

Appendix A. PHYSICAL, SOCIAL, AND ECONOMIC STATISTICS FOR THE CARIBBEAN REGION

TABLE A1. CORAL REEF AREA IN THE WIDER CARIBBEAN

Country/Territory	Estimates of Coral Reef Area		
	<i>Reefs at Risk in the Caribbean</i> km ²	<i>World Atlas of Coral Reefs</i> km ²	UNEP-WCMC and NOAA km ²
Anguilla	70	<50	33
Antigua and Barbuda	180	240	220
Aruba	25	<50	47
Bahamas	3,580	3,150	2,805
Barbados	90	<100	92
Belize	1,420	1,330	1,152
Bermuda	210	370	332
British Virgin Islands	380	330	335
Cayman Islands	130	230	207
Colombia	2,060	900	2,541
Costa Rica	30	0	47
Cuba	3,290	3,020	2,783
Dominica	70	<100	47
Dominican Republic	1,350	610	567
Grenada	160	150	131
Guadeloupe ^a	400	250	400
Guatemala	0	0	0
Haiti	1,260	450	458
Honduras	1,120	810	811
Jamaica	1,010	1,240	1,206
Martinique	260	240	617
Mexico	1,220	1,350	1,216
Montserrat	25	<50	41
Navassa Island	10	n.d.	n.d.
Netherlands Antilles Total (North, South) ^b	250 (40, 210)	420 (n.a., n.a.)	386 (85,301)
Nicaragua	870	710	508
Panama	1,600	570	492
Puerto Rico	1,610	480	2,171
St. Kitts and Nevis	160	180	170
St. Lucia	90	160	98
St. Vincent and the Grenadines	140	140	131
Trinidad and Tobago	40	<100	62
Turks and Caicos Islands	1,190	730	2,002
United States	840	1,250	1,131
Venezuela	230	480	486
Virgin Islands (U.S.)	590	200	748
Regional Total	25,960	20,000	24,860

Sources:

1. *Reefs at Risk in the Caribbean* mapping was done at WRI and is based on the best data available at the time of publication. Data come from the University of South Florida, Institute for Marine Remote Sensing (IMaRS), Millennium Coral Reef Mapping Project (draft data, 2004); US National Oceanographic and Atmospheric Administration (NOAA) Benthic Habitats of Puerto Rico and the U.S. Virgin Islands, (2001); Coastal Zone Management Institute of Belize (1999); and UNEP-WCMC Biodiversity Map Library: Global Coral Reef Distribution (2002). In order to convert these sources to a single layer of broadly comparable resolution the maps were fitted to a 500-m resolution grid and it was from this gridded data layer that reef area estimates were generated.
2. The reef maps prepared for the *World Atlas of Coral Reefs* (Spalding et al., 2001) represented the best available information at the time of publication. Data were drawn from multiple sources, ranging from hydrographic charts and remote sensing studies, to much lower-resolution maps. To convert these sources to a single layer of broad comparable resolution, the maps were fitted to a 1-km grid, and estimates of reef area were generated from this gridded data layer.
3. The reef maps from UNEP-WCMC come from a variety of sources, including hydrographic charts, remote sensing, and much lower-resolution maps. Positional accuracy of some of these data were checked and improved by NOAA by rectifying the coral reef maps with bathymetric data from the 1-km resolution SeaWiFS sensor. Data were gridded by NOAA at 1-km resolution and estimates of reef area were generated from this gridded data layer.

Notes:

Estimates include only Caribbean and Atlantic (not Pacific) reefs.

The three sources cited in this table use various map sources, and differing methods of estimating area. Reef area estimates are sensitive to the definition of coral reef, as well as the data sources and mapping techniques used (i.e., satellite imagery versus charts).

Efforts to map Caribbean coral reefs are rapidly advancing.

- a. Guadeloupe includes the French islands of St. Martin and St. Barthelemy.
- b. Netherlands Antilles North includes the islands of St. Maarten, St. Eustatius, and Saba. Netherlands Antilles South includes the islands of Bonaire and Curaçao.

TABLE A2. PHYSICAL GEOGRAPHY OF THE WIDER CARIBBEAN

Country/Territory	National Land Area km ²	Land Area Draining to Caribbean km ²	Maritime Claim in Caribbean/ Atlantic km ²	Shelf Area to 30 m within Maritime Claim km ²	Shelf Area to 200 m within Maritime Claim km ²	Caribbean Coastline Length km
Anguilla	90	90	91,150	650	2,840	90
Antigua and Barbuda	440	440	110,225	2,385	4,820	270
Aruba	190	190	2,770	115	1,140	100
Bahamas	12,900	12,900	622,695	113,810	127,785	9,265
Barbados	430	430	187,535	80	695	95
Belize	22,965	22,965	34,735	7,850	9,115	2,220
Bermuda	55	0	449,735	840	1,400	140
British Virgin Islands	155	155	80,785	2,060	3,570	300
Cayman Islands	265	265	123,590	185	760	210
Colombia	1,038,700	678,745	490,680	18,635	40,680	3,445
Costa Rica	51,100	23,710	29,200	975	2,610	650
Cuba	111,950	110,860	342,615	50,870	58,210	12,005
Dominica	750	750	28,640	85	640	150
Dominican Republic	48,445	48,445	255,720	7,020	14,540	1,530
Grenada	345	345	27,380	960	3,670	195
Guadeloupe ^a	1,710	1,710	28,790	1,435	5,930	515
Guatemala	108,890	84,575	1,570	1,210	1,480	355
Haiti	27,750	27,750	124,590	3,305	5,905	1,820
Honduras	112,090	92,395	241,040	35,850	73,060	2,325
Jamaica	10,990	10,990	242,920	9,615	14,735	825
Martinique	1,100	1,100	18,740	415	1,515	320
Mexico	1,958,200	1,055,245	830,505	92,330	245,950	12,315
Montserrat	105	105	8,120	40	230	45
Netherlands Antilles North ^b	70	70	12,420	1,510	3,540	65
Netherlands Antilles South ^c	740	740	66,240	12	1,080	295
Nicaragua	120,255	110,110	63,845	39,470	52,150	2,075
Panama	75,520	22,295	142,565	6,105	11,570	2,905
Puerto Rico	8,950	8,950	205,410	3,500	6,680	930
St. Kitts and Nevis	270	270	9,835	460	1,415	120
St. Lucia	620	620	15,445	190	895	155
St. Vincent and the Grenadines	390	390	36,175	665	2,240	210
Trinidad and Tobago	5,130	5,130	73,460	5,925	24,045	665
Turks and Caicos Islands	430	430	149,315	7,005	8,510	745
United States	9,158,960	4,364,890	1,131,665 ^d	233,830 ^d	460,990 ^d	22,875 ^d
Venezuela	882,050	822,095	472,950	51,365	110,205	6,400
Virgin Islands (U.S.)	350	350	5,890	1,030	2,435	305
Other ^e		284,580				
Regional Total (excl. U.S.)	4,604,390	3,430,190	5,627,280	467,955	846,045	64,055
Regional Total (incl. U.S.)	13,763,350	7,795,080	6,758,945	701,785	1,307,035	86,930

Sources:

1. National Land Area: data were compiled from FAO (FAOSTAT, 1998), *CIA World Fact Book* (2002), *CARICOM Environment in Figures 2002*, and the Global Maritime Boundaries Database (GMBD) (Veridian - MRJ Technology Solutions, 2002).
2. Caribbean drainage area was calculated at WRI, using watershed boundaries developed by the *Reefs at Risk* project.
3. Maritime Claims were derived at WRI using data from the Global Maritime Boundaries Database (GMBD) (Veridian - MRJ Technology Solutions, 2002). Maritime claims are a sum of the Territorial Sea, Contiguous Zone, Exclusive Economic Zone, and Fishing Zones claimed by a country (up to 200 nautical miles from the coastline), on the Caribbean and Atlantic side only.
4. 5. Shelf Area within national waters was derived at WRI. Shelf areas were defined based on a bathymetric data set developed at WRI from depth point data from the Danish Hydrologic Institute's (DHI) C-MAP data product, interpolated at 1-km resolution. Territorial claim is based on Veridian-MRJ's Global Maritime Database (2002).
6. Caribbean Coastline length was derived at WRI using World Vector Shoreline data as the base. For Central American countries, the Pacific coastline was excluded. Small islands with a perimeter of less than 3 km were excluded from the tally. Coastline measurements are scale-dependent, and vary with the scale of the data source. This estimate uses a standardized 1:250,000 data set.

Notes:

- a. Guadeloupe includes the French islands of St. Martin and St. Barthelemy.
- b. Netherlands Antilles North includes the islands of St. Maarten, St. Eustatius, and Saba.
- c. Netherlands Antilles South includes the islands of Bonaire and Curacao.
- d. For the US, only the coastline along the Gulf States (Texas, Louisiana, Mississippi, Alabama, and Florida) was included. In addition, the maritime claim and shelf area estimates only include areas adjacent to these Gulf states.
- e. Includes the parts of Brazil, Guyana, Surinam, and Canada draining to the Caribbean.

TABLE A3. POPULATION OF THE WIDER CARIBBEAN

Country/Territory	Population (1990)	Population (2000)	Population Change (1990–2000)	Population Density (2000)	Population in Watershed Draining into the Caribbean (2000)	Percentage of Population Living Within a Given Distance of the Coastline (2000)	
	Thousands	Thousands	% Change	People/km ²	Thousands	10km %	100km %
Anguilla ^a	8	11	72.7	122	11	100	100
Antigua and Barbuda	63	65	3.3	147	65	100	100
Aruba	66	101	52.7	529	101	100	100
Bahamas	255	304	19.2	24	304	100	100
Barbados	257	268	4.0	622	268	100	100
Belize	186	226	21.9	10	226	29	100
Bermuda	59	63	7.0	1,189	0	100	100
British Virgin Islands	17	24	37.2	154	24	100	100
Cayman Islands	26	38	45.2	145	38	100	100
Colombia	34,970	42,105	20.4	41	38,142	7	18
Costa Rica	3,049	4,024	32.0	79	1,278	2	71
Cuba	10,629	11,199	5.4	101	11,199	41	100
Dominica	71	71	-1.1	94	71	100	100
Dominican Republic	7,061	8,373	18.6	173	8,373	28	100
Grenada	91	94	3.1	271	94	100	100
Guadeloupe ^b	391	428	9.5	250	428	100	100
Guatemala	8,749	11,385	30.1	105	6,202	1	5
Haiti	6,907	8,143	17.9	293	8,143	48	100
Honduras	4,870	6,417	31.8	57	4,271	8	47
Jamaica	2,369	2,576	8.7	234	2,576	53	100
Martinique	360	383	6.4	349	383	100	100
Mexico	83,223	98,872	18.8	50	55,328	3	15
Montserrat ^a	11	4	-36.4	39	8	100	100
Netherlands Antilles ^c	188	215	14.7	266	215	100	100
Nicaragua	3,824	5,071	32.6	42	3,673	1	7
Panama	2,398	2,856	19.1	38	964	6	90
Puerto Rico	3,528	3,915	11.0	437	3,915	58	100
St. Kitts and Nevis	42	39	-8.1	143	39	100	100
St. Lucia	131	148	12.5	238	148	100	100
St. Vincent and the Grenadines	106	113	7.1	291	113	100	100
Trinidad and Tobago	1,215	1,294	6.5	252	1,294	72	100
Turks and Caicos Islands	12	17	44.0	39	17	100	100
United States	254,776	283,230	11.2	31	115,958	4 ^d	10 ^d
Venezuela	19,502	24,170	23.9	27	24,167	21	73
Virgin Islands (U.S.)	104	121	16.0	346	121	100	100
Other ^e					1,002		
Regional Total (excl. U.S.)	194,736	233,130	19.7		173,199		
Regional Total (incl. U.S.)	449,512	516,360	14.9		289,157		

Sources:

- Population for 1990 & 2000 from Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2000 Revision* (2002).
- Population change: calculated at WRI as the percentage change in UN population estimates between 1990 and 2000.
- Population density: calculated at WRI as the population in 2000 divided by national land area (see Table A2).
- Population in watershed draining into the Caribbean: drainage area derived from watershed delineation work undertaken at WRI, population data from Center for International Earth Science Information Network (CIESIN), *Gridded Population of the World, Version 3* (Palisades, NY: CIESIN/ Columbia University, 2003).
- Percentage of population living within a distance of the coastline (2000): calculated for 10 km or 100 km at WRI using gridded CIESIN (2003) population data at 1-km resolution and a 10-km buffer of 1:250,000 World Vector Shoreline (E.A. Soluri and V.A. Woodson. 1990. "World Vector Shoreline." *International Hydrographic Review*, vol 67, no. 1.).

Notes:

- Population data for Anguilla and Montserrat were unavailable from the UN source. They were derived at WRI from CIESIN population density grid at 1-km resolution.
- Guadeloupe includes the French islands of St. Martin and St. Barthelemy.
- Netherlands Antilles includes Bonaire, Curacao, Saba, St. Eustatius, and St. Maarten.
- US population within 10 and 100 km of the coast includes Texas, Louisiana, Mississippi, Alabama, and Florida only.
- Other includes the parts of Brazil, Guyana, Suriname, and Canada draining to the Caribbean.

TABLE A4. TOURISM ECONOMY OF THE WIDER CARIBBEAN

Country/Territory	GDP Per Capita (PPP) (2000)	Tourist Arrivals (stay-over) (2000)	Cruise Arrivals (2000)	International Tourism Receipts (2000)	Tourism Penetration Ratio (2000)	Value of Tourism Economy (2002)	Contribution of Tourism Economy to GDP (2002)	Projected Travel and Tourism Growth Rate (2002-2014)
	US\$	Thousands	Thousands	US\$ (millions)	Avg. number of tourists per thousand inhabitants	US\$ (millions)	Percent of GDP	Percent growth per annum
Anguilla	8,200	44	n.d.	55	76	58	58	5
Antigua and Barbuda	8,200	237	429	291	n.d.	528	72	5
Aruba	28,000	721	490	837	161	1,064	47	4
Bahamas	15,000	1,596	2,513	1,814	63	2,497	46	6
Barbados	14,500	545	533	711	56	1,032	37	5
Belize	3,200	196	58	121	16	194	23	6
Bermuda	33,000	328	210	431	86	729	26	4
British Virgin Islands	16,000	281	189	315	352	343	85	3
Cayman Islands	24,500	354	1,031	559	152	468	31	6
Colombia	6,200	557 ^a	n.d.	1,028 ^a	n.d.	5,541	6	5
Costa Rica	6,700	1,088 ^a	n.d.	1,229 ^a	n.d.	2,057	12	6
Cuba	1,700	1,774	n.d.	1,857	4	2,572	11	6
Dominica	4,000	70	240	47	23	64	22	5
Dominican Republic	5,700	2,973	182	2,860	11	4,136	18	6
Grenada	4,400	129	180	70	25	99	23	6
Guadeloupe	9,000	807	329	454	27	658	33	4
Guatemala	3,700	n.d.	n.d.	n.d.	n.d.	1,656	8	5
Haiti	1,800	140	305	54	n.d.	182	5	4
Honduras	2,700	471 ^a	n.d.	262 ^a	n.d.	568	8	6
Jamaica	3,700	1,323	908	1,333	14	2,025	27	5
Martinique	11,000	526	286	370	49	568	10	4
Mexico	9,100	3,045 ^b	1,505 ^b	2,346 ^b	n.d.	60,700	9	8
Montserrat	5,000	10	n.d.	9	n.d.	n.d.	n.d.	n.d.
Netherlands Antilles ^c	11,400	693	347	765	64	n.d.	n.d.	n.d.
Nicaragua	2,700	486 ^a	n.d.	111 ^a	n.d.	204	7	7
Panama	6,000	484 ^a	n.d.	576 ^a	n.d.	1,527	15	6
Puerto Rico	10,000	3,341	1,302	2,388	6	3,506	5	4
St. Kitts and Nevis	7,000	73	165	58	43	93	25	5
St. Lucia	4,500	270	444	277	45	380	51	5
St. Vincent and the Grenadines	2,800	73	86	75	n.d.	110	29	5
Trinidad and Tobago	9,500	399	82	213	n.d.	787	9	5
Turks and Caicos Islands	7,300	151	n.d.	285	13	n.d.	n.d.	n.d.
United States	36,200	74,100 ^d	n.d.	82,042 ^a	n.d.	1,160,300	11	4
Venezuela	6,200	469	135	563 ^a	n.d.	9,000	6	6
Virgin Islands (U.S.)	15,000	607	1,768	1,157	69	1,629	42	4
Regional Total (excl. U.S.)		24,261	13,716	25,523		104,974		
Regional Total (incl. U.S.)		98,361		105,565		1,265,274		

Sources:

- Gross Domestic Product (GDP) per capita, (PPP) is gross domestic product converted to international dollars using Purchasing Power Parity (PPP) rates and divided by the population of the country that year. *World Factbook* (CIA, 2000). Published online at <http://www.cia.gov/cia/publications/faebook/>.
- Tourist arrivals (stay-over) includes visitors staying in the country at least 24 hours. Caribbean Tourism Organization (CTO), *Caribbean Tourism Statistical Report 2001–2002* (St Michael, Barbados: CTO, 2002).
- Cruise arrivals: CTO (2002).
- Tourism receipts: includes expenditures by tourists, cruise passengers, and other same-day visitors. Estimates supplied by the relevant national agency. CTO (2002).
- Tourism penetration ratio is a basic but useful measure of tourism interaction quantifying the average number of tourists per thousand local inhabitants, in the country at any one time. CTO (2002).
- Value of tourism economy: WTTC (World Travel and Tourism Council) *The Impact of Travel & Tourism on Jobs and the Economy - 2002: Country Reports* (London, UK: WTTC, 2002).
- Contribution of tourism economy to total GDP: CTO (2002).
- Projected travel and tourism growth rate: CTO (2002).

Notes:

n.d. = no data

- Supplementary data for Tourist Arrivals (stay-over) and International Tourism Receipts: when not available from CTO (2002), taken from Development Data Group, The World Bank, *World Development Indicators 2002* (Washington, D.C.: The World Bank, 2002). Online.
- Mexico data from CTO refers to Cancun and Cozumel only.
- Netherlands Antilles includes Bonaire, Curacao, Saba, St. Eustatius, and St. Maarten.
- US tourist arrivals figure refers to Florida only and includes domestic and international tourist arrivals (source: "visit Florida" <http://www.flausa-media.com/Subcategories/florida%20ofacts/Fact%20Pages/ffrefct.htm>).

TABLE A5. MANAGEMENT OF MARINE PROTECTED AREAS (MPAs) IN THE WIDER CARIBBEAN

Country / Territory	Number of MPAs	Management Effectiveness Rating				Percent of Reef Area Inside of MPAs
		Good	Partial	Inadequate	Unknown	
Anguilla	5	0	0	5	0	0
Antigua and Barbuda	6	0	0	4	2	13
Aruba	0	0	0	0	0	0
Bahamas	9	0	1	0	8	2
Barbados	1	0	1	0	0	6
Belize	12	1	8	2	1	27
Bermuda	35	1	1	33	0	14
British Virgin Islands	11	1	0	10	0	42
Cayman Islands ^a	1	1	0	0	0	15
Colombia	7	0	0	6	1	20
Costa Rica	4	0	0	0	4	55
Cuba	30	0	4	24	2	13
Dominica	2	0	0	2	0	4
Dominican Republic	15	0	4	2	9	43
Grenada	2	0	0	2	0	1
Guadeloupe ^b	6	1	2	1	2	12
Guatemala	3	0	0	1	2	0
Haiti	0	0	0	0	0	0
Honduras	12	0	1	2	9	11
Jamaica	4	0	1	3	0	22
Martinique	3	0	0	0	3	7
Mexico	9	0	0	7	2	67
Montserrat	1	0	0	1	0	0
Netherlands Antilles North ^c	3	1	2	0	0	67
Netherlands Antilles South ^d	2	1	0	1	0	65
Nicaragua	2	0	0	1	1	68
Panama	4	0	1	2	1	11
Puerto Rico	15	0	3	7	5	21
St. Kitts and Nevis	0	0	0	0	0	0
St. Lucia	20	1	4	15	0	6
St. Vincent and the Grenadines	1	0	0	1	0	16
Trinidad and Tobago	1	0	0	1	0	17
Turks and Caicos Islands	21	0	3	5	13	4
United States	9	7	0	0	2	52
Venezuela	18	0	0	0	18	48
Virgin Islands (U.S.)	11	2	1	0	8	8
Regional Total	285	17	37	138	93	20

Sources:

1. Number of MPAs: Reefs at Risk in the Caribbean (WRI, 2004). This table reflects summary statistics on the MPA database compiled by the Reefs at Risk in the Caribbean Project. Data were assembled by WRI and project partners. The data for some countries may be incomplete. In addition, definition of MPAs vary.
2. Management effectiveness rating: Project partners were asked to rate management effectiveness of MPAs based upon a limited set of criteria: existence of management activity, existence of a management plan, availability of resources (financial and human), and level of enforcement. Those ratings are summarized by country in this table and are available by MPA within the full database.
3. Estimated location and boundaries of MPAs were overlaid with a data set on coral reef locations to determine the percentage of a country's coral reefs within the boundaries of an MPA. These percentages should be regarded as rough estimates based upon available data.

Notes:

- a. The Cayman Islands has a zoned system of protected areas, which was considered as a single unit in this analysis.
- b. Guadeloupe includes the French islands of St. Martin and St. Barthelemy.
- c. Netherlands Antilles North includes the islands of St. Maarten, St. Eustatius, and Saba.
- d. Netherlands Antilles South includes the islands of Bonaire and Curaçao.