzal Home Page
<http://www.puerto-quetzal.com>

Winds—Weather.—Generally, the wind blows from between SSE and W from 1000 to 2100. After a short calm, the wind then veers to between NW and N. Winds from the S, accompanied by heavy squalls and frequent rains, prevail from about the middle of June to October.

Tides—Currents.—The tides rise about 2.8m at springs and 0.2m at neaps.



Puerto Quetzal Lighted Buoy PQ

Depths—Limitations.—The W breakwater projects 540m SSE and then 600m ESE from the shore. The E breakwater extends 307m S from the shore. An inner breakwater extends 367m W from the root of the E breakwater.

A turning basin, 340m in diameter, lies close inside the entrance and is dredged to a depth of 14m.

The entrance channel is dredged to a depth of 14.5m and is initially 457m wide, but narrows to approximately 238m at its

narrowest point.

Upon entry into the harbor, a fishing pier is passed to starboard, with the Auxiliary Dock close N of this. Close E of the Auxiliary Dock is the Dock for Services, with the Commercial (Multipurpose) Dock situated close N of the Auxiliary Dock. Container vessels are usually berthed opposite the container yard along the Commercial Dock. The total length of the Commercial Dock is 810m, allowing several vessels to be berthed at one time. A ro-ro ramp is located on the N section of the Commercial (Multipurpose) Dock. Several other smaller berths for local coasters and tugs are located in the S section of this area.

Upon passing the Southern Quay heading N, the Western Basin, with a N and S side, is located to port. The Temsa Berth, for self-unloading coal vessels to discharge their cargo, and the Cruise Terminal are located on the N side. The Cruise Terminal is a jetty extending S from shore, with a flat side length of 58m and dolphins on either side of the flat head extending 285m between them, for mooring cruise vessels. The alongside depth at the Cruise Terminal is 13m. The Temsa Berth will accommodate vessels as large as 50,000 dwt and with a length of 228m. An LPG terminal is located in the S side. For further details about the berths available within the harbor, see the graphic titled **Puerto Quetzal—Pier Information**.

Vessels use their own cargo-handling gear for loading and off-loading operations.

Aspect.—The entrance to the harbor is marked by a lighted range and is clearly indicated by the two breakwaters leading into the port. The N and S breakwaters are lighted and provide excellent radar and visual aids to navigation. Three conspicuous white tanks line the front of the port.

Two white buoys were reported (2011) to lie E of the designated anchorage areas in position 13°53.2'N, 90°45.5'W and position 13°52.9'N, 90°46.2'W.

Pilotage.—Pilotage is compulsory for all vessels arriving and departing but not for shifting berths within the harbor. Pilots are available 24 hours a day and will board in the anchorage area located about 1 mile S of the breakwater or in the vicinity of Fairway Lighted Buoy (13°54'24"N., 90°46'05"W.).

Regulations.—The use of tugs is compulsory for vessels over 500 grt for arrival and departure at a berth.

The vessel's ETA should be sent 8 days, 72 hours, 24 hours, and 12 hours in advance.

The ETA message should contain the following information:

1. Vessel name.
2. ETA.
3. Length overall.
4. Gross registered tons.
5. Quantity, weight, cargo type, and all information needed to calculate the deposit for the services that the port provides.

Puerto Quetzal—Contact Information	
Pilots	
VHF	VHF channel 16
Telephone	502-788-11555 (extension 516)

Puerto Quetzal—Contact Information	
Facsimile	502-788-11072
Harbormaster	
Telephone	502-788-11056
	502-788-11057
Facsimile	502-788-11036
E-mail	banapac@yahoo.com
Port Authority	
Telephone	502-788-11555
Facsimile	502-788-11555 (extension 507)
E-mail	plaorganizacion@puerto-quetzal.com
Port Operations	
VHF	VHF channels 14 and 16
Telephone	502-788-12276

Contact Information.—See the accompanying table titled **Puerto Quetzal—Contact Information**.

Anchorage.—A designated anchorage area, with nine berths, best seen on the chart, lies centered 1 mile S of the W breakwater. This area has depths of 19 to 28m, with moderately-good holding ground, although exposed to considerable swell.

A vessel may also anchor in front of the harbor, not less than 1 mile offshore, without using a pilot.

Caution.—A wreck, depth unknown and marked by a buoy, is situated E of the breakwaters in the vicinity of position 13°55.0'N, 90°46.7'W.

A small unmarked shoal area lies along the left side of the entrance channel between bearings of 297° and 288° from the forward range.

Puerto Quetzal to Acajutla

6.6 Iztapa (13°55'N., 90°38'W.), an open roadstead, lies 6 miles E of San Jose, at the mouth of a river. It is now a resort and is of little importance. Anchorage can be taken, in depths of 20 to 24m, mud and sand, about 0.5 mile offshore.

The coast between Iztapa and Fondeadero Acajutla, 51 miles ESE, consists of a grayish, sandy beach broken by the entrances of several small rivers. Several villages stand near the shore along this stretch of coast and have been reported to be useful landmarks.

The **Rio Paz** (13°45'N., 90°08'W.), one of the larger rivers, lies 36 miles ESE of Iztapa and marks the approximate boundary between Guatemala and El Salvador. A shoal, with a depth of 10m, is reported to lie 12 miles SW of the mouth of this river.

Acajutla (13°35'N., 89°50'W.)

World Port Index No. 15640

6.7 The port of Acajutla, the largest port in El Salvador, is

COAL TERMINAL / FUEL
FACILITIES: 1 berth consisting of 4 mooring dolphins to unload coal and fuel. **DIMENSION:** length 10.67m, width 10.36m each dolphin. **DEPTH:** 12m below hydrographic zero.

CRUISES TERMINAL
 1 berth consisting of 6 mooring dolphins for passenger cruises mooring. **DIMENSION:** length 285m. **DEPTH:** 13m below hydrographic zero.

COMMERCIAL WHARF
 2 berth for general cargo; 2 berths for solid/liquid general cargo; 1 multipurpose ramp. **DEPTH:** 11m below hydrographic zero. **DIMENSION:** length 810m



LINKING OR SERVICES
 Connection between the commercial wharf and the southern wharf, its purpose is to service small ships. **DIMENSION:** length 50m and width 40m. **DEPTH:** varies between 5m and 11m below hydrographic zero.

GAS TERMINAL
 1 berth consisting of 2 holding piles and 6 mooring piles, with specialized attachments to unload liquefied petroleum gas (LPG). **DIMENSION:** Length 58m. **DEPTH:** 13m below hydrographic zero.

ADDITIONAL WHARF
 1 berth to handle general cargo, (shallow-draft vessels) in the northern side. **DEPTH:** 5m below hydrographic zero. **DIMENSION:** length 170m and width 31m

Puerto Quetzal—Pier Information

a primary export center for locally grown coffee. General cargo, containers, liquid bulk, and refrigerated cargo are also worked at the port. Acajutla lies 20 miles SE of the Rio Paz and is exposed to W winds. It serves the region of Santa Ana in

the W part of El Salvador. The town, a popular resort, includes an extensive industrial complex comprised of a cement factory, an oil refinery, and a grain silo.

Winds—Weather.—Strong W winds usually raise a heavy



Port of Acajutla

sea at the exposed anchorage and cause surging at the piers. Mooring lines are frequently parted. Chubascos, violent thunder squalls, are frequent during the wet period, May to October.

Tides—Currents.—The tides rise about 2m at springs and 1.2m at neaps.

The offshore current in this vicinity usually sets in an E di-

rection at a rate of 0.5 knot.

Depths—Limitations.—There is no channel for entry into the port, however, vessels approaching from the E should pass at least 4 miles off Punta Remedios to avoid numerous rocks and shoals as best seen on the chart.

The port consists of a breakwater mole which extends 480m W, then 300m NW, and finally 300m NNW from the shore. A finger pier, 360m long, extends NW from midway along the first section of the breakwater.

The **Acajutla Offshore Terminal**, also known as the Cenergica CBM (ex-El Paso) Terminal, is located about 1.2 miles WNW of the breakwater and finger pier facilities. This is an offshore tanker berth consisting of a cluster of five mooring buoys, in a depth of 17m, and is connected to the shore by a submarine pipeline. Tankers of up to 60,000 dwt, 231m in length, and 12.8m draft can be handled.

Another offshore terminal, known as the Rasa Terminal, is located approximately 1 mile SSW of the breakwater pier and is best seen on the chart. This terminal is operated by a private company and can accommodate tankers with crude products up to 220m in length, 32.3m in width, and a draft up to 11.4m. For clean product tankers, the maximum length is 194m and maximum draft is 13.4m.

Acajutla—Berthing Facilities					
Berths	Length	Maximum Vessel		Depth alongside	Remarks
		LOA	Draft		
Breakwater Mole—Piers A and C					
A-1	160m	156m	8.8m	10.0m	General cargo, including liquid or bulk.
A-2	161m	156m	10.3m	12.0m	General cargo, including liquid or bulk.
C-7	140m	120m	10.0m	11.9m	General cargo, including liquid, bulk, and containers
C-8	140m	122m	12.0m	14.9m	General cargo, including liquid, bulk, and containers
Finger Pier—Pier B					
B-3	159m	150m	8.2m	10.0m	General cargo and containers.
B-4	159m	150m	9.4m	10.4m	General cargo and containers.
B-5	174m	159m	7.0m	10.0m	General cargo and containers.
B-6	174m	159m	9.4m	10.0m	General cargo and containers.



Acajutla Berthing Facilities

The breakwater and finger pier provide eight berths for general cargo, bulk, and container vessels. The accompanying table titled **Acajutla—Berthing Facilities** contains specific information regarding the berthing facilities at the Acajutla breakwater and finger pier facilities.

Aspect.—A light is shown from a framework tower, 8m high, standing at Puerto Viego, the old part of the town, 0.5 mile ENE of the breakwater head. It is reported (2011) that this light is hard to see when approaching the harbor during the day and it should not be used as a head bearing during daylight hours.

A light is shown from the head of the breakwater.

An outer lighted buoy is moored about 2 miles SW of the breakwater head.

Pilotage.—Pilotage is compulsory for all vessels and available by day and at night. Pilots can be contacted by VHF channel 16. Pilot will board in the vicinity of Fairway Lighted Buoy (13°34'45"N., 89°52'07"W.). Vessels should send an ETA 72 hours, 48 hours, and 24 hours in advance. It has been reported that there is only one pilot available for the harbor on any given day.

Contact Information.—Port Operations can be contacted, as follows:

1. VHF: VHF channel 16
2. Telephone: 503-240-53382
3. Facsimile: 503-240-53391

The Port Authority can be contacted, as follows:

1. Telephone: 503-240-53201
2. Facsimile: 503-240-53390

Anchorage.—Vessels can anchor anywhere outside of the port along the coast in depths of 20m to 100m, mud and sand. Cargo vessels usually anchor about 1 mile NW of the head of the breakwater, mud and shells. Tankers are advised not to anchor, but to remain underway and within VHF range unless they are waiting for berthing at the offshore terminal, in which case there is an anchorage area located close S of the mooring buoys.

Caution.—A dangerous wreck is located in position 13°34'40"N, 89°50'15"W. Another dangerous wreck lies about 90m due S with depth unknown.

Two wrecks lie in approximate positions 0.8 mile NNW and 1 mile N of the breakwater head, with depths of 9.2m and 6m respectively.

Unlit barges frequently anchor within 0.5 mile of the breakwater.

An underwater obstruction is reported to lie about 0.7 mile SSW of the offshore tanker berth.

There are several uncharted rocks between Berths A1/A2 and Berths B3/B4. At the entrance to Berths B5/B6 there are uncharted rocks; one in particular rises over 1 meter from the sea bed.

Another uncharted rock, with a depth of 8m, is reported (2011) in the entrance to the slip for Berths C7/C8.

Vessels should always have their engines available at short notice in order to leave the berth due to heavy swell. During such periods, vessels usually remain underway and within VHF range.

From May to October, vessels should maintain a radar watch from 2 hours before sunset until sunrise in order to detect incoming squalls. If there is evidence of a Chubasco within 25

miles of the port, all operations are ceased. Vessels are requested to maintain a minimum mean draft of 6m at all times.

It has been reported that navigational aids and small craft are difficult to identify against the background of lights shown from the industrial complex.

Acajutla to Golfo de Fonseca

6.8 Punta Remedios (13°31'N., 89°48'W.), marked by a light, is low, cliffy, and thickly covered with mangroves. A foul area, with reefs and rocks, extends up to 2.5 miles seaward of the point and may best be seen on the chart.

A stranded wreck, with its hull visible at all stages of the tide, lies about 2.3 miles WNW of the point and was reported (1985) to be conspicuous.

Caution.—The waters in the vicinity of Punta Remedios have not been closely surveyed and vessels are advised to pass not less than 4 miles off the point when transiting from the E. When the point bears NE, vessels should keep in a depth of not less than 18m as they proceed up the coast.

6.9 Sacasa Rock (13°28'N., 89°47'W.) lies about 3.5 miles SSE of Punta Remedios, but its position is doubtful. The sea breaks occasionally over this rock at LW.

The coast between Punta Remedios and La Libertad, 28 miles E, consists of a gray, sandy beach for the first 12 miles and also for the last 6 miles. The remaining part of the coast consists of a succession of projecting headlands and steep cliffs.

La Libertad (13°29'N., 89°19'W.), an open roadstead anchorage, is no longer used for commercial traffic, but is frequented by fishing vessels. A pier, 270m long, fronts the town, which is a popular resort, and has a depth of 5m alongside its head. A dangerous wreck lies about 5 miles WSW of La Libertad.

6.10 La Concordia (13°21'N., 89°03'W.), located 17 miles ESE of La Libertad, stands at the entrance to a lagoon, about midway between La Libertad and the Rio Lempa. The Rio Jiboa, flowing from a lake in the interior, discharges into the sea about 1.5 miles W of this settlement. The entrance to the lagoon, which cannot be entered, is marked by heavy breakers.

Volcan San Vicente, shaped like truncated cone, rises 18.5 miles NNE of La Concordia. This peak is 2,173m high and appears as a double summit when viewed from the E or W. The lights of a city situated on the S slopes of this peak are conspicuous from seaward.

A conspicuous white house stands on a hill, 196m high, which rises 9 miles NNW of La Concordia.

The **Rio Lempa** (13°14'N., 88°49'W.), the largest river in El Salvador, lies 16 miles E of La Concordia. It is navigable by river steamers, but has little commercial importance. The river entrance may be recognized by some large trees, with white trunks and almost bare tops, standing in the vicinity, and by discolored water which extends up to 5 miles offshore.

The coast between the Rio Lempa and Punta San Juan, 20 miles E, is fringed by a belt of white sand backed by an extensive plain.

6.11 Bahia de Jiquilisco (13°10'N., 88°28'W.), lying 20



FISHING PIER, LA LIBERTAD

La Libertad—Fishing Pier at LW

miles E of the Rio Lempa, is entered between Peninsula San Juan and the SW extremity of Isla San Sebastian. This bay is fronted by an extensive shoal which is divided into two separate parts by a straight and narrow channel. The bay, within its entrance, is extensive, but most of the area is occupied by several large, low islands. Deep and narrow creeks surround almost all of these islands.

Bajos Lempa, two shallow shoals separated by a narrow channel, extend about 3 miles S from the coast on either side of the bay entrance. A bar, with a least depth of 4.3m, lies across the S part of this channel and joins the outer extremities of the two shallow shoals. A line of breakers usually forms over the shoals on either side of the bar at certain stages of the tide, even in good weather. Within the bar, several shoal patches, with depths of 4.6 to 5.5m, lie in the channel. About 1.5 miles above these shoals, which are centered 0.5 mile inside the bar, the channel narrows and the depths increase to 20m. In this narrow section of the channel, a strong current, accompanied by a choppy sea, is usually encountered.

The passage leading N and then W to Puerto El Triunfo

(13°16'N., 88°33'W.) from the inner end of the entrance channel has sufficient depths to accommodate any vessel capable of crossing the bar. This town is a shrimping center and the only place of any importance in the bay. A local craft will meet and lead a vessel over the bar and into the bay provided prior arrangements have been made with the town authorities. Entrance into the bay should not be attempted without local knowledge.

The currents are regular and follow the direction of the channels. They usually attain rates of 3 to 4 knots in the entrance channel and set W, with a rate of 1 knot, outside the bar.

Good and sheltered anchorage can be taken in any part of the main channel between Isla Pajarito (13°12'N., 88°28'W.) and Isla Tortuga, 6.5 miles NW.

Caution.—Bajos Lempa, the shoals at the entrance, were reported to have extended farther seaward than charted.

The depths in the channel are subject to change.

A dangerous wreck is reported to lie about 1 mile S of the entrance.

An ammunition dumping ground, 10 miles wide, lies be-

tween 55 miles S and 60 miles SW of Bahía de Jiquilisco and may best be seen on the appropriate chart.

6.12 The Rio Grande de San Miguel ($13^{\circ}10'N.$, $88^{\circ}23'W.$) flows into the sea about 4 miles E of Bahía de Jiquilisco. The entrance is obstructed by a bar, which is marked by breakers.

The coast between the river mouth and Punta Amapala, 28 miles E, consists of a sandy beach broken in places by cliffs. The currents off this section of the coast, which attain rates of 1.5 knots, set E for a period and then set in the opposite direction.

Caution.—The sandy beaches along this part of the coast give a very deceptive appearance to the land, especially at sunrise and sunset, causing it to appear nearer than it really is, and the surf to appear to break further from the shore than it actually does.

Golfo de Fonseca

6.13 Golfo de Fonseca ($13^{\circ}09'N.$, $87^{\circ}54'W.$) is entered between Punta de Amapala and Punta Cosiguina, 19 miles SE, and recedes about 30 miles NE to its head. The coasts of El Salvador and Honduras front the NW and NE shores of the gulf and contain Puerto La Union, Puerto Amapala, and Bahía San Lorenzo. The Estero Real, a navigable river, discharges into the SE side of the gulf and is bordered by Nicaragua.

Several prominent volcanic peaks rise on both sides of the gulf entrance and a number of high and conspicuous islands lie within the inner part. Punta de Amapala, the W entrance point, is low, flat, and fronted by a reef which extends up to 0.3 mile offshore. This reef, which is marked by breakers, has been reported (1994) to extend farther offshore than charted.

Volcan San Miguel ($13^{\circ}25'N.$, $88^{\circ}18'W.$), 2,132m high, rises 28.5 miles NW of Punta de Amapala and is very conspicuous.

Volcan Conchagua, with a double-peaked summit, rises close to the coast, 8 miles NE of Punta de Amapala. El Pinal, the tallest summit, is 1,280m high and partly wooded. The other summit is grass-covered and more rounded.

Volcan Consiguina, the tallest peak rising on the SE side of the entrance, is 872m high and stands 8.5 miles NE of Punta Cosiguina. On a clear day, this volcano can be seen from up to 70 miles offshore.

Winds—Weather.—Land and sea breezes blow regularly from the end of February to the beginning of May. The land breezes are light, blowing from between NE and NNW. The sea breezes blow from between S and SW. During the rainy season (May to October), the weather is often variable with heavy rain squalls from the E. However, light variable NE or NNE winds prevail when the weather is settled. Strong N winds may be expected from October to February, sometimes lasting for more than one week at a time. When these N winds are not blowing, light and variable winds prevail.

Caution.—Numerous fishing vessels may be encountered in the approaches to the bay.

Golfo de Fonseca—Punta de Amapala to Puerto La Union

6.14 Isla Conchagueta ($13^{\circ}14'N.$, $87^{\circ}46'W.$), 505m high, lies on the W side of the gulf, 8 miles NE of Punta de Amapala. The channel lying W of this island leads to La Union. A shallow flat extends 2.3 miles NNE from Isla Conchagueta to Isla Martin Perez ($13^{\circ}17'N.$, $87^{\circ}44'W.$).

Isla Zacatillo (Isla Punta Sacate) ($13^{\circ}18'N.$, $87^{\circ}46'W.$), irregular in shape, lies NW of Isla Martin Perez and is separated from it by Dyer Strait. Zacate Reef, with rocky heads awash in places, extends about 0.5 mile S from the SW end of this island. An isolated shoal, with a depth of 2.1m, lies in Dyer Strait, about 0.5 mile S of the reef. The channel lying between the reef and Punta Chiquirin forms the main approach to La Union.



Isla Zacatillo Light (near Punta Los Negritos)



Isla Zacatillo Light Tower (NW part of island)

Colima Shoal, with a depth of 3.9m, lies on the W side of this channel, about 0.3 mile NNE of Punta Chiquirin. Several other detached shoals, with depths of 3.9 to 4.3m, lie close off the E and SE sides of the same point.

Lights are shown from structures standing on Punta Chiquirin and the NW and SW side of Isla Zacatillo.



Punta Chiquirin Light Tower

Bahia de la Union (13°20'N., 87°47'W.), large and sheltered, has shallow depths over most of its area. This bay is entered close E of Punta Chiquirin and extends about 8 miles in a NW direction. The N shore of the bay is fronted by a large drying flat and, with the exception of the approach channel, depths of 6m and less prevail over the remaining area.

Puerto La Union (13°20'N., 87°50'W.)

World Port Index No. 15600

6.15 Puerto La Union (formerly known as Cutuco) derives its importance from having the best sheltered harbor in the country. The prominent features of the Bay of La Union are the new port facilities at Puerto de La Union, specializing in containers, grain, and passengers. **Puerto Corsain** (13°19'25"N, 87°48'40"W), the Industrial Fishing Port, is located close SE of Puerto La Union and was built to benefit the fishing industry.

Winds—Weather.—In as much as the harbor is landlocked, the prevailing winds are usually light, but the heat is excessive. During the dry season (December to May), a strong wind blows from the N. During the rainy season, the Chubascos blow usually from the E.

Tides—Currents.—The tides rise about 3m at springs and 2m at neaps.

The currents are fairly regular except during the rainy season when the ebb flows somewhat longer than the flood. Off Punta Chiquirin, the ebb current sometimes runs at a rate of 3 knots and causes a heavy race which has the appearance of breakers. The current divides N of Isla Conchaguaita. One branch sets N into the bay and the other branch sets NE between Isla Zacatillo and Isla Martin Perez.

Depths—Limitations.—Puerto Corsain and Puerto La Union are approached from the S and E by passing between Isla Conchaguaita and Punta El Caguano, then between Punta El Chiquirin and Punta Los Negritos, where the width of the channel is approximately 0.5 mile, then passing E then N of Bajos Colima, which is marked by a lighted buoy, and then continuing W within a channel with minimum depth of 10m.

Puerto La Union has one concrete pier, Muelle de Cutuco,



Puerto La Union and Puerto Corsain



Puerto La Union Wharf from SE



Puerto La Union Wharf from NE

fronting the town. It is 320m in length but not currently in use.

The L-shaped Navy Pier, for Navy use only, lies W of Muelle de Cutuco.

Cutuco Cepa Terminal is comprised of two oil berths on the N and S side of a jetty located close to the Navy Pier. Both



Puerto Corsain from NE

sides of the jetty will accommodate tankers up to 175.3m in length. The N berth, 152m long, with depths alongside of 9.1m at the outer end and 7.3m at the inner end at LW, can accommodate tankers up to 40,000 dwt. The S berth, 174m long with depths alongside of 7.6m at the outer end and 6.7m at the inner end at LW, can accommodate tankers up to 23,368 dwt.

The new port of La Union, completed in 2012, located ESE of the old port, has a pier, 560m in length, with depths alongside of 14m. This pier has facilities for container, breakbulk, and passenger vessels. It represents Phase 1 of an enlargement of the port facilities.

Aspect.—Volcan Conchagua, a distinctive double-peak summit, lies 3 miles S of the port. El Pinal, 1,225m high, is covered with trees and slopes gradually. The lower summit is covered in grass and is the true crater of the inactive volcano.

In Puerto La Union the main office building sits on a hill in the backdrop on the pier and is much larger than the buildings in La Union.

Pilotage.—Pilotage is compulsory for all vessels proceeding to Puerto Corsain. Pilotage is not compulsory for entry into Puerto La Union but is recommended, particularly for vessels with drafts over 6.7m. Pilot is compulsory for all vessels proceeding to Puerto Corsain.

Pilots will board about 1 mile S of Punta El Chiquirin for all port facilities in Bahia de La Union, as shown on the chart,

Regulations.—Vessels bound for Puerto Corsain should send an ETA 48 hours and 24 hours prior to arrival and maintain a constant listening watch on VHF channel 22A during the entire time they are in the port area.

Vessels bound for either the old or new port of La Union vessels should send an ETA, including their expected arrival draft, 48 hours prior to arrival.

Signals.—Local meteorological and tidal information, along with navigational warnings, anchoring information, and berthing information, are broadcast by Cutuco Radio.

Contact Information.—See the accompanying table titled **Puerto Corsain and Puerto La Union—Contact Informa-**

tion.

Puerto Corsain and Puerto La Union—Contact Information	
Puerto Corsain (Operations)	
VHF	VHF channels 16 and 22A
Telephone	503-268-21747
E-mail	operaciones@puertocorsain.com
Puerto Corsain (Port Authority)	
Telephone	503-268-21700
Facsimile	503-268-21750
E-mail	gerencia@puertocorsain.com
Puerto La Union	
Call sign	Cutuco Radio
VHF	VHF channels 12, 14, and 16
Telephone	503-260-44222
Facsimile	503-260-44055
E-mail	info@launion.gob.sv

Anchorage.—Vessels may anchor off the port entrance in depths of 10m to 12m if intending to stay for only a short amount of time. Caution must be taken if this option is chosen since rough sea state will prevail when the ebb tide is opposed to a strong sea breeze so it is recommended to align the vessel's anchors in a N-S line.

The preferred anchorage is located about 2 miles S of Punta El Chiquirin, NW of Isla Conchagueta; however, caution must be taken to avoid the submarine power cable that crosses through the N part of this anchorage, as best seen on the chart.

Vessels may anchor almost anywhere within the harbor, taking care to avoid the mud flats and also taking caution to avoid the submarine power cable that crosses through the E part of this area. Small vessels will anchor about 1 mile NE of the town, in depths of 8m. Care must be taken to account for a strong current of 2 knots that will be experienced at these anchorages during spring tides.

Caution.—Several floating markers are present throughout the area to warn of local fishing areas and submerged fish and crab traps.

Vessels with drafts exceeding 7m can enter the harbor only at HW since the depths across the bar at LW are 7.31m.

Golfo de Fonseca—Puerto La Union to Punta Consiguina

6.16 Isla Meanguera (13°11'N., 87°43'W.) lies near the middle of the Golfo de Fonseca, 9 miles within the entrance. This island has irregular cliffy shores and is 494m high in its central part. Isla Meanquerita, a small islet, lies close off the SE extremity of this island and may safely be passed on either side.

Isla del Tigre (13°16'N., 87°38'W.), lying 3.5 miles NE of Isla Meanguera, is almost circular in shape and 783m high. The

N and E sides of this island are fronted by extensive shallow flats; a bank, with shallow depths, extends up to about 2 miles seaward from its S side. A narrow channel lies along the W side of the island and leads to Puerto Amapala. A light is shown from a structure standing near the summit of the island.

Caracolita (Isla Paca) (Knob Island), low and heavily wooded, lies close off the W side of Isla del Tigre and a dangerous pinnacle rock, marked by tide rips, lies close off its W side.

Isla Zacate Grande, lying N of Isla del Tigre, is the largest island in the gulf and the only one not densely wooded to the summit.

6.17 Puerto Ampala (13°18'N., 87°39'W.), approached through a narrow channel, lies at the NW end of Isla del Tigre. The port is no longer used by commercial traffic as cargo operations were transferred to Puerto de Henecan. The small pier fronting the town is reported to be used by naval craft.

Bahia Chismuyo (13°25'N., 87°38'W.), lying 5 miles N of Puerto Amapala, is entered between Isla Zacate Grande and Isla Exposicion. Vessels may enter this bay through two narrow channels which lie E and W of the latter island and extend about 7 miles NNE to the head. The bay has no commercial facilities for large vessels and is frequented only by small craft. Entry should not be attempted without local knowledge. Good anchorage can be taken off the NW extremity of Isla Zacate Grande, but the currents are strong.

Bahia San Lorenzo (13°18'N., 87°30'W.) is entered between Isla del Tigre and Isla Raton, 6 miles E.

6.18 Puerto de Henecan (Puerto de San Lorenzo) (13°24'N., 87°27'W.) (World Port Index No. 15570) lies near the head of the bay, 1.5 miles SE of the town of San Lorenzo and is situated in an estuary with a mangrove swamp. This is a small port with light traffic handling containers, petroleum products, LNG/LPG imports, and some general cargo.

Depths—Limitations.—An approach channel, with depths of 9.1m at MLW and 10.6m at MHW, leads 16 miles NNE to the harbor. The fairway is narrow, tortuous, and subject to constant shifting.

The main pier, which provides four berths, is T-shaped and 296m long. The N inner berth is 134m long and has a depth of 6.7m alongside. The S inner berth is 116m long and has a depth of 6.7m alongside. The outer face, which forms two berths, has depths 10m alongside, allowing vessels to have a maximum draft of 9.46m at these berths.

The San Lorenzo Terminal consists of a jetty-type berth capable of accommodating tankers as large as 45,000 dwt, 182.9m in length, and maximum draft of 7.92m at HW. Also part of this terminal is Pier 1, with a CBM arrangement for petroleum products accommodating tankers with a maximum draft of 11.88m.

Aspect.—The approach fairway is marked by lighted buoys and beacons. An outer fairway lighted buoy marks the seaward entrance of the channel.

A conspicuous hill, 170m high, stands on the E side of Isla Zacate Grande.

Pilotage.—Pilotage is compulsory for vessels larger than 300 grt. Pilots can be requested by contacting the agent's office or through VHF channels 6, 10, or 16. Vessels should call the pilot vessel on VHF channel 16 one hour prior to arrival at the

outer fairway lighted buoy, where the pilot will board, about 6 miles E of Isla Meanguera (13°11'00"N., 87°43'30"W.).

Regulations.—Vessels should send an ETA at least 72 hours, 48 hours, 24 hours, 12 hours, and 6 hours before expected arrival time.

The use of a tug is compulsory for berthing and unberthing of vessels larger than 300 grt. One tug is available in the port.

Contact Information.—The port can be contacted, as follows:

- | | |
|---------------|--|
| 1. VHF: | VHF channel 16 |
| 2. Telephone: | 504-278-15142 |
| 3. Facsimile: | 504-278-15142
504-278-15109 |
| 4. E-mail: | supciasanlo@enp.hn |

Anchorage.—Vessels can anchor, in a depth of 8m, about 0.9 mile SSW of the main pier.

Caution.—The tidal currents in the approach channel are strong and are reported to set across the fairway.

Although arrivals and departures can be carried out 24 hours a day, daylight navigation is recommended.

Evening fog is prevalent.

6.19 Estero Real (12°55'N., 87°23'W.), a broad and navigable river, rises near Lago de Managua and flows into the head of the bay, 15 miles SE of Punta El Rosario. It can be ascended by vessels with drafts of up to 3m for a distance of about 30 miles.

A bar, which lies about 6 miles SSW of Punta Condega (13°06'N., 87°26'W.), was reported (1992) to have a least depth of 5m. Above this bar, the depths are sufficient to accommodate vessels capable of entering as far as the junction of the Estero Palomina, about 20 miles above the entrance. Above this junction, the depths decrease rapidly.

Entrance to the river should not be attempted without local knowledge as the currents are very strong at times.

6.20 Punta El Rosario (13°05'N., 87°35'W.), located 8.5 miles WSW of Punta Condega, is low and sandy. The anchorage lies in the NW part of the bay and E of the point. This anchorage area, which is 6 miles long and 2.3 miles wide, is well-sheltered and has depths of 9 to 16m. It is frequently used by vessels bound for Estero Real.

At a position about 2 miles E of Punta El Rosario, the ebb and the flood set NW and SE, respectively, at rates of up to about 4 knots at springs.

Farallones de Consiguina (Islas Farallones) (13°05'N., 87°41'W.), a group of light-colored rocks fringed by shoals, lies 6 miles W of Punta El Rosario. The largest rock of the group has a rounded top, whereas the others are sharp and jagged. When seen from the S, they appear as one large dome with pinnacle rocks on either side. Vessels are advised to give this group of dangers a berth of at least 1 mile. A shoal, with a depth of 13.1m, is reported to lie about 2.8 miles WSW of the group.

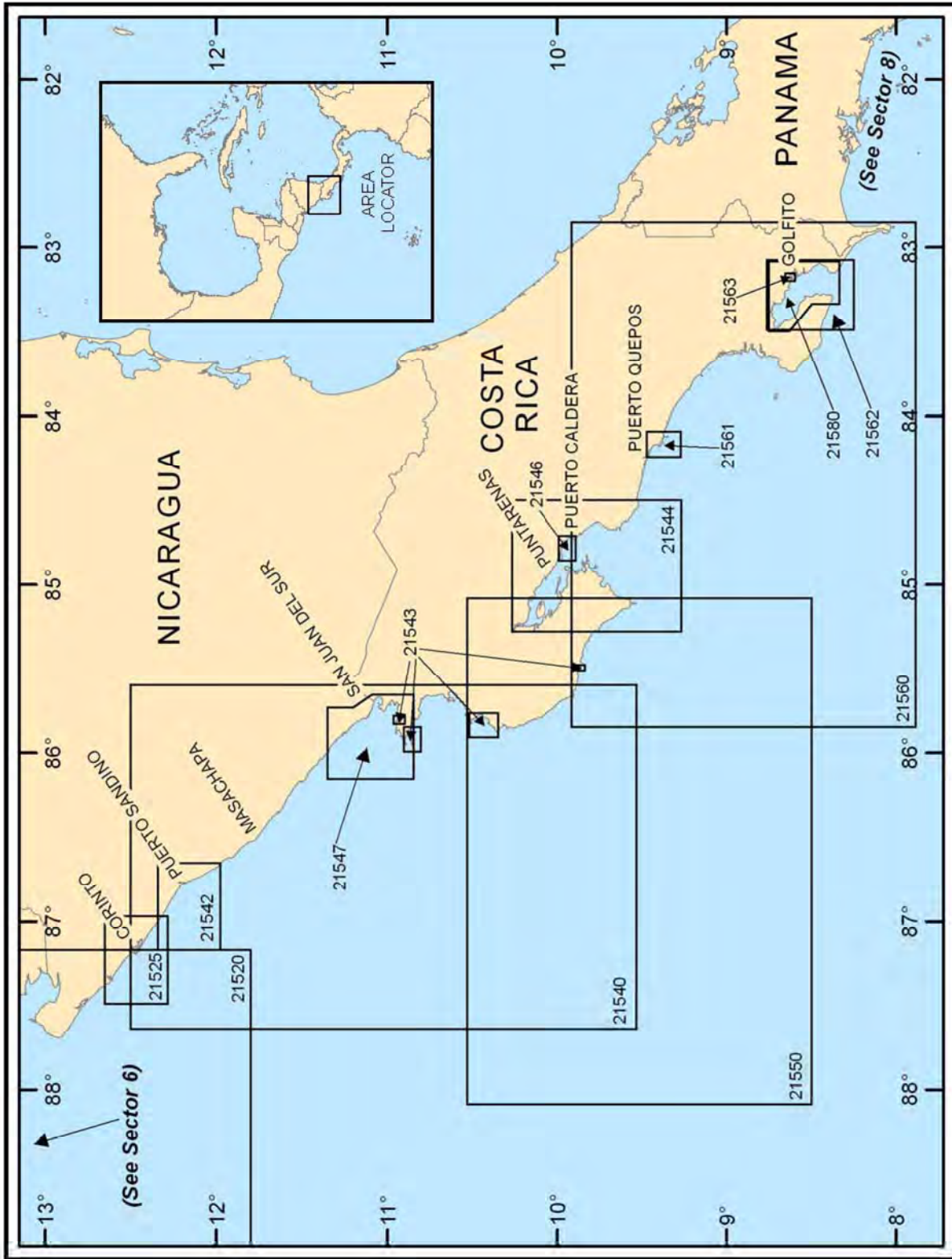
Caution.—The swell off this coast causes breakers along the shore and on Farallones de Consiguina.

6.21 Punta Consiguina (12°55'N., 87°41'W.), the SE entrance point of Golfo de Fonseca, is located 11.5 miles SW of Punta El Rosario. It consists of a series of cliffs which rise in-

land to Volcan Cosiguina.

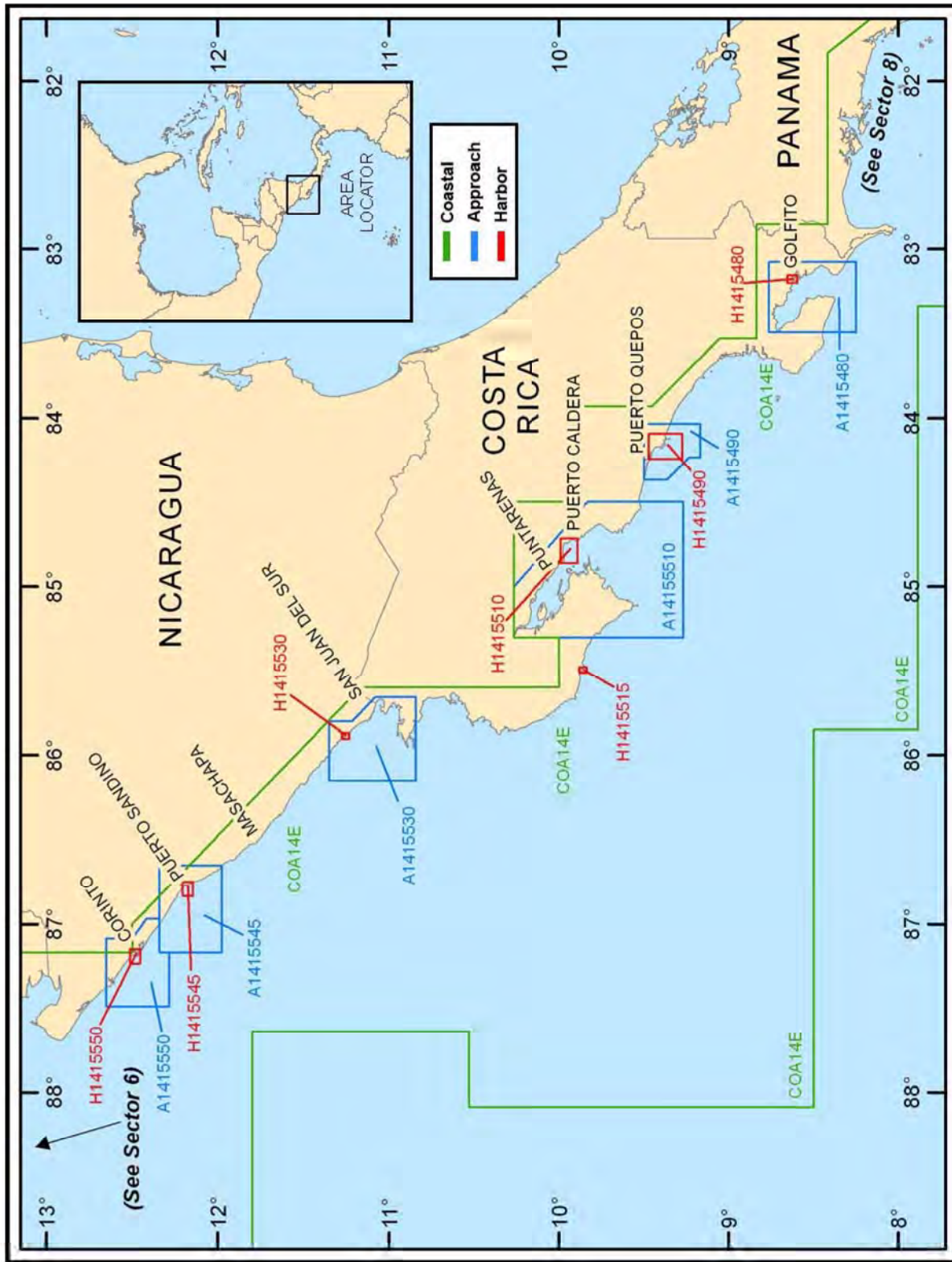
Caution.—A dangerous wreck is reported to lie about 1 mile WSW of Punta Consiguina.

An obstruction lies about 8 miles SE of Punta Consiguina; a shoal patch, with a depth of 4.8m, is reported to lie about 2 miles N of it.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 7 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 14 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 7 — DNC LIBRARY INFORMATION

SECTOR 7

COASTS OF NICARAGUA AND COSTA RICA

Plan.—This sector describes the W coasts of Nicaragua and Costa Rica. The descriptive sequence is SE.

Golfo de Fonseca to Puerto Corinto

7.1 The coast between Punta Cosiguina, the E entrance point of the Golfo de Fonseca, and Puerto Corinto, 40 miles SE, is fronted by numerous detached shoals and reefs within the 20m curve which extends up to 4 miles offshore in places. The shore, up to 6 miles SE of Punta Cosiguina, is backed by almost perpendicular cliffs, 61m high. Approximately 9 miles farther SE, an islet lies across the entrance of a river or lagoon. A breaking shoal extends 0.5 mile seaward from the islet.

Speck Reef (12°41'N., 87°27'W.), consisting of several isolated shoal patches, lies about 5.5 miles SSE of the above islet and 1.3 miles offshore. The westernmost shoal of the group is considered to be especially dangerous because it is not marked by breakers, even with a heavy swell. The other shoals of the group usually break in a heavy sea.

Isla de Limon (12°36'N., 87°21'W.), lying 7.5 miles SE of Speck Reef, is low, wooded, and encircled by a white sandy beach. It is joined to Isla Punta Icaico (Islas de Aserradores) by a submerged rocky bank which breaks.

Arrecife Burra Grande, a breaking reef, lies parallel to the coast about 2 miles W of Isla de Limon and 1.5 miles offshore. The channel lying between the reef and the coast should not be attempted. An isolated shoal, with a depth of 6.4m, was reported to lie 4 miles W of Arrecife Burra Grande.

Isla Punta Icaico (12°33'N., 87°16'W.), long and narrow, extends from Isla de Limon to Isla Cardon and forms the shoreline on the W side of the approach to Puerto Corinto.

Puerto Corinto (12°29'N., 87°10'W.)

World Port Index No. 15550

7.2 Puerto Corinto is the principal port of entry on the Pacific coast of Nicaragua and lies at the mouth of Estero del Realejo. Puerto Corinto has facilities for general cargo vessels and tankers handling manufactured goods, containers, bananas, sugar, cotton, and oil.

Winds—Weather.—The year is divided into rainy and dry seasons, with the rainy season lasting from June through October. The average temperature during the day is 30°C and 23°C at night. Northeast winds prevail from November to March and SW winds prevail the rest of the year.

Tides—Currents.—The mean range of the tide is 2.3m at springs and 1.9m at neaps. The lowest recorded tide was 0.5m below chart datum and the highest was 2.8m above datum.

A tide gauge is situated at the S end of the main wharf.

In Puerto Corinto, the currents are strong and should be guarded against. At the outer anchorage, the flood sets strongly from NE to ENE, and the ebb in the reverse direction, with a mean velocity of about 0.8 knot, but sometimes attains a veloc-

ity of 2 knots. The flood current is reported to set through Boca Falsa at a rate of about 3 knots. It has a tendency to set a vessel onto the shoal that extends N from Peninsula Castanones. Inside the harbor, the tidal currents set in a direction parallel with the main axis of the outer part of the pier at a rate of about 3 knots.

Occasionally, waves 3 to 4.6m high, enter through Boca Falsa and then run nearly at right angles in a SE direction toward the beach, capsizing any boats in their wake. Motor launches have thus been carried to this beach and broken up. During such times, however, the waters to the E and N of the red channel buoys are preferable for anchorage and small boats.

It is advisable for a large vessel, especially one of the single-screw type, to select the flood tide for coming alongside the pier. By doing so, the vessel can proceed to a position off the upper end of the pier, drop anchor, swing to the tide, and then go alongside the pier heading out. A vessel of this type might experience some difficulty in getting away from the pier if moored heading in.

Depths—Limitations.—The harbor is well sheltered, being protected from the W by Isla El Cardon. There are entrances on either side of this island, but Barra de Cardon (Canale Cardon), on its N side, which is marked by buoys and lighted beacons, is the preferred channel. Boca Falsa (False Bar Channel) leads S of Isla Cardon, but is not recommended.

There are an outer and inner approach channel. The outer approach channel, with a depth of 14.6m, extends 1.8 miles ENE from the sea buoy, with a width of 150m, then turns SE to pass N of Isla El Cardon, following three sets of lighted range lines through the inner approach channel, with a depth of 13.35m, for a distance of 1.4 miles with a width of 115m leading to the harbor area. The channel is further reduced to a width of 108m E of Isla El. The depths over the bar is 8.53m, while the depths in the harbor area are between 13.1m and 13.7m.

Vessels are advised to enter only during favorable conditions and then only with extreme caution. Entry should not be attempted when a heavy ground swell is running on the bar. The pilot should be consulted for the existing state of swell and depth allowance.

The W and SW edges of Banco Sawyer, which form the NE side of the channel entrance, are steep-to. The edge of the bank is rarely marked by breakers, and the flood current sets towards the bank.

Depths of less than 9m extend S from Banco Sawyer, with depths of 7m lying on the N edge of the channel, 0.2 mile S of the drying part of the bank. On the S side of the channel, a bank extends E from the NE shore of Isla Cardon and forms a bar at the NE end of Boca Falsa, which then connects to the shoal ground at the N extremity of Peninsula Castanones.

The Banana Pier, named Duke of Alba (No. 1), close E of Punta Icaico, is 122m long and has depths alongside of 10m.

The General Cargo Pier, a concrete marginal wharf close NE of the Banana Pier, has two berths (No. 2 and No. 3), and is 370m long and 22.5m wide, and has depths alongside of

12.7m. It can handle medium-size vessels using either port or starboard mooring.

The Container Terminal (No. 4) is a concrete marginal wharf with one berth, 240m long, with depths alongside of 13.3m that can accommodate vessels as long as 244m.

The Liquid Cargo Terminal, close N of the General Cargo Pier, named Duke of Alba (No. 5), is a single berth on a T-headed pier with berthing dolphins, 180m in length with depths of 13.3m alongside. Tankers as large as 25,000 dwt with a maximum draft of 10.0m at HW can be accommodated.

The maximum length of a vessel to enter the port is 198m.

Aspect.—The land in the vicinity of Puerto Corinto is low with but few prominent distinguishing features and stretches for a considerable distance on either side of the approach. However, the numerous high volcanic peaks which rise in the interior are visible for a considerable distance seaward and are excellent landmarks when not obscured by cloud cover.

Volcan Viejo, rising to a height of 1,728m about 18 miles NE of Puerto Corinto, is the highest peak in Nicaragua. A conspicuous white chimney, 43m high, stands 10 miles S of Volcan Viejo.

Volcan Momotombo, an active volcano, 1,258m high, stands about 38 miles E of Puerto Corinto. The peak is cone-shaped and so regular in outline that it resembles a pyramid. When viewed from the sea at some distance S of the port, this volcano appears as an immense isolated mountain, but when seen from Isla El Cardon it appears to be joined to Assoco, a volcano of lesser height, about 8 miles W. The two mountains then appear as perfect cones.

Isla El Cardon, 14m high, is reddish-brown in color during the dry season and green during the rainy season. The island is nearly level and almost bare of trees. Morro Cardon Light is shown from a 13m high round concrete tower situated on the NE point of the island.

A conspicuous water tower, marked by a red obstruction light, stands in the W part of the town.

Channel Cardon is buoyed and marked by three sets of range lights. The first set of range lights leads across the bar through the approach channel to Channel Cardon, bearing 076°40'. The second set, bearing 122°24', leads through Channel Cardon between Banco Sawyer and Isla El Cardon. The third set, bearing 074°32', leads along the channel S of Punta Icaico. It has been reported that some of the range light structures are partially obscured by trees and difficult to distinguish.

Pilotage.—Pilotage is compulsory for all vessels exceeding 500 grt or a draft of 2.1m. The port is open 24 hours, however, entry is restricted by the tide and vessel's draft. The vessel's ETA should be sent 72 hours, 48 hours, and 24 hours in advance. Vessels should establish VHF contact with the pilot 2 hours before arrival. Pilots board about 2 to 2.5 miles W of Morro Cardon Light.

Contact Information.—The port can be contacted, as follows:

1. VHF: VHF channels 11 and 16
2. Telephone: 505-234-22312
3. Facsimile: 505-234-22763
4. E-mail: puertocorinto@epn.com.ni

Regulations.—It has been reported (2013) that there are speed limits of 8 knots in Corinto Bay and 5 knots in the vicinity of the berths.

Anchorage.—The anchorage off Isla El Cardon is safe, but uncomfortable because of the heavy swell that sets in. A vessel planning to stay for any length of time is advised to enter the port. Large vessels usually anchor with Morro Cardon Light bearing 095°, distant 2 miles, in a depth of about 16m, mud and black sand. Farther S, a heavier sea is usually experienced.

Vessels waiting to go alongside usually anchor in mid-channel abreast the town, in depths of 8 to 12m. Large vessels can anchor, in a depth of 13m, about 0.5 mile NE of Cabo Austro, the S end of Isla El Cardon.

Directions.—The approach channel and Canal Cardon are marked by sets of numbered buoys. The channel buoys are moored about 90m outside the charted dredged channel. Keeping midway in the channel, the three sets of range markings are followed into Corinto Harbor. The best time to enter the harbor is during the afternoon, or as the visibility improves.

Caution.—Vessels may be anchored close to the 074°32' range line.

It is advisable to moor rather than anchor as the currents are strong at springs and the swinging room is limited.

An area lying about 0.3 mile S of the Corinto pier should be avoided as an anchorage, because the full force of the tidal current are concentrated here and the holding ground is very poor.

Puerto Corinto to Puerto Sandino

7.3 The coast between Puerto Corinto and the mouth of the Rio Tamarindo, 29 miles SE, consists mainly of sandy beach broken by an occasional cliff. Seaward of the 20m curve, which lies up to 2.5 miles offshore, the depths are regular with no off-lying dangers.

A range of hills with two peaks, 280 and 271m high, runs parallel to the coast about 4 miles inland from a position 11 miles NW of the mouth of the Rio Tamarindo.

Puerto Sandino (12°11'N., 86°46'W.)

World Port Index No. 15545

7.4 Puerto Sandino, formerly Puerto Somoza, a small cargo and oil discharging facility, is situated on the E bank of the Rio Tamarindo, about 1 mile within the entrance. Puerto Sandino is a lighterage port with no alongside berthing facilities for ocean-going vessels. Main cargo worked here is fertilizer and there is a CBM arrangement for crude oil handling at an offshore pipeline berth SW of the river entrance.

Winds—Weather.—Northeast winds are prevalent from November to April and SW winds from June to September. During the dry season, November to April, the prevailing winds vary along the coast, being at right angles to the coastline. The seasonal winds are rather irregular and are interrupted by calms and occasional squalls. Strong N winds occur mostly in January and February. These N winds may reach a gale force of force 8, but are usually of force 4 to 5.

Tides—Currents.—The tides rise 2.2m at springs and 1.7m at neaps.

The flood current ascends the river as far as the settlement at a velocity of about 2 knots. After rains, the ebb frequently has a velocity of 5 to 6 knots in the river and a velocity of 4 knots over the banks at the entrance. A slight N set has been experi-

enced at the anchorage.

Depths—Limitations.—Depths in the approach appear to shoal gradually within the 20m curve which lies about 3.5 miles W and 3 miles SW of Penas del Tiscuco, the S entrance point of the river. Several detached shoal patches, with depths of less than 10m, lie close to the alignment of the entrance range and within 0.5 mile N and S of it. The entrance of the river is obstructed by a bar which consists of drying sand banks and submerged rocks.

Mariners are advised to exercise extreme caution in making the approach because the buoyage is unreliable and less depths than charted may exist.

Cargo is discharged into lighters at the anchorage for discharge onto a small dock fronting the settlement. This dock is 150m long and 22m wide, and can accommodate up to four barges at one time.

The Esso Berth (CBM) for tankers is located approximately 4 miles SW of the pier, and is capable of accommodating tankers up to 60,960 dwt, with a maximum length of 213m and a maximum draft of 12.2m.

Aspect.—Volcan Momotombo, about 19 miles NE, and Volcan Viejo, about 33 miles NNW, respectively, of the mouth of the river, are useful marks when making the approach.

A prominent power station stands on Penas del Tiscuco, the SSE entrance point of the Rio Tamarindo. There is a prominent house on the hillside ENE of it. Two white oil tanks are situated about 0.3 mile SE of the house. These conspicuous tanks are reported to be visible up to 15 miles from seaward. The three gray warehouses at Puerto Sandino may also be visible for a considerable distance seaward.

Range lights, in line bearing 080°, are situated 0.7 mile NE of Penas del Tiscuco and lead toward the anchorage lying 2.5 miles W of the front light structure.

Pilotage.—Pilotage is compulsory and is available only during daylight hours.

Pilots board vessels about 0.5 mile W of the sea berth.

Regulations.—Vessels send their ETA 5 days, 72 hours, 48 hours, and 24 hours before expected arrival. If transiting the Panama Canal the ETA should be sent through the agent for transfer to the port.

Contact Information.—The port can be contacted, as follows:

1. VHF: VHF channels 6, 13, and 16
2. Telephone: 505-231-22236
3. E-mail: puertosandino@epn.com.ni

Anchorage.—Anchorage can be taken, in depths of 7 to 13m, coral and sand, about 1.3 miles W of the S entrance point of the river, although it is very dangerous between June and October.

Caution.—The positions of the lighted range beacons leading to the anchorage are approximate. The lights have been reported visible for only 2 miles at night.

Anchoring and trawling near the pipeline is prohibited.

Puerto Sandino to Puerto San Juan del Sur

7.5 Cabo Desolado (11°59'N., 86°41'W.), a conspicuous headland, lies 12 miles SE of Penas del Tiscuco. It rises to its highest point, 140m, about 0.5 mile inland.

The cape appears to project well seaward because of the low

land SE of it, although in reality the change in direction of the coast is very slight.

The coast between Penas del Tiscuco and Cabo Desolado is marked by a heavy surf and appears foul up to 2 miles offshore. Vessels should approach this section of coast with caution and keep at least 5 miles offshore when passing.

Venadillo (11°55'N., 86°40'W.), an open roadstead lying 5 miles SE of Cabo Desolado, provides anchorage in depths of 13 to 26m for vessels stopping to load cedar cargo. When a vessel is expected, a flag inscribed with the name "Venadillo" is displayed from a mast, but is difficult to distinguish beyond 1.5 miles. The best guide is Volcan Momotombo, which bears 011° from the roadstead.

The anchorage is safe during winter, but during the summer vessels must anchor well offshore and be prepared to get underway should an onshore wind develop.

Puerto Masachapa (11°47'N., 86°33'W.), lying 11 miles SE of Venadillo, consists of an open roadstead obstructed by numerous reefs close inshore. A pier, 305m long, has a depth of 6m alongside and extends from the shore abreast the port. The port was once a tanker port but is reported to be no longer in operation.

Several aluminum tanks at the inshore end of the pier and a white chimney, 1.2 miles N, are conspicuous from seaward. Approaching from W, a hill standing 4 miles E of Masachapa bearing 092° leads to the roadstead.

7.6 Punta Pie del Gigante (Punta Gigante) (11°23'N., 86°03'W.), a large and rocky point lying 39 miles SE of Puerto Masachapa, is the N projection of a series of bold promontories. A mountain, 474m high and 4 miles inland of the point, appears capped by a small circular eminence when viewed from the W.

A deep crescent-shaped bay, on the N side of Punta Pie del Gigante, is frequented by large vessels loading cattle and logs. Inside the point, a depth of 9m lies 0.2 mile offshore.

Morro Brito (11°20'N., 86°01'W.), 113m high, projects 0.2 mile S from the general line of the coast on the W side of the mouth of the Rio Grande. The depths in Brito Roadstead, on the E side of the point, are regular, shoaling gradually to the 10m curve about 0.2 mile from the beach.

Puerto Morazan (11°16'N., 85°54'W.), little more than a recess in the cliffs, is frequently used as an anchorage by small vessels with local knowledge.

7.7 Puerto San Juan del Sur (11°15'N., 85°53'W.) is a small lightering port with a developing resort town that also accommodates cruise ships from an anchorage offshore. The village lies along the E shore of the bay and is clearly visible to a vessel approaching from the W.

Winds—Weather.—Strong E and NE winds occur from January to April. Squalls are experienced in May and October.

During the season of the Papagayos, the gale winds blow directly out of the bay to the SW. At such times, vessels are advised to anchor so as to drag clear of the shoals should the anchors fail to hold.

Tides—Currents.—The currents within the port are not strong and vessels usually ride to the prevailing winds. The tidal range is 2.13m.

Depths—Limitations.—The harbor is formed by an opening 0.5 mile wide between two high wooded bluffs and is marked by San Juan del Sur Light, located in the southernmost point of the port at 30m above sea level. Rocks extending from the entrance reduce the navigable width of the bay to less than 0.4 mile.

Depths in the approach range from 18m, about 0.2 mile seaward of a line extending between the entrance points, to a depth of 5.5m within 0.1 mile of the shore of the bay.

Only small vessels (cruise ship tenders or lighters) can berth in the harbor with all cargo being worked at anchorages outside the harbor and transferred to the wharf inside the harbor. This dock is on a concrete wharf, 70m long, with depths of 4.2m alongside, and is located on the N side of the E entrance point.

Cruise ships will be required to provide their own tender service to transfer passengers back and forth from the port from the anchorage.

Aspect.—Range lights, in line bearing 067°, are shown from the head of the bay. A fort stands on the SE entrance point of the port. Monte Papayal, 427m high, rises directly behind the port and may be distinguished by the mounds along its ridge which resemble the knuckles of a left fist.

Pilotage.—Pilotage is compulsory but is only available during daylight hours. Vessels contact the pilot, who is also the loading master, by VHF or by sounding three long blasts on the ship's whistle at intervals. The pilot boards about 1 mile SW of the harbor.

Contact Information.—The port can be contacted, as follows:

1. VHF: VHF channel 16
2. Telephone: 505-256-82336
3. E-mail: puertosanjuan@epn.com.ni

Regulations.—Customs and Port Health officers will board vessels upon anchoring, between sunrise and sunset, to issue clearance unless prior arrangements have been made.

Anchorage.—The recommended anchorage for vessels working cargo is on a bearing of 170° with San Juan del Sur Light, in depths of 12m at HW, about 0.4 mile off the wharf. Depths at this anchorage will reduce to 9.6m at LW. Vessels not working cargo may take anchorage, in depths of 24 to 26m, on the S side of the entrance, about 0.6 mile off San Juan del Sur Light.

Directions.—The high volcanoes rising in the interior serve as excellent landmarks. On approach, Monte Papayal and San Juan del Sur Light can be readily distinguished.

When the lighted beacons on the NE side of the bay are in range, bearing 067°, steer this course and anchor as convenient.

Caution.—The shoal water bordering the SE entrance point is reported to be extending seaward and a detached shoal, with a depth of 6.4m, lies 0.4 mile NNW of the fort.

Submarine cables enter the bay off the N entrance point, close S of the reefs, then circulate the bay to surface at the SE corner.

Puerto San Juan del Sur to Punta Blanca

7.8 Rocas Frailes (11°12'N., 85°51'W.), a group of three almost circular rocks, each 18m high, steep-topped, and flat-topped, lies offshore about 3 miles SE of San Juan del Sur Light. The

easternmost rock of the group appears as a ship under sail when seen from the N, but is not easily distinguished from the W.

Punta La Flor (Cabo Natan) (11°06'N., 85°48'W.), a projecting promontory lying 9 miles SE of San Juan del Sur, has a shoal spit with depths of less than 5.5m extending about 1 mile from it. La Flor, a small crescent-shaped bay close N of the cape, is frequented by small vessels intending to load lumber.

Bahia de Salinas (11°04'N., 85°44'W.), entered between Punta Arranca Barba and Punta Zacate, lying 2.5 miles S, indents the coast 4 miles to the SE.

The N shore is high and bold, but elsewhere the coastline consists of sandy beaches and low marshy valleys.

The soundings decrease from 36m just outside the bay entrance, to 5.5m about 0.4 mile from its head.

The approximate boundary between Nicaragua and Costa Rica, 3.3 miles E of Punta Arranca Barba, is marked by a silver-colored building. The customhouse and the remains of a small wharf at Puerto Soley, the Costa Rican Customs port, is situated at the head of the bay.

Bahia de Salinas is frequented by vessels sheltering from gales during the season of the Papagayos.

Punta Descartes (11°02'N., 85°46'W.), lying 2 miles SSW of Punta Zacate, is the outer extremity of the promontory which separates Bahia de Salinas to the N from Golfo de Santa Elena to the S. A rock, awash, surrounded by foul ground, lies about 1.3 miles WNW of the point. The channel lying between this rock and the mainland has not been examined.

7.9 Golfo de Santa Elena (10°58'N., 85°46'W.), entered between Punta Descartes and Punta Blanca, 9 miles WSW, is indented by Bahia Santa Elena along its S shore and Bahia Tomas and Bahia Juanilla in its SE part. Isla Despensa and Isla Juanilla, two detached islands, lie about 0.5 mile offshore in the N section of the gulf. Isla Despensa has two summits, the S peak being the higher and the N peak the more abrupt. Anchorage can be taken as convenient to the SE of Isla Juanilla.

Bahia Juanilla (10°57'N., 85°44'W.), together with Bahia Tomas close SW of it, provides shelter with good holding ground over a bottom of mud, but local knowledge is necessary. Vessels approaching from the W should favor the S side of the channel in order to avoid the dangers which lie within 0.8 mile W of the N entrance point of Bahia Juanilla. Bahia Tomas provides good shelter during W winds and seas.

Bahia Santa Elena (Port Parker) (10°56'N., 85°49'W.), a fine landlocked harbor, lies about midway between Bahia Juanilla and Punta Blanca. Cerros de Santa Elena, the ridge behind the harbor, is crowned by two high conical peaks that can be readily distinguished.

Islands lie about 0.5 mile offshore of each entrance point of the harbor; Roca Tooth, a small rock, lies 0.2 mile W of the easternmost island.

Anchorage can be taken about 0.4 mile SSE of the W entrance point of the harbor. A vessel planning to enter should keep at least 0.5 mile offshore until the entrance is recognized and then steer a mid-channel course between Roca Tooth and the W entrance point.

Punta Blanca (10°57'N., 85°54'W.) is a bold striking headland lying 4.5 miles W of the W entrance to Bahia Santa Elena. It rises 1 mile inland to a 207m high jagged summit. A de-

tached 3.6m shoal lies about 1 mile W of the point.

Punta Blanca to Cabo Velas

7.10 Bahia Playa Blanca (10°56'N., 85°54'W.), entered between Punta Blanca and Cabo Santa Elena, 5.5 miles SW, is obstructed by two large rocks and an islet in its central part. Anchorage can be taken with local knowledge, in depths of 15 to 18m, in the NE part of the bay.

Cabo Santa Elena (10°54'N., 85°58'W.), a narrow rocky ridge extending about 2 miles from the coast, rises abruptly from the water to a sharp summit, about 137m high. When seen from the W, Cabo Santa Elena looks like a mountainous island, but from N or S it appears as an oval serrated ridge, the outline resembling the edge of a half-open fan.

The Golfo de Papagayo, a deep coastal indentation, lies between Cabo Santa Elena and Cabo Velas about 33 miles S.

Bahia Murcialagos (10°53'N., 85°56'W.), entered between Cabo Santa Elena and Punta Parker, about 6 miles ESE, is encumbered by numerous islets, rocks, and submerged dangers in its central part. Vessels have anchored in the NE part of the bay between Punta Parker and Isla Pedada, 2.2 miles NW, in a depth of 22m, but the holding ground is poor and is not considered safe during the season of the Papagayos.

7.11 Bahia Potrero Grande (10°50'N., 85°49'W.), located 3 miles E of Punta Parker and entered between high hills, is exposed to the W. The bay widens within the entrance, but provides little additional protection to the anchorage. A number of above-water rocks lie off the entrance points, but there are no dangers outside of these. Depths range from 37m in the entrance to 9.1m about 0.1 mile from the head of the bay.

The coast, from a position about 2.7 miles SE of the S entrance point of Bahia Potrero Grande to Islas Huevos, about 11 miles SSE, is indented by a large open bay. The shores of the bay consist of high bold cliffs backed by a wooded plateau about 300m high, gradually descending to lesser heights in the vicinity of Islas Huevos. The water in the bay is deep up to within 1 mile of the shore.

Roca Blaze, 43m high and the only rock of any size in the bay, lies about 5 miles E of the N entrance point and seaward of a broad valley which extends inland through the high plateau mentioned above. Sunken rocks lie off the W side of the rock, but the depths off its S side are convenient for anchoring by vessels with local knowledge.

Bahia Huevos (10°39'N., 85°42'W.), a small inlet open to the SW, is entered close S of Islas Huevos. The two islands located in the bay lie so close to each other and the shore that they appear to be high wooded bluffs on the mainland. The entrance of the bay is obstructed by a detached reef lying offshore, about 0.1 mile S of these islands.

7.12 Puerto Culebra (10°36'N., 85°42'W.), lying 3 miles S of Bahia Huevos, is entered between Punta Mala, and Punta Ballena, 1.5 miles SE. Spacious and sheltered, the harbor has sufficient depths for large vessels.

Norte Viradores, two flat, rocky islets barely showing above water, lie about 0.3 mile SW of Punta Mala. A rocky column, 18m high, stands on the outer islet and forms an excellent landmark when seen clear of the land.

The shores of the harbor are generally steep-to, but foul ground extends about 0.1 mile offshore at Punta Buena.

Anchorage can be taken anywhere in Puerto Culebra over a bottom of mud and sand.

Bahia del Coco (10°34'N., 85°43'W.), entered between Punta Cacique and Punta Miga, 1.2 miles SW, lies 2.5 miles SW of the entrance of Puerto Culebra. The entrance points of the bay are formed by rocky cliffs with hills rising behind them.

Sur Viradores, three grass-covered islets, are separated from Punta Cacique to the SE by a foul passage.

A line of drying rocks fronts the sandy beach at the head of the bay.

Anchorage can be taken within the bay, in a depth of 15m. When entering, the Punta Cacique side of the entrance should be favored in order to avoid the dangers extending from the SW shore.

7.13 Punta Gorda (10°32'N., 85°47'W.), backed by hills which descend abruptly to the sea from a height of 104m, lies 4 miles W of Bahia del Coco. A point lying 2.5 miles farther SW appears as a rounded hill with an indentation in its summit, but is less striking in appearance.

Islas Brumel (10°30'N., 85°50'W.), two small 43m high grass-covered islets, lie close together 0.5 mile SW of the above point. Reefs extend 0.3 mile N and 0.4 mile SSE from the W island. The two islets appear as one, except when viewed from the NW.

Islas Santa Catalina (10°29'N., 85°53'W.) lie close together 3.2 miles SW of Islas Brumel. These islands are an important landmark and are not easily mistaken. The islands rise to an elevation of 70m, with 30m high cliffs on all sides. The surface above these cliffs is grass-covered and the resemblance to a stone fortification with tufted parapets is striking. The opening between the two islets is only visible from the SW.

A shoal bank, with above and below-water dangers, lies about midway between Islas Santa Catalina and the mainland 5 miles SE. The channel to the E of these dangers is deep and clear, but vessels passing to the W should give them a wide berth, not venturing E of a line drawn from Islas Santa Catalina to Cabo Velas.

7.14 Bahia Potrero (10°28'N., 85°48'W.), together with Bahia Brasilito (Bahia Braxilito) close S of it, are two small, open bays which indent the coast to the E of Islas Santa Catalina. A narrow peninsula, with Isla Plata (Isla Eyre) off its outer end, separates the two bays, which are occasionally frequented by vessels, with local knowledge, loading timber. Both bays are considered to be fairly secure anchorages despite a prevalent sea.

Depths in Bahia Potrero shoal gradually from 27.4m in the entrance. Depths in Bahia Brasilito decrease to 9.2m about 0.5 mile from its head.

Anchorage can be taken on the SW side of Bahia Potrero and as convenient in Bahia Brasilito, in depths of 13 to 18m.

Cabo Velas (10°22'N., 85°53'W.), 4 miles SW of the S entrance point of Bahia Brasilito, has Monte Hermoso, 234m high, rising immediately behind it and marking this important turn in the coast. The sides of the mountain slope gradually and the short, narrow ridge running E and W has a slight depression which gives it a saddle-shaped appearance. The E summit

is round and the W summit is sharp. When approaching from the W, Monte Hermoso will first be sighted as a conical hill seaward of the higher hills inland. When first seen from the S, Monte Hermoso has the appearance of an island. Cabo Velas is well wooded; off the coast to the SE of it are several islets and rocks.

Caution.—Vessels of deep draft should not approach within 3 miles of the coast between Punta Guiones and Cabo Velas and should guard against being set to the E.

Several shoal areas have been reported to lie close W of the 200m curve along the Costa Rican coastline.

Cabo Velas to Golfo de Nicoya

7.15 Bahía Tamarindo (Barca Quebrada) (10°19'N., 85°52'W.), entered between Cabo Velas and Punta San Francisco (Wreck Point), 4 miles S, although exposed, provides anchorage to vessels with local knowledge. Vessels can anchor about midway between Punta San Francisco and a rocky reef which lies 0.7 mile offshore and 1.5 miles S of Cabo Velas.

The coast between Bahía Tamarindo and Punta Guiones, 28 miles farther SSE, is fringed by foul ground extending up to 2 miles offshore in places. A group of red-roofed houses on Punta Filibusteros, 14 miles S of Punta San Francisco, is a useful landmark.

Punta Guiones (9°54'N., 85°41'W.), when viewed from either side, appears as a wooded hill, 110m high, with a gradual descent to overhanging cliffs. Numerous sunken dangers extend seaward from the point and it should be given a wide berth, especially at night, when it is difficult to make out. Vessels approaching from the NW should allow for a NW set which attains a velocity of up to 2 knots in the winter. Punta Guiones has been reported to be radar conspicuous.

Bahía Carrillo (Bahía Piedra Blanca) (9°52'N., 85°30'W.), small in extent and about 0.8 mile wide between the entrance points, lies 11 miles E of Punta Guiones. The vicinity may be identified by Piedra Blanca, a large white rock lying close SW of the W entrance point.

The entrance width is narrowed to about 0.4 mile by a rocky reef which extends 0.5 mile SE from the W side of the entrance. Depths decrease from 18m in the entrance to 5.5m about 0.1 mile from the head of the bay.

The small bay 2 miles W of Bahía Piedra Blanca, although fairly deep, is rocky and unsafe.

7.16 Punta Bejuco (9°54'N., 85°20'W.), a sharp and rocky projection, extends from the coast 10 miles E of Bahía Piedra Blanca.

Punta Coyote (9°45'N., 85°16'W.), 5 miles SE of Punta Bejuco, is similar in aspect, but more projecting. A small non-navigable river discharges into the bay close N of the point.

The coast between Punta Coyote and Cabo Blanco, 5.5 miles SE, is wooded and intersected by several small rivers. Anchorage can be taken anywhere along this section of coast, in depths of 18 to 37m, sand and mud, but it is not advisable to venture inside of the 20m curve.

The coast between Cabo Velas and Cabo Blanco is backed by Cerros de San Blas and Cerros de la Habana, the summits of which attain elevations of 1,017m and 651m, respectively. Cerro Marquenco (Mount Boughey), 780m high, is a cone-

shaped summit rising 38 miles NW of Cabo Blanco near the W end of Cerros de la Habana. Pico Partido (Split Peak), 790m high, rises 15 miles N of Cabo Blanco and can be identified by a distinctive cleft visible from the W. Cerro Marquenco and Pico Partido are the only two summits likely to be identified in the Cerros de la Habana range.

Cabo Blanco (9°33'N., 85°07'W.), 21 miles SE of Punta Coyote, is the seaward termination of a fairly high plateau that forms one of the most striking landmarks along this coast, especially for vessels approaching from the W. The more elevated part of the terrain extending inland resembles a long island when viewed from some distance seaward.

The cape and the land in the vicinity have been reported to be radar conspicuous.

A stranded wreck lies 1.5 miles NW of Cabo Blanco, close SW of Punta Coquitos.

Isla Cabo Blanco (9°32'N., 85°07'W.), oval in shape, barren, and composed of white rock, rises to an elevation of 69m. The channel between the islet and the cape is about 1 mile wide, but is not recommended. A light is shown from the summit of the island. A high rock lies close off the SE side of the islet and appears as a white sail from a distance.

Guardian Bank (9°22'N., 87°27'W.) lies 130 miles W of Cabo Blanco. Soundings over this narrow bank, which extends about 45 miles in a NNW-SSE direction, have been reported to be 9 to 31m. In 1981, depths of less than 11m were reported to exist E of the charted bank.

Golfo de Nicoya

7.17 Golfo de Nicoya (9°35'N., 84°49'W.), one of the most expansive bodies of water on the W coast of Central America, is about 34 miles wide at the entrance between Cabo Blanco and Punta Judas. It penetrates inland for about 52 miles in a N and NW direction, narrowing to a width of 5.5 miles 26 miles above the entrance and then increasing to an average width of 8 miles to its head. Puntarenas lies at the narrowest part of the gulf, on the E shore, 26 miles above the entrance.

A considerable number of islands, rocks, and shoals lie along the W shore of the gulf, whereas, the E shore is comparatively free of dangers. Vessels entering the gulf pass E of these islands and other dangers.

The W side of the Golfo de Nicoya borders an uncultivated region which is seldom visited by commercial shipping.

Bahía Ballena (9°43'N., 85°00'W.), lying 12 miles NE of Cabo Blanco and entered between Punta Piedra Amarilla and Punta Tambor, 2.8 miles ENE, is a small, deep coastal indentation. Depths range from 42m in the entrance, to a depth of 9.1m about 0.5 mile from its head.

Bahía Murcielago (Bahía Falsa), a small and open bay, lies close N of Bahía Ballena.

7.18 Islas Tortugas (9°46'N., 84°54'W.) lies about 3 miles NE of Bahía Murcielago. These islands lie on a shoal bank separated from the mainland by a channel about 0.5 mile wide and having depths of 20m.

Islas Negritos (9°49'N., 84°50'W.), two high, narrow, and heavily wooded islands, lie 4.5 miles NE of Islas Tortugas.

Sail Rock lies at the outer end of a ledge which extends about 0.2 mile E of Negritos Afuera, the E island. Strong cur-

rents and tide rips are experienced off this large rock and it should be given a wide berth when passing.

A light is shown from a metal framework tower situated on the E end of Isla Negritos Afuera.

The coast to the W of a line drawn from the E tangent of Negritos Afuera to Isla San Lucas, about 8 miles NW, is indented by two shallow bays fronted by several small islets and detached shoals. A drying shoal lies about midway between the two islands.

Isla San Lucas (9°56'N., 84°54'W.), 125m high and of irregular shape, lies 3 miles SW of Puntarenas at the turn of the gulf. A foul channel, about 0.5 mile wide, separates the island from Punta Gigante to the SW. A penal colony is situated on the NW side of the island and landing is strictly forbidden.

Between Isla San Lucas and Isla Chira, 15 miles NW, the navigable waters of the gulf, as defined by the 10m curve, decrease to a width of 2 miles N of the E extremity of the latter island. The best water is found along the E shore of the gulf. Above Isla Chira, the depths shoal rapidly and numerous drying flats are encountered. Small native coasters regularly navigate the upper reaches of the gulf and the Rio Tempisque, which discharges into its head.

A ferry operates close N of Isla San Lucas, calling at the ports situated at Playa Naranjo and La Punta.

7.19 Isla Chira (10°06'N., 85°09'W.), 14 miles NW of Isla San Lucas and the largest island in the upper part of the gulf, rises to an elevation of 173m in its W part. This island is surrounded by shoals on all except its NE side, where anchorage can be taken, in depths of 9 to 11m, about 0.5 mile offshore.

The E side of the gulf between Punta Judas and Punta Herradura, 12 miles NW, and then to Punta Caldera, 15 miles farther NNW, is bordered by deep water within 1.3 miles of the shore and backed by heavily wooded slopes. Between Punta Caldera and Puntarenas, 8 miles NW, the coast trends N and then W to form a fairly deep bay where anchorage can be taken by vessels awaiting a berth at Puntarenas.

Punta Judas (9°31'N., 84°32'W.), the E entrance point of the Golfo de Nicoya, lying 34 miles E of Cabo Blanco, may be identified by Monte Judas, a heavily-wooded peak which rises to an elevation of 98m about 0.3 mile inland. Vessels are advised to give this point a berth of at least 2 miles in order to avoid the drying reef extending about 1 mile SW from it. The sea breaks heavily on this reef.

Cerro Herradura, the NW spur of the mountain range inland, rises abruptly from the coast to an elevation of 782m about 11 miles N of Punta Judas. Cerro Turabales, 17 miles NNE of the same point, can be seen rising over Cerro Herradura when viewed from the entrance. This prominent peak rises to a small conical summit, 1,682m high.

Bahia del Jaco (9°36'N., 84°38'W.), entered close N of Punta Guapinol, 7.5 miles NW of Punta Judas, provides a fair anchorage, in depths of 11 to 20m, between November and March for vessels with local knowledge.

Bahia Herradura (Puerto Herradura) (9°39'N., 84°40'W.), entered between Isla Herradura (Isla Cano) to the S and Punta Herradura to the N, is a small crescent-shaped bay obstructed in its central part by Roca Havannah, a patch with a least depth of 0.6m, lying 0.5 mile N of the E end of Isla Herradura. Care should be taken when entering to avoid this sunken danger as it

seldom breaks, even at LW. The bay provides anchorage, protected from all except W winds, but it is seldom used.

Isla Herradura, whose sides rise abruptly and terminate sharply at its crest, is 125m high and is connected to the mainland by a reef which almost dries. The island is a prominent landmark for vessels approaching from the SE. A light is shown from a metal tower at an elevation of 99m.

Punta Sucia (9°41'N., 84°40'W.) is located 2.8 miles N of Punta Herradura, and Punta Leona lies 0.8 mile farther NE.

7.20 Bahia Rio Grande (9°46'N., 84°39'W.), entered between Punta Leona and Punta Torres, 12 miles NNW, has the Rio Grande de Tarcoles at its head. The bay is generally deep, but the bank extends about 1 mile offshore in the vicinity of the mouth of the river. There are four villages scattered at intervals of about 1 mile along the shore of the bay to the NE of Punta Leona. The village of Tivives stands on the shore 4.5 miles SE of Punta Caldera. This latter point is high, wooded, and prominent when viewed from the S.

Bahia Caldera (9°55'N., 84°44'W.) is entered between Punta Corralillo and Roca Carballo, located 2.5 miles N. In the bay, a restricted area, having a radius of 250m, surrounds a wave recorder buoy moored 0.5 mile NW of Punta Corralillo. A submarine cable connects the buoy to the shore E of it. The bay is clear and unobstructed, with a least depth of 10m within 0.5 mile offshore.

Puerto Caldera (9°55'N., 84°43'W.)

World Port Index No. 15500

7.21 Puerto Caldera lies 1.3 miles S of the village of Caldera at the S side of Bahia Caldera. It is a major container port and the principal port terminal for the railway from San Jose. In addition to container cargo, the port also handles general cargo, refrigerated cargo, ro-ro traffic, and bulk cargo.

Winds—Weather.—Prevailing winds are NE; strong N winds will be most frequent during January but continue at less frequent intervals until April. Strong N winds will cause rough seas at HW. During the summer and early autumn season, strong S winds will cause seas to break over the breakwater, making the port untenable.

Tides—Currents.—The tidal range is 2.8m. Tidal currents of up to 1.5 knots may accompany the flood tide.

Depths—Limitations.—The port is protected by a breakwater, located close W of the wharf, extends 300m NW from the shoreline, then another 300m further W.

There is a concrete wharf, 490m in length, aligned in an ENE direction with three dry cargo berths inside the breakwater.

A dredged area, marked by lighted buoys and best seen on the chart, is located N of the concrete wharf inside the breakwater. The area is dredged to ensure the maximum draft restrictions for the berths can be complied with. Vessels should ensure they remain within the dredged area to avoid numerous dangerous shoals, some showing 1m above the water at LW within 300m N and NE from the breakwater.

A CBM tanker berth is located about 300m offshore. Tankers moor at the offshore berth by using the starboard anchor and running lines to three additional buoys.

Refer to the table titled **Puerto Caldera—Berth Limitations** for details on the dry cargo berths and the tanker CBM berth.

Puerto Caldera—Berth Limitations				
Berth No.	Maximum			Remarks
	LOA	Size	Depth	
Dry Cargo Berths				
1	210m	25,000 dwt	10.7m	Containers and dry bulk
2	150m	15,000 dwt	10.0m	Dry bulk, general cargo, and ro-ro
3	130m	5,000 dwt	7.5m	General cargo and ro-ro
Tanker Berth				
CBM	175m	—	9.9m	Maximum draft allowed is 9.9m
NOTES:				
1. A dangerous underwater obstruction submerged lies at a depth of 5.1m close off the center portion of Berth No. 1.				
2. The Port Authority should be consulted for the latest information regarding the depths alongside the berths.				

Aspect.—Five buff-colored storage tanks stand along the shore.

Pilotage.—Pilotage is compulsory. Pilots board WNW of the breakwater in position 9°55'N, 84°45'W. Tugs are compulsory for berthing and unberthing. Requests for pilots should be made by VHF 1 hour prior to arrival.

Regulations.—Vessels should send their ETA 48 hours prior to arrival, then reconfirmed 24 hours and 12 hours prior to arrival. The ETA message should include the following information:

1. Vessel name, flag, and voyage number.
2. Net registered tonnage and gross tonnage.
3. Vessel International Radio Callsign (IRCS).
4. Arrival draft (fore and aft).
5. LOA and beam.
6. Names of owners, shipping company, charterers, Master, and agents.
7. ETA/ETD.
8. Quantity in tons of bulk cargo to be loaded or unloaded, or the number of containers to be loaded or unloaded.
9. Identify any dangerous cargo on board.

Contact Information.—See the accompanying table titled **Puerto Caldera—Contact Information**.

Anchorage.—Good anchorage can be taken in Bahia de Caldera. Temporary anchorage can also be obtained 1.25 miles N of Punta Corralillo, in depths of 12 to 15m, as best seen on the chart. A rough sea is usually raised at the time of HW during the month of January, with strong N winds being the frequent cause.

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Puerto Caldera—Contact Information	
Pilots	
VHF	VHF channels 14 and 16
Telephone	506-263-43218
Facsimile	506-263-43217
Port Authority	
Telephone	506-263-44145
Facsimile	506-263-44146
E-mail	gerencia@incop.go.cr
Port Operators	
VHF	VHF channels 14 and 16
Telephone	506-263-44003
Facsimile	506-263-44590 506-263-44595
E-mail	info@puertocaldera.com

Caution.—A lighted buoy equipped with a wave recorder moored, best seen on the chart, lies NNW of Punta Corralillo with a 200m restricted area around it.

Two submerged wrecks reported in Bahia de Caldera are located as follows:

1. Close E of the temporary anchorage, best seen on the chart, in position 9°55'09.3"N, 84°43'26.0"W, in a depth of 5.4m.
2. Close N of the dredged area, best seen on the chart, extending N from vicinity Berth No. 1, in position 9°54'56"N, 84°43'20"W, in a depth of 5.2m.

7.22 Bahia Barranca (9°57'N., 84°46'W.) is the bay into which the Rio Barranca flows, arriving close N of Punta Farallon, a point lying 3.5 miles N of Punta Corralillo. The bay is contained between Punta Farallon and the shore 2.5 miles NW of it.

Depths—Limitations.—An offshore berth lies 4 miles NW of Puerto Caldera, in Bahia Barranca. A pipeline is connected to the berth for the discharging of ammonia to a fertilizer plant ashore, 2 miles NNE, where a conspicuous chimney stands. Two small buoys mark the end of the submerged pipeline laid NNE to the shore. Vessels secure to four mooring buoys in a depth of 12.2m. There is nearly always a moderate to heavy swell from the S or SW at the berth.

A CBM system for the discharge of ammonia, consisting of four mooring buoys, is located at the seaward end of a submarine pipeline extending 1.5 mile offshore. The shoreside connection for the pipeline is located about 0.2 mile W of the hospital. There are depths of 12.8m at the CBM and caution must be taken during almost constant periods of heavy S or SW swells.

Pilotage.—The pilot boards at the anchorage. See paragraph in 7.23 for details.

Anchorage.—Anchorage for vessels waiting to use this berth lies E of the pier head at Puntarenas.

Puntarenas (9°59'N., 84°50'W.)

World Port Index No. 15510

7.23 Puntarenas, lying midway along the E shore of the Gulf of Nicoya, is a port of entry. At one time, half of the foreign trade of the country passed through this port, however Puerto Caldera, now considered an extension of Puntarenas, handles most cargo discharged in the region. Puntarenas remains the primary off-loading port for bulk cargo. The harbor N of the town is shallow and is suitable only for small craft with local knowledge.

Winds—Weather.—There are only two seasons, the rainy and the dry, the former generally lasting from April through November.

During the rainy season, the winds will be from the NE and light in strength from late evening through the morning hours, shifting from the S and SW during the middle of the day and through the afternoon into early evening, with winds strengthening to gale or near gale strength, accompanied by periods of heavy rain. Winds and storms will be at their strongest during September and October.

During the dry season, calms prevail, but in the evening there are often violent “Chubascos,” which are from a direction between N and E and are accompanied by heavy rain. These rain storms last close to an hour. The N winds, which are considered dangerous to shipping during February and March, do not generally jeopardize operations underway at the mole, but rather, due to the protection afforded by the spit, are most hazardous at a position about 1 mile to the S. Southerly winds are broken by the Islas Negritos and the peninsula that forms the W shore of the gulf. During the afternoon, at times, strong W winds set up a choppy sea, but do not affect large vessels. Easterly winds are seldom troublesome.

Tides—Currents.—At Puntarenas, the tides rise 2.8m at springs and 1.6m at neaps. The flood current sets W and the ebb current ESE with a strength of 1 to 1.5 knots. Currents with a velocity of as much as 2 knots have been observed.

The flood current in Golfo de Nicoya sets NE, then N, and then, off Puntarenas, to the W; the ebb sets in the reverse directions. The flood current off Punta Herradura has a slightly NW set, but it is hardly strong enough to be noticeable. Strong tide rips will be found off Sail Rock.

The flood current, on entering Golfo de Nicoya, sets directly toward the mouth of the Rio Barranca, causing the sediment of the river to deposit most heavily at the mouth and also, to some extent, along the shore to the W. These currents then set W at a maximum rate of 2 knots. From a position E of Angostura, the rate decreases, varying from 1.5 to 1.7 knots, until near the mole where it again increases and sets away from the shore. The ebb sets in a contrary direction.

Depth—Limitations.—Depths in the approach to Golfo de Nicoya, between the entrance points and as far N as Puntarenas, are deep and clear and no exceptional difficulty should be experienced by entering vessels.

A short approach channel extending from the 10m curve to the E side of the Commercial Pier is marked by buoys. It is reported that this channel is dredged to 10m.

Alongside berthing facilities are provided for ocean-going vessels at Muelle Nuevo, an L-shaped pier, extending about 28m S from the shore at a position 0.1 mile E of the Custom House, then extending another 160m to the W. There are two berths, 135m and 112m in length. The maximum allowable draft alongside is 7.9m. Recent (2011) dredging operations have increased the depths around the pier area to between 10 and 10.5m, with the exception of one area having a depth of 9.7m.

The roadstead lies E of a bank, with depths of less than 11m, which extends 4.5 miles SSE from Puntarenas and separates it from the main channel leading through the gulf. There are several patches having depths of less than 5.5m on this bank; the shallowest depth of 3.3m lies about 1 mile SW of the pier at Puntarenas. The entire area between this bank and the mouth of the Rio Barranca, 4 miles E, is clear of dangers, with suitable depths for anchoring.

A dangerous wreck, marked by a buoy, lies 0.8 mile W of the light situated at the end of the pier and is often uncovered at LW.

A CBM system consisting of three mooring buoys is located at the seaward end of a submarine pipeline 0.5 mile offshore, about 1.2 miles E of Muelle Nuevo. Tankers with a draft of 7.3m can be accommodated at this berth. Berthing at the CBM should only be undertaken during flood tide, preferably within 3 hours of HW. Night berthing is not recommended. Departure from the CBM should commence at slack water or during ebb tide. If departure is done at night, it should only be carried out at HW.

Aspect.—The high mountains which serve to identify the entrance of the gulf from seaward have been previously described. On closer approach to Puntarenas, a conspicuous church spire in the town and a red-roofed building near the pier can be readily identified. A light is shown from the head of the pier.

Pilotage.—Pilotage is compulsory for vessels berthing at the pier, but not for vessels anchoring in the roadstead. The pilot boards vessels SE of the pier in position 9°57'18"N, 84°48'00"W. The pilot will take vessels alongside at night, but prefers to wait until daylight. Pilots can be contacted on VHF channels 14 and 16.

Regulations.—Vessels should send their ETA 72 hours prior to arrival. Any changes in ETA should be confirmed 48 hours and 24 hours prior to arrival. The ETA message should include the following information:

1. Vessel name.
2. Port of registry.
3. Name of Master.
4. ETA/ETD.
5. Request for tugs.
6. Draft.
7. Number of crew including passengers, if any.
8. Request for garbage removal and fresh water.
9. Last port of call.
10. Next port of call.

Contact Information.—The pilots can be contacted, as follows:

1. VHF: VHF channels 14 and 16
2. Telephone: 506-263-43218
3. Facsimile: 506-263-43217

The port authorities can be contacted, as follows:

1. Telephone: 506-263-44145
2. Facsimile: 506-263-44146
3. E-mail: gerencia@incop.go.cr

Signals.—Vessels berthed alongside the pier must sound the following whistle signals:

Signal	Meaning
One long blast	Shore line parted
One long/two short blasts	Line to mooring buoy parted

The pilot and mooring party will shift the vessel at any hour of the day or night.

Vessels about to sail sound the following signals:

Signal	Meaning
Four long blasts 1 hour before sailing	Request for customs clearance.
One long and two short blasts	Clearance papers are on board and a pilot and mooring party is requested.

Anchorage.—Anchorage can be taken during the dry season, from November to April, about 0.6 mile SE of the light on the mole, in depths of 9m, but the depths farther to the E are also convenient for anchoring. It is reported that the bottom is grey sand and mud and provides poor holding. All commercial traffic usually anchors near Puerto Caldera with ferries being the only vessels using the recommended anchorage at Puntarenas.

During the summer and autumn, heavy rollers set in from the SW and it is necessary to anchor farther out.

Caution.—Lesser depths than charted have been reported in the roadstead and vessels are advised to use caution.

A heavy surge is experienced around Muelle Nuevo at certain times of the year.

Golfo de Nicoya to Quepos

7.24 The coast between Punta Judas and Punta Quepos, 23 miles ESE, is fronted by deep water within 0.5 mile offshore and backed by low land rising gradually to the high mountain ranges in the interior. An extinct volcano, with a crater 2 miles wide across the top, rises to an elevation of 2,420m about 20 miles ESE of Cerro Grande de Turabales and 14 miles inland. A number of elevations along the brink give the summit the appearance of a lofty serrated ridge. A dome-shaped mountain rises to an elevation of 2,169m about 4 miles S of the extinct volcano.

Punta Quepos (9°24'N., 84°10'W.) is a bold prominent point, 146m high, and the termination of a series of densely wooded bluffs. Flat Rock, awash at LW and the outermost danger, lies about 0.4 mile SW of the point. A 2.1m shoal, which breaks at half-tide, lies 0.8 mile N of Flat Rock. A light is shown from Punta Quepos

7.25 Quepos (9°24'N., 84°10'W.) (World Port Index No. 15490), a small banana exporting terminal, lies 1.5 miles N of Punta Quepos.

Depths—Limitations.—The main wharf extends 140m from two islets, lying close offshore on the S side of the entrance of Boca Vieja Creek, which are connected to the mainland by a trestle bridge. There is a breakwater to protect vessels at the main wharf and lighters discharge at the smaller wharf. Vessels not exceeding 152m in length and a draft of 8.2m can be accommodated alongside.

A considerable swell is usually experienced and two mooring buoys are used to breast vessels off the wharf while working cargo. Heavy springs and wires are provided when securing.

Pilotage.—Pilotage is not compulsory, but is advisable if berthing alongside. The pilot boards about 1 mile off the wharf and will take a vessel in at night under favorable conditions.

Anchorage.—Anchorage can be taken SW of the wharf, in a depth of 29m, about 1.2 miles N of Punta Quepos.

Quepos to Cabo Matapalo

7.26 Islas de los Quepos (9°22'N., 84°09'W.), a group of detached islets and rocks, lie between 1 mile and 4.5 miles SE of Punta Quepos. Isla Toro Amarillo, 30m high, is the S islet of the group. During thick weather, this islet is easily recognized because of its distinctive red color. A sunken rock, awash at LW, lies almost 0.5 mile S of the islet. Vessels should give this chain of islets and other dangers a wide berth and not attempt to pass inshore of them.

Punta Uvita (9°09'N., 83°46'W.), lying 28 miles SE of Punta Quepos, is the N entrance point of Bahía Uvita. The point is fronted by two spurs of foul ground, one extending 2 miles to the W and the other 1 mile to the S. Numerous small, above-water dangers lie on these spurs. Isla Uvita, small in extent and circular, lies close SW of the point and Barrel Rock, 6.4m high, lies 1.3 miles W of the islet. Both of the above spurs are marked by tide rips.

Bahía Uvita (9°08'N., 83°44'W.), which lies S of Punta Uvita, is entered between that point and the spur of foul ground S of it and Round Rock, 1.5 miles SSE. A ridge of foul ground, marked by above and below-water dangers, breakers, and tide rips, extends in a general E direction from the rock almost to the mainland 3 miles distant. Isla Ballena, white in color and 35m high, lies on this foul ground 1 mile ESE of Round Rock. This islet shows up well from seaward and is the best landmark for approaching the bay.

Several huts stand on Isla Uvita in the N part of the bay and can be seen for several miles.

Anchorage can be taken as convenient in the N part of the bay, in a depth of 12m, sand, 0.7 mile ESE of Isla Uvita.

Cerro Chirripo Grande (Mount Walker) (9°28'N., 83°31'W.) rises to an elevation of 3,783m about 23 miles NE of Bahía Uvita and is one of the loftiest summits in Central America.

7.27 Punta Mala (9°05'N., 83°41'W.), bold and cliffy, lies 2.5 miles SE of Bahía Uvita and is the seaward spur of the high mountain range which rises in the interior. South of the point, the coast is backed by a low plain covered by mangroves as far

S as Punta Violin, a distance of about 22 miles. A shoal, coastal bank, with depths of 10m and less, extends up to 2 miles offshore in places along this section of coast.

Punta Violin (8°48'N., 83°40'W.), lying 18 miles S of Punta Mala, rises to an elevation of 250m and is fronted by a group of small, wooded islets, known as Islas Violin, which lie 1 mile offshore. Vessels passing along this section of coast are advised to pass about 1 mile W of these islets and Islas Sacate, lying 2.5 miles N.

Punta San Jose (8°41'N., 83°43'W.), a bluff headland with deep water close offshore, lies 7.5 miles SSW of Punta Violin, and may be recognized by a large green patch on its seaward slope.

Punta San Pedro (8°39'N., 83°44'W.), a cliffy projection fringed by submerged rocks, lying about 3 miles S of the above point, has been reported as being radar conspicuous. Lowrock Reef, which breaks, lies 1 mile offshore, midway between these two points.

Punta Llorona (8°36'N., 84°45'W.), 3 miles S of Punta San Pedro, is a high, almost perpendicular headland which extends inland to a well-wooded plain, 150m high. This point can easily be distinguished at a distance of 15 miles, and on closer approach, a number of red patches on the face of the cliff can be seen. Punta Llorona has been reported to be radar conspicuous.

Vessels navigating along this coast between Punta San Pedro and Punta Llorona can avoid the fringing coastal dangers by keeping at least 1 mile offshore.

7.28 Isla del Cano (8°43'N., 83°53'W.), 10 miles NW of Punta Llorona and steep-to within 0.5 mile offshore, rises abruptly to a flat top with an elevation of 123m. Anchorage can be taken off the NE side of this heavily wooded island in a depth of not less than 27m.

A light is shown from the W end of the island. Isla del Cano has been reported to be radar conspicuous.

A depth of 18m was reported to lie about 3 miles SSW of Isla del Cano Light.

Punta Salsipuedes (8°27'N., 83°35'W.) lies 13 miles SE of Punta Llorona, is high and precipitous, and may easily be recognized from the E or W by the natural terrace behind it. A reef, marked by above and below-water rocks, extends 0.6 mile S and W from the point.

The coast between Punta Llorona and Punta Salsipuedes, which is low, sandy, and featureless, is fronted by several above-water rocks which lie within 2 miles of the shore line. Roca Corcovado, 18m high, is the largest rock and dome-shaped. This rock, which lies about midway between the two points, should be given a berth of at least 1 mile when passing. A current setting N and W at a rate of 1.5 knots is usually encountered in the vicinity of Corcovado Rock.

A shoal area, with depths of 13 to 18m, lies 17 miles SW of Punta Salsipuedes.

Cabo Matapalo (8°23'N., 83°18'W.), the W entrance point of the Golfo Dulce, lies 17 miles E of Punta Salsipuedes. The intervening coast is backed by mangrove-covered low land rising abruptly to the mountain range a few miles inland. Depths of 18m and greater lie within 0.5 mile of the shore.

Cabo Matapalo is high, steep-to, and covered with trees. A conical rock, prominent from the W, lies close SE of the cape. Roca Matapalo, a dark rock lying 0.5 mile SE of the cape, is

prominent from the SW. Cabo Matapalo has been reported to be radar conspicuous.

Caution.—It is reported (2010) that Cabo Matapalo Light is not visible. This may indicate only a temporary problem or one of lasting duration.

Cabo Matapalo to Punta Burica

7.29 Golfo Dulce (8°23'N., 83°13'W.), entered between Cabo Matapalo and Punta Banco, 8 miles E, extends 11 miles N and then 17 miles NW to its head. The gulf has a commercial port and the rest of the region is sparsely populated. Puerto Golfito, a banana exporting port, lies in a small landlocked bay on the E side of the gulf, 15 miles within the entrance.

Punta Banco Light, marking the S entrance to Golfo Dulce, is mounted on a red and white structure, but it is reported (2010) that the light is extinguished.

The depths throughout the gulf are deep to within 1 mile of the shore except in the vicinity of the Rio Coto, located on the E side of the gulf, 12 miles inside the entrance. The bank fronting this river extends up to 1.5 miles offshore, but it is usually marked by breakers and can easily be avoided.

The position of the gulf is easily recognized by the terrain on either side of the entrance. The E side rises to a height of 709m at the summit of Pico Burica, located 9 miles E of Punta Banco. The W side of the entrance rises gradually from a height of 404m, about 3 miles NW of Cabo Matapalo, to a height of 615m about 12 miles farther NW.

The W shore of the gulf between Cabo Matapalo and Punta Arenitas, 10 miles to the N, consists of flat well-wooded country rising gradually to high terrain about 1 mile inland. The fringing shoals extend up to 0.5 mile offshore along this section of coast.

Golfo Dulce can accommodate vessels with a maximum length of 195m, beam of 30m, and draft of 13m.

7.30 Punta Arenitas (8°32'N., 83°17'W.), lying 9 miles N of Cabo Matapalo, is a low, sandy point bordered by shoal depths on its NE side. The village of Puerto Jimenez (San Domingo) stands on the inshore side of the point. The houses are partially obscured by trees and difficult to distinguish.

The coast between Punta Arenitas and Punta Isidora, 15 miles to the NW, remains low and heavily wooded, but is steep-to within a short distance offshore.

Bahia Rincon (8°43'N., 83°29'W.), a small, deep, crescent-shaped indentation, lies N and W of Punta Isidora and provides the only good shelter in the gulf N of Puerto Golfito. A conspicuous yellow patch on one of the cliffs to the E of the bay is visible from the entrance of the gulf. A conspicuous tank stands near the shore in the SW corner of the bay. Two piers extend from the shore N of the bank.

Anchorage can be taken off Punta Arenitas, in a depth of 18m, about 1 mile to the SE. Anchorage can be taken NW of the point, but the water is deep a short distance offshore. Vessels are advised not to anchor in depths of less than 27m. Secure, well-sheltered anchorage can be taken as convenient in Bahia Rincon.

The shore at the head of the gulf to the E of Bahia Rincon and then, as far SE as Punta Voladera (8°38'N., 83°12'W.), is indented by several small bays. Depths along this section of

coast generally are deep within 0.5 mile of the shore.

7.31 Puerto Golfito (8°38'N., 83°10'W.) (World Port Index No. 15480) lies in a landlocked bay on the NE side of the gulf and is a small port with a single pier and a lighterage port for larger vessels loading woodchips from barges at anchorages outside the harbor. The entrance, which lies between Punta Voladera on the N side and the peninsula extending N from the Rio Coto, is about 0.3 mile wide in its outer part, but narrows in its inner reaches. Ample depths are available in the fairway leading to the berthing facilities in the NE corner of the upper bay, but elsewhere the depths shoal rapidly. Numerous drying flats encumber the S half of the bay to its head.

Tides—Currents.—There are fairly strong tidal currents in the anchorage, with the flood tide setting SE and the ebb tide setting NW.

The tidal range is 3.1m. The flood current may not run parallel to the berths along the pier and caution is necessary.

Depths—Limitations.—It is reported (2010) that the entrance channel is not well marked and can be deceiving at times. Caution must be exercised due to the presence of numerous small fishing vessels around the entrance to the channel at times.

The entrance channel has a minimum width of approximately 500m between the 5.5m depth contours. Depths in the entrance channel decrease from 20.1m S of Punta Voladera to a depth of 15.2m about 1 mile SW of the main wharf and then decrease to depths of 8.3 to 12.3m in the pier area. The minimum depth in the approaches is 9.2m. Depths decrease gradually to a depth of 9.1m about 1 mile SE of the berthing facilities.

The main wharf is 317m long and is divided into two berths, identified as SE and NW. The NW berth is the banana pier, accommodating vessels with drafts up to 7.3m. The SE berth is used for general cargo and also as a tanker berth, accommodating all vessels with drafts up to 7.9m. Tankers are restricted to a maximum length of 140m. Tankers usually berth starboard side-to but at times during the ebb tide it is reported that berthing has taken place port side-to. Berthing during nighttime hours is not recommended.

It is reported (2013) there is a designated mid-stream anchorage, marked by buoys, for ocean-going vessels to load wood chips from barges. Vessels anchor with their stern secured to two mooring buoys, which maintain the vessel's bow in a SSW direction. Vessels up to a maximum draft of 13m, a maximum beam of 30m, and a maximum length of 195m, can be accommodated at this anchorage.

Aspect.—A wooded hill, 263m high, rises from the low, sandy peninsula, on the SE side of the entrance. Located about 2.5 mile SE is another hill, similar in appearance, but slightly higher, which is more prominent to vessels in the gulf, as the coast S of it is comparatively flat for several miles.

Adam's Peak, 526m high, with a radio mast marked by obstruction lights standing on the summit, is a conical summit at the NW end of a steep ridge on the NE side of the harbor.

Two sets of range lights lead through the harbor entrance. The first set, in line bearing 047°, is reportedly (2010) difficult to distinguish due to the proximity of the range lights to each other, thus making it difficult to determine whether the vessel is right or left of the range; the forward marker is located above

a highway and may be obscured until approaching within 1 mile.

The second set, in line bearing 037°; is reported (2010) to have the rear structure obscured by buildings and vegetation; the rear structure may also be difficult to discern due to a similarly-colored roof in its vicinity. Additionally, this second range does not align with the center of the channel, but rather more to the SE side. It is reported (2010) that pilots are steering a bearing of 035° or 036° for a better clearance NE of the shoals located on the right side of the channel.

Several lighted aids mark the outer extremities of the principal shoals found around the perimeter of the harbor area.

It is reported (2010) that the buoys in the inner harbor may not accurately mark the limits of shoal water; the buoys swing excessively and do not remain in reliable positions.

There may also be uncharted buoys observed on either side of the channel to mark the changeable limits of the shoal water.

The lighted beacon S of Punta Voladera and a similar beacon on the S side of the entrance channel have been reported to be radar conspicuous.



Puerto Golfito Range

Pilotage.—Pilotage is not compulsory, however, pilots can be requested from the Port Authority and come from Caldera. ETA should be advised 24 hours prior to arrival, then contact should be established again 1 hour before arrival.

Pilots board at the entrance to the channel.

Contact Information.—The port office can be contacted, as follows:

1. VHF: VHF channels 14 and 16
2. Telephone: 506-277-50097
3. Facsimile: 506-277-50097

The Port Authority can be contacted, as follows:

1. Telephone: 506-263-44145
2. Facsimile: 506-263-44146



Golfito Buoy

3. E-mail: gerencia@incop.go.cr

Anchorage.—Anchorage is available for three or four vessels at one time in the NW part of the harbor. The holding ground is good and the anchorage is sheltered.

Anchorage is not permitted off the pier, but may be found in a depth of 13m, about 0.3 mile SSE of the head of the main wharf.

Caution.—It has been reported that buoys in the inner harbor can be unreliable and may not accurately reflect the limits of shoal water.

7.32 The **Rio Coto** (8°33'N., 83°10'W.), which discharges into the gulf 9 miles SSE of Punta Voldadera, is shallow and fronted by an extensive drying bank which extends about 1.5 miles seaward of the entrance. The outer edge of the bank is

steep-to and usually breaks.

Between Punta Coto and Punta Banco, 10 miles S, the coast is indented by Bahia Pavon, a broad expanse of water with moderate depths. Anchorage, exposed to SW winds, can be taken anywhere within the bay, in depths of 7 to 15m.

Punta Banco (8°23'N., 83°09'W.), the E entrance point of the gulf, is not prominent, but as the entrance is neared, it can be distinguished at the foot of the NW slope of Punta Platanal. Vessels rounding the point should give it a berth of at least 1 mile in order to avoid the foul ground extending about 0.5 mile offshore.

Punta Platanal (8°21'N., 83°07'W.), 3 miles SE of Punta Banco, rises abruptly to a height of 357m and has a very conspicuous flat top.

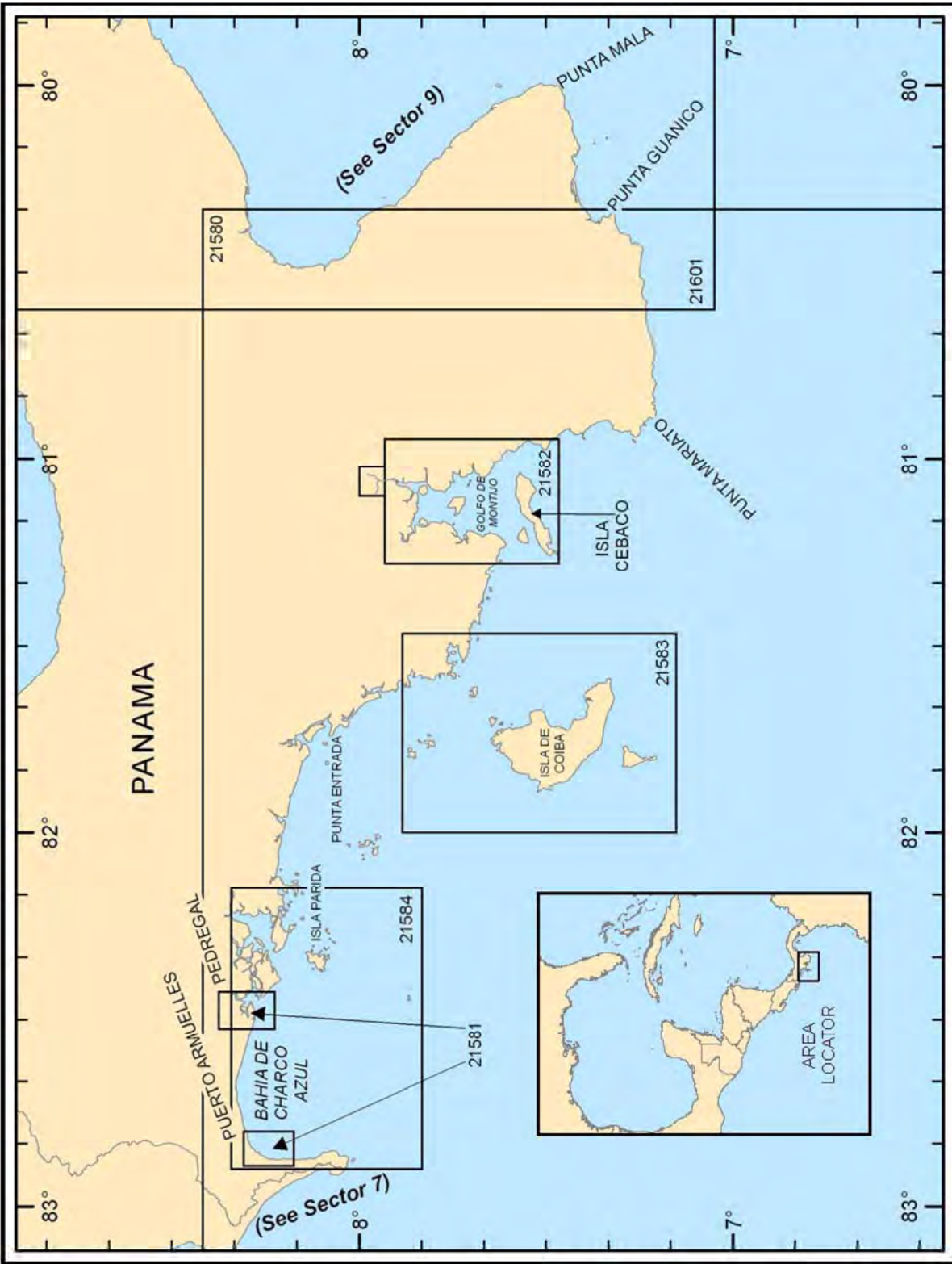
The coast between Punta Platanal and Punta Burica, about 23 miles SE, is fronted by deep water within 1 mile of the shore and backed by high hills.

Isla Burica, small in extent and high, lies 0.5 mile S of Punta Burica, to which it is connected by a reef. A black above-water rock lies 1.3 miles NW and some sunken rocks lie S of the islet.

A strong NW current is experienced off the islet during the flood. Vessels passing this section of coastline should give the islet a berth of at least 1 mile. A light is shown from the island.

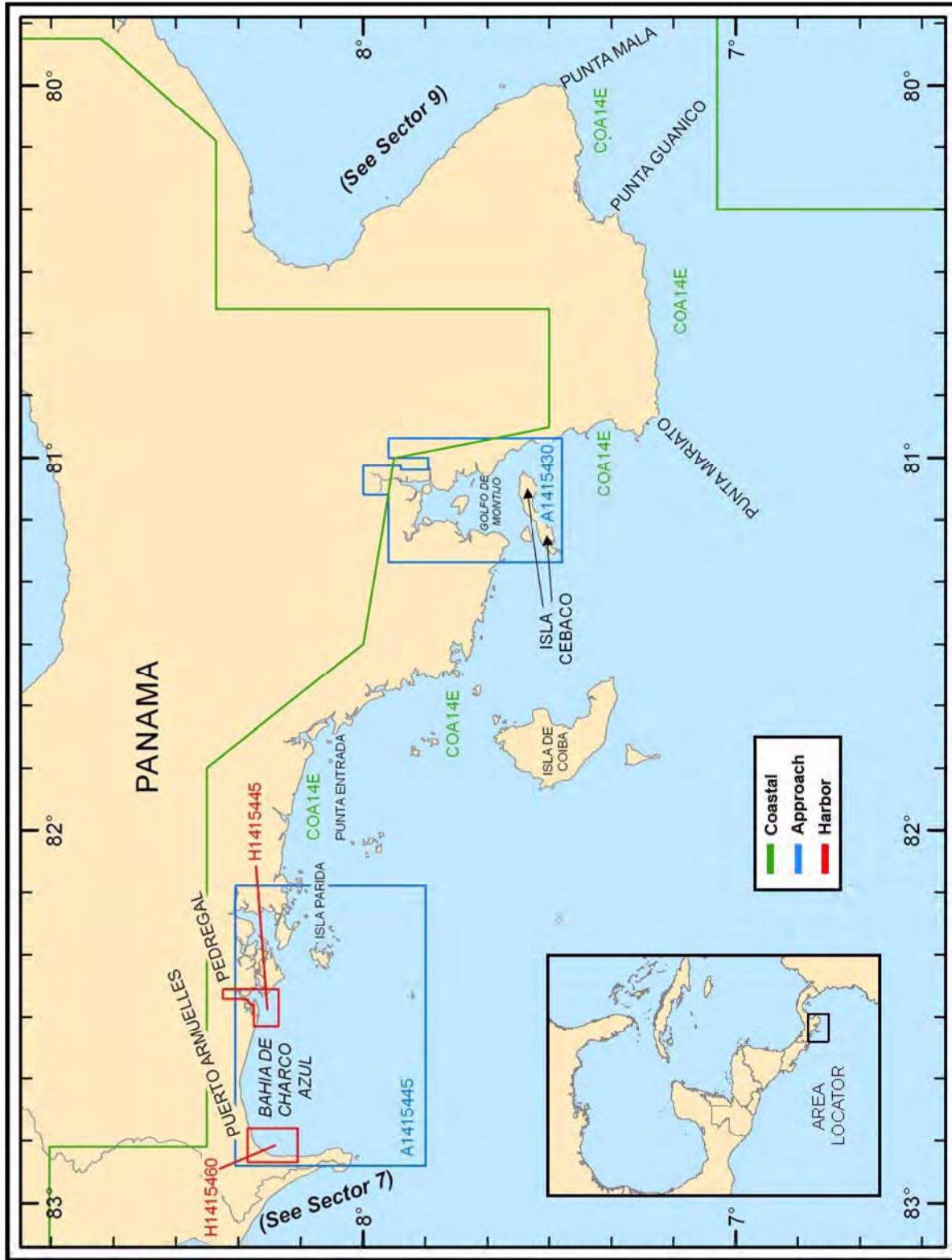
Punta Burica (8°02'N., 82°52'W.), the outer end of a long peninsula that forms the W side of Bahia Charco Azul, rises abruptly from the sea to an elevation of 357m, and is an excellent landmark from any direction. In clear weather it has been sighted at a distance of 35 miles.

The point has been reported to be radar conspicuous and identifiable with relationship to charted features at a distance of 18 miles.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 8 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 14 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 8 — DNC LIBRARY INFORMATION

SECTOR 8

COAST OF PANAMA—PUNTA BURICA TO PUNTA MALA

Plan.—This sector describes the S coast of Panama from Punta Burica to Punta Mala with adjacent islands. The descriptive sequence is E and then SE.

General Remarks

8.1 Winds—Weather.—The predominant wind along this section of coast from November to April is NE, and from June to September, is SW. During the dry season, from November to April, there is a tendency for the prevailing wind to vary locally. Seasonal winds are irregular and are modified by the alternation of land and sea breezes, interrupted by calms and occasional squalls. The climate is tropical, hot, and humid, with a rainy season from May to January and a dry season from January to May.

Tides—Currents.—Due to the influence of the Equatorial Countercurrent, an E set will usually be experienced within 20 miles of the coast in the vicinity of Morro de Puercos. The current flowing out of the W side of the Gulf of Panama in the area of Punta Mala will join this current and then set to the SW, gradually turning to the W, and so passing into that part of the South Equatorial Current which flows W between the equator and 4°N. From June to November, the outflow from the Gulf of Panama does not extend S of about 6°N. From June to August, the emerging water turns W or NW and passes into the NW flow along the W coast of Central America, reversing the set of the coastal flow.

Punta Burica to Puerto Armuelles

8.2 Bahía de Charco Azul (8°10'N., 82°40'W.), lying between Punta Burica and Isla Parida, 30 miles E, extends 16 miles N of a line joining these two positions. Depths in the central and W parts of the bay are deep, but are moderate in the N and E parts. The W shore of the bay between Punta Burica and Punta Balsa, 2.5 miles N, has a coastal bank extending 1 to 1.8 miles offshore, with the sea breaking on it at LW. The coast between Punta Balsa and Puerto Armuelles is high. The N shore is low and intersected by several rivers.

Punta de Piedra (8°13'N., 82°53'W.), located 8 miles N of Punta Balsa, projects slightly E into the bay, affording protection for the crude oil transshipment terminal, Charco Azul, which lies close N of the point.

8.3 Charco Azul (8°13'N., 82°52'W.) (World Port Index No. 15427) also known as Petroterminal de Panama, is an oil-storage and trans-shipment terminal for tankers of up to 320,000 tons. It is a transfer point for Alaskan oil from VLCC's to either the transcontinental pipeline or smaller vessels for canal transit. The pipeline connects Charco Azul to Chiriqui Grande Terminal on the Atlantic coast.

Winds—Weather.—The port is sheltered from all except ENE veering through S winds. There are seldom winds of high velocity and SE winds are rare. If there are any high winds they

can be expected to be of short duration. It has been reported that dense haze in the early morning will make recognition of landmarks difficult.

Petroterminal de Panama Home Page

<http://www.petroterminal.com>

Tides—Currents.—The tidal range is 2.3m in the vicinity of the loading berths.

Strong tidal currents running in a N and S direction have been reported close to the berths but these are unpredictable.

Depths—Limitations.—The W side of the bay is very deep. The 30m curve approaches within 0.3 mile of the coast above Punta de Piedra.

The terminal consists of two loading berths plus a smaller construction wharf used for general cargo and fuel.

Berth No. 1 is a fixed-loading platform at the head of a T-shaped jetty, with depths alongside of 24.38m at LW. This berth can handle tankers of 28,000 to 320,000 dwt, with a maximum length of up to 335m and a maximum draft of 21.9m at HW. Depths vary between 26m and 32m alongside the seaward edge of the loading platform, decreasing to less than 20m alongside either side of the jetty upon heading more than 15m towards the shoreline. Depths decrease more sharply S of the jetty, with soundings of 1.6m and 5.4m being found 50m and 75m, respectively, SW of the loading platform.

Berth No. 2 is a fixed-loading platform at the head of a T-shaped jetty, with depths alongside of 23.46m at LW. This berth can handle tankers of 28,000 to 320,000 dwt, with a maximum draft of 21m at HW. Depths vary between 28m and 32m alongside the seaward edge of the loading platform, decreasing to less than 15m after heading more than 20m towards the shoreline from the seaward loading platform on either side.

Caution must be taken to avoid an extensive area of shallow water between 50m and 120m SE of the loading platform. The following specific depths having been identified by surveys (2012):

Position	Depth
8°12'35.5"N, 82°52'21.2"W	0.9m
8°12'35.5"N, 82°52'20.8"W	3.1m
8°12'35.8"N, 82°52'20.2"W	8.1m
8°12'35.9"N, 82°52'19.4"W	11.1m

Note.—The area up to 50m SE of the depths listed above is unsurveyed and may include depths as shallow as the ones listed here and should be avoided.

The Construction Wharf is a breakwater-type platform located N of Berth No. 1, with depths of 9.1m alongside and has a width of 15m length of 25m, although only 16m of this length



Petroterminal Berths No. 1 and No. 2

is usable. Vessels up to 3,000 dwt can be accommodated.

Pilotage.—Pilotage is compulsory and is available 24 hours. Pilots will generally board in position 8°11'N, 82°49'W; however, there may be different boarding positions assigned depending on whether or not a vessel is loading, discharging, or what berth the vessel is associated with. Close attention should be paid to any special requirements for pilot boarding accommodations needed.

Regulations.—The vessel's ETA should be sent 72 hours in advance as well as reconfirmed if it changes by more than 4 hours. The ETA should be advised through agents who will notify the terminal.

All ETA messages should contain the following information:

1. Vessel name.
2. ETA.
3. Draft fore and aft expected upon arrival.
4. If tanker is discharging—Bill of Lading, gross and net barrels, and specific gravity of oil or petroleum to discharge.
5. Any deviations from the recommended deck fittings.
6. Any additional information required by the terminal for discharging vessels or loading vessels, together with any details that could affect the loading or discharging operations.
7. Fresh water request, if any.

Vessels should establish contact with the terminal on VHF when within approximately 50 miles.

Vessels required to wait off the terminal should ensure they maintain a continuous watch on VHF channel 16.

Vessels should not approach the immediate vicinity of the terminals without prior authorization.

Outgoing tankers or tankers leaving the berths shall have priority over all incoming tankers except for those cases in which the normal rules of navigation are not compromised.

Vessels should always have both anchors readied for use.

Prior to berthing, vessels will advise the terminal of any damage or disability to the vessel.

Contact Information.—The port terminal can be contacted, as follows:

1. Call sign: Petroterminal Control
2. VHF: VHF channels 11, 12, 13, 14, and 16
3. Telephone: 507-770-7246
507-770-9166
4. Facsimile: 507-770-7261

Petroterminal de Panama, in Panama City, can be contacted, as follows:

1. Telephone: 507-263-7777
2. Facsimile: 507-263-9949
3. E-mail: info@petroterminal.com

VHF channel assignments are listed in the table titled **Charco Azul—VHF Channel Assignments**.

Charco Azul—VHF Channel Assignments	
VHF channel	Assigned to
1	Terminal operations channel.
11	Alternate channel for cargo handling.
13	Tugs and berthing.
14	Cargo handling only.

Charco Azul—VHF Channel Assignments

VHF channel	Assigned to
16	Call up channel and for vessels at anchor to monitor. Also for use by vessels on their initial contact to agents before switching to a working channel other than VHF channel 11, 13, or 14.
Note. —The terminal will provide a portable radio for use by the person in charge of petroleum and ballast transfer operations on board the tanker.	

Anchorage.—The NE part of Bahía de Charco Azul is believed to be the best area to anchor, with deep water and good holding ground. Medium-size vessels can obtain good anchorage 12 miles E of the terminal in position 8°10'N, 82°40'W. VLCC-size tankers can obtain good anchorage in the vicinity of position 8°15'N, 82°45'W.

Caution.—A marine farm has been established in the S part of the bay between 8°05'N to 8°11'N along 82°51'W. Small craft will be operating in this area to service the nets. Mariners are required to give this area a wide berth.

Puerto Armuelles (8°16'N., 82°51'W.)

World Port Index No. 15460

8.4 Puerto Armuelles, 3 miles NNE of Charco Azul, lies close S of Boca de Carache. The port is owned and operated by United Brands Company and engaged primarily in the export of bananas.

Winds—Weather.—Prevailing winds are E of light to moderate strength.

Tides—Currents.—The tidal range is 3.65m.

Depths—Limitations.—There is only one pier in the port. Depths in the approach are deep, shoaling gradually as the pier is approached. Access to the pier is free of obstructions.

Although the pier is 460m in length, extending from shore in a SE direction; there is only 136m of berthing space available along the E side of the pier, with depths alongside of 12.2m. Vessels berth starboard side-to using mooring buoys with the bow facing out to sea. Since the mooring operation is complicated, United Brands provides personnel who will board the vessel and manipulate the cables used in the mooring process.

Aspect.—In the approach to the port, two large silver-colored tanks stand on the shore 0.7 mile W of the pier end. Two framework radio towers, each 31m high and 91m apart, stand 0.9 mile NNE of the pier. A green light is shown from a church 0.5 mile NW of the pier. A light is shown from the head of the pier.

Pilotage.—Pilotage is compulsory for berthing operations. Vessels should send their ETA 48 hours and 24 hours in advance through their agent. Pilots and mooring personnel board 1 mile E of the pier.

Pilots must be requested by the vessel on VHF channel 12 to the Port Authority or on VHF channel 16 to United Brands. The pilot vessel is white but does not have a VHF radio on board.

Anchorage.—Vessels may anchor, in depths of 33m, about 0.5 mile E of the pier. Care must be taken when letting go of the anchor due to the rapid deepening of the water depths seaward of the pier. Vessels arriving in these waters for the first time should consult the pilot regarding the best place to anchor since there are no navigational aids available to mark the best place to anchor.

Puerto Armuelles to Puerto Nuevo

8.5 The coast between the mouth of the Rio Rabo del Puerto and Punta Boca de Hacha (Punta San Pedro), 20 miles E, is intersected by numerous small rivers.

Isla Parida (8°06'N., 82°21'W.), which lies 12 miles SE of Punta Boca de Hacha, is well-wooded, high, and of irregular shape. Numerous above and below-water dangers surround this island on all sides. A light is shown from the SW part of the island.

La Bandera (8°03'N., 82°25'W.), a steep-to rock with a depth of less than 1.8m, lies about 4 miles SW of Isla Parida.

Islas Ladrones (7°52'N., 82°26'W.), three rocky, barren islets which occupy an area about 1 mile in extent, lie 14 miles SSW of Isla Parida. Rocks lie within 1 mile NNE of the islands, and a bank on which there are least depths of 5.5m extends 8 miles NNE. A light is shown from the 75m high summit of the island. The islands have been reported to be radar conspicuous.

The **Rio Chiriqui** (8°15'N., 82°23'W.), which is fronted by numerous islets, shoals, and other dangers, lies between Punta Boca de Hacha to the NW, Isla Parida to the S, and the mainland to the NE.

The delta is intersected by three principal channels; Boca de San Pedro, Boca Brava, and Boca Chica. Boca de San Pedro is the deepest and most direct approach to the Rio Chiriqui and Pedregal. The other two channels have silted and are no longer in use.

The channel leading through Boca de San Pedro should not be entered without local knowledge.

8.6 Pedregal (8°22'N., 82°26'W.) (World Port Index No. 15445) is a small village, lies at the head of Estero Pedregal. The port is primarily used for the local fishing industry but can handle small amounts of general cargo, fertilizers, and bulk commodities.

Depths—Limitations.—Entry and departure from the port is only during HW, which varies between 3.35m and 5.3m. It is preferable for the vessel to have a draft at least 0.3m less than the tide height at HW due to the sand bar crossing the estuary. Occasional heavy swells will cause the HW clearance to decrease even more and may even prevent entry altogether until conditions subside.

The one pier in the port is 86m in length, with depths of 3.3 to 5.3m alongside. There is no fendering on the pier itself. At LW vessels will usually rest safely on the bottom, which is soft mud. Vessels must use their own gear for loading or discharging cargo.

Vessels calling at Pedregal must be self-sustaining with their own cargo-handling gear in good working order.

Pilotage.—Pilotage is compulsory and provided by local experienced mariners. An ETA must be given 48 hours in ad-

vance through local agents. Pilots and the port may be contacted on VHF channels 15, 16, and 17. Pilot boards in the anchorage area in the vicinity of Fairway Lighted Buoy marking the entrance to Boca de San Pedro.

Anchorage.—Vessels awaiting entry into Pedregal can anchor in vicinity of the Fairway Lighted Buoy marking the entrance to Boca de San Pedro, in depths of 21 to 24m.

Caution.—The numerous islets, rocks, and other dangers, which extend up to 10 miles E of Isla Parida and then N to the coast, are intersected by several deep passages leading to Boca Chica, the E entrance of the delta.

8.7 Islas Viudas (8°06'N., 82°10'W.), a group of islets extending N and NW of a detached rock, 4.6m high, lies on the S side of the approach to Boca Chica about 9 miles E of Isla Parida. The rock is usually marked by breakers. A reef, with several above and below-water rocks on it, extends 0.5 mile SE

Islas Monitas (8°09'N., 82°10'W.) are two islets on a reef lying about 3 miles N of Islas Viudas. A light is shown from the SE point of the NE islet.

Islas Secas (7°59'N., 82°02'W.), a group of islands and rocks which cover an area approximately 5 miles in extent, lies 11 miles SE of Islas Viudas. Isla Cavada, in the center of the group, is 94m high.

La Bruja (7°59'N., 81°59'W.), a 0.6m high rock, lies 3 miles E of the N extremity of Isla Cavada and is a formidable danger, especially at night.

The coast to the E of Boca Chica, as far as the entrance leading to Puerto Nuevo, is intersected by several rivers and streams.

Isla Silva de Afuera (8°05'N., 81°49'W.), 43m high and wooded, lies 4.5 miles W of the S entrance point leading to Puerto Nuevo.

8.8 Puerto Nuevo (8°06'N., 81°42'W.), which lies on the E bank of an estuary into which several rivers discharge, is entered between Punta Entrada on the S and Punta Aguda, 1.8 miles ENE, the S extremity of Isla Insolita.

The position of the entrance may be recognized by Sugarloaf Hill (8°10'N., 81°46'W.), 165m high, which stands 5 miles N of Punta Entrada, and by Isla Silva de Afuera and Isla Silva de Tierra, which lie W of the entrance.

The entrance channel is about 0.2 mile wide between the 10m curves until within 0.3 mile of Isla Intrusa, beyond which no vessel should attempt to proceed if drawing more than 3.7m. At HW, vessels drawing up to 3.7m can reach the wharf at San Juan Enfrente, but will ground alongside at LW.

Anchorage can be taken by large vessels, in depths of 9 to 11m, about 1.3 miles WSW of Punta Entrada. Deep-draft vessels can anchor in mid-channel, in depths of 14 to 16m, about 0.5 mile E of Punta Entrada.

Puerto Nuevo to Isla Jicarita

8.9 Morro Negrito (8°02'N., 81°43'W.), 91m high, is a bluff headland joined to the land to the N by a narrow isthmus, and lies 3 miles S of Punta Entrada.

Between Morro Negrito and Punta Pajaron, 9 miles SE, the coast is fronted by a shallow bank which extends up to 1.5 miles offshore in places. The bank is steep-to and breaks on its

edge with a SE swell. Between Punta Pajaron and Punta Jabali, 13 miles SE, the coast is irregular and indented by a number of small bays. The land gradually rises to high hills and peaks close inland as Punta Jabali is approached.

Bahia Honda (7°45'N., 81°32'W.), entered between Punta Guarida (Punta del Miel) and Punta Jabali, is deep, sheltered, and provides excellent shelter. Tidal currents have a velocity of 0.5 to 1 knot. Drying flats fringe the E and NE ends of the bay, but elsewhere the shores are generally steep-to.

Isla Talon, 80m high, lies in the inner reaches of the harbor and divides it into two parts, known as Bahia Chinche to the W and Bahia Legamo to the E. Two small islets lie off the W and S sides of Isla Talon.

Anchorage can be taken anywhere within the harbor, but the best berth for large vessels is in Bahia Chinche, in a depth of 27m, mud, 0.6 mile W of Isla Calentador.

Confined anchorage may be taken in Bahia Legamo, in depths of 9 to 18m.

Islas Contreras (7°50'N., 81°47'W.), lying NW of Bahia Honda, consists of two groups of uninhabited islands and rocks separated by a deep channel about 1.5 miles wide.

Isla Uva (7°49'N., 81°46'W.), the largest of the S group, lies 15 miles NW of Punta Jabali and 9.5 miles offshore. A light is shown from a point on the SW side of the island.

Roca Prosper, which has the appearance of a black tower, is 2.7m high and lies 1.3 miles S of Isla Uva. The other islets and rocks of the group lie within 1 mile of the remaining coastline of Isla Uva.

Isla Brincanco (7°52'N., 81°35'W.), the largest of the N group, is 196m high and lies 3 miles N of Isla Uva. The other islets which make up the group lie within 0.8 mile of Isla Brincanco.

Anchorage can be taken, in a depth of 55m, about 0.5 mile N of Isla Brincanco. Small vessels can anchor close N of the islet, in a depth of 26m.

Isla Canal de Afuera (7°41'N., 81°38'W.), 201m high, lies 5 miles WSW of Punta Jabali and can be passed on either side. A small islet lies close N of the W end of the island. A light is shown from the S side of the island.

8.10 Isla Rancheria (7°39'N., 81°42'W.), 130m high, lies within 1.5 miles of Punta Baltasar, the N end of Isla de Coiba. Several islets and sunken rocks lie within 1.3 miles NW and 0.8 mile NE of the islet.

La Viuda (7°39'N., 81°41'W.), a dangerous pinnacle rock with a depth of 8.5m, lies 0.8 mile ENE of Isla Rancheria.

Isla de Coiba (7°30'N., 81°48'W.), the largest island off this section of coast, is mountainous and heavily wooded, but there is some swampy land on its W side. The island rises to an elevation of 427m in its central part.

The W side of the island between Punta Baltasar, its N extremity, and Punta Hermosa, 10 miles S, is bordered by deep water and may be approached closely. Punta Hermosa, together with Punta Adelarda, 2 miles S, form the W extremity of the island. Punta Hermosa has been reported to be radar conspicuous.

Between Punta Adelarda and Punta Anegada, the SE extremity of the island, the coast remains steep-to as far SE as Punta Brigida (7°22'N., 81°47'W.), but E of this point several detached dangers lie within 3 miles of the shore.

A bank, with a least depth of 6.5m, lies 1.5 miles S of Punta Anegada. Breakers extend offshore for about 1 mile during the winter season when SW winds prevail.

Anchorage can be taken off various parts of the island, but there are no harbors to provide shelter.

Caution.—The island has a penal colony on its E side; landing is prohibited without prior permission of the Panamanian government.

A local magnetic anomaly was reported to exist off the S coast of Isla de Coiba between positions 14 miles SE and 12 miles SSW of Punta Anegada.

Hill Rocks, comprised of two rocks awash, lies 5.5 miles WSW of Punta Anegada.

Passage Rocks, a group of rocks awash, lies 7.3 miles WSW of the same point and 1.5 miles offshore.

Between Punta Anegada and Punta Fea, 5 miles NW, the coast is fronted by foul ground which extends up to 1 mile offshore in places.

8.11 Bahia Damas (7°27'N., 81°40'W.), entered between Punta Fea and Punta Clara, 7 miles NNE, is the principal anchorage of the island. There are depths of more than 50m between the entrance points, shoaling to a depth of 18m about 1 mile offshore. Anchorage can be taken as convenient. It is not advisable to anchor in depths of less than 27m. The penal colony lies along the N shore of this bay.

Ensenada Arenas (7°34'N., 81°42'W.), entered N of Punta Damas, provides anchorage in its central part, in depths of 9 to 36m.

Isla Montuosa (7°28'N., 82°15'W.), a small and heavily wooded island, lies 21 miles W of Isla de Coiba and rises to a height of 155m. Foul ground extends about 1.5 miles W and 0.5 miles S from this island.

Isla Montuosa has been reported to be radar conspicuous. A light is shown from the highest point on the SW side of the island. Banco Hannibal (7°23'N., 82°03'W.), with a least depth of 17m, lies 12 miles ESE of Isla Montuosa.

Isla Jicaron (7°16'N., 81°48'W.), heavily wooded and uninhabited, rises to a height of 418m. This island is separated from Isla de Coiba to the N by Canal de Jicaron, a passage about 3 miles wide. Tidal currents up to a rate of 2 knots have been observed in the channel. A dangerous group of rocks, with depths of less than 1.8m, which does not always break, lies about 2 miles WNW of the S point of the island. Isla Jicaron has been reported to be radar conspicuous.

Isla Jicarita (7°13'N., 81°48'W.), close S of Isla Jicaron, is heavily wooded with bold cliffs at its S end, and rises to a height of 136m. The passage separating this island from Isla Jicaron to the N is shoal. Isla Jicarita has been reported to be radar conspicuous. A light marks the S end of the island.

Caution.—Breakers have been observed 0.5 mile S of the island.

Isla Jicarita to Punta Mariato

8.12 Islotes de Cativos (7°41'N., 81°29'W.), lying 1 mile offshore, small in extent, and fringed by foul ground on their N side, lie 4 miles ESE of Punta Jabali. Anchorage can be taken by vessels of any size about 1.5 miles NE of the largest islet and 0.5 mile offshore. Small vessels can anchor about the same

distance to the NW of the same islet.

Between Islotes de Cativos and Punta Brava, 16 miles E, the coast remains high and bold. Several small islets lie within 1 mile offshore along this section of coast. Vessels should not transit the area at a distance of less than 3 miles offshore.

Golfo de Montijo (7°38'N., 81°07'W.), entered between Punta Brava on the W and Punta Duartes, 16 miles ESE, is obstructed by two islands which lie across the entrance. The channel of approach leads E of these islands and extends 17 miles N to the mouths of the Rio San Pablo and the Rio San Pedro. The W side of the gulf is obstructed by extensive shallow flats intersected by shoal passages.

The Rio San Pedro is navigable as far as Puerto Mutis, 11 miles above Isla Leonis (7°44'N., 81°07'W.), by vessels with a length of not more than 30.5m and a draft of not more than 3.3m.

The Rio San Pablo is more difficult to navigate, but at HW a vessel with a draft of 3m can proceed upriver as far as Sona, 36 miles above Isla Leones.

Currents at the entrance of the gulf attain a velocity of up to 2 knots, but elsewhere are of varying strength.

Isla Cebaco (7°32'N., 81°09'W.), a high long narrow island, lies across the entrance of the gulf about midway between the entrance points. Several hills rise on the island, the highest peak attaining an elevation of 355m about 4.5 miles from Punta Zurrón, the SW point of the island. A light is shown from a square framework tower on Punta Zurrón.

Pilar de Sal, lying 1.3 miles S of Punta Zurrón, is a rock named for its resemblance to a pillar of salt. Other small islets and rocks lie in this vicinity.

English Rock, which breaks at half-tide, has a depth of 1.2m, and lies about 1 mile E of Punta Campana, the NE extremity of Isla Cebaco.

Anchorage can be taken in Caleta Cayman, a small bight on the S side of the island near its W end, between the months of January and May.

The preferred channel leading into the gulf leads E and then N of English Rock.

The known dangers adjacent to or within the fairway N of English Rock are charted and some are marked by beacons.

8.13 Isla Gobernadora (7°34'N., 81°13'W.), small in extent, with a 224m high peak, lies 1.5 miles N of the W part of Isla Cebaco. The peak on the island is an excellent landmark for vessels approaching from the W.

A pilot can be obtained at Isla Gobernadora.

Good well-sheltered anchorage can be taken as convenient either N or S of Isla Gobernadora. If using the anchorage S of this island, care should be taken to avoid the shoal depths lying in mid-channel, S of the E end of the island.

The coast between Punta Duartes and Punta Mariato, 19 miles S, is indented by two small bays. Good anchorage is provided in both bays from January to May, but Bahia Arenas, the S bay, with depths of 9 to 37m, is preferred as better shelter is provided and the holding ground is good. Shoaling has been reported.

Punta Naranjo (7°15'N., 80°57'W.), a bluff headland lying 15 miles S of Punta Duartes and extending 2 miles W of the general line of the coast, is backed by a range of high hills. Islote Roncador (Isla Naranjas), a rocky, wooded islet, lies 1

mile off the point and a dangerous rocky shoal, with a depth of 2.1m, lies 1.3 miles farther WNW. This shoal is occasionally marked by breakers.

A bank, with a depth of 17.7m, lies 8 miles WNW of Punta Naranjo.

Punta Mariato to Punta Mala

8.14 Punta Mariato (7°12'N., 80°53'W.), a bold headland lying 4.3 miles SE of Punta Naranjo, marks the W extremity of a range of high coastal land that terminates to the E at Morro de Puercos. Two red patches on the headland are conspicuous when viewed from the S. The point is marked by a light.

Morro de Puercos (7°15'N., 80°26'W.), a lofty headland at the E end of the high coastal range, lies 27 miles E of Punta Mariato. The intervening coast is high and steep-to within 2 miles of the shore. Vessels rounding this point are advised to give it a wide berth. A vessel reported (1955) striking a submerged object, believed to be an uncharted rock, about 4 miles ESE of the point. Less water than charted has been reported to exist between this obstruction and the coast.

Shoals, with a depth of 9.5m, lie 4.3 miles ESE and 4.5 miles NE of Morro de Puercos. Strong tide rips have been observed 7 miles SSW of the point.

Morro de Puercos has been reported to be radar conspicuous. A light is shown from the point.

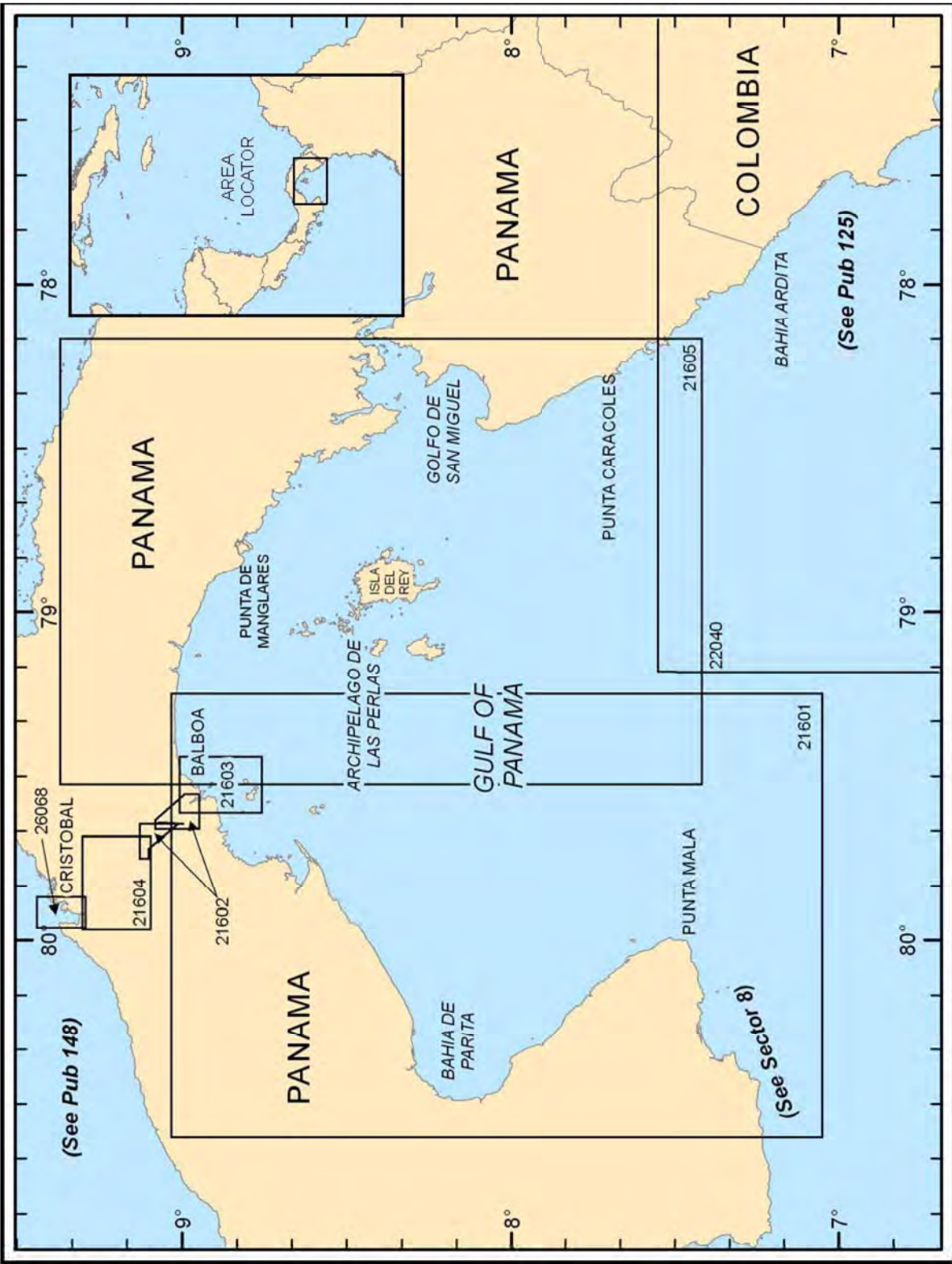
The coast between Morro de Puercos and Punta Mala, 30 miles ENE, sweeps to the NE to form two exposed bights. This section of coast is low and fronted to a considerable distance by moderate depths. Punta Guanico, 7 miles NE of Morro de Puercos, has been reported to be radar conspicuous.

The bight to the NE of Punta Guanico is fronted by shoal depths which extend up to 2.5 miles from the W shore, decreasing to a width of about 1 mile off the N shore to the W of Punta Raya, 9 miles NE of Punta Guanico.

8.15 Frailes del Norte (7°22'N., 80°10'W.), a small barren flat-topped islet surrounded by deep water, lies 5 miles SE of Punta Raya.

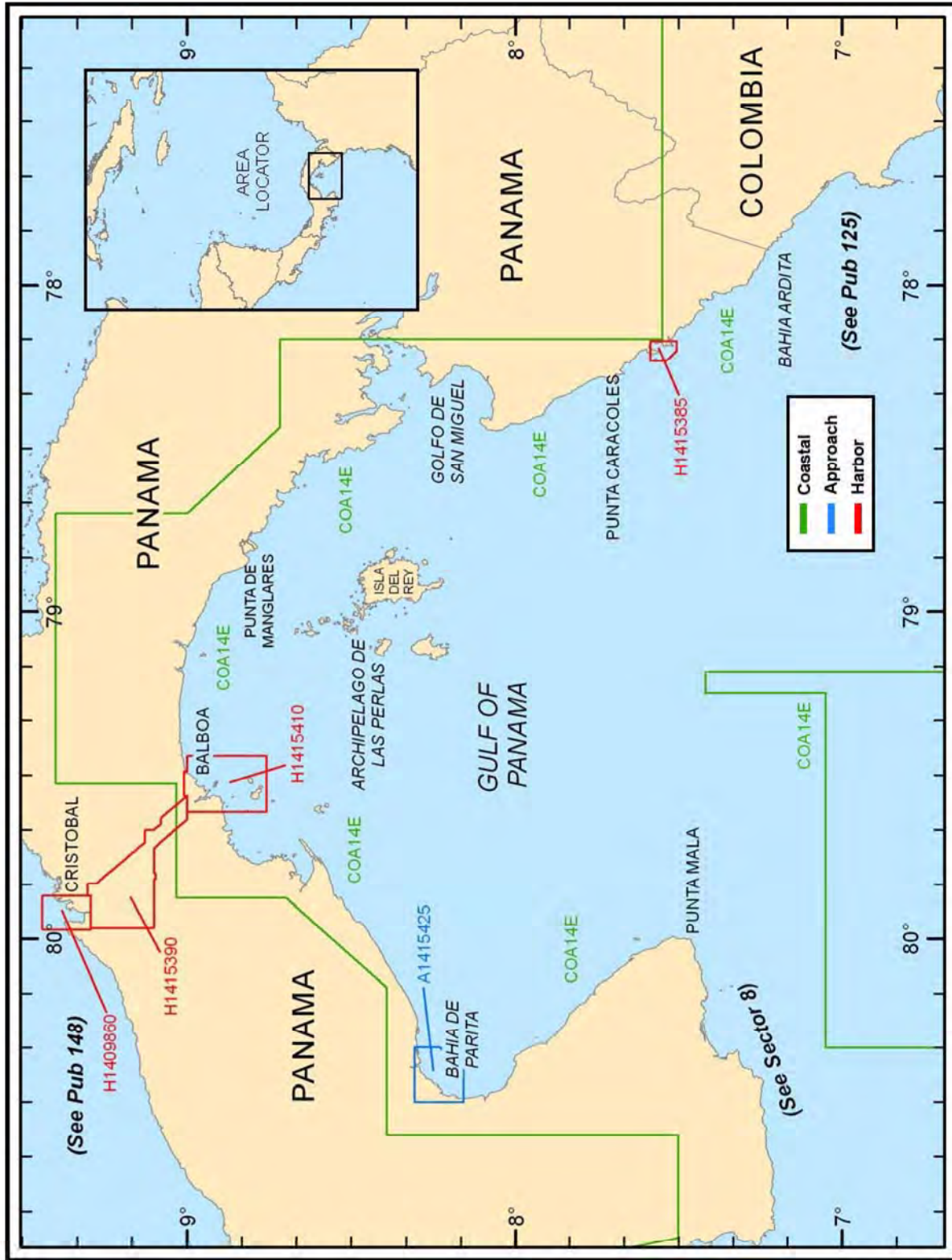
Frailes del Sur (7°20'N., 80°09'W.), an islet similar to Frailes del Norte and steep-to, lies 2.5 miles SSE. Both of the above islets are good landmarks in clear weather for vessels approaching Punta Mala. A light is shown from an 11m high pyramidal tower situated on the N end of Frailes del Sur. Vessels passing Frailes del Sur are advised to give it a wide berth.

Punta Mala (Cabo Mala) (7°28'N., 80°00'W.), located 14 miles ENE of Punta Raya, is the W entrance point of the Gulf of Panama and is described in paragraph 9.2.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 9 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 14 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 9 — DNC LIBRARY INFORMATION

SECTOR 9

THE GULF OF PANAMA

Plan.—This sector describes the Gulf of Panama between Punta Mala and Bahia Arditá, and includes the Archipelago de Las Perlas. The descriptive sequence is N, E, and then SE.

The Gulf of Panama

9.1 The Gulf of Panama, a broad expanse of water lying on the Pacific side of the approach to the Isthmus of Panama, may be considered to lie N of a line extending from Punta Mala, on the W, to Bahia Arditá, on the E.

The gulf recedes N of these entrance points to Bahia de Panama, which forms its head, and serves as the S approach to the Panama Canal. The entrance to the canal lies 93 miles NNE of Punta Mala.

Archipelago de Las Perlas ($8^{\circ}25'N.$, $79^{\circ}00'W.$), which consists of many islands, islets, and numerous dangers within its limits, lies in the NE part of the gulf and is described in paragraph 9.19.

Punta Mala to the Panama Canal

9.2 Punta Mala (Cabo Mala) ($7^{\circ}28'N.$, $80^{\circ}00'W.$), the W entrance point of the Gulf of Panama, is low, but cliffy and fronted by steep-to rocky ledges. From a considerable distance NW, the land slopes gradually toward the cape, which is not easily distinguished unless the breakers are seen. Several buildings stand on the point. Tide rips were reported to occur 16 miles ENE of the point. Vessels generally experience a strong S set in this area, especially during the dry season. Vessels are advised to remain outside the 200m curve in the vicinity of Punta Mala. Punta Mala has been reported to be radar conspicuous.

The point is marked by a light; a racon is situated at the light. A wreck lies 3 miles SW of Punta Mala, depth 11m.

Isla Iguana ($7^{\circ}37'N.$, $80^{\circ}00'W.$), lying 9 miles N of Punta Mala and 2.5 miles offshore, is slightly higher than the adjacent coast and can readily be identified. The island, marked by a light situated on its W extremity, has been reported to be radar conspicuous.

The coast between Punta Mala and Punta Lisa, 39 miles NW, is generally low and intersected by the mouths of several rivers and streams.

Isla Villa ($7^{\circ}57'N.$, $80^{\circ}18'W.$), an islet 12m high and marked by a light, lies 1.5 miles offshore, 5.5 miles SE of Punta Lisa.

Bahia Parita ($8^{\circ}07'N.$, $80^{\circ}20'W.$), entered between Punta Lisa and Punta Anton, 18 miles N, recedes inland 10 miles, is low and swampy, and fronted by drying shoals which extend up to 3.5 miles offshore in places.

Boca de Estero Palo Blanco (Estero Aguadulce) ($8^{\circ}14'N.$, $80^{\circ}28'W.$), the channel leading to Puerto Aguadulce at the head of an inlet, is entered between the drying flats which lie 11 miles WSW of Punta Anton and 2 miles offshore.

9.3 Puerto Aguadulce ($8^{\circ}14'N.$, $80^{\circ}30'W.$) (World Port



Punta Mala Light

Index No. 15425) is a small port situated in Parita Bay and handles bulk sugar and molasses for export, principally to the United States.

Tides—Currents.—The mean spring tidal range is 5m; the mean neaps tidal range is 2.7m.

Depths—Limitations.—The channel leading to the port is marked by lighted buoys and beacons. The channel is 7 miles long, has a least navigable width of 75m, and a least depth of 1m at LW.

The port has a 70m long pier, with alongside depths of 2.4 to 3.3m. There is no fendering available on the pier.

A dolphin berth, 50m in length, with an alongside depth of 2.7m, on the W bank of the river farther upstream, has one berth dedicated to the loading of sugar and the other berth dedicated to the loading of molasses.

The port has accommodated vessels as large as 2,500 grt, 100m in length, and a maximum draft of 5m but only under the following restrictions:

The port can only be entered during daylight hours during HW, which ranges between 3.3m and 5.3m. It is preferable for the vessel to have a draft at least 0.3m less than the tide height at HW due to the sand bar crossing the estuary. There are times when entry into the port at HW will not be possible due to heavy swells reducing the water level at the harbor entrance. Vessels will generally lie safely aground in mud alongside the pier at LW.

No port facilities are available for loading or unloading cargo. All cargo operations must be performed with ship's gear. The only exception is belt-type conveyor loaders are available for loading sugar.

Pilotage.—Pilotage is compulsory for vessels greater than 150 grt. Although pilots are available 24 hours, berthing is only allowed during daylight hours. Vessels request pilotage through their agents or the National Port Authority on VHF channel 12 or 16 upon arrival. Pilot will board at the anchorage, which has depths of 7.4m, in position 8°13'N, 80°25'W.

Contact Information.—The National Port Authority can be contacted, as follows:

1. Telephone: 507-501-5106
507-501-5227
2. Facsimile: 507-501-5405
3. E-mail: dpuertos@amp.gob.pa

9.4 The low coast between Punta Anton and Punta Prieta (8°32'N., 79°55'W.), 28 miles NE, is intersected by numerous rivers and fronted by a shore bank which extends up to 2.3 miles offshore. To the SE of Punta Prieta, the bank extends 8.5 miles offshore, but gradually decreases in extent in the vicinity of Punta Chame, 14 miles farther NE.

Isla Bona (8°35'N., 79°36'W.), together with the other islands and rocks within 3 miles N of it, lies 8 miles SE of Punta Chame and is the southernmost group of a chain of islands and rocks which lies within 20 miles S of Flamenco Island. Isla Bona has a single peak which rises to an elevation of 205m and has been reported to be radar conspicuous. A light is shown from a small islet close S of Isla Bona.

Isla Otoque (8°36'N., 79°36'W.), the N island, is irregular in shape and rises to two peaks, both slightly lower than the peak on Isla Bona. A village is situated on a bay at the NW side of the island.

Roca Redonda, an above-water rock, and Isla Estiva, a small islet, lie about midway between the above islands on the E and W sides, respectively. From a distance, the islands do not appear as separate islands until viewed from the E or W.

Bahía de Chame (8°40'N., 79°41'W.), a shallow bay encumbered by numerous drying flats, is entered between Punta Chame and Punta Juanita, 5 miles NW.

The coast between Punta Juanita and Punta Vaca Monte, 10 miles N, is fronted by a shoal bank which extends up to 4.5 miles offshore in places.

9.5 Bahía Chorrera (8°50'N., 79°42'W.), which lies 3.5 miles SW of Punta Vaca Monte, is encumbered by drying flats extending 2.5 miles from the head of the bay. Depths of less than 9m extend up to 4.5 miles offshore. The bay is frequented primarily by small craft.

Vacamonte (8°52'N., 79°40'W.) (World Port Index No. 15423) lies 10 miles SW of the Panama Canal entrance and provides services to domestic and international fishing vessels. Tuna and shrimp are the primary cargo. The port is situated on Punta Vaca Monte. A spit that extends from the shoreline forms the NE end of Chorrera Bay. A breakwater protects the harbor from the open sea conditions.

Depths—Limitations.—The access channel to the port is 1.5 miles long, 140m wide, and has a depth of 5.5m. The average tidal range is 4m.

A T-headed wharf for tuna boats that can accommodate up to four vessels at the same time, as well as small reefer vessels. The berthing length for this wharf is 240m, with depths alongside of 7m.

Two piers available for unloading shrimp have a berthing length of 200m and depths alongside of 6.58m. Up to eight vessels can be accommodated at one time.

Two small berths, with lengths of 100m each, are available for fishing vessel repair and maintenance.

Aspect.—Range lights lead through the entrance channel, which is marked by lighted buoys.

Pilotage.—Pilotage is compulsory for any vessel greater than 150 grt. The pilot can be contacted on VHF channel 15, while the port can be contacted on VHF channels, 15, 16, and 17. Pilots will board in the anchorage area.

Anchorage.—Vessels may anchor close E of the Fairway Buoy in area centered on position 8°52'14"N, 79°39'17"W.

9.6 Cerro Cabra (8°55'N., 79°39'W.), a prominent tripe-peaked summit, rises to an elevation of 510m about 3 miles NE of Punta Vaca Monte.

The coast between Punta Vaca Monte and Punta Bruja, 5.3 miles E, is fronted by a shorebank which extends up to 3 miles offshore. Several small islets and rocks lie within the limits of this bank, seaward of Punta Bruja.

Commission Rock (8°51'N., 79°34'W.), the outermost danger, lies on the edge of the shore bank, 3 miles SSE of Punta Bruja. This rock has a least depth of 1.5m.

Isleta Melones, 24m high and flat-topped, together with Roca Melones, a drying rock 0.5 mile N, lie 3.5 miles WSW of Commission Rock.

Punta Guinea (8°55'N., 79°34'W.), 2.5 miles NE of Punta Bruja, is backed by a summit, 95m high. A leper colony stands on the shore about midway between the two points. The mouth of the Farfan River lies between Punta Guinea and Farfan Point, 1 mile N.

Panama Canal Approach—South Side

9.7 A chain of islands, rocks, and sunken dangers lies on the S side of the approach to the Panama Canal and extend from Islote Valladolid, 10 miles S of Punta Bruja to Isla Taboguilla, 6 miles SE of the same point.

Islote Valladolid (8°43'N., 79°36'W.), the southernmost danger of the chain, consists of two white-colored rocks lying close together. The highest rock of the two is prominent when the sun shines on it. A light is shown from a metal framework tower situated on the rock.

Isla Chame (8°44'N., 79°35'W.), 2 miles N of Islote Valladolid, is 96m high, wooded, and prominent. Roca Perique, 17m high, lies close N of the islet and is marked by a light tower. A lighted buoy marks the dangerous rocks lying close off the S end of Isla Chame.

Isla Taboga (8°47'N., 79°33'W.), the largest and highest island of the chain, rises to an elevation of 307m near its center. The village of Taboga stands on the NE side of the island. A conspicuous radio tower, equipped with an aeronautical radio-beacon, and another radar tower are situated midway along the S side of the island. Morro de Taboga, a smaller, high islet, lies on the shore bank which extends 0.5 mile NE from the N part of the island.

Anchorage can be taken off the village of Taboga, in a depth of 18m, about 0.3 mile offshore.

A fuel and water barge is stationed off Isla Taboga and is of-



Roca San Jose



Flamenco Island Light

ten used by vessels transiting the canal. A recommended protected bunkering anchorage lies 1.5 miles E of the church in Taboga, in a depth of 31m. A pilot for this anchorage boards at Balboa, or 2 miles NE of Morro de Taboga for vessels entering the canal.

Isla Taboga has been reported to be a radar conspicuous.

9.8 Isla Urava ($8^{\circ}47'N.$, $79^{\circ}32'W.$), 177m high, is separated from Isla Taboga by a narrow channel with a least depth of 2.1m. Islote Tarapa, a small islet, lies close S of Isla Urava.



Isla Perico and Isla Flamenco

A light is shown from the SE shore of Isla Tarapa.

Isla Taboguilla (8°49'N., 79°31'W.), 1.5 miles NE of Isla Urava, is the northernmost island of the chain. It is wooded, and rises to a height of 213m. Several small islets lie off its E and SW sides. Two rocky patches lie between 2 and 3 miles WNW of the W side of Isla Taboguilla. A light is shown from a tower on Punta de Cruz, the N point of the island. Another light is shown from the summit of Piedra de Pon, an islet lying close SE of Isla Taboguilla.

Anchorage can be taken about 0.3 mile seaward of the W side of the island.

Isla Farallon (Roca Farallon), a fairly high rock, lies 0.3 mile SSE of the S extremity of Isla Taboguilla. It is white and bare with a well-defined projection on the summit.

Roca Tabu, with a depth of less than 1.8m, and a 5.8m patch close NE, lie 0.6 mile SW of Isla Farallon.

Panama Canal Approach—East Side

9.9 A group of small islands and rocks lies on the E side of the approach to the entrance channel leading to the Panama Canal from SE of Ciudad de Panama.

Roca San Jose (8°54'N., 79°31'W.), the southeasternmost danger of the group, is 29m high, of a gray color, and an excellent landmark for approaching vessels to use when anchoring off the canal entrance. Deep water can be found within 0.3 mile of this rock, but care should be taken to avoid a rocky patch, marked by a lighted buoy, with a depth of 9.7m, which lies 1.3 miles ESE.

Flamenco Island (8°55'N., 79°31'W.), 0.5 mile NW of Roca San Jose, is the southernmost island of four which lie close together and are joined by causeways.

Flamenco Island, from a distance, shows a symmetrical flat-topped outline. A signal mast stands on the summit of the island. A light is shown from the SW side of the island; a racon is situated at the light.

Isla Culebra, Isla Perico, and Isla Naos lie NW of Flamenco Island.

Tides—Currents.—A current of variable strength, but fairly constant in direction, sets W across the head of Bahia de Panama and then S between Isla Taboga and the mainland.



Flamenco Island Light and Signal Station

This current, when combined with the tidal current on the ebb, has rates of 1 to 2 knots at springs, between and W of Isla Taboga and Isla Otoque. It effectively reduces the rate of the current on the flood. Between Isla Taboga and Isla Otoque, the currents on both the flood and ebb vary greatly in direction at different stages of the tide and cross currents, setting E or W, are frequently encountered near the shores of the islands and in the vicinity of Islote Valladolid.

Current observations carried out at three stations in Bahia de Panama, between Isla Taboga and Flamenco Island, indicate that the general direction of the current is approximately parallel with the canal axis. Surface currents during the flood were found to be more from the E, especially at the observation point nearest Flamenco Island, indicating that the currents here are affected by winds and the coastal current in Bahia de Panama. The greatest rate observed in this part of the bay is 0.5 knot.

Aspect.—Ancon Hill (Mount Ancon) (8°57'N., 79°33'W.), 202m high and the most outstanding landmark to be seen when approaching the entrance of the Panama Canal, is located 3.5



Isla Naos



Cerro Ancon



Sosa Hill

miles NW of Flamenco Island. Four radio masts stand on its summit. The old white stone administration building, with a red roof, on the E slope is easily made out. A masonry reservoir, with white coping, is conspicuous from seaward.

Sosa Hill, 110m high, lies between Ancon Hill and the canal. The city of Balboa stands at the base of the hill.

The Bridge of the Americas spans the canal close N of Farfan Point and is described in paragraph 9.10.

Directions.—Vessels entering the Gulf of Panama from S should pass 15 miles E of Punta Mala and those approaching the gulf from N should round the point at a distance of about 5 miles. Upon approach to the entrance of the Panama Canal, a vessel should pass E of Isla Bona and 2 miles E of Isla Taboguilla, bringing the summit of Ancon Hill to bear 328°. On this heading, the summit will be roughly in range with Flamenco Island, and Perico Island. This course should then be followed to the anchorage.

As the depths decrease gradually from about 37m to the NE of Isla Bona, to 13 to 16m in the vicinity of the entrance of the canal, soundings are of great assistance when approaching in thick weather. If there is doubt as to position, a vessel should anchor, in a depth of 18m, which will be within 2 miles of the canal entrance.

Caution.—It has been reported (2003) that background lighting in the canal may make it difficult to identify lighted aids to navigation.

At night, after identifying the canal entrance range lights and lighted channel buoys, it is advisable to keep just N and E of the range and anchor in a depth of not less than 18m.

The Panama Canal

9.10 The Panama Canal, a lock-type canal, connects the

Pacific Ocean with the Atlantic Ocean. The canal crosses the Isthmus of Panama from Cristobal on the N side to Balboa, on the S side. The canal is maintained to a minimum depth of 12.2m to 13.7m at LW over a minimum width of 152m. The most extensive part of the canal lies at the level of Gatun Lake, which has depths of 25.9m to 26.5m above sea level, varying according to the season of the year. Gatun Lake is reached through three sets of locks, which are arranged in duplicate on either side of the most elevated part of the canal.

The lock gates and valves are electrically operated from a central control station. A vessel is moored to electric towing locomotives which run on tracks on both sides of the lock, pulling the vessel through and keeping it in position.

The entire operation is directed by a lock master on the center wall. All of the canal lock chambers are similar in dimensions and method of operation. The average canal transit is 12 hours.

It is reported that fog conditions during the rainy season (May through November) may suspend night transits in the canal.

Panama Canal Authority (ACP) Home Page

<http://www.pancanal.com>

Local authorities should be contacted to confirm conditions of all aids to navigation and other conditions in the canal. Additional information may be obtained from the website of the Panama Canal Authority.

The Panama Canal is undergoing an extensive expansion program, expected to be completed in the spring of 2015, that will increase the maximum draft, loa, and beam allowable for vessels to transit the canal. The program involves the dredging

container vessels may have a loa of up to 294.13m.

The maximum loa for integrated tug and barge combinations is 274.32m. The maximum aggregate loa for non-self-propelled vessels, including accompanying tugs, is 259.1m, provided that the tugs lock through with the vessel. There may be exceptions to this requirement, but these would have to be approved by the Transit Operations Division Executive Manager.

The maximum beam for commercial or non-commercial vessels and integrated tug and barge combinations is 32.31m, however, a beam of up to 32.61m may be permitted with prior permission from the Transit Operations Division Executive Manager, provided that the deepest point of immersion does not exceed 11.3m TFW (Tropical Fresh Water). The maximum beam for non-self-propelled vessels is 30.5m.

Vessels with protrusions that extend beyond the hull, except for the anchors, must obtain confirmation from the Transit Operations Division Executive Manager that these protrusions will not interfere with the safe transit of the vessel nor will they cause any hazard to the locks.

The maximum allowable height for any vessel transiting the canal or entering the port of Balboa at any state of the tide is 57.91m, measured from the waterline to its highest point. With prior permission on a case-by-case basis, the maximum allowable height may be increased to 62.5m for vessels passing Balboa at MLWS.

The maximum permissible draft for canal transit is 12.04m TFW when the level at Gatun Lake is 24.84m or higher; however, maximum draft may be reduced, depending on the level of Gatun Lake. Draft limits on vessels are also subject to vessel design criteria (i.e., bilge radius information to determine clearance of rubber fenders on lock walls) and vessel handling criteria.

If there is any doubt concerning a vessel's suitability, this should be clarified directly with the Transit Operations Division.

The currents in Gatun Lake may be caused by winds and flood inflow, but they are seldom strong enough to greatly affect shipping. Currents in Gaillard Cut produced by water being drawn at the Pedro Miguel Locks may attain a velocity of 1.5 knots.

Aspect.—The three sets of locks that will be encountered during transit of the Panama Canal from the Pacific Ocean are as follows; Miraflores Locks at the S end of Miraflores Lake, Pedro Miguel Locks at the N end of Miraflores Lake, and Gatun Locks at the N end of Gatun Lake which exits into the Atlantic Ocean. Between the Padre Miquel Locks and Gatun Lake is the Gaillard Cut, where the excavation through the Continental Divide took place. The Gaillard Cut is about 8 miles in length.

There are two bridges spanning the width of the Panama Canal. The oldest of these bridges is the Bridge of the Americas, completed in 1962 and the most recent is the Centennial Bridge, completed in 2004.

The Bridge of the Americas, formerly known as the Thatcher Ferry Bridge, crosses the entrance channel about 0.2 mile N of Farfan Point. The main span of the bridge measures 344m and has an overhead clearance of 61.3m at HW. The center of the bridge is marked by two lights displayed vertically.

The Centennial Bridge crosses the canal about midway through the Gaillard Cut, 9 miles N of the Bridge of the Amer-



Gatun Light

icas. The main span measures 320m and has an overhead clearance of 80m at HW.

In general, the lighting and buoyage of the Panama Canal include the use of range lights, usually green in the longest reaches, and lighted buoys and beacons along the sides, showing red lights on one side and green on the other. Each long reach has a double range, a front and a back range, so that a vessel going in either direction will have a range ahead.

The range towers are cylindrical concrete structures, set a little to the right of the axis of the canal so that if vessels going in opposite directions keep on their respective front ranges, they will have ample room to pass.

It is reported (2010) that the rear range light standing on Pier 1 in Balboa is obscured by trees, causing it to be difficult to discern until the light is abeam. Caution should be exercised for all other range lights throughout since this type of a problem may exist anywhere due to the existence of unchecked foliage growth.

Lighted buoys and beacons are placed along the sides of the canal and across Gatun Lake at intervals of a little less than 1 mile and at all turns. Lights on aids indicating turns are equipped with flashing lights.

It is reported (2012) that between sunset and sunrise, all range lights are sectored to minimize light pollution. Consequently, visual fixes will not be possible during this time. It is also reported (2012) that there are little to no visual aids available for navigation through Gatun Lake for night transit.

In Gaillard Cut, the canal prism is lighted by electric lights spaced 152.4m apart on each bank, suspended from the bank so that the lights are 2m above the water level and mark the edge of the prism of the canal. These lights are fixed green on the E bank and fixed red on the W bank.

The lock at Pedro Miguel is the dividing line between the Atlantic and Pacific buoyage systems; therefore, having passed through the lock, red and green buoys will be found on sides of the channel opposite to those on which they were before reach-



Bridge of the Americas (originally the Thatcher Ferry Bridge) looking from S



Panama Canal—Pedro Miguel Lock (front) and Miraflores Locks (rear)

ing the lock.

The aids to navigation are numbered in five sections:

1. From the Atlantic entrance to Gatun Locks.
2. Gatun Lake from Gatun Locks to Gaillard Cut.



Centennial Bridge



Gaillard Cut

3. Gaillard Cut.
4. Miraflores Lake.
5. From the Pacific entrance to Miraflores Locks.

In association with the dredging operations and temporary obstructions, small wooden buoys may be placed from time to time to mark constricted channels.

Pilotage.—Pilotage is compulsory for all vessels in transit through the canal between the Pacific Entrance (line passing through Lighted Buoy No. 1 and Lighted Buoy No. 2) until vessel passes N of a line passing through Lighted Beacon No. 1 (mole) and Lighted Buoy No. 2 at Crisobal. Pilotage is also compulsory for entry into the port of Balboa.

Vessels are required to forward their ETA at least 96 hours in advance to the Traffic Management Unit of the Panama Canal Authority. Additional reporting requirements from the Panama Canal Authority are described in the Regulations portion of this paragraph.

Vessels must report to the Traffic Operations Division when passing the latitude of Punta Mala (07°28'N), giving time and vessel speed, then must report to the signal station at Flamenco Island upon arrival. The port radio station at Flamenco Island (call sign: WHC) may be contacted on VHF channel 12 or 16.

The following vessels will need to advise the Traffic Management Unit when ready to commence canal transit and will

need to monitor VHF channels 12 and 16 until the pilot is on board:

1. All power driven vessels of 300 grt or more.
2. All vessels, 100 grt or more, carrying one or more passengers.
3. All commercial towing vessels greater than 7.93m.

The pilot assigned shall have control of the navigation and movements of such vessel. The master, or his qualified representative, must be on the bridge at all times when the vessel is underway, in order to keep the pilot informed of any peculiarities in ship handling, so that he may be better able to control its navigation and movement.

The actual transit time is advised over VHF channel 12.

The Panama Canal Authority will grant exemptions from compulsory pilotage to certain vessels provided the vessel owners or operators submit a request for this exemption to the Transit Operations Division Executive Manager. All exemptions granted will be valid for 1 year and if a continuation of a granted exemption is needed, a new request must be submitted within 1 month before expiration of the existing exemption. Failure to make the continuation request within 1 month of expiration of the existing exemption will result in a new request having to be submitted.

Vessel categories that are eligible for this exemption are, as follows:

1. Self-propelled vessels up to 38.1m in length.
2. Self-propelled vessels up to 1,000 Panama Canal (PC) gross tons.
3. Self-propelled vessels carrying hazardous cargo (bulk or packaged) up to 500 Panama Canal (PC) gross tons.
4. Self-propelled passenger vessels up to 500 Panama Canal (PC) gross tons.
5. Towboats without tows.

For vessels exempted from compulsory pilotage, permission must be obtained from the Panama Canal Port Captain before vessels commence any movement into or out of the harbor or when shifting berths. A watch must be maintained on VHF channel 12 to receive any further instructions while maneuvering.

Note.—The Panama Canal uses their own Panama Canal/Universal Measurement System (PC/UMS) which is based on net tonnage, modified for Panama Canal purposes. The PC/UMS is based on a mathematical formula to calculate a vessel's total volume. A PC/UMS net ton is equivalent to 100 cubic feet of capacity and is the same as the Panama Canal (PC) gross ton that is referred to in the Panama Canal Authority (ACP) Operations Requirements given above. Contact the Panama Canal Authority (ACP) for further clarification, if needed.

All vessels with pilotage exemption must still obtain permission from the port captain before commencing any movement in or out of the harbor, including arrivals and departures or when shifting berths. The vessel is also required to contact the MTC watch supervisor through the appropriate signal stations or by telephone (272-4201) before initiating any authorized movement. The vessel must follow any instruction advised by the watch supervisor and also maintain a continuous watch on VHF channel 12 to receive any further instructions while maneuvering.

All vessels with pilotage exemption are still subject to boarding and inspection by personnel from the Transit Opera-

tions Division.

There are many additional requirements that must be met by any individuals requesting an exemption and these are listed in the Panama Canal Harbor Operations Requirements posted on the Panama Canal Authority Home Page identified earlier in this paragraph or by contacting the Transit Operations Division directly.

The pilot, as well as any Panama Canal Authority boarding officers, will board the vessel in the vicinity of the sea buoy (08°51'45"N., 79°29'50"W.) for entry into Balboa or commencing transit of the canal from the Pacific side.

Vessels with a length of up to 129.54m must be trimmed so the pilot can see the ranges over the forecastle from the center of the navigation bridge.

The following is a table of minimum drafts required to provide the proper trim of vessels greater than 129.54m in length intending to board a pilot:

Panama Canal—Minimum Drafts in Tropical Salt Water (TSW)		
Length overall	Draft forward	Draft aft
> 129.54m	2.44m	4.27m
> 144.78m	5.49m	6.10m
> 160.02m	6.10m	6.71m
> 176.78m	6.71m	7.31m
> 190.50m	7.31m	7.92m

Regulations.—All ships should be familiar with the Maritime Regulations issued by the Panama Canal Authority. These regulations can be accessed from the Panama Canal Authority (ACP) home page given earlier in this section. Vessels should also be familiar with the Notices to Shipping section from the Panama Canal Authority (ACP) home page, most notably the Panama Canal Harbor Operations Requirements and the Panama Canal Vessel Requirements, accessed from the Panama Ca-

nal Authority (ACP) home page. Vessels should consult these regulations prior to transiting. These regulations apply to all navigable waters in the canal E of a line passing through Buoy No. 1 and Buoy No. 2 and San Jose Rock

All vessels, whether new or newly modified, intending to transit the canal for the first time, that are greater in length than 274.3m, are subject to the requirements of inspection, prior review, and approval of vessel plans. Any vessels in this category that do not receive advance approval or do not comply with these requirements may be denied transit.

All vessels greater than 300 grt or over 20m in length must be equipped with an Automatic Identification System (AIS) transponder that meets the standards set by the International Maritime Organization. Any vessels without this equipment must rent portable AIS units from the Panama Canal Authority.

Masters of all vessels should familiarize themselves with all the quarantine regulations and requirements for both the Panama Canal and the ports of Colon and Panama in the Republic of Panama.

All vessels arriving in canal waters shall be granted free or provisional pratique after being inspected by the Canal Authority. Upon special request, the Canal Authority may grant pratique by radio to a vessel upon the basis of information received prior to arrival, provided the entry of the vessel will not result in the introduction, transmission, or spread of any communicable diseases.

The discharge overboard of any ballast or other waste is strictly prohibited anywhere in canal waters.

The items of information listed in the following table titled **Panama Canal—Advance Reporting Required Information** shall be provided to the Traffic Management Unit not less than 96 hours in advance of arrival at the canal (or earlier if radio communication is practicable at an earlier time), unless this information has been previously communicated to the canal authorities by other means. Symbols of the phonetic alphabet shall be used to identify each item. The word "NEGAT" shall be used after the items that can be answered "no," "none," or "not applicable."

Panama Canal—Advance Reporting Required Information	
Designator	Information
ALFA	The Panama Canal Identification Number of the vessel.
BRAVO	Estimated date and time of arrival, port of arrival and request for canal transit if desired.
CHARLIE	Estimated draft upon arrival as well as for transit, if the vessel is scheduled for loading or bunkering before transit. Draft to be given in meters and decimeters, fore and aft, in TFW (Tropical Fresh Water).
DELTA	Any changes in the vessel's name, country of registry, structure or use of tanks that have occurred since the vessel last transited the Panama Canal.
ECHO	Will the vessel dock at Balboa or Cristobal? What is the reason for docking? If it is for cargo operations, fuel or water, give the tonnage involved in each case. Is there any other reason the vessel will not be ready to transit upon arrival? If so, for what reason?
FOXTROT	The nature and tonnage of any deck cargo.

Panama Canal—Advance Reporting Required Information	
Designator	Information
GOLF	<p>If the vessel is carrying any explosives or dangerous cargoes in bulk, state the following:</p> <ol style="list-style-type: none"> 1. Correct technical name. 2. Quantity (in metric tons). 3. United Nations classification number. 4. International Maritime Organization class and division (including compatibility group only for explosives). 5. The stowage of each product. 6. Flashpoint of each product. 7. Use of inert gas in cargo or cargo slop tanks. Tankers claiming to be gas-free shall report the following statement: "cargo tanks including cargo slop tanks are safe for hot work and safe for entry." 8. Last cargo of empty tanks not gas-free. If the vessel is a tanker in ballast condition and not gas-free, it shall state the following information about the previously carried cargo: <ol style="list-style-type: none"> i. Technical name. ii. United Nations classification number. iii. International Maritime Organization class and division. <p>Tankers reporting GOLF NEGAT shall, in addition, state the technical names of non-dangerous cargoes carried.</p>
HOTEL	<p>If the vessel is carrying any packaged dangerous goods other than explosives, and if so, state the International Maritime Organization class and division and the total quantity in long tons within each class.</p>
INDIA	<p>Quarantine and immigration information:</p> <ol style="list-style-type: none"> 1. Is radio pratique desired? 2. State the ports at which the vessel has called within 15 days of preceding its arrival at the canal. 3. State all cases of communicable disease aboard and the nature of the disease or diseases, if known. 4. The number of deaths which have occurred since departure from the last port and the cause of each death, if known. 5. The number of passengers disembarking and their port of disembarkation. 6. The number and ports of origin of any stowaways and a brief description of the identity papers of each stowaway. 7. The number, kind and country of origin of any animals aboard. Are any animals to be landed? 8. The country of origin of all meat, whether carried as cargo or as ship's stores. 9. Has the vessel called at a port in any country infected with foot-and-mouth disease or rinderpest during its present voyage, in accordance with the list issued periodically by the World Health Organization? 10. Specify whether the vessel has a valid deratting certificate or a deratting exemption certificate issued within 180 days prior to arrival.

All vessels must declare all cargo being carried on board at least 96 hours in advance of arrival. Vessels that arrive from ports that are less than 96 hours away must submit revisions to their original cargo declarations if necessary. Exceptions to this requirement are, as follows:

1. Bins (standard size open top containers) or any other receptacles (not containers) that are carried on deck to store equipment that is not welded or spot welded. Any information regarding these items must be disclosed to the Canal Authority boarding officers upon arrival.

2. Vessels carrying radioactive fissionable material classified by the International Maritime Organization (IMO) as Class 7— Schedule 13 shall provide a 30-day advance notification to the authorities.

3. Vessels carrying dangerous cargo, other than radioactive material, shall report 48 hours in advance of canal transit to confirm that all cargo alarms, safety, and shut down devices have been tested and are in good working order.

The cargo and other pre-arrival information to visit or transit the canal may be submitted through the Electronic Data Collection Systems (EDCS), by way of the EDCS web site. For more information, refer to the EDCS Technical Requirements at the following web site:

EDCS Technical Requirements

<http://www.pancanal.com/eng/maritime/edcs/index.html>

Panama Canal Authority boarding officers will verify cargo information submitted in the pre-arrival notification and any discrepancies will be reported. Failure to submit accurate and timely information or to resolve any discrepancies may result in transit delays, escorting of the vessel, or additional charges and possible fines.

The Panama Canal authorities may dispatch vessels through the canal in any order and at any time they may see fit. Priority of arrival does not give any vessel the right to pass through the canal ahead of another that may arrive later.

Commercial passenger vessels shall be given preference over other vessels in order of transit provided they have booked their transit prior to arrival. The exception to this would be if such preference would impair the safe and efficient operation of the canal.

All vessels underway in the canal will maintain a continuous watch on VHF channel 13. Bridge to bridge communications between vessels in the canal will be carried out on VHF channel 13 as well.

Contact Information.—The various agencies of the Panama Canal authorities can be contacted as listed in the accompanying table titled **Panama Canal—Contact Information**.

If any of the following events occur during canal transit, a report must be made to the Traffic Management Unit:

1. Any accident or other incident which may cause delay or require assistance.
2. Discovery of any defect that may interfere with safe navigation.
3. Anchoring or mooring when visibility falls below 305m.

Panama Canal—Contact Information	
Panama Canal Pilots	
VHF	VHF channels 12, 13, and 16
Telephone	507-228-4015
	507-314-1026
Facsimile	507-228-4125
Panama Canal Authority and Marine Bureau	
VHF	VHF channels 12, 13, and 16
Telephone	507-272-4500
Facsimile	507-272-3892
Traffic Management Unit	
Telephone	507-272-4201
Facsimile	507-272-3976
E-mail	eta@pancanal.com
Transit Operations Division	
Telephone	507-272-4211
Facsimile	507-272-7688
Dangerous Cargo Information	
Telephone	507-272-4219
	507-272-4213

Panama Canal—Contact Information	
Facsimile	507-272-3015
E-mail	opts@pancanal.com

Anchorage.—There is a general anchorage area for merchant vessels located S and SE of Flamenco Island. It is marked by lighted buoys and is best seen on the chart.

An extension of the general anchorage area for merchant vessels, best seen on the chart, is unmarked and located S of the general area and is bounded by lines joining the following positions:

- 8°51'45"N, 79°32'21"W.
- 8°51'45"N, 79°27'52"W.
- 8°49'55"N, 79°27'52"W.
- 8°49'55"N, 79°32'21"W.

An area designated for vessels loaded with dangerous or explosive cargo is located W of the general anchorage area. This area is marked by lighted buoys, best seen on the chart, and is bounded by lines joining the following positions:

- 8°51'45"N, 79°32'42"W.
- 8°52'32"N, 79°32'21"W.
- 8°52'43"N, 79°31'30"W.
- 8°51'45"N, 79°29'50"W.

Anchorage for small craft is designated inside an area delimited by a point lying 183m offshore from Flamenco Island and the Panama Canal Channel Buoy No. 6.

Anchorage is prohibited within 335m of either side of the dredged entrance channel leading to the canal, SW of Flamenco Island.

In case of emergencies, three designated beaching areas are established throughout the channel leading to Miraflores Locks and are best shown on the chart.

Caution.—A spoil ground is located close W of the general anchorage expansion area best seen on the chart. Numerous caution areas and submarine cables are all best seen on the chart.

Submarine cable cross the channel on the Buena Vista Reach, between the Frijoles Turn and the Orchid Turn, close E of Beaching Area 6.

It is reported (2012) that the light strength for lighted buoys marking dredging operations found throughout the canal is weak; a sharp lookout should be maintained for identification of these hazards between sunset and sunrise.

Balboa (8°57'N., 79°34'W.)

World Port Index No. 15410

9.11 Balboa is situated on the E side of the bay at the entrance to the Panama Canal, on the Pacific coast. It is the second largest port terminal in Panama, following the Port of Cristobal. Balboa Heights consists principally of administration buildings and it presides as the seat of the Panama Canal Commission. Balboa also provides residences for employees, and other installations used in conjunction with the operation of the canal.

Balboa is configured with the main portion of working cargo piers on the E side of the canal approach channel. The port can



Balboa Terminal



Rodman Harbor Piers



Balboa Reach from S

accommodate all types of cargo. Directly across the channel are the piers belonging to the old Rodman Naval Base. These are now simply identified as the Rodman Piers by the Panama Canal Authority and accommodate bunkering and stores operations, as well as serving as berths for visiting military vessels. A new container terminal being constructed NW of the Rodman Piers has commenced operations within the last year but is still being expanded.

Balboa Home Page

http://www.ppc.com.pa

Winds—Weather.—Favorable weather conditions usually prevail from December through April, which is the dry season.

Tides—Currents.—Tides are semidiurnal. The mean spring range is 5.0m and the mean neap range is 2.7m. Occasional northerlies and strong gusts reduce the tidal range, but are not severe enough to interfere with navigation.

Tidal currents of up to 2.5 knots are reported to set across the pier heads.

Depths—Limitations.—The approach channel to the

Panama Canal is the only access into the port of Balboa, thus any movement in or out of the port is subject to the same rules and regulations as those that govern passage through the canal. The Bridge of the Americas crosses the approach channel close S of the port (see paragraph 9.10 for discussion of height and draft restrictions and other details concerning the approach channel).

Vessels having a draft exceeding 11.7m are not handled from 2 hours 30 minutes before LW until 2 hours after LW.

Refer to the accompanying table titled **Balboa—Berthing Facilities** for specific information regarding the berthing facilities at Balboa and the Rodman Pier area.

Pilotage.—Pilotage is compulsory, even if not transiting the canal. See the pilotage section in paragraph 9.10 for details and contact information.

Contact Information.—The port authority for Balboa can be contacted, as follows:

1. VHF: VHF channel 12
2. Telephone: 507-207-5100
3. Facsimile: 507-232-5583
4. E-mail: blb-marineserv@ppc.com.pa

Balboa—Berthing Facilities					
Dock/Berth	Maximum		Depth alongside (MLWS)	Pier length	Remarks
	LOA	Draft (MLWS)			
Port of Balboa—E side of Panama Canal Approach Channel					
6AB	182.92m	9.64m	10.0m	226.21m	Petroleum products/liquid bulk/ro-ro/passenger (See Notes 1 and 2)
7ABC	259.14m	10.0m	10.3m	320.12m	Petroleum products/liquid bulk/ro-ro/passenger (See Notes 2, 3, and 4)
7D		5.0m	5.3m		Petroleum products/liquid bulk/ro-ro/passenger (See Notes 2, 3, and 4)
8	161.59m	5.0m	5.3m	143.29m	For use with Drydock No. 1
13	67.07m	8.7m	9.0m	85.37m	Repairs

Balboa—Berthing Facilities					
Dock/Berth	Maximum		Depth alongside (MLWS)	Pier length	Remarks
	LOA	Draft (MLWS)			
14AB	290.85m	12.5m	12.8m	321.22m	Containers/general cargo
15AB	243.90m	12.7m	13.0m	274.32m	Containers/general cargo
16	304.88m	13.2m	13.5m	335.37m	Containers/general cargo
17	304.88m	14.3m	14.6m	335.37m	Containers/general cargo
18	304.88m	13.9m	14.2m	335.37m	Containers/general cargo
Rodman Piers and the PSA Panama International Container Terminal					
Pier 1 North (C)	168m	11.5m	11.8m	215m	Fuel loading and discharging stores (See Notes 5 and 7)
Pier 1 North (D)	217m	11.5m	11.8m	215m	Fuel loading and discharging stores (See Notes 5 and 7)
Pier 1 South (AB)	236m	11.9m	12.19m	215m	Fuel loading and discharging stores (See Notes 5 and 7)
Pier 2 North (CD)	230m	11.9m	12.19m	215m	Fuel loading and discharging stores (See Notes 6 and 7)
Pier 2 South (A)	168m	10.4m	10.67m	215m	Fuel loading and discharging stores (See Notes 6 and 7)
Pier 2 South (B)	229m	10.4m	10.67m	215m	Fuel loading and discharging stores (See Notes 6 and 7)
Pier 3 North	300m	—	—	215m	Used by Panamanian Coast Guard and other small craft (See Note 8)
Pier 3 South	300m	—	—	215m	Unusable due to wreck blocking access
PSA Panama International Terminal—Berth 1	330m	14.5m	—	—	Containers/ro-ro (See Note 9)
NOTES:					
1. When alongside in this berth, mooring lines need to be kept tight, especially during ebb tide, as this will prevent surging of the vessel from ship traffic passing close W of the pier.					
2. Approaches to all berths at Dock 6 and Dock 7 are restricted to a maximum draft of 8.7m					
3. Drydock No. 1 is located between Wharf 7 and Wharf 8 and can accommodate vessels up to 60,000 dwt. If there are vessels moored alongside both Wharf 7 and Wharf 8, any movement by vessels in or out of the drydock will be prohibited.					
4. The port captain will need to review and authorize any mooring of vessels at Wharf 7 or Wharf 8 that require tug assistance if there is already another vessel moored at either of these berths. Mooring for vessels with a combined beam of 33.5m at both wharfs at the same time will only be authorized on a case-by-case basis.					
5. The approach to Pier 1 is dredged to 12.19m.					
6. The approach to Pier 2 is dredged to 10.98m.					
7. It has been reported (2011) that depths are greater than charted in and around these piers.					
8. Fuel loading not allowed at this pier.					
9. This is a new container terminal situated NW of the Rodman Piers and has commenced operations with the arrival of the first vessel in 2012 but is still under construction so more berthing will be available in the future. Exact details and estimated time of completion are unknown.					

Anchorage.—In case of emergencies, there are three designated beaching areas established throughout the channel leading to Miraflores Locks and are best shown on the chart. Designated anchorage areas for Balboa are the same as they are for awaiting entry to the channel for transit of the Panama Canal. See paragraph 9.10 for details.

Caution.—It has been reported (2013) that a large wreck with superstructure showing at LW lies alongside the center of Rodman Pier 3 South, blocking access.

Mariners are advised to use caution when anchoring due to numerous underwater cables and pipelines.

The Panama Canal to the Golfo de San Miguel

9.12 Puerto de Panama (8°57'N., 79°32'W.) (World Port Index No. 15390) lies between Punta Paitilla and the SE Bastion of the old fortifications of Ciudad de Panama, 3.3 miles N of Flamenco Rock. The port is shallow with a greatest depth of 2.7m between the entrance points, shoaling to 2.4m and less within the harbor. Depths over the coastal bank fronting the harbor increase gradually to 9.1m about 3 miles SE of the entrance.

A number of finger piers extend E from the coastline, with alongside berthing available for small craft; these piers dry at LW.

Very few vessels call at this port and pilotage is not available. Entry should only be attempted by those with local knowledge. The port can be contacted on VHF channels 15, 16, and 17.

Rocas Danaide (8°56'N., 79°30'W.), the outermost dangers of many which lie within the limits of the shorebank, have a least depth of 3.3m and lie 2.5 miles ESE of SE Bastion.

The flood current sets NW and the ebb sets S. The rate varies from 0.5 knot to 1.5 knots with the ebb being the stronger current.

Anchorage can be taken, in a depth of 4.6m, about 1 mile E of NE Bastion or, in depths of 9 to 11m, NE of Perico Island (8°55'N., 79°32'W.).

The piers, which lie around the perimeter of the harbor, all dry at LW and are available only to small craft and lighters.

The coast between Punta Paitilla and Isla Chepillo, 23 miles E, consists of mangrove-covered shore fronted by drying flats which extend up to 1.5 miles offshore in places.

Isla Chepillo (8°57'N., 79°08'W.), which lies off the entrance of the Rio Chepo, is low at its N end rising gradually toward its center. Depths are ample to approach within 1 mile of the S end of this island. A light is shown from the summit of the island.

9.13 The Rio Chepo (8°59'N., 79°07'W.), with depths of less than 2.1m, is entered 2.8 miles NNE of Isla Chepillo. Only small craft with local knowledge can enter the river.

The coast between the Rio Chepo and the Rio Chiman, 32 miles SE, is low and covered with mangroves. It is interrupted by many shallow streams and rivers.

Punta de Manglares (Punta Mangle) (8°49'N., 78°51'W.), 19 miles SE of the Rio Chepo, is bordered by drying flats which extend up to 3 miles offshore.

The shore bank in this vicinity extends up to 10 miles W and 6 miles S of the point. North and NE of the point, the land rises to considerable elevations. Pico Columna, 1,055m high, rises 12 miles NE of the point and Thumb Peak, 387m high, rises 11 miles NNW of the point. Both peaks are conspicuous from seaward.

The **Rio Chiman** (8°41'N., 78°39'W.), which almost dries, is marked by wooded bluffs on either side. A small village stands on the E bank 1 mile within the entrance.

Isla El Pelado (Islote Pelado) (8°38'N., 78°42'W.) lies 5 miles SW of the mouth of the Rio Chiman. The island is marked by a light.

9.14 Punta Brujas (8°35'N., 78°32'W.), lying 22 miles SE of Punta de Manglares, is the extremity of a low, rocky projec-

tion and forms the SW entrance point of the Rio Trinidad. A small conspicuous rock lies on the edge of the mud flats 3.8 miles NNW of the point. A light is shown from Punta Brujas.

Punta Gorda (8°28'N., 78°30'W.), bold and wooded, lies 7.5 miles S of Punta Brujas. The shorebank, which extends up to 2.5 miles SW of the latter point, gradually decreases in width to lie within 0.3 mile offshore, abeam of Punta Gorda.

Punta Pedernales (Otro Lado) (8°26'N., 78°29'W.) lies 3 miles SE of Punta Gorda.

Punta Brava (8°21'N., 78°25'W.), located 9 miles SSE of Punta Gorda, is the N entrance point of Golfo de San Miguel, and is fringed by foul ground and off-lying rocks on which the sea breaks heavily. The shoal bank, as defined by the 10m curve, extends 9 miles SW from Punta Brava. Banco del Buey, a heavily breaking shoal, with a least depth of 0.9m, lies on the inner half of this shoal.

Golfo de San Miguel

9.15 Golfo de San Miguel (8°15'N., 78°23'W.), entered between Punta Brava and Punta Garachine, 14.5 miles S, extends 25 miles NE. The E and W entrance points of the gulf are marked by lights shown from Isla Patinito and Islita Batatilla, respectively. The gulf narrows to a width of 6.5 miles about 6 miles NE of the entrance points and gradually narrows to a width of 2 miles about 12 miles farther NE. The channel then turns sharply SE to the head of the gulf which forms the landlocked harbor of Puerto Darien (8°23'N., 78°06'W.), at the junction of the Rio Sabana and the Rio Tuira.

The Rio Tuira is navigable during the rainy season by vessels having a draft of 4.6m or less, as far as El Real, 35 miles SE of Punta Sabana.

The yellow, muddy waters of the gulf are usually marked by swirls due to the discharge from the rivers and the variable currents. During the rainy season, navigation is severely hindered by floating trees.

Punta Garachine (8°06'N., 79°25'W.), the S entrance point of Golfo de San Miguel, is the outer extremity of a high peninsula which projects 2 miles N from the general trend of the coast. The peninsula is steep-to off its NW side. A light is shown 1.3 miles S of Punta Garachine.

Vessels can take anchorage, well-protected in the summer, 0.7 mile E of Punta Garachine, in depths of 11 to 13m.

Roca Trollope (8°07'N., 78°39'W.), with a least depth of 2.7m, lies near the middle of Banco San Jose, 14 miles W of Punta Garachine. Banco San Jose, marked by a lighted buoy, is about 4.5 miles long in a NW and SE direction, and 2 miles wide. Two shallow patches, with depths of 6.5m and 8m, lie in the middle of the entrance channel leading into the gulf, 4.5 miles N of Punta Garachine.

9.16 Ensenada de Garachine (8°10'N., 78°21'W.), entered between Punta Garachine and Punta Patino, 11 miles NE, is mostly shallow and backed by drying flats which extend up to 3 miles offshore at its head. A breaking shoal, with a least depth of 1m, lies 3 to 7 miles NE of Punta Garachine.

Punta Patino (8°15'N., 78°18'W.), a wooded projection, lies 11 miles NE of Punta Garachine.

Punta Barro Colorado (8°27'N., 78°17'W.), a bold and rocky point lying 2.5 miles NE of Punta Patino, can be identi-

fied by a conspicuous red cliff on its W side. A shoal depth of 9m lies 2.5 miles W of the point.

Ensenada Mogul (8°19'N., 78°13'W.), a shallow bay with mangrove-covered shores, lies between Punta Alegre, located 1.5 miles NE of Punta Barro Colorado, and Punta Pinta Jaya (Punta Momosenega), 4.5 miles farther NE.

Isla El Cedro (8°21'N., 78°13'W.), small and densely wooded, lies on the outer edge of the shore bank about 1.5 miles W of Punta Pinta Jaya. The NW side of the islet is steep-to.

Punta Isla Maria (8°24'N., 78°12'W.) lies 4.5 miles N of Punta Pinta Jaya.

9.17 Isla Corozal (8°24'N., 78°11'W.), the northeasternmost islet of a group of several, lies 1 mile S of Punta Isla Maria. East of this islet, the navigable channel narrows to a width of about 1 mile.

Isla San Carlos (Isla Boca Grande) (8°26'N., 78°10'W.), together with Isla El Encanto off its NE side, divides the approach to the head of Golfo de San Miguel into two channels. Boca Grande, the preferred channel, passes W and N of Isla San Carlos and E of Isla El Encanto.

Boca Chica, which passes S of Isla San Carlos, although deep, is narrow and intricate.

Isla Cartagena (8°26'N., 78°08'W.), together with two small islets lying within 0.5 mile S of it, lies in mid-channel off the E side of Isla El Encanto. Deep water lies in the passages to the E and W of these islets. The preferred fairway passes E of these islets. A bank, with a depth of less than 9m, extends about 1 mile into the fairway from the W side of Punta Sabana, 2.5 miles SE of Isla Cartagena.

The preferred anchorage for vessels not proceeding to Puerto Darien, or those awaiting a more favorable current, lies in the fairway N and NE of Isla El Cedro.

Roca Vaguila (8°24'N., 78°06'W.) dries 2.1m and lies about 0.6 mile SSW of Punta Sabana (8°25'N., 78°06'W.).

Depths of 11 to 26m lie in the anchorage, over a width of 1.5 miles, up to 3 miles SE of Isla Cartagena. The depths decrease rapidly to the S of this position. The best anchorage, which has depths of 13 to 18m, lies 0.3 mile offshore abeam of La Palma.

9.18 La Palma (8°24'N., 78°09'W.), a small village situated 2 miles WSW of Punta Sabana, is reached by sailing through the Golfo de San Miguel, passing Punta Alegre to starboard and Punta Buena Vista to port. La Palma is a very small port with one dock used by small craft sailing the Panama/Yaviza (Darien) route with passengers and commodities such as logs, plantains, and vegetables.

Depths—Limitations.—The dock is 39m in length with a width of 16m, allowing vessels with a maximum draft of 3m to use it.

Pilotage.—No pilots are available and local knowledge is recommended.

Contact Information.—There are no fixed hours of operation for the port. Contact is made through VHF channel 16 or by contacting the National Port Authority, as follows:

1. Telephone: 507-501-5106
507-501-5227
2. Facsimile: 507-501-5405
3. E-mail: dpuertos@amp.gob.pa

Caution.—Numerous islets, rocks, and shoals lie within the

shore bank on the N side of the channel between Punta Isla Maria and Punta Buena Vista, 3 miles WSW.

Roca Sombrereta (8°22'N., 78°14'W.), a prominent grass-covered rock and the southwesternmost danger, lies 1.5 miles SSE of Punta Buena Vista.

Ensenada Pena Hueca (8°24'N., 78°19'W.), entered between Punta Buena Vista and Punta San Lorenzo, 9 miles WSW, is mostly shallow and obstructed by drying flats at its head. Several rivers discharge into the bay, but are not generally navigated.

Archipelago de las Perlas

9.19 Archipelago de las Perlas (8°25'N., 79°00'W.) consists of a large number of islands, islets, and numerous rocks covering an extensive area in the NE part of the Gulf of Panama. The group extends 30 miles in a NW and SE direction and has a width of about 20 miles. The larger islands are high, heavily wooded, and fairly steep-to.

There are no commercial ports, but well-sheltered anchorage can be taken leeward of some of the islands.

Isla Pacheca (8°40'N., 79°03'W.), the N island of the group, although small, rises to an elevation of 61m. A shoal bank extends 0.5 mile NW and 1.5 miles SE from the island. Isla Pachequilla, and Isla Bartolome, similar islets, lie near the outer edges of this bank to the NW and SE, respectively. A light is shown from the NE point of Isla Pacheca.

Isla Saboga (8°38'N., 79°04'W.), 1.8 miles S of Isla Pacheca and 68m high, has a large village with a church on its E side. A shoal bank, with several islets and rocks on it, extends 1.5 miles N from the islet. Isla Chitre, a small, high islet, lies on the shoal bank which extends 2 miles S from Isla Saboga. Isla Santa Catalina, awash at extreme HW, lies 1.8 miles S of Isla Chitre.

9.20 Isla Contadora (8°38'N., 79°02'W.), high and of irregular shape, lies 0.3 mile E of Isla Saboga.

An anchorage area, centered in position 8°38'N 79°03'W, lies in the center of the triangle formed by Isla Saboga and Isla Contadora and the islands and the shoals to the N. The anchorage is about 1.5 miles long and 0.8 mile wide. Good well-protected anchorage can be taken, in depths of 9 to 14m, mud, about 0.5 mile N of the village on the E side of Isla Saboga. A considerable current is usually experienced.

Two preferred entrance channels lead into the anchorage. Canal Pacheca, 0.2 mile wide at its narrowest part with a least mid-channel depth of 10m, is entered S of Isla Pacheca. Canal Contadora (Canal Tolome), 0.3 mile wide, is entered close N of Isla Contadora and has a mid-channel depth of 11m. Tidal currents in this channel are strong.

Canal Saboga, a 0.2 mile wide channel leading into the anchorage from the S, has a least depth of 5.8m, but is not recommended except for small craft with local knowledge.

Directions.—If entering by Canal Pacheca from the N, pass about 0.5 mile W of Isla Pachequilla and head S until the center of Isla Bartolome bears 116°. Steer on this bearing until the E extremity of Isla Saboga bears 180°, then alter course to this bearing which will lead to the anchorage.

If entering by Canal Contadora, pass about 1.5 miles E of Isla Bartolome on a S heading until the church spire on the E

side of Isla Saboga bears 244°, then alter course to this heading, which leads to the anchorage. The currents in this channel are strong and must be allowed for.

9.21 Isla Chapera (8°35'N., 79°02'W.), 2 miles S of Isla Contadora, lies at the outer end of a shoal bank which extends 4.5 miles NW and then 5.5 miles N from the NW extremity of Isla del Rey. Numerous islands, islets, and rocks lie within the limits of this bank, which has a width of about 5 miles in its central part. The channel between this group of islands and the previously-described group to the N should be attempted only by vessels with local knowledge because of the strong currents and the shallow water on both sides.

Anchorage, with good holding ground, mud or sand, can be taken by all classes of vessels, in depths of 11 to 18m, in the vicinity of Isla Caracoles (8°30'N., 78°57'W.). Care should be taken to avoid the shoal patches which lie within 2.5 miles NNW of this islet.

Anchorage, with good holding ground, is also available 3 miles E of Isla Chapera, in a depth of 24m.

Isla del Rey (8°23'N., 78°54'W.), the largest island in the archipelago, is 15 miles long, 7.5 miles wide, and topped by several high peaks. Cerro del Chiquero, the highest peak, rises to an elevation of 223m in the central part of the island. Numerous islets and shoal patches lie up to 4 miles off the W coast of the island and should be passed at a prudent distance.

Punta Cocos (8°13'N., 78°54'W.), the S extremity of the island, is the outer end of a remarkable promontory which extends 4 miles S from the general line of the coast. A small islet lies on the shoal bank which extends about 0.5 mile farther S.

A number of islands lie off the E coast of Isla del Rey, but they are fairly steep-to and can safely be approached to within 0.5 mile in most instances.

Bahia San Telmo (8°16'N., 78°53'W.), entered E of Punta Cocos, is 4 miles wide between the entrance points and recedes the same distance to the NW. The dangers in the bay lie within 0.5 mile of the shore with the exception of a detached shoal patch, with a least depth of 1.8m, which lies about 1 mile E of Punta Cocos and an 8.5m patch lying 2 miles NE of the same point. Elsewhere, the bay has depths of 11 to 24m.

Safe anchorage can be taken as convenient anywhere within the bay. Southerly winds raise a heavy swell at times, but the sandy bottom provides good holding ground. A strong current sets across the entrance, but diminishes N of Isla San Telmo, the E entrance point.

9.22 Isla Galera (8°12'N., 78°47'W.), 42m high, lies on a shoal bank about 1.3 miles in extent, 7.5 miles ESE of Punta Cocos. A sunken rock, which breaks, lies 0.5 mile W of the S extremity of the island.

A reef, with three above-water rocks on its outer part, extends 1 mile SE from the island. A shoal, with a depth of 15.5m, lies 7.8 miles SW of the island and a shoal, with a depth of 16m, lies 7 miles WSW of the same island. Vessels should not transit in depths of less than 20m when passing this islet.

Isla Pedro Gonzalez (8°24'N., 79°06'W.), lying 7 miles W of Isla del Rey, is high, irregularly shaped, and separated from the NW side of Isla del Rey by a broad, deep channel. Islas Senora and Senorita, two small islets, lie on a shoal bank 0.8 mile

N of the NW part of Isla Pedro Gonzalez.

North Passage, which lies between these islets and the islets to the NE, is deep and clear with no known dangers.

Ensenada Honda (8°25'N., 79°06'W.), a small, irregular bay which provides well protected anchorage, in depths of 9 to 13m, indents the N coast of Isla Pedro Gonzalez about 1 mile SE of Isla Senora. The outer half of the bay has depths of 9 to 15m. Depths in the S half of the bay shoal rapidly. Currents within the bay are negligible, but a considerable set has been experienced N of the entrance. The flood sets to the N; a strong ebb sets to the S.

West Passage, which is about 3 miles wide between the fringing dangers, lies between Isla Pedro Gonzalez and Isla de San Jose. Bajo del Medio, a rock awash at LW, lies 1.8 miles SSW of the SE point of Isla Pedro Gonzalez. Niagara Rock, with a least depth of 2.7m, lies 2 miles W of Bajo del Medio. The channel S of these dangers is deep and clear, but the N channel should be avoided.

9.23 Isla de San Jose (8°16'N., 79°07'W.), a large irregularly-shaped island, is indented by a deep bay on its SE side and a small shallow bay on its W side. Ensenada Playa Grande, the E bay, has ample depths for anchoring, but a violent swell is usually experienced.

The island is steep-to within 0.5 mile of the shore on all except its SE side. Several small islets and rocks, on which the sea breaks heavily, lie up to 1 mile offshore along this part of the coast, which should be avoided. A light is shown from the SW side of the island.

South Passage, leading to Bahia del Rey to the N, passes E of Isla de San Jose. This channel, which is about 3.5 miles wide between the fringing dangers, has depths of 14.5 to 51m in its central part.

Bahia del Rey (8°21'N., 79°08'W.), which lies between Isla del Rey on the E side and Islas Pedro Gonzalez and San Jose to the W, provides anchorage for all classes of vessels with good holding ground, mud. A choppy sea develops during S winds, but winds from other quarters have little effect.

Punta Garachine to Bahia Ardita

9.24 The coast between Punta Garachine and Bahia Pina, 36 miles SSE, is bold, high, and wooded.

Punta Escarpada (8°05'N., 78°26'W.) lies 2 miles SW of Punta Garachine. Islita Gajuala, a 0.9m high rock, lies on the outer part of a reef which extends 0.6 mile SW from the point.

Cerro Sapo (7°59'N., 78°22'W.), a sharp, conical peak, rises to a height of 1,409m about 8 miles SE of Punta Escarpada.

Punta Caracoles (7°41'N., 78°18'W.), a bold, rocky point lying 25 miles SSE of Punta Escarpada, has a small bay on its N side. Good anchorage is provided for boats over a bottom of mud and sand.

9.25 Bahia Pina (7°33'N., 78°12'W.) is entered E of Punta Pina, which lies 9 miles SE of Punta Caracoles. The bay extends 2.3 miles N and provides one of the best anchorages to be found in the vicinity. The sides of the bay are high and rocky, although, its head is low and sandy. Depths range from 36m in the entrance to a depth of 9.1m lying 0.3 mile from its head.

A light is shown from a white metal tower situated on the tip

of Punta Pina.

Islas Centinelas (7°34'N., 78°13'W.), two small islets which are low and tree-covered, lie 1 mile SW and 1.3 miles WNW of Punta Pina.

Anchorage can be taken as convenient in any part of the bay over a bottom of sand.

During the wet season, a considerable swell is raised by the heavy squalls. At such times, vessels should anchor more to the

W side of the bay, in a depth of 22m.

A light is shown from the SW extremity of Punta Pina.

Isla Mono (7°13'N., 77°53'W.), 26 miles SE of Bahia Pina, lies 0.5 mile offshore in the vicinity of the boundary between Panama and Colombia.

The intervening coast between Bahia Pina and Isla Mono is high, rugged, heavily wooded, and steep-to within 0.5 mile of the shore.

Spanish

SPANISH	English	SPANISH	English
A		F	
aduana	customhouse	fanal.....	light tower
agua	water	faro	lighthouse
amarillo	yellow	fondeadero.....	anchorage
amarra.....	anchorage, mooring	fortaleza, fuerte	fort
arrecife.....	reef	freo	strait
arroyo	brook, rivulet	G	
atalaya	lookout station, signal staff	golfo	gulf
B		gran, grande.....	great
bahia	bay	gris.....	gray
baixo, baxo	shoal, bank	H	
baja, bajo	low, shoal	hondo, hondura	deep
baliza	beacon	I	
banco	bank	isla	island
barlovento.....	windward	isleta	islet
barra.....	bar	L	
barranca	ravine, precipice	laja.....	lake
blanco	white	lago.....	flat rock
boca	mouth, entrance	largo	long
C		loma.....	hilltop
cabeza	shoal head	M	
cabezo.....	summit of hill	medano.....	sand bank
cabo	cape	meridional	southern
cala	creek, small bay	mesa	tableland
caleta	small bay, cove	monte.....	mountain
canal	channel	muelle.....	mole, landing wharf
casa.....	house	N	
castillo	castle	negro	black
cayo	cay	norte	north
cerro.....	hill	O	
chico	small	oeste	west
ciénaga.....	marsh	P	
colina.....	hill	pardo	gray
cuenca.....	river bed	paso, passa.....	pass
D		penon.....	rocky mountain
darsena.....	dock, harbor basin	pico.....	peak
desembarcadero.....	landing	piedra.....	stone, rock
dique	dock	playa, praia	beach
dique de carena.....	drydock	pueblo.....	town, village
dique seco.....	drydock, basin	puente.....	wharf, dock
E		puerto	port, harbor
embocadero	mouth, opening	punta.....	point
ensenada	bay, cove	Q	
escollo	rock	quebrado.....	pass
estancia.....	ranch, farm	quebradero.....	breaker
este.....	east		
estero	lagoon, creek		
estrecho	strait, narrow passage		
estuaria	wide river mouth		

SPANISH

English

R

rada.....road, roadstead
 rama.....branch
 restinga.....reef
 ribera.....bank
 rio.....river
 roca.....rock
 rojo.....red

S

saco.....bay
 salina.....salt works
 salto.....cliff

SPANISH

English

seno.....bay
 septentrional.....northern
 sierra.....mountain chain
 silla.....saddle
 sotavento.....leeward
 sur.....south

T

tetas.....paps
 torre.....tower

V

verde.....green
 vigia.....lookout

