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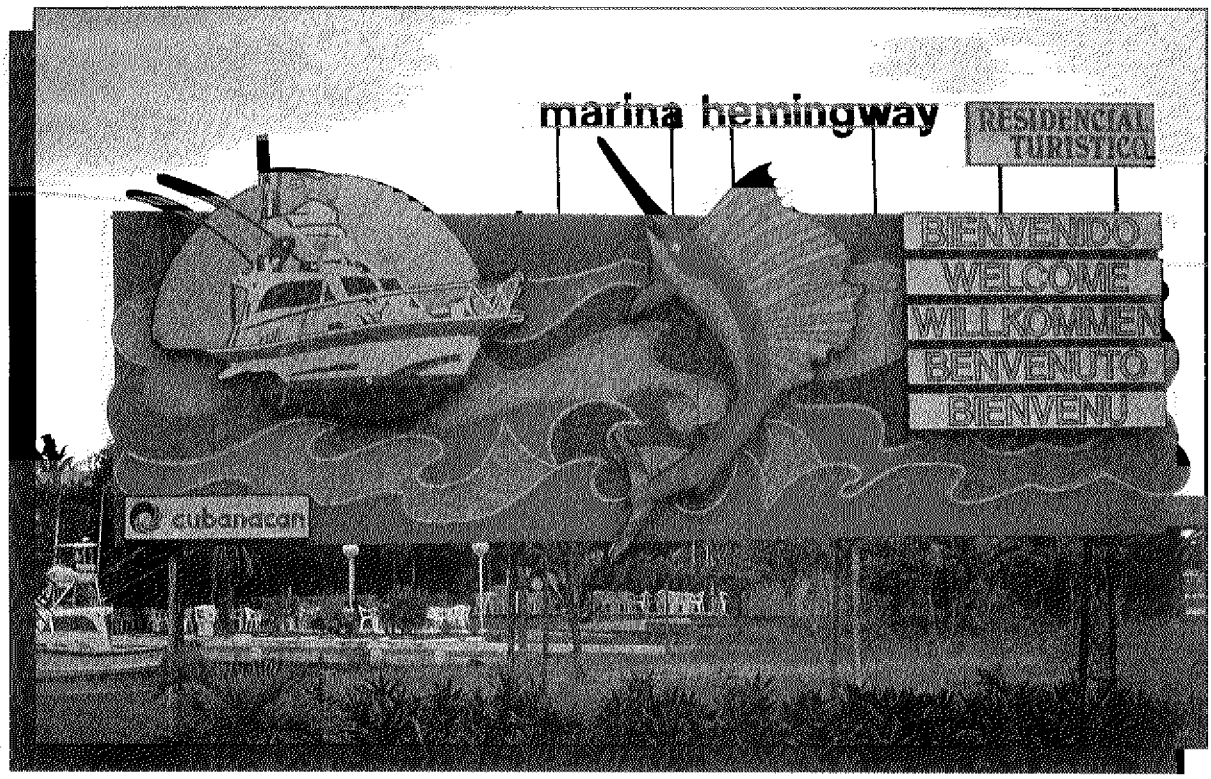
The Potential Impact on Florida-Based Marina and Boating Industries of a Post-Embargo Cuba: An Analysis of Geographic, Physical, Policy and Industry Trends

JAMES C. CATO — EDITOR



FLORIDA SEA GRANT COLLEGE PROGRAM

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The Boating Geography of Cuba and Its Recreational Potentials

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PREFACE

In June, Florida Sea Grant and the University of Florida's Center for Latin American Studies jointly sponsored a workshop called, "Past, Present and Future Recreational Boating and Marine Relations with Cuba: The Florida Perspective."

The workshop confirmed what many Floridians already suspected—namely, that our state and the island nation of Cuba have many traditional links that bring us together despite political and ideological differences. Of course, one of the most important of these linkages is the sea that both unites and divides us from each other.

Throughout the workshop, experts spoke of how this stretch of blue water may some day be a pathway once more by which Cubans and Americans can easily enjoy the best of what each of our countries has to offer. Recent headlines indicate that concerns about future travel between the US and Cuba are a timely topic for discussion.[1] From the perspective of the Florida-based marina and recreational boating industry representatives, our workshop showed that these concerns can be viewed either as problems or opportunities.

One month after our workshop, Terry McCoy, Gustavo Antonini, Max Sheppard and I traveled to Cuba to visit with many scientists in the Cuban Academia de Ciencias, Instituto de Hydrografia, Instituto de Oceanologia, five marinas, and a number of other locations of marine and coastal interest. Throughout our visit we engaged in frank, full and useful exchanges with Cuban scientists and those in charge. We made scientific presentations and, in return, received valuable information about Cuban science programs and perspectives on recreational boating and the importance it holds for their economic future.

The information in this Technical Paper addresses the future of the US-Cuban marina and recreational boating industries from the geographic, physical, policy making and economic perspectives for a post-embargo Cuba. Each individual paper builds on the presentations made at the workshop, the information obtained in the subsequent trip to Cuba and presents in detailed form information which we hope is useful to all readers.

JAMES C. CATO

[1] For more information about the workshop presentations, write to Florida Sea Grant, University of Florida, PO Box 110409, Gainesville, FL 32611-0409, or call (904) 392-2801, and ask for a copy of the Summer 1994 issue of FATHOM Magazine. This special issue is devoted exclusively to Cuban-US boating and marina issues and is filled with articles recapping the speakers presentations.

The Boating Geography of Cuba and Its Recreational Potentials

Gustavo A. Antonini [1, 2]

Abstract

This paper describes the boating geography of Cuba. The evolution of recreational boating in pre-Revolutionary Cuba is traced. Physical and infrastructural conditions that determine the island's marine recreational geography are discussed. Nine boating regions are identified and described, in terms of area, coastal topography, shoreline, water depth, currents, entrance channels, anchorages, shore facilities, boating activities, and hazards to navigation. Boating facilities in Cuba are compared with other Caribbean countries and south Florida, in terms of growth over the past 40 years. Development trends in marinas and yacht clubs, boat yards, and other boating facilities, as charter boating, are analyzed. Finally, the dilemmas and opportunities facing boaters in search of discovering Cuba are highlighted.

Introduction

Cuba has a special allure -- it is a subtropical island, unspoiled and largely undeveloped. This is appealing to a growing number of recreational boaters, disenchanted with increased regulation of U.S. coastal waters and the crowded condition of Caribbean cruising locales. To many Florida boaters, Cuba's geographical location, one-day's sail from our shores, gives the island a special appeal -- it is a tropical destination just over the horizon (Figure 1).

This paper describes the boating geography of Cuba. The evolution of recreational boating in pre-Revolutionary Cuba is traced. Physical and infrastructural conditions that determine the island's marine recreational geography are discussed. Nine boating regions are identified and described, in terms of area, coastal topography, shoreline, water depth, currents, entrance channels, anchorages, shore facilities, boating activities, and hazards to navigation. Boating facilities in Cuba are compared with other Caribbean countries and south Florida, in terms of growth over the past 40 years. Development trends in marinas and yacht clubs, boat yards, and other boating facilities, as charter boating, are analyzed. Finally, the dilemmas and opportunities facing boaters in search of discovering Cuba are highlighted.

Boating Before the Revolution[3]

Yacht racing on the island can be traced to 1930 when "Gidge" Gandy of St. Petersburg and Rafael Posso of Havana organized a race that became the classic St. Petersburg to Havana Race, the forerunner of the Southern Ocean Racing Circuit (SORC), and an annual ocean sailing event for over 30 years (Hewitt,

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[2]A number of individuals provided assistance which made this study possible. Kiko Villalón (Marine Concepts, Ft. Myers) examined the environmental site analysis based on his extensive sailing experiences in Cuba, and Jorge Foyo (Instituto de Oceanología, Havana) reviewed current shore facilities. Hector René Ledesma and Paul Box, Geography graduate students, prepared the camera-ready maps and tables.

[3]Arturo Sordo, Mario Bustamante, Sergio Gallo and Kiko Villalón gave oral accounts of sailing and recreational boating history during this period.

1985).[4] Cuban boaters, as Gómez Mena, Hernán Dorena, Vidaña, Rasco, Inclán, Gallo, Sordo, and the Bustamante brothers, promoted offshore yacht racing with their boats, *Galocamm, Polux, Bicho Malo, Bellatrix*, and the famed *Criollo* and *Ciclón*.[5] The Club Náutico Internacional de la Habana (Photo 1) served as the catalyzing institution, which sponsored boating and sailing events. In time, power boat cruises and races between Miami and Havana were organized (Photo 2), as boating became more popular on the island, and between Florida and Cuba. Boating in Cuba during the pre-1950 period was, to a large degree, a pastime of upper-middle class and well-to-do individuals.

Beginning in the early 1950s, however, boating became more popular as organizations, like the Federación Náutica Cubana and Amigos del Mar, were formed by Cubans seeking to learn more about the lore of the sea. Recreational boating facilities began to be established in Havana and elsewhere, such as the Club Amateur de Pesca in Santiago (Photo 3) and the Cienfuegos Yacht Club (Photo 4). Recreational boating facilities, by the late 1950s, were being built at Santa Fé and Jaimanitas (west of Havana) and at Varadero to the east on the north coast (Photo 5). By and large, however, boating in pre-Revolutionary Cuba offered primitive maintenance facilities (Photo 6). Shore access outside Havana was restricted to town docks (Photo 7).

This was the status of Cuba's recreational boating when the Revolution occurred and the island was sealed from outside contacts. At the close of the 1950s, recreational boating and fishing were beginning to appeal to an increasing number of middle-income Cubans. Local boating clubs had been organized. Some specialized marina facilities had been built to meet local and U.S. demands. However, the popularity of offshore cruising, as it is known today, had not yet emerged. An island cruise, in those days, was an exceptional event.[6] Typical boating activities were day sailing, design class racing, and deep sea fishing. The St. Petersburg to Havana Race was **the** annual event that capped the boating season.

The Revolution froze construction of boating facilities. The dredged residential canal-front development at Barlovento, predecessor of Marina Hemingway, and the Acúa Marina at Varadero, had just been completed. The Club Náutico situated in Havana harbor eventually was converted to an Officers Club. Cuban boating was poised for the 1960s "take-off" in popularity and growth. However, the island never experienced the demand for tropical cruising vacation-lands as did other Caribbean islands. These conditions may well change in the near future.[7]

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[4]Motor Boating, The Rudder and Yachting magazines, during the post-war to early 1960s, published race results. Examples include Bertram (1951 and 1952), Coulson (1956), Loomis (1954 and 1957), McMasters (1951).

[5]Both *Criollo* and *Ciclón*, a 47' Sparkman-Stevens designed yawl, were built at the Hermanos Blanco boat yard on the Almendares River in Havana. Local high quality boat-building and superior seamanship provided the Cubans with winning results. Vidaña's *Criollo* took overall Class A honors in the St. Petersburg-Havana Race and won the Southern Ocean Racing Circuit in 1957, successfully competing against such heavyweights as Carleton Mitchell's *Finisterre*. Local construction elsewhere produced quality commercial vessels. Two-masted 60 ft fishing schooners were built at Batabanó and a full displacement launch built at Cienfuegos (lancha Cienfuegina) were noted products.

[6]Jansen (1950) cruised from Cabo Maisí to Cayo Verde, on *Billy II*, a 58 ft Elco in 1949, en route from San Juan to Miami. The Stevensons (1953a,b,c) spent 10 months in 1952 cruising Cuba aboard *Sea Eagle*, a 46 ft cruiser, and reported conditions west of Havana and for the south coast from Cabo San Antonio to Niquero. Aguilera (1956) circumnavigated the island during November-December 1955, logging 2178 miles aboard *Indra*, a 47 ft Chris Craft. Conover (1958), aboard the sloop *Revonoc*, sailed the Isle of Youth-Cabo San Antonio-Havana coast.

[7]There is substantial evidence that Cuba is being rediscovered by recreational boaters, judging from recently published articles, as Allen (1991a,b), Cushing (1994a,b,c), Flannery (1992), and Fleming (1992). Small-craft charts (1:50,000 scale) are being published by the Cuban Instituto de

Boating Environment

Cuba's coastal geography presents a variety of boating conditions. An understanding of the pattern and distribution of these conditions -- offshore, nearshore, onshore -- is basic to appreciating Cuba's boating potentials. This section examines key physical resource determinants[8].

Cuba has a 1900 mile coastline (longer than Florida) which trends southeast - northwest.[9] Large open embayments fringed by coral reefs are found along the south coast; smaller, island-studded bays characterize the northcentral and western shores. Coastal shelf areas, which comprise 60% of the inshore zone, have water depths less than 100 f (Figure 2). Elsewhere deep water ($\geq$100 f) lies within 2 miles of the coast. Seventy percent of Cuba's coastal shelf waters (Figure 3) are navigable ($\geq$ 1 f) for small-craft.

The set and drift of offshore and coastal currents are shown in Figure 4 (adapted from Blázquez, 1989a,b and García Díaz, 1989a,b). Offshore currents along the north coast are moderate (50-100 cm/sec) to strong (>100 cm/sec). Set varies seasonally in the vicinity of Old Bahama Channel -- southeast in the summer and northwest in the winter. There is a weak (10-50 cm/sec) coastal current which sets northwest along the coast east of Havana and northeast from Havana to Cabo San Antonio. Cuba's western and eastern capes have notoriously unpredictable current conditions. Weak to very weak (<10 cm/sec) coastal currents are found along the island's embayed south shore.

Eighty percent of the island's coastline is lowland. Uplands and mountains predominate in the southeast (Figure 5, adapted from Díaz Díaz, 1989). The shoreline along the coastal lowlands typically is mangrove, beaches and floodplains, or some combination. Upland shorelines include cliffed headlands, escarpments and elevated marine terraces (Figure 6, adapted from Ramírez Cruz and Sosa Fernández, 1989).

The island's subtropical location in the Trade Wind Belt and its coastal topography strongly influence seasonal precipitation and wind patterns. A two wet-dry seasons regime covers 22 percent of the coastline and coincides with the mountainous southeastern sector; this is also an area of reinforced Trade Winds. A one wet-dry season regime covers 78% of Cuba's coast. Figure 7 maps these climate regimes and Table 1 lists monthly wet-dry conditions (adapted from Vidaillet Rodríguez, 1989).

Though situated in the path of the prevailing northeast Trade Winds, considerable variations in wind direction and intensity occur both regionally and locally. Figure 8 (adapted from Boytel Jambú, 1989) shows the distribution of the primary coastal wind conditions: Trade Winds with minor variation (covering 13% of Cuba's coast); reinforced Trade Winds (34%); weakened Trade Winds (43%); and mountain-valley, strong gravity force winds (10%). Figure 9 (adapted from Boytel Jambú, 1989) shows how local wind conditions vary island-wide along the land-seabreeze front.

Hidrografía to meet boater demand; charts for the north coast, from Marina Hemingway to Cárdenas, and the south coast (Canarreos Islands) are currently available to the public through El Navegante, Mercaderes #115, Havana. The Instituto is preparing a yachting guide (García Alvarez, 1994). Other cruising guides are in press, as described in Caribbean Journal (1994) and by Moquin (1994).

[8]Mariners' measurement conventions have been adopted: mile is nautical (6080 ft); water depth is fathom (6 f = 1 ft); elevation is meter (1 m = 3.28 ft).

[9]Resource mapping was conducted at a 1:1,200.000 scale using NOAA Chart 11013, Straits of Florida and Approaches, as the compilation base. U.S. Navy, Hydrographic Office, 1:150,000 series charts were used to determine shoal/deep water conditions. The 21 charts covering the Cuban coast were obtained from the University of Florida Map Library and the Library of Congress, Washington. Additional hydrographic and shore facilities information was obtained from the Cuban Coast pilot (ICH, 1988) and the Seven Seas Cruising Association, Commodores' Bulletin reports (SSCA, 1993a,b, 1994). Source data were digitized into a geographic information system using ARC/INFO and final copy was produced using Micrografx Designer.

Access to and availability of anchorages as well as shoreside facilities (fuel, water, repairs, etc.) are other important characteristics of the island's boating resources. Seventy percent of the principal entrance channels (passes) are deep water (Figure 10). These passes provide access to anchorages (Figure 11) and shore facilities (Figure 12). Current (1994) recreational boating facilities are listed in Table 2 and illustrated in Photos 8-11.[10]

Most protected (all-weather) anchorages (40% of the total) are located in pocket bays situated in the eastern and northwestern sectors. The island's shore facilities are more or less evenly divided between marinas catering to recreational boats, and small-scale commercial operations, principally fishing ports, offering minimal services.

Boating Regions

Environmental and site features confront the boater as areally associated site conditions. The boating geography of a locale is defined by the interplay of such site conditions. An association of locales which shares similar conditions defines a boating region. Nine regions with unique boating conditions have been identified and mapped (Figure 13). Their location and size, near and offshore waters, climate and prevailing winds, shore features, potential boating activities, and hazards to navigation, are described below.

Region 1 (Cabo Cruz to Punta Maisí).

This South Region is 225 miles long and covers 12% of Cuba's coastline. It is an area of mountainous terrain (Turquino Peak, 2020 m) and deep inshore waters (Bartlett Trench, 3700 f). There are two wet seasons, October and May-June. Mountain-valley gravity winds predominate though weakened Trade Winds are found in more sheltered locations. Coastal currents along this south coast are weak and set westward. Off Punta Maisí, Cuba's eastern extremity, currents set east and north, are weak in winter and moderate in summer. Protected anchorages are situated at Baitiquirí, Puerto Escondido, Guantanamo, and Santiago. Deep water passes are at Escondido, Guantanamo and Santiago; shallow water channels are at Baitiquerí and Puerto de Pilón. Commercial shore facilities are at Santiago and Caimanera (Guantanamo). Punta Gorda marina is located at Santiago. Boating hazards include strong down-draft mountain winds, currents and seas off Punta Maisí, and strong ebb currents in the narrow entrance channels leading to protected anchorages.

Region 2 (Punta Maisí to Punto Maternillo).

This Southeast Region is 225 miles long and covers 12% of the coastline. Hills and mountains in the east grade westward to coastal plains. Deep water lies close inshore. There two wet seasons, October-January and May-June. Reinforced Trade Winds alternate with a nocturnal land breeze. Coastal currents off Puerto Padre are moderate and set southeastward; those off Punto Maternillo are northwest setting and weak in winter, and southeast setting and moderate in summer. Most anchorages are protected pocket bays with deep water access channels. Commercial facilities are at Baracoa, Nipe, Gibara, and Nuevitas. Marina facilities are at Sama and Santa Lucía (Nuevitas). Boating dangers include reinforced Trade Winds on this

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[10]Facilities data are from Hernández Sotolongo (1994), Hernández Sotolongo et al (1994), and Díaz Escrich (1994). Acúa Marina, at the west end of Varadero, near the Paradiso Hotel, has a deep water entrance channel and U.S.-type berths. Chapelín Marina, on a natural, deep water protected channel in the lee of Hicacos Point (east end of Varadero), has a large (by Caribbean standards) boat repair facility and slipway for deep (6 ft) draft vessels. Tarará Marina, near Cojímar, east of Havana, is a small shallow water facility with Mediterranean-type mooring that caters to sportsfishing clientele.

windward coast and strong ebb currents in the narrow channels leading to protected anchorages and shore facilities.

Region 3 (Punto Maternillo to Varadero).

This Northeast Region is 280 miles long and covers 15% of the coastline. The Sabana and Camagüey barrier island chains create a series of bays, such as la Gloria, Jigüey, Buenavista, Santa Clara, and Cárdenas. Half the bays are very shallow (< 1 f). A fringing coral reef extends along the seaward edge of the island chains. Mangrove and coastal swamp account for 70% of the shoreline and cover numerous cays; the remaining shoreline consists of marine beaches and river floodplains. Caibarién marks the transition from two wet seasons (October-November and May-June) which extend eastward, to one wet season (May-June) which extends westward. Reinforced Trade Winds alternate with a nocturnal land breeze. Currents in the Old Bahama Channel off the Camagüey barrier islands fluctuate seasonally: they are northwest setting and weak in winter, and southeast setting and moderate in summer. Currents in the Nicolás Channel off the Sabana barrier chain are weak and west setting year-round. All anchorages are unprotected and there are only two deep water entrance channels, at La Isabela and Cárdenas. Commercial shore facilities are located at Caibarién, La Isabela and Cárdenas, and recreational boat services are available at Cayo Guillermo. This section of the Cuban coast presents several notable dangers to recreational boating: for an offshore passage, the Old Bahama Channel, a narrow deep tongue of ocean between the Bahama Bank and Camagüey barrier chain, combined with reinforced Trade Winds along the windward fringing reef coast, and few shallow water passes; for day sailing and inshore fishing, shoal bay waters (< 1 f) and numerous coral heads.

Region 4 (Varadero to Bahía Honda).

This North Region is 135 miles long, covers 7% of the coastline and includes Havana. The 100 f deep water contour lies 1 mile offshore. There are no barrier islands. A coastal plain fronts this stretch of the shore. Raised marine terraces make up 50% of the shoreline; the remainder consists of beaches and floodplains. There is one wet season from June to September. Reinforced Trade Winds during the day alternate with a nocturnal land breeze. Coastal and offshore currents vary: near Matanzas (eastern sector), a weak nearshore current sets westward, and a strong offshore current sets eastward; off Bahía Honda (western sector), the west setting coastal current is weak in winter and moderate in summer, while the offshore current is strong and sets eastward. Most of Cuba's commercial and recreational boating facilities are situated in this region: commercial sites are at Matanzas, Havana (Almendares), Mariel, Cabañas and Bahía Honda; recreational sites are at Varadero (Gaviota, Acúa and Chapelín), Tarará and Jaimanitas (Hemingway). All anchorages are protected pocket bays and are accessed by deep water channels. Though nearshore waters are clear of hazards, this is an exposed windward coast.

Region 5 (Bahía Honda to Cabo San Antonio).

This Northwest Region is 135 miles long and covers 7% of the coastline. The Colorados barrier island chain parallels the mainland coastal plain and encloses a shallow water shelf with numerous cays and shoals, especially north of Los Arroyos; about 50% of this area has water depths < 3 f. Deeper water and fewer obstructions are found south in the Gulf of Guanahacabibes. There is one wet season, from June to September. The Los Organos Mountains have a weakening effect on winds over 60% of the region's central sector; there are minor variations in the Trade Winds over the western third. Coastal currents are weak and set northeastward. Offshore currents set southwestward, are weak in winter and moderate in summer. Currents off Cabo San Antonio, Cuba's western extremity, are moderate in strength and set variously north or south. There are four unprotected anchorages, one commercial facility at La Esperanza, and one recreational facility at Palma Rubia. All entrance channels are shallow. Principal hazards are shifting currents off Cabo San Antonio, shoals and coral heads in the bays, and few shallow water passes.

Region 6 (Cabo San Antonio to Cabo Francés).

This West Region is 80 miles long and covers 4% of the coastline. Deep water (> 100 f) is 1 mile offshore. This is a sparsely settled coastal plain consisting of elevated marine terraces and headland shorelines. The Trade Winds blow with minor variations. There is one wet season, from May to September. Currents are weak; nearshore currents set southwestward and offshore currents set eastward. There is a recreational boating facility at La Gorda. The coast is open and the one anchorage at Corrientes Bay is exposed.

Region 7 (Cabo Francés to Ensenada de Cazones).

This Southwest Region is 400 miles long, covers 20% of the coastline, includes the shallow Gulf of Batabanó, and the Isle of Youth. A coastal plain fronts the shore which is mangrove or river floodplains, or has few marine beaches. Water depth on the Batabanó shelf generally is less than 4 f, but shoals less than 1 f lie to the east. The Canarreos barrier island chain extends north and east from the Isle of Youth. There is one wet season, from May to June. The northern two-thirds of the Gulf experiences weakened Trade Winds, while Trade Winds with minor variations cover the south sector including the Isle of Youth. Gulf currents are very weak and set westward; embayed eddies in La Broa set clockwise and in Siguanea set counterclockwise. Commercial facilities are at La Coloma and Batabanó; recreational boating facilities are at the Isle of Youth (Colony Hotel) and at Cayo Largo. All anchorages are unprotected. The entrance to Siguanea is deep while Rosario Channel into Cayo Largo is shallow. The main hazards to navigation are the few passes, shifting shoals and shallow bay waters.

Region 8 (Ensenada de Cazones to Punta María Aguilar).

This Southcentral Region is 145 miles long and covers 8% of the coastline. Generally, deep water (≥ 100 f) lies less than 1 mile offshore; there are some offshore islands and shoals with < 3 f, as off Cayo Miguel and Cayo Piedras. This is a coastal plains landscape though some topography, in the vicinity of the easternmost Trinidad Mountains, is upland (14%). River floodplains and marine beaches comprise 86% of the shoreline. There is one wet season, from May to June. This lee shore weakens the Trade Winds, and mountain-valley gravity winds are experienced near the Trinidad Mountains. Nearshore currents are affected by the land-seabreeze front, blowing onshore during the day and offshore at night. Commercial and recreational boating facilities and a protected anchorage in Cienfuegos Bay are reached by a deep water access channel. No major navigational hazards are found in this boating region.

Region 9 (Punta María Aguilar to Cabo Cruz).

This Centraleast Region is 280 miles long and covers 15% of the coastline. This is an extensive embayed, shallow water (< 16 f.) region, and includes La Vela Sound, the Gulf of Ana María and the Gulf of Guacanayabo. Numerous shoals and islands fill these waters. A barrier island chain, Jardines de la Reina, is situated well offshore and demarcates the edge of the coastal shelf. A coastal plain, consisting of mangrove and some beach and river floodplain shorelines, extends along the perimeter of the mainland. There is one wet season, from May to June. Weakened Trade Winds are experienced in this region but so are strong atmospheric convection and turbulence in the form of intense thunderstorm activity, especially over the Gulf of Guacanayabo. Currents on the shelf are very weak and set north-northwestward. All anchorages are unprotected. There are recreational boating facilities at Cayo Blanco (Trinidad) and Júcaro. Five deep water passes provide access to this region. Principal dangers are the intense thunderstorms during the wet season and mountain offshore winds near Trinidad.

Tables 3-7 summarize environmental and site characteristics and provide a means for identifying common conditions among boating regions. For example, Table 4 shows that most deep water passes and protected anchorages are situated in Regions 1 and 2: this coincides with deep inshore water and a

predominance of upland coastal topography (Table 5). Precipitation regimes fluctuate throughout coastal Cuba, but the following conditions are shared: a May-June wet season in Regions 1,2,3; and a November-April dry season in Regions 4,5,6,7,8,9 (Table 6). Reef fishing, flats fishing and diving opportunities prevail in Regions 3,5,7,9, while offshore sailing is found in Regions 1,2,4,6,8 (Table 7). Table 7 also shows that the most commonly shared boating hazard is currents, followed by onshore winds and few passes.

Cuba presents a rich, extensive but untapped cruising ground with a range of boating conditions. The maps and tables presented above offer a blueprint to understand better the potentialities and drawbacks to recreational boating in Cuba. How Cuba's boating facilities compare with those elsewhere in the Caribbean and south Florida is discussed below.

Trends in the Development of Boating Facilities in Cuba and the Caribbean

When Carleton Mitchell anchored *Caribe* in Admiralty Bay, Bequia, the most northerly of the Grenadines, in 1948, he found a pristine deserted roadstead (Photo 12), the quaint village of Elizabethtown, and friendly people, who offered "...green coconuts filled with water, tops neatly lopped off with a machete,..., and, on making an offering [to pay], were told 'we never charges strangers'" (Mitchell, 1948). Street visited that anchorage in the late 1970s and reported up to 30 moored vessels (Street, 1974). Today, during the Easter Regatta, one can find 150 recreational boats at anchor (Photo 13). Modern Port Elizabeth is a town with 2,000 individuals and over fifty, local yacht-supported businesses: chandleries, docks, fuel/water barges, communications, mechanics, sail and canvas repair, water taxis, bars, restaurants, boutiques, supermarkets, etc. (Doyle, 1994).

Hiscock (1957) on *Wanderer III* visited English Harbour, Antigua, site of Nelson's Dockyard, in 1952, and described a gathering of eight yachts, tied to abandoned stone quays and historic, decaying buildings (Photo 14). Robinson (1966) cruised there on *Mollihawk* and *Viking II* in the late 1960s and described the beginnings of a charter yacht base. Today this location is not only Antigua's yachting capital but a major Caribbean marine recreation center, servicing hundreds of cruising vessels. Antigua Week, the Caribbean's premier regatta, is based at English Harbour, and attracts over 100 racing yachts from many countries. Doubtless the Hiscocks would have difficulty recognizing the Harbour today (Photo 15).

These changes in the boating landscape are repeated elsewhere throughout the Caribbean: the Guadeloupe Yacht Club at Point-à-Pitre in 1948, with its docks on a sheltered cove (Photo 16) and the marina today (Photo 17); Yacht Haven, St. Thomas, when Eggleston (1959) visited aboard *Renegade*, in 1957, "a very deluxe marina" serving 50 yachts (Photo 18), and presently, a 200 slip destination marina resort (Photo 19). Even "belly-button" islands have been affected by this growth in demand for boating facilities: Marina Cay, in the British Virgin Islands, White's (1953) famous pre-war homestead has a marina which provides fuel, ice, water, hot showers, laundry, restaurant, dive shop and boutique services. Bahamas boating locations, described by Rigg (1949) and compared with Fields (1993) are worlds apart.

Secluded boating locales have been the grist of boaters' dreams of cruising to distant places, and the Caribbean has been a part of those dreams. The underlying psyche, that "...one of the great charms of cruising ... is that you go when and where you please -- you operate completely by whim," offers telling comment of the importance that "get-away" seclusion appeal has in a boaters' mind (Eggleston, 1959). An understanding of the changes that have occurred in the growth of recreational boating within the Caribbean can offer insights concerning the potential impact of Cuba's opening to marine recreational activities. Is it possible to quantify how much change, what type of change, and where such change has occurred?

Pre-1960 Boating Facilities.[11]

One hundred and seventy-four facilities, consisting of marina/yacht clubs (64), boat yards (73) and town docks (37) were found at south Florida, Caribbean and Central American/Mexican locations during the closing years of the 1950s. Figure 14 maps their locations (Appendix 1 provides specific location data). Table 8 summarizes relative distributions of facilities within each facility category (column %) and compares south Florida with the Caribbean. Table 9 examines the relative distribution of different types of facilities by each location (row %).

South Florida accounted for 61% of all facilities, 70% of the marina/yacht clubs, and 84% of the boat yards; 100% of the town docks were in the Caribbean. Within the Caribbean, most (42%) marina/yacht clubs were in the Bahamas; Cuba and the Leeward/Windward Islands each accounted for 16%. One-third of all boat yards were in Cuba; Bahamas and the Virgin Islands each accounted for 25%. Forty-five percent of all town docks used by recreational boats were in the Bahamas, 35% were in Cuba and 16% in the Leeward/Windward Islands.

The relative distributions of boating facilities by location (Table 9) were: south Florida had 42% in marina/yacht clubs and 58% in boat yards (there were no town docks); the Caribbean had 28% in marina/yacht clubs, 18% in boat yards, and 54% in town docks. Within the Caribbean, the Bahamas, Cuba and the Leeward/Windward Islands had two-thirds of its facilities in town docks.

General conditions at the close of the 1950s were: a large concentration of specialized boating facilities in south Florida; reliance on town docks in the Caribbean which serviced occasional recreational needs. There were in south Florida more boat yards (61) than marina/yacht clubs (45); the Caribbean ratio was 12:19 (there were no yards in Puerto Rico or the Leeward/Windward Islands). Cuba ranked second after the Bahamas in total numbers of boating facilities -- marina/yacht clubs (3), boat yards (4), town docks (13) -- far exceeding any of the other island locations (Appendixes 1a and b).

1993 Boating Facilities.[12]

There were 589 facilities in the region: marina/yacht clubs (400); boat yards (158); and town docks (31). The map in Figure 15 shows their distribution and Appendixes 2a and b gives specific location data. Tables 10 and 11 present relative summaries of facilities.

There is an almost even distribution of marina/yacht clubs and boat yards between south Florida and the Caribbean. Concentrations of marina/yacht clubs in the Caribbean were in the Bahamas (27%), Leeward/Windward Islands (22%), northern South America and the Virgin Islands (14% each). Boat yard concentrations were in the Leeward/Windward Islands (25%), Cuba (19%), the Bahamas (17%), and northern South America (13%). Over half of all town dock facilities were in Cuba.

Were there adequate yard facilities in the Caribbean? Data show a 2:1 ratio in south Florida of marina/yacht clubs to boat yards. Cuba, Hispaniola and Central America/Mexico met this measure; other locations fell short; the greatest discrepancies were the Bahamas and Puerto Rico.

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[11]South Florida data are based on the Inland Waterway Guide (1955). Boating facilities in the Caribbean are based on observations by Davidson (1956), Eggleston (1959), Ellam and Mudie (1956), Hiscock (1957), Mitchell (1948), Pye (1961), and Rigg (1949).

[12]South Florida data are based on the Waterway Guide (1993). Boating facilities in the Caribbean are based on observations by Doyle (1989 and 1990), Fields (1993), Scott (1990), Stone and Hays (1993), and Van Sant (1989). Cuba data are field observed.

An analysis was made of charter boats in the Caribbean and south Florida.[13] Figure 16 maps their distribution and Appendix 3 presents specific location data. The eastern Caribbean accounted for 94% of all charter boats which totalled over 1000 vessels.

Conditions prevailing in 1993 included specialized boating facilities in the Bahamas (69), Leeward/Windward Islands (63), northern South America (39), and Virgin Islands (36) (Appendix 2). Marina facilities in Cuba (16) ranked well below the leading boating centers in the region but above Jamaica (5), Central America/Mexico (5) and Hispaniola (3). The high proportion of boat yards to marina/yacht clubs in Cuba is explained by the large number of small yards servicing fishing fleets that can provide minimal service to recreational vessels.

Development Trends.

The Caribbean's share of recreational boating facilities before 1960 was 39%, as compared to south Florida. Today the Caribbean has 52% of the marina/yacht clubs, boat yards and town docks (Figure 17). Relative changes in the number of facilities at specific locations, as a proportion of the total facility stock in the Caribbean, is shown in Figure 18. Though the Bahamas stock of facilities has increased from pre-1960 (28) to 1993 (69), its share of the total has decreased from 42% to 23%. Major net expansions occurred in northern South America, the Leeward/Windward Islands, Puerto Rico, and the Virgin Islands.

Table 13 shows specific relative changes, expressed as percent decline or percent growth of the total, in marina/yacht clubs and boat yards. The largest proportional increase in boat yards has been in the Leeward/Windward Islands. Northern South America experienced substantial relative growth both in marina/yacht clubs (+14%) and boat yards (+13%); Puerto Rico sustained smaller increases, +3% and +6%, as did Hispaniola, +1% and +3%.

Combined relative growth-decline trends were sustained by the Virgin Islands with marina/yacht clubs (+9%) and boat yards (-15%), and Jamaica, -8% and +1%. Major relative declines in both boating facility stocks -- marina/yacht clubs, and boat yards -- were experienced in the Bahamas, with -15% and -8%, and Cuba, with -8% and -15%.

Dilemmas and Opportunities

Cuba is the remaining, undeveloped, premier cruising area in the Caribbean. Its varied geography, size and location make the island a magnet for coastal development. Dissatisfaction with crowding, crime and pollution at traditional Caribbean cruising locations is prompting recreational boaters to examine Cuba more closely as a boating destination, and to encourage investments in Cuba's boating infrastructure. Results of this boating geography study underscore the island's exceptional marine recreational resources.

Boating has had a mixed impact elsewhere in the Caribbean. Positive effects can be found in the types of local investments this form of tourism promotes, ones that support locally owned and operated small enterprises. Estimates from the eastern Caribbean of boater expenditures/annum are $1US million/1000 cruisers and $40US million/500 bareboat and skippered charters (Doyle, 1994). These expenditures in waterfront communities are "stay-around" funds that become the mainstay of local economies.

There are, however, environmental and social costs embedded in promoting recreational boating. An increased boating population often brings changes in habitat and the loss of wilderness experiences. Mitchell's pristine Admiralty Bay of 1948 lost its wilderness quality in later years when 30-100 boats anchored there. Such impact can be slowed or even reversed by limiting the number and location of moored

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[13]Data on numbers and locations of charter boats were taken from the Chartering Directory (Cruising World, 1993) for south Florida and the Caribbean; Cuba tallies are based on field observations and interviews.

vessels. The Virgin Islands (1990) has adopted legislation to deal with unseaworthy and derelict vessels moored in St. Thomas harbor.

Recreational boaters may also damage living coral by anchoring, or through inexperienced reef diving and spear fishing. Many Caribbean islands, recognizing the importance of their reef ecosystems, have established marine and coastal protected areas. There are over 100 in the region (OAS, 1988) and Cuba accounts for a large percentage (Figure 19). Parks offer a way to manage use in an ecologically sustainable manner and generate income. Bonaire Underwater Park, Netherlands Antilles, is a major reef resort which attracts 8000 divers annually (1983); it serves recreational users (diving, fishing), researchers, nursery stock producers, and generates an annual income of $5 million (OAS, 1988). Many marine parks in the region were legislated after degradation had occurred. Cuba has many pristine marine areas where its parks system can focus on maintaining quality coastal resources prized by recreational boaters. There are areas, however, undergoing rapid development (Oro, 1992).

Boaters may also impact the environment by discharging effluent (toilet and grey water), disposing of garbage, producing noise, or destroying habitat by prop-dredging. Opinion research from Florida indicates, however, that boaters value highly scenic beauty and clean (marine) waters as part of their boating experience, and are less likely to pollute or disturb the environment if provided with adequate disposal facilities or visitor guidance (Antonini et al, 1990 and 1994).

Recreational boaters may have a social impact on local people. The disparity in disposable income between tourist boater and local person, and the ensuing love-hate relationship is well documented. Attitudes and values change: what was once given is now marketed. Mitchell was freely offered a green coconut on arrival at Admiralty Bay in 1948. Boaters today are beset by hawkers in skiffs competing to sell coconuts for the highest price.

There is little doubt that increased recreational boating between the U.S. and Cuba could have major economic, social and environmental consequences for Cuba, south Florida and the Caribbean. Balancing these potential conflicts will require enlightened attitudes and policies. Caribbean and south Florida experiences, both good and bad, offer valuable lessons to guide opening Cuban waters to the public and future development of its boating resources.

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Legend for Wet-Dry Seasons Map

TYPE	WET		DRY	
	PRIMARY	**SECONDARY**	**PRIMARY**	**SECONDARY**
1-1	JUNE	-	DEC-APR	-
1-2	MAY-JUNE	-	NOV-APR	-
1-3	MAY-JUNE	-	DEC-MAR	-
1-4	JUNE-SEPT	-	NOV-APR	-
1-5	JUNE-AUG	-	DEC-APR	-
2-1	OCT-NOV	MAY-JUN	FEB-MAR	JUL-AUG
2-2	MAY-JUN	AUG-NOV	DEC-APR	JULY
2-3	OCTOBER	MAY-JUN	DEC-APR	JULY
2-4	OCT-JAN	MAY	FEB-APR	JUN-SEP

Table 1

Existing Marinas in Cuba

Name	Location	Company*	Depth	# Slips	Water	Level	Fuel	Repairs
Palma Rubia	Puerto Esperanza	PS	1.0	-	x	x	x	
Marina Tabara		PS	1.0	25	x	x	x	x
Marina Acua	Varadero	PS	3.0	76	x	x	x	x
Cayo Guillermo	Ciego de Avila	PS	3.0	10	x	x	x	
Playa Santa Lucia	Nuevitas	PS	2.0	2	x	x	x	x
Marina Jucaro	Jucaro	PS	3.0	15	x	x	x	
Nautica Cayo Blanco	Arcon	PS	1.5	2	x	x	x	x
Marina Jagua	Cienfuegos	PS	3.0	20	x	x	x	x
Marina Cayo Largo	Los Camarress	PS	3.5	25	x	x	x	
Marina Colony	Isla de la Juventud	PS	1.5	4	x	x	x	
Marina La Gorda	Bahia Corriente	PS	2.0	3	x	x	x	x
Hemingway	Havana	MR	4.5	140	x	x	x	x
Chapelin	Varadero	MR	3.0	16	x	x	x	
Boca de Sama	Holguin	MR	2.5	-	x	x	x	x
Punta Gorda	Santiago	MR	2.0	30	x	x	x	
Gaviota	Varadero		3.0	20	x	x	x	x

(*) PS = Puerto Sol

MR = Marlin

Table 2

Boating Regions Location and Area

Feature	REGION									Cuba
	1	2	3	4	5	6	7	8	9	
Location	South	South east	North east	North	North west	West	South west	South central	Central east	
SIZE (%)	12	12	15	7	7	4	20	8	15	100

Table 3

Near and Offshore Waters

Feature	REGION									Cuba total (%)
	1	2	3	4	5	6	7	8	9	
Water depth: deep shallow	100f,1-2 nmi	100f, 1-2 nmi	≤9f 100% <1f 50%	100f,1nmi	≤12f 100% <3f 50%	100f,1nmi	≤4f 100% <1f 10%	100f,5nmi 80% ≤3f 20%	≤16f 100%	40 60
Currents: set/strength/period Location 1 Location 2 Location 3	w/wk/y e/wk/y	se/md/y nw/wk/w;nw/md/s	nw/wk/w;se/md/s w/wk/y	w/wk/y w/wk/w;w/md/s	ne/wk/y n and s/md/y	sw/wk/y	w/vwk/y clk/vwk/y ctclk/vwk/y	s/wk/d;n/wk/n	nnw/vwk/y	
Passes: Deep(≥1f) Shallow	 3 2	 16 3	 1 5	 6 0	 0 4	 0 0	 1 1	 1 0	 5 0	 69 31
Anchorages: Protected Unprotected	 4 10	 20 2	 0 10	 5 0	 1 3	 0 1	 0 6	 1 0	 0 12	 41 59

Abbreviations:
f - fathom (6 ft)
nmi - nautical mile (6080 ft)
current set - west (w), northwest (nw), nnw (north-northwest), north (n), northeast (ne), east (e), southeast (se), south (s)
clockwise (clk), counterclockwise (ctclk)
current strength - very weak (vwk), weak (wk), moderate (md)
current period - summer (s), winter (w), day (d), night (n), year (y)

Table 4

Shore Features

Feature	REGION									Cuba total (%)
	1	2	3	4	5	6	7	8	9	
Topography (%)										
uplands	90	55						14	15	20
lowlands	10	45	100	100	100	100	100	86	85	80
Shoreline (%)										
headlands	78	40		50		100	3			22
beach/floodplains	18	60	30	35			27	86	25	32
mangrove	4		70		100		60	14	70	42
mixed				15			10		5	4
Facilities (num.)										
commercial	2	4	3	5	1	0	2	1	0	53
recreational	1	2	1	5	1	1	2	1	2	47

Table 5

Climate and Prevailing Winds

Feature	REGION									Cuba total (%)
	1	2	3	4	5	6	7	8	9	
Climate:										
Wet season(s)	Oct; May-Jun	Oct-Jan;May-Jun	Oct-Nov;May-Jun	Jun-Sep	Jun-Sep	May-Sep	May-Jun	May-Jun	May-Jun	
Dry season(s)	Dec-Apr; Jul	Feb-Apr;Jul-Sep	Dec-Mar;Jul-Aug	Nov-Apr	Nov-Apr	Nov-Apr	Nov-Apr	Nov-Apr	Nov-Apr	
Winds (%)										
trades unaltered					30	100	33			13
trades reinforced		100	100	100	10					34
trades weakened	37				60		66	80	100	43
mountain-valley	63							20		10

Table 6

Potential Boating Activities and Hazards

Feature	REGION									Cuba total (row %)
	1	2	3	4	5	6	7	8	9	
Activities:										
Coastal Cruising	Y	Y	Y		Y		Y		Y	67
Offshore Sailing	Y	Y		Y		Y		Y		56
Day Sailing	Y	Y	Y		Y		Y	Y	Y	78
Deep Sea Fishing	Y	Y		Y						33
Reef Fishing			Y		Y		Y		Y	44
Flats Fishing			Y		Y		Y		Y	44
Diving			Y		Y	Y	Y		Y	56
Rowing	Y	Y						Y		33
Hazards:										
Offshore winds	Y								Y	22
Onshore winds		Y	Y	Y						33
Currents	Y	Y	Y		Y					44
Few passes			Y		Y		Y			33
Thunderstorms									Y	11
Shoals			Y		Y					22

Table 7

Relative Distribution of Pre-1960 Boating Facilities, Within Each Facility Category, in South Florida and the Caribbean (Column %)

LOCATION	MARINA/YACHT CLUB	BOAT YARD	TOWN DOCK	TOTAL
	PERCENT OF REGION			
BAHAMAS	42.11	25.00	45.95	41.18
CUBA	15.79	33.33	35.14	29.41
JAMAICA	10.53	8.33	0.00	4.41
HISPANIOLA	0.00	0.00	0.00	0.00
PUERTO RICO	5.26	0.00	0.00	1.47
VIRGIN ISLANDS	5.26	25.00	2.70	7.35
LEEWARD/WINDWARD ISLANDS	15.79	0.00	16.22	13.24
NORTHERN SOUTH AMERICA	0.00	0.00	0.00	0.00
CENTRAL AMERICA/MEXICO	5.26	8.33	0.00	2.94
TOTAL	100.00	100.00	100.00	100.00

FLORIDA (PALM BEACH - CLEARWATER)	70.31	83.56	0.00	60.92
CARIBBEAN (Above)	29.69	16.44	100.00	39.08
TOTAL	100.00	100.00	100.00	100.00

Table 8

Relative Distribution of Pre-1960 Boating Facilities by Each Location, in South Florida and the Caribbean (Row %)

LOCATION	*MARINA YACHT CLUB*	*BOAT YARD*	*TOWN DOCK*	*TOTAL*
	PERCENT OF LOCATION			
BAHAMAS	28.58	10.71	60.71	100.00
CUBA	15.00	20.00	65.00	100.00
JAMAICA	66.67	33.33	0.00	100.00
PUERTO RICO	100.00	0.00	0.00	100.00
VIRGIN ISLANDS	20.00	60.00	20.00	100.00
LEEWARD/WINDWARD ISLANDS	33.33	0.00	66.67	100.00
CENTRAL AMERICA/MEXICO	50.00	50.00	0.00	100.00

FLORIDA (PALM BEACH - CLEARWATER)	42.45	57.55	0.00	100.00
CARIBBEAN (Above)	27.94	17.65	54.41	100.00

Table 9

Relative Distribution of 1993 Boating Facilities, Within Each Facility Category, in South Florida and the Caribbean (Column %)

LOCATION	MARINA/YACHT CLUB	BOAT YARD	TOWN DOCK	TOTAL
	PERCENT OF REGION			
BAHAMAS	27.40	17.39	0.00	22.40
CUBA	7.69	18.84	58.06	15.26
JAMAICA	2.40	1.45	0.00	1.95
HISPANIOLA	1.44	2.90	12.90	2.92
PUERTO RICO	8.66	5.80	0.00	7.14
VIRGIN ISLANDS	13.95	10.14	3.23	12.01
LEEWARD/WINDWARD ISLANDS	21.64	26.09	22.58	22.73
NORTHERN SOUTH AMERICA	14.42	13.04	3.23	12.99
CENTRAL AMERICA/MEXICO	2.40	4.35	0.00	2.60
TOTAL	100.00	100.00	100.00	100.00

FLORIDA (PALM BEACH - CLEARWATER)	48.00	56.33	0.00	47.71
CARIBBEAN (ABOVE)	52.00	43.67	100.00	52.29
TOTAL	100.00	100.00	100.00	100.00

Table 10

Relative Distribution of 1993 Boating Facilities by Each Location, in South Florida and the Caribbean (Row %)

LOCATION	MARINA/YACHT CLUB	BOAT YARD	TOWN DOCK	TOTAL
	PERCENT OF LOCATION			
BAHAMAS	82.61	17.39	0.00	100.00
CUBA	34.04	27.66	38.30	100.00
JAMAICA	83.33	16.67	0.00	100.00
HISPANIOLA	33.33	22.22	44.45	100.00
PUERTO RICO	81.82	18.18	0.00	100.00
VIRGIN ISLANDS	78.38	18.92	2.70	100.00
LEEWARD/WINDWARD ISLANDS	64.29	25.71	10.00	100.00
NORTHERN SOUTH AMERICA	75.00	22.50	2.50	100.00
CENTRAL AMERICA/MEXICO	62.50	37.50	0.00	100.00

FLORIDA (PALM BEACH - CLEARWATER)	68.33	31.67	0.00	100.00
CARIBBEAN (Above)	67.53	22.40	10.07	100.00

Table 11

Relative Distribution of Charter Boats in 1993, by Location in South Florida and the Caribbean

LOCATION	SUBTOTAL PERCENT OF REGION
BAHAMAS	3.95
CUBA	2.23
JAMAICA	0.00
HISPANIOLA	0.00
PUERTO RICO	0.00
VIRGIN ISLANDS	41.29
LEEWARD/WINDWARD ISLANDS	52.53
NORTHERN SOUTH AMERICA	0.00
CENTRAL AMERICA/MEXICO	0.00
TOTAL	100.00

SOUTH FLORIDA	5.82
CARIBBEAN (Above)	94.18
TOTAL	100.00

Table 12

Relative Change in Caribbean Boating Facilities: 1960-1993
(Percent decline [-] and growth [+] of Total)

LOCATION	MARINA/YACHT CLUB	BOAT YARDS
BAHAMAS	-14.71	-7.61
PUERTO RICO	+3.39	+5.80
VIRGIN ISLANDS	+8.68	-14.86
JAMAICA	-8.13	+1.45
CUBA	-8.10	-14.49
CENTRAL AMERICA	-2.86	-3.98
LEEWARD/WINDWARD	+5.84	+26.09
HISPANIOLA	+1.44	+2.90
NORTHERN SOUTH AMERICA	+14.42	+13.04

Table 13

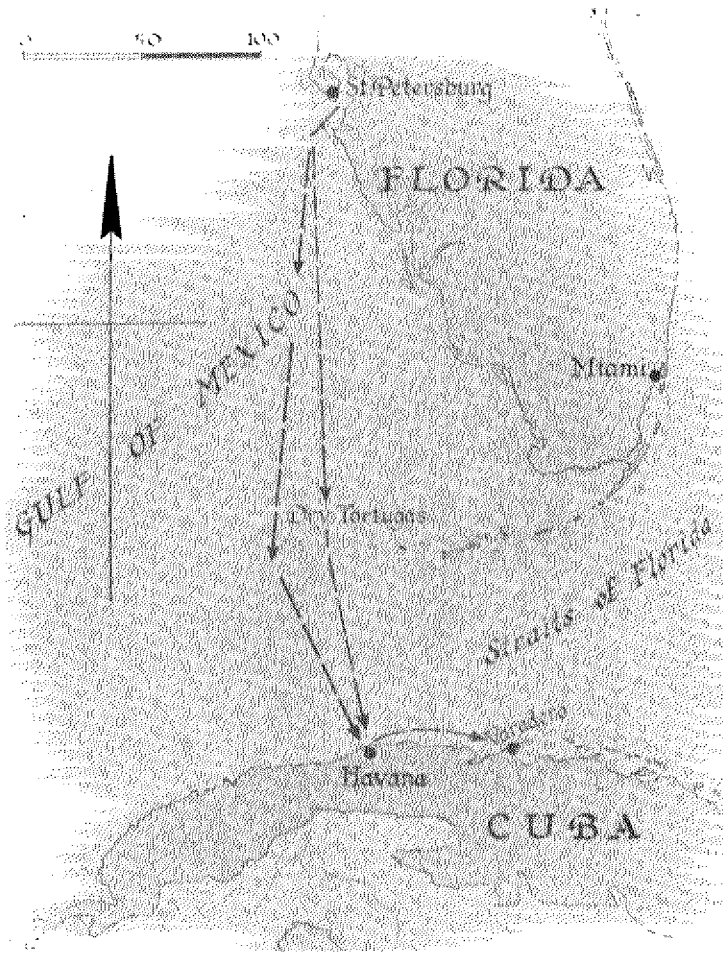

Figure 1. Cuba's Location in Relation to South Florida (Yachting, 1957).

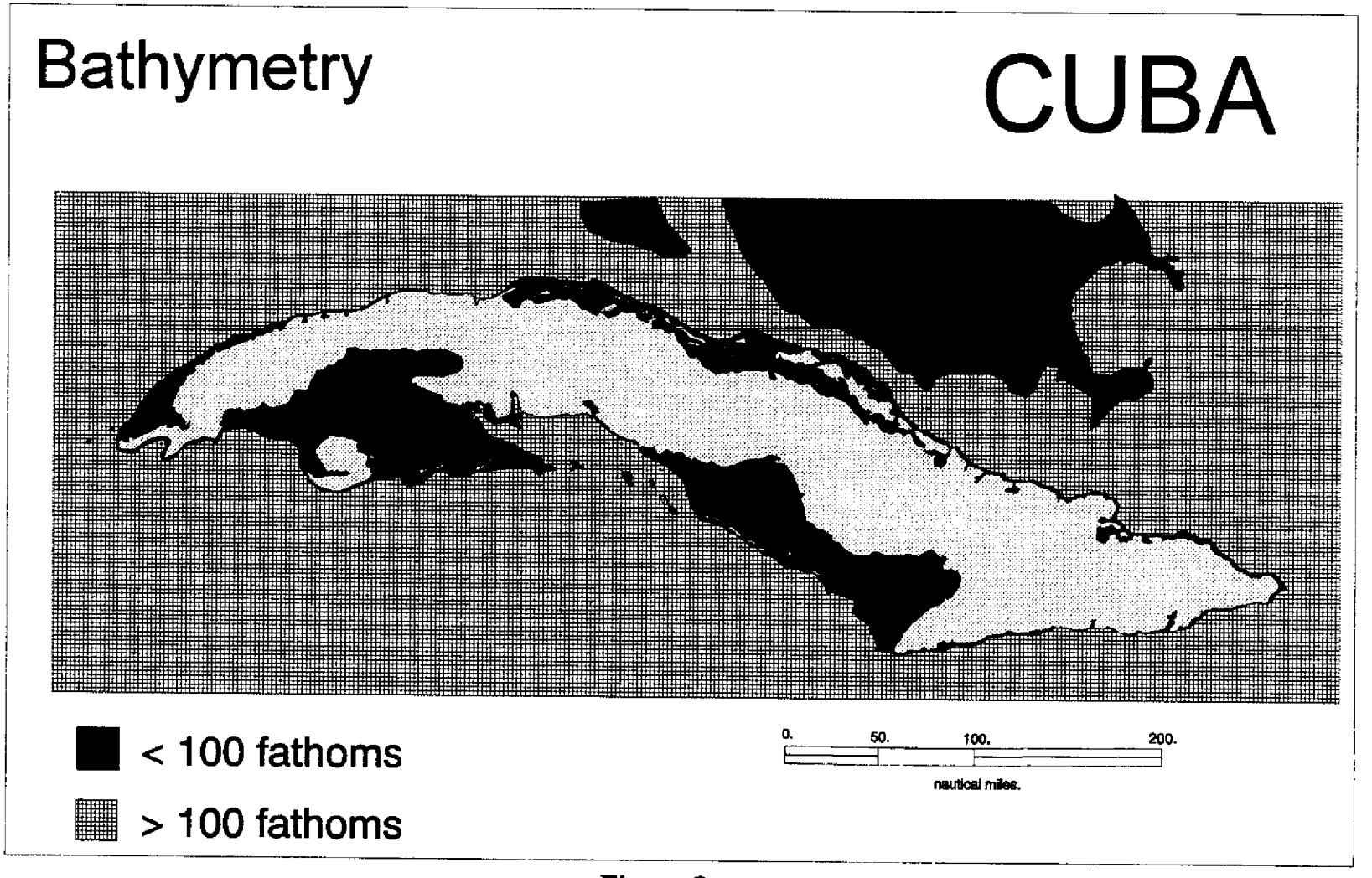
Bathymetry
CUBA
< 100 fathoms
> 100 fathoms
0.
50.
100.
200.
nautical miles.

Figure 2

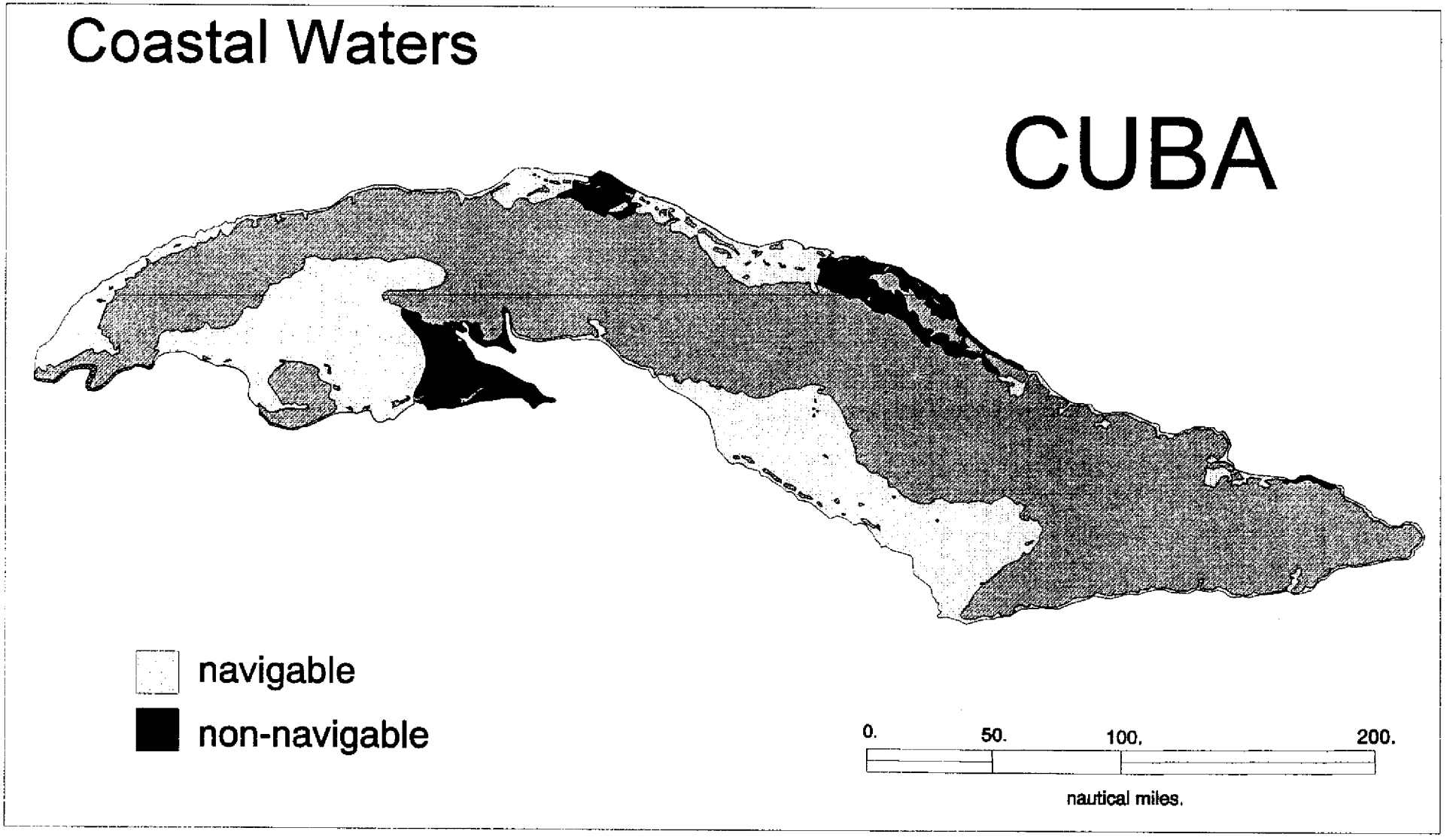
Coastal Waters
CUBA
navigable
non-navigable
0.
50.
100.
200.
nautical miles.

Figure 3

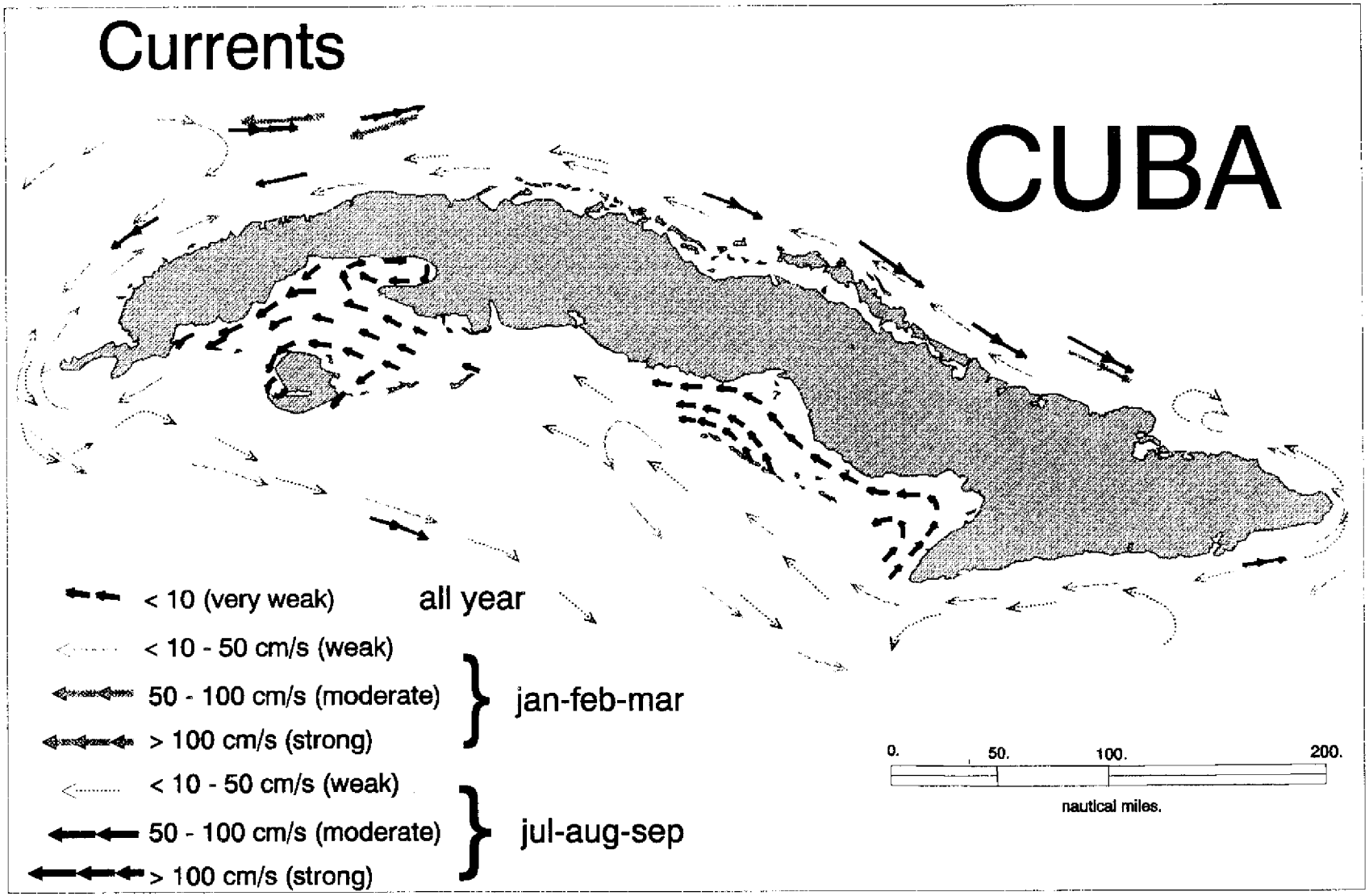
Currents
CUBA
< 10 (very weak)
all year
< 10 - 50 cm/s (weak)
50 - 100 cm/s (moderate)
> 100 cm/s (strong)
jan-feb-mar
< 10 - 50 cm/s (weak)
50 - 100 cm/s (moderate)
> 100 cm/s (strong)
jul-aug-sep
0.
50.
100.
200.
nautical miles.

Figure 4

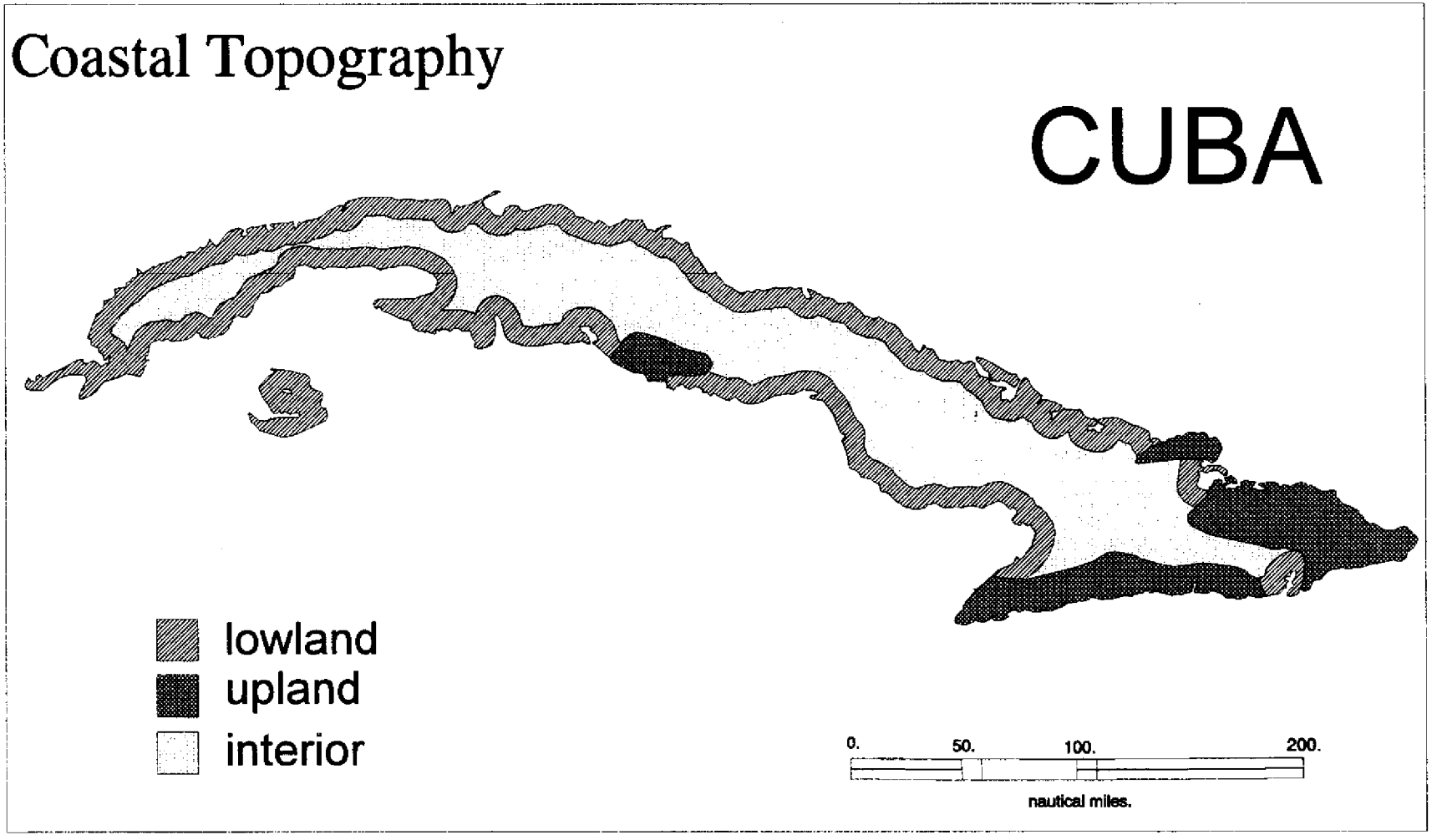
Coastal Topography
CUBA
lowland
upland
interior
0.
50.
100.
200.
nautical miles.

Figure 5

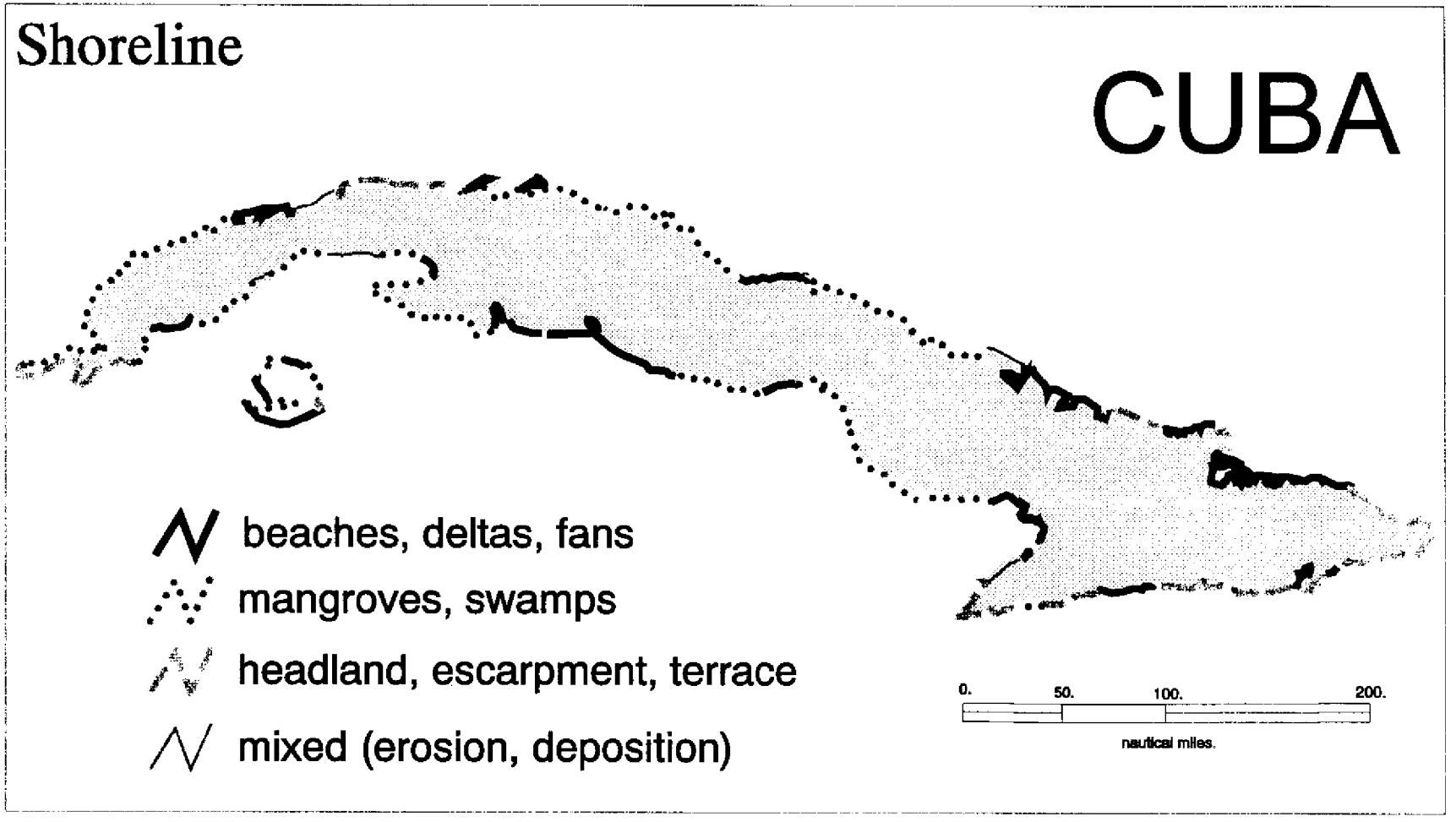
Shoreline
CUBA
beaches, deltas, fans
mangroves, swamps
headland, escarpment, terrace
mixed (erosion, deposition)
0.
50.
100.
200.
nautical miles.

Figure 6

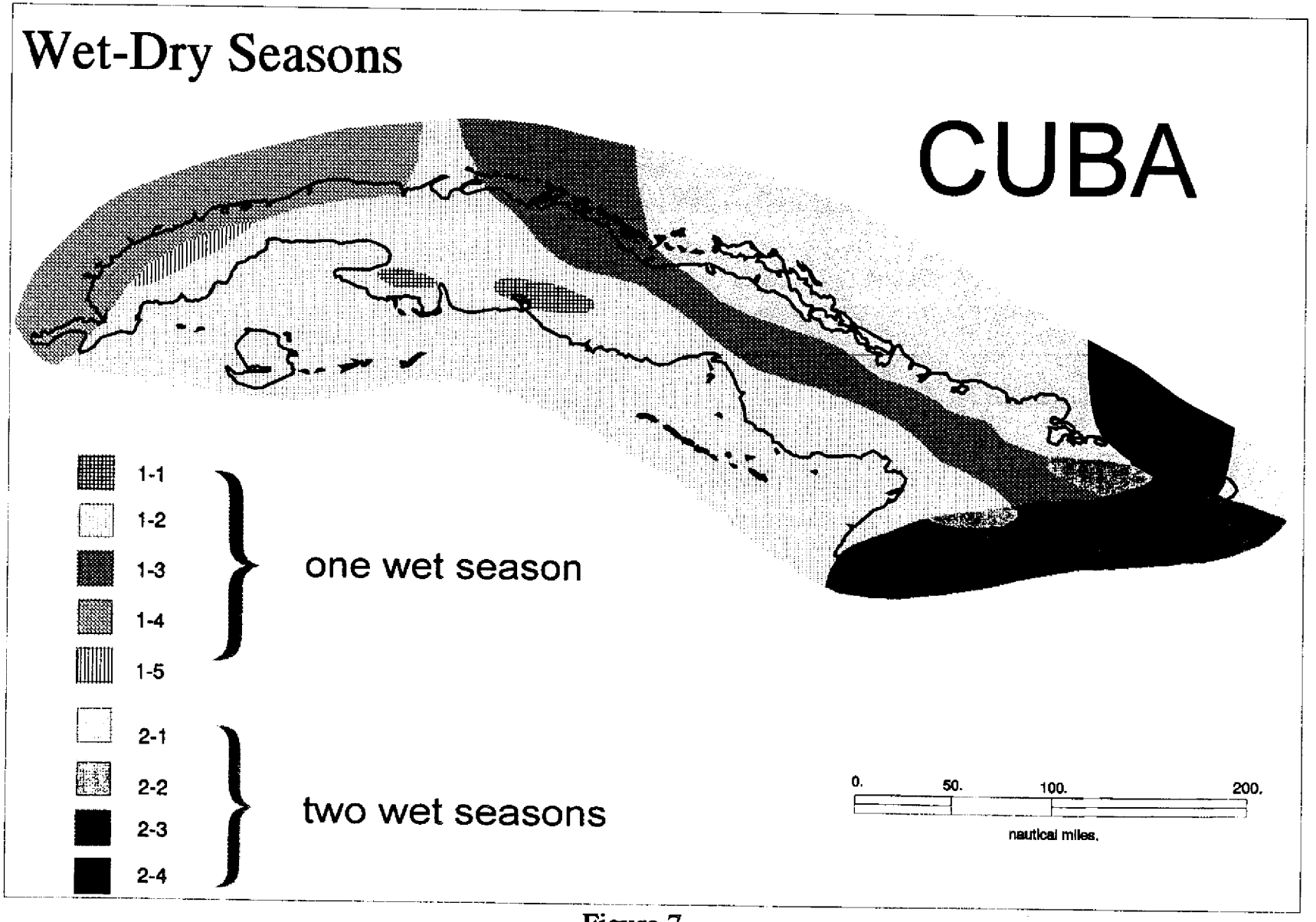
Wet-Dry Seasons
CUBA
1-1
1-2
1-3
1-4
1-5
one wet season
2-1
2-2
2-3
2-4
two wet seasons
0.
50.
100.
200.
nautical miles.

Figure 7

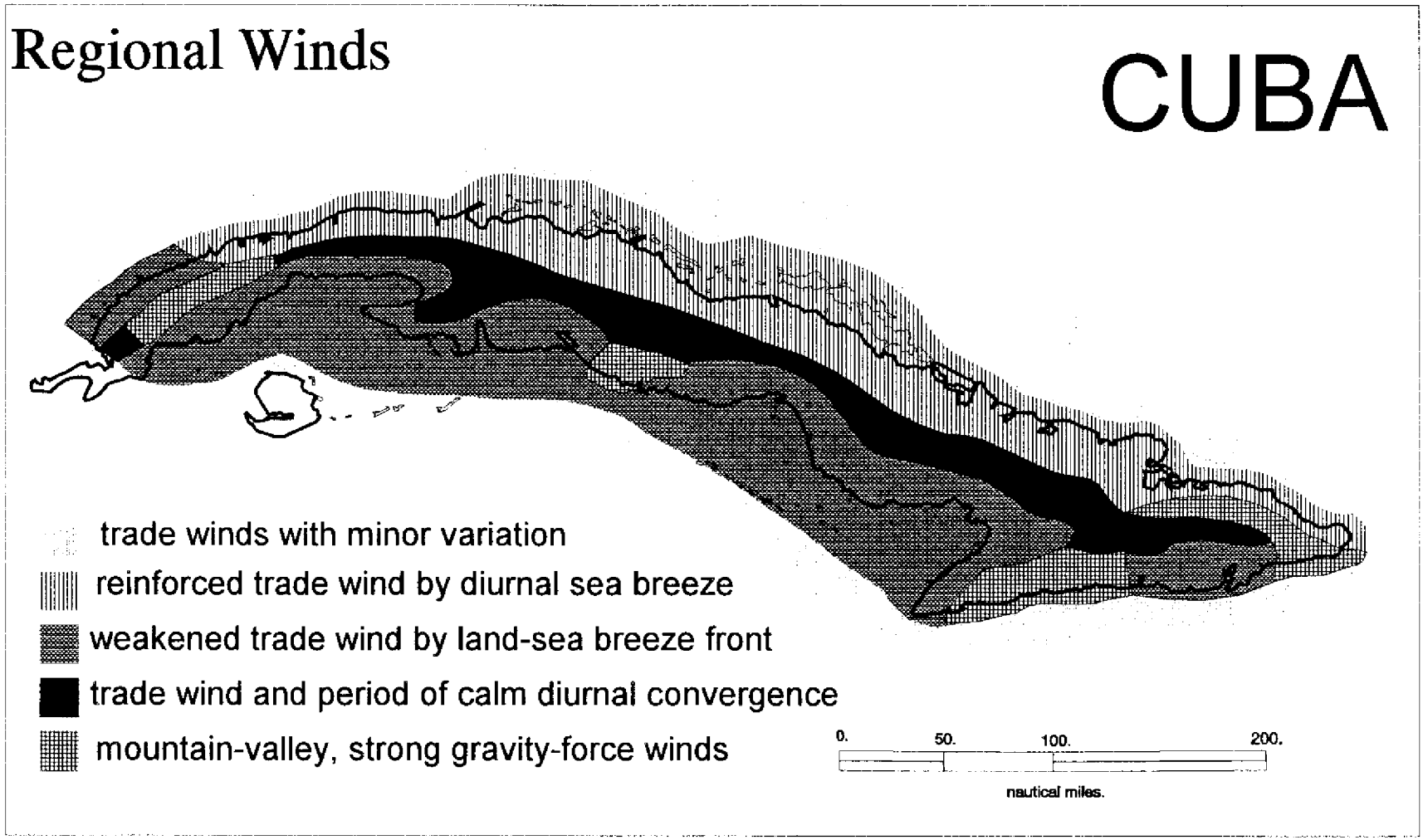
Regional Winds
CUBA
trade winds with minor variation
reinforced trade wind by diurnal sea breeze
weakened trade wind by land-sea breeze front
trade wind and period of calm diurnal convergence
mountain-valley, strong gravity-force winds
0.
50.
100.
200.
nautical miles.

Figure 8

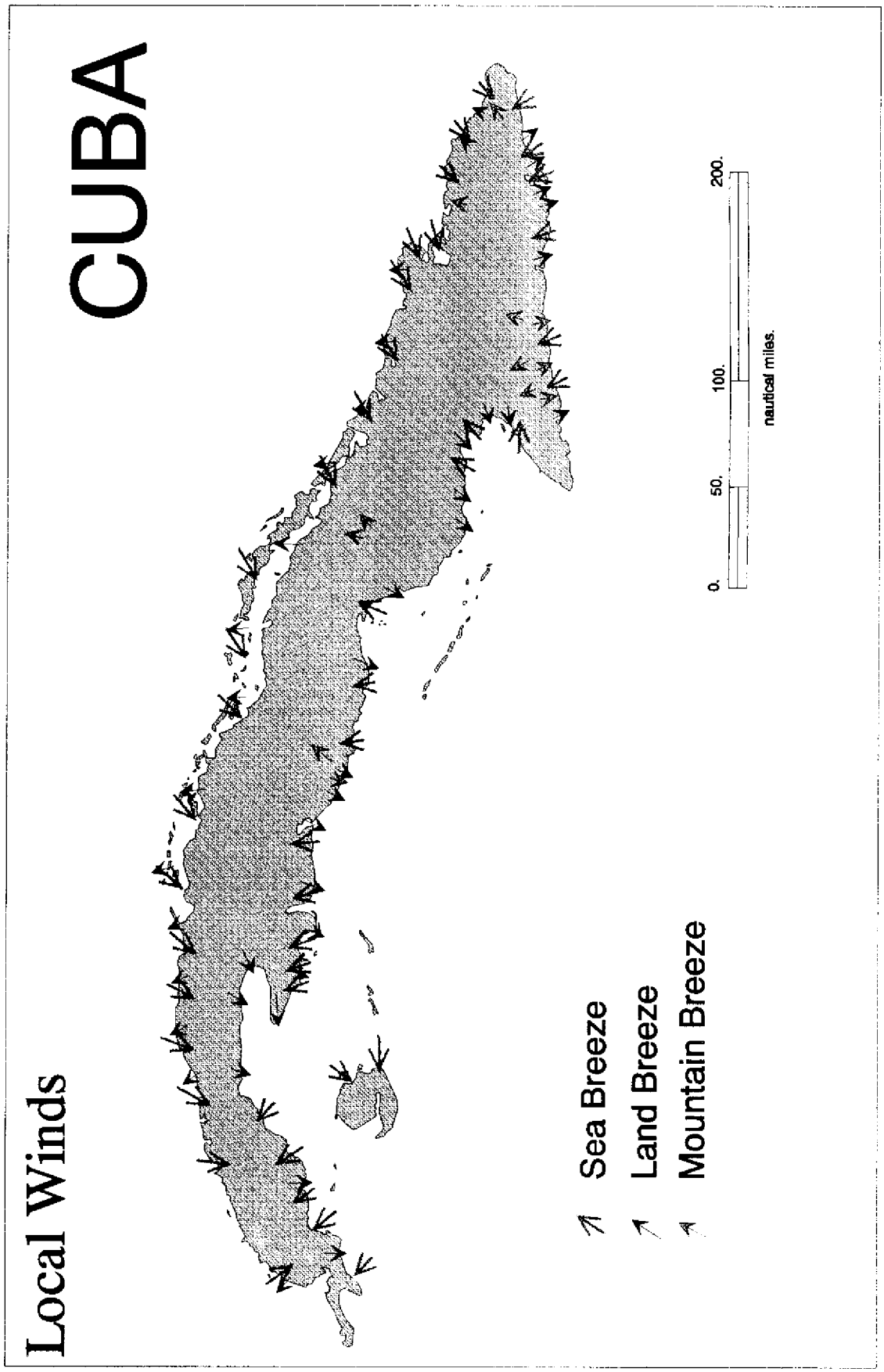
Local Winds
CUBA
Sea Breeze
Land Breeze
Mountain Breeze
0.
50.
100.
200.
nautical miles.

Figure 9

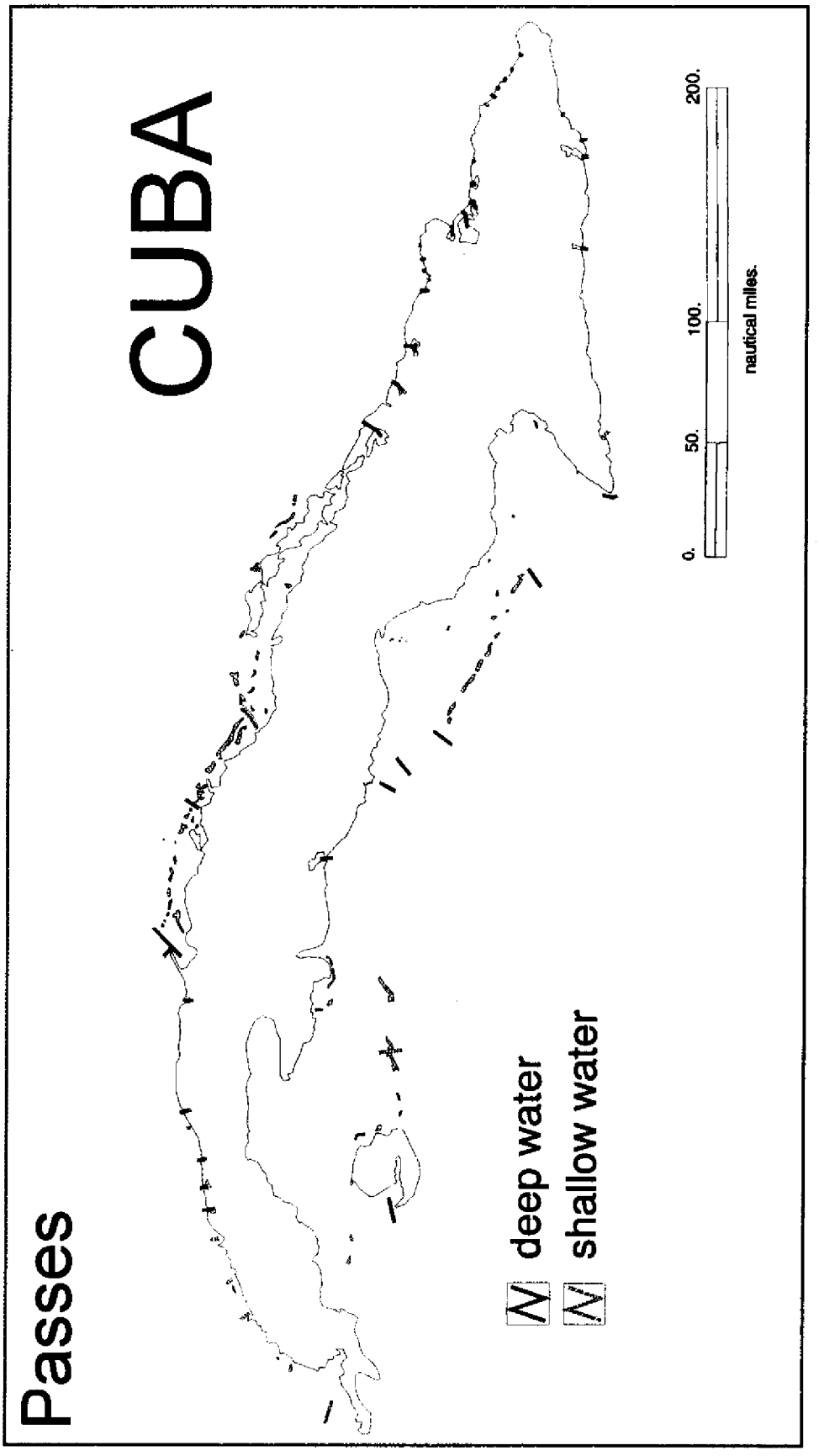
Passes
CUBA
deep water
shallow water
0.
50.
100.
200.
nautical miles.

Figure 10

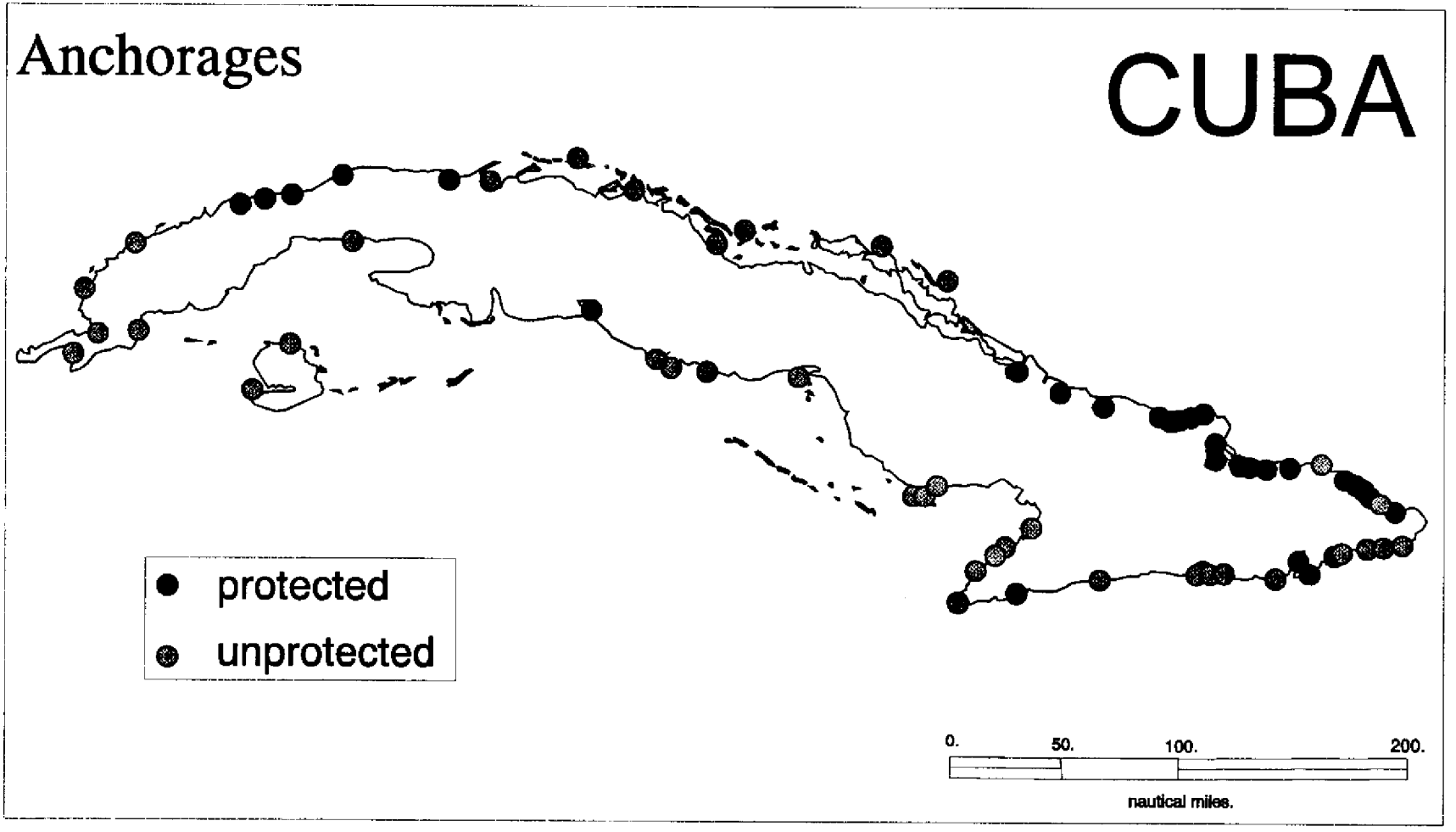
Anchorages
CUBA
protected
unprotected
0.
50.
100.
200.
nautical miles.

Figure 11

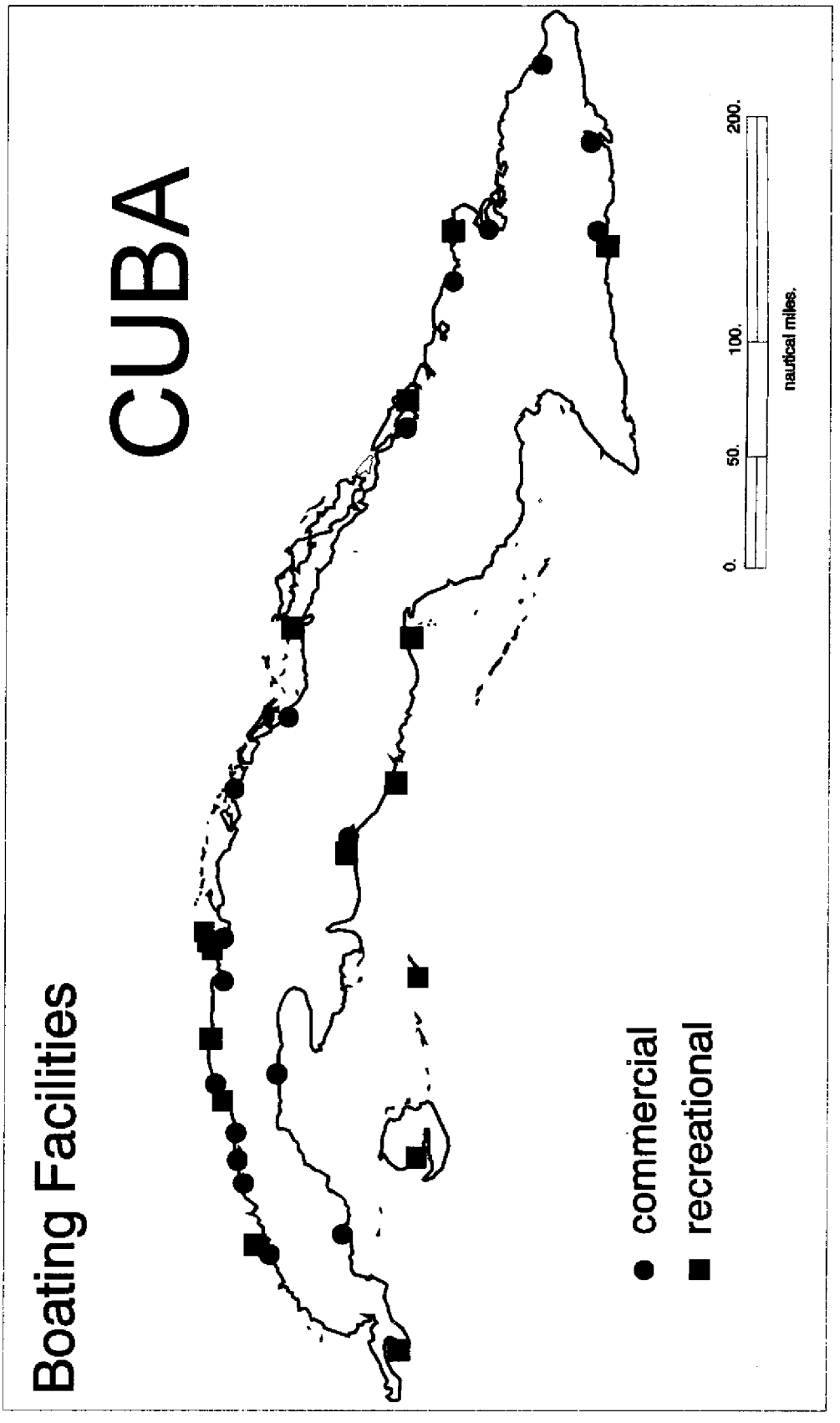
Boating Facilities
CUBA
commercial
recreational
0.
50.
100.
200.
nautical miles.

Figure 12

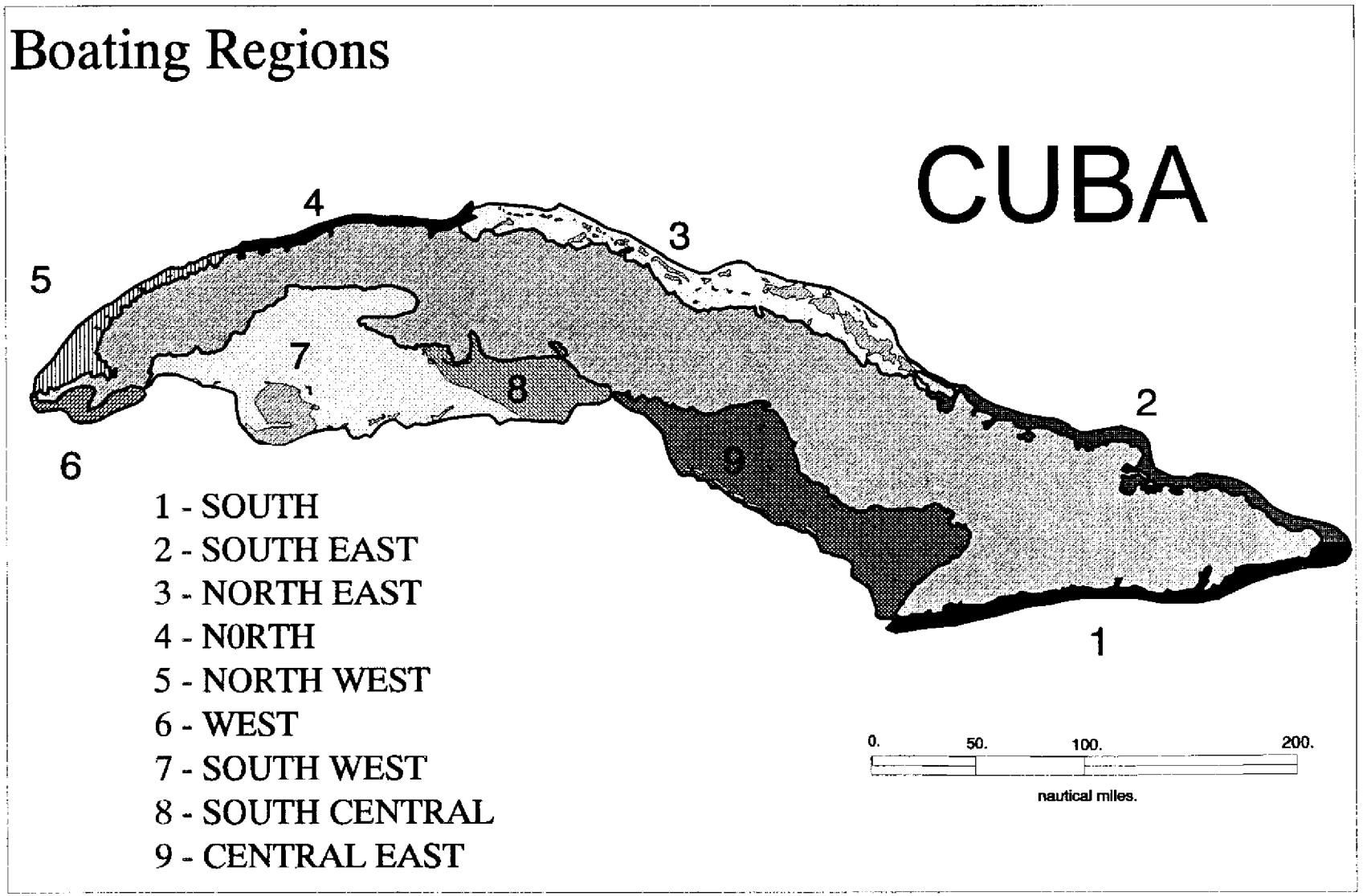
Boating Regions
CUBA
4
3
5
7
8
2
6
9
1
1 - SOUTH
2 - SOUTH EAST
3 - NORTH EAST
4 - N0RTH
5 - NORTH WEST
6 - WEST
7 - SOUTH WEST
8 - SOUTH CENTRAL
9 - CENTRAL EAST
0.
50.
100.
200.
nautical miles.

Figure 13

Pre-1960 Boating Facilities in South Florida and the Caribbean

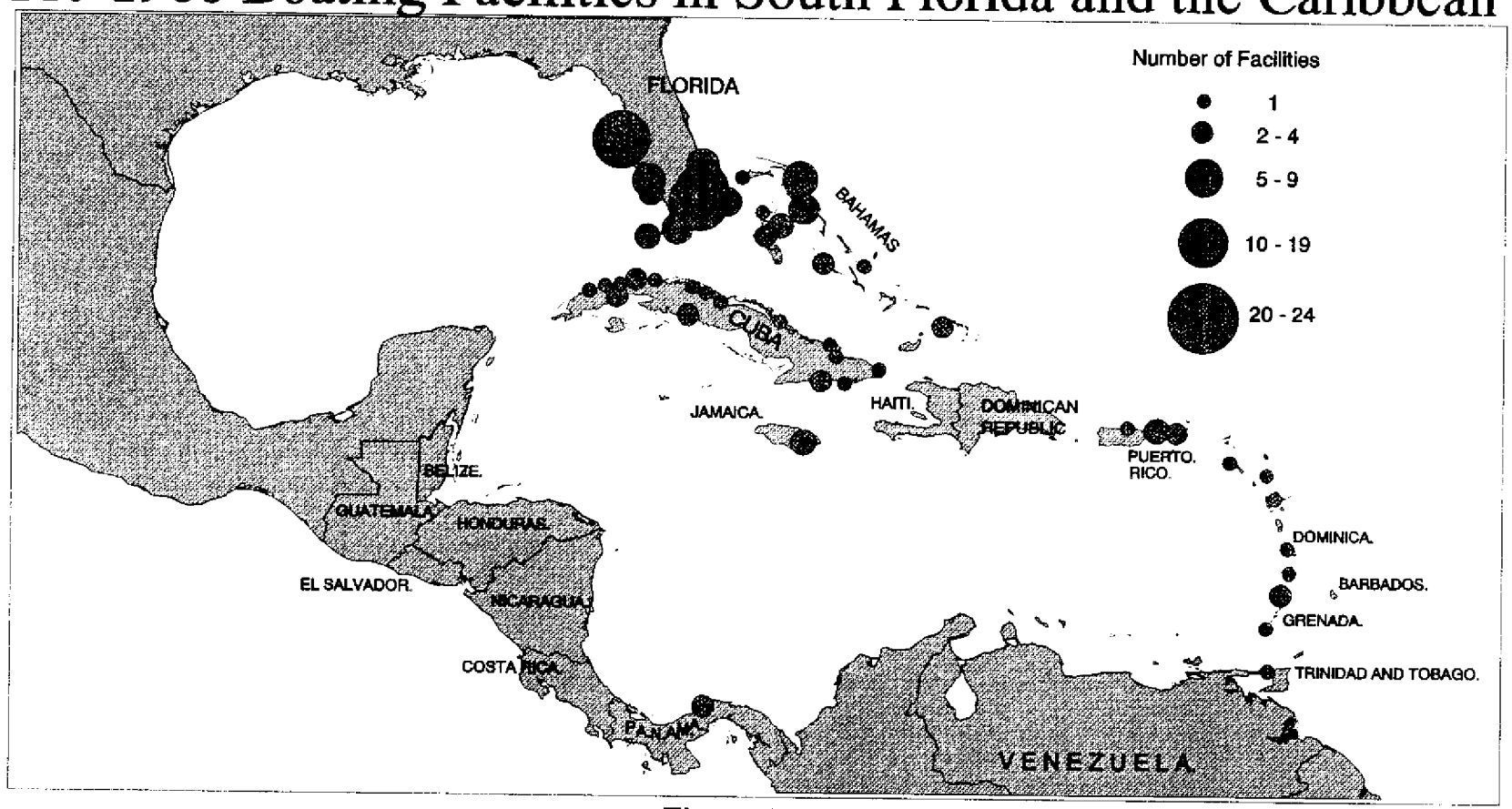

Figure 14

1993 Boating Facilities in South Florida and the Caribbean

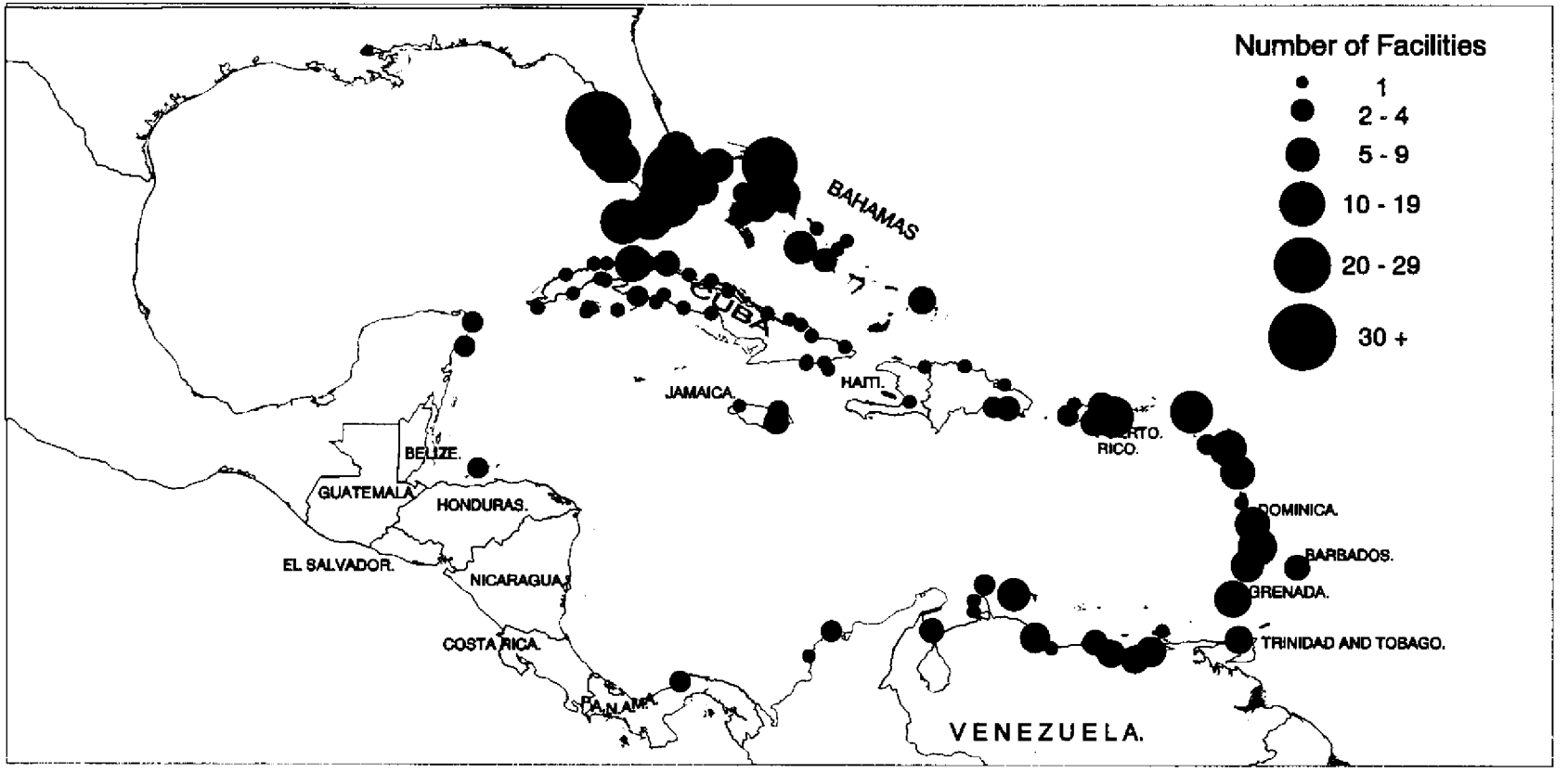

Figure 15

Charter Boats in the Caribbean and South Florida ,1993

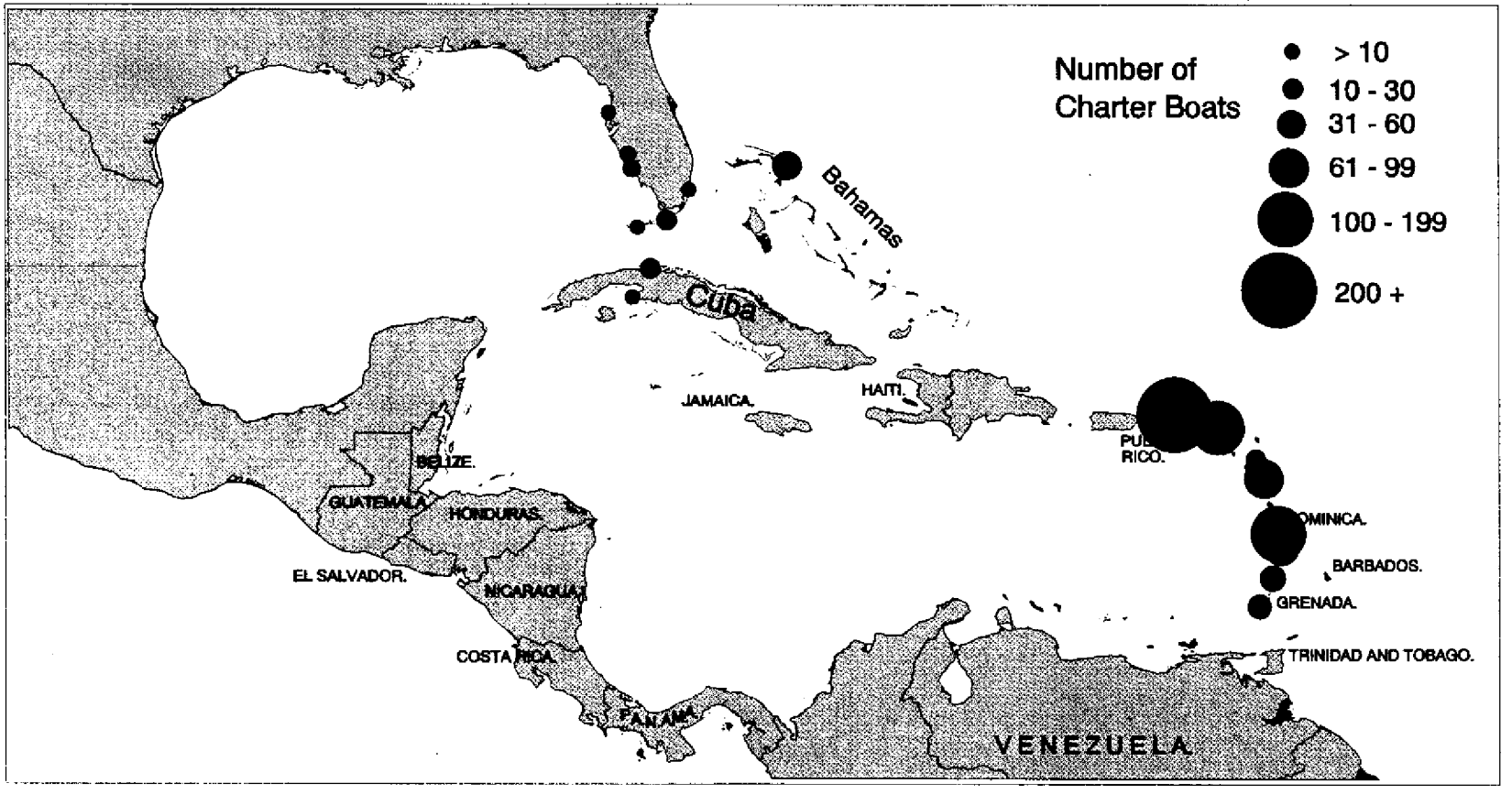

Figure 16

Caribbean and South Florida Boating Facilities

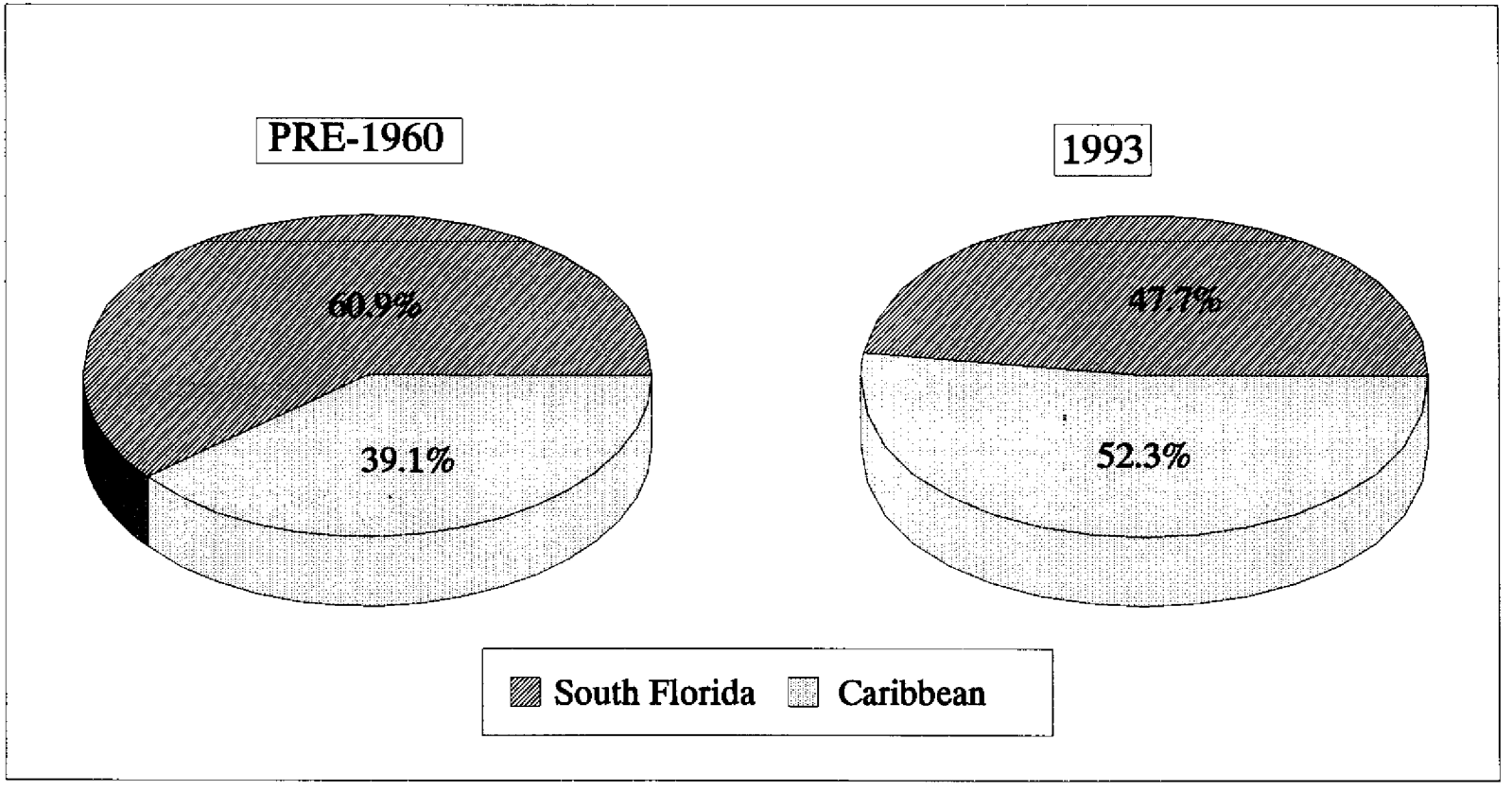

Figure 17

Relative Change In Facilities Between 1960 and 1993

(Proportional Change of Total Stock)

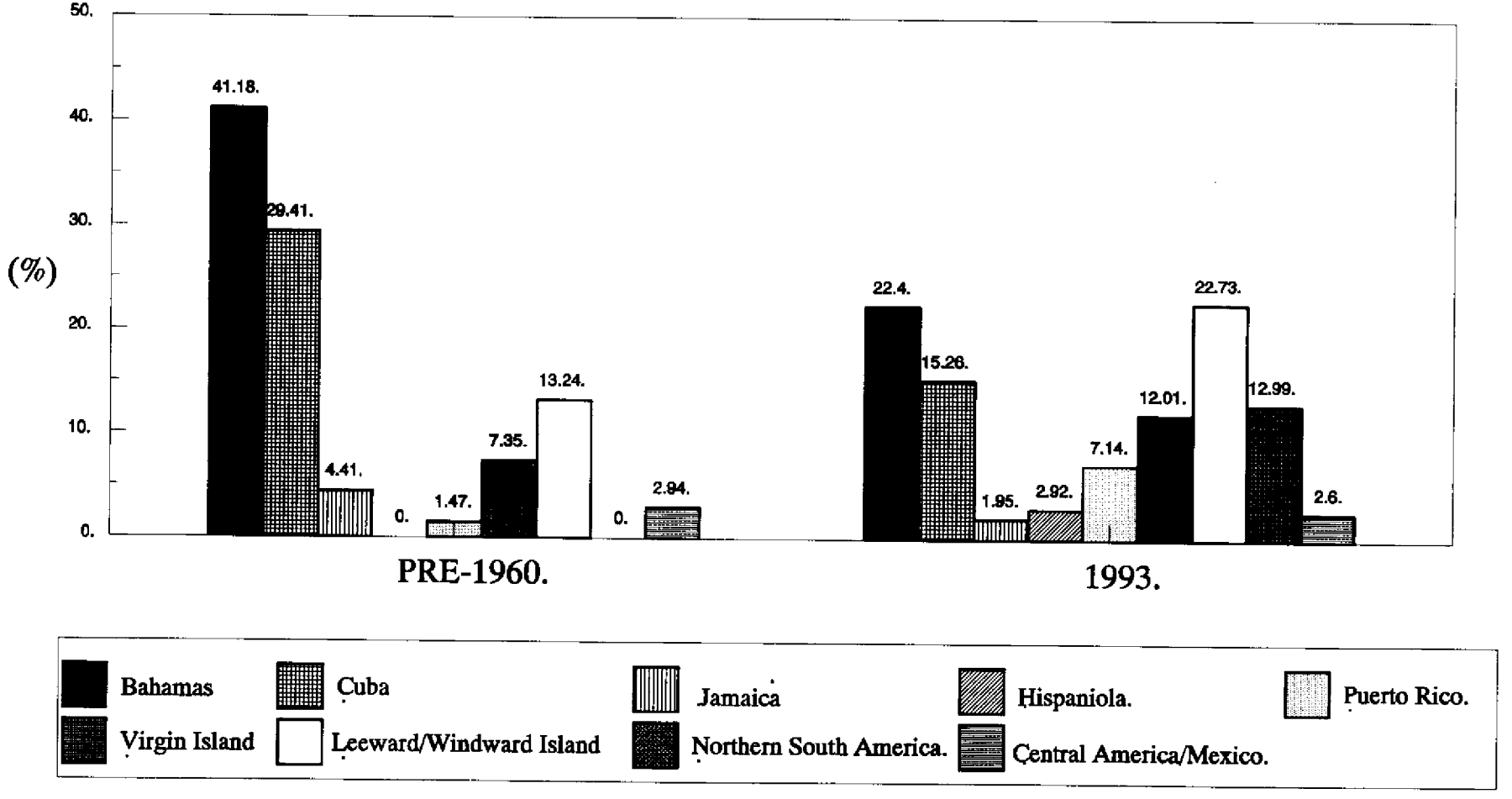

Figure 18.

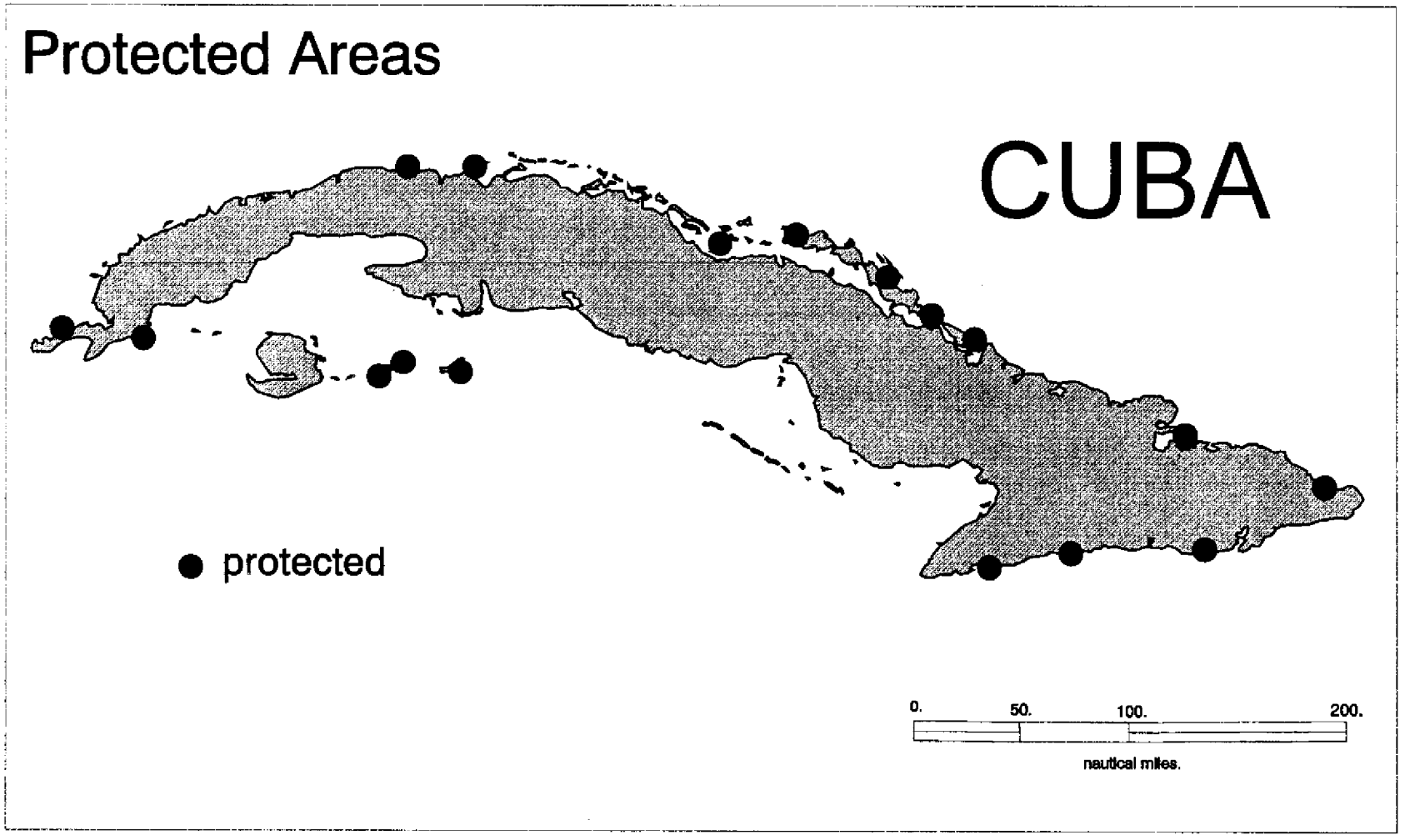

Figure 19

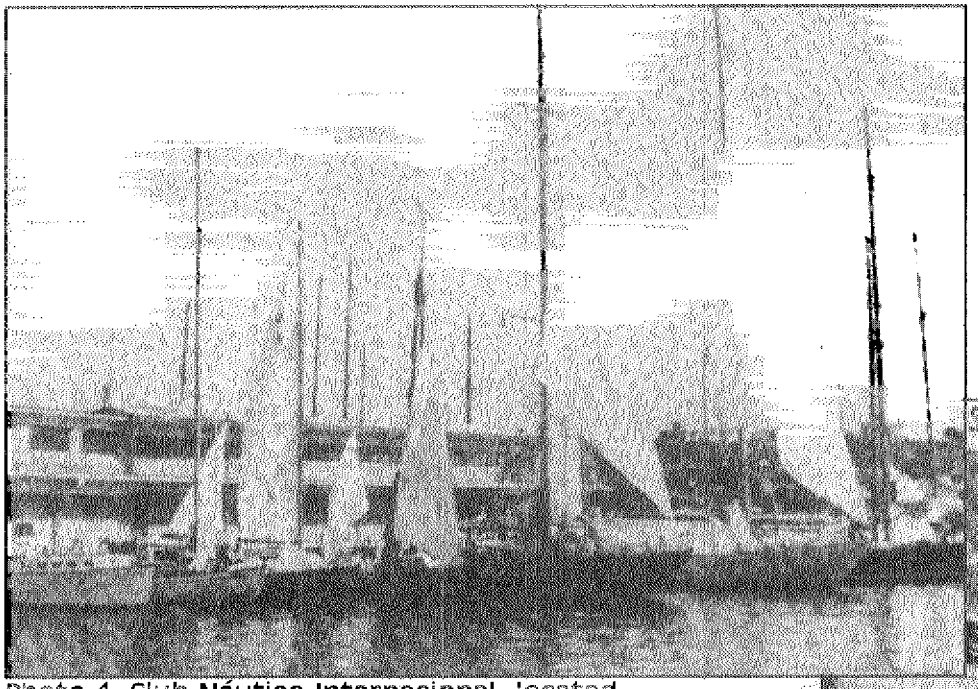

Photo 1. Club Náutico Internacional, located in Havana Harbor (Yachting, 1956).

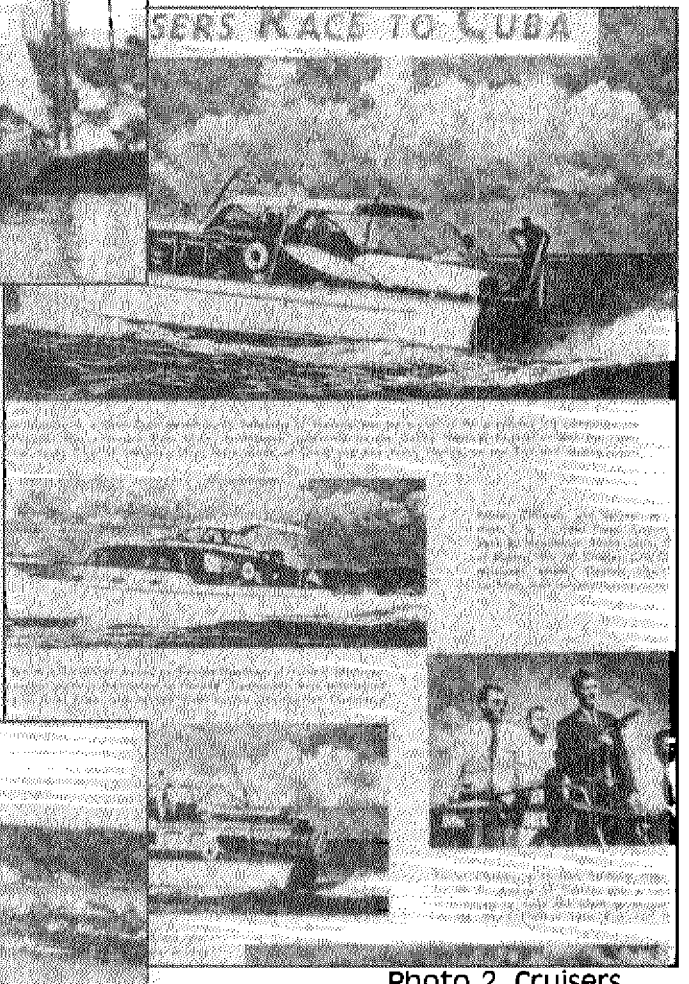

Photo 2. Cruisers race to Cuba (Yachting, 1950).

Photo 3. Santiago de Cuba Bay, location of one of the island's most active (1955) yacht clubs, the Club Amateur de Pesca (Aguilera, 1956).

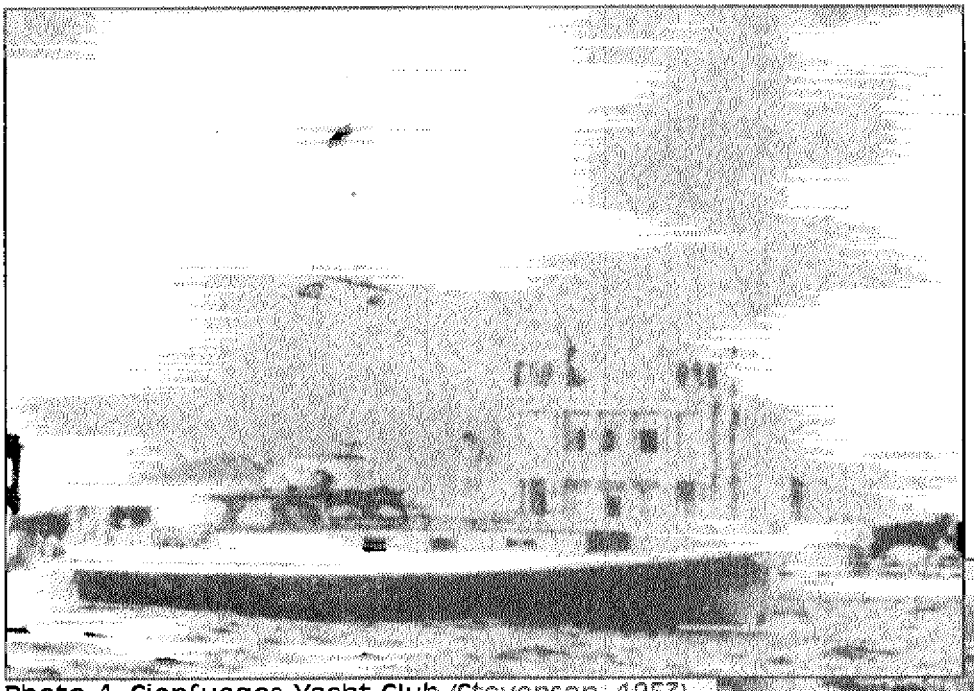

Photo 4. Cienfuegos Yacht Club (Stevenson, 1953).

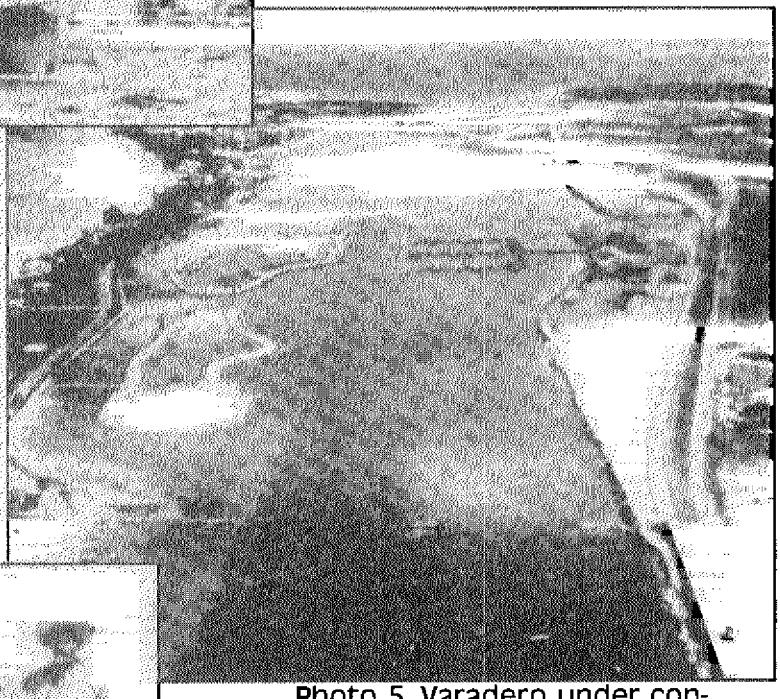

Photo 5. Varadero under construction (Aguilera, 1956).

Photo 6. Haul-out by a 6 ox-power railway at Niquero (Stevenson, 1953a).

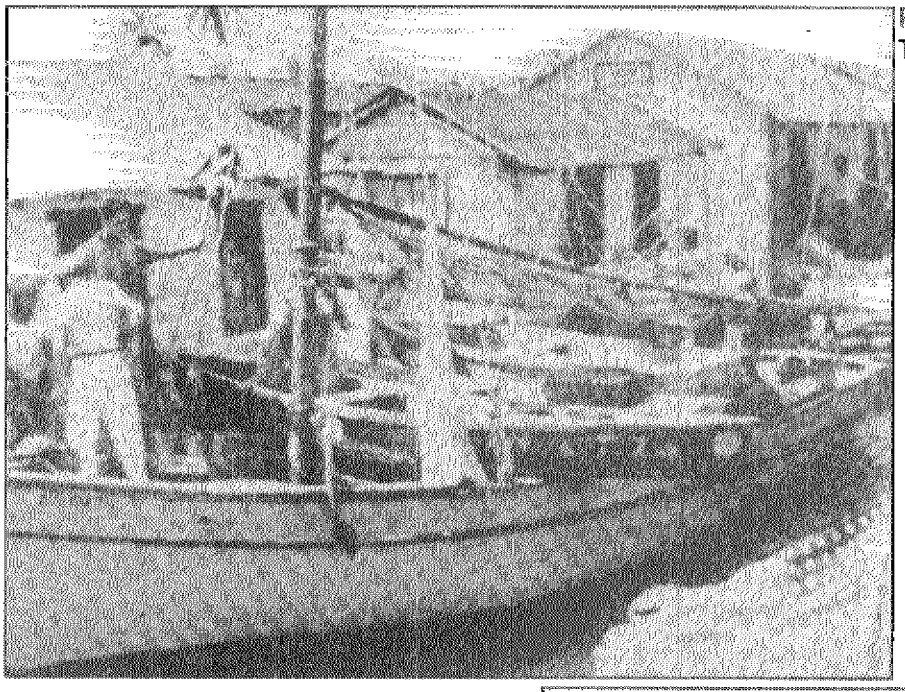

Photo 7. Town dock with fishing sloops at Tunas de Zaza (Stevenson, 1953a).

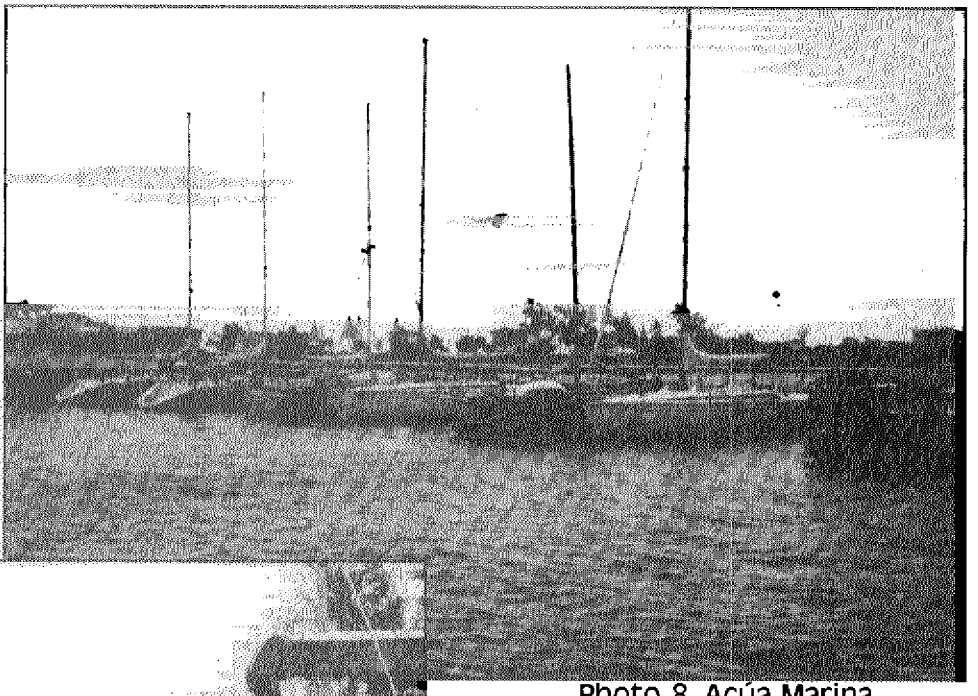

Photo 8. Acúa Marina, Varadero, Cuba (Photo by the author.)

Photo 9. Tarará Marina near Cojímar, Cuba (Photo by the author.)

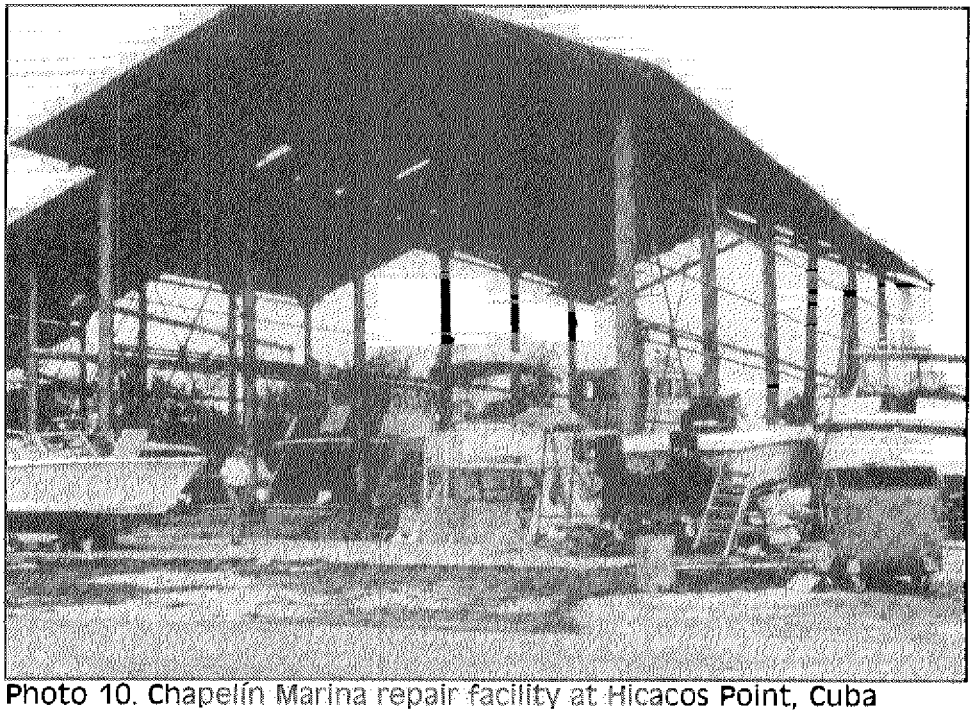

Photo 10. Chapelín Marina repair facility at Hicacos Point, Cuba (photo by author).

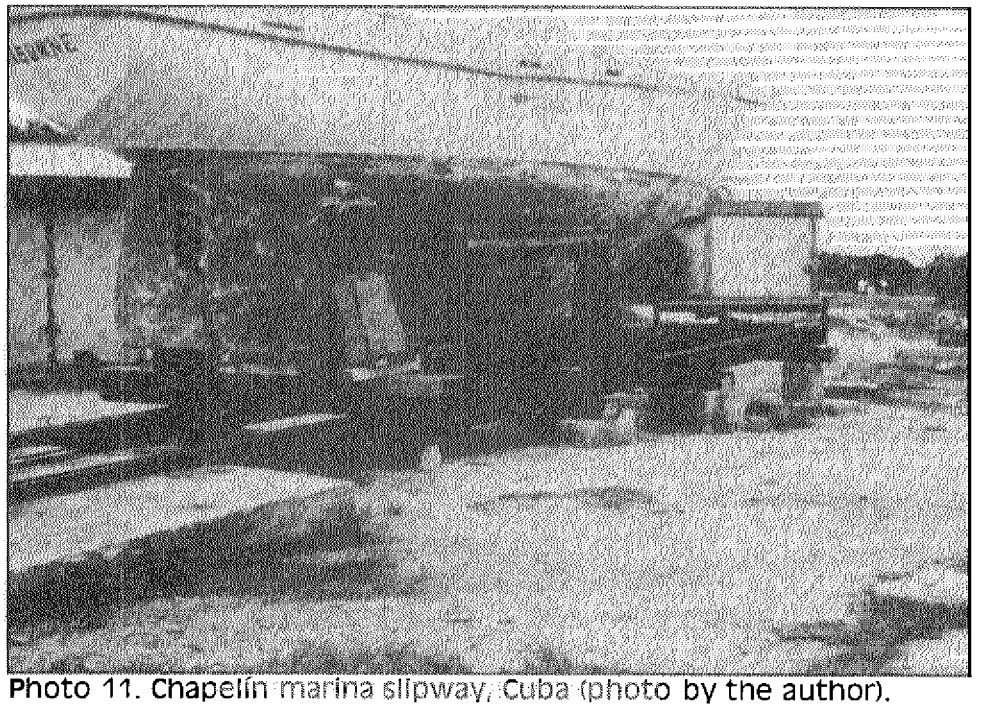

Photo 11. Chapelín marina slipway, Cuba (photo by the author).

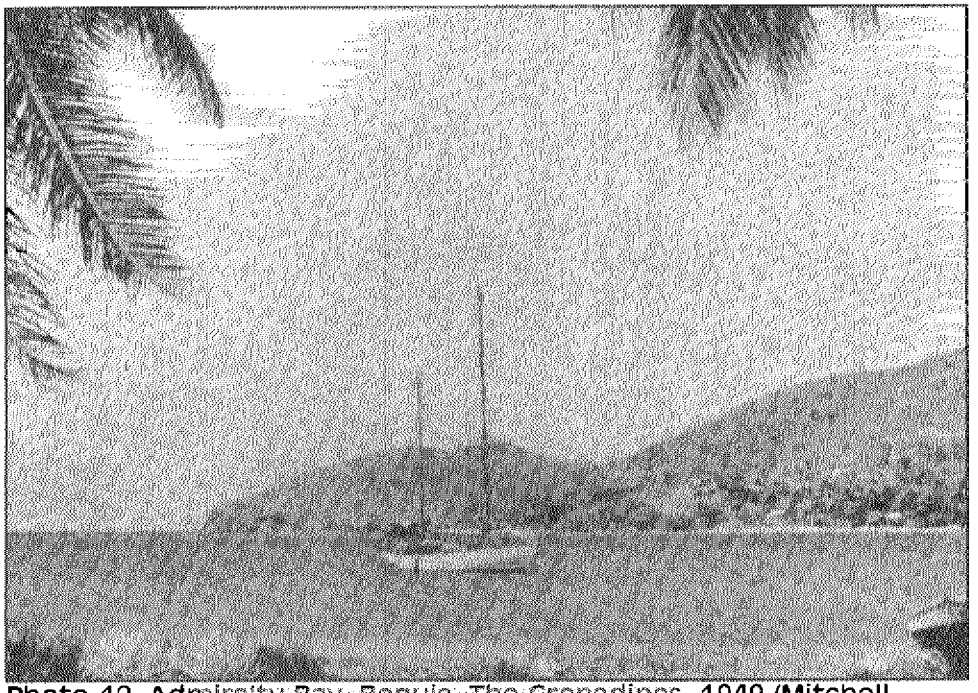

Photo 12. Admiralty Bay, Bequia, The Grenadines, 1949 (Mitchell, 1948).

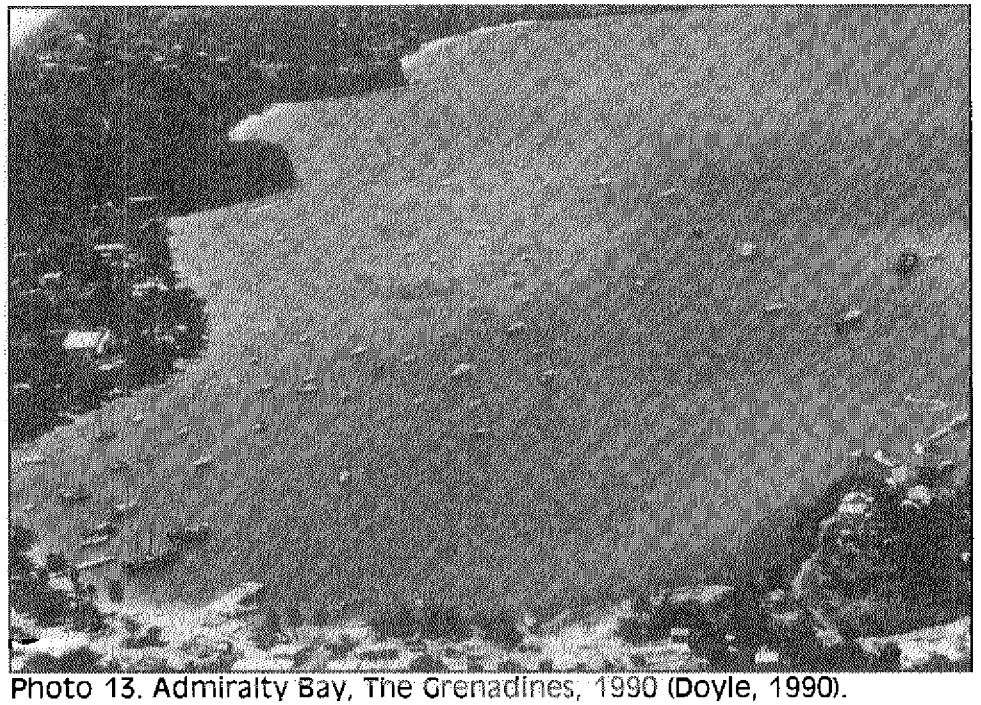

Photo 13. Admiralty Bay, The Grenadines, 1990 (Doyle, 1990).

Photo 14. English Harbor, Antigua, 1953 (Hiscock, 1957).

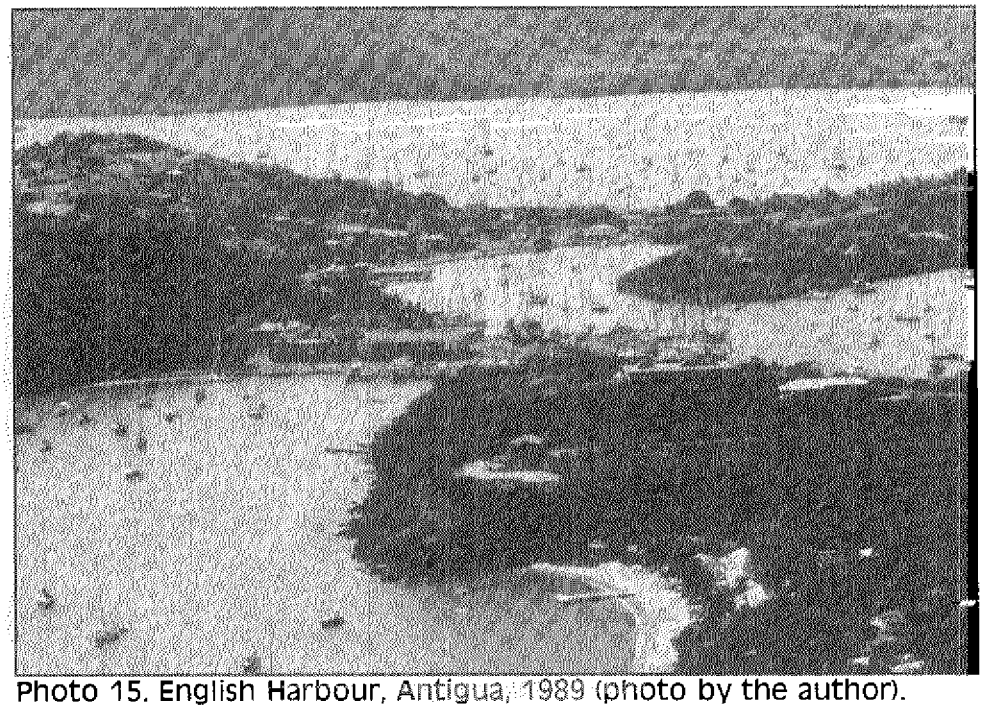

Photo 15. English Harbour, Antigua, 1989 (photo by the author).

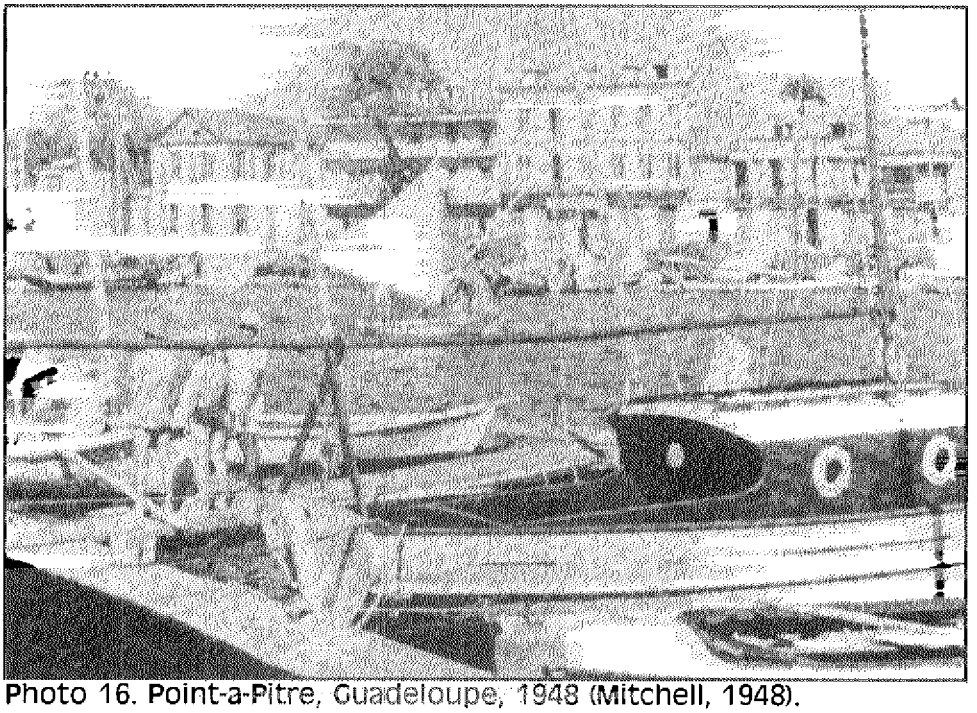

Photo 16. Point-a-Pitre, Guadeloupe, 1948 (Mitchell, 1948).

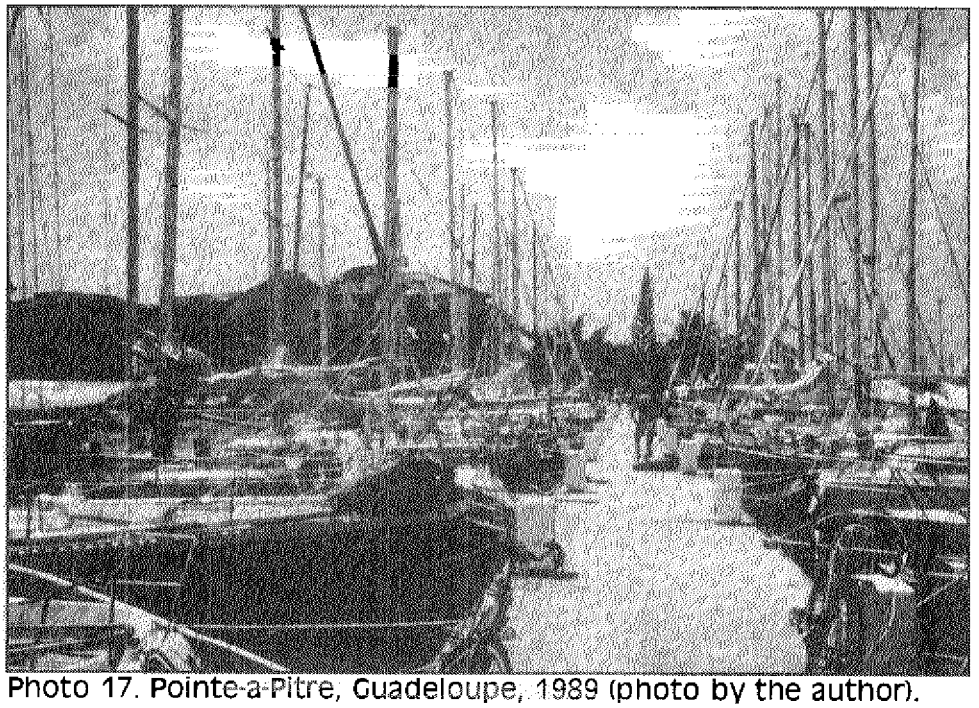

Photo 17. Pointe-a-Pitre, Guadeloupe, 1989 (photo by the author).

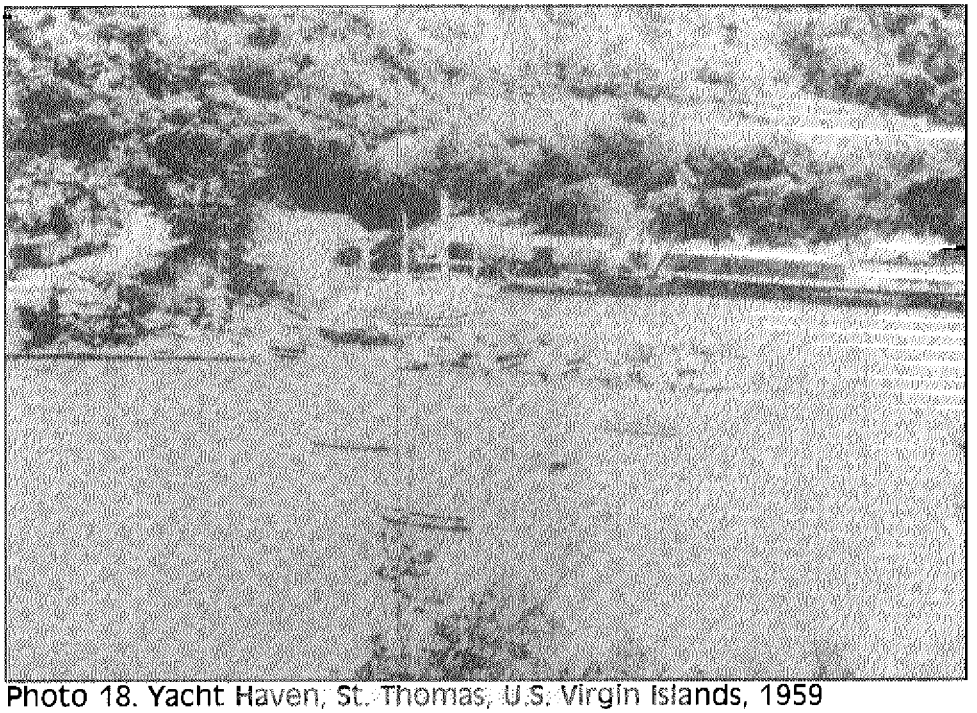

Photo 18. Yacht Haven, St. Thomas, U.S. Virgin Islands, 1959 (Eggleston, 1959).

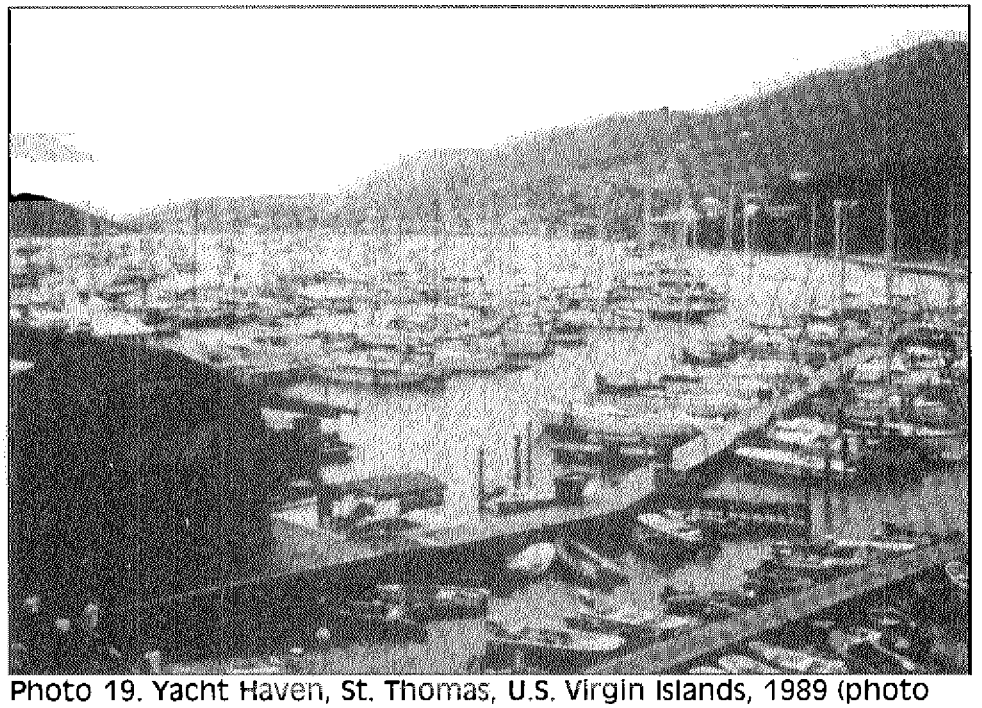

Photo 19. Yacht Haven, St. Thomas, U.S. Virgin Islands, 1989 (photo by the author).

Appendix 1 Pre-1960 Boating Facilities
A. Caribbean and Central America

Location Name	Marina and Yacht Club	Boat Yard	Town Dock	Total
Bimini - Cat Cay	4			4
Berry Islands	1			1
New Providence	2	1		3
Grand Bahama			1	1
Great Abaco	1	1	5	7
Andros			2	2
Eleuthera			5	5
Exuma			2	2
Rum Cay			1	1
Turks and Caicos		1	1	2
Bahamas Subtotal	8	3	17	28
Puerto Rico, San Juan	1			1
Puerto Rico Subtotal	1	0	0	1
US Virgin Islands	1	1	1	3
British Virgin Islands		2		2
Virgin Islands Subtotal	1	3	1	5
St. Kitts			1	1
Antigua			1	1
Guadeloupe	1			1
St. Vincent and Grenadines			2	2
Grenada			1	1
Martinique	1			1
St. Lucia			1	1
Trinidad and Tobago	1			1
Leeward/Windward Islands Subt	3	0	6	9
Jamaica - Kingston	2	1		3
Jamaica Subtotal	2	1	0	3
Panama - Colon	1	1		2
Central America/Mexico Subtota	1	1	0	2
Cuba - Havana	1	1		2
Cuba - Cienfuegos	1	1		2
Cuba - Santiago	1	1		2
Cuba - Cabanas			1	1
Cuba - Mariel			1	1
Cuba - Pto La Esperanza			1	1
Cuba - Batabano		1	1	2
Cuba - Guantanamo/Caimanera			1	1
Cuba - Baracoa			1	1
Cuba - Gibara			1	1
Cuba - Nipe			1	1
Cuba - Nuevitas			1	1
Cuba - Caibarien			1	1
Cuba - Isabela			1	1
Cuba - Cardenas			1	1
Cuba - Matanzas			1	1
Cuba Subtotal	3	4	13	20
TOTALS	**19**	**12**	**37**	**68**

Appendix 1 Pre-1960 Boating Facilities

B. South Florida

Location Name	Marina and Yacht Club	Boat Yard	Town Dock	Total
North Palm Beach	4	2		6
Boca Raton	1	1		2
Fort Lauderdale	6	11		17
North Miami	2	2		4
Miami	10	14		24
Upper Keys	2	1		3
Middle Keys	4	1		5
Lower Keys	2	1		3
Everglades City and Marco Island	1	2		3
Naples	0	2		2
Fort Myers and Fort Myers Beach	3	3		6
Sarasota	1	3		4
Bradenton	1	2		3
Tampa and St. Petersburg	7	15		22
Clearwater	1	1		2
TOTALS	45	61	0	106

Appendix 2 1993 Boating Facilities
A. Caribbean and Central America

Location Name	Marina and Yacht Club	Boat Yard	Town Dock	Total
Bimini - Cat Cay	6			6
Berry Islands	2			2
New Providence	3	4		7
Grand Bahama	6	1		7
Great Abaco	18	3		21
Andros	3			3
Eleuthera	5	2		7
Exuma	6			6
Long Island	2	1		3
Cat Island	1			1
San Salvador	1			1
Rum Cay	1			1
Turks and Caicos	3	1		4
Bahamas Subtotal	**57**	**12**	**0**	**69**
Haiti - North Coast, Fort Liberte			1	1
DR - North Coast, Puerto Plata			1	1
DR - North Coast, Samana			1	1
Haiti - West Coast, Port-au-Prince			1	1
DR - South Coast, Boca Chica	1	1		2
DR - South Coast, La Romana	2	1		3
Hispaniola Subtotal	**3**	**2**	**4**	**9**
PR - West Coast, Mayaguez	2			2
PR - South Coast	3	1		4
PR - North Coast, Arecibo	1			1
PR - North Coast, San Juan	3	1		4
PR - East Coast	9	2		11
Puerto Rico Subtotal	**18**	**4**	**0**	**22**
US Virgin Islands	15	4	1	20
British Virgin Islands	14	3		17
Virgin Islands Subtotal	**29**	**7**	**1**	**37**

Caribbean and Central America (Continuation)

Location Name	Marina and Yacht Club	Boat Yard	Town Dock	Total
St. Martin	11	1		12
St. Barts	2			2
St. Kitts	1	1		2
Monserrat	1			1
Antigua	5	2	1	8
Guadeloupe	4	3		7
Dominica	1			1
St. Vincent and Grenadines	3	2	1	6
Grenada	4	4		8
Martinique	3	3	1	7
St. Lucia	5	1	3	9
Barbados	2	1		3
Trinidad and Tobago	3		1	4
Leeward/Windward Islands Subtotal	**45**	**18**	**7**	**70**
Jamaica - Kingston	2	1		3
Jamaica - Pt. Antonio	2			2
Jamaica - Montego Bay	1			1
Jamaica Subtotal	**5**	**1**	**0**	**6**
Venezuela - Margarita	1			1
Venezuela - Pto Sucre/Pto Guanta	2	3		5
Venezuela - Pto La Cruz, Barcelona	3	1		4
Venezuela - Carenero	3	1		4
Venezuela - Pto Azul/Pto Carabellado	3			3
Venezuela - Pto Calera	1			1
Venezuela - Pto Cabello	1			1
Venezuela - Boca de Suanchez	4	1		5
Venezuela - Bahia Estanques		1		1
Venezuela - Pto Guaraganao	1			1
Venezuela - Maracaibo	2	1		3
Dutch ABC - Curacao	4	1	1	6
Dutch ABC - Aruba	2			2
Colombia - Barranquilla	2			2
Colombia - Cartagena	1			1
Northern South America Subtotal	**30**	**9**	**1**	**40**

Caribbean and Central America (Continuation)

Location Name	Marina and Yacht Club	Boat Yard	Town Dock	Total
Panama - Colon	1	1		2
Honduras - Bay Islands	1	1		2
Mexico - Cozumel	1	1		2
Mexico - Isla Mujeres	2			2
Central America/Mexico Subtotal	**5**	**3**	**0**	**8**
Cuba - Marina Hemingway	1			1
Cuba - Cayo Largo	1			1
Cuba - Varadero	3	1		4
Cuba - Bahia Hondo			1	1
Cuba - Cabanas		1	1	2
Cuba - Mariel		1	1	2
Cuba - Pto La Esperanza	1	1	1	3
Cuba - La Colonia			1	1
Cuba - Siguanea	1			1
Cuba - Batabano		1	1	2
Cuba - Playa Giron/Playa Larga			1	1
Cuba - Cienfuegos	1	1	1	3
Cuba - Santiago	1	1	1	3
Cuba - Guantanamo/Caimanera		1	1	2
Cuba - Baracoa		1	1	2
Cuba - Gibara			1	1
Cuba - Nipe			1	1
Cuba - Nuevitas	1	1	1	3
Cuba - Caibarien			1	1
Cuba - Isabela		1	1	2
Cuba - Cardenas		1	1	2
Cuba - Matanzas			1	1
Cuba - Havana/Almendares		1		1
Cuba - Tarana	1			1
Cuba - Cayo Guillermo	1			1
Cuba - Jucaro	1			1
Cuba - Cayo Blanco	1			1
Cuba - Bahia Corriente	1			1
Cuba - Sama	1			1
Cuba Subtotal	**16**	**13**	**18**	**47**
TOTALS	**208**	**69**	**31**	**308**

Appendix 2 1993 Boating Facilities
B. South Florida

Location Name	Marina and Yacht Club	Boat Yard	Town Dock	Total
North Palm Beach	3	5	0	8
Lake Worth Inlet	6	2	0	8
West Palm and Palm Beach	3	2	0	5
Boca Raton	11	2	0	13
Fort Lauderdale	23	8	0	31
North Miami	16	0	0	16
Miami	12	13	0	25
Upper Keys	21	4	0	25
Middle Keys	10	4	0	14
Lower Keys	9	4	0	13
Everglades City and Marco Island	4	2	0	6
Naples	4	5	0	9
Fort Myers and Fort Myers Beach	5	6	0	11
Sanibel and Pine Island Sound	8	0	0	8
Gasparilla Sound	5	2	0	7
Charlotte Harbor	6	2	0	8
Venice	8	8	0	16
Sarasota	8	3	0	11
Bradenton	4	3	0	7
Tampa and St. Petersburg	21	9	0	30
Clearwater	5	5	0	10
TOTALS	**192**	**89**	**0**	**281**

Appendix 3
1993 Caribbean and South Florida Charter Boats

LOCATION NAME	TOTAL
NEW PORT RICHEY	9
CHARLOTTE HARBOR	12
SANIBEL	13
MIAMI	9
MIDDLE KEYS	20
LOWER KEYS	9
FLORIDA SUBTOTAL	72
ABACOS	46
BAHAMAS SUBTOTAL	46
ST. THOMAS	134
ST. JOHN	5
TORTOLA	342
VIRGIN ISLANDS SUBTOTAL	481
ST. MARTIN	180
ANTIGUA	21
GUADELOUPE	93
ST. VINCENT AND GRENADINES	36
GRENADA	32
MARTINIQUE	184
ST. LUCIA	66
LEEWARD AND WINDWARD ISLANDS SUBTOTAL	612
NORTH COAST SUBTOTAL	17
SOUTH COAST	9
CUBA SUBTOTAL	26
TOTAL	1237

Boating and Politics: Why You Can't Go to Cuba, Yet

Terry L. McCoy[1]

"It's a SAILBOAT race and it's not political," participants in June 1994 Sarasota-to--Havana regatta (*Southwinds* (May 1994: 11).

"The organizers of this regatta should not try to disguise the event as a humanitarian cause nor sports event--it is an act of complete indifference and insensitivity toward the Cubans who continue suffering," Florida Governor Lawton Chiles (*Diario de los Negocios Inter-Americanos,* mayo de 1994, translated from Spanish).

There was a sharp difference of opinion regarding the 1994 Sarasota-to-Havana race. Participants saw it as nothing more than a recreational sporting event, but there were others who viewed it as the naive act of lending support to a ruthless dictatorship. The fact of the matter is that what most boaters take for granted -- the right to weigh anchor and cruise wherever they wish -- is caught up in a geopolitical dispute between Washington and Havana. As a result, for the last 35 years Cuba, the largest of the Caribbean islands and the one closest to the U.S., has been effectively off limits for U.S. boaters. This paper proposes to review the policies governing recreational boating to Cuba and the political forces which shapes them in order for U.S. boaters to better understand why they cannot cruise in Cuba and the prospects for a change in this situation.

U.S. Policy

The Political Context

Although a full discussion of U.S.-Cuban relations is beyond the scope of this paper, it is impossible to understand the restrictions on recreational boating to the island without putting it in this larger context.[2] What is most striking is that the relations soured very soon after Castro came to power and have remained highly polarized for 35 years. Today, five years after the end of the Cold War, Washington and Havana, the closest of neighbors prior to 1959, are still, in the words of Wayne Smith, "the closest of enemies" (1987). Appendix A contains a chronology of key events in U.S.-Cuban relations 1959-1994.

Castro, briefly welcomed by the U.S. in his struggle to overthrow the discredited Batista dictatorship, became Washington's worst dream in a matter of months. He summarily tried and executed his enemies, employed radical rhetoric, delayed promised elections, and seized private property, including the extensive holdings of U.S. investors. But his cardinal sins were to ally Cuba with the Soviet bloc and promote radical revolution elsewhere in Latin America. At the height of the Cold War frenzy in the U.S., he brazenly challenged Washington by introducing communism and the Soviet threat into the Western hemisphere.

The U.S. responded to each Castro provocation in kind, and U.S.-Cuban relations rapidly drifted

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[2]For two overviews of U.S.-Cuban relations, see Smith, 1987, and Wright, 1991.

toward the point of a total break. In January 1961, only two years after Castro came to power, the two countries broke diplomatic relations; in April, the U.S. sponsored the Bay of Pigs exile invasion to overthrow Castro; and, in December 1961, Castro, who easily turned back the Bay of Pigs force, declared himself to be a Marxist-Leninist and his revolution to be socialist. At this point, there was no turning back for Washington, and Cuba became the central preoccupation of U.S. Latin American policy and its containment a fundamental concern of U.S. foreign policy.

The objectives of U.S. policy, pursued by nine Republican and Democratic presidents, are: to isolate and contain Castro within the Hemisphere; to weaken Cuba's ties to the Soviet Union (and vice versa); and to remove the Castro regime. The instruments chosen to achieve these objects have been negative -- sticks not carrots. They have included everything from diplomatic isolation to exile raids and covert attempts to assassinate Castro. The centerpiece of U.S. policy, however, is the economic embargo prohibiting U.S. firms from trading with and investing in Cuba and U.S. citizens from traveling to Cuba.

The Cuban exiles who resettled in south Florida have reinforced the U.S. policy of containment. Cubans opposed to Castro began leaving very early in the revolution, and they have steadily streamed out of Cuba, often facilitated by Castro. Today, there are nearly one million Cubans living in the U.S. (versus 11 million in Cuba); and approximately 600,000 of whom reside in south Florida. The Cuban-American community has become an effective lobby in favor of the embargo and other measures to isolate and undermine the Castro regime. Its crowning accomplishment was the 1992 Cuban Democracy Act. Cuban-American opposition to any U.S. contacts with Castro's government has affected recreational boating relations with Cuba, directly as well as through the embargo.

U.S.- Cuban policy has fared less well in the international arena. At the height of Castro's attempts to export his revolution in the mid 1960's, the countries of Latin America broke diplomatic relations, voted to suspend Cuba from the Organization of American States, and adopted an economic embargo of their own (see Appendix A). But Canada and many European states refused to adopt such measures, arguing that it was more effective to engage the Castro regime than isolate it. In the 1970's as Castro retreated from radicalism, the Latin American countries began to re-establish diplomatic and commercial ties with Cuba. This rapprochement accelerated in the late 1980's with the demise of socialism throughout the world.

In recent years the U.S. has stood increasingly alone in its campaign to undermine Castro. In the 1970's when relations between the two countries began to warm up, Cuba and the U.S. opened diplomatic interest sections in each other's capitals in 1977. Many observers saw this as an important step toward full diplomatic recognition and the resumption of economic relations. The Carter administration did relax restrictions on travel and U.S. subsidiaries doing business with Cuba. But the dispatching of Cuban troops to Africa, Cuban intervention in Central America, the Mariel refugee crisis, and the advent of the conservative Reagan administration in Washington, brought a return to the policies of containment and isolation. Nor did these policies disappear with the end of the Cold War. In fact, the 1992 Cuban Democracy Act tightened the embargo.

The Act prohibits the Treasury Department from licensing trade by subsidiaries of U.S. firms with Cuba; prohibits foreign commercial vessels that have called on Cuban ports from stopping in U.S. ports for 180 days; and mandates the President to suspend U.S. foreign aid to any country providing grants or subsidized loans to Cuba. At the signing ceremony in Miami during the fall presidential campaign, President Bush stressed the purpose of the Act:

> The legislation that I sign here today reflects our determination . . . that the Cuban government will not benefit from U.S. trade or aid until the Cuban people are free. And it reflects another belief: I'm not going to let others prop up Castro with aid or some sweetheart trade deal (Bush,1992).

The Act also contains provisions for increasing humanitarian assistance to Cuba, improving telecommunications with the island, and promoting cultural and people-to-people exchanges, reducing the embargo in response to moves taken toward democracy and respect for human rights, and assisting a

transitional government (Watson, 1993). The international community has strongly condemned the act. In a 1993 UN vote condemning U.S. policy toward Cuba, only two countries -- Israel and Romania -- sided with the U.S..

President Clinton, who unsuccessfully courted Cuban-American voters in the 1992, is thus far committed to maintaining the economic embargo. In response to the August 1994 refugee crisis, the administration tightened it by suspending monetary remittances and charter flights to Cuba following measures to prevent Cuban refugees from reaching U.S. shores. Thus, as 1994 draws to a close, the United States is still locked into a policy of sealing off Cuba until, in the congressional testimony of a State Department official, "there is true, democratic reform and respect for human rights" in Cuba (Watson, 1993). This policy has obvious implications for boating.

Regulations Affecting Recreational Boating to Cuba

U.S. officials are quick to point out that Americans are free to travel to Cuba. In testimony before Congress regarding implementation of the Cuban Democracy Act, Assistant Secretary of State Alexander Watson stressed that "freedom to travel is a fundamental right that Americans cherish," and he claimed that 15,000 Americans went to Cuba in 1992 (*Ibid.*). The Cuban desk officer in the Department of State reiterated that "travel to Cuba is not prohibited under current U.S. law and policy" (Hays, 1994). The Constitution, as interpreted by the courts, does guarantee Americans the right to travel wherever and by whatever means they wish. Boaters may go to Cuba, but what they can do once there is severely limited by the embargo. After his assurance that there is no law nor policy against travel to Cuba, the Cuban desk officer continues: "but financial transactions incidental to travel to Cuba are regulated" (Hays, 1994). U.S. boaters cannot spend money in Cuba.

Table 1 summarizes the regulations and procedures affecting pleasure boating to Cuba. The most important are the Cuban Assets Control Regulations promulgated in 1963 under the Trading with the Enemy Act. The underlying rationale of these regulations, which are administered by the U.S. Treasury Department's Office of Foreign Assets Control, is to "isolate Cuba economically and deprive it of U.S. dollars" (U.S. Department of Treasury, 1993). The regulations prohibit the following: selling U.S. goods in Cuba, importing Cuban goods to the U.S., sending money (except small amounts to family members), and "[s]pending money in connection with tourist, business, or recreational trips . . ., whether travelers go directly to Cuba or via a third country" (Ibid.). They also specify reporting procedures and penalties for violating the regulations.

Although the regulations do not single out boating, they clearly apply to it. For example, "boat docking fees" would be a "financial transaction incidental to travel to Cuba," according to the Cuba desk officer (Hayes, 1994). Under the regulations, it is possible for boaters to travel under one of the four exempted categories -- U.S. government employees, family, professional researchers, and journalists -- which are allowed to spend up to $100/day, or to seek a Treasury Department license to take humanitarian supplies to Cuba. It is also possible to cruise Cuba living off of onboard stores and not spend any money. Although the Cuban Democracy Act did strengthen some aspects of the embargo, none of the changes affect boating.[3]

[3]The Act does not prohibit foreign pleasure craft which have been in Cuba from calling in U.S. ports, only foreign vessels which have commercially traded with Cuba (Hays, 1994).

Table 1

U.S. REGULATIONS AND PROCEDURES AFFECTING U.S. PLEASURE CRAFT CRUISING IN CUBAN WATERS

Regulations	Cuban Assets Control Regulations	
Before Departure	Eligibility:	Travel to Cuba not prohibited under U.S. law
	Restrictions:	Persons subject to U.S. jurisdiction prohibited from spending money related to travel to Cuba
	Exemptions:	Journalists, professional researchers, government officials, persons visiting close relatives, fully sponsored travelers (persons in these categories need not apply for permission and may spend up to $100 a day directly related to travel)
	Licensed Travel:	Those engaged in humanitarian or human rights activities may apply for licenses authorizing travel related transactions
	Boating:	Licensing normally denied for recreational travel, tourist travel and travel related to hobbies
Departure	Travelers flying to Cuba are required to fill out forms about their trip and the funds they are carrying; no similar controls exist for those going by boat	
Return	Boaters returning from Cuba must check in with U.S. Customs Service and report Cuba trip; all those dealing with Cuba must maintain records and make them available to Treasury Department Office of Assets Control on request	
Contacts	Public Affairs Office, U.S. Customs Service, Miami (305-536-4126) Office of Assets Control, Department of Treasury (202-622-2480)	

Sources:
- Letter from Dennis Hays. Coordinator of Office of Cuban Affairs, U.S. Department of State, April 29, 1994.
- U.S. Department of Treasury, Office of Assets Control, "Cuba: What You Need to Know About the U.S. Embargo," pamphlet, 1993.

Enforcement

While a few boaters go as journalists (see Cushing, 1994 a, b, c), or go on their own (see Fleming, 1992), or even on humanitarian missions (Halloran, 1994), the clear intent of the regulations is to discourage U.S. pleasure boating on a scale commercially rewarding for Cuba. Do the regulations work or do boaters ignore or skirt them? Enforcement depends on self-reporting. Skippers are not required to obtain prior approval but only to report to Customs on returning that they have been to Cuba and to maintain records on their expenditures and activities. This makes it relatively easy to falsify both, especially expenditure of funds (something that would be almost impossible to avoid, if only on a casual basis).[4]

There are only scattered reports of action to prosecute boaters who do go to Cuba. Customs seized the Dutch-registered vessel of a U.S. citizen who had been in Cuba because they discovered that he had repair parts delivered to him there which constituted trading with the enemy (*Cruising World*, September, 1993: 13). The boat was later returned after the owner paid a small fine. Treasury officials threatened to seize the boats of Key West charter captains who advertised that they were going to participate in the 1992 Ernest Hemingway International Marlin Tournament in Havana (Flannery, 1992). Only two boats participated, and the skipper of one had his trophy confiscated on returning to the U.S.. This treatment contrasts with that given participants in the 1994 Sarasota-Havana regatta. Federal authorities not only blessed the event, since Cuba was waiving slip and visa fees, but they provided participants protection from Cuban-American protesters (*St. Petersburg Times*, June 11, 1994). They also chose not to act on reports that the Sarasota sailors had in fact spent money in Cuba.

Although American yachtsmen do venture into Cuban waters, during a July 1994 visit to Cuban marinas, we saw very few U.S. registered boats.[5] This suggests that, while the probability of the individual boater facing legal reprisals for cruising Cuban waters may be very low, the mere existence of the embargo and its occasional use "muddies the waters" for recreational boaters contemplating going to Cuba (*Cruising World*, September, 1993: 13). An even more effective deterrent is the political controversy surrounding boating in Cuba. Two recent incidents illustrate this phenomenon.

In early 1993, the prestigious St. Petersburg Yacht Club announced that it was reviving the popular 284-mile St. Petersburg-Havana sail boat race which it had sponsored from 1930 until 1958. The club's announcement brought immediate protests from Cuban-Americans who claimed that it would benefit the Castro government. Florida Governor Lawton Chiles and other state and local officials sided with the Cuban-American community in urging that the race be canceled. The yacht club resisted these pressures until ten days before the start when the race was abruptly canceled. A local Cuban-American real estate developer thanked the club for "exercising good sense." The club issued a statement asserting that it "certainly has no desire to insult any of its friends or members by implying that it supports the current Cuban government" and that the race "engendered a level of controversy which was unanticipated and unintended" (*St. Petersburg Times*, March 11, 1993: 1C).

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[4]A skipper from Texas whose power boat was moored at the Hemingway Marina outside of Havana in July, 1994, told us that he avoided detection by entering and leaving Cuba through the Bahamas.

[5]At the five largest marinas on Cuba's north coast, we counted fewer than 20 vessels with U.S. hailing ports on their transoms, and met only four skippers who admitted that they were from the U.S.

Undaunted by what happened to the St. Petersburg Yacht Club, the more laid-back Sarasota Sailing Squadron announced in early 1994 that it was sponsoring a Sarasota-Havana regatta. Sailors throughout the southeast signed up to participate in spite of opposition from the Cuban American community and state officials. Regatta organizer, Bob Winters, had negotiated with Cuban authorities a fee waiver so that the racers would have no official expenses in Cuba. Winters also sought to give the event a humanitarian character by asking participants to bring food and clothing.

In contrast to the St. Petersburg Yacht Club's race, the Sarasota regatta took place, with 84 boats and several hundred sailors going to Havana.[6] But the squadron beat a hasty retreat on its return home. In the face of Cuban-American threats to prosecute the participants and the sponsoring Squadron for violating the embargo (press coverage of the regatta reported that many of the participants did spend money in Cuba) and the threat of the Sarasota City Commission to revoke the Squadron's lease of city property, the Squadron sent a letter to the commission "apologizing for its insensitivity to Cuban-Americans and promising it wouldn't sponsor another Havana race until relations improve" (James Flannery in *Soundings*, September, 1994: A14). The Squadron also revoked organizer Winters' membership.[7] Thus, the "Sarasota-Havana race faded into history as fast as it arrived, the sponsoring yacht club deciding against scheduling any more forays to Cuba because they are too politically charged" (*Ibid.*).

Although it is now legally possible for U.S. boaters to go to Cuba, it is hard to imaging how they can do so without spending money -- if only to buy a cold beer -- and thereby violate U.S. law. In any case, the "politically charged" atmosphere surrounding boating to Cuba guarantees that it will not occur on a large scale until the U.S. embargo is lifted.

Cuban Policy

The Economic and Political Context

While U.S. policy and politics discourage recreational boaters from going to Cuba, Cuban policy encourages them, even if it means violating the embargo (although the Castro government is clearly hoping that the embargo will be dropped). Cuba is in the midst of a severe economic crisis, and the government has turned to international tourism, including boating, for relief.

Before the revolution, Cuba was a major destination for U.S. tourists. Cuba's reputation as a North American playground complete with prostitution, gambling, and underworld ties, plus the general anti-American thrust of the revolution, led Castro to repudiate international

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[6]Fifty protesters greeted the June 10 start with shouts of "Freedom for Cuba" and "Cubans drown while sailors race" (*St. Petersburg Times*, June 11, 1994). An impressive array of federal, state, and local law enforcement agencies provided security for the racers.

[7]Winters was his own worst enemy. In addition to poor organization of the race itself, he shocked everyone when he announced on arrival in Havana that he was staying in Cuba for an unspecified period of time, working with "no salary" for the Club Náutico Internacional Hemingway (*St. Petersburg Times* , June 17, 1994). In a conversation with the author in July, Winters was enthusiastic about Cuba, although he admitted that he had left problems back in Florida. Then in the September 1994 issue of *Southwinds* (16) he indicated that he was having second thoughts: "They [the Cubans] . . . don't have much. It's a tough situation. I am not as fond of the government as I was. There are restrictions on travel. The young people have nothing to do." Squadron members felt that Winters had misled and used them.

tourism in the first decade of his rule. Instead he emphasized domestic, "social" tourism, turning over major resorts to unions, the Communist Young Pioneers, and other revolutionary organizations (Hall, 1992: 110-111). Of course, the embargo closed off the U.S. market, which had provided nearly 90 percent of foreign tourists to Cuba prior to the revolution (*Ibid.*). Relaxation in U.S.-Cuban relations in the mid 1970s, along with moderation of Cuban politics and policies, resulted in increased foreign tourist arrivals and revenue. In the 1980's Cuba gave even higher priority to developing tourism as it came under pressure to pay its hard currency foreign debt. It was the collapse of the Soviet Union and socialism in Eastern Europe, however, which provided the definitive impetus for Castro to return international tourism to the importance it had before 1959.

The end of the Cold War has triggered a major economic disaster in Cuba. The Soviet bloc accounted for over 85 percent of all Cuban trade, much of it subsidized on terms favorable to Cuba. The sudden loss of this trade after 1989 threw the Cuban economy into a free fall. From 1989 through 1993, the country's gross domestic product declined by an astounding 44 percent (Economist Intelligence Unit, 1994: 4). The extraordinary challenge represented by this crisis forced a "special period at a time of peace" with required harsh austerity measures for the Cuban people, on the one hand, and special incentives to develop the Cuban economy, on the other. The incentives include: permitting Cubans to hold and spend dollars, authorizing small self employment enterprises, establishing semi-private agricultural cooperatives, and funneling public resources and foreign investment into the development of sectors with the greatest promise for generating hard currency, minerals extraction and international tourism (Gunn, 1994). For Castro, "tourism is gold" because it produces hard currency (*Miami Herald*, January 10, 1994: 1).

It is important to stress that the Cuban government has adopted these capitalistic measures not to abandon socialism but to save it. It is possible that they may eventually undermine the system, but there is no commitment to a fundamental transition, either to a market economy or constitutional democracy, as demanded by the U.S. government and Cuban exile community (Caivano, 1994).[8]

Development of the Tourism Sector

The government's plan for reviving Cuba as a major international tourist destination includes reallocating resources, seeking foreign partners, reorganizing government agencies, and sophisticated marketing. There is evidence of success, but there are problems, the most daunting being the absence of U.S. tourists.

The government is funneling a significant percentage of its severely stressed budget and scarce foreign exchange reserves into the construction of new hotels, restoration of existing facilities, training personnel, improving infrastructure, and the addition of complementary activities and facilities. Castro promises to add 4,000 new rooms a year (*Miami Herald,* January 10, 1994: 1). Special attention is given to upgrading accommodations and service, which, although improved, are still low by Caribbean standards. Although tourist development has concentrated on the Varadero Beach region east of Havana, it is now taking place elsewhere on the island.[9]

Foreign investors are sought for capital but also for management skills (Caivano,

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[8]In a speech celebrating Cuba's family medicine program televised to the Cuban people while we were in Havana, Fidel Castro made it very clear he had no intention of presiding over a transition to capitalism. He ended his remarks with the revolutionary exhortations: "Socialismo o muerte. Patria o muerte. Venceremos!" ("Socialism or death. Fatherland or death. We will be victorious!)

[9]There were a number of new large hotels under construction at Varadero in July 1994.

1994: 2). Joint venture arrangements give the foreign companies autonomy in dealing with a wide range of issues, including labor relations. For their part, tourism workers, paid in pesos (which allows the government to capture more hard currency), are now allowed to keep a portion of their dollar tips, which acts as a powerful incentive to work in tourism.[10] Cuba's joint ventures in tourism also offer investors a quick return on investments, thus minimizing some of the long term uncertainty Cuba presents the potential investor (*Ibid.*). Companies from Europe, Canada, and Latin America are investing in tourism under the various arrangements (Zellers, 1994: 262).

In its effort to develop tourism as quickly as possible, the Cuban government has experimented with various organizational arrangements. The most interesting are semi-autonomous, semi-private, competitive *empresas* (enterprises). Cubanacan is the largest and most visible of *empresas*, but even the armed forces has its own tourism enterprise, Gaviota. In April, 1994, the government pushed tourism development to an even higher level institutionally by establishing a Ministry of Tourism to replace the National Institute of Tourism or INTUR (*Latin America Weekly Report, May 5, 1994: 183)*. Although the ministry -- one of five new ministries -- was only in its infancy, in July, 1994, we spoke with two people likely to be named to high positions in it, and they stressed that the ministry would set general policy and evaluate results, but not manage projects. Management would continue to be the responsibility of the *empresas* . They also stressed that the new objectives of Cuban tourism policy were: to improve service, to diversify Cuban tourism, and to generate better economic returns.[11]

Cuba has made impressive strides in expanding its tourism facilities and reaping the benefits in a relatively short period of time. The number of foreign visitors to the island has doubled every year since 1988, reaching 600,000 in 1993 (more than twice the number of tourists during the best year prior to the revolution). Not only are more tourists going to Cuba, but they are spending more money. In 1993 tourism generated $700 million in revenue of which $350 million was profit for Cuba (*Miami Herald*, January 10, 1994: 1). In June, 1992, Cuba became a member of the Caribbean Tourism Organization, a sign of its acceptance as a serious and legitimate participant in the competitive Caribbean market (Zellers, 1994: 260)

Arturo Villar (1994) describes tourism as "the only bright star in Cuba's economic future." There are problems, however. The level of service and value added are still low. But of much greater concern is the enclave nature of tourism in Cuba today and the absence of Americans.

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[10]At the black market exchange rate, which is the only way dollars and pesos are exchanged, a waiter in a tourist hotel makes the equivalent of more in tips in one day than a medical doctor makes in a month. The director of a scientific institute complained to us that his son had no interest in attending the university, but instead enrolled in a tourist training program. Caivano (1994:2) reports, "Many of those filling jobs as waiters, chambermaids and bellboys are doctors, teachers and engineers who prefer to work for dollar tips rather than their meager peso salaries."

[11]We visited two other agencies -- the Instituto de Hidrografía and the Academia de Ciencias -- in which tourism has assumed greater importance. Although the former is linked to the Ministry of Defense, its resources (51 percent) and staff are increasingly devoted to tourism-related projects, while the Academy of Sciences has been absorbed by the new Ministry of Science, Technology and the Environment. Both are supposed to become self-supporting. Beyond anxiety about whether positions would be eliminated and what the new lines of authority would be, academy scientists with whom we spoke were concerned about reconciling tourism development with environmental protection.

Because most Cubans do not have dollars, they do not have access to tourist resorts.[12] Perhaps just as significant for building Cuba as a tourist destination is the fact that, although tourists are theoretically free to wander anywhere, "the currency barrier, coupled with the effects of tight rationing, pretty much keep [them] on the tourist track" (Mosak, 1992). Cuba's rich history and culture remain beyond the experience of most tourists. As for the Americans, they account for 60 percent of all tourists in the Caribbean. Without them, Cuba will have difficulty expanding beyond the three percent of Caribbean tourist arrivals it currently receives (Hall, 1992: 104-105).

Marine Tourism

> "Our facilities are yours, just choose the time . . . we provide the rest" (Marina Hemingway Brochure).

With 5,746 kilometers of coastline, 1600 keys and islets, coves, bays and inlets, and 289 recognized beaches, Cuba's marine resources are unsurpassed in the Caribbean, if not in the world, and the government's development plan gives special attention to coastal and marine tourism (*Ibid.*: 111-112). Thus far the emphasis has been on developing water sports linked to the large destination resorts that cater to European and Canadian package tours. These include diving, fishing, nautical tourism, and beach activities (jet skis, wind surfers, etc.). According to officials of Marlin, the Cubanacan subsidiary responsible for its marine tourism, 40 percent of Cubanacan visitors engage in nautical activities. These generated $2.7 million in revenues in 1993, up 33 percent over the previous year. Marlin coordinates its activities with the marine enterprises of Cubanacan's two "competitors."

The Cuban government is also developing pleasure boating facilities, most importantly chartering and marinas. In addition to individual charter boats -- sail and power -- available by the day and week with captain and crew, in Varadero we visited a charter operation with a fleet of ten 43' Beneteau look-alikes made in the former Yugoslavia.[13] The government has a three-stage plan for marina development: first, to improve and expand current marinas; next, to build new facilities adjacent to popular tourist areas without marinas; and, finally, to build new marinas in remote areas in order to open up under-utilized areas of the coast (Villar, 1994). It seems clear from our conversation with officials that the last stage will not be embarked upon until U.S. boaters have access to Cuba in large numbers.

A Marlin official told us that Cuba currently only has only two full service marinas (Hemingway and Acúa), but Villar (1994) reports that there are 13 marinas suitable for tourist use and another ten designated for expansion. In July 1994, we visited five marinas from Marina Hemingway west of Havana to Gaviota on the eastern tip of the Varadero peninsula. Hemingway is the largest and best known marina in Cuba. Begun in the 1950's as a water front community with canals for residents to dock their boats behind their houses, its current capacity is two hundred boats, but with finger piers it could hold up to 2000, according to the marina's architect. Recent

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[12]Some of the resorts formerly available to Cuban tourists are being converted to dollar resorts for foreigners. At the José Martí Young Pioneers camp east of Havana, we saw dormitories and cottages being turned into condominiums to complement the marina now in operation. An added attraction of this site is the memorial to policemen killed by Cubans who were trying to steal a boat and flee to the U.S.

[13]According to the captain of one of the boats, their charge for day sails is $55 a day per person with lunch and captain. The clientele are European tourists and the operation is a joint venture between Puerto Sol and a German company.

construction and upgrading has added a hotel, restaurants, a discotheque, furnished villas, a small grocery store, swimming pool, tennis courts, a repair yard with lift, and other features found in U.S. marinas.[14] There is also a club -- Club Náutico Internacional Hemingway -- at the marina which is trying to promote international boating in Cuba.[15] Although prices and charges are reasonable, they are all in dollars. The four other marinas we visited (Marlin, Acúa, Chapelin, and Gaviota) were not as large or well equipped as Marina Hemingway, but they were real marinas and could easily be upgraded. Table 2 summarizes the Cuban regulations and procedures governing U.S. pleasure craft in Cuba.

Boating in Cuba

The main impression we came away with is that recreational boating is currently on hold in Cuba, in spite of the island's great appeal as a boating destination and the efforts of the Cuban government to attract foreign boaters. Boaters who have cruised Cuba praise its unspoiled natural beauty and the friendliness of the Cuban people (see Cushing, Fleming, Stone, and reports on Cuba in *Commodores' Bulletin* of Seven Seas Cruising Association). Generally they find the facilities acceptable, and the bureaucratic red tape no worse than other foreign landfalls. One author compared cruising Cuba to a remote mid-ocean landfall since boaters "must solve provisioning and parts from their own on-board lockers" (Kellogg, 1992: 61).

But whatever its attractions may be, we saw very few foreign registered boats in Cuba, and the vacancy rate in the marinas was very high. Part of the explanation lies in the fact that boating in Cuba is a little too adventuresome for most boaters, even those who are legally permitted to do so. There is also evidence that boaters feel uncomfortable cruising where there is growing discrepancy between the visitor and the local population. Crime and begging are also on the rise in Cuba, although they are still less a problem than in most other Caribbean islands. Finally, the refugee crisis of August 1994 has undoubtedly created more uncertainty about boating in Cuba.

The most obvious explanation for absence of foreign boaters in Cuba is the U.S. embargo -- it effectively deters U.S. boaters from taking that 90 mile passage across the Florida Straits to the last unexplored cruising, fishing, and diving area in the Caribbean. Those U.S. boaters who do go to Cuba receive a warm welcome but end up spending very little money.[16] Cuban officials repeatedly made it clear that they are betting that U.S. boaters will soon be able to freely spend dollars in Cuba because without them the future of marine tourism in Cuba is bleak.

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[14]In its September 1994 issue, *Southern Boating* reports that Yacht Support Services Ltd. is operating out of Marina Hemingway, and that it claims that "it can smooth entry procedures, get spare parts through customs, arrange duty-free fuel and even arrange sail or power charters." YSS was setting up its office during our visit. For U.S. boaters to purchase its services would clearly violate the embargo. In one of the ironies that characterizes Cuba today, the Marina Hemingway is across from a special academy of the Communist party.

[15]According to the manager, the club has 230 paying members, primarily from Havana's diplomatic community. It hosted the Sarasota race in 1994.

[16]Cuban officials and the Cuban press heralded the Sarasota-Havana race as a new era in marine relations, but economically the event had to have been a net loss for Cuba, since slip and visa fees were waived.

Table 2

CUBAN REGULATIONS AND PROCEDURES AFFECTING U.S. PLEASURE CRAFT CRUISING IN CUBAN WATERS

Before Departure	Not necessary to secure permission to enter Cuba prior to departure, but it can be done at least 20 days prior to entry by contacting Cubatur (Calle 23# 156 entre NYO, Ha- bana 4; telex: 511366; tel: 324521) and providing information on captain, crew, and vessel	
Entering	Ports of Entry:	Barlovento (Marina Hemingway); Camagüey (Santa Lucía Beach); Casilda [Trinidad] (Ancón); Cienfuegos Bay (Jagua); Golfo de Guacanayabo (Manzanillo); Guantánamo (Baracoa); Holguín South (Marina Bahía de Naranjo); Isla de Juventud (Colony); Los Canarreos (Cayo Largo); Pinar del Río (Santa Lucía); Santiago de Cuba (Muelle Romero); Varadero (Marina Gaviota, Marina Chapelín, Marina Agua, Marina Paraíso)
	Proce-dure:	For entering Marina Hemingway -- Call Coast Guard (Guardiafronteras) on VHF Ch. 16 to identify and seek permission to proceed -- Tie up at police dock at entrance to marina and stay on board ship until inspected and certified by: -- Sanitation: Health certificate -- Immigration: All persons aboard must be issued tourist cards -- Customs: Signed declaration of contents of vessel -- Agriculture: Plant and animal products -- Coast Guard: Must have a permit to use boat or dinghy
Cruising	Must have permit (Certificado de Seguridad) to cruise Cuban coast, specifies areas which cannot be visited Must clear in and out of ports open to foreign vessels Advise Coast Guard by VHF of proposed overnight anchorages	
Departure	Vessels must notify Coast Guard 24 hours prior to leaving of desire to depart, subject to inspection and formal check out	
Contacts	Cuban Interest Section 2639 16th Street NW Washington, D.C. 20009 Tel. 202-797-8609/8615 Fax 202-797-8521	

Sources:

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Conclusion

Until the U.S. embargo is lifted, recreational boating in Cuba will remain beyond the reach of all but a very few U.S. boaters. Once it is lifted, U.S. boating to Cuba will boom, probably overwhelming facilities in Cuba and Florida. The most recent crisis in U.S.-Cuban relations has in the short run strengthened the embargo and shoved boating of the recreational variety further into the background. In the longer run, it may precipitate deeper changes, either in the form of a political upheaval in Cuba that would bring down the regime or through mutual concessions that would initiate significant changes in Cuba and progressively lower the embargo. As a result we may be closer to a resumption of U.S. recreational boating in Cuba than we were before August 1994.

Appendix

Chronology of Key Events in U.S.-Cuban Relations 1959-1994

Date		Event
1959	January	Batista government falls and Castro assumes power U.S. recognizes government of Fidel Castro
	April	Castro pays official visit to Washington
1960	February	USSR agrees to buy Cuban sugar and extend long term credit
	August	U.S. imposes partial embargo on exports to Cuba; raises Cuban issue in OAS and gets weak condemnation
	October	Total U.S. embargo on exports to Cuba (except food and medicines); extends embargo to foreign subsidiaries of U.S. firms; eliminates Cuban sugar quota; blacklists vessels carrying cargo to and from Cuba from carrying U.S. government-financed cargo
1961	January	U.S.-Cuban diplomatic relations severed
	April	Bay of Pigs invasion
	December	Castro declares himself a Marxist-Leninist and proclaims the Revolution socialist
1962	January	OAS suspends Cuba
	Feb-May	U.S. bans virtually all imports from Cuba
	July	OAS bans military trade by members with Cuba
	October	Missile crisis; U.S. acts to withhold foreign assistance from countries with ships trading with Cuba but reaches an agreement with the USSR to cease attempts to overthrow Castro
1963		U.S. freezes all Cuban assets under Trading with the Enemy Act; NATO agrees to military but not trade embargo
1964		OAS votes for members to sever diplomatic relations with Cuba and adopt a full trade embargo

1975		OAS votes to lift collective sanctions; U.S. allows licensing of foreign subsidiaries of U.S. firms to do business with Cuba
1977		U.S. and Cuba open diplomatic interest sections in each other's capitals; U.S. loosens restrictions on travel to Cuba; discussions underway on broad range of issues
1978		Cuban troops deployed in Africa
1979		Report of Soviet combat brigade in Cuba; outbreak of conflict in Central America
1980		Mariel boat lift
1981		U.S. tightens economic embargo
1982		U.S. bans business and tourist travel to Cuba
1984		U.S. and Cuba negotiate agreement to normalize immigration and return Mariel excludables
1985		Cuba suspends Mariel immigration agreement to protest Radio Marti
1986	July	Cuba stops servicing $7 billion foreign debt
	August	U.S. tightens embargo by acting against front companies in third countries, revoking permission for Cubans to obtain U.S. visas in third countries and reducing amount relatives can remit to Cuba as gifts
1987		Mariel agreement reinstated allowing normal migration
1988		Cuba agrees to begin withdrawing troops from Angola
1989		Collapse of Socialist Bloc
	December	U.S. invades Panama, eliminating key location for circumventing embargo
1990	February	Sandinistas defeated in Nicaraguan election
	March	TV Marti begins transmitting to Cuba
	Spring	Cuban Democracy Act introduced into Congress
	October	Castro declares "Special Period" to cope with economic crisis
1991	May	Pres. Bush offers to improve relations with Cuba if it holds free elections under international supervision, respects human rights and stops subverting its neighbors

1992		Pres. Bush signs Cuban Democracy Act
1993		Cuban government legalizes U.S. dollar and small private businesses
1994	April	Cuban exile conference in Havana
	August	U.S. prohibits Cuban refugees from entering U.S. and suspends remittances and charter flights in response to refugee crisis
	September	U.S. and Cuba sign agreement funneling migration through legal channels

Compiled from various sources.

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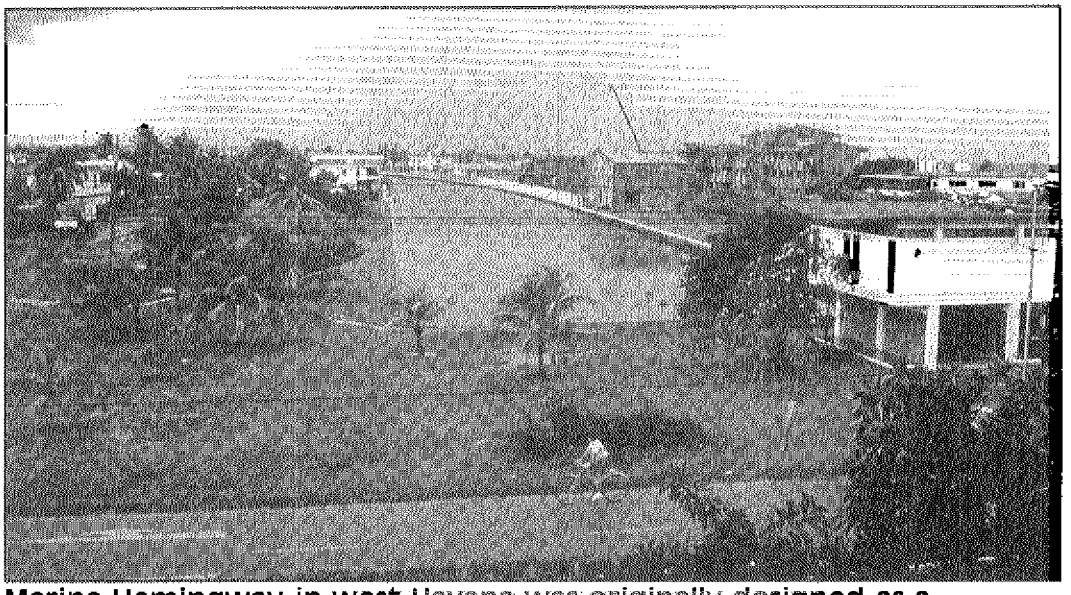
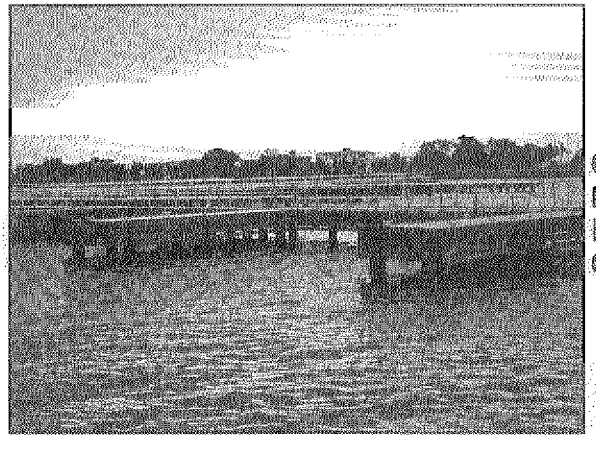
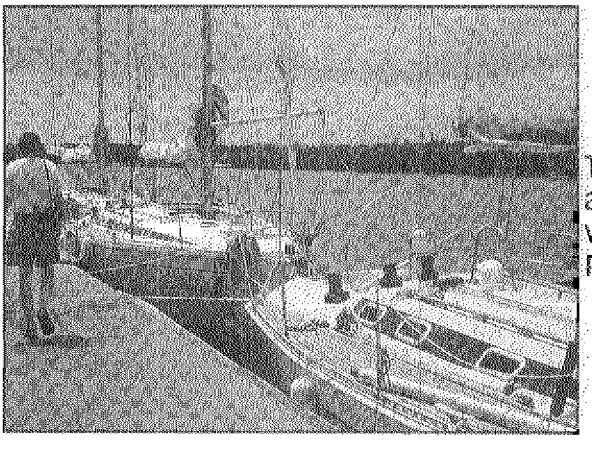


Marina Hemingway in west Havana was originally designed as a residential project. The long-term development plan includes 2,070 rooms, restaurants, golf courses, boat repair facilities support for sailing schools and other activities at a planned cost of $219 million U.S. dollars. It's clearly aimed at the U.S. boater.



Cuban tourism officials hope to one day see Marina Acua and Varadero filled with visiting boaters. This marina is the closest one in Cuba to Key West, Florida.



This charter fleet of ten 43-foot sailboats awaits customers near Varadero. It is a joint venture between the Cuban enterprise Puerto Sol and German investors.

The Impact on Florida's Marinas and Recreational Boating Based Industries of a Post-Embargo Cuba: The Need to Plan Now

James C. Cato[1]

Introduction

Cuba is destined to become a major center of tourism not only in the Caribbean, but over time in the entire hemisphere. The mystique of Cuba, and its historical ties and nearness to the United States, will make it a major choice of both vacation destination and expanded business opportunity. The government of Cuba recently made tourism a high priority for development,[2] and tourism in Florida stands to be impacted by tourism in Cuba more substantially than any other geographic area of the U.S. This impact can be positive or negative from either an economic or environmental point of view.

Everyone is asking, "What if the U.S. embargo against Cuba is lifted? How will it affect my business or way of life?" The effect on "ocean and coastal" trades can be substantial -- ranging from cruise line opportunities and shrimp farming (The Cuba Report, June 1993) to major shipping and transportation opportunities for Florida ports (Jacksonville Magazine, September 1993). Florida boating and marina-related businesses are in a position to be greatly impacted by the opening of Cuba to unrestricted travel by U.S. citizens, and this has implications for an important sector of Florida's economy. It has been almost a decade since an in-depth statewide study has been conducted regarding the economic value of the Florida recreational boating and marina industry. In 1985 the total direct economic activity associated with boating and marinas was $1.4 billion (Milon and Adams, 1987) with 23,000 jobs created.

Today that value would be much larger and boating and marinas continue to contribute to Florida's economy. One could speculate that the industry might grow based on a Cuba open to U.S. based travel. More people might purchase boats to recreationally boat to Cuba, and more transient boats might pass through Florida to reach Cuba. More marinas would be required as well as more services. Florida will be the point of departure. The impact on individual businesses (boat manufacturers, marine equipment manufacturers, marinas and boatyards, and those who provide marine trades and services) however, will likely depend on the unique attributes of those businesses, their location, the strategic planning skills of their owners and mangers, and their ability to plan now and to take risks in the face of an uncertain situation.

This paper is designed to focus on the impact of an open Cuba on the Florida-based sectors of the recreational boating and marina industries, and how to prepare for the future. The key questions for a Florida marina owner or the boating industry sector are: What opportunities exist now in Cuba for boating and how will that affect current boating patterns and thus my business? What opportunities exist in Cuba for expansion or linking my business to opportunities there? What business and environmental laws exist in Cuba that affect the potential for increased boating? Will environmental restrictions relating to expansion in Florida be a problem? If increased boating brings me additional business, am I in a financial position to expand?

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[2] Cuba's future economic development will be focused on its natural resources: (1) biotechnology; (2) minerals; and (3) tourism according to Gisela Alonso, Director, Recursos Naturales y Turismo in the Academia de Ciencias, Cuba (personal communication, July 6, 1994). In addition, Dr. Angel García Alvarez, Vice Presidente, de Hidrografía y Oceanografía, Cuba, indicates that 51 percent of their main programmatic thrust is tourism (personal communication, July 7, 1994). This group among other activities produces 80-100 nautical charts each year and is publishing a cruising guide to Cuba. They are also in charge of Cuban aids to navigation.

Should I reposition myself in a different boating-related market niche? What can I do now or in the future and what is really out of my control?

Florida boaters, sailors and marina and boating business operators are starting from behind. As noted by one recent boater to Cuba, "From the cruising grapevine, we had learned that U.S. sailors were becoming the odd cruisers out. English, French and German cruising crews regularly visit Cuba during cruises to the Caribbean and U.S. east coast. Indeed, for Canadians southbound on the Intracoastal Waterway, Cuba is often a happily less-costly winter destination than south Florida" (Fleming, 1992). Fleming also notes that the Cuban tourism department is expanding marina services to attract live-aboards. Recent participation in the annual Ernest Hemingway International Marlin Tournament and the Sarasota Sailing Squadron's June 1994 race to Havana are just two indicators of the rapidly increasing interest in fishing and cruising from Florida to Cuba.

Florida boaters, marina owners and others associated with recreational boating should take heed from the recent statement made by the Governor's Commission on a Free Cuba which indicates that if Florida is not ready, it will be unable to minimize the impacts on state and local government that may occur as Cuba becomes open to U.S. travel, and at the same time be able to take advantage of its opportunities. In no sector is this more true than in the industries associated with recreational boating.

Limits to Growth

There is no question that a Cuba open to U.S. boating will place more pressure on Florida's marinas, waterways and boating traffic patterns. Florida's coastline represents an extremely valuable asset. These resources provide recreational boating opportunities for the public. However, Florida's environment is limited in its ability to support more boating activities. From a financial perspective, Florida's marinas may benefit from Cuba boating, earn a higher return on their investment, and delay for a while longer the pressure to convert marina space to other uses. However, it will continue to be difficult to expand in particular, wet slip marinas, where the pressure from Cuba boating will be the greatest.

The very existence of marinas in Florida is threatened by several factors. First, escalating coastal land prices have placed an increasing tax burden on waterfront facilities and have made them less profitable to operate. Second, condominium and other residential waterfront developments continue to displace marinas since they represent a higher value use of the property. Third, the environmental concerns and restrictions associated with expanding existing marinas and in building new ones are tremendous.

As Bell (1990) points out, the demand for recreational[3] boats is really a demand for recreational services (e.g., cruising, fishing) provided by the boats. Boat use is predominantly a function of leisure time. As incomes rise, the demand for leisure time usually increases. Previous research has shown that the number of boats registered can be predicted based on Florida population and Florida real personal income per capita. Bell (1990) projected that by the year 2000, a total of 898,017 pleasure boats will be registered in Florida. Of this total 852,218 will be under 26 feet and 45,799 will be 26 feet or greater (Table 1 and Figure 1). The analysis presented later in this paper indicates the projection for all boats under 26 feet may not be reached, while that for boats 26 feet or greater has already been surpassed.

[3] The term "recreational" boat is used in the Bell study. The data reported as recreational by Bell are the same data reported as pleasure by the Bureau of Licenses, Titles and Permits, Florida Marine Patrol. The term pleasure boat will be used in this paper.

Table 1. Actual and projected number of pleasure boats in Florida, 1982 to 2000.

Year	Under 26 feet	26 feet or greater	Total
1982	457,084	24,530	481,614
1993	620,548	48,876	669,424
2000	852,218	45,799	898,011

Source: Bell (1990) for 2000 projection. Data for 1982 (1981-82) and 1993 (1992-93) from Bureau of Licenses, Titles and Permits, Florida Marine Patrol.

These estimates assume unlimited waterfront land and unlimited ability to expand marina and dock space, which Bell acknowledges as not completely realistic. Bell (1990) projects that the demand for dry stack storage will triple (between 1982 and 2000) while wet slip demand will double. In any event, the marina industry will need to rapidly expand to accommodate the projected increase by the year 2000. The increase in dry stacking will allow more vertical use of the waterfront than wet slip use. But, for boats capable of cruising to Cuba, the demand will be strong for wet slip storage. It is particularly important to note that the number of pleasure boats 26 feet and greater in length registered in 1993 has already exceeded the Bell projection for the year 2000 by seven percent while the growth rate for smaller boats has not kept pace. The faster growth rate for boats 26 feet and greater will increase the demand for marinas with wet slips.[4]

Bell's work (1990) using a 1981 sample showed statewide that 55 percent of boats 26 feet and greater used storage in marinas. Of this total, 61 percent used wet slips and 39 percent used dry stacks. Thus, using Bell's projected estimates to 2000 for the number of boats in Florida 26 feet and greater of 45,799 (already surpassed in 1993), a total of approximately 25,189 marina spaces would be needed: 9,824 in dry stacks and 15,365 in wet slips.

Only general data are available to analyze the availability of marina slips and dry stack facilities. A statewide analysis done every five years (Table 2) indicates that between 1987 and 1992, the number of saltwater marinas has declined by 127, the number of slips/moorings by 4,063 and the number of dry storage slips by 2,424. There has been an increase in the number of freshwater marinas and slips/moorings but dry storage slips declined by 498. For 1992 a total of 1,416 marinas of ten slips or more were in existence: 1,074 saltwater; 342 freshwater. Saltwater wet slips/moorings in 1993 totaled 45,436.

When compared to the Bell projections it appears there might be adequate marina space to accommodate an increase in the number of boats. However, because of the general nature of the data on the sizes of slips available, and the general nature of state boat registration data, it is not possible to make an accurate assessment of current wet slip demand. However, it is unlikely that waterfront space limitations and environmental considerations will allow much expansion to occur. It is more likely that the downward trend in marina wet slips will continue.

[4] The projections by Bell (1990) used boat registration data through 1988. A later section of this paper will indicate a dramatic slowdown of recreational boat registration beginning in 1990.

Table 2. Sites, slips, moorings and dry storage at saltwater and freshwater marinas in Florida, 1987 and 1992.

	Federal, State, County, Municipal			Private			Total		
	1987	1992	Change	1987	1992	Change	1987	1992	Change
Saltwater marina									
Sites	92	92	0	1,104	982	-122	1,201	1,074	-127
Slips/moorings	6,312	6,463	+151	43,187	38,973	-4,214	49,499	45,436	-4,063
Dry Storage	1,304	1,314	+10	32,172	29,738	-2,434	33,476	31,052	-2,424
Freshwater Marinas									
Sites	22	25	+3	302	317	+15	324	342	+18
Slips/Moorings	521	623	+102	10,662	10,794	+132	11,183	11,417	+234
Dry Storage	129	111	-18	4,169	3,689	-480	4,298	3,800	-498

Source: Division of Recreation and Parks, Department of Environmental Protection. Statewide Outdoor Comprehensive Recreation Plan. For marinas 10 slips or more.

Now enter Cuba with unrestricted travel by U.S. boaters. Will this cause current boaters to change their boating patterns? Will they leave from your marina? Will more people purchase boats so they can cruise to Cuba from the Florida west coast? Will boaters stay in Cuba longer, rather than in Florida, thus reducing your revenue? Will more transient boats come through Florida to travel to Cuba? Will that increase your business and boat traffic? Will more Cuba boating increase your marine services business?

To be ready for increased U.S./Cuba boating, each marina owner, each boating service business, and each business that anticipates being impacted needs to have a plan. A recent article (Florida Trend, 1994) indicates some Florida businesses are already doing this. The survey covered over 20 types of industries and indicated that 17 percent already have a business plan for Cuba. A total of 62 percent see the need to have a physical presence in Cuba and 69 percent plan to engage in a service related activity in Cuba.

Current Status of Boats in Florida

Before any boating and marina-related plan can be developed, it is critical to understand the numbers and types of boats in Florida, and the growth rate in the number of boats. The most useful data are from boat registration data at the county level. These data do have shortcomings, but are useful to indicate general trends.[5] This analysis also does not include boats registered outside Florida. No data exists on the number, kind and boating patterns of transient boats.

Boat registration data in Florida are collected by size class: less than 12'; 12' to less than 16'; 16' to less than 26'; 26' to less than 40'; 40' to less than 65'; 65' to less than 110'; 110' or larger. Data are also collected by type of craft, propulsion and more general use categories. Boats that do not use engines are not included. The analysis in the paper provides some general data on boats registered in Florida and then is restricted to general categories of boats that could potentially move between Florida and Cuba. General interest is in those boats 26' and larger, although some boaters would travel between Florida and the U.S. in boats in the very top of the 16' to less than 26' class.

[5] Boat registration data indicate the location of the county registering the boat. It does not mean the boat is physically located in that county. Florida registrations also include those boats not registered in Florida but that are in Florida 90+ days on an annual basis.

In 1993,[6] a total of 715,516 boats were registered in Florida. Almost 95 percent are pleasure boats which includes powered canoes (Table 3). Of the total boats in Florida, 86.7 (620,548) percent are pleasure boats under 26 feet and 6.8 percent (48,876) are pleasure boats 26 feet or longer. The number of boats has been increasing steadily through 1990 when registrations peaked at 718,054, then have fallen slightly to the 1993 level of 715,516 (Figure 2). The number of commercial boats registered has shown a gradual but steady increase, with the decline coming in the pleasure boat category. For the three largest size classes,[7] a total of 48,875 recreational boats and 7,825 commercial boats were registered in 1993 (Table 4). The predominant propulsion is power, in contrast to sail, with 4,216 sail boats 26' and over registered (Figure 3).[8]

Table 3. Vessels registered in Florida for fiscal year 1993.

Category	Number	Percent of Total
Dealer	5,058	.7
Commercial	32,877	4.6
Pleasure	677,581	94.7
Canoes (8,157)		
Boats (669,424)		
Under 26 feet (620,548)		
26 feet and over (48,876)		
TOTAL 715,516	100.0	

Source: Bureau of Licenses, Titles and Permits, Florida Marine Patrol.

Table 4. Registered boats in Florida in 1993 by use for the four largest size classes.

Category	16' to Under 26'	26' to Under 40'	40' to Under 65'	65; and Over
Commercial	15,596	5,234	2,256	335
Pleasure	305,246	41,412	7,129	334
TOTAL	320,842	46,646	9,385	669

Source: Bureau of Licenses, Titles and Permits, Florida Marine Patrol.

[6] Actually for the state fiscal year 1992-93.

[7] 65' to less than 110' and 110' and over were combined for this analysis.

[8] Data in Figure 4 from: Atlas of Boats, Date County, Florida, 1993. Boating Research Center, University of Miami. February, 1994. Totals for each category are slightly lower than those reported by the Division of Recreation and Parks. The original data base is the same, but apparently not all people registering boats report propulsion type.

The growth in registered pleasure boats has shown two distinct growth patterns over the last decade. Through 1989, the number of registered pleasure boats (all size classes) grew at a rate of 6-7 percent per year, and in 1989 was at a level 95 percent greater than in 1975.[9] However, since 1989, the number of registered pleasure boats has been level and actually declined slightly to 677,581 in 1993 (Figure 4).

However, the growth rate has been different for the various size classifications, with total numbers declining in only the under 16' category (Figures 5, 6, 7). A summary of boat registration trends is given in Table 5. It is clear that the growth in the number of boats in Florida is occurring in precisely those categories capable of boating between Florida and Cuba. While the growth rate appears to be slowing, the potential for increased demand for "Cuba-related" boating is real.

The analysis from this point will focus on those counties where the major concentration of pleasure boats are located. Fifteen Florida counties have at least 15,000 pleasure boats (all sizes) registered, representing 60 percent of Florida's total. These are concentrated in south Florida, the central west coast, and the central Atlantic coast (Figure 8). Twenty counties have at least 6,000 pleasure boats 16' to under 26', representing 76 percent of Florida's total in this size class. These boats are distributed uniformly

Table 5. Trends in registration of pleasure boats in Florida by boat size classification prior to 1989 and 1989-93.

Category	Prior to 1989	1989 to 1993
All Pleasure Boats	Steady Increase	Slight Decline
Under 16 Feet	Steady Increase	Steady Decline
16 Feet to Under 26 Feet	Steady Increase	Level
26 Feet to Under 40 Feet	Steady Increase	Increase at Decreasing Rate
40 Feet to Under 65 Feet	Steady Increase	Increase at Decreasing Rate
65 Feet and Over	Steady Increase	Increase at Decreasing Rate

from Tampa Bay southward and around the entire east coast to Duval county (Figure 9). For pleasure boats 26' to under 40', 22 counties account for 91 percent of Florida's total. Again there is general distribution from Tampa Bay southward and around to Duval county. There is also a cluster of boats in the far western Panhandle (Figure 10). A very similar distribution pattern exists for the 21 counties that represent the 91 percent of Florida's pleasure boats 40' to under 65' (Figure 11). Finally, nine counties mostly in south Florida, hold 85 percent of the pleasure boats 65' and over (Figure 12). In general, for those pleasure boats capable of boating to Cuba (26' and over), the boats are generally distributed from Tampa Bay south and around Florida all the way to Jacksonville, with the major concentrations of the larger boats in south Florida.

[9] Prior to 1975 boats with less than 10 horsepower were not included.

Preparing Now for an Uncertain Future

Whisenand (1993) gives some excellent advice on how to prepare for a post-embargo Cuba. While these guidelines are intended principally for businesses intending to operate in Cuba, they can be adapted to the Florida based boating and marina industry. They recognize the critical issues of political risk and country risk which are very elusive questions at the current time but encourage each business sector to plan ahead. Here are some suggestions. Overall you need to do the following:

1. Estimate the impact in Florida on your boating business of post-embargo Cuba.

    - The Marine Industries Association of Florida and other boating and marina-related trade associations should appoint a Cuba task force to study in detail how a post-embargo Cuba will affect the members of your association. Boating clubs and associations should do the same.

2. Determine the current status and development of the marina and recreational boating sector in Cuba.

    - Marinas and boating related businesses should examine the potential for domestic or foreign joint venture opportunities in Cuba. Will you be better off by linking with a partner in Cuba (when that is allowed) and thus expanding your business both there and here from spin-off activities?

3. Determine the interest of the Cuban government and foreign competitors in developing the Cuban marina and boating sector.

    - Identify Cuban state enterprises, ministries and other government groups most important to the boating and marina industry in Cuba, and determine what they are doing in Cuba.[10] Determine which foreign investors are interested in developing the marina and boating sector.[11]

4. Develop a detailed strategic plan to follow to take advantage of the opportunities and minimize the negative impacts of increased Cuba boating.

    - Identify the ways boating in Cuba will affect your current business. For example, will boating to the Bahamas decrease, and thus decrease/increase your current boating business? What will be the

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[10] The Cuban government has created under Cubanacan, the tourist development sector of the government, three competing "empresas," or enterprises. The goals are to produce better economic returns, to provide better service, and to diversify Cuba's tourist economy. These three enterprises are involved in developing destination resort hotels, marinas and water sport activities related to the hotel trade. The enterprises are Marlin, Puerto Sol and Gaviota. Each has facilities in various stages of development across Cuba according to Daniel Herrera, Ministerio de Turismo, Cuba (personal communication, July 8, 1994).

[11] It is clear that foreign investment is being sought. For example, the Spanish are investing in hotels. The level of foreign investment in marinas is not clear, although proposals are being reviewed according to Calixto Noche Fernandez, Sub-Gerente General, Marina Hemingway, Havana, Cuba (personal communication, July 7, 1994).

likely destinations in Cuba by U.S. boaters? Will the location of your marina or type of your boating service trade give you an advantage?[12]

- Will current U.S. and personal financial conditions allow expansion if needed? Will environmental permitting be feasible to allow expansion?
- Determine the impact of current and potential Cuban and U.S. laws and rules on boating and marina operation.
- Develop a financial plan.
- Develop a human resource plan to accommodate expanded businesses and/or opportunities.
- Develop contingency plans in activities and time for various scenarios for when a post-embargo Cuba might occur.
- Create a monitoring plan to keep aware of boating and political conditions in Cuba.

Summary

Cuba has the long-term potential to become a major center of tourism in the Caribbean. This will likely have both positive and negative economic impacts on marina and boating-related tourism in Florida and on Florida's coastal environment. After several decades of rapid growth, the number of registered pleasure boats in Florida has declined since 1989. However, the decline is in smaller size boat classes. For those boats 26 feet and greater, the increase in number of boats continues to increase, but at a decreasing rate. The number of saltwater marinas, slips/moorings and dry storage spaces has declined the last five years. If Cuba becomes open to unrestricted U.S. boat travel, the demand for larger boats will likely increase, the number of transient boats passing through Florida will increase and all of them will be faced with fewer marina spaces, particularly in the wet slip category.

The major distribution of boats in Florida capable of boating to Cuba begins in the Tampa Bay area south and around Florida all the way to Jacksonville, with the major concentrations of the larger boats in south Florida. There is some speculation that boating patterns might shift slightly from Florida's lower Atlantic coast to the lower Gulf Coast, since the preferred passage from Florida to Cuba will be through the Florida Keys and through the Dry Tortugas. The lower Gulf Coast of Florida will be a closer destination for those boats in Cuba preferring to come to the U.S. for maintenance.

Florida based marina and boating businesses should prepare now for a post-embargo Cuba, whenever it occurs. These businesses need to estimate the impact in Florida of a post-embargo Cuba, determine the current status and development of the marina and recreational boating sector in Cuba, determine the interest of the Cuban government and foreign competitors in developing the Cuban marina and

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[12] A major long-term development plan including 2,070 rooms (hotel; condominium, etc.), restaurants, golf courses, boat repair facilities, sailing schools, etc., has been developed for Marina Hemingway. It is clear the marina is aimed to the "north," with its long-term success depending clearly on U.S. boaters being able to travel to Cuba. This marina is a project of the Marlin group of Cubanacan (personal observation, July 7, 1994).

boating sector, and develop a detailed strategic plan to follow to take advantage of the opportunities and minimize the negative impacts of increased Cuba boating. The biggest risk of all is doing nothing.

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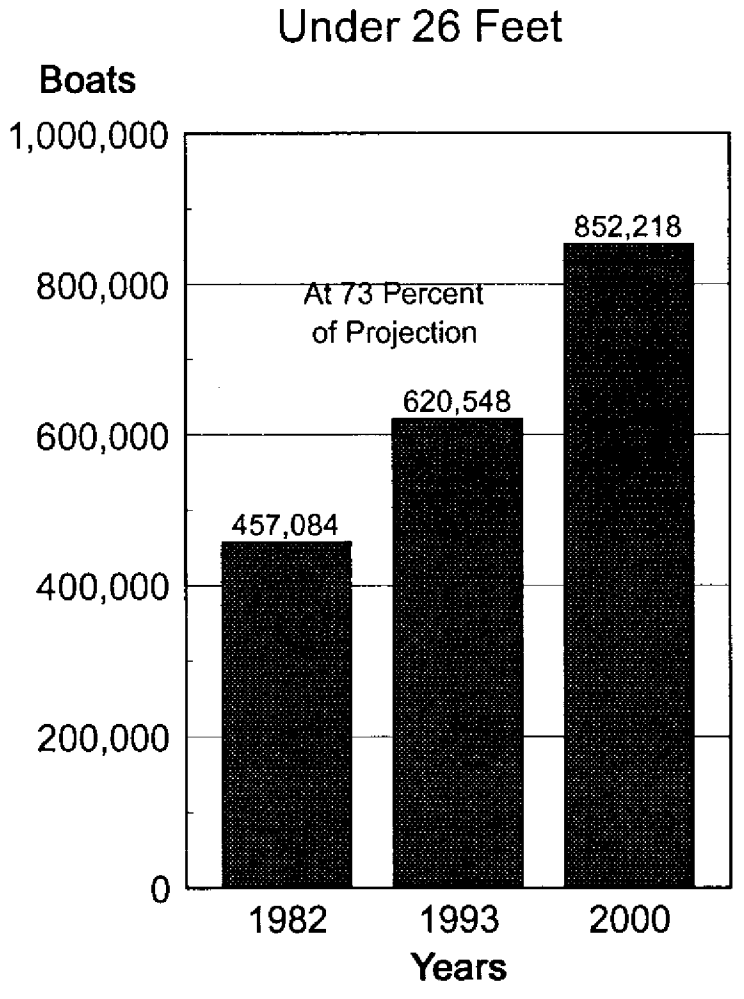
Figure 1.
Number of Pleasure Boats Registered in Florida in 1982 and 1993 and the Predicted Number for 2000 by Two Size Classes



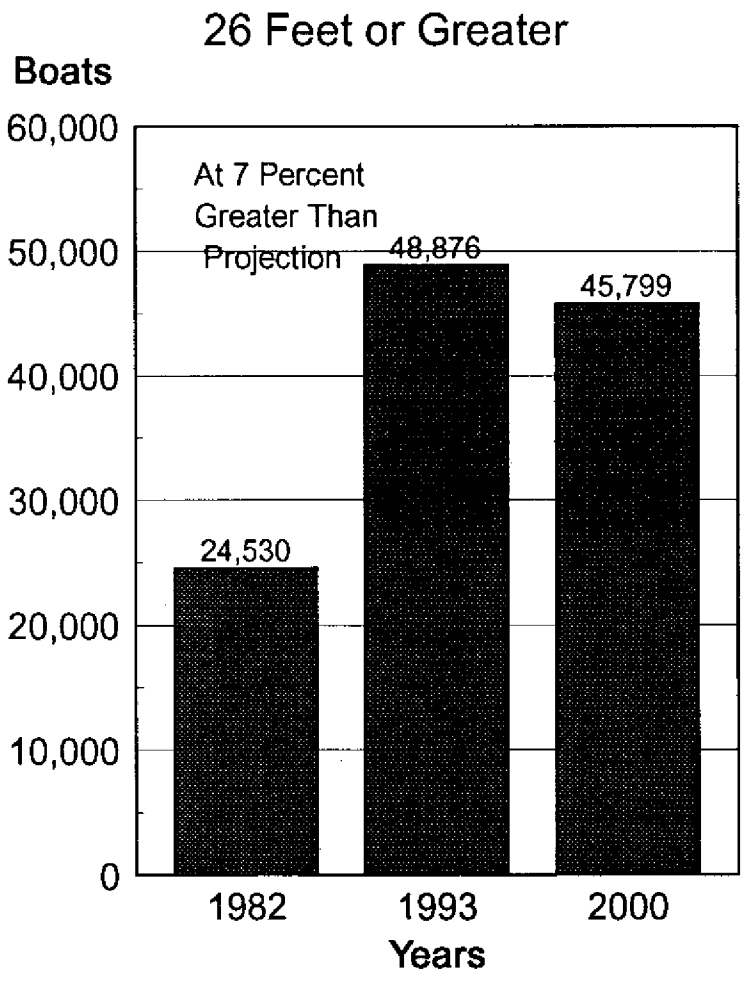


Figure 2.
Number of Boats Registered in Florida, 1975 to 1993

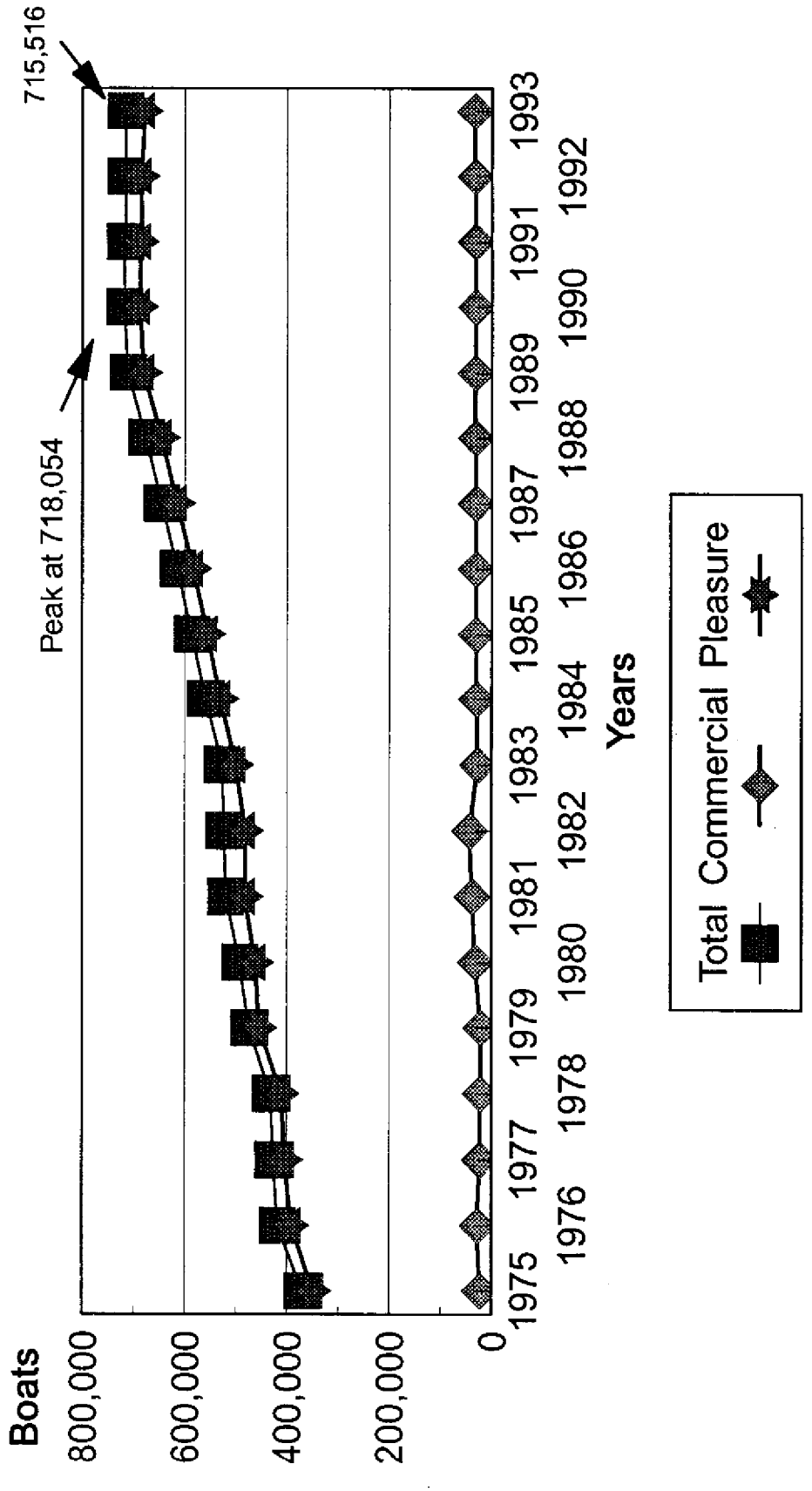
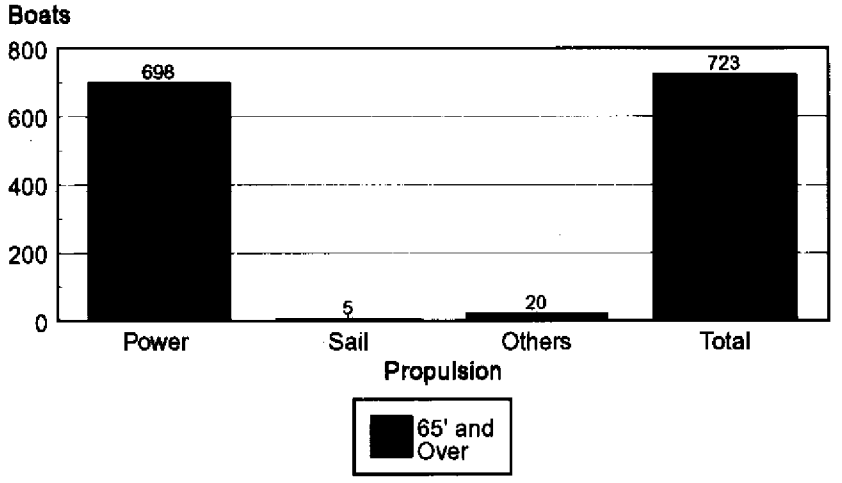
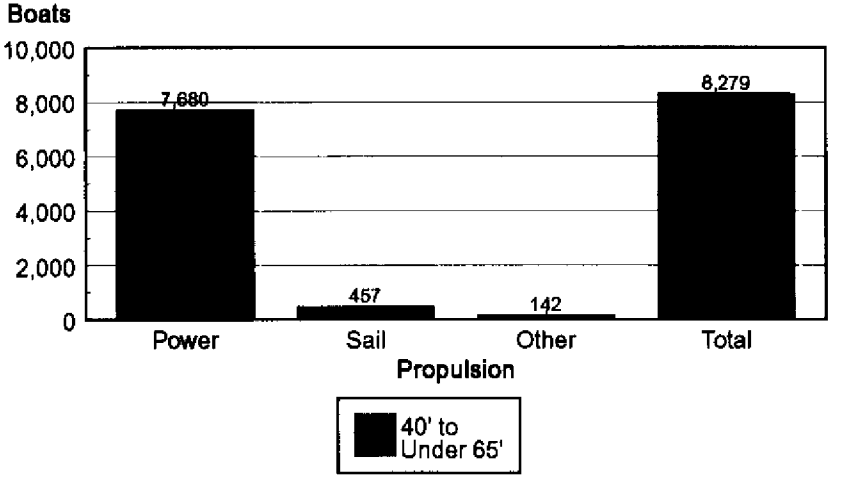
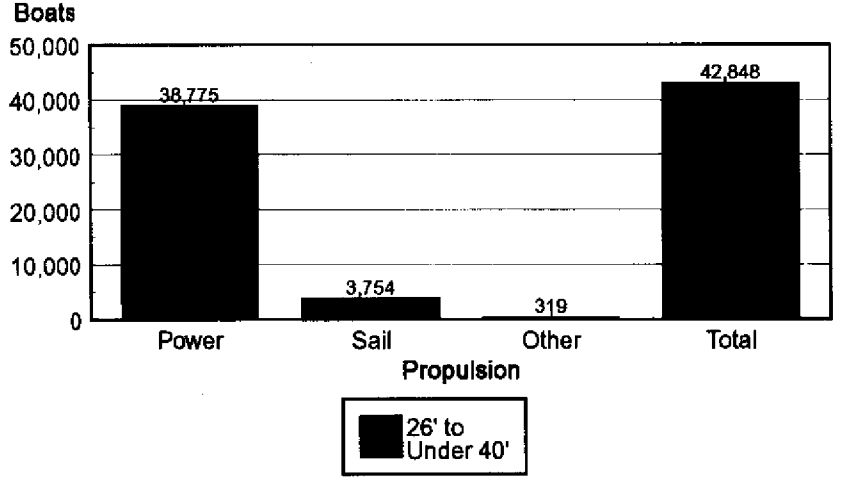


Figure 3.
Registered Boats in Florida in 1993 by Propulsion for the Four Largest Size Classes







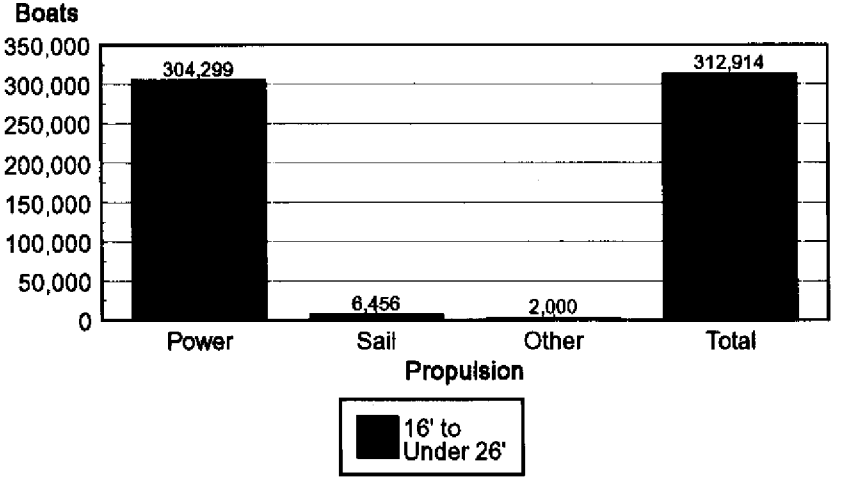


Figure 4.
Number of Pleasure Boats Registered in Florida, 1984 to 1993

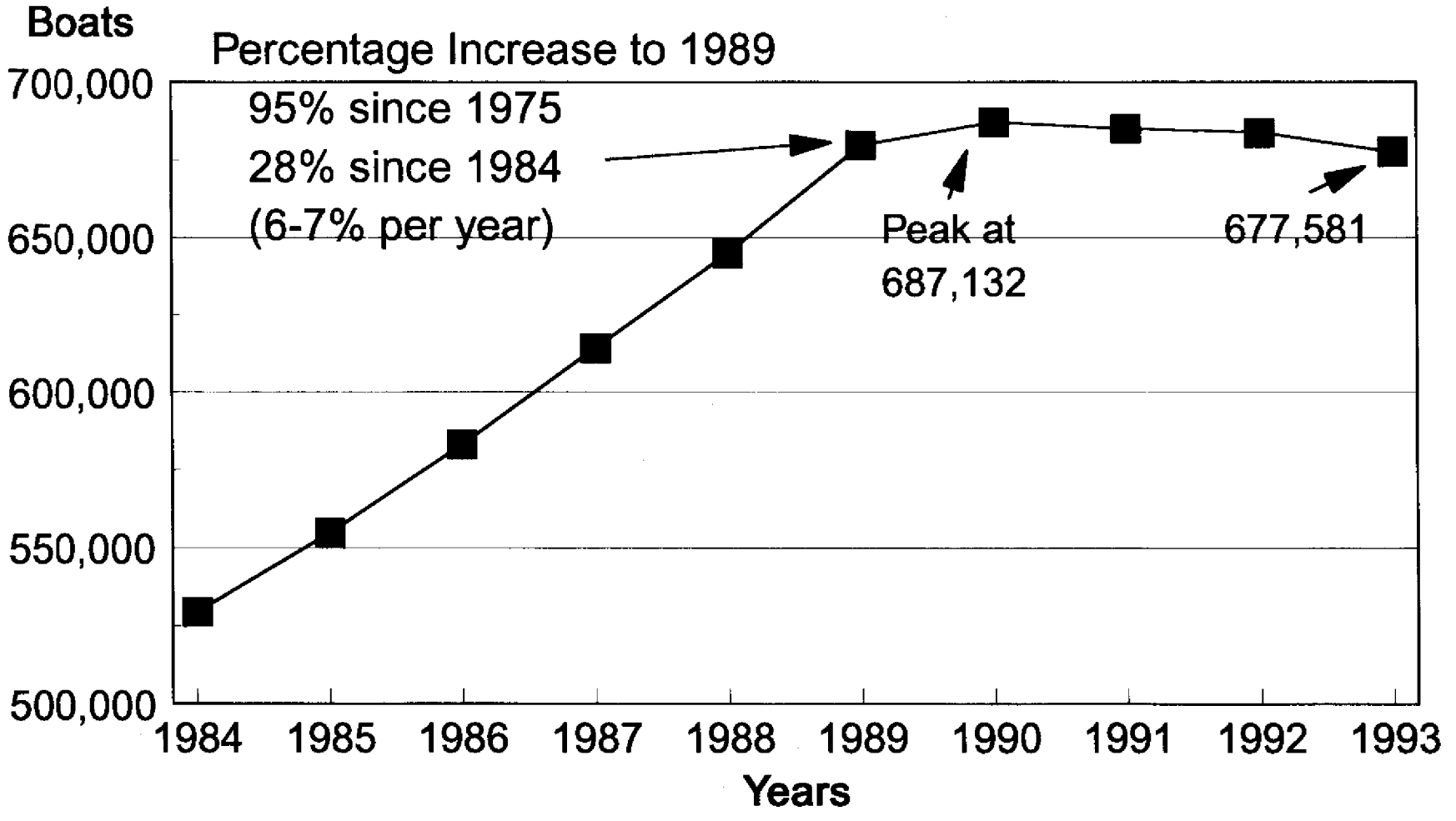
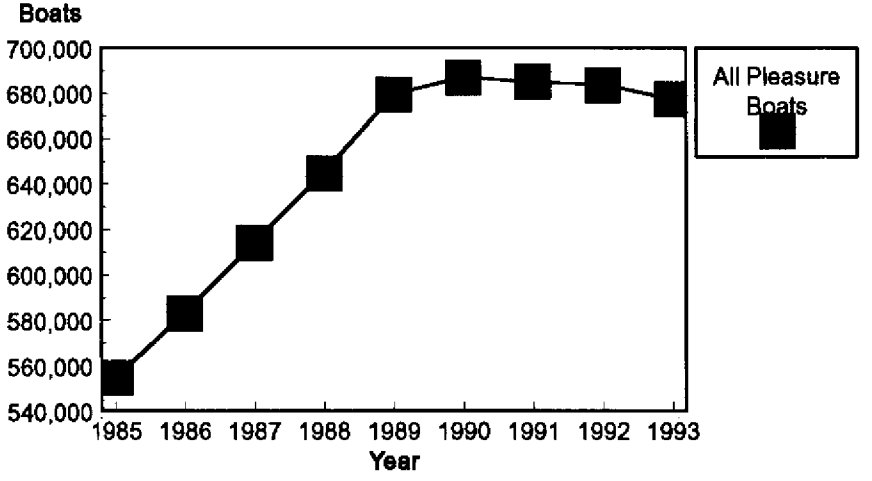
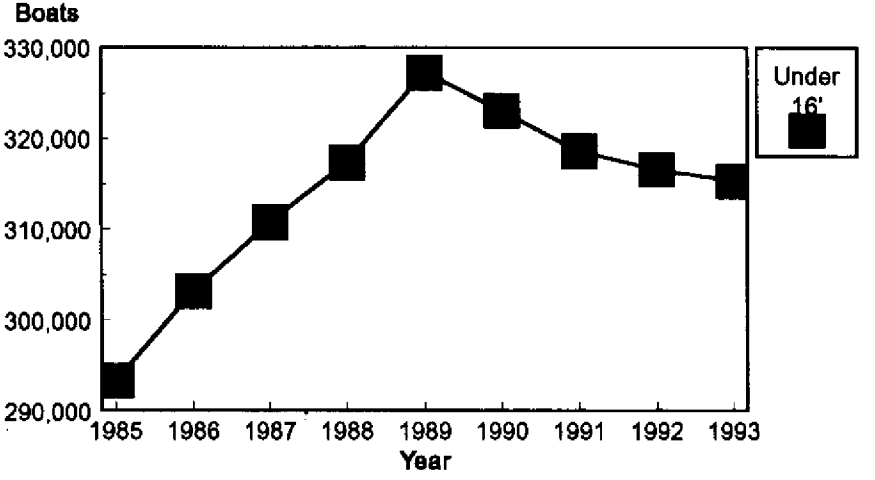
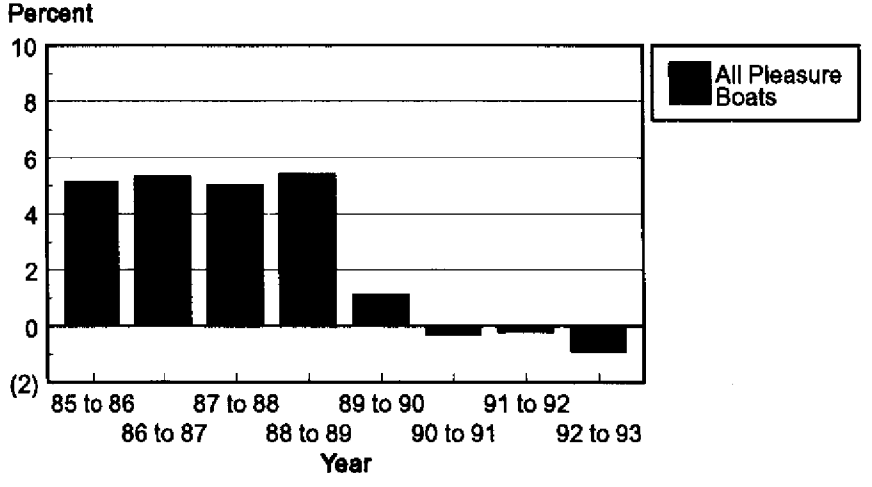


Figure 5.

Total Pleasure Boats and Number in the Smallest Size Class Registered in Florida, 1985-1993, and the Annual Percentage Change in Registrations for These Classes, 1985-86 to 1992-93







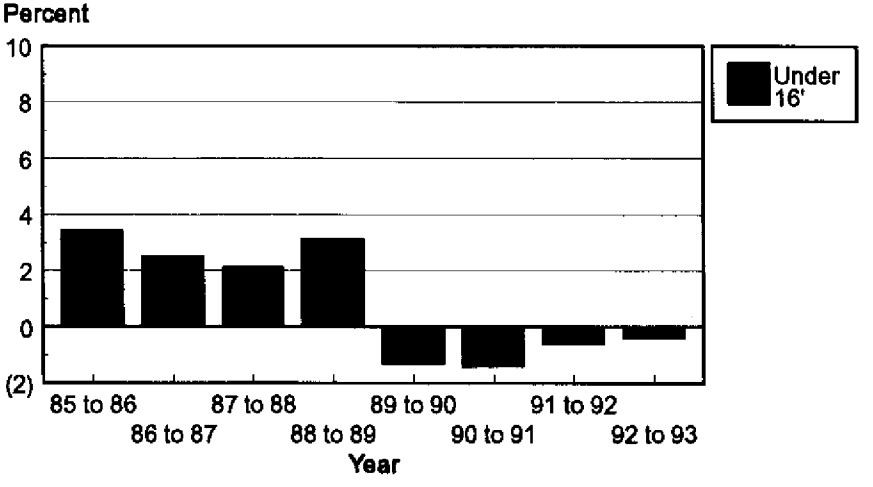
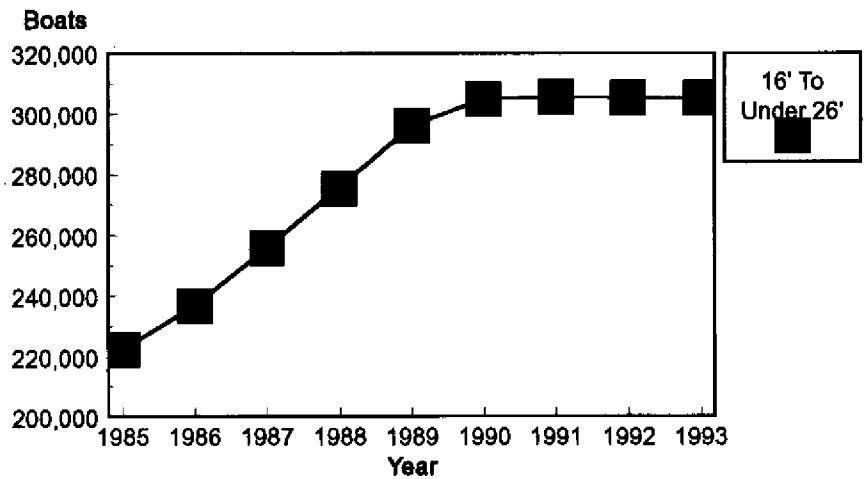
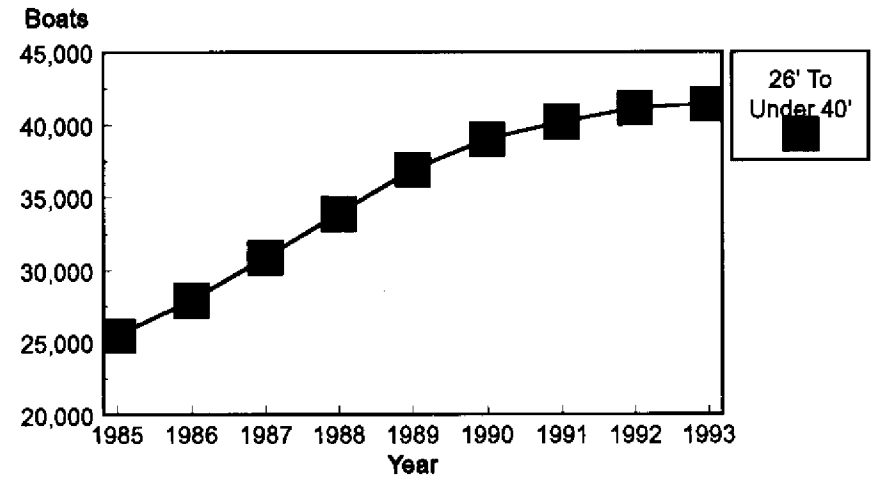
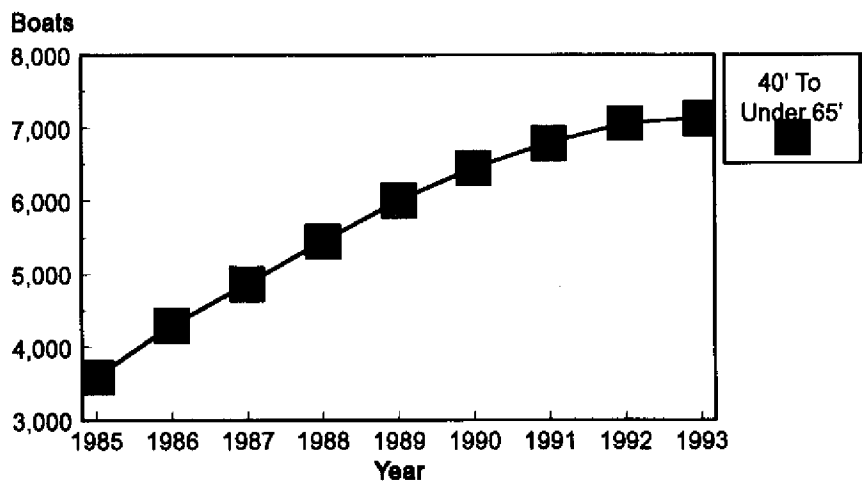


Figure 6.
Number of Pleasure Boats Registered in Florida in the Four Largest Size Classes, 1985-1993







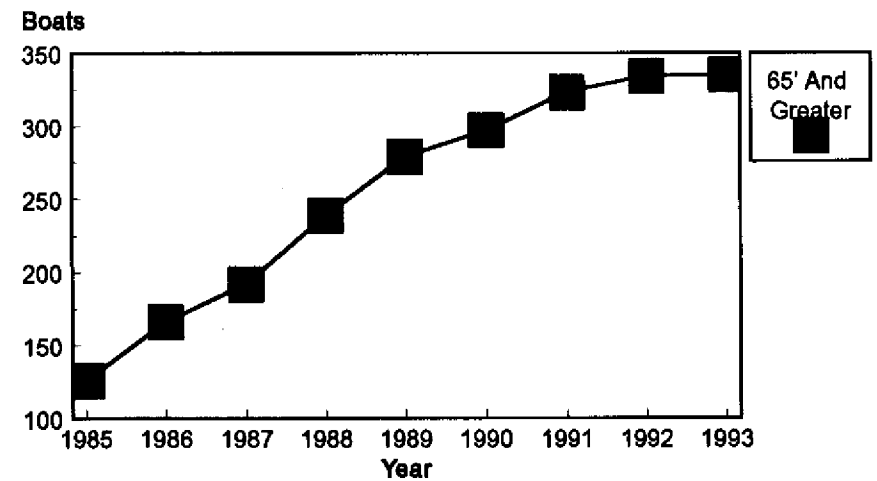
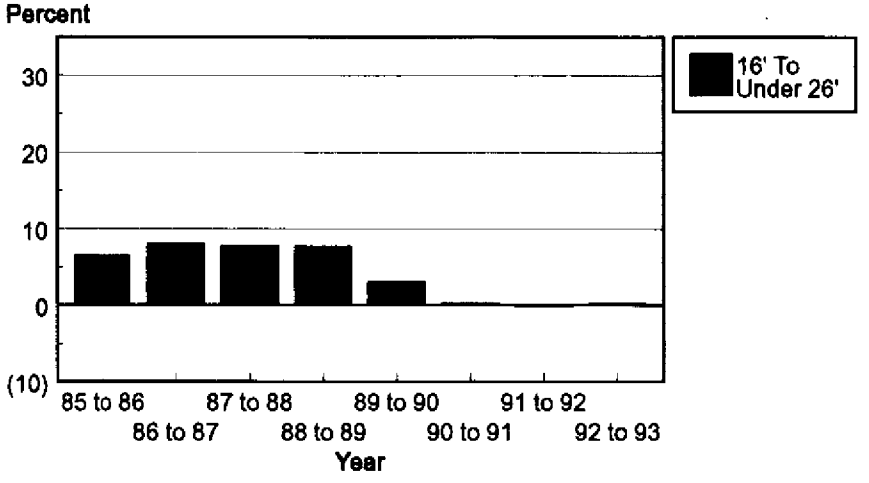
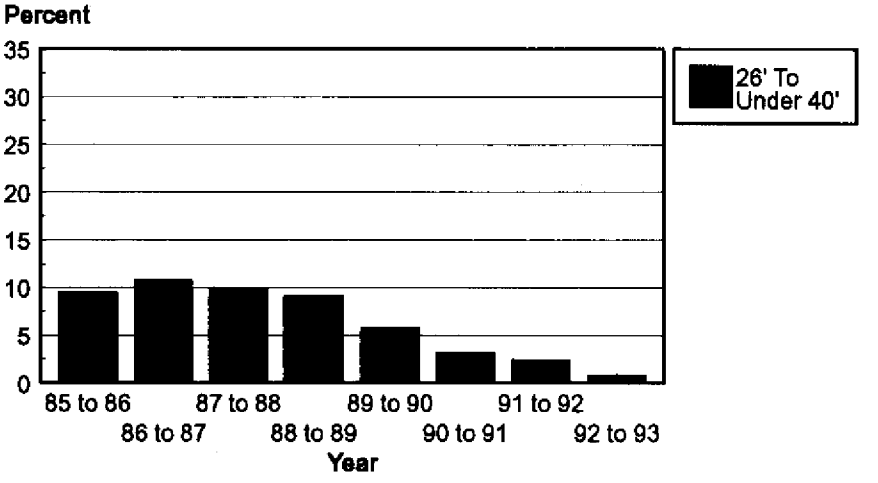
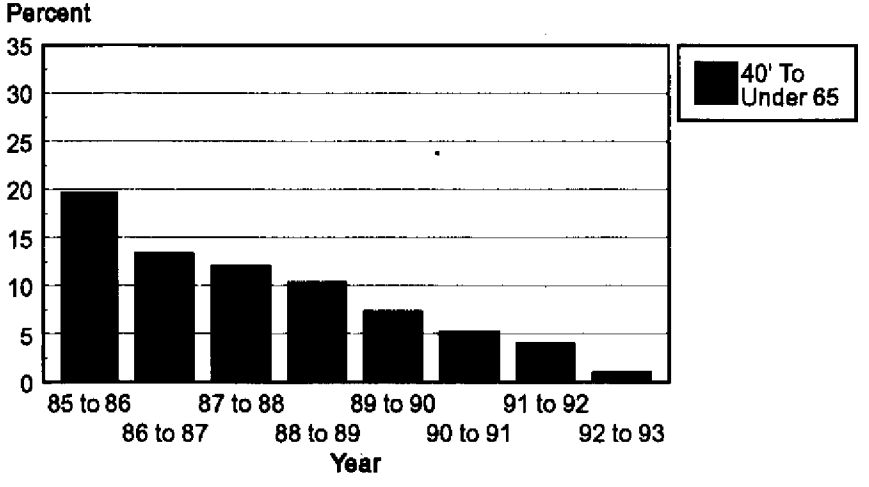


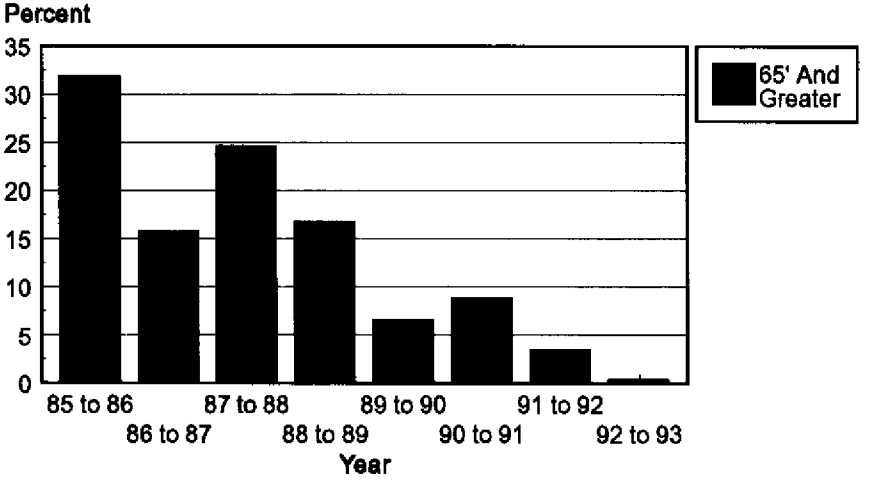
Figure 7.

Annual Percentage Change in the Number of Pleasure Boats Registered in Florida in the Four Largest Size Classes, 1985-86 to 1992-93









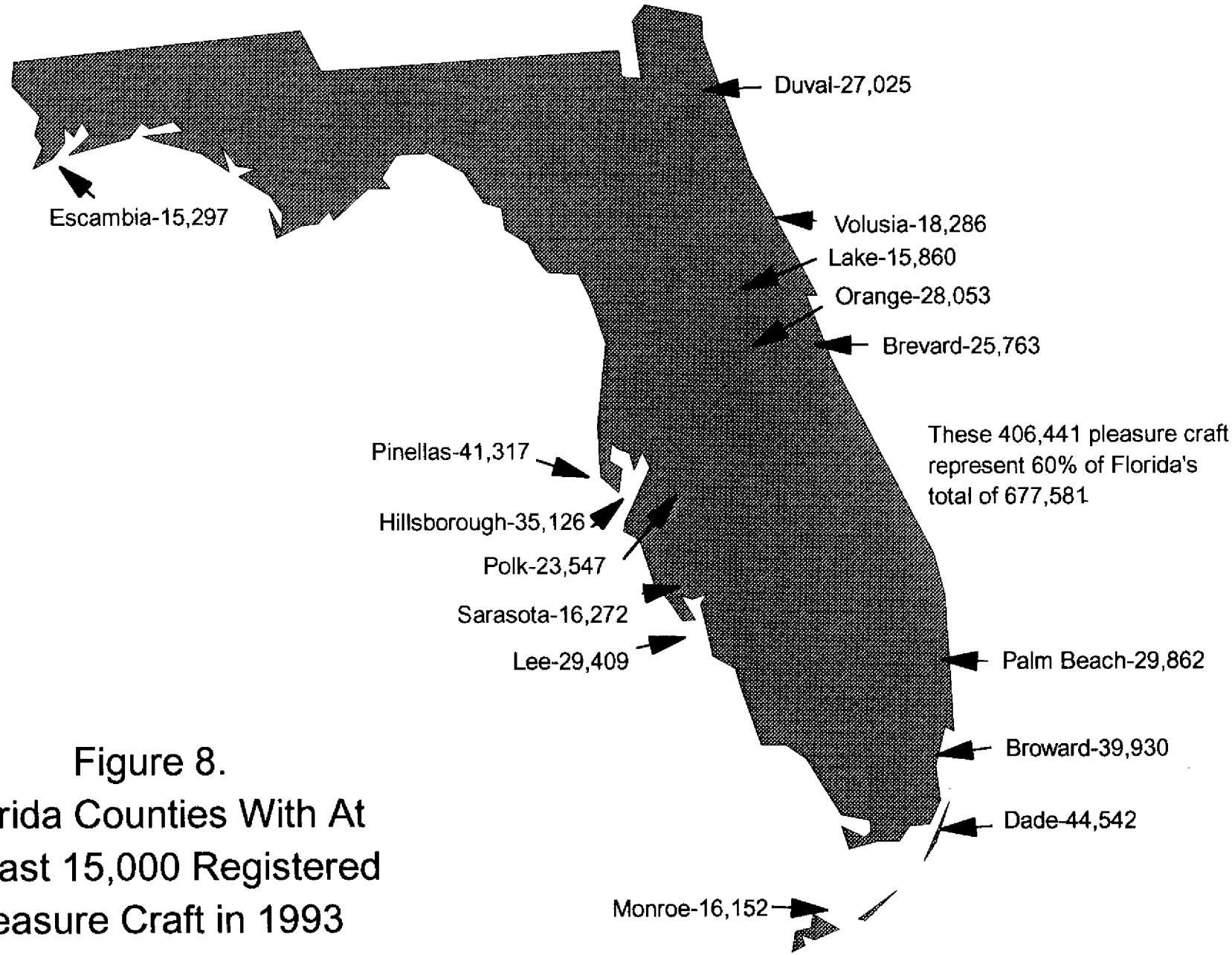


Figure 8.
Florida Counties With At Least 15,000 Registered Pleasure Craft in 1993

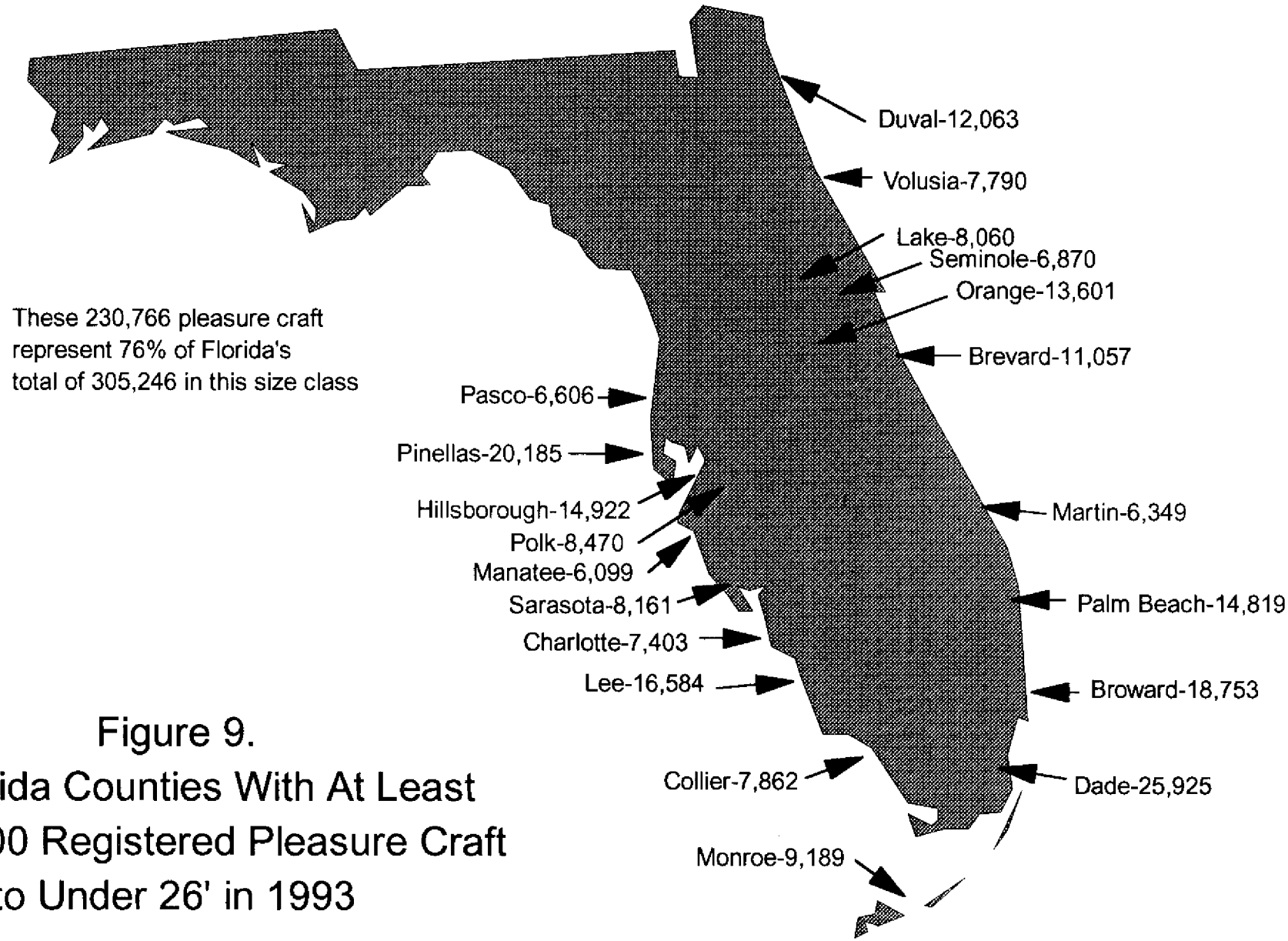


Figure 9.
Florida Counties With At Least
6,000 Registered Pleasure Craft
16' to Under 26' in 1993

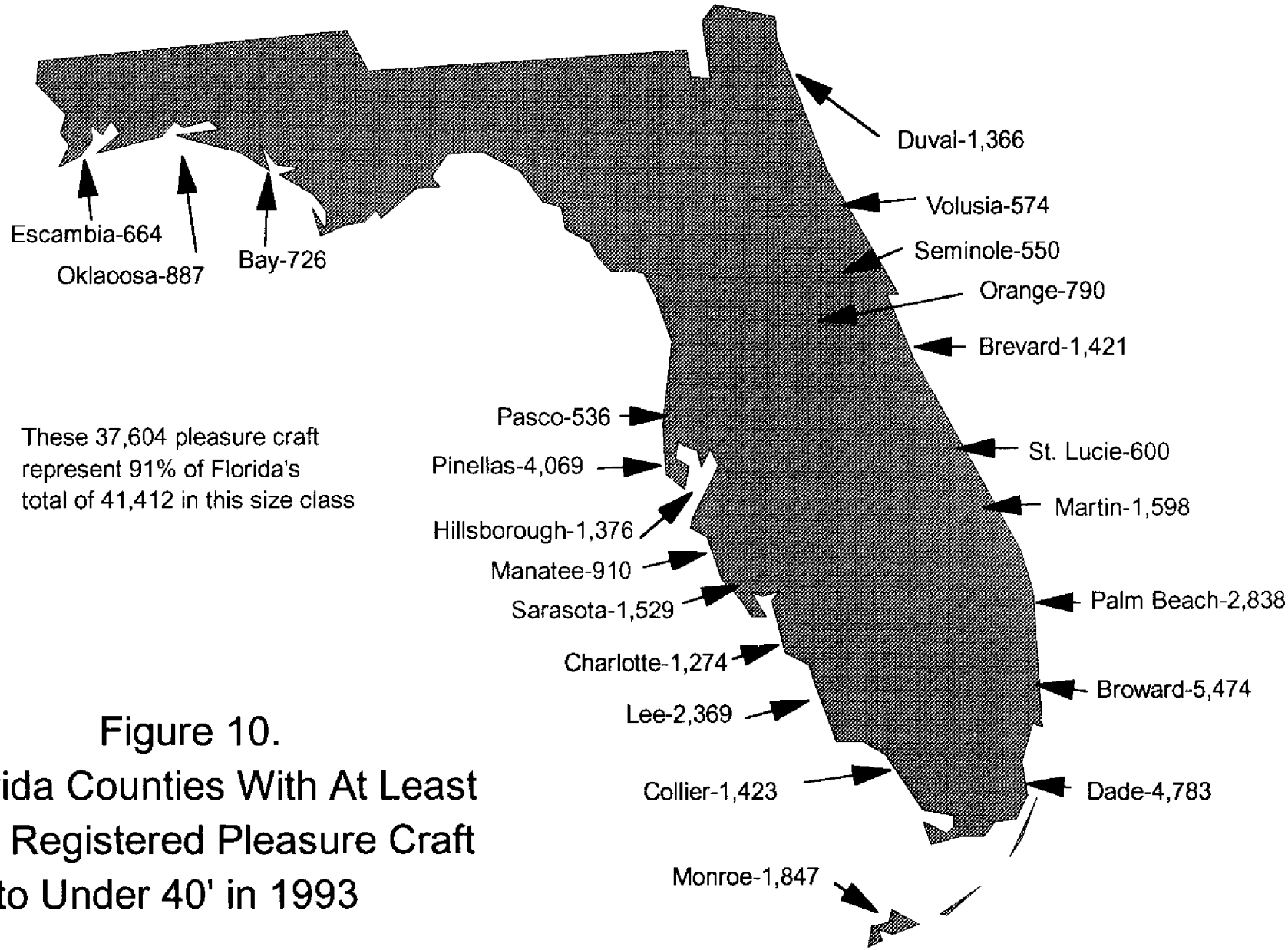


Figure 10.
Florida Counties With At Least 500 Registered Pleasure Craft 26' to Under 40' in 1993

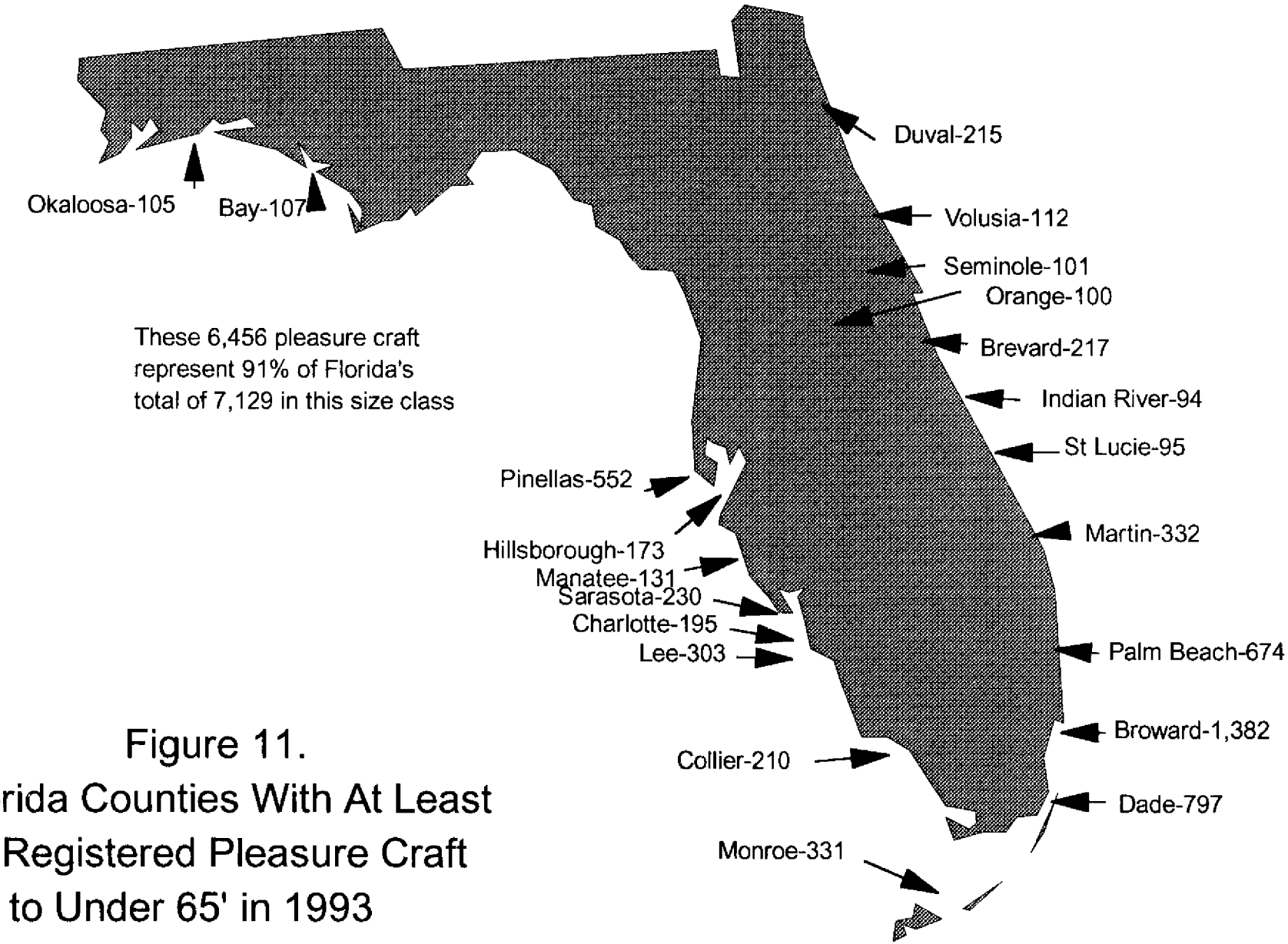


Figure 11.
Florida Counties With At Least
90 Registered Pleasure Craft
40' to Under 65' in 1993

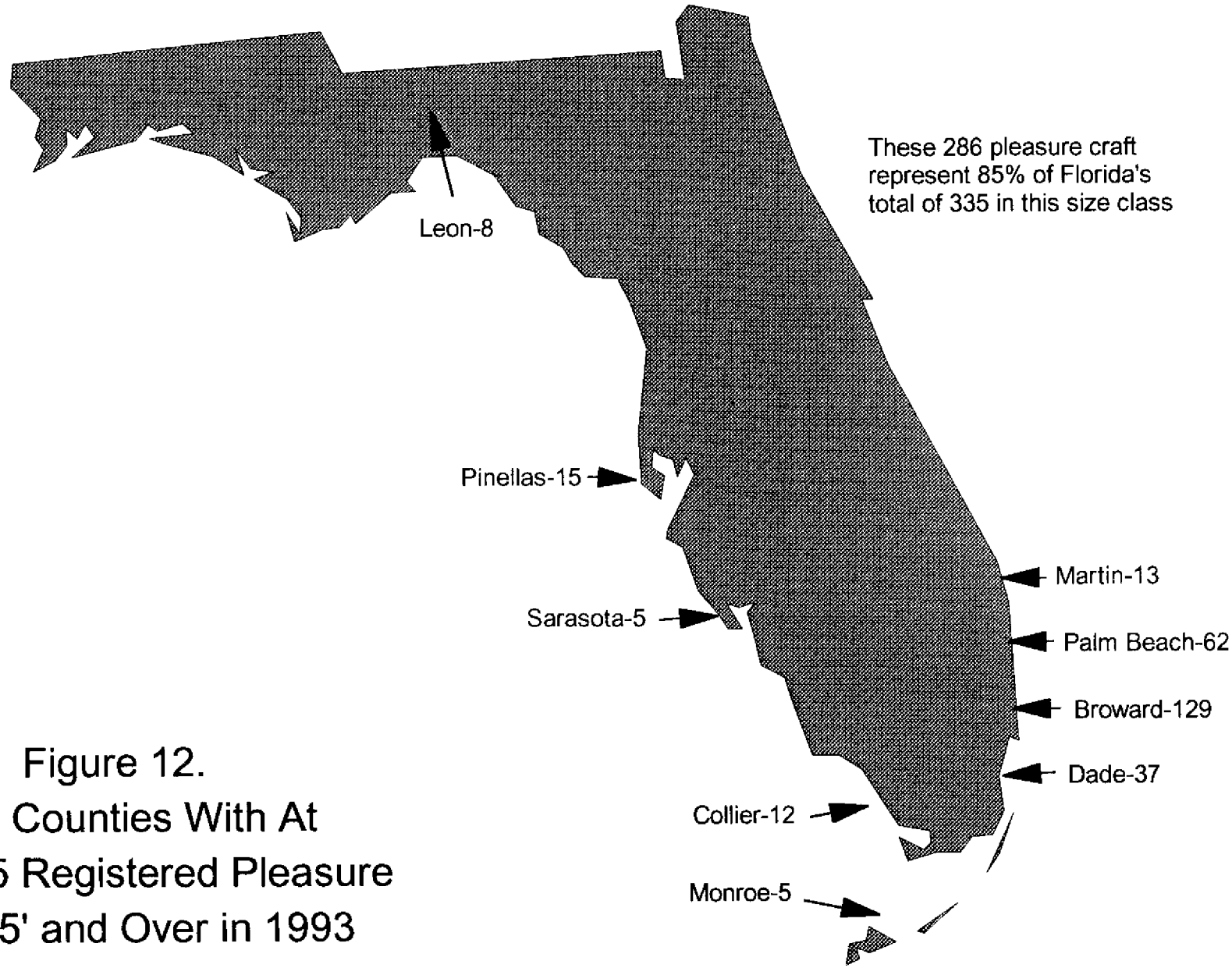


Figure 12.
Florida Counties With At Least 5 Registered Pleasure Craft 65' and Over in 1993

The Influence of Meterological and Oceanographic Conditions on Recreational Boat Routes Between The United States and Cuba

D. Max Sheppard[1]

Introduction

When the conditions are such that people can travel freely between the United States and Cuba there will be many boaters sailing to Cuba from the Gulf of Mexico and U.S. east coasts. The routes taken by these boaters will be determined, in part, by the meteorological and physical oceanographic (met/ocean) conditions that exist in and over the waters connecting these two countries. The purpose of this paper is to summarize and present information about those met/ocean parameters having the greatest impact on boaters and, based on this information, speculate on what will be the most popular routes taken. It is hoped that this information will be useful to those in the marine related industries attempting to plan for this increased boating activity. Those parameters deemed most important to boaters include: wind speed and direction; wave height and period; surface current magnitude and direction; and frequency, timing and severity of storms. Each of these parameters will be discussed briefly and summary data presented for the regions of interest. This is followed by a discussion of how these parameters are likely to impact boating and boating routes between the United States and Cuba.

Met/Ocean Parameters

Wind

The variability of wind speed and direction with time differs significantly with location and season. In some locations the wind is nearly constant in speed and direction while in other areas it displays a cyclic behavior with periods ranging from hours to months. For the regions of concern, namely the lower U.S. east coast and the Gulf of Mexico, the winds are variable but have definite biases that change with the season of the year. Figure 1 is a definition chart showing 1) the mean astronomical tide range at various locations along the coast and 2) the location of the sites where wind and wave information is presented. Wind (and wave) roses for locations in the Gulf of Mexico and Florida Straits are shown in Figures 2 and 3. Note that at station 51 the wind is from the eastern sector (67.5° to 112.5°) 50% of the time. Twelve percent of the wind from this sector had speeds between 5.0 and 9.9 knots, 58% had speeds between 10.0 and 14.9 knots and 30% had speeds between 15.0 and 19.9 knots. Even in locations where there is a prevailing wind direction there is variability, as shown in the wind stick diagram in Figure 4 for Key West, Florida for the year 1985. The length of the lines indicates the speed of the wind and the lines point in the direction to which the wind is blowing. For example, at 12:00 AM on January 1, 1985 the wind speed was 12 knots from the east-southeast (110°).

Wind direction is more important for sailboaters than powerboaters, but is of concern to all boaters due to its effect on wave heights, steepness and propagation directions. Winds in a direction opposite to strong surface currents produce very steep, short crested waves that are difficult to navigate. This is discussed further in the section on waves.

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Waves

Most surface waves are generated by wind, either by local wind or that due to some distant storm. In deep water, waves can travel great distances with minimal loss of energy. When they reach water depths that are less than about one-half their length (distance from one crest to the next) they start to "feel the bottom" and lose energy. Wind generated waves depend primarily on wind speed and duration, fetch and water depth. Fetch is the distance over which the wind is blowing over water. In an enclosed body of water fetch is the distance from the lee shore to the point of interest; in an open body of water it is the distance from the start of the wind system to the point of interest. Wind generated waves are random in nature with a range of wave lengths and heights present at any given time. This presents a problem in trying to quantify the wave height of a given sea state. One representation that has found wide acceptance and use is the quantity called "significant wave height". If the water elevation is recorded at a particular site for a duration of about 20 minutes and the one-third largest wave heights in this record are averaged, the result is called the "H-one-third" (denoted by $H_{1/3}$) for the wave field. A quantity known as the significant wave height can be obtained by computing the area under a plot of wave energy density versus wave frequency for the same wave field. Such a plot is known as a wave energy density spectrum. A spectrum for a site off the coast of West Palm Beach, Florida in 12 ft water depths on January 15, 1994 is shown in Figure 5. For all practical purposes the value of the significant wave height is equal to the value of $H_{1/3}$ for the wave field. The period of the waves with the most energy in the wave record is called the peak period, T_p. Specification of significant wave height, peak period, and wave energy density spectrum are good ways to quantify a random wave field. The maximum height of an individual wave in a random sea is about twice the significant wave height.

Wave data are more difficult and costly to obtain than wind data and, therefore, are more scarce. To circumvent this lack of data, computer wind and wave models have been developed to "hindcast" waves. Knowing the distribution of pressure in the atmosphere along with a limited number of wind measurements at specific locations, the wind field that existed in a specified area for a particular interval of time in the past can be computed (hindcast). The wind model output is then used as input to a wave model which in turn computes the wave conditions for the area. The resulting time history of winds and waves is called a "hindcast" since it is a prediction of something that took place in the past. The U.S. Army Corps of Engineers, Coastal Engineering Research Center has hindcasted winds and waves in the waters surrounding the United States on a fifteen minute interval for a 20-year period (1956-1975) [Hubertz and Brooks (1989) and Hubertz et al. (1993)]. These data can be used to obtain valuable statistical information about wind and waves. This particular Corps study purposely excluded tropical storms and hurricanes. Wave roses for several locations are presented in Figures 2 and 3. Note that at station 51 in the Florida Straits waves propagate from the easterly sector (67.5° to 112.5°) 57% of the time. Of those waves from this sector 43% have heights (trough to crest) between 0.0 and 0.9 m (2.95 ft) and 52% have heights between 1.0 m (3.28 ft) and 1.9 m (6.23 ft). Recall that the hindcasts that produced this data excluded tropical storms and hurricanes.

Waves can be significantly affected by surface currents. When a wave propagates in the direction of the current, its height is reduced and its length becomes longer than it would be if there were no current. On the other hand, when a wave propagates in the direction opposite to the current, its height is increased and its length is shortened, thus it becomes steeper. Figure 6, which is a plot of wave height divided by deep water wave height versus surface current speed divided by deep water wave speed, illustrates these facts. For a particular wave the deep water wave height and speed are constant so the plot in Figure 6 can be thought of as wave height versus current speed. When the waves are propagating in the direction of the current ($U/c_0 > 0$) the wave heights are reduced; when the waves propagate opposite the direction of the current ($U/c_0 < 0$) the wave height is increased significantly. In general, large steep waves make for an uncomfortable, and often unsafe passage for sailors in small craft, such as cruising and fishing boats. The prevailing easterly winds in the Straits of Florida (the passage between the Florida Keys and the northern coast of Cuba) produce waves that propagate opposite to the strong easterly flowing currents in that region producing undesirable wave conditions when the winds are strong.

Waves also increase in height and shorten in length when they propagate into shallower water (a

process known as shoaling). These effects start when the water depth decreases to about one-half the length of the wave and continues until either the wave breaks or it reaches the shore. To illustrate the effect of shoaling, the height and length of a 12 second period wave is followed from deep water to breaking for a coast with a bottom slope of 1:200. The results are presented in Table 1.

Table 1

The Propagation of a 12 Second Period Wave from Deep to Shallow Water

Water Depth in ft.	Deep Water	100	50	25	15.1 Breaking
Wave Height in ft.	10	9.19	9.83	11.01	11.8
Wave Length in ft.	737	582	443	327	220

Wave heights in tropical storms and hurricanes can be very large. In the Gulf of Mexico the maximum wave heights expected to occur in a one-in-one hundred year return interval hurricane range from 60 to 80 ft with periods between 11 and 15 sec (API 1993). One-in-one hundred year hurricanes generate waves off the southeastern coast of Florida and are influenced by the Bahama Islands but are large as well. It goes without saying that boaters must take every possible precaution in order to avoid such events. The number of protected anchorages known as hurricane holes are limited and as the boating activity in southern Florida and Cuba increases this will become a critical problem. Due to the number of tropical storms and hurricanes that form or pass through the waters connecting the United States and Cuba and the extreme importance of these storms to boaters, a section in this paper is devoted to hurricanes.

Surface Currents

Surface currents will play an important role in boating between the United States and Cuba. Some of the strongest currents in U.S. coastal waters are found in the vicinity of South Florida and Cuba. These currents, which vary on a seasonal basis, will certainly influence the sailing routes taken by boaters. Water entering the Caribbean Sea from the east (as a result of prevailing winds in the southern part of the North Atlantic Ocean) flows northward through the passage between Cuba and the Yucatan Peninsula to form the Yucatan Current (see Figures 7 and 8 which show general surface currents in the southern Atlantic Ocean, Caribbean Sea and Gulf of Mexico for the months of January and July). This intense jet penetrates deep into the Gulf of Mexico prior to being deflected south along the west coast of Florida and then east through the Florida Straits. While in the Gulf of Mexico, this current is known as the "Loop Current". As this current emerges from the Florida Straits and heads up the east coast of the United States it is called the "Florida Current" or "Gulf Stream". This intense, concentrated, western boundary current impacts all boating and shipping activity in its path. As the Loop Current meanders in the Gulf of Mexico, large eddies (circular bodies of water) are shed and propagate throughout the Gulf rebounding off the continental slope (relatively steep portion of the bottom connecting the deep Gulf to the continental shelf). These eddies, which last months to years before dissipating their energy, have diameters up to about 200 nautical miles, current speeds on the order of 3 knots (but values as large as 4 knots have been observed) and forward movement speeds between 0.5 and 1.5 knots. The size and position of these eddies are monitored by infrared sensors in satellites and the results are reported by the National Oceanic and Atmospheric Administration (NOAA). Figure 9 shows a color enhanced, infrared satellite image of the Gulf of Mexico on March 8, 1994 [Rouse

(1994)]. The boundaries of the Loop Current are apparent due to the sharp horizontal gradients in water temperature. The Loop Current water temperature is significantly warmer than the Gulf and Shelf waters during the fall, winter and spring months. The flow streamlines in Figures 10 -14 show how the surface currents can change throughout the year. The numbers in these figures refer to current speed in nautical miles per hour (knots).

Currents, such as the Loop Current and Gulf Stream, are sometimes referred to as background currents since they are generated by conditions far removed from the point of interest. A discussion of all of the mechanisms that can produce surface currents is beyond the scope of this paper but a brief description of local wind generated currents is presented. The drag of a steady wind blowing over an ocean surface produces a surface current. In deep water (i.e. water depths greater than approximately 250 ft at South Florida and Cuba latitudes) the wind generated current direction evolves in time to an angle approximately equal to 45° to the right (in the northern hemisphere) of the wind direction as viewed from above. This misalignment of drag force and water surface movement is due to the Coriolis accelerations created by the earth's rotation about its axis. The current speed decreases with distance down from the surface but the angle between the wind and current increases. As the depth of water decreases, so does the angle between the wind and surface currents. A rule of thumb for the speed of wind generated surface currents is 3% of the 10 meter elevation wind speed. Thus, a wind speed of 25 knots (at the standard 10 m elevation) will produce a surface current of about 0.75 knots.

The magnitude of both the Yucatan Current and Gulf Stream is greatest during the summer months when surface currents can exceed 4 knots. Any small boat passage between the United States and Cuba must take these currents into consideration.

Hurricanes

The waters connecting the U.S. and Cuba are very susceptible to tropical storms and hurricanes. These relatively compact, fast moving, severe storms are extremely dangerous to boaters due to their excessive wind speeds, waves heights, water elevations and the tornadoes and water spouts that they generate. These approximately circular air masses rotate in a cyclonic direction (counter clockwise in the northern hemisphere). Figure 13 shows a ground based radar image of Hurricane Andrew as it made landfall near Miami, Florida on August 24, 1992 (Houston 1994a). The center or eye of the storm is a region of low wind speed and low pressure. The wind speed increases with increased distance from the center to a point called the "radius to maximum winds" then decreases to the edge of the storm. Relative to someone moving with the eye of the storm, the wind speeds are primarily a function of the distance from the center. However, with the forward motion of the storm (with speeds between 5 and 20 knots) the absolute wind speed (as seen by a boater) is greatest in the forward right quadrant. For a storm moving to the north, maximum wind speeds will occur in the northeast quadrant. Significant strides in hurricane forecasting have been made in recent years due to: the existence of weather satellites and reconnaissance aircraft, the development of computer models for predicting storm parameters and an increased level of understanding of the mechanisms that control the growth and decay, and the paths of these storms. The distance from the predicted to the actual point where the center of the hurricane made landfall for the time period 1989-1993 at various time intervals prior to landfall are given in Table 2 [Houston (1994b)]. These numbers are based on a self-evaluation study conducted by forecasters at the National Hurricane Center in Coral Gables, Florida. All boaters, but in particular those with slower boats, need to seek a safe anchorage well in advance of approaching hurricanes.

Table 2

Landfall Prediction Errors as a Function of Time Prior to Landfall

Time Prior to Landfall in Hours	72	48	36	24	12
Error in Predicting Point of Landfall in Miles	224	87	68	47	31

The combination of low pressure in the hurricane and wind drag on the water surface produces a significant change in water elevation in a hurricane when it reaches shallow water. This effect is known as a meteorological tide or storm surge. In the area to the right and in front of the storm center the water can rise to heights in excess of fifteen or even twenty feet along a coast. The rate of rise and fall is rapid for fast moving storms such as the one shown in Figure 16, which is a plot of measured water elevation versus time for Hurricane Betsy (1965) at Biloxi, Mississippi. This rapid change in water elevation can be as important as wind speed and wave heights to boaters in many locations and circumstances.

Official hurricane season runs from June 1 through November 30 but on rare occasions hurricanes have developed as early as May and as late as December. Figure 17 shows the number of hurricanes and tropical storms and hurricanes by date of origin for the 100 year period from 1886 to 1986 [Neumann et al. (1987)]. The tracks of tropical storms and hurricanes by month for the same 100 year period are shown in Figures 18-25 [Neumann et al. (1987)].

Boating Routes Between the US and Cuba

As a rule, boaters are a freedom loving, independent minded group so it is very difficult to predict when and where they will sail and what route they will take. There are many factors that influence their decisions but the meteorological and oceanographic conditions for the region are major considerations, especially in areas where these parameters are extreme and predictable. The waters connecting the United States and Cuba have strong, relatively predictable currents and good statistics exist on wind speed and direction, and frequency of occurrence of severe storms. These factors should have a strong influence on when the majority of boaters travel to and from Cuba and the routes they will take. Economic factors including the price, availability and quality of fuel, boat parts and repair facilities, ships stores, etc. will also influence the routes taken. Even though the Cuban government is placing a high priority on developing marinas to attract foreign boaters there is still a severe shortage of boat supplies, parts and repair facilities. While some of the marinas, such as Marina Hemingway near Havana, have the physical space to accommodate a sizable increase in the number of boats, they are not (at this time) ready for the demands that will be placed on them once boaters are allowed to travel freely between the two countries. At present, fuel is in short supply and is expensive in Cuba and there are (unsubstantiated) reports of problems with fuel quality (water in diesel fuel, etc.). Nearly all existing marinas in Cuba are on the northern coast. The Cuban government is making an all out effort to upgrade existing marinas and to develop new ones on the southern coast. The marina development philosophy appears, however, to be geared more toward supplying tourists that fly to Cuba and stay in coastal hotels with water-related activities including scuba diving, sport fishing and boat rentals. In the opinion of this author, there will be an extended period of time after free and unobstructed travel is allowed between the U.S. and Cuba when boaters will need to purchase much of their services, goods and fuel from U.S. ports near Cuba. For those boaters originating from ports on the Gulf coast (Texas, Louisiana, Mississippi, Alabama and the west coast of Florida) this will mean the lower west coast of Florida and the Florida Keys. For larger boats with greater fuel and stores capacities, they may choose to depart from points on the central west coast of Florida when heading for Havana to take advantage

of the eastern part of the Loop Current and to have a better angle on the currents in the Florida Straits. Due to the time required to sail from the more distant locations, while avoiding adverse currents in the mid-Gulf, there undoubtedly will be those that will want to move their boats to Florida locations so that trips to Cuba can be made in a reasonable length of time. At any rate, the central and southwest coasts of Florida should experience a substantial increase in boat traffic from boats traveling from Gulf coast states to Cuba. For those boaters from the central and western Gulf that wish to circumnavigate Cuba, the most likely direction would be clockwise, perhaps starting at Havana. Once marinas on the west coast of Cuba can supply sufficient quantities of fuel and stores, these boaters can ride the Yucatan Current and the western portion of the Loop Current to their destinations on their return passage.

Boaters originating from locations on the U.S. and Florida east coast will most likely make their port of departure, Key West. Some of the smaller, slower boats wishing to sail to Havana may choose to depart from the Dry Tortugas, which are west of Key West by some 60 nautical miles, in order to have a more desirable angle on the current in the Florida Straits. However, there are no facilities, stores or fuel in the Tortugas and the anchorage at Garden Key is small and can only accommodate a few boats. All marinas on the east coast should experience more transient boats as people from Canada and the northeast United States travel down the Intracoastal Waterway prior to departing for Cuba. The opening of Cuba to U.S. boaters will no doubt affect boating between the U.S. and the Bahamas. Many of the boaters that presently depart Florida from the Palm Beach area to cruise the northern Bahamas are likely to choose Cuban destinations, at least for some period of time. This will result in an even greater number of boats traveling through southeast Florida and the Florida Keys. Boaters returning from Cuba with east coast destinations will most likely take advantage of the Gulf Stream and bypass Key West except perhaps in times of bad weather.

In summary, once boating between the United States and Cuba is free and unobstructed, the uncrowded, pristine Cuban waters will lure many boaters from the United States. The routes taken by these boaters will depend in part on the meteorological and oceanographic conditions that exist in and over the waters connecting these two countries. It also seems apparent that much of the marine industry in Florida will be impacted by this increased boating activity with perhaps the central and south Florida west coast, the southeast Florida coast and the Florida Keys experiencing the greatest impact. This means economic opportunities for those associated with these industries and new challenges for everyone involved in seeing that these increased activities are done in such a way that the beauty and unspoiled nature of this unique environment is preserved for the enjoyment of generations to come.

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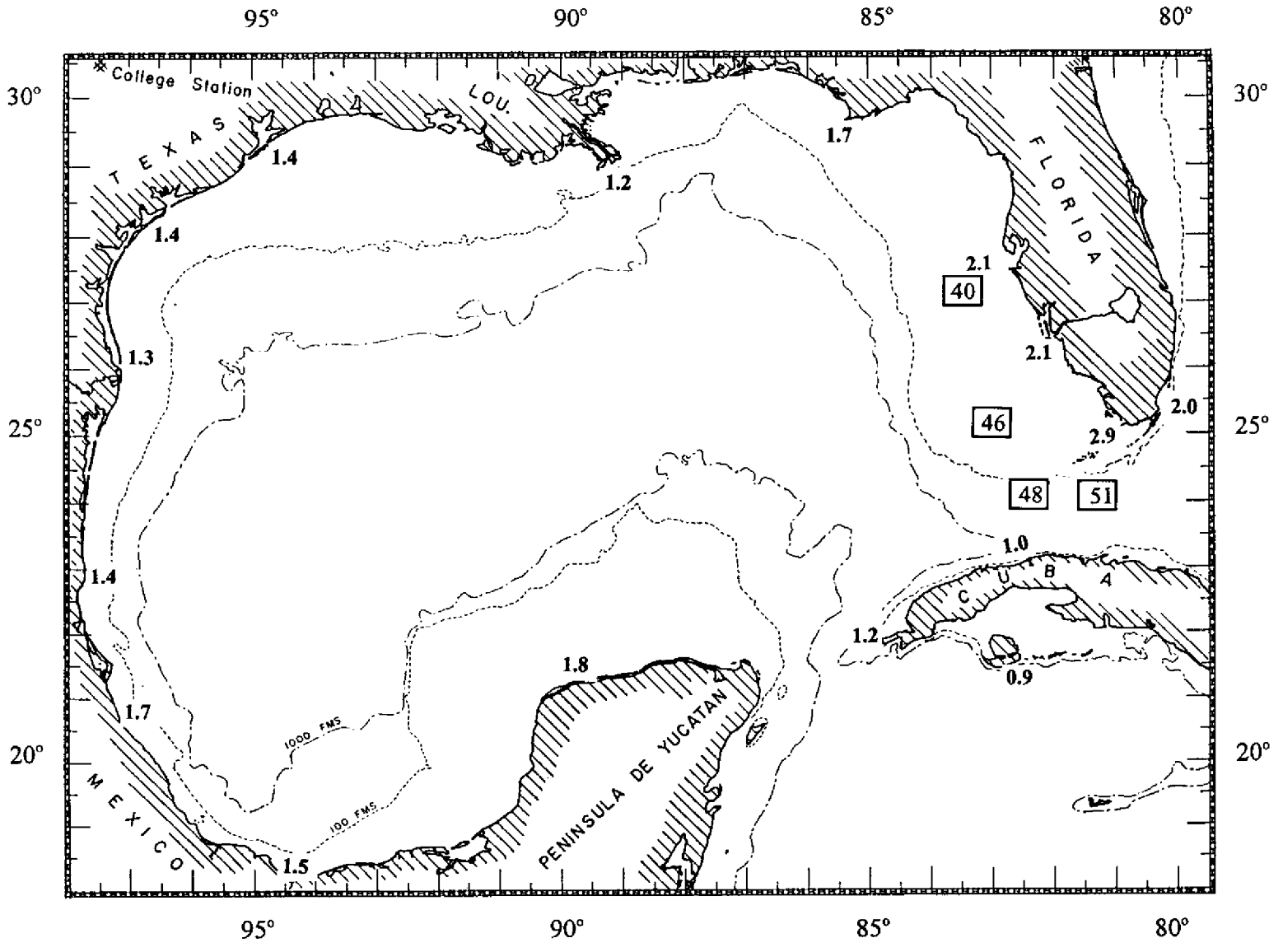

Figure 1. Definition chart of the Gulf of Mexico and surrounding waters. The numbers along the coast are mean astronomical tide ranges in feet. The station numbers enclosed in square boxes are the location of the wind and wave roses shown in Figures 2 and 3.

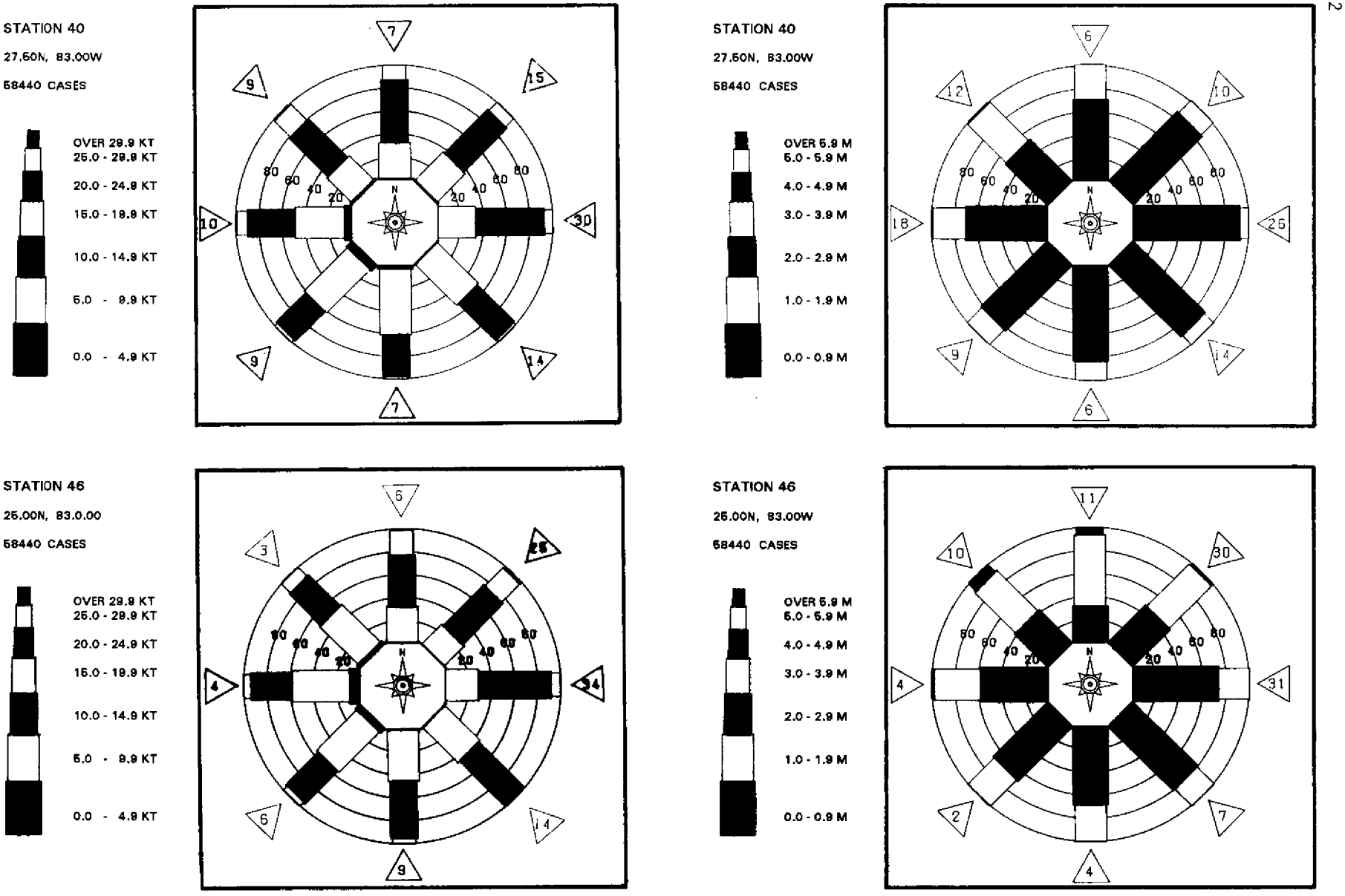

Figure 2. Wind and wave roses for Stations 40 and 46 (see Figure 1).
(Huber and Brooks, 1989)

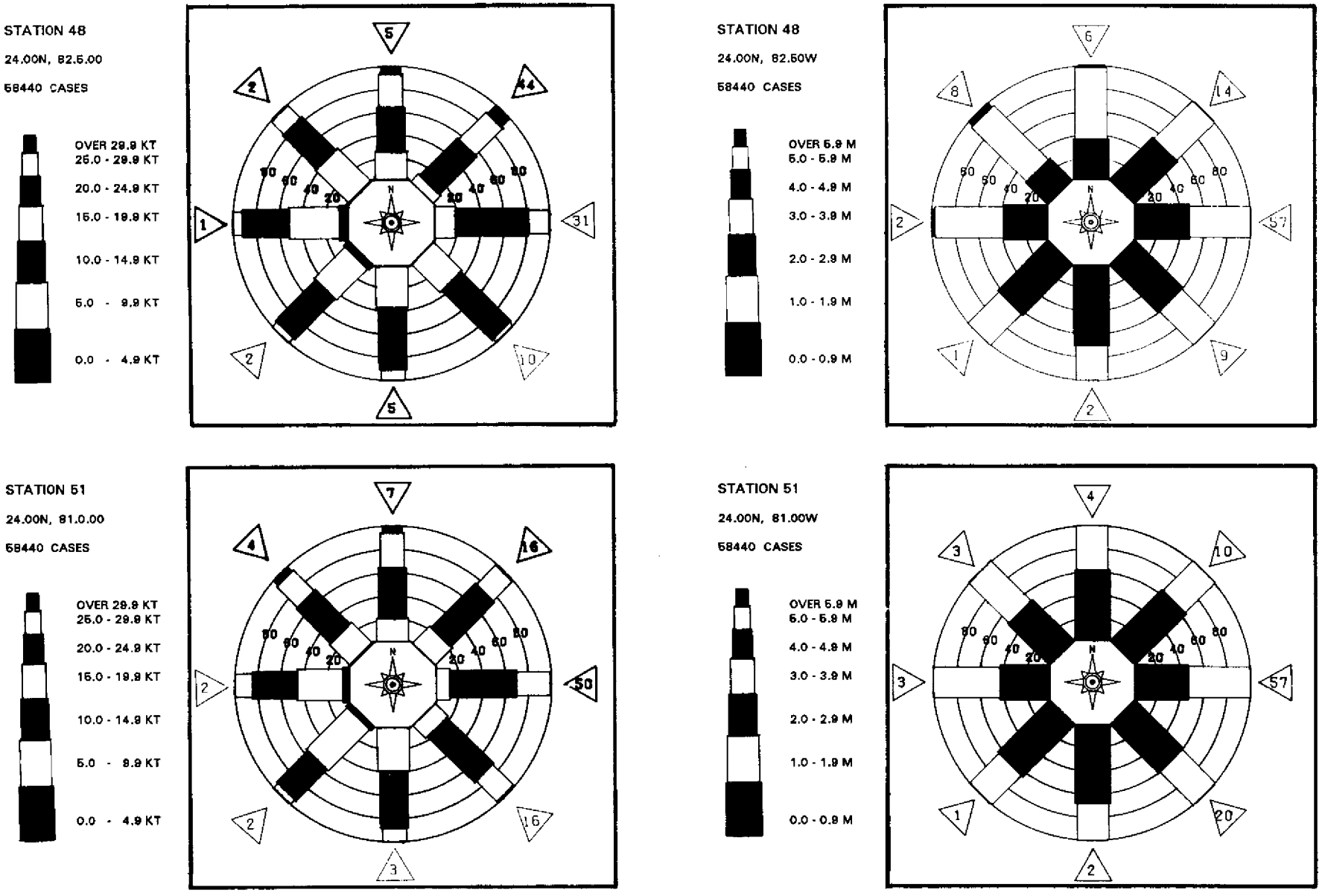

Figure 3. Wind and wave roses for Stations 48 and 51 (see Figure 1).
(Huber and Brooks, 1989)

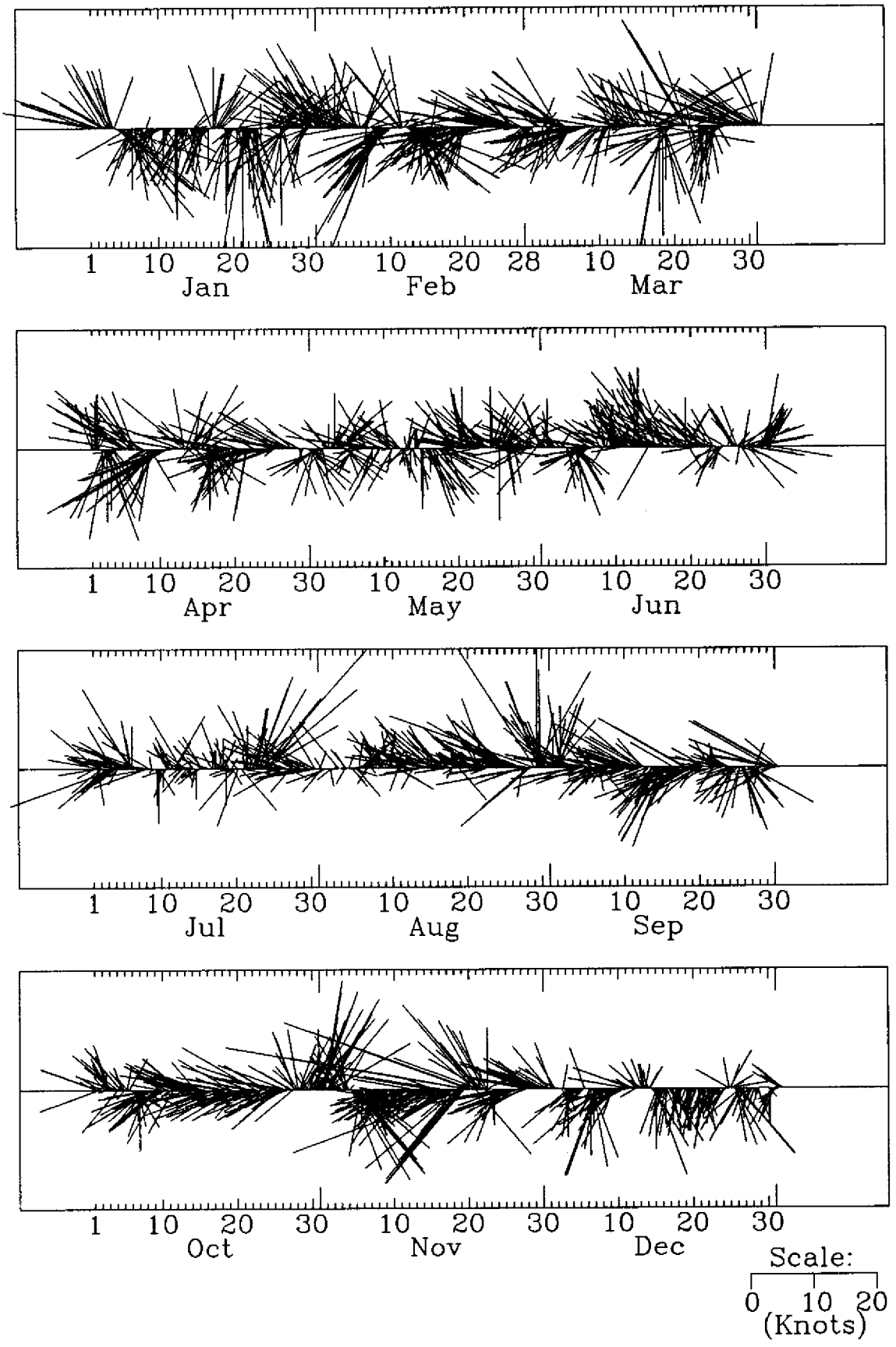

Figure 4. Wind stick diagram for Key West, Florida winds for the year 1985, measured and plotted in 15 minute intervals. The sticks point in the direction to which the wind is blowing.

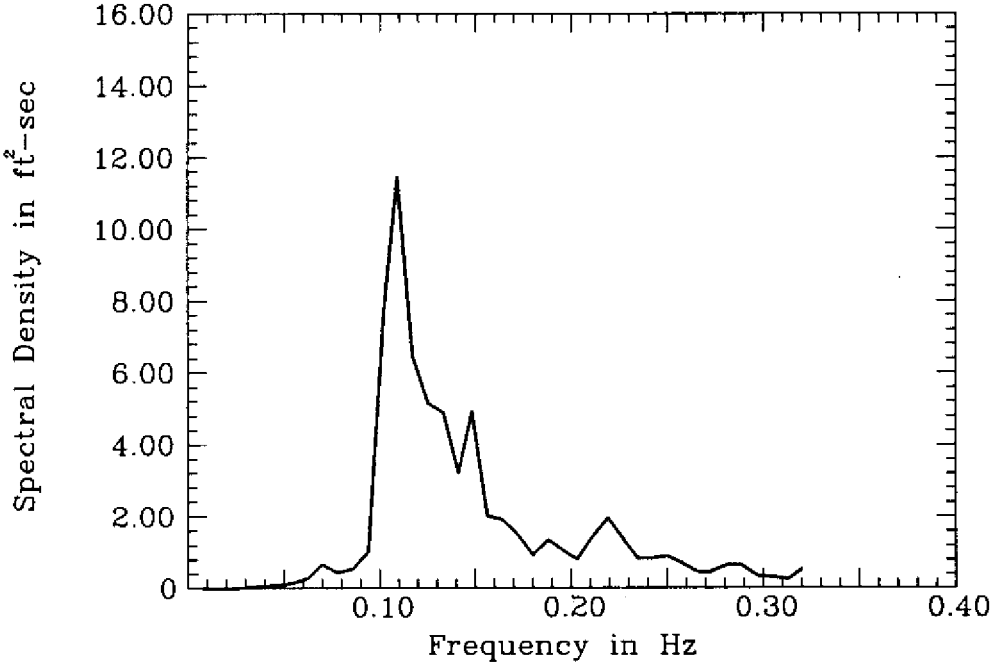

Figure 5. Wave energy density spectrum for a location off West Palm Beach, Florida in water depths of 12 ft. on January 15, 1994.

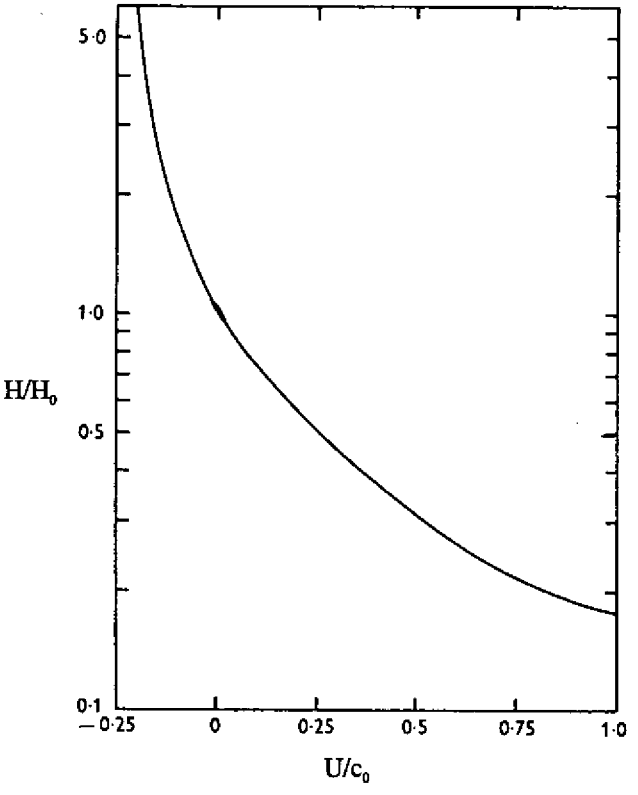

Figure 6. Plot of wave height (divided by deep water wave height) versus current speed (divided by deep water wave speed). Positive U/c_0 means that the waves are propagating in the direction the current is flowing. Negative U/c_0 means the waves are propagating in the direction opposite the current.

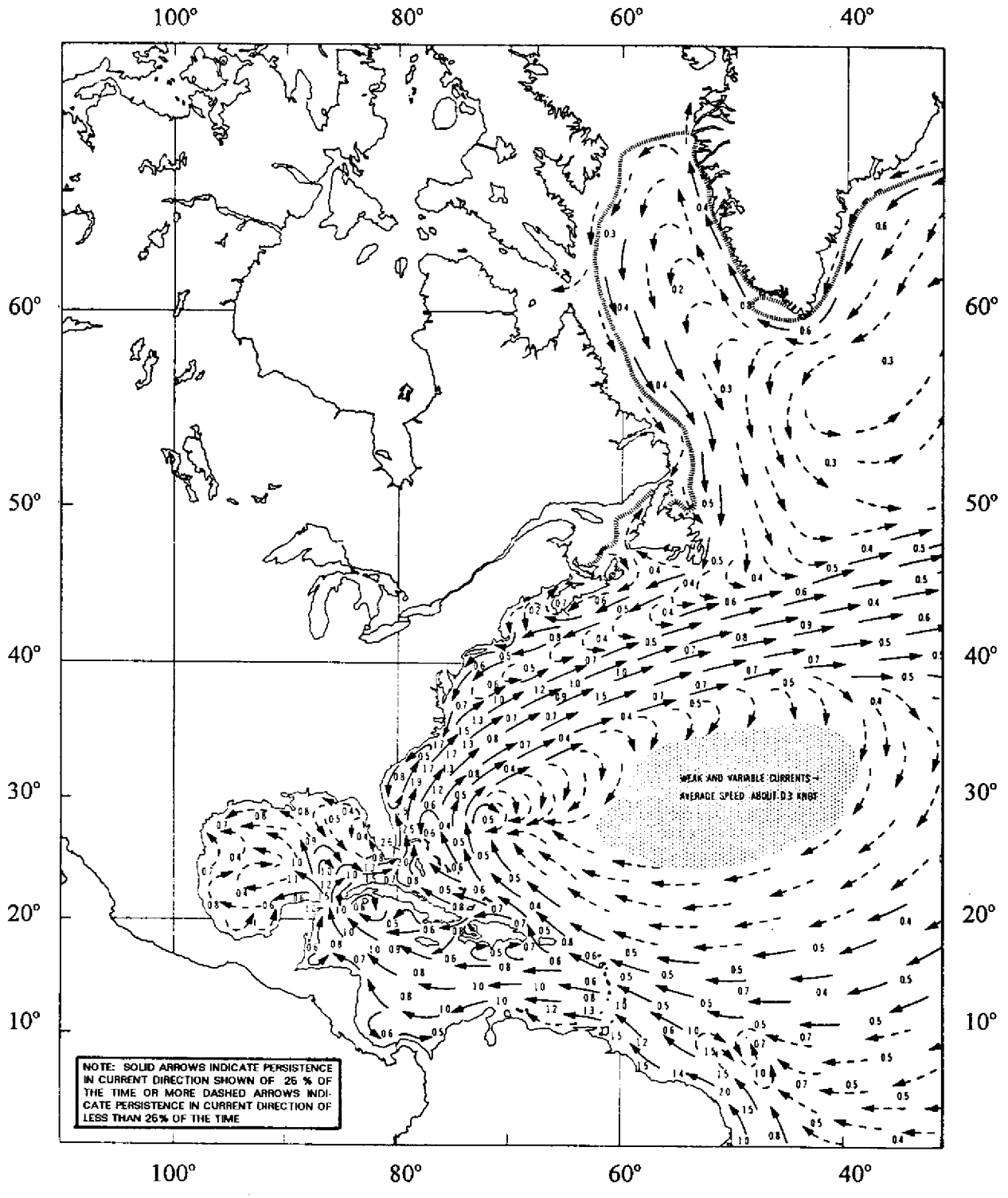

Figure 7. Surface currents in the southwestern North Atlantic Ocean, Caribbean Sea and Gulf of Mexico in January (Ichiye et al. 1973).

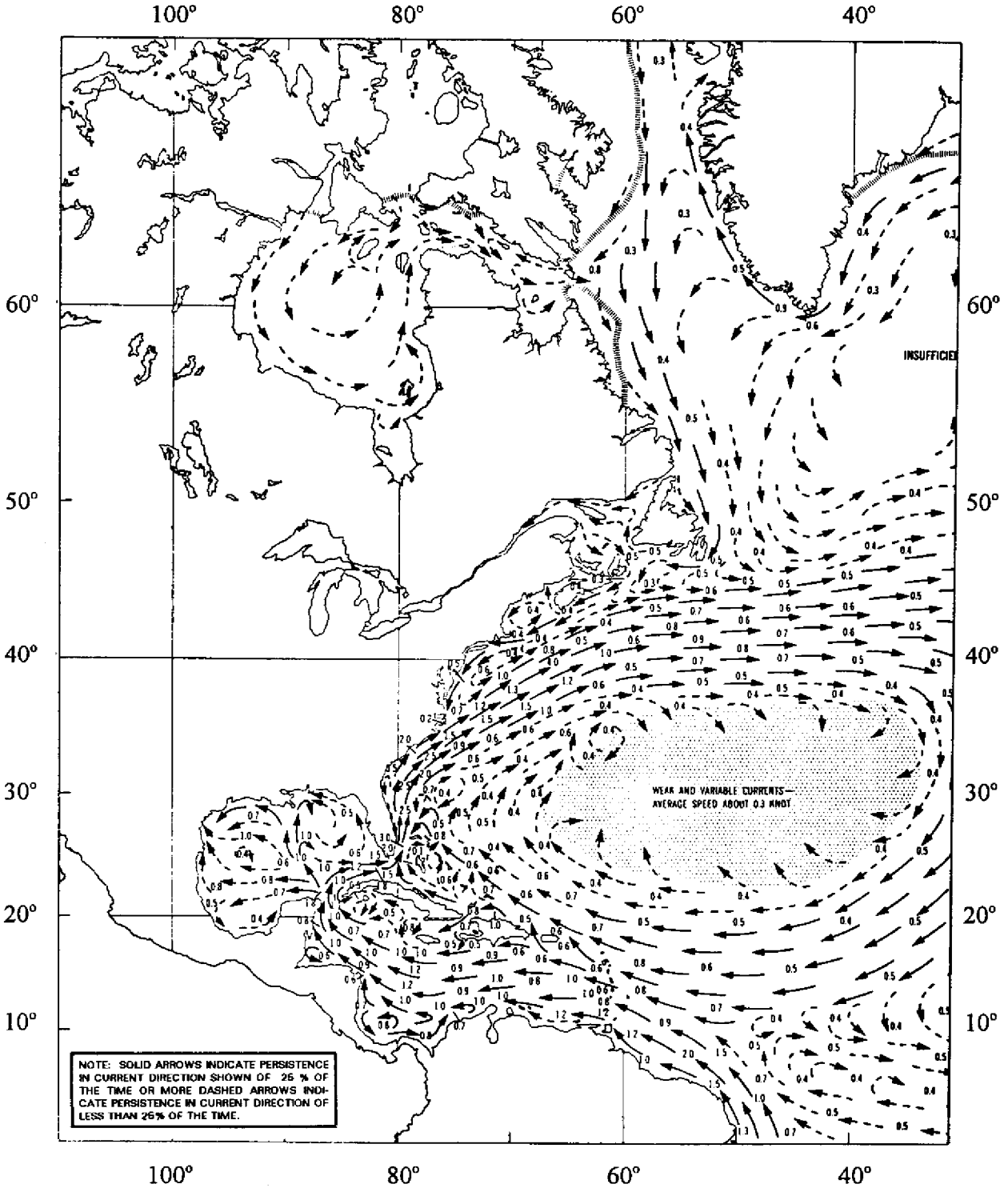

Figure 8. Surface currents in the southwestern North Atlantic Ocean, Caribbean Sea and Gulf of Mexico in July (Ichiye et al. 1973).

See back cover for figure 9.

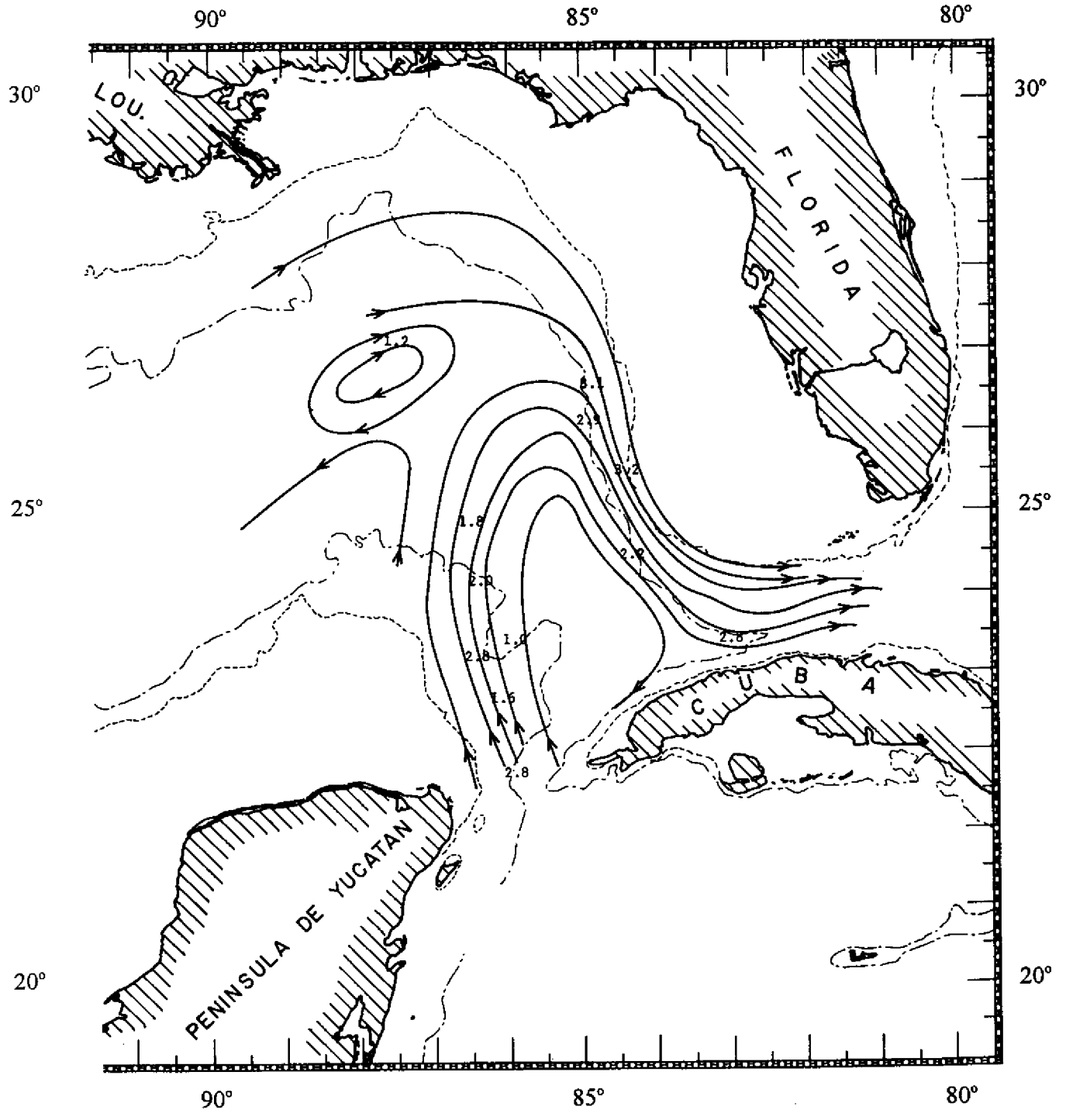

Figure 10. Typical streamlines of the surface currents in the Gulf of Mexico and surrounding waters for the month of February (Ichiye, 1973).

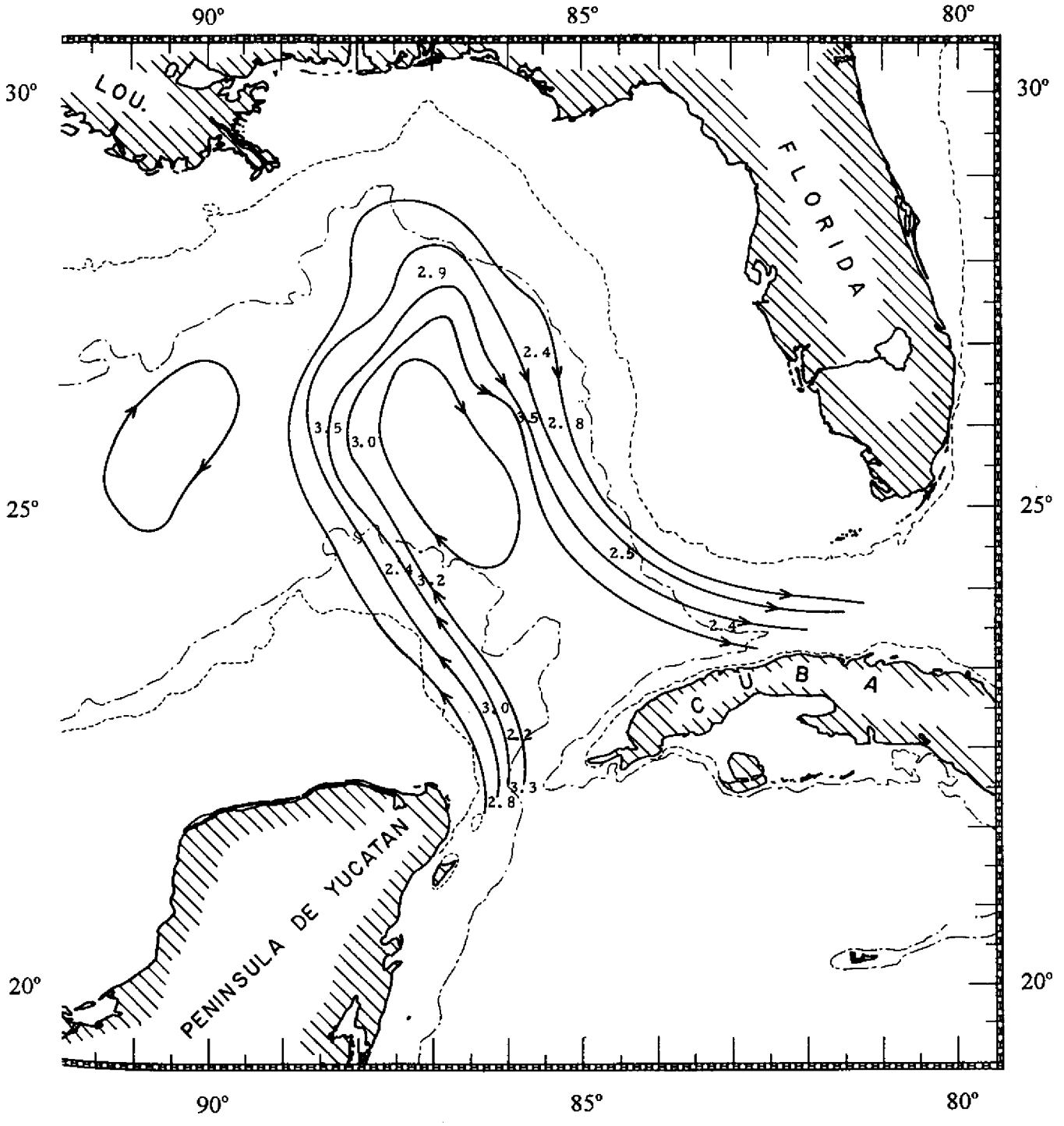

Figure 11. Typical streamlines of the surface currents in the Gulf of Mexico and surrounding waters for the month of June (Ichiye, 1973).

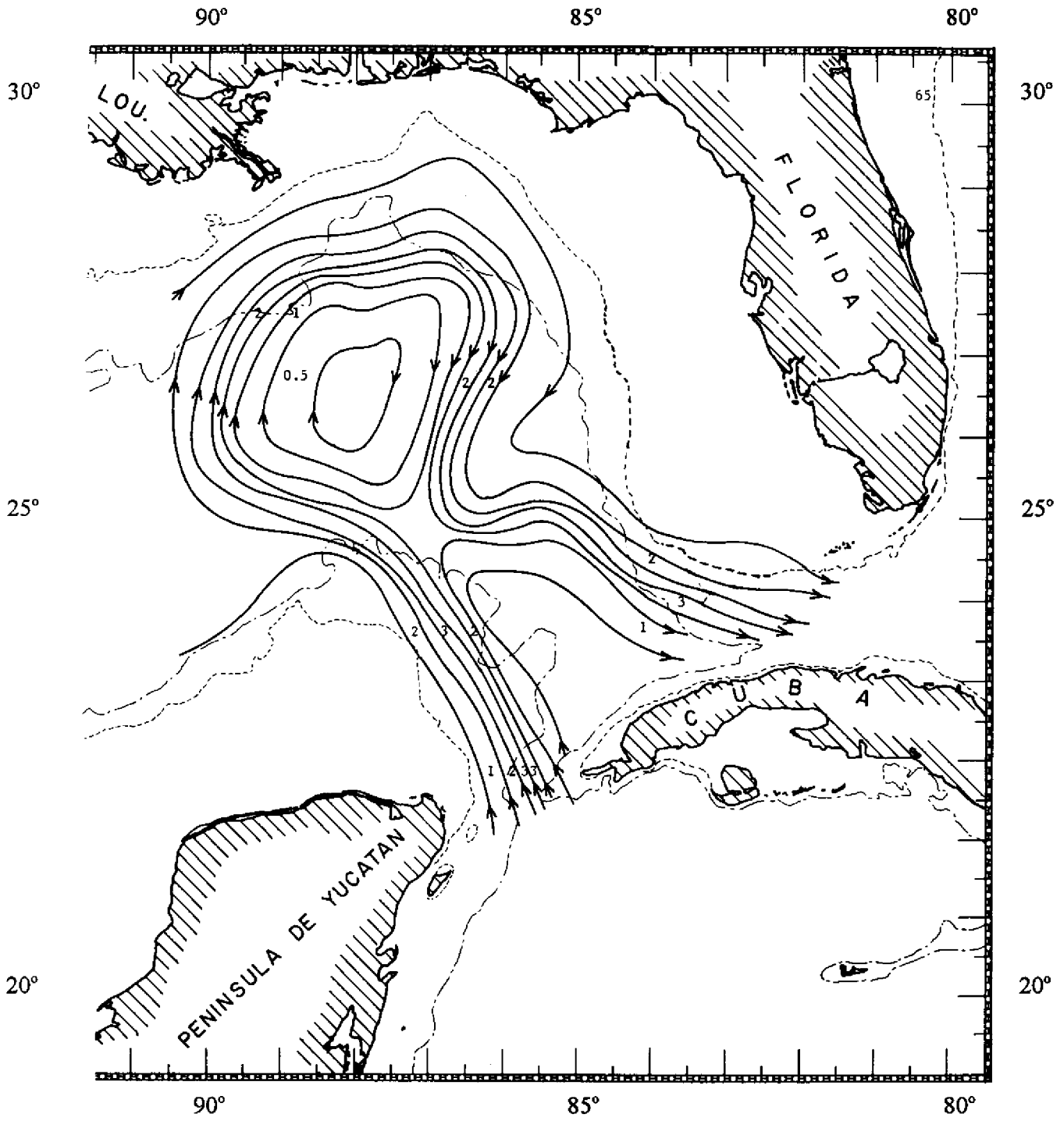

Figure 12. Typical streamlines of the surface currents in the Gulf of Mexico and surrounding waters for the month of August (Ichiye, 1973).

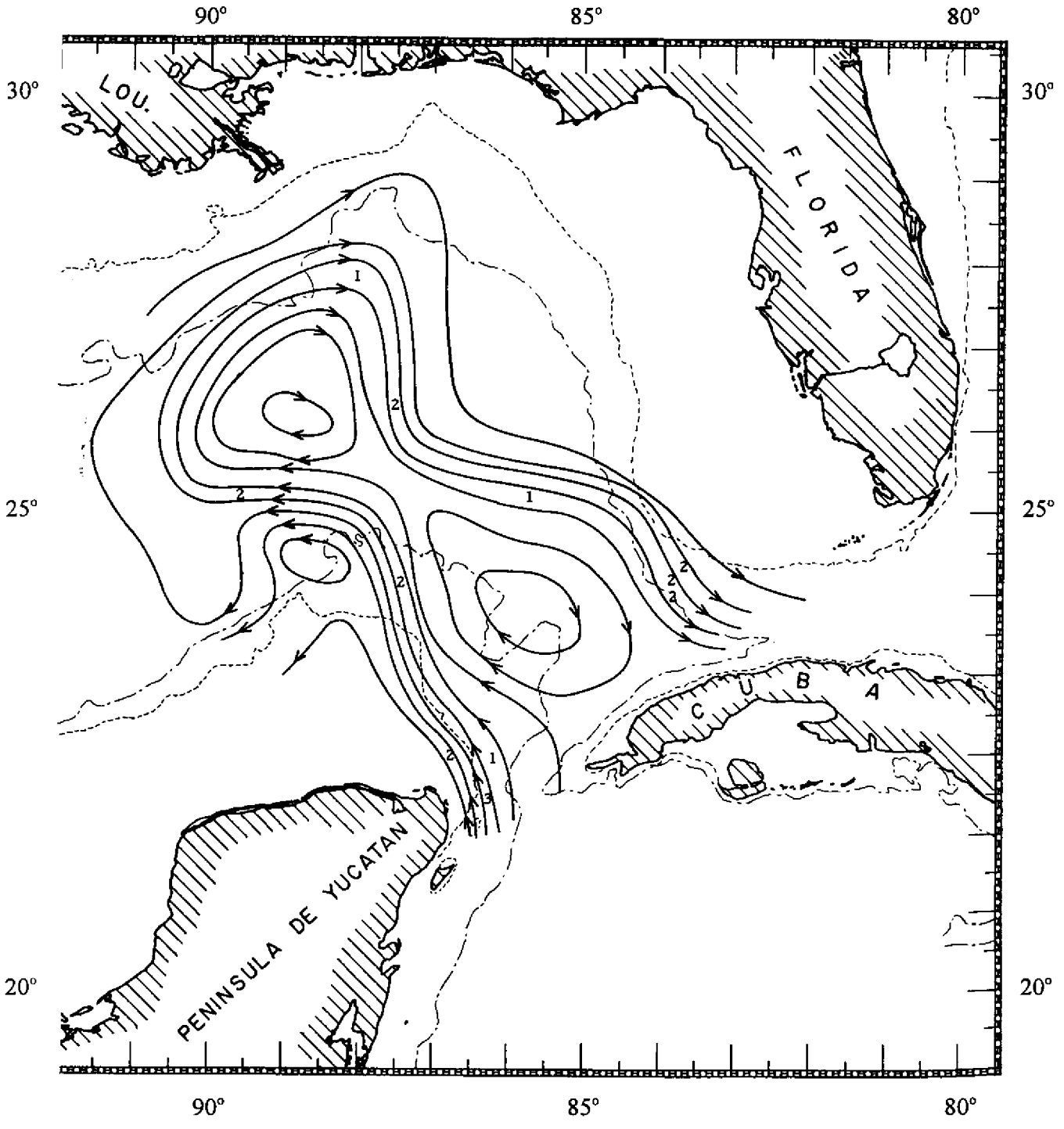

Figure 13. Typical streamlines of the surface currents in the Gulf of Mexico and surrounding waters for the month of October (Ichiye, 1973).

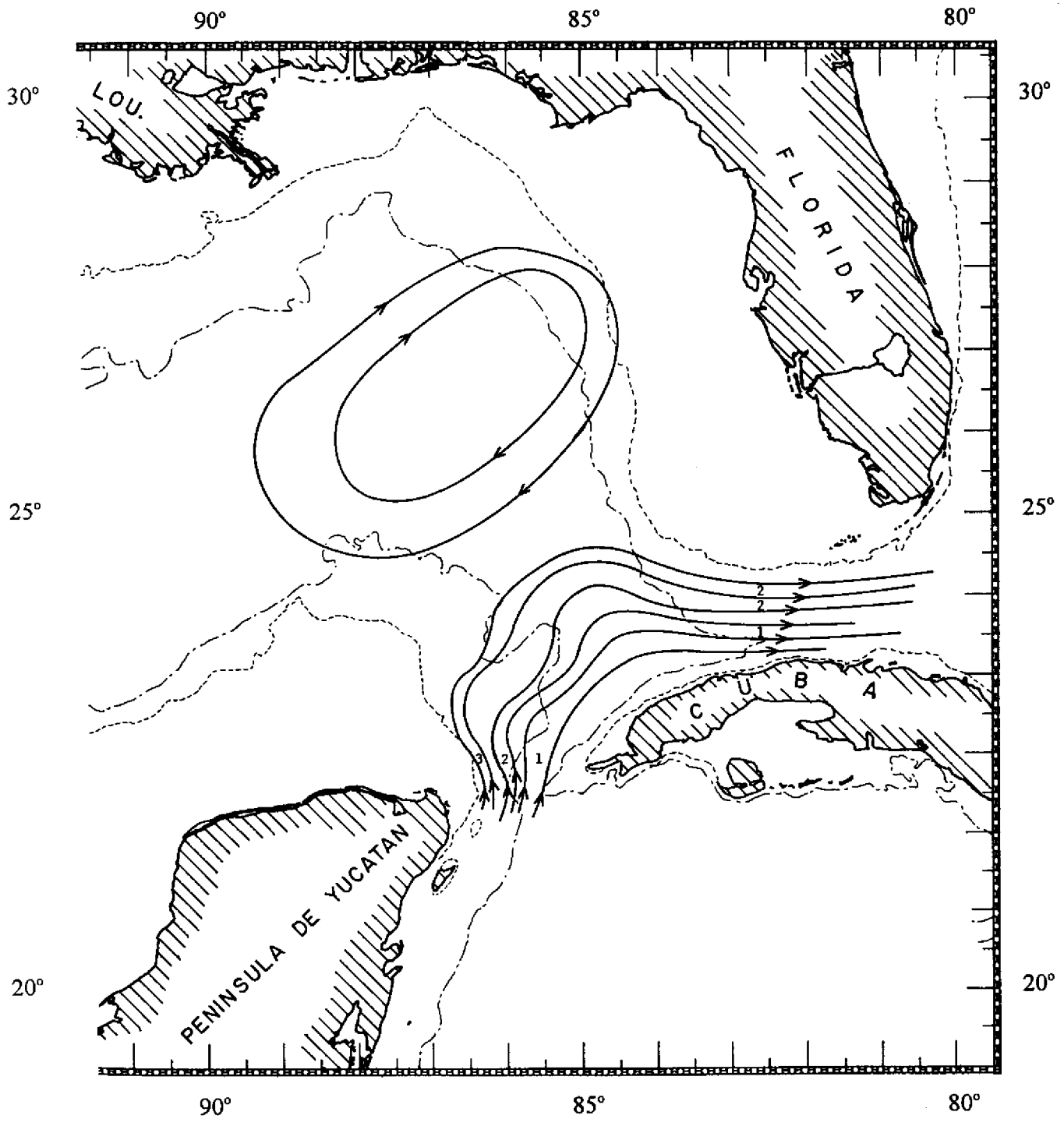

Figure 14. Typical streamlines of the surface currents in the Gulf of Mexico and surrounding waters for the month of November (Ichiye, 1973).

See back cover for figure 15.

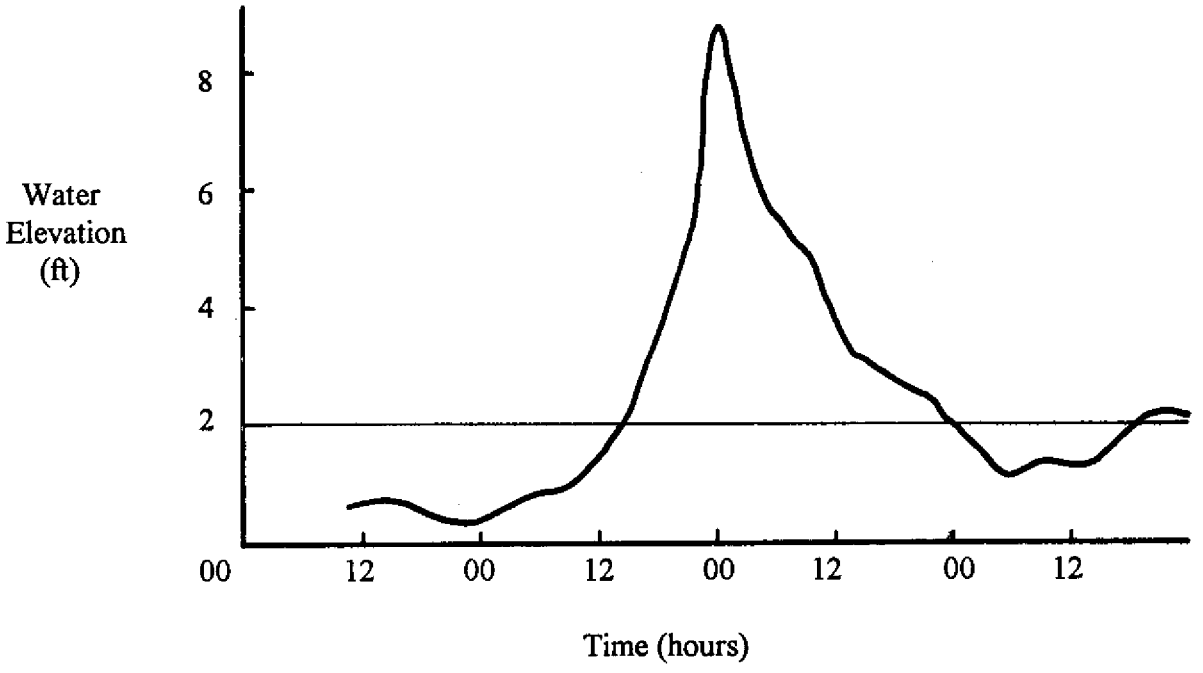

Figure 16. Storm surge hydrograph for Hurricane Betsy (September 10, 1965) at Biloxi, Mississippi (Jelesnianski, 1992).

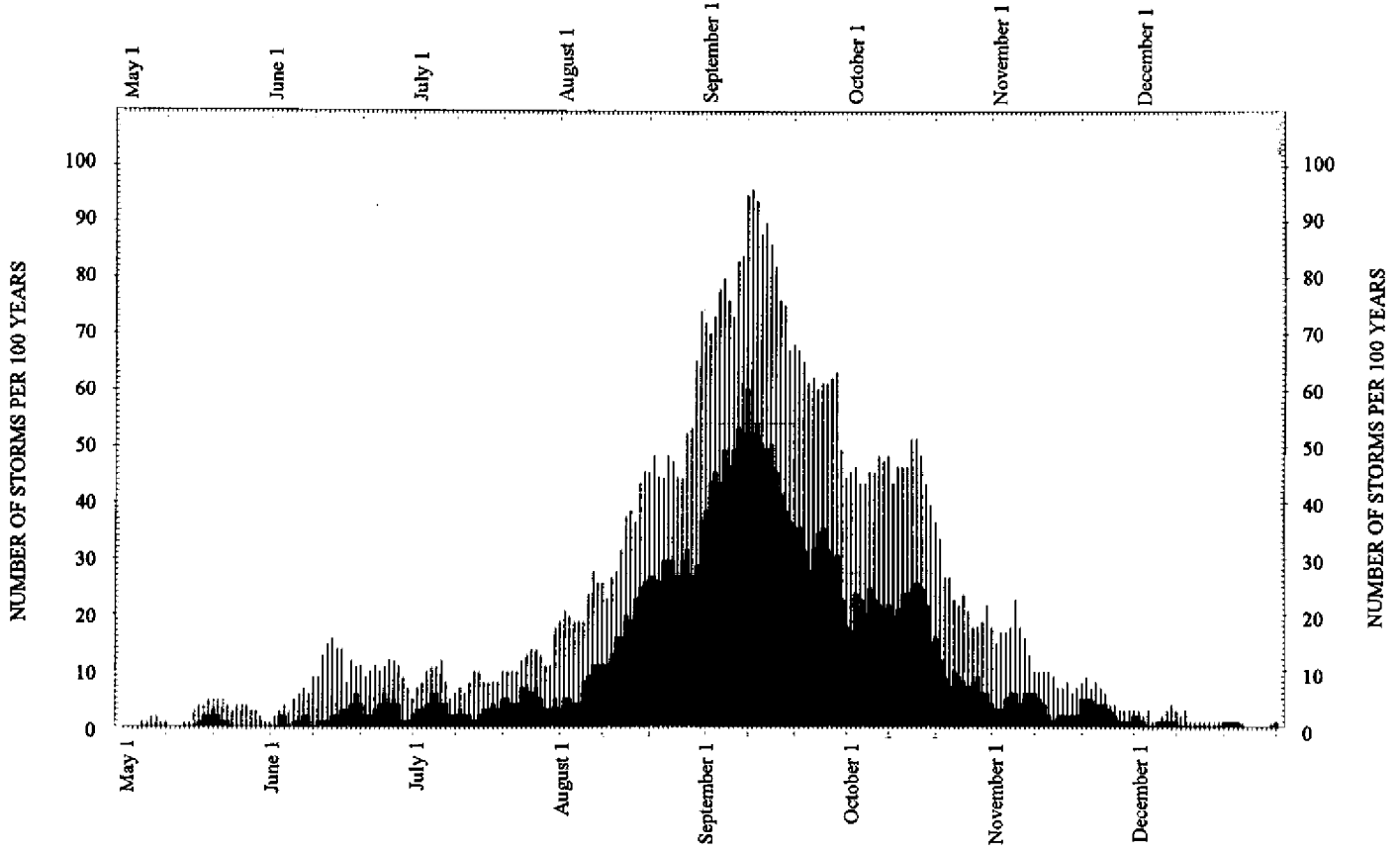

Figure 17. Intra-seasonal variations in the 100-year frequency of tropical storm occurrence. Lower bar is for hurricanes only and upper bar is for hurricanes and tropical storms combined. Data from 1886 - 1986 (Neumann, et al. 1987).

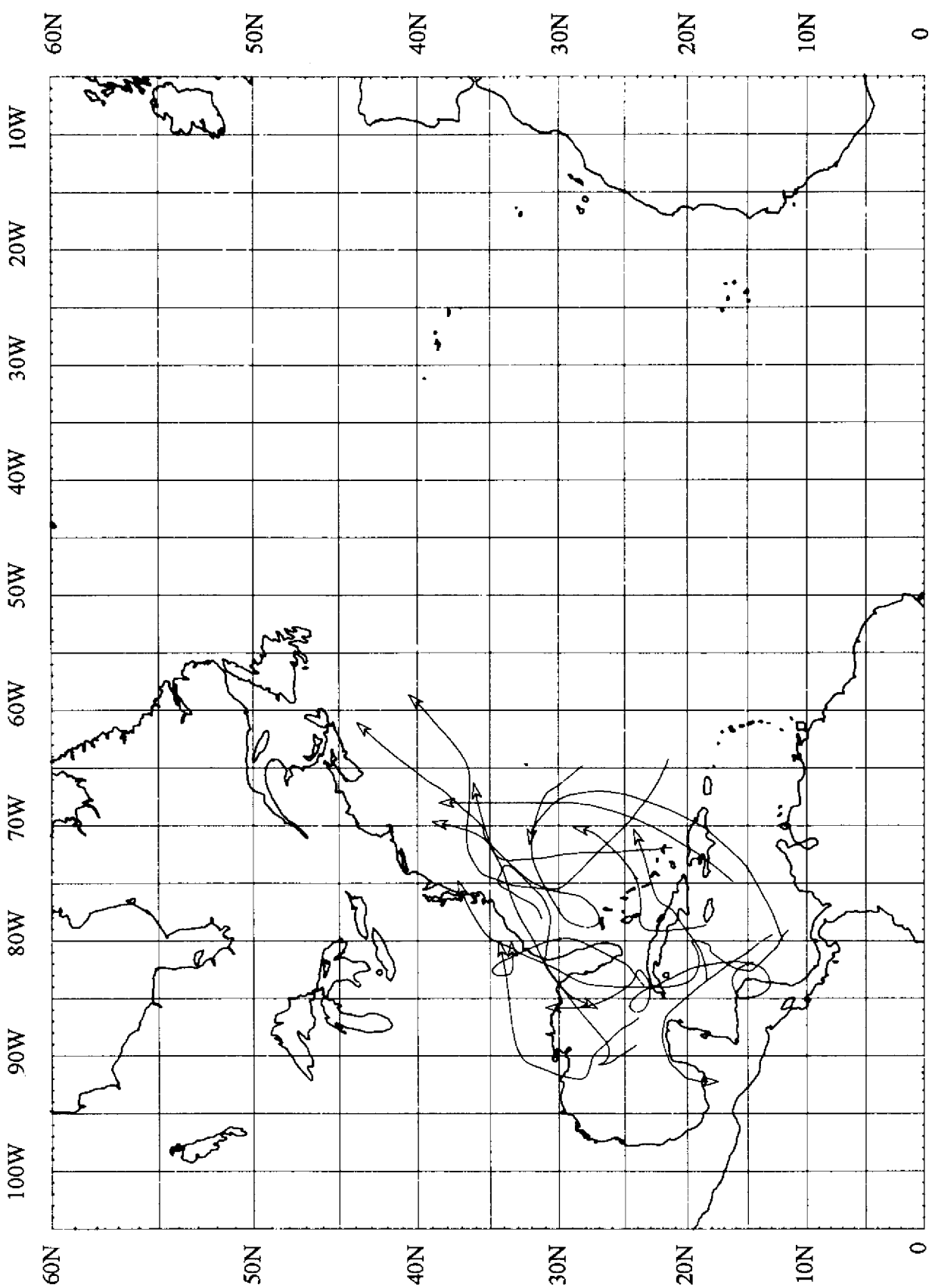

Figure 18. Tropical storms and hurricane paths for the month of May, for the 100-year period 1886 - 1986 (14 Storms) (Neumann, et al. 1987).

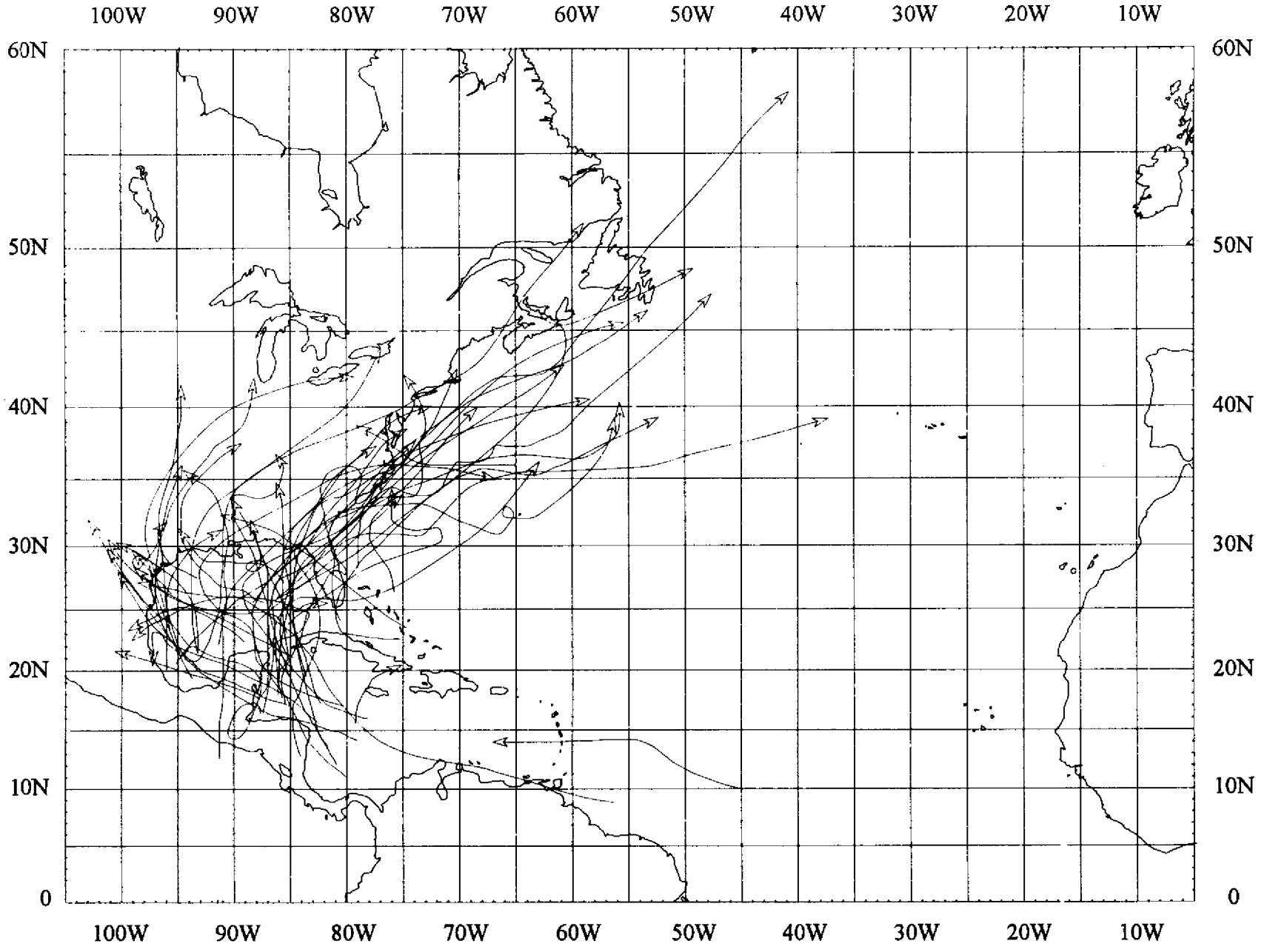

Figure 19. Tropical storms and hurricane paths for the month of June, for the 100-year period 1886 - 1986 (55 Storms) (Neumann, et al. 1987).

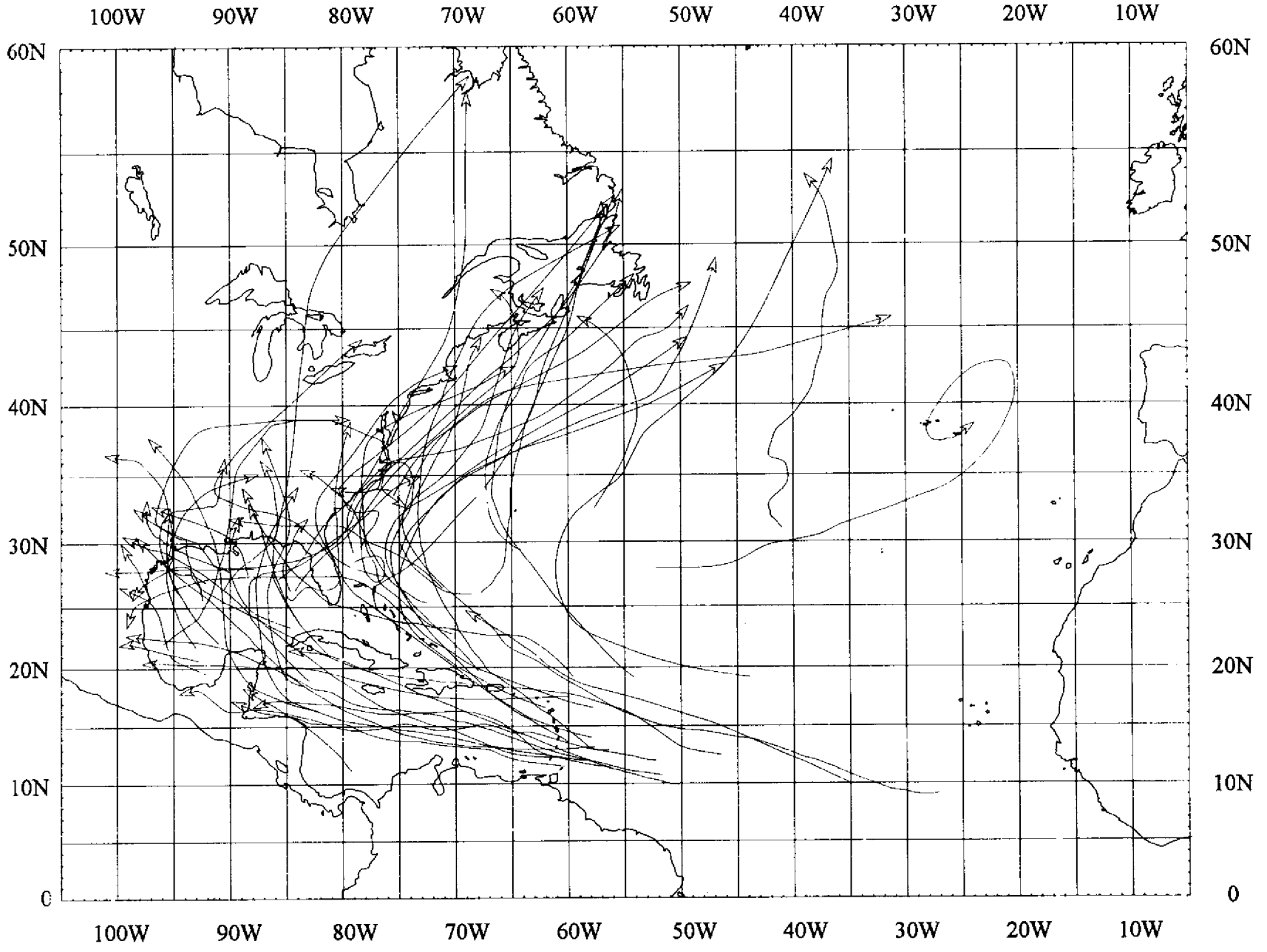

Figure 20. Tropical storms and hurricane paths for the month of July, for the 100-year period 1886 - 1986 (63 Storms) (Neumann, et al. 1987).

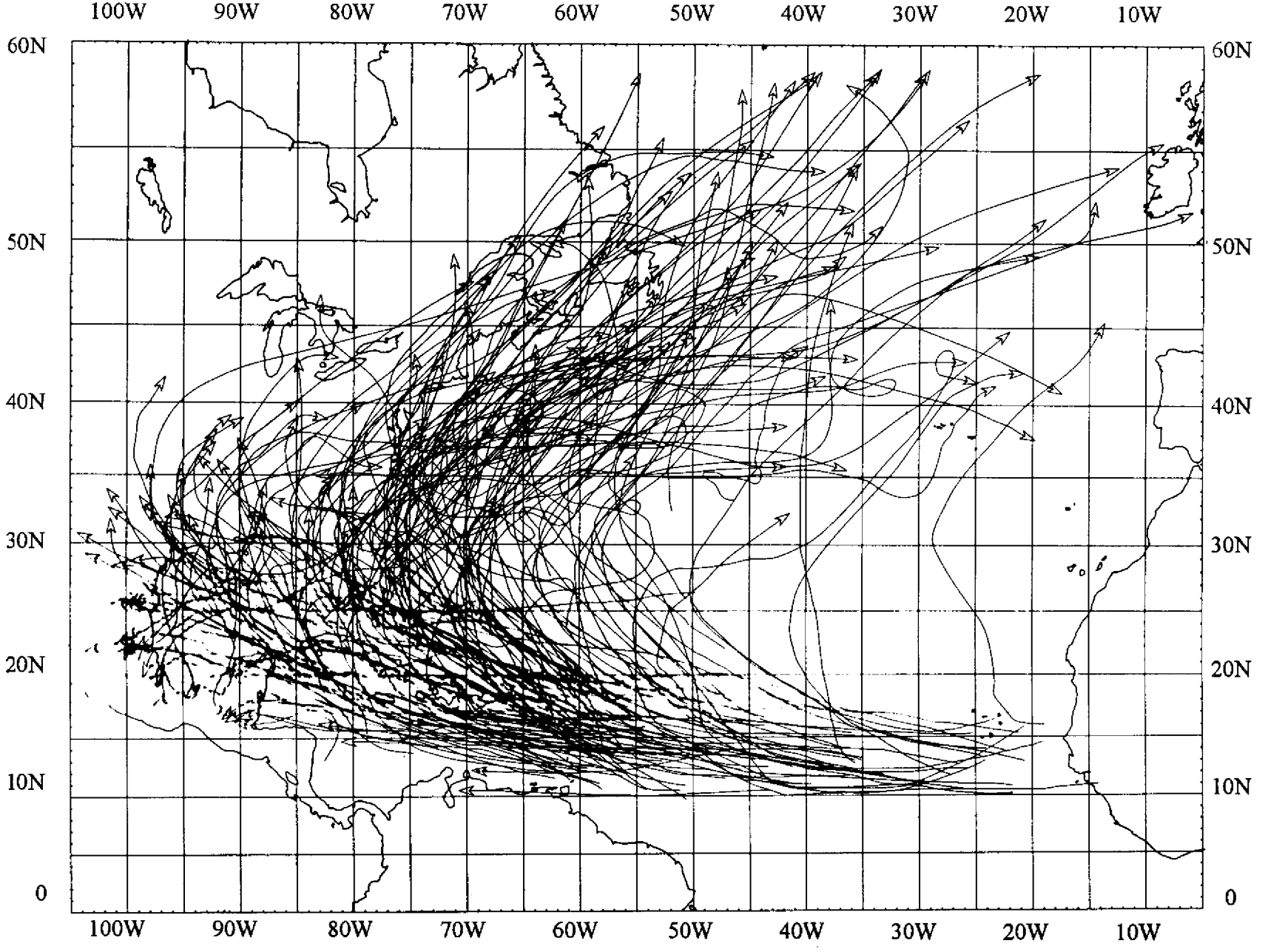

Figure 21. Tropical storms and hurricane paths for the month of August, for the 100-year period 1886 - 1986 (199 Storms) (Neumann, et al. 1987).

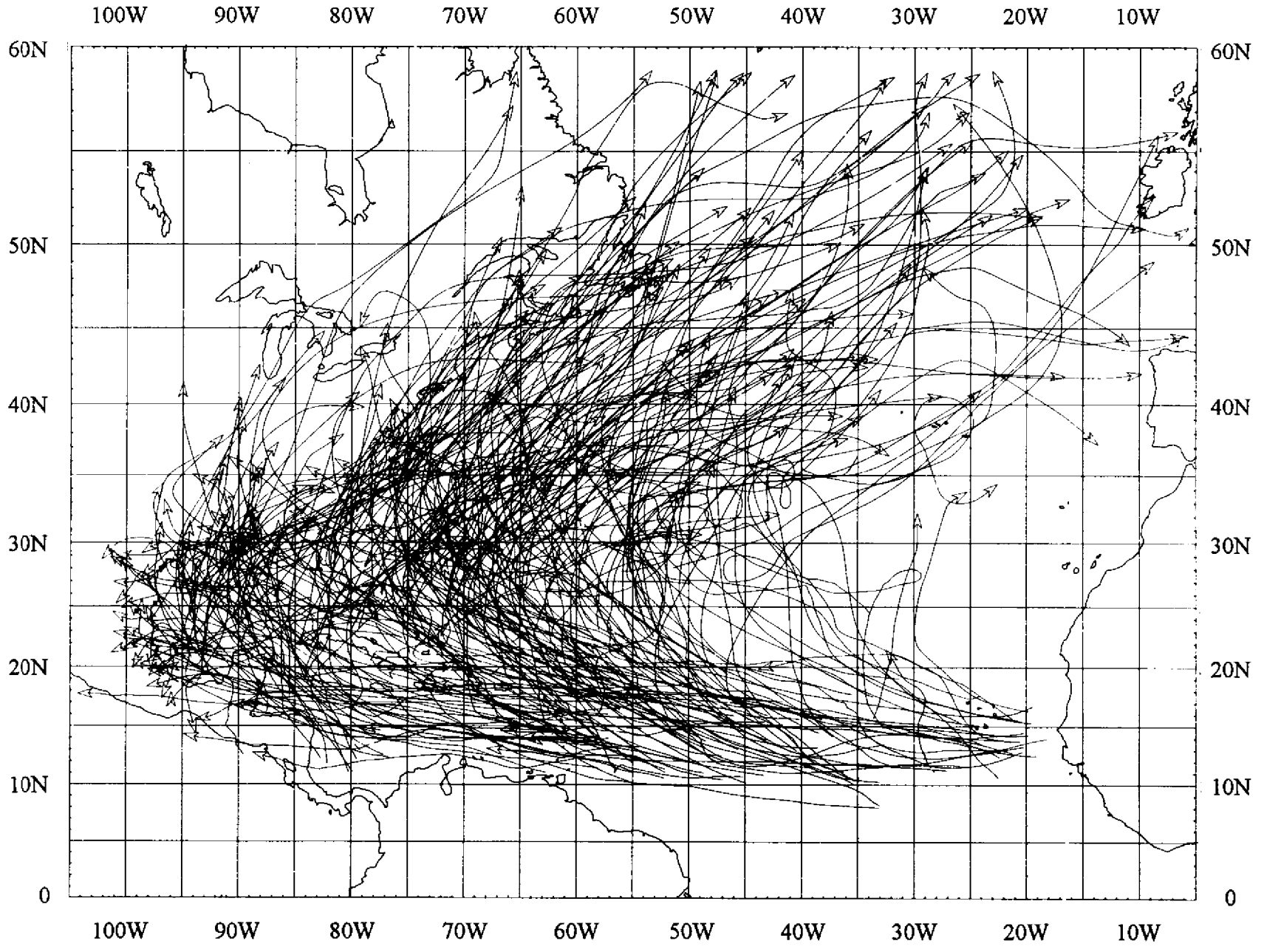

Figure 22. Tropical storms and hurricane paths for the month of September, for the 100-year period 1886 - 1986 (287 Storms) (Neumann, et al. 1987).

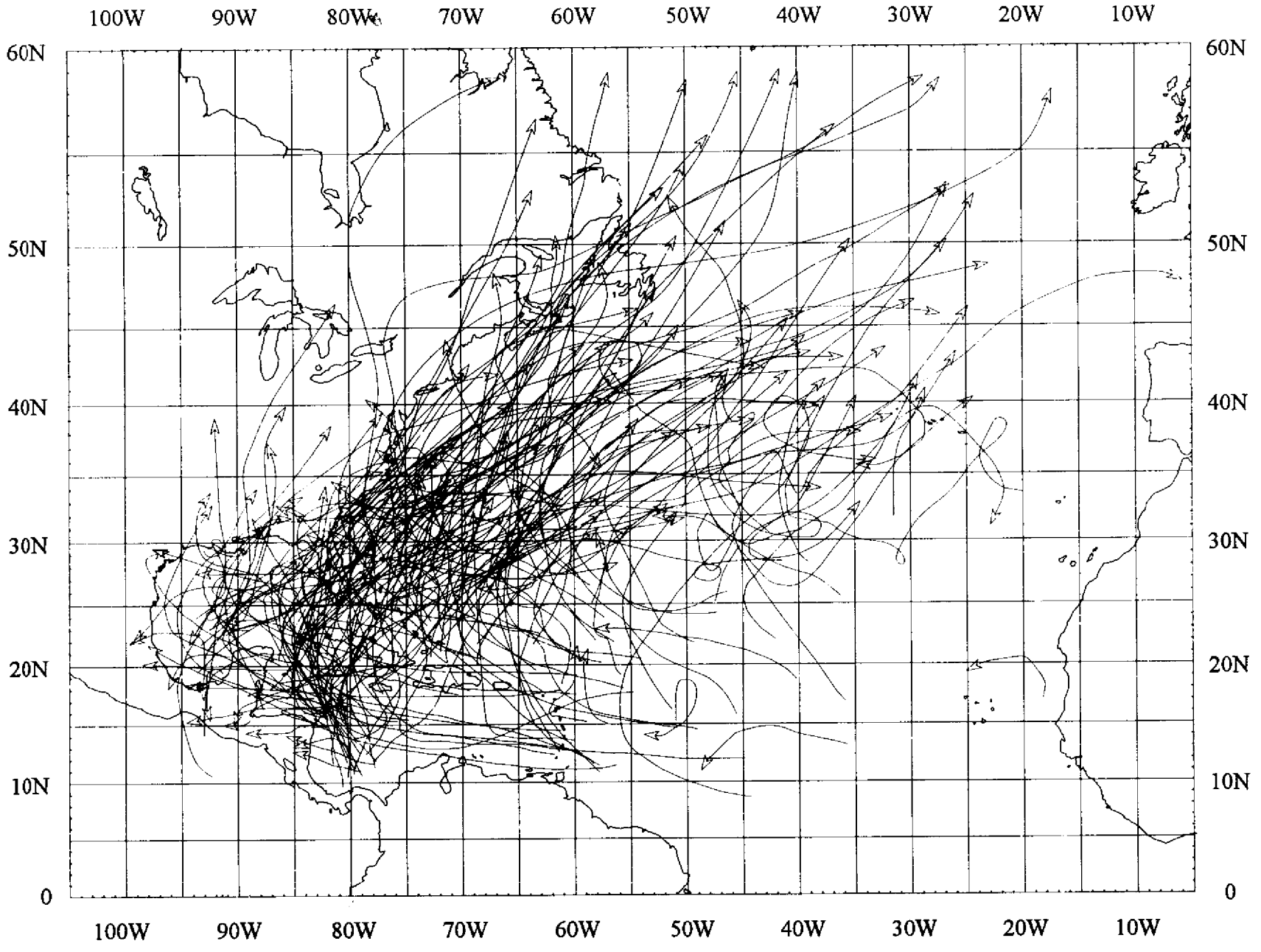

Figure 23. Tropical storms and hurricane paths for the month of October, for the 100-year period 1886 - 1986 (178 Storms) (Neumann, et al. 1987).

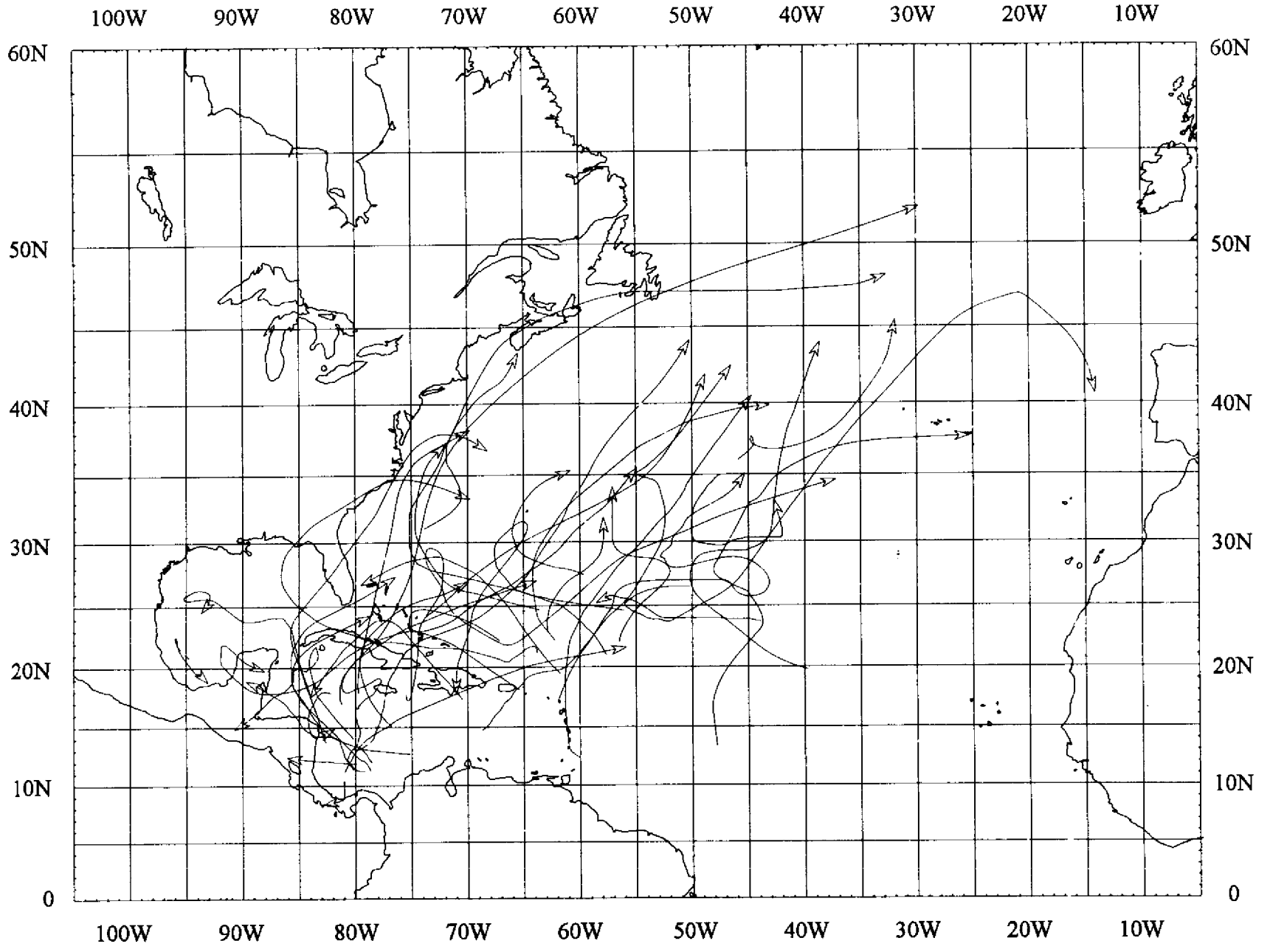

Figure 24. Tropical storms and hurricane paths for the month of November, for the 100-year period 1886 - 1986 (40 Storms) (Neumann, et al. 1987).

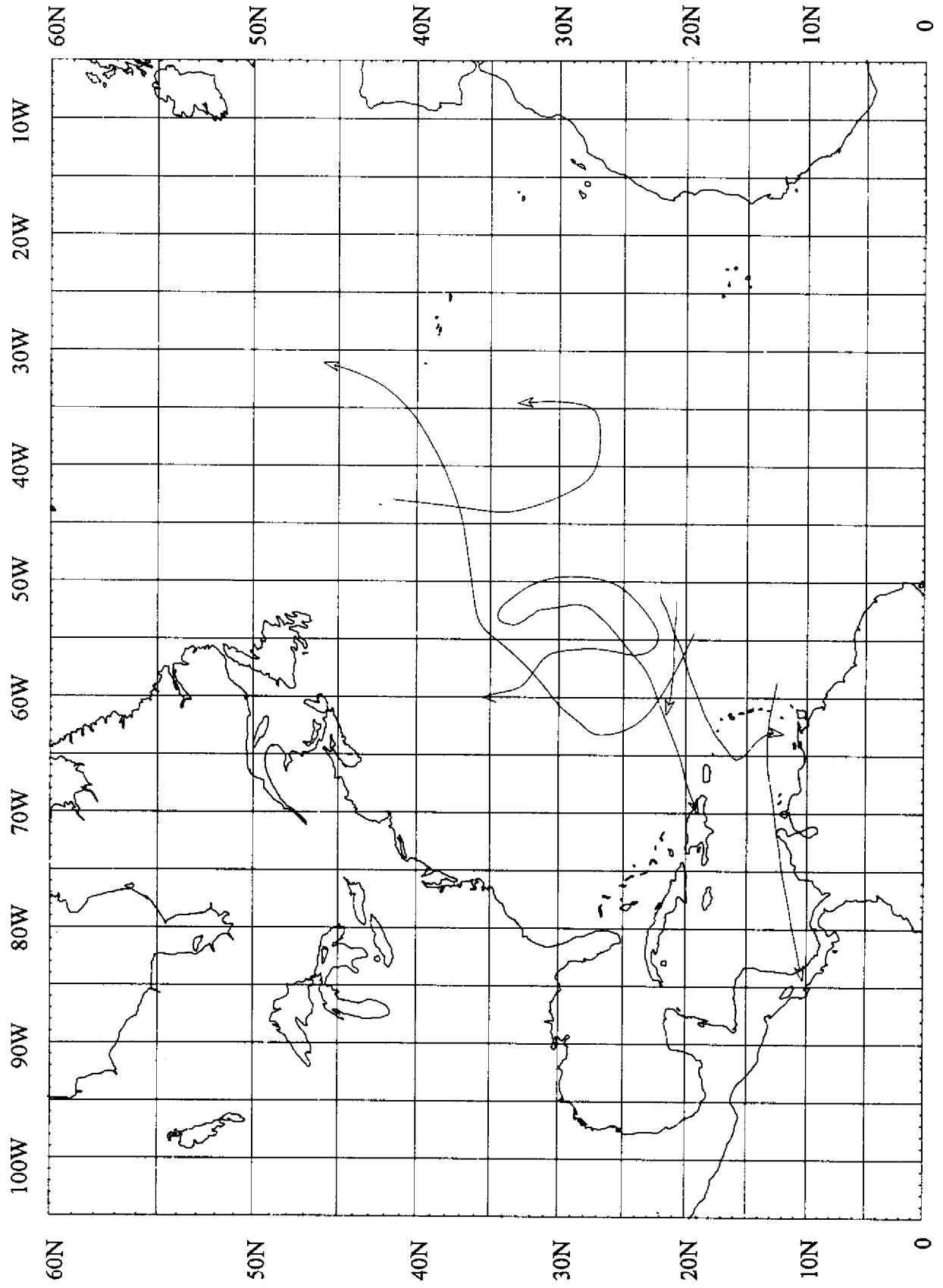

Figure 25. Tropical storms and hurricane paths for the month of December, for the 100-year period 1886 - 1986 (6 Storms) (Neumann, et al. 1987).

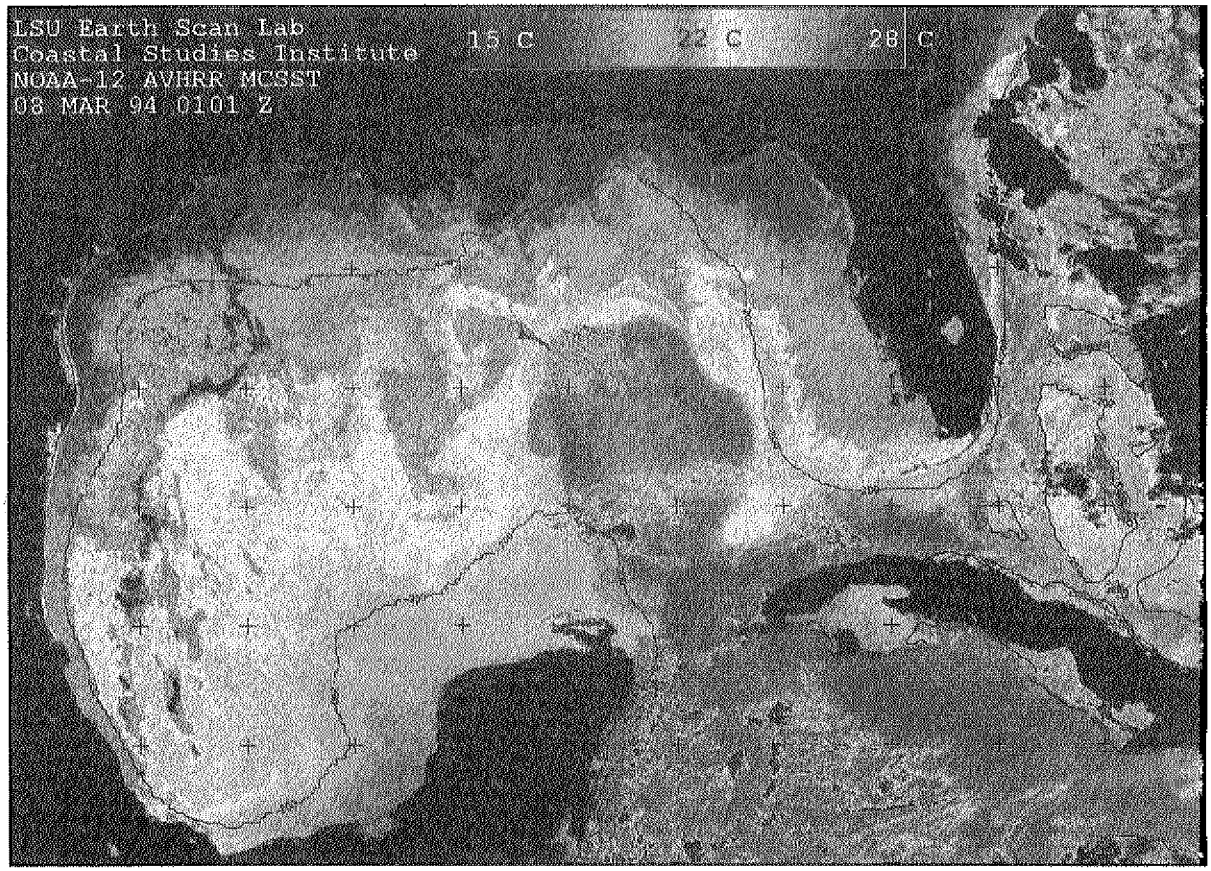

Figure 9. (See pages 103-132) An AVHRR sea surface temperature image of the Gulf of Mexico acquired on March 8, 1984. Warmest waters are shades of red and coolest waters are shades of blue. This image was acquired by Dr. Lawrence J. Rouse, Coastal Studies Institute, Louisiana State University, and processed by the Earth Scan Laboratory at the Coastal Studies Institute (1994).

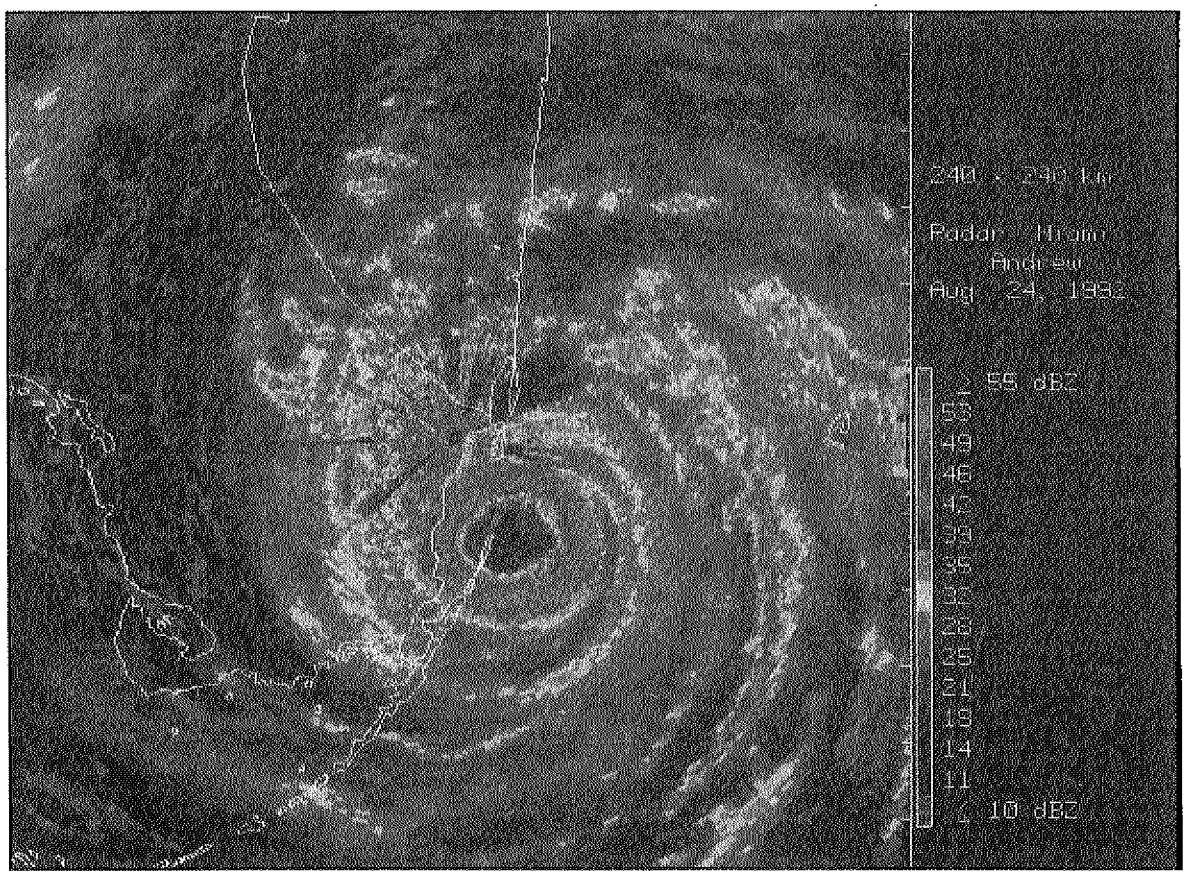

Figure 15. (See pages 103-132) Radar image of Hurricane Andrew as it made landfall near Miami, Florida on August 24, 1992. Image supplied by Mr. Peter Dodge of the Hurricane Research Division of NOAA (Houston and Dodge, 1994).

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