2021 ENVIRONMENTAL STATISTICS COMPENDIUM

GOVERNMENT OF BERMUDA
Department of Statistics

Published by

GOVERNMENT OF BERMUDA
Department of Statistics

Research Division
Cedar Park Centre
48 Cedar Avenue
Hamilton, HM 11

Telephone: (441) 297-7761
Fax: (441) 295-8390

E-mail: statistics@gov.bm
Website: www.gov.bm
Social Media: @BermudaStats

CONTENTS

FOREWORD

The Department of Statistics is pleased to release its tenth issue of the *Environmental Statistics Compendium*. In alignment with the Department's mission to produce and provide statistical information for the data-driven decision making for Bermuda, this publication reflects the collation of existing data sourced from stakeholders about issues affecting Bermuda's environment.

Additionally, the delivery of this report supports the combined efforts of the United Nations Statistics Division and the Caribbean Community to strengthen capacity and harmonize the compilation of social, gender and environmental statistics and indicators.

The Environmental Statistics Compendium is structured into thirteen (13) sections which include:

1. Population and Housing
2. Tourism
3. Environmental Health and Weather
4. Natural and Environmental Disasters
5. Energy, Minerals and Transport
6. Agriculture
7. Land Use
8. Coastal and Marine Resources
9. Biodiversity
10. Forestry
11. Air
12. Waste
13. Water

The figures in the Compendium are mainly totals for calendar months for the period 2016 to 2020.

The Department acknowledges the continued support of all subject-area experts and stakeholders who committed to providing the statistical data and information needed to compile and publish this report.

Melinda Williams
Director
Department of Statistics

January 2022

EXPLANATORY NOTES

-	Not applicable	km	Kilometer
..	Not available	km2	Square kilometer
**	Less than one percent	kWh	Kilowatt-hour
r	Revised figure	mio m3/y	Million cubic meters per year
e	Estimated figure	mT	Metric tonnes
—	Nil or negligible	No.	Number
'000	Thousands	µg/m3	Microgram
°	Degrees	NO2	Nitrogen Dioxide
%	Percent	SO2	Sulfur Dioxide
$	Bermuda dollar	ppb	Parts per billion
F	Fahrenheit	TSP	Total Suspended Particles
ha	Hectare	PM10/PM2.5	Fine Particulate Matter
kg	Kilograms	mg/nm3	Milligrams per cubic meter
⫽	Axis scale has a discontinuity	NTR	Note to Reader

Note: In some tables, figures may not add to totals due to rounding.

MEASURING UNITS CONVERSION TABLE

METRIC		IMPERIAL	IMPERIAL		METRIC
LENGTH					
1 millimetre (mm)		0.03937 inch (in)	1 inch (in)		2.54 centimetre (cm)
1 centimetre (cm)	10 mm	0.3937 inch	1 yard (yd)	3 feet (ft)	0.9144 metre (m)
1 metre (m)	100 cm	1.0936 yards (yds)	1 mile	1,760 yds	1.6093 kilometre (km)
1 kilometre (km)	1,000m	0.6214 mile			
AREA					
1 square meter (m^2)	10,000 cm^2	2.4712 acres	1 acre	4,840 yd^2	4,046.9 square meter (m2)
1 hectare (ha)	10,000 cm^2	0.3861 square mile ($mile^2$)	1 acre		0.4047 hectare (ha)
1 square kilometer (km^2)	100 ha		1 square mile (mile2)	640 acres	2.59 square kilometer(km2)
MASS					
1 kilogram (kg)	1,000 grams (g)	2.2046 pounds (lbs)	1 pound (lb)	16 ounces (oz)	0.4536 kg
1 metric tonne (mT)	1,000 kg	0.9842 ton	1 ton	2,240 lbs	1.016 metric tonne (mT)
TEMPERATURE					
1 degree Celsius (°C)		33.8 degrees Fahrenheit (°F)	1 degree Fahrenheit (°F)		-17.2 degrees Celsius (°C)

CONTRIBUTORS

Ascendant Group Limited
Bermuda Fire and Rescue Services
Bermuda Hospitals Board
Bermuda Tourism Authority
Department of Environmental and Natural Resources, Marine Management Section
Department of Environmental Protection
Department of Health
Department of Planning
Department of Statistics
Department of Works and Engineering - Waste and Enforcement Section
Land Title and Registration Office
The Bermuda Business Development Agency
The Bermuda Weather Service
Transport Control Department

POPULATION AND HOUSING

The Population and Housing Section contains information on the number of persons in Bermuda and the type of households they occupied.

Population

- In 2020, the population of Bermuda was projected to be 64,054 persons, a 3.7% increase from the 61,779 persons counted in the 2016 Population and Housing Census (Table 1.1).
- Population projections were used to estimate the population for 2017 to 2020.

Households

- During the period 2010 to 2016, there was a 4.7% increase in the total number of households (Table 1.2).
- In 2016, over one-third (35.4%) of the households were two-unit dwellings (Table 1.2).
- One-person households accounted for 34.1% of the total households in Bermuda in 2016 (Table 1.3).
- The average size of a household continued to drop from 2.4 persons in 2010 to 2.3 persons in 2016 (Table 1.3).
- The number of rental units increased by 0.9 percentage points over the seven-year period 2010-2016 to 51.6% (Table 1.4).
- In 2016, private dwelling units with two bedrooms accounted for over one-third (36.0%) of households in Bermuda (Table 1.5).
- The average number of persons per bedroom was 1.1 persons in 2016 (Table 1.5)

NOTE TO READER

Group Dwelling Unit: where the occupants live collectively for disciplinary, health, custodial, work or other reasons and share the cooking, sleeping and/or sanitary facilities with other households. Generally, group dwellings are available primarily to selected persons, not the general population. They differ from institutions in that occupants movements to and from the premises are less restricted. Examples of group dwellings include hotel staff quarters, nurses' hostels, transitional housing, police barracks and rooming houses catering for six or more paying guest as well as Mid-Atlantic Wellness Institute group homes catering to any number of clients.

Household: a person or group of persons living together in a dwelling unit.

Population Density: a measure of the average non-institutional population per unit of land area. It is calculated by dividing the de jure civilian non-institutional population by the total land area. Bermuda's land area as of 2008 was 21.0 square miles and as of 2016 was 20.7 square miles or 53.6 km^2 (source: Department of Land Title and Registration).

$$\text{Population Density} = \frac{\text{De Jure Civilian Non-Institutional Population}}{\text{Total Land Area}}$$

Private Dwelling Unit: a room or group of rooms used, or intended to be used, for living purposes. It must be capable of permanent human habitation and must have its own:

From a structural perspective, a private dwelling may be contained within a one-unit dwelling, a house comprising two or more apartments, an apartment building, or within part of a building which is used for residential as well as business or other purposes.

Source: Department of Statistics

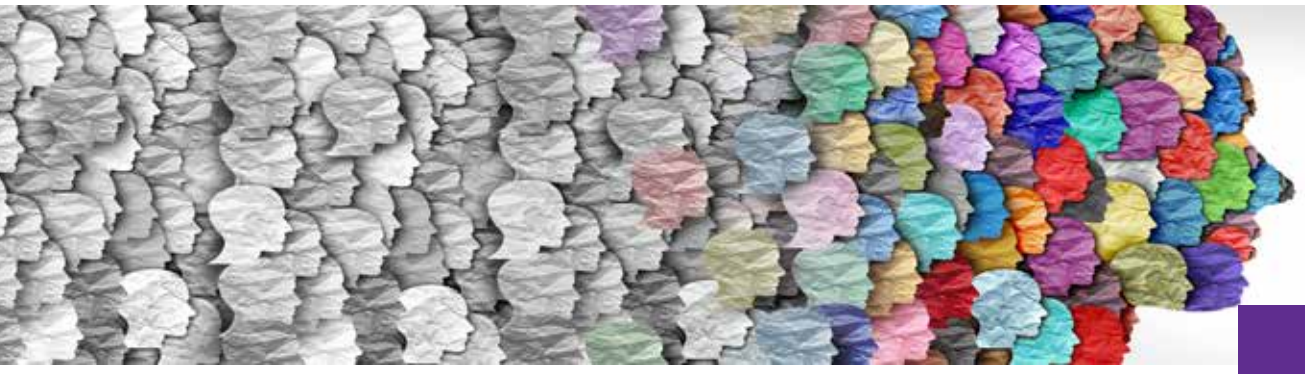


Table 1.1

POPULATION AND POPULATION DENSITY, 2016-2020

Year	Population	Population Density (per km^2)
2016	63,779 [1]	1,190
2017	63,892 [2]	1,192
2018	63,973 [2]	1,194
2019	64,027 [2]	1,195
2020	64,054 [2]	1,195

Sources: Department of Statistics and the Land Title and Registration Office

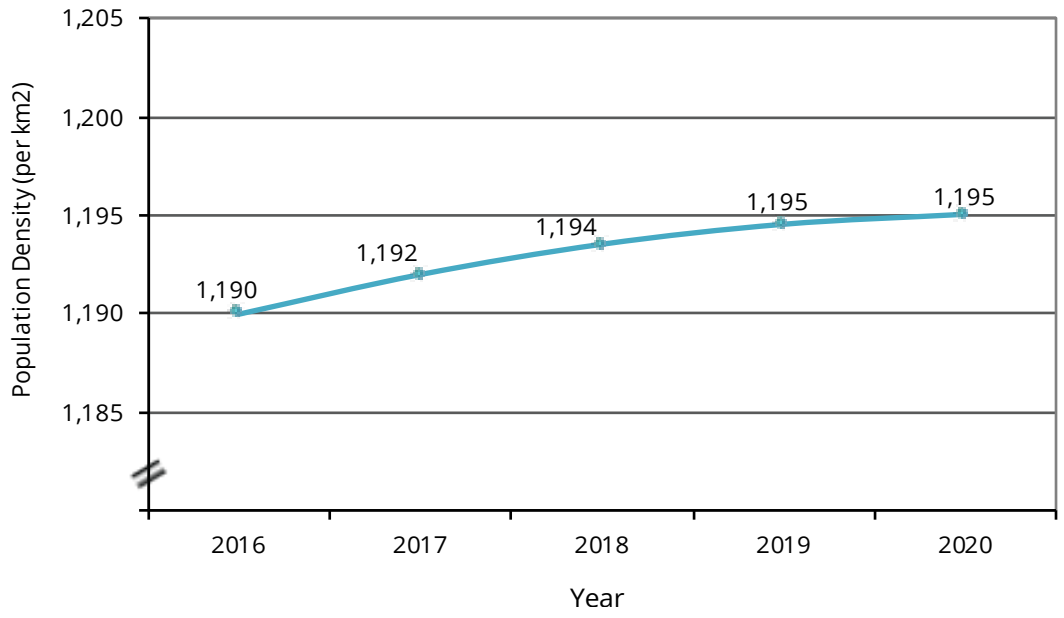
[1] Based on the 2016 Population and Housing Census.

[2] Based on Bermuda's Population Projections 2016-2026.

[3] Bermuda's land area as of 2016 is 53.6 km^2 (20.7 square miles) Land Title and Registration Office.

Chart 1.1

POPULATION DENSITY, 2016-2020



Source: Department of Statistics

The 2016 figure is based on the 2016 Population and Housing Census.
The 2017-2019 figures are based on Bermuda's Population Projections 2016-2026.

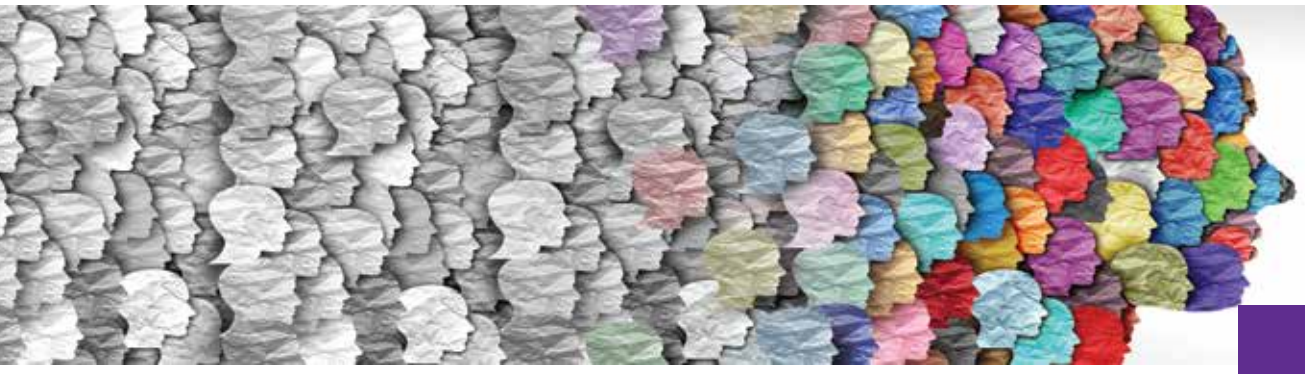


Table 1.2

NUMBER OF HOUSEHOLDS BY TYPE OF DWELLING, 2010 AND 2016

Type of Dwelling	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,923 [1]	28,192	100.0 [2]	100.0
One-Unit Dwelling	6,280	6,767	24.3	24.0
Two-Unit Dwelling	8,870	9,972	34.4	35.4
Three-Unit Dwelling	4,639	4,849	18.0	17.2
Four or more apartments	5,024	5,253	19.5	18.6
Group dwellings	696	751	2.7	2.7
Residential/commercial premises	281	577	1.1	2.0
Other/not stated	27	23	**	**

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of dwelling.

[2] The denominator for percentage distribution is 25,817 (26,923 - 1,106).

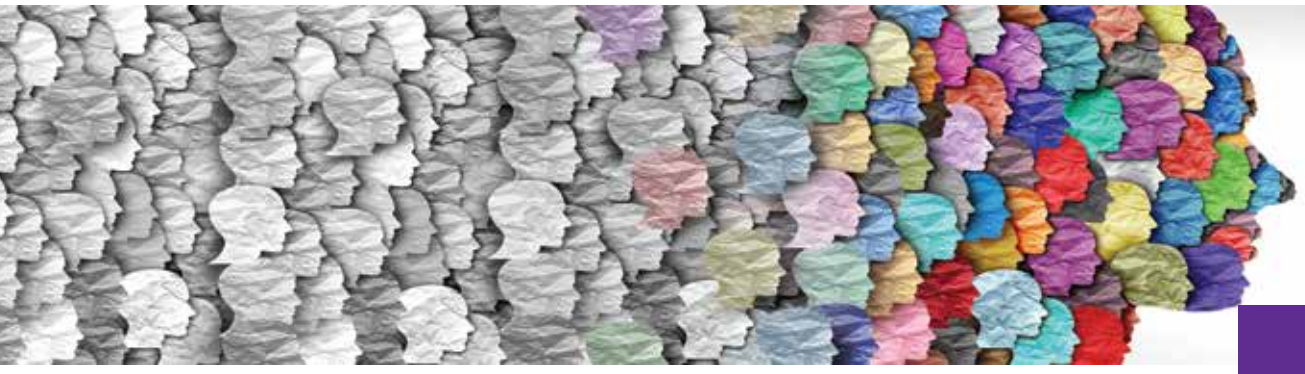


Table 1.3

HOUSEHOLDS BY SIZE OF HOUSEHOLD, 2010 AND 2016

Type of Dwelling	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,923 [1]	28,192	100.0 [2]	100.0
Average size of household	2.4	2.3		
One	7,942	9,611	30.8	34.1
Two	7,999	8,841	31.0	31.4
Three	4,515	4,802	17.5	17.0
Four	3,540	3,317	13.7	11.8
Five	1,238	1,141	4.8	4.0
Six	385	329	1.5	1.2
Seven	112	99	**	**
Eight	52	35	**	**
More than eight	34	17	**	**

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of dwelling.

[2] The denominator for percentage distribution is 25,817 (26,923 - 1,106).

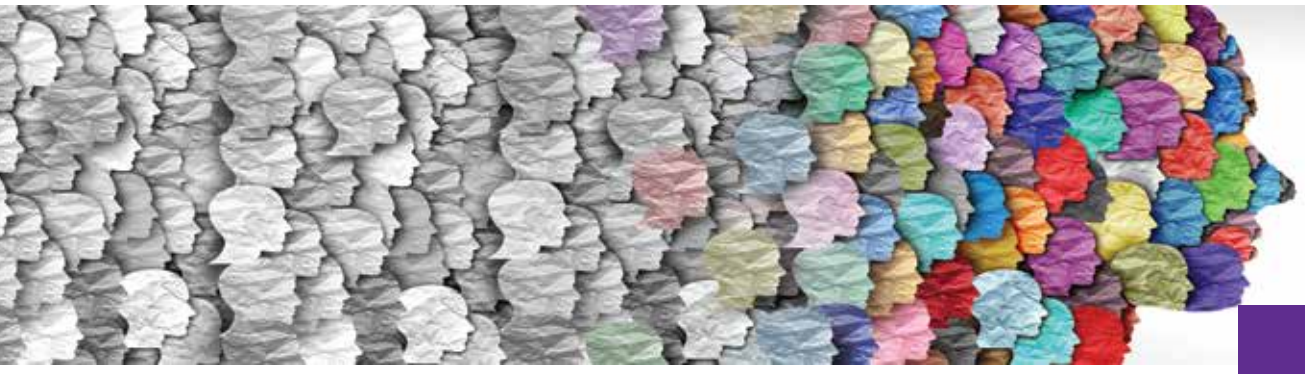


Table 1.4

PRIVATE DWELLING UNITS BY TYPE OF TENURE, 2010 AND 2016

Type of Tenure	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,200 [1]	27,418	100.0 [2]	100.0
Non-Owner Occupied	12,723	14,140	50.7	51.6
Rented - unfurnished	7,747	8,356	30.9	30.5
Rented - partly/fully furnished	3,972	4,650	15.8	17.0
Rent Free	1,004	1,134	4.0	4.1
Owner Occupied	12,238	13,267	48.8	48.4
Owned without a mortgage	6,417	7,483	25.6	27.3
Owned with a mortgage	5,821	5,784	23.2	21.1
Other/Not Stated	133	11	**	**

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of tenure.

[2] The denominator for percentage distribution is 25,094 (26,200 - 1,106).

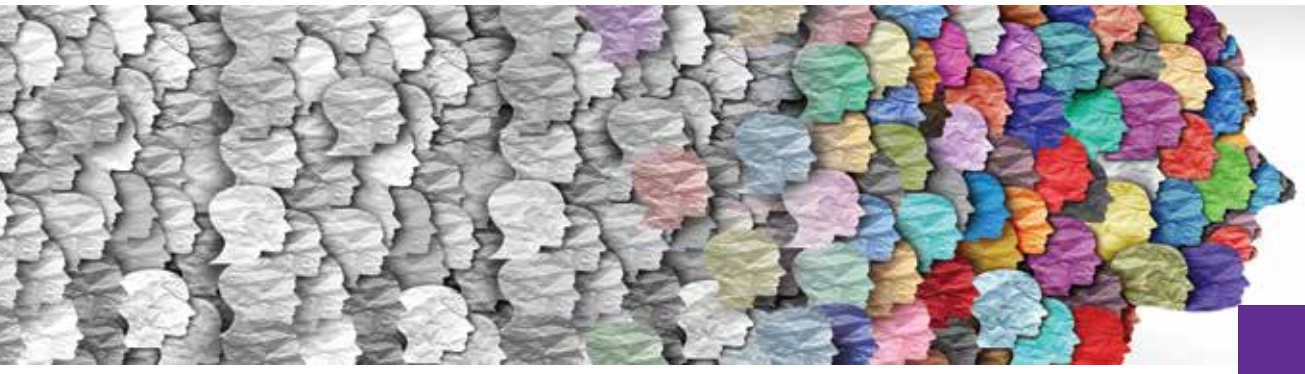


Table 1.5

PRIVATE DWELLING UNITS BY NUMBER OF BEDROOMS, 2010 AND 2016

Type of Dwelling	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,923 [1]	27,418	100.0 [6]	100.0
Average number of bedrooms per houshold	2.1 [2]	2.1 [4]		
Average number of persons per bedroom	1.1 [3]	1.1 [5]		
None (Studio)	790	1,145	3.2	4.2
One	6,101	6,469	24.4	23.6
Two	8,944	9,857	35.8	36.0
Three	7,473	7,928	29.9	28.9
Four or more	1,645	2,018	6.6	7.4
Not Stated	141	1	**	**

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of dwelling.
[2] The calculation is 53,544 bedrooms ÷ 24,953 households.
[3] The calculation is 60,503 persons ÷ 53,544 bedrooms.
[4] The calculation is 58,604 bedrooms ÷ 27,417 households.
[5] The calculation is 62,668 persons ÷ 58,604 bedrooms.
[6] The denominator for percentage distribution is 24,953 (26,200 - 1,106 - 141).

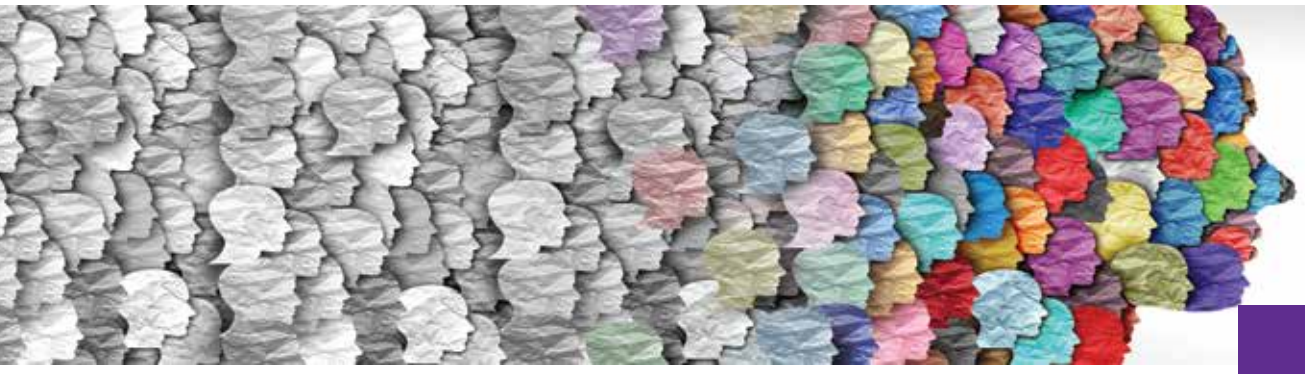


Table 1.6

PRIVATE DWELLING UNITS BY NUMBER OF FULL BATHROOMS, 2010 AND 2016

Number of Full Bathrooms	Number		Percentage Distribution	
	2010	2016	2010	2016
Total	26,200 [1]	27,418	100.0 [2]	100.0
None	41	16	**	**
One	15,340	16,146	61.5	58.9
Two	7,532	8,550	30.2	31.2
Three or More	2,046	2,705	8.2	9.9
Not stated	135	1		

Sources: 2010 and 2016 Population and Housing Censuses

[1] Includes 1,106 households for which there is no data by type of dwelling.
[2] The denominator for percentage distribution is 24,959 (26,200 - 1,106 - 135)

TOURISM

Bermuda's tourism industry is the second largest source of foreign exchange revenue to the economy, only following international business.

Visitor Arrivals

- The total number of visitors to Bermuda decreased by 93.6 percent from 805,039 in 2019 to 51,439 in 2020 (Table 2.1).
- Air passenger arrivals decreased 84.4 percent from 2019 to 2020 (Table 2.1).
- Cruise ship passenger arrivals decreased 98.3 percent from 535,561 in 2019 to 9,366 in 2020 (Table 2.1).
- In 2020, the average length of stay for air passengers increased to 9.9 days (Table 2.1).

Air Passengers

- Air passenger arrivals from the United States decreased 86.1 percent from 2019 to 2020 (Table 2.2).
- In 2020, air passengers from the United States accounted for 67.0 percent (28,183) of the total number of air visitors in 2020 (Table 2.2).
- Hotels remained the most popular accomodation type as more than half (60.4%) of all air passengers stayed at hotels (Table 2.3).

Tourist Properties

- The total number of tourist properties (41) in Bermuda remained the same from 2019 to 2020 (Table 2.4).
- The total number of rooms available increased by 1.0 percent from 2,409 rooms in 2019 to 2,432 rooms in 2020 (Table 2.4).
- There was a 2.1 percent increase in the total number of beds from 5,140 in 2019 to 5,250 in 2020 (Table 2.4).

Visitor Expenditure

- Visitor expenditure decreased significantly between 2019 ($556.5 million) and 2020 ($71.2 million), a $485.3 million decrease. (Table 2.5).
- In 2020, there were 3,591 persons employed directly in the tourism industry; a decrease of 23.4 percent over 2019. Males accounted for 2,161 compared to 1,430 females (Table 2.5).

NOTE TO READER

Air Passenger Arrivals: includes all stay-over (overnight) visitors. It does not, however, include cruise passenger and yacht arrivals.

Average Length of Stay: intended length of stay or number of nights spent, unless otherwise stated.

Estimated Electricity Consumption by Tourists: a more direct tourism pressure indicator. It is estimated as the national daily per capita electricity consumption times the number of tourist arrivals by the average length of stay, per 1 million population.

Index of Social Pressure or Ratio of Tourists (or Visitors) to the Local Population: measures the number of tourists (or visitors) to one resident of the country at any given point in time.

Number of Hotel Rooms per km^2: commonly accessible indirect proxy to measure tourism's imprint on the physical environment. It is the number of hotel rooms available divided by the total land area (53.6 km^2).

Occupancy Rate: is calculated by dividing the monthly or yearly sum of room nights utilized by the number of room nights available for use, then multiplying the quotient by 100 to express as a percentage.

Tourism: the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes.

NOTE TO READER CONT'D.

Tourism Density Ratio (TDR): ratio attempts to show the density of tourist in the country at any one time on average. Its value is limited by the fact that tourists flows are seasonal and tourism activity tends to be concentrated in specific geographical areas. (Caribbean Tourism Organization) Tourism Density Ratio is calculated as:

$$\text{Tourism Density Ratio} = \frac{\text{Number of visitors * average length of stay}}{\text{land area (53.6 km2) * 365}}$$

Tourism Expenditure: the total expenditure made by a visitor or on behalf of a visitor for and during his/her stay at a destination.

Tourism Intensity Rate (TIR): the indicator 'arrivals/population' provides an estimate of tourism intensity in the country of reference. This indicator is calculated by World Tourism Organization (UNWTO) based on the available basic data on inbound and domestic tourism, which can be be either the number of visitors or the number of tourists. (UNWTO Methodological Notes to the Tourism Statistics Database at http://cf.cda.unwto.org/sites/all/files/pdf/2015_meth_notes_eng_0.pdf) Tourism Intensity Rate is calculated as:

Tourist Intensity Rate = Number of visitors/1,000 population/land area (53.6 km2)

Tourism Penetration Ratio (TPR): the penetration ratio quantifies the average number of tourist arrivals by air, per thousand local inhabitants, in the country at any one time. (modified Caribbean Tourism Organization definition) Tourist Penetration Ratio is calculated as:

$$\text{Tourism Density Ratio} = \frac{\text{Number of visitors * average length of stay}}{\text{land area (53.6 km2) * 365}}$$

Tourist: a person traveling to and staying in places outside his or her usual environment for not more than one consecutive year but who stays for more than 24 hours in a destination for leisure, business and other purposes.

Visitor: any person traveling to a place other than his/her usual environment for less than twelve months and whose main purpose of visit is other than the exercise of an activity remunerated from within the place visited.

Source: CARICOM Environment Program

Table 2.1

AIR PASSENGER ARRIVALS, CRUISE SHIP ARRIVALS, AVERAGE LENGTH OF STAY, TOURISM INTENSITY RATE AND PENETRATION RATIO, 2016-2020

Indicator	Year				
	2016	2017	2018	2019	2020
Total visitors[1]	**642,395**	**687,625**	**766,226**	**805,039**	**51,439**
Percentage change (%)	+7.6	+7.0	+11.4	+5.1	-93.6
Air passengers	**244,491**	**269,576**	**281,887**	**269,478**	**42,071**
Percentage change (%)	+11.2	+10.3	+4.6	-4.4	-84.4
Average length of stay for air passengers[2]	6.0	6.3	5.9	6.0	9.9
Air passengers to residents ratio	3.8	4.2	4.4	4.2	0.7
Tourism density ratio	74.9 [r]	86.9	85.1	82.7	21.3
Cruise ship passengers	**397,904**	**418,049**	**484,339**	**535,561**	**9,366**
Percentage change (%)	+5.4	+5.1	+15.9	+10.6	-98.3
Cruise ship passengers to residents ratio	6.2	6.5	7.6	8.4	0.1
Cruise ship arrivals	**139**	**161**	**171**	**181**	**4**
Percentage change (%)	+5.3	+15.8	+6.2	+5.8	-97.8
Population	**63,779** [2]	**63,892** [3]	**63,973** [3]	**64,027** [3]	**64,054** [3]
Visitors to residents ratio	10.1	10.8	12.0	12.6	0.8
Land area (km^2) [4]	53.6	53.6	53.6	53.6	53.6
Tourism intensity rate	187.4	200.6	233.6	234.8	15.0
Tourism penetration ratio	62.9 [r]	72.4 [r]	71.2	69.2 [r]	17.8

Sources: Bermuda Tourism Authority, Department of Statistics, Department of Planning and the Land Title and Registration Office.

[1] Does not include yacht passengers.

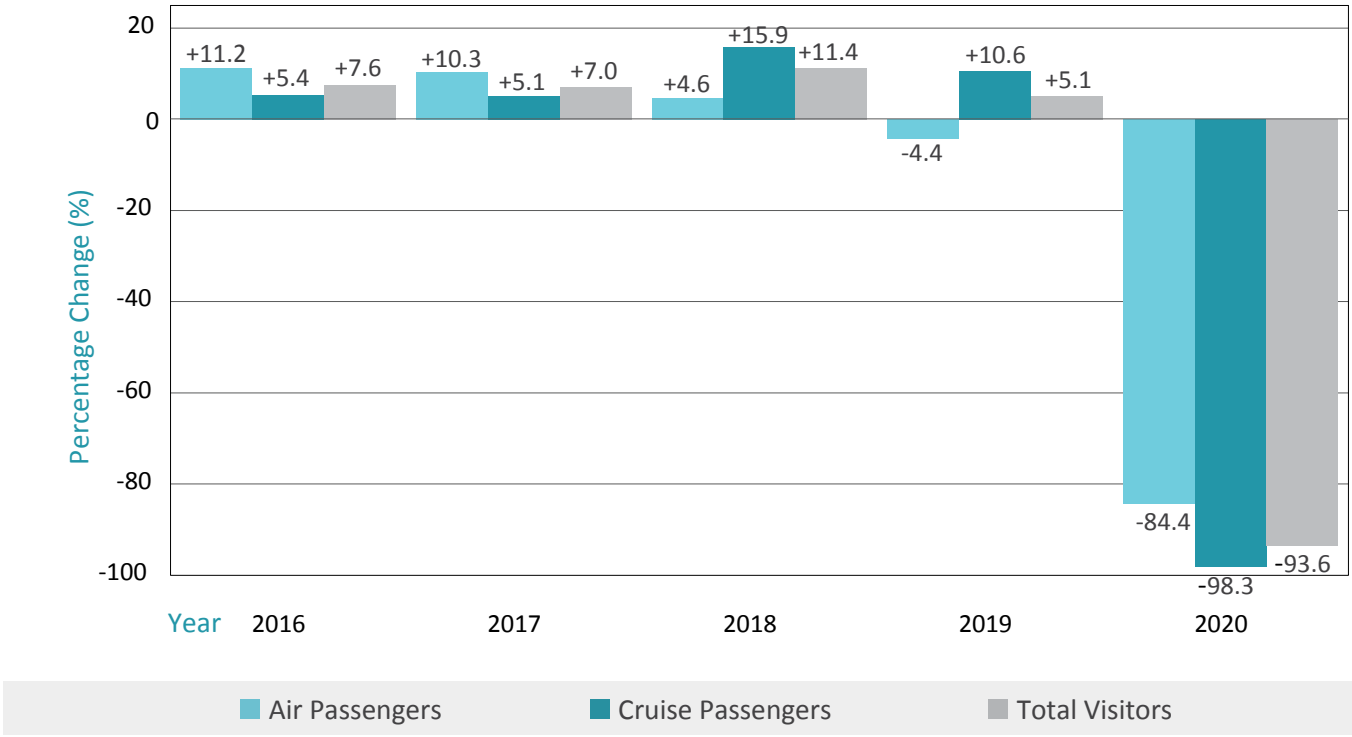
[2] 2016 Population and Housing Census.

[3] Bermuda's Population Projections 2016-2026.

[4] Bermuda's land area as of 2016 was 53.6 km^2 (20.7 square miles) Land Title and Registration Office.

Chart 2.1

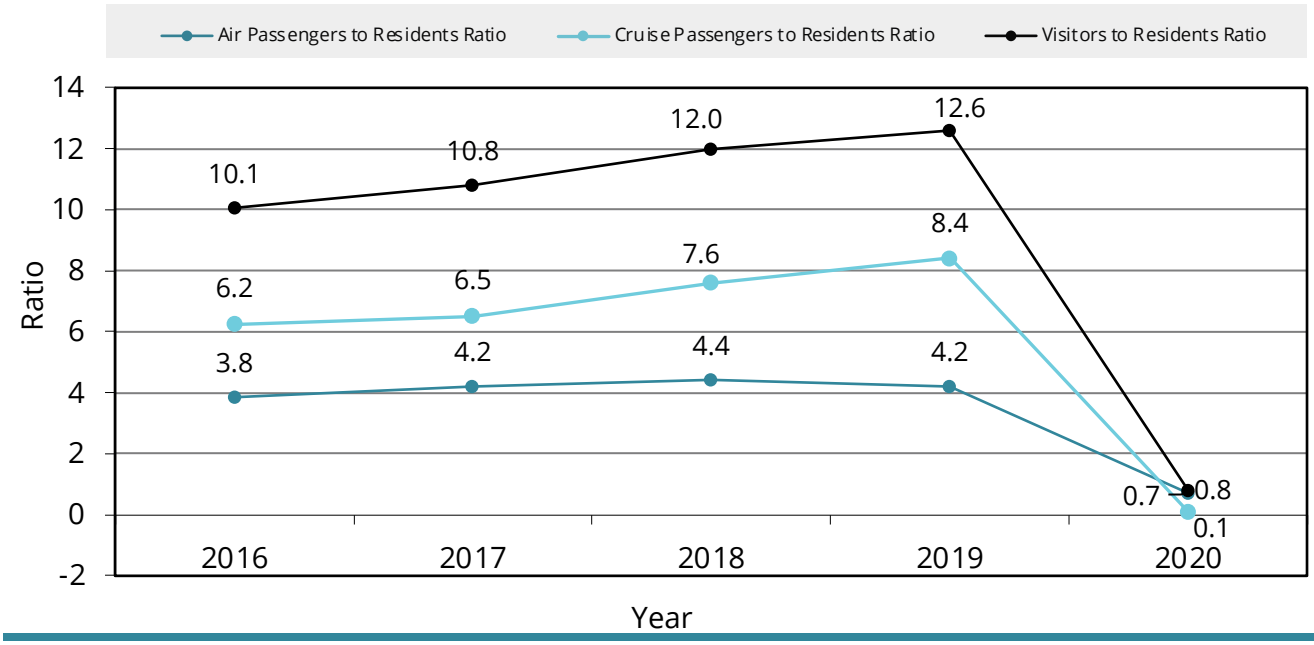
GROWTH IN AIR PASSENGERS, CRUISE SHIP PASSENGERS AND TOTAL VISITORS, 2016-2020



Sources: Bermuda Tourism Authority and Department of Statistics

Chart 2.2

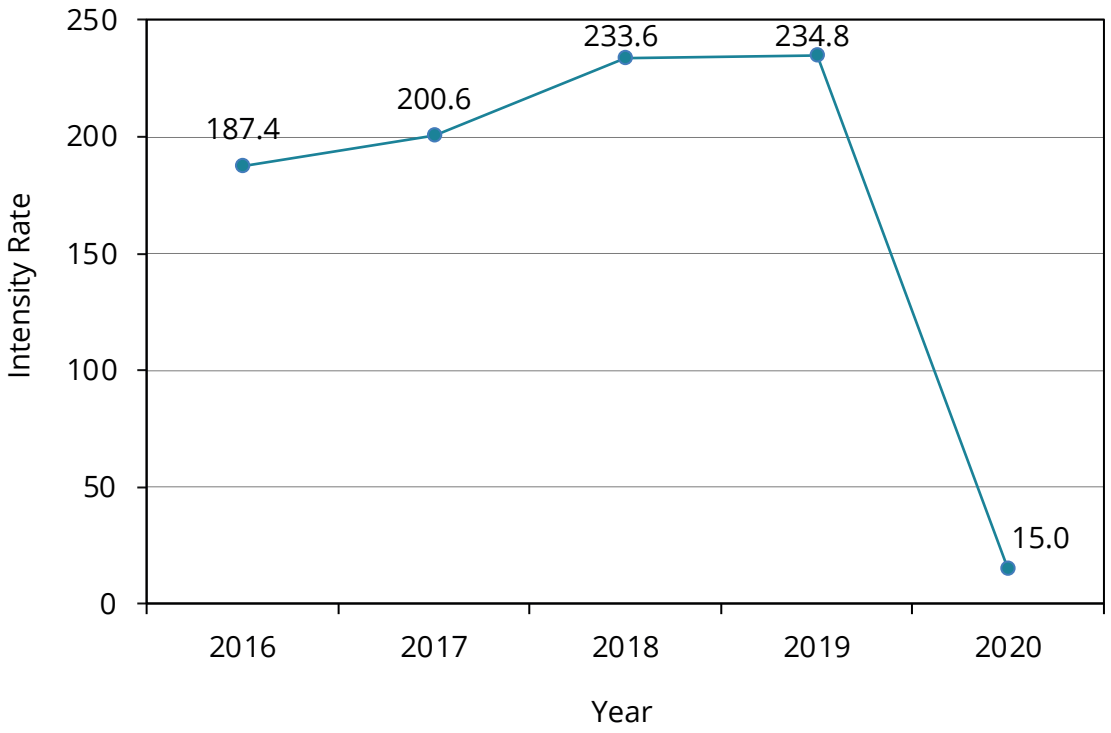
AIR PASSENGERS TO RESIDENTS, CRUISE SHIP PASSENGERS TO RESIDENTS AND VISITORS TO RESIDENTS RATIO, 2016-2020



Sources: Bermuda Tourism Authority and Department of Statistics

Chart 2.3

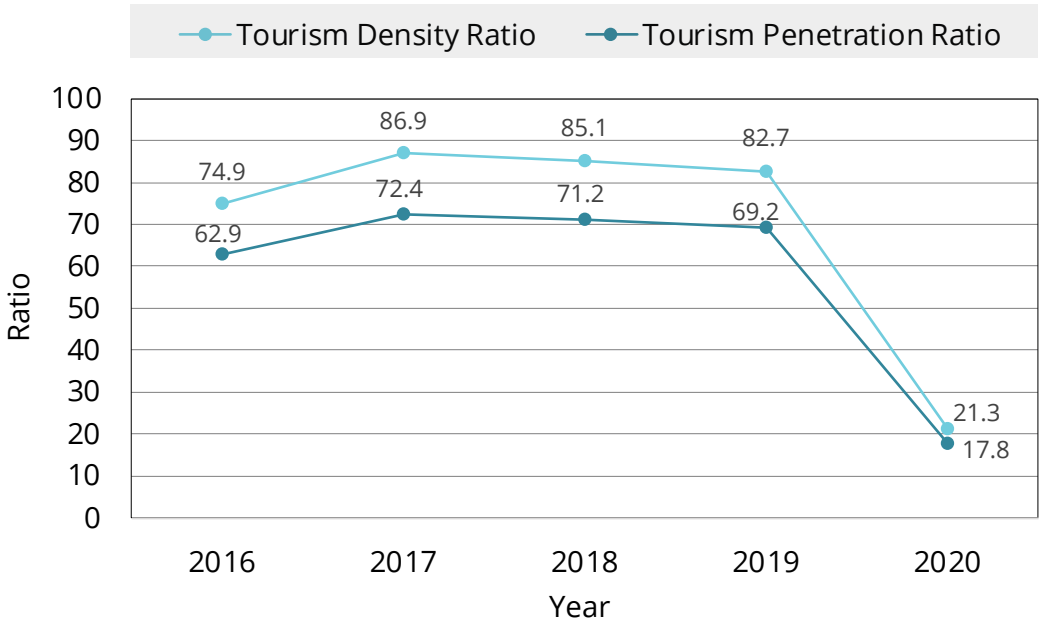
TOURISM INTENSITY RATE, 2016-2020



Sources: Bermuda Tourism Authority and Department of Statistics

Chart 2.4

TOURISM DENSITY AND PENETRATION RATIOS, 2016-2020



Sources: Bermuda Tourism Authority and Department of Statistics

Table 2.2

AIR PASSENGER ARRIVALS BY COUNTRY OF ORIGIN, 2016-2020

	Year				
Country of Origin	2016	2017	2018	2019	2020
Total	**244,491**	**269,576**	**281,887**	**269,478**	**42,071**
United States	182,896	198,259	214,499	202,460	28,183
Canada	23,744	27,416	27,638	27,748	4,936
United Kingdom	21,738	22,997	20,955	21,641	5,955
Other	16,113	20,904	18,795	17,629	2,997

Source: Bermuda Tourism Authority

Table 2.3

AIR PASSENGER BY INTENDED TYPE OF ACCOMMODATION, 2016-2020

Type of Accommodation	Year				
	2016	2017	2018	2019	2020
Total	**244,491**	**269,576**	**281,887**	**269,478**	**42,071**
Comercial Properties	181,661	189,413	203,754	194,132	27,398
Hotels or similar accomodations[1]	171,472	179,272	192,963	182,388	25,413
Bed and Breakfast/Guest House[2]	10,189	10,141	10,791	11,744	1,985
Residential Homes	58,176	73,477	74,392	71,418	13,171
Friends and Relatives	36,921	39,530	38,002	35,978	6,433
Rental House or Apartment	17,441	26,691	31,383	26,995	4,119
Private Homes	3,814	7,256	5,007	8,445	2,619
Other[3]	4,654	6,686	3,741	3,928	1,502

Source: Bermuda Tourism Authority

[1] Includes resort hotels, small hotels, cottage colonies and clubs.

[2] Includes housekeeping accommodations.

[3] Includes not stated.

Table 2.4

NUMBER OF TOURIST PROPERTIES, OCCUPANCY RATE AND NUMBER OF ROOMS PER KM^2, 2016-2020

Item	Year				
	2016	2017	2018	2019	2020
Number of properties	42	42	41	41	41
Total number of rooms available	2,334	2,409	2,404	2,409	2,432
Total number of beds	4,866	5,120	5,110	5,140	5,250
Total number of room nights sold	..	..	..	..	..
Occupancy rate (%)[1]	57.7	63.1	63.7	61.0	24.1
Number of rooms per km^2	42.9 [2]	44.9 [2]	44.9 [2]	44.9 [2]	45.4 [2]

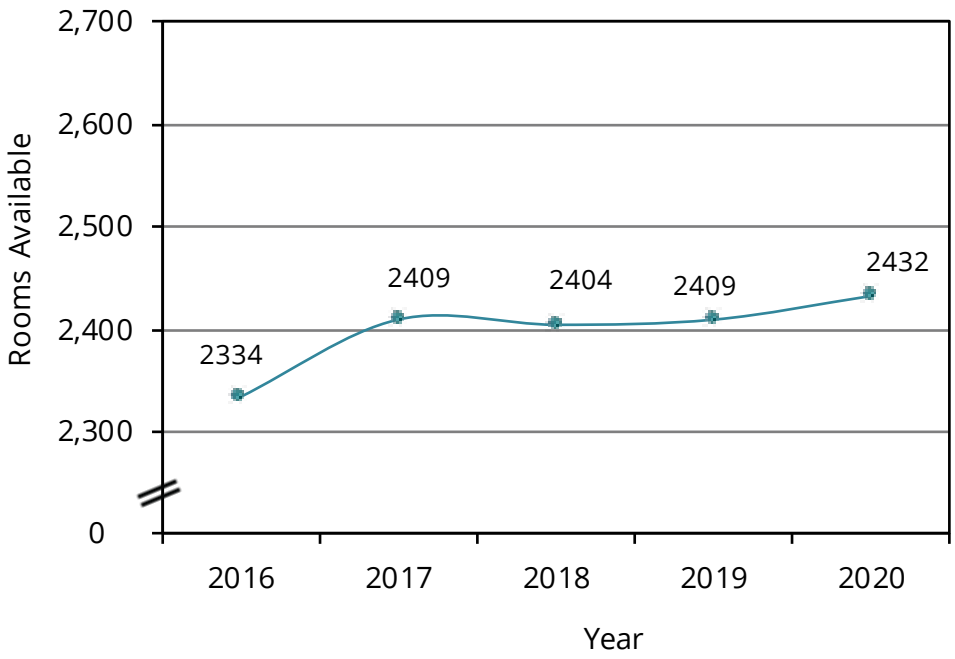
Sources: Bermuda Tourism Authority and the Land Title and Registration Office

[1] Occupancy rate is only reported by the Bermuda Hotel Association which accounts for approximately 50% of the total properties and 80% of the total number of rooms and beds available.

[2] Bermuda's land area as of 2016 was 53.6 km^2 (20.7 square miles) The Land Title and Registration Office.

Chart 2.5

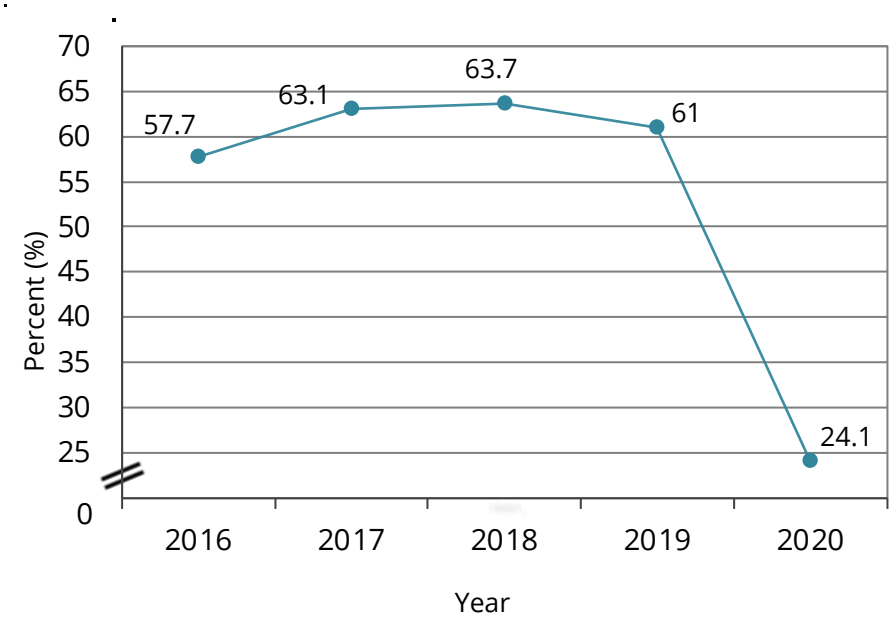
NUMBER OF HOTEL ROOMS AVAILABLE, 2016-2020



Source: Bermuda Tourism Authority

Chart 2.6

OCCUPANCY RATE, 2016-2020



Source: Bermuda Tourism Authority

Table 2.5

VISITOR EXPENDITURE AND NUMBER EMPLOYED IN TOURISM, 2016-2020

Item		Year				
		2016	2017	2018	2019	2020
Visitor expenditure (in US$'000)[1]		398,230	468,760	544,180	556,520	71,200
Expenditure on same-day visits		65,450	66,040	130,670	141,740	2,100
Expenditure on accommodation, meals and drinks, shopping, entertainment, etc.		332,780	402,720	413,510	414,780	69,100
Total directly employed in tourism[2]						
	Total	4,129 r	4,370 r	4,546 r	4,691 r	3,591
	Male	2,480	2,648 r	2,785 r	2,849 r	2,161
	Female	1,649 r	1,722	1,761	1,842	1,430

[1] Source: Bermuda Tourism Authority.

[2] Includes hotels, restaurants, cafés and bars.

ENVIRONMENTAL HEALTH AND WEATHER

The Environmental Health and Weather Section contains information concerning environmentally-related diseases as well as weather data for Bermuda.

Environmental Health

- In 2020, there were 2,835 reported cases of environmentally-related diseases in Bermuda, with males accounting for less than half (42.8%) (Table 3.1).
- Respiratory diseases accounted for 2,548 (89.9%) of the total reported cases in 2020 (Table 3.1).
- In 2020, females accounted for the largest proportion (57.2%) of environmentally-related diseases (Table 3.1).

Weather

- Total rainfall in Bermuda decreased by 8.1% over the period 2019 to 2020 (Table 3.2).
- In 2020, the months with the most rain days (17) were April and August while the least days (9) was recorded in July (Table 3.2).
- August had the highest mean air temperatures during 2020 with an average daily air temperature of 83.0°F. The lowest mean air temperature during the same year was recorded in January (64.9°F) (Table 3.3).
- Over the five-year period, 2016 to 2020, the average daily air temperature reported was 72.8°F. The average daily maximum air temperature was 76.4°F while the average daily minimum was 68.9°F for the same period (Table 3.3).
- In 2020, June had the highest average humidity (79.6%), while the lowest was recorded in December (70.5%). The average relative humidity for the five-year period, 2016 to 2020, was 75.1% (Table 3.4).

Table 3.1

REPORTED CASES OF ENVIRONMENTALLY-RELATED DISEASES BY SEX, 2016-2020

Cause	SEX	2016	2017	2018	2019	2020
Gastroenteritis [1, 2]	Total	466	446	529	467	130
	Male	202	187	234	194	58
	Female	264	259	295	273	72
Malaria (imported)	Total	—	1	3	1	—
	Male	—	1	3	1	—
	Female	—	—	—	—	—
Dengue (imported)	Total	—	—	—	2	—
	Male	—	—	—	1	—
	Female	—	—	—	1	—
Accidental pesticide	Total	1	1	4	1	—
	Male	—	—	3	1	—
	Female	1	1	1	—	—
Poisoning	Total	69	96	66	75	59
	Male	30	46	34	34	13
	Female	39	50	32	41	46
Diarrhea	Total	116	96	133	169	98
	Male	51	42	49	76	47
	Female	65	54	84	93	51
Respiratory diseases (all) [3]	Total	5,224	4,627 [r]	4,833	5,071	2,548
	Male	2,380	2,017 [r]	2,133	2,236	1,096
	Female	2,844	2,610	2,700	2,835	1,452
Acute bronchitis	Total	370	407	420	546	170
	Male	137	159	169	218	74
	Female	233	248	251	328	96
Chronic sinusitis	Total	126	88	113	29	10
	Male	37	30	40	10	2
	Female	89	58	73	19	8
Other	Total	4,728	4,132	4,300	4,496	2,368
	Male	2,206	1,828	1,924	2,008	1,020
	Female	2,522	2,304	2,376	2,488	1,348
TOTAL CASES, all causes	Total	5,876 [r]	5,267	5,568	5,786	2,835
	Male	2,663 [r]	2,293	2,456	2,543	1,214
	Female	3,213	2,974	3,112	3,243	1,621
Percentage change (%)	Total	-5.7	-10.4 [r]	+5.7 [r]	+3.9	-51.0
	Male	-7.4 [r]	-13.9 [r]	+7.1 [r]	+3.5	-52.3
	Female	-4.2	-7.4	+4.6	+4.2	-50.0

[1] Includes inpatient discharges and emergency encounters.

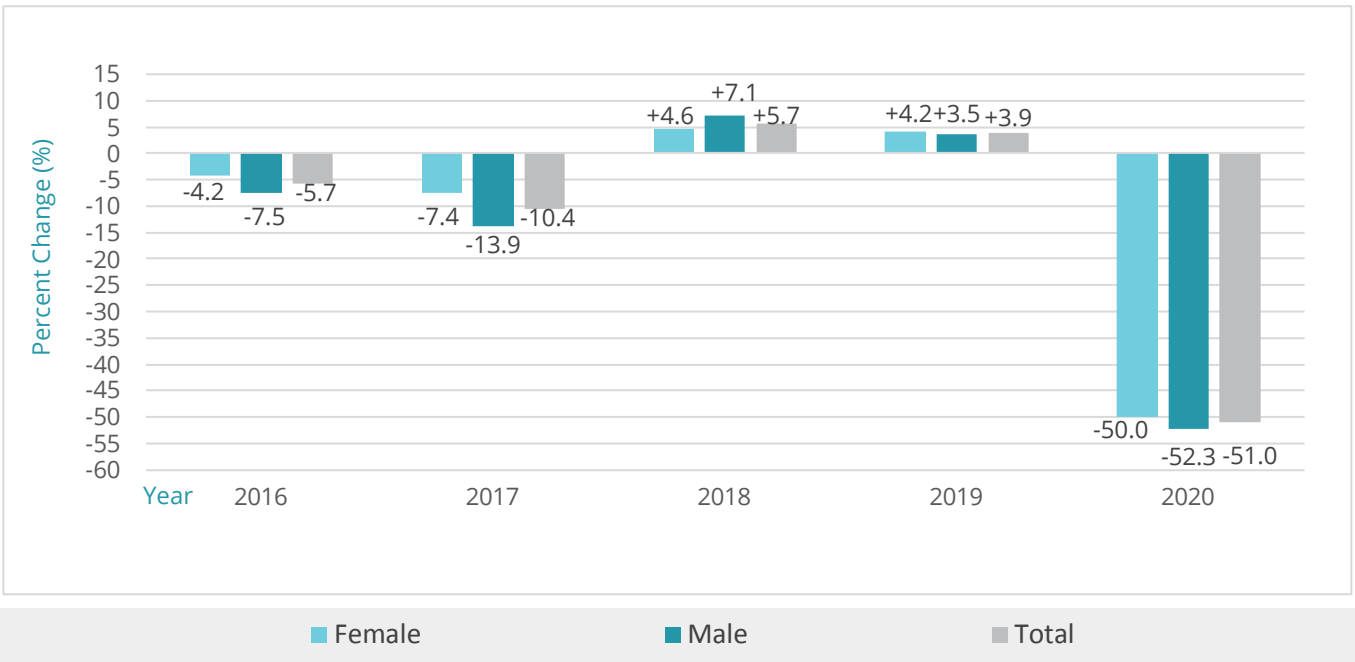
[2] Includes cases that may have been inadvertently coded as non-infectious gastroenteritis.

[3] Respiratory diseases (all) includes acute bronchitis, chronic sinusitis, asthma, pneumonia, etc.

Sources: Department of Health and Bermuda Hospitals Board

Chart 3.1

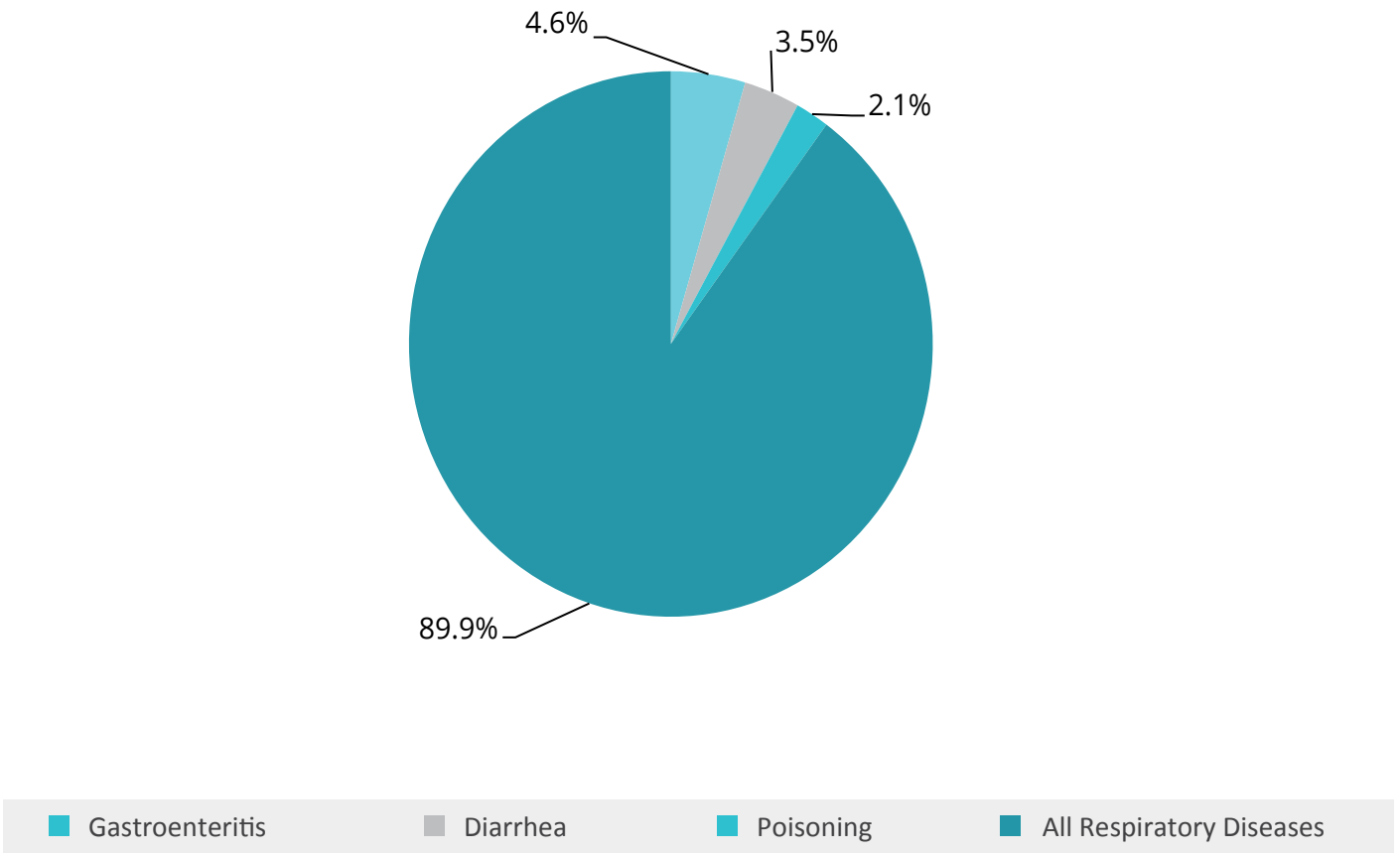
PERCENTAGE CHANGE IN REPORTED CASES OF ENVIRONMENTALLY-RELATED DISEASES BY SEX AND TOTAL, 2016-2020



Sources: Department of Health and Bermuda Hospitals Board

Chart 3.2

REPORTED CASES OF ENVIRONMENTALLY-RELATED DISEASES BY CAUSE, 2020[1]



Sources: Department of Health and Bermuda Hospitals Board

[1] Excludes Malaria, Dengue and Accidental pesticides

Table 3.2

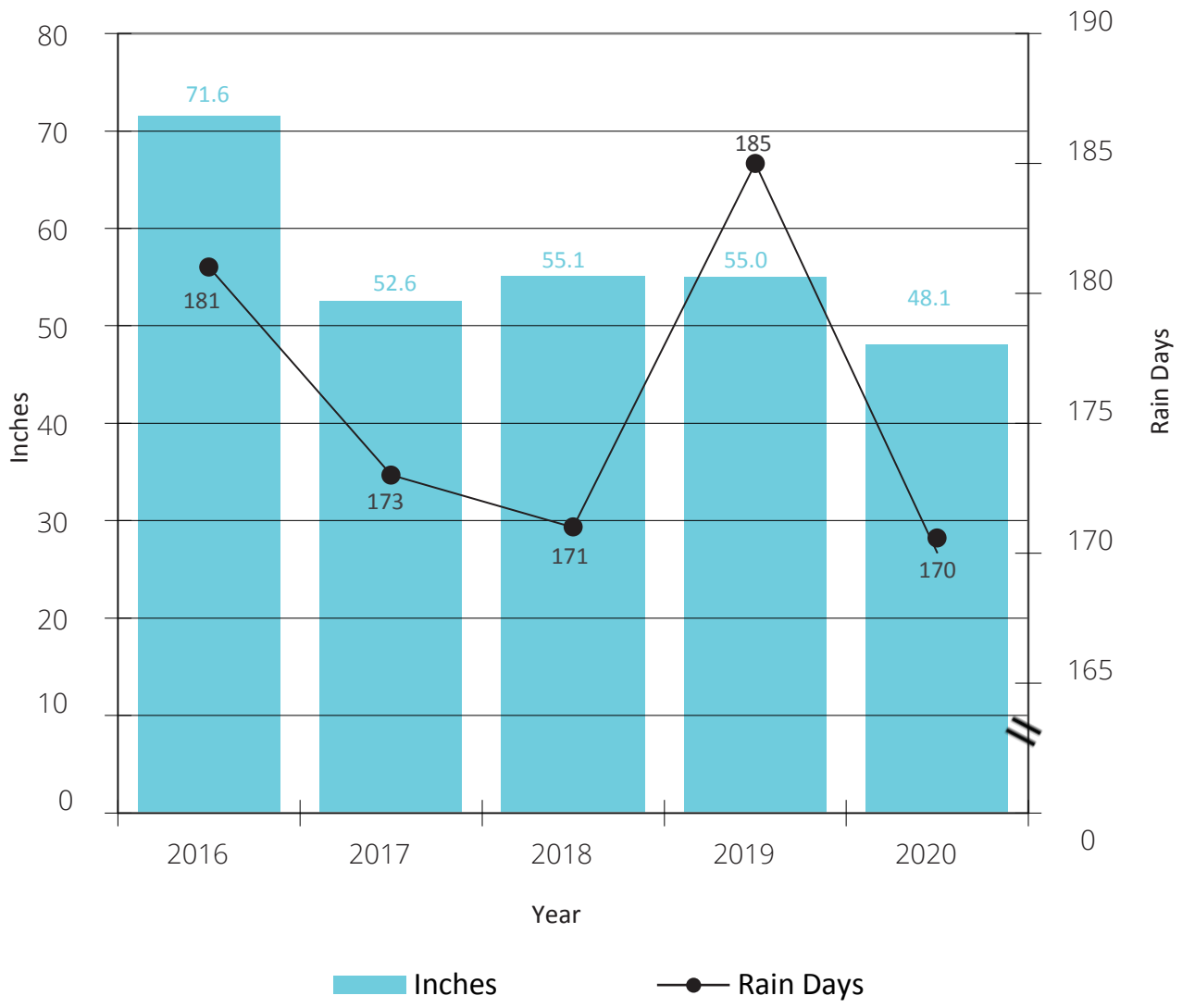
TOTAL NUMBER OF INCHES OF RAINFALL AND RAIN DAYS, 2016-2020

		Month											
Year		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
2016	Inches	6.9	5.5	7.7	2.9	6.6	5.0	4.1	3.3	11.8	10.7	3.5	3.6	71.6
	Rain Days	24	18	16	16	11	16	10	15	17	13	12	13	181
2017	Inches	9.7	3.8	2.8	0.7	0.8	4.8	5.6	5.6	4.0	6.4	3.6	4.8	52.6
	Rain Days	15	13	16	8	10	18	17	15	13	16	15	17	173
2018	Inches	3.8	2.9	7.6	3.6	2.7	5.8	3.7	3.2	6.8	3.3	8.2	3.5	55.1
	Rain Days	16	12	20	10	6	16	16	14	15	12	19	15	171
2019	Inches	7.0	4.9	9.0	1.6	3.0	4.2	2.8	7.6	4.2	1.1	4.8	4.8	55.0
	Rain Days	20	15	16	8	11	18	12	20	15	11	19	20	185
2020	Inches	4.4	5.3	2.1	3.2	5.0	4.8	1.8	5.0	5.3	1.9	6.5	2.8	48.1
	Rain Days	16	16	12	17	13	11	9	17	12	16	16	15	170

Source: The Bermuda Weather Service

Chart 3.3

TOTAL NUMBER OF INCHES OF RAINFALL AND RAIN DAYS, 2016-2020



Source: The Bermuda Weather Service

Table 3.3

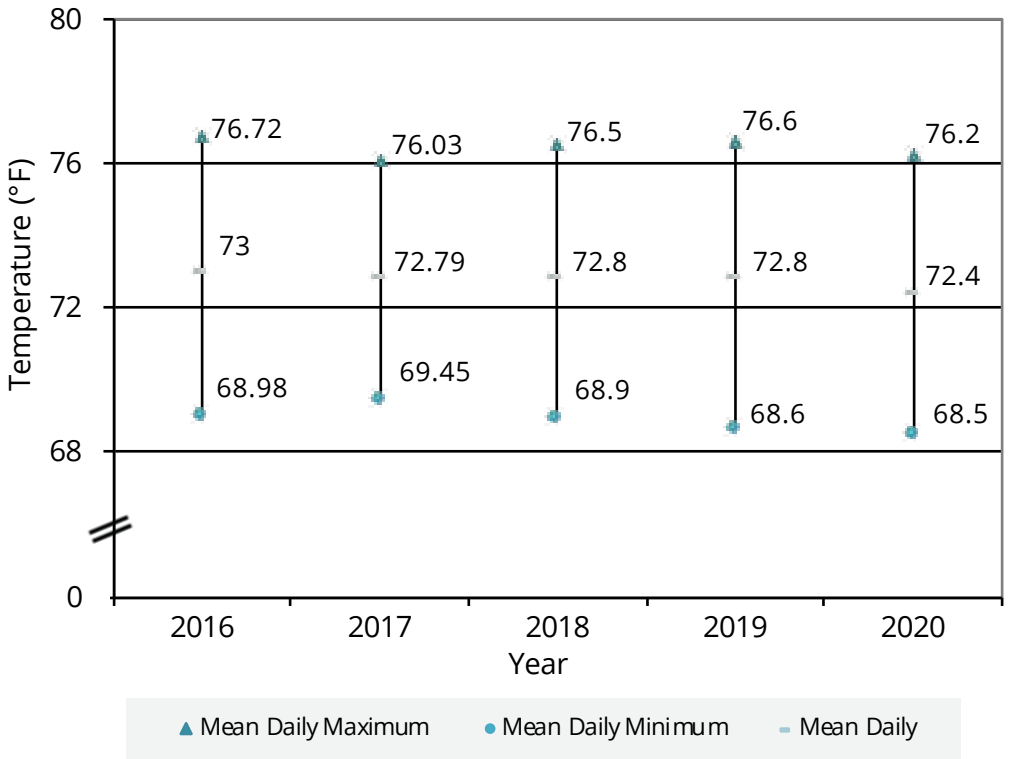
MEAN DAILY MAXIMUM, MINIMUM AND DAILY AIR TEMPERATURES, 2016-2020

Year		Month Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	(°F) Yearly Ave.
2016	Mean Daily Max.	70.4	69.4	71.2	71.6	76.9	80.6	85.4	86.5	84.8	79.9	72.7	71.2	76.7
	Mean Daily Min.	62.6	61.1	63.1	63.8	69.5	73.5	77.9	78.2	76.8	72.8	65.0	63.5	69.0
	Mean Daily	66.6	65.6	67.6	67.9	73.3	76.9	81.5	82.3	81.2	76.4	69.2	67.5	73.0
2017	Mean Daily Max.	69.4	68.9	67.0	71.9	68.7	82.2	85.6	86.4	84.2	79.6	76.1	72.4	76.0
	Mean Daily Min.	61.8	60.4	58.8	64.4	76.8	74.3	77.4	78.3	77.3	71.7	67.8	64.4	69.5
	Mean Daily	65.9	64.9	62.9	67.9	72.3	78.1	81.7	82.5	80.8	75.9	72.0	68.6	72.8
2018	Mean Daily Max.	68.8	70.9	67.8	72.3	78.3	81.5	83.4	85.8	84.7	79.2	75.1	70.7	76.5
	Mean Daily Min.	61.5	63.9	59.0	64.4	70.6	74.2	75.9	78.2	76.1	71.7	68.0	63.3	68.9
	Mean Daily	65.4	67.1	64.0	68.4	74.2	77.8	79.7	82.0	80.6	75.6	71.7	67.5	72.8
2019	Mean Daily Max.	68.8	68.8	68.8	72.6	76.1	81.7	85.4	86.5	84.2	79.8	75.5	70.4	76.6
	Mean Daily Min.	60.8	60.6	61.0	64.8	67.9	74.1	77.3	77.9	76.5	72.5	67.3	62.5	68.6
	Mean Daily	65.4	65.1	65.0	68.7	72.1	77.8	81.5	82.5	80.2	76.0	71.7	67.1	72.8
2020	Mean Daily Max.	68.6	69.9	69.7	70.8	73.9	78.3	84.4	87.2	83.8	81.0	75.4	71.5	76.2
	Mean Daily Min.	60.7	61.8	61.5	62.6	65.9	71.0	77.0	78.9	76.5	74.2	67.7	64.4	68.5
	Mean Daily	64.9	66.2	65.9	67.2	69.8	74.5	80.6	83.0	80.2	77.3	71.6	68.1	72.4

Source: The Bermuda Weather Service

Chart 3.4

MEAN DAILY MAXIMUM, MINIMUM AND DAILY AIR TEMPERATURE, 2016-2020



Source: The Bermuda Weather Service

Table 3.4

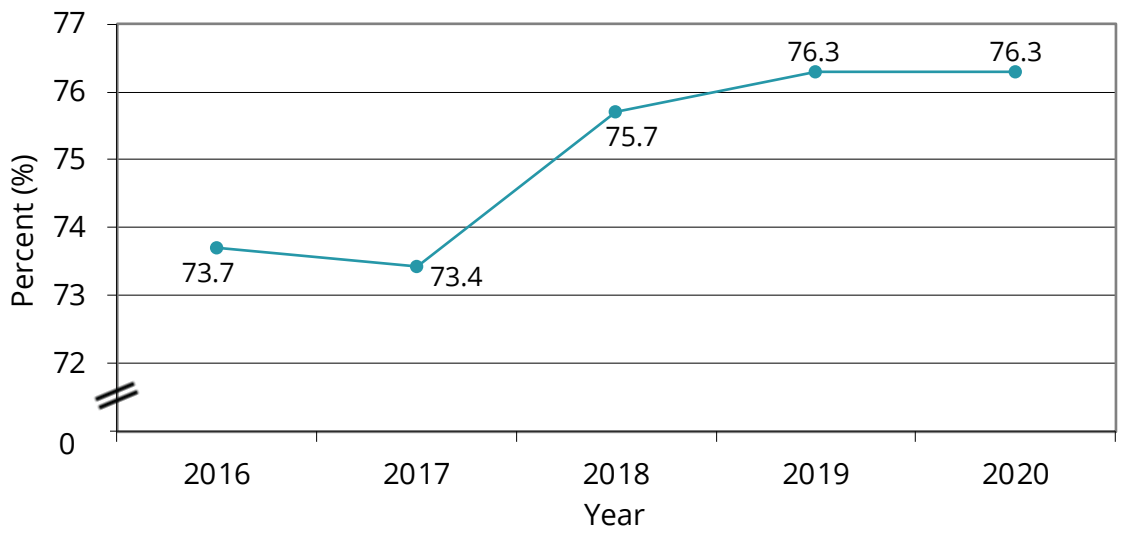
MEAN RELATIVE HUMIDITY, 2016-2020

Year	Month												(°F) Yearly Ave.
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
2016	72.3	73.8	74.9	71.6	80.2	79.4	77.4	73.8	74.9	70.7	64.3	71.2	73.7
2017	74.3	69.9	66.4	71.0	74.2	78.2	76.1	74.3	73.4	74.0	77.2	72.1	73.4
2018	73.1	78.3	69.8	78.1	79.7	80.9	80.4	75.5	75.2	70.0	75.7	71.1	75.7
2019	75.8	75.9	77.3	75.4	74.7	82.2	76.9	78.7	75.6	74.3	75.9	73.3	76.3
2020	71.0	77.9	74.8	74.1	76.1	79.6	79.4	75.5	78.0	79.0	79.2	70.5	76.3

Source: The Bermuda Weather Service

Chart 3.5

MEAN RELATIVE HUMIDITY, 2016-2020



Source: The Bermuda Weather Service

NATURAL AND ENVIRONMENTAL DISASTERS

Occurrences of natural and environmental disasters are very rare in Bermuda.

Hurricanes

- One hurricane, Paulette, affected Bermuda in 2020 causing $50M in damages and 80% (51,634) of customers lost electricity (Table 4.1).

Fires

- In 2020, there were 2,186 reported incidences of fire in Bermuda. This represented a 16.6% decrease from the 2,620 reported incidences in 2019 (Table 4.2).
- In 2020, most of the fires (50.2%) were classified as "Structural" fires (Table 4.2).

NOTE TO READER

Natural Disaster: a natural event which overwhelms local capacity, necessitating a request for national or international assistance, or is recognized as such by a multilateral agency, or by at least two sources, such as national, regional or international assistance groups and the media. There are two types: sudden-impact disasters e.g. earthquakes; or those that develop gradually, e.g. drought.

Types of Disaster: Avalanches, floods, earthquakes, hurricanes, torrential rains,
volcanic eruptions, droughts, landslides, mudslides, fires, blizzards, tsunamis, etc.

Source: CARICOM Environment Programme

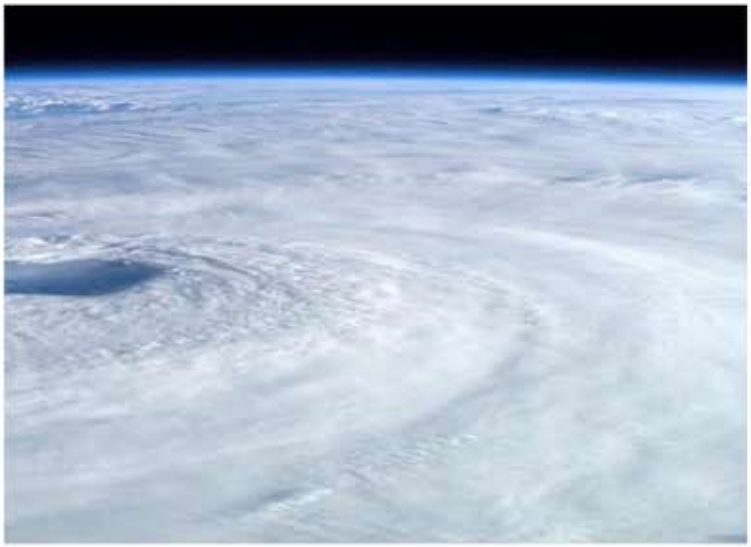


Table 4.1

NATURAL DISASTERS, 2020

Item	
Type of disaster	Hurricane Paulette
Date started	14-Sep-20
Total casualties:	—
of which: dead	—
Total population affected [1]	51,634
Damage ($ million) [2]	50

Source: Bernews

[1] Bermuda Electric Light Company - Customers without power

[2] Insured losses

Table 4.2

INCIDENCES OF FIRE BY TYPE, 2016-2020

		Type					
Year	Total	Minor Incidents[1]	Structure[2]	Island Fires	Vehicle	Boat Fires	Other[2,3]
2016	2,033	298	1,069	..	18	..	648
2017	2,033	337	1,049	..	18	..	629
2018	2,102	384	1,109	..	15	..	594
2019	2,620	553	1,081	..	28	..	958
2020	2,186	232	1,098	..	24	..	832

Source: Bermuda Fire and Rescue Service

[1] Includes brush, trash, gas cylinder leaks, oil spills, floodings, pole fires, etc.

[2] Includes false alarms.

[3] Reflects the activities of the Crash and Fire Rescue Service in other emergency duties such as Airport Operations Division incidents, foreign object debris checks, hot refuel, aircraft standby, etc.

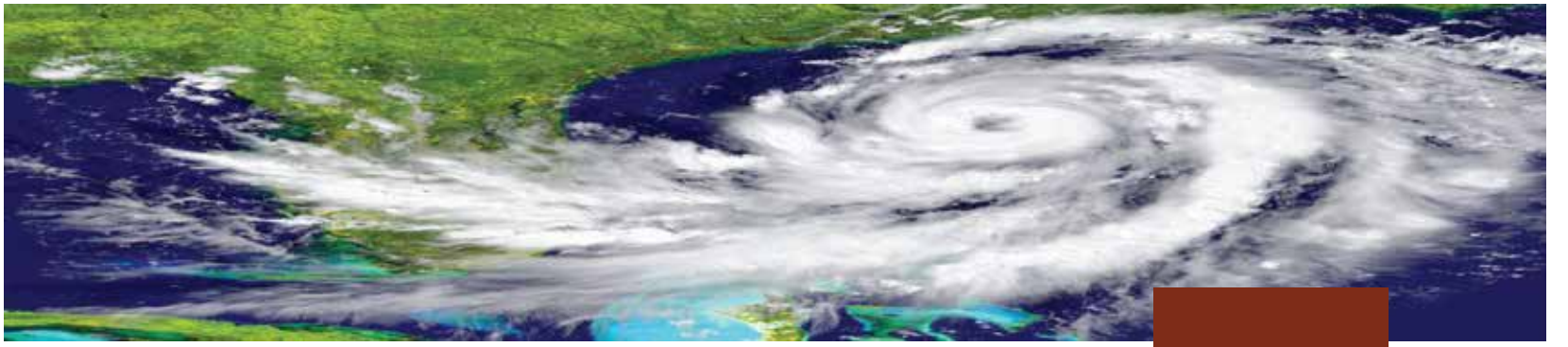
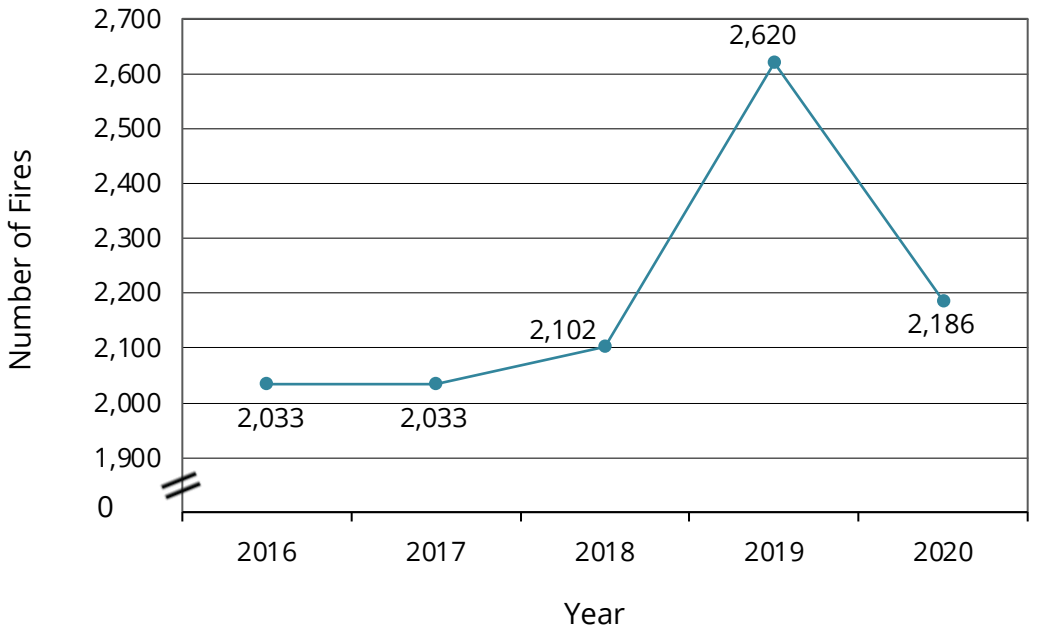


Chart 4.1

TOTAL INCIDENCES OF FIRES, 2016-2020



Source: Bermuda Fire and Rescue Service

ENERGY, MINERALS AND TRANSPORT

The Energy, Minerals and Transport Section comprises information on the types of fuels imported to Bermuda such as gasoline, diesel and propane. It also contains statistics on electricity consumption by type of consumer and the types of vehicles on Bermuda's roads.

Fuel

- In 2020, the value of imported petroleum oils and oils from bituminous minerals, other than crude imported into Bermuda, was $25.5 million, a decrease of 73.9 percent from the total value imported in 2019 (Table 5.1).
- The quantity of gas oils (diesel) decreased to 20.8 million kg in 2020, a decrease of 27.8 percent over the previous year (Table 5.1).
- Both the value and quantity of kerosene & other medium oils (not including gas oils) decreased from 2019 to 2020, with the value decreasing more rapidly. (Table 5.1).

Mineral Fuels

- In 2020, the value of imported mineral fuels, mineral oils and related products fell to $53.0 million. This is a 47.1% decrease from the $100.3 million imported in 2019 (Table 5.2).

Electricity

- Total electricity consumption in 2020 dropped to approximately 518 million kWh from 554 million kWh in 2019. The residential sector accounted for just under half (46.9%) of all electricity consumed in Bermuda (Table 5.3).

Transport

- In 2020, there were 49,201 registered road vehicles in Bermuda. Private cars accounted for nearly half (45.8%) of this total, while just over one-third (36.7%) were motorcycles and scooters (Table 5.6).

Table 5.1

VALUE AND QUANTITY OF IMPORTED FUEL[1] BY TYPE, 2018-2020

Type	Year					
	2018		2019		2020	
	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)
Total	**125,771,352**	**224,051,499**	**97,593,222**	**184,782,215**	**25,485,540**	**96,468,426**
Percentage change (%)	+22.7	-1.0	-22.4	-17.5	-73.9	-47.8
Light oils and preparations (i.e. motor spirits)	21,151,146	21,472,971	13,504,338	13,819,065	8,591,376	16,186,610
Gas oils (diesel)	26,399,712	37,088,222	20,757,302	28,793,199	11,308,505	20,777,052
Gas oils (heavy atmospheric)	—	—	—	—	—	—
Kerosene and other medium oils (not including gas oils)	21,034,479	30,170,302	14,474,603	25,851,350	5,211,921	12,034,416
Fuel oils not elsewhere specified	54,250,523	134,601,158	45,794,276	115,422,850	24,599,716	96,229,353
Other lubricating oils and grease, etc.	2,916,711	713,767	3,045,498	891,539	835,885	226,618
Other waste oils	18,781	5,080	17,205	4,213	49,939	12,455

Source: Department of Statistics

[1] Petroleum oils and oils obtained from bituminous minerals, other than crude.

Table 5.2

VALUE AND QUANTITY OF IMPORTED MINERAL FUELS, MINERAL OILS AND RELATED PRODUCTS CONSUMED BY TYPE, 2018-2020

Type	Year					
	2018		2019		2020	
	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)
Total	**129,818,819**	**240,463,839**	**100,302,740**	**199,736,387**	**53,033,454**	**149,959,788**
Percentage change (%)	+21.5	+3.4	-22.7	-16.9	-47.1	-24.9
Coal, briquettes	36,956	15,921	14,301	8,125	14,184	3,447
Lignite	214	18	760	72	—	—
Peat	158,333	43,432	165,783	78,180	240,384	86,530
Coke and semi coke	82,437	49,623	46,019	30,786	91,553	54,316
Coal gas, water gas	2,027	50	—	—	—	—
Tar distilled	—	—	—	—	—	—
Oils and other products	3,275	702	1,967	626	1,251	503
Pitch and pitch coke	—	—	—	—	—	—
Petroleum oils	—	—	—	—	—	—
Petroleum oils other than crude	125,771,352	224,051,499	97,593,222	184,782,215	50,597,342	145,466,505
Petroleum gases & other gaseous hydrocarbons	3,215,651	15,538,081	1,560,651	13,825,338	1,258,205	3,055,165
Petroleum jelly	41,681	5,221	47,161	4,610	57,048	5,227
Petroleum coke	42,648	3,628	38,659	3,919	29,766	2,614
Other bitumen and asphalt	38,040	67,341	588,921	647,407	434,109	366,573
Bituminous mixtures	426,205	688,323	245,296	355,108	309,612	918,910
Electrical energy	—	—	—	—	—	—

Source: Department of Statistics

Table 5.3

ELECTRICITY CONSUMPTION BY TYPE OF CONSUMERS, 2016-2020

		Type		
Year	Total ('000 kWh)	Residential ('000 kWh)	Commercial ('000 kWh)	Other[1] ('000 kWh)
2016	585,774	245,105	286,588	54,081
2017	584,518	245,124	284,866	54,528
2018	567,827	240,302	274,770	52,755
2019	554,100	237,710	263,793	52,597
2020	517,883	242,697	224,744	50,442

Source: Ascendant Group Limited

[1] Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.

Table 5.4

GROWTH IN ELECTRICITY CONSUMPTION BY TYPE OF CONSUMERS, 2016-2020

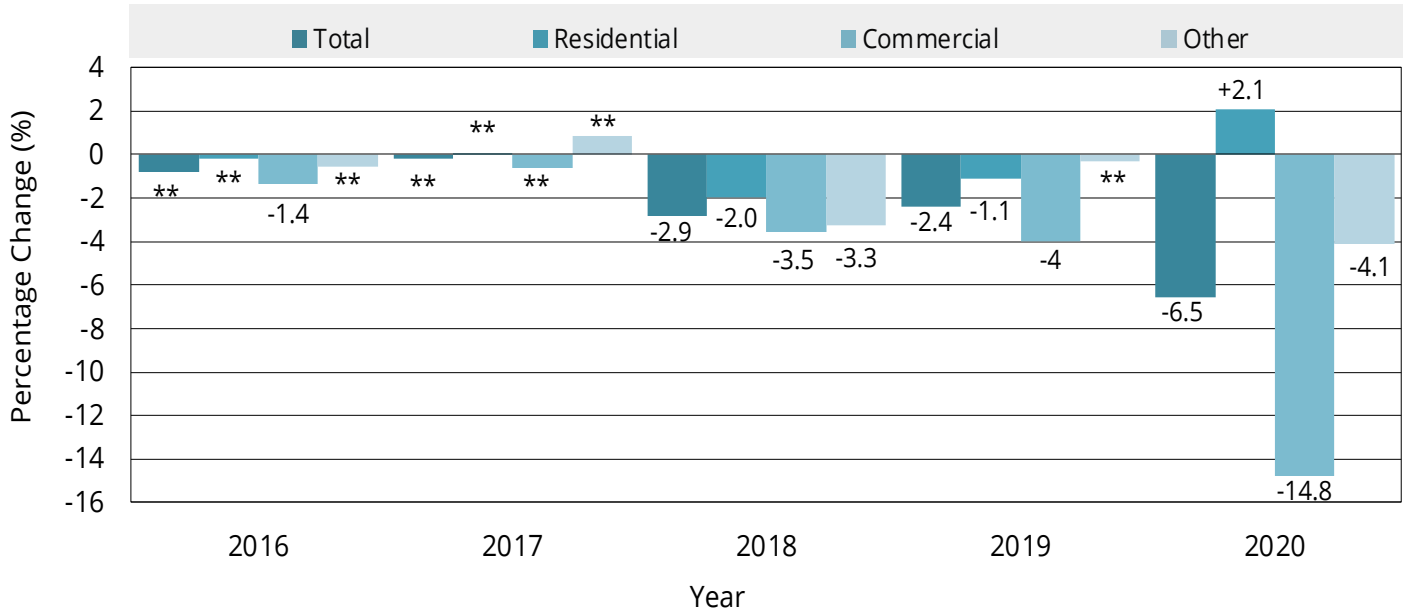
	Growth	Type		
Year	Electricity Consumption	Percentage	Percentage	Percentage
2016	**	**	-1.4	**
2017	**	**	**	**
2018	-2.9	-2.0	-3.5	-3.3
2019	-2.4	-1.1	-4.0	-0.3
2020	-6.5	2.1	-14.8	-4.1

Source: Ascendant Group Limited

[1] Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.

Chart 5.1

GROWTH IN ELECTRICITY CONSUMPTION BY TYPE OF CONSUMERS AND TOTAL CONSUMPTION, 2016-2020



Source: Ascendant Group Limited

Table 5.5

PERCENTAGE OF TOTAL ELECTRICITY CONSUMPTION BY TYPE OF CONSUMER, 2016-2020

		Type		
Year	Total	Residential Percentage	Commercial Percentage	Other[1] Percentage
2016	100	41.8	48.9	9.2
2017	100	41.9	48.7	9.3
2018	100	42.3	48.4	9.3
2019	100	42.9	47.6	9.5
2020	100	46.9	43.4	9.7

Source: Ascendant Group Limited

[1] Includes street lighting paid by Parish Councils and sales to Government for offices, distillation plant, etc.

Table 5.6

REGISTERED ROAD VEHICLES[1], 2016-2020

Type	Year				
	2016	2017	2018	2019	2020
Total	**47,482**	**49,019**	**49,047**	**49,647**	**49,201**
Percentage change (%)	**	+3.2	**	+1.2	**
Private Cars	21,709	22,046	22,151	22,238	22,515
Buses, Minibuses & Limousines	225	250	258	292	295
Taxis	553	555	557	573	558
Trucks	3,624	3,742	3,762	3,778	3,806
Trailers	288	258	276	280	351
Farm Tractors	26	26	27	27	24
Ambulances & Fire Engines	46	47	48	46	45
Military Vehicles	36	42	49	47	50
Tractors & Tractor Trailers	262	254	241	324	302
Light Private Cars	73	71	63	64	68
Auxiliary Cycles[2]	3,933	3,925	3,547	3,351	2,392
Motor Cycles & Scooters	16,116	17,148	17,438	17,857	18,042
Construction Vehicles[3]	51	45	47	44	38
Government Private (GP) Vehicles[4]	241	272	246	245	238
Other [5]	299	338	337	481	477

Source: Transport Control Department

[1] Number of vehicles for which a valid license was in effect as of 31st December.

[2] Includes livery cycles.

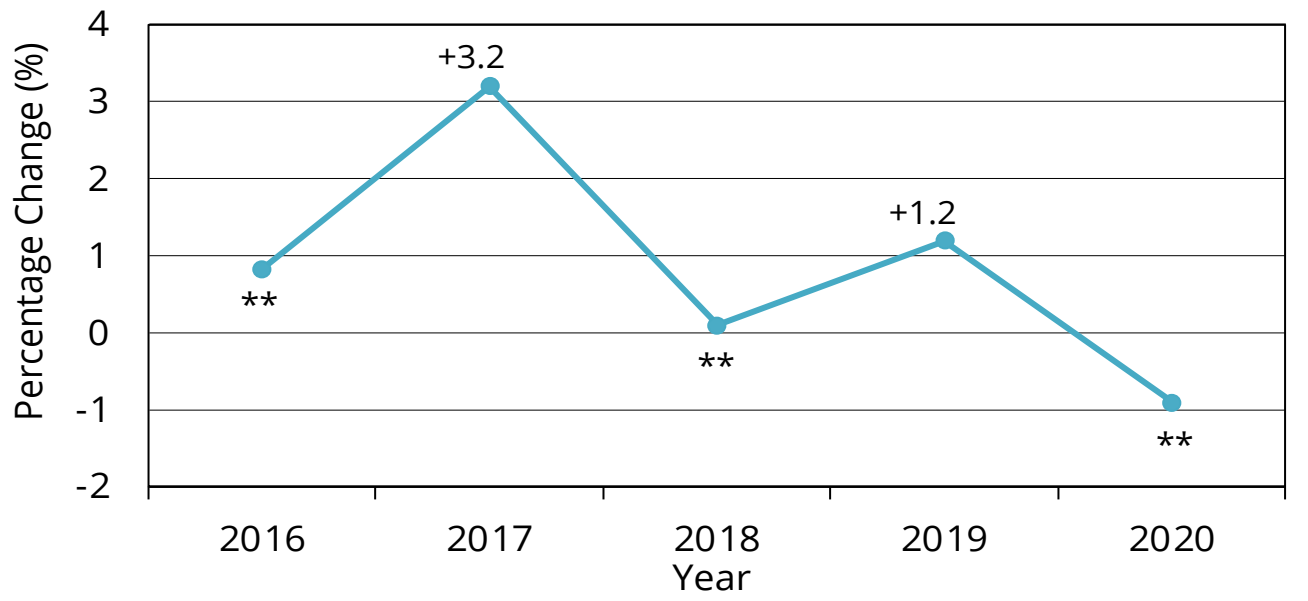
[3] Includes cement mixers.

[4] Includes cars (classes A-H) and minibuses.

[5] Includes classic cars, community service vehicles, doctors' cars, garbage trucks, hearses, instructional vehicles, loaner vehicles, locomotives, police utility vehicles, public carriages and sporting associations.

Chart 5.2

PERCENTAGE CHANGE IN REGISTERED ROAD VEHICLES, 2016-2020



Source: Transport Control Department

AGRICULTURE

The Agriculture Section includes tables and charts on the importation of fertilizers and pesticides to Bermuda.

Fertilizers and Pesticides

In 2020:

- the value of fertilizers imported into Bermuda totaled nearly $804 thousand for 305,061 kg, a 27.3% increase from 2019 (Table 6.1).
- other fertilizers accounted for 70.3% of the total value of fertilizers imported to Bermuda (Table 6.1).
- the total value of pesticides imported into Bermuda rose to approximately $3.5 million for 793,217 kg, a 70.4% increase from 2019 (Table 6.2).
- disinfectants accounted for over half (59.6%) of the total value of imported pesticides (Table 6.2).

Table 6.1

IMPORTED FERTILIZERS BY TYPE, 2018-2020

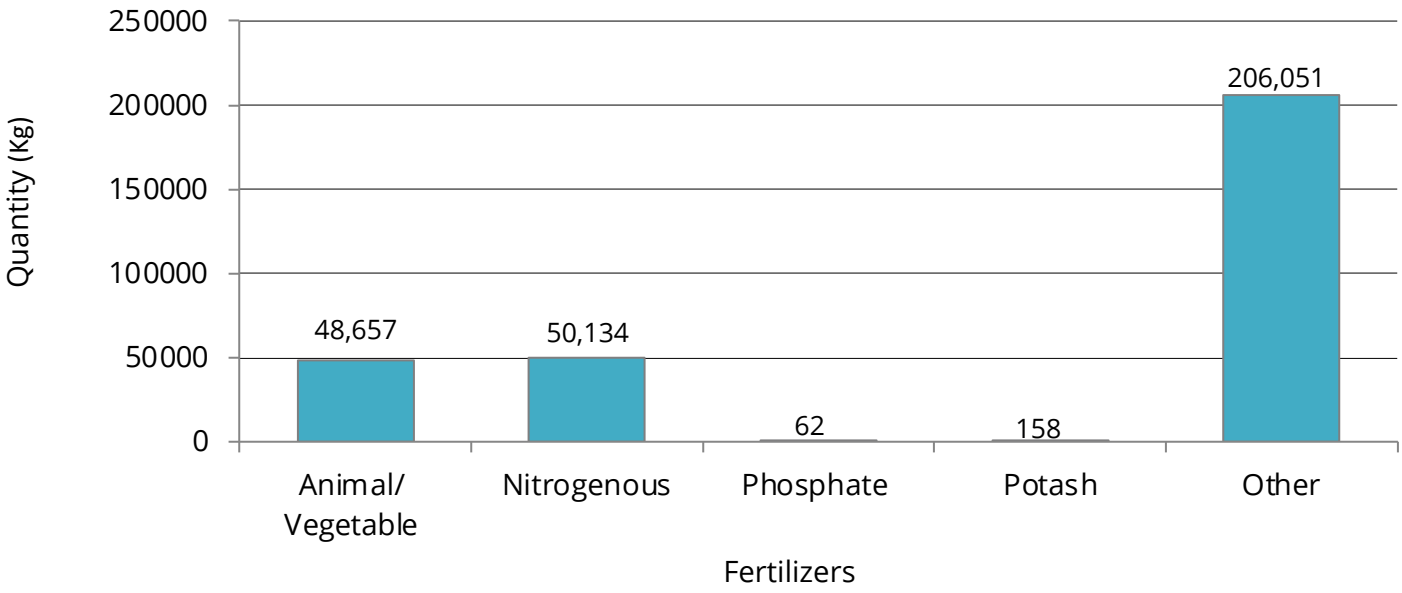
Category	Year					
	2018		2019		2020	
	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)
Total	638,810	284,394	631,678	285,545	803,979	305,061
Percentage change (%)	-29.4	+25.7	-1.1	**	+27.3	+6.8
Animal/Vegetable fertilizers	150,552	69,439	129,279	53,951	166,400	48,657
Nitrogenous fertilizers	153,880	67,578	77,176	38,994	68,327	50,134
Phosphate fertilizers	9,680	9	--	--	2,703	62
Potash fertilizers	716	62	4,448	6,308	1,189	158
Others fertilizers[1]	323,982	147,306	420,774	186,292	565,359	206,051

Source: Department of Statistics

[1] Other fertilizers include mixtures of two or three of the fertilizing elements nitrogen, phosphorus or potassium.

Chart 6.1

IMPORTED FERTILIZERS BY TYPE, 2020



Source: Department of Statistics

Table 6.2

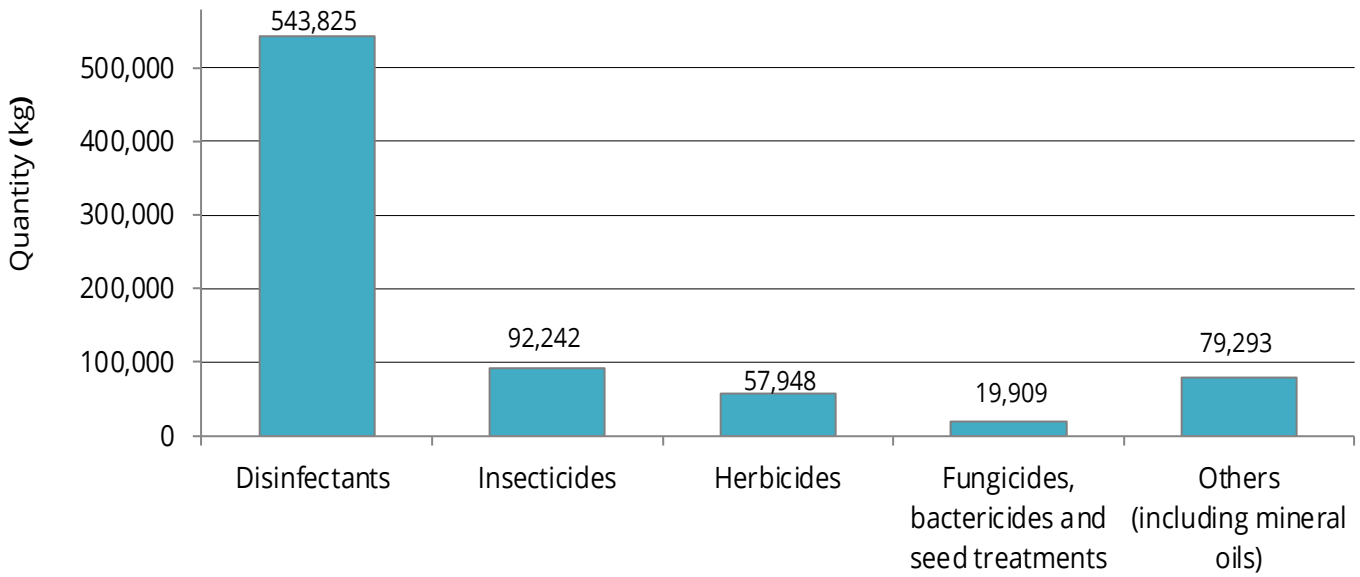
IMPORTED PESTICIDES BY TYPE, 2018-2020

Category	Year					
	2018		2019		2020	
	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)	Value ($)	Quantity (kg)
Total	**1,963,623**	**344,427**	**2,079,537**	**360,631**	**3,543,550**	**793,217**
Percentage change (%)	-30.3	-9.0	+5.9	+4.7	+70.4	+120.0
Disinfectants	623,956	74,870	677,375	79,651	2,112,056	543,825
Insecticides	769,367	112,743	821,973	107,475	876,168	92,242
Herbicides	279,645	48,745	305,915	62,388	214,340	57,948
Fungicides, bactericides and seed treatments	75,096	8,851	80,377	15,282	91,388	19,909
Others (including mineral oils)	215,559	99,218	193,896	95,835	249,598	79,293

Source: Department of Statistics

Chart 6.2

IMPORTED PESTICIDES BY TYPE, 2020



Source: Department of Statistics

LAND USE

The data in the Land Use Section was collected in 2001 and 2016, respectively by the Department of Planning and has not been updated.

Land Use

- Residential land occupied 46.7 percent of all land in Bermuda, covering roughly 6,210 acres of land (Table 7.1).
- 4,335 acres were dedicated to open space land use which is comprised of nature reserves, rural areas, golf courses, recreational spaces and other open spaces. This represents nearly one-third (32.6%) of Bermuda's land (Table 7.1).
- Land used for commercial purposes (such as retail and office space) accounted for 2.0 percent of all occupied land space in Bermuda (Table 7.1).

Parishes

- A comparison of land use by parish showed that St. George's holds the largest share of land (2,162.7 acres) and Pembroke has the least (1,170.3 acres) (Table 7.2.1).

Municipalities

- Among the two municipalities, the City of Hamilton occupies the least amount of land in Bermuda (176.3 acres) and the Town of St. George holds the most (341.0 acres) (Table 7.2.1).

Note: The Land Use Section uses data collected from the Department of Planning, Land Use Survey 2001 and 2016, respectively. In some tables, figures will not be comparable.

Table 7.1

LAND USE, 2020

Main Use	Total Area (Acres)	Sub-Category	Percentage Distribution
Total		13,289.3	100.0
Residential	Total	6,209.8	46.7
	Housing	5,924.1	44.5
	Condos	257.7	1.9
	Institutional	28.0	**
Open space	Total	4,335.0	32.6
	Nature reserve	1,231.4	9.3
	Rural	1,088.7	8.2
	Other	960.7	7.2
	Golf courses	790.1	5.9
	Recreation	264.1	2.0
Utilities	Total	752.0	5.7
	Airport	548.6	4.1
	Waste	89.7	**
	Transport	44.0	**
	BELCO	37.9	**
	Docks	31.8	**
Institutional	Total	580.6	4.4
	Education	258.0	1.9
	Religious	106.0	**
	Government	78.1	**
	Police	31.5	**
	Hospital	34.7	**
	Prison	29.3	**
	Social	43.0	**
Tourism	Total	293.2	2.2
	Cottage colonies	185.4	1.4
	Hotels	107.8	**
Industrial	Total	313.4	2.4
	General	197.9	1.5
	Light industrial	65.2	**
	Quarry	50.3	**
Vacant	Total	553.7	4.2
	Vacant land	506.2	3.8
	Vacant buildings	47.5	**
Commercial	Total	260.7	2.0
	Retail	144.8	1.1
	Office	64.4	**
	Mixed-use	51.5	**

Sources: Department of Planning, Land Use Survey 2016

The 2016 Land Use Survey was based on the 2012 digital survey of the islands, whose coastline was probably taken at the high water mark hence the discrepancy in total area which now stands at 13,430.39 acres (low time mark) in 2007 as a result of the more accurate 2003 Topographic Mapping Database.

Table 7.2.1

LAND USE BY PARISH, CITY AND TOWN IN ACRES, 2020

Main Use / Sub-Category	St. George's	Town of St. George	Hamilton	Smith's	Devonshire	Pembroke	The City of Hamilton	Paget	Warwick	South-ampton	Sandy's
Total	2,162.7	341.0	3 1,312.2	1,216.3	1,221.4	1,170.3	176.3	1,303.0	1,415.4	1,511.7	1,438.4
Residential	450.3	98.6	585.4	709.7	562.4	758.1	27.4	803.6	707.0	610.7	669.5
Housing	444.2	95.9	570.1	696.0	527.2	742.8	25.7	780.0	686.2	586.1	645.4
Condos	6.1	2.7	15.3	10.6	28.0	11.9	—	21.8	20.8	24.6	20.4
Institutional	—	—	—	3.1	7.2	3.5	1.7	1.8	—	—	3.7
Open space	715.6	138.8	611.3	432.7	499.3	132.3	7.9	296.8	584.8	614.4	383.0
Nature reserve	296.4	8.4	156.2	106.0	163.7	74.0	6.4	70.3	164.5	104.3	107.8
Other	218.9	30.2	167.9	75.3	57.0	25.4	1.5	59.3	65.3	121.7	124.0
Golf courses	139.5	79.7	127.7	—	76.6	—	—	10.8	171.0	198.1	5.4
Recreation	36.0	—	9.1	24.8	35.4	27.3	—	4.2	53.4	16.9	33.9
Rural	24.9	20.4	150.4	226.6	166.6	5.7	—	152.2	130.7	173.5	111.9
Utilities	606.2	9.4	10.8	6.7	23.5	23.5	26.4	—	—	4.7	20.2
Airport	548.4	—	—	—	—	—	—	—	—	—	—
Waste	37.0	2.4	10.8	—	14.1	—	—	—	—	—	2.7
Transport	10.2	3.2	—	—	5.0	3.2	16.1	—	—	3.3	2.5
Docks	6.5	3.7	—	—	—	—	10.3	—	—	—	15.1
BELCO	4.1	—	—	6.7	4.4	20.3	—	—	—	1.4	—
Institutional	48.1	33.9	13.0	15.8	72.6	96.2	29.9	66.4	54.6	30.7	60.6
Education	27.3	20.4	8.9	11.3	36.0	47.8	4.4	27.9	28.0	17.0	25.3
Police	15.5	0.5	—	—	9.3	1.3	1.1	—	9.0	6.8	15.4
Religious	2.3	10.0	4.1	4.5	5.0	15.7	6.6	10.3	10.3	6.9	11.9
Prison	1.5	—	—	—	—	2.8	5.3	4.6	2.6	—	—
Government	1.5	2.9	—	—	11.0	25.5	12.5	8.9	—	—	1.2
Hospital	—	—	—	—	11.3	—	—	14.7	—	—	3.2
Social	—	—	—	—	—	3.2	—	—	4.7	—	3.7

Source: Department of Planning, Land Use Survey 2001

Table 7.2.2

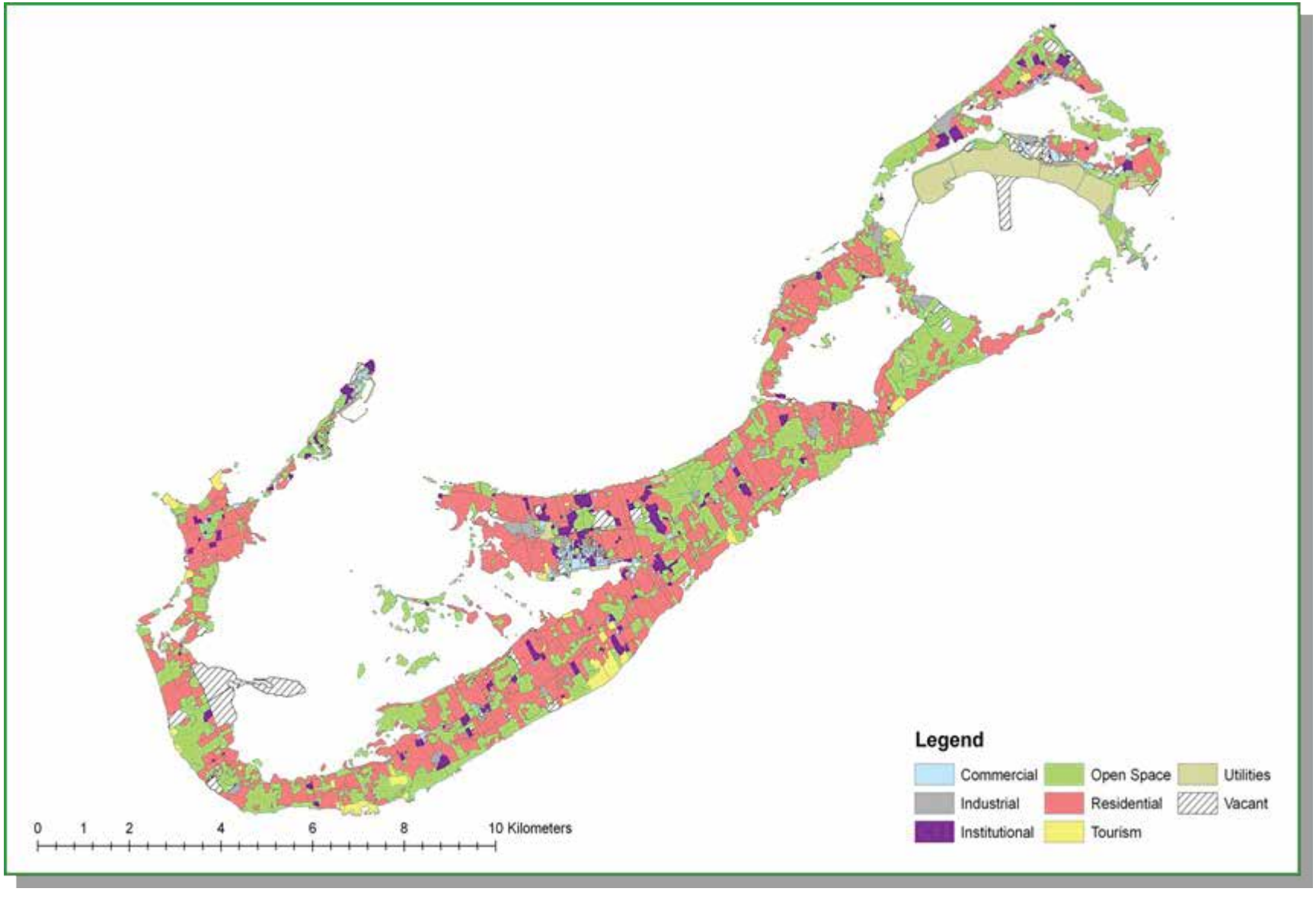
LAND USE BY PARISH, CITY AND TOWN IN ACRES, 2020

Main Use / Sub-Category	St. George's	Town of St. George	Hamilton	Smith's	Devonshire	Pembroke	The City of Hamilton	Paget	Warwick	South-ampton	Sandy's
Tourism	4.0	10.2	18.7	15.3	14.2	15.7	—	112.1	8.7	88.7	44.7
Cottage colonies	4.0	10.2	18.7	15.3	14.2	3.0	—	62.4	8.7	23.6	44.7
Hotels	—	—	—	—	—	12.7	—	49.8	—	65.2	—
Industrial	99.6	8.9	47.5	21.1	18.9	55.6	12.3	4.1	18.0	21.8	13.9
General	66.6	1.3	11.5	9.5	11.3	52.9	6.0	0.7	7.8	18.9	13.9
Light industrial	33.0	7.6	—	—	7.5	2.7	6.4	3.4	1.0	2.9	—
Quarry	—	—	36.0	11.6	—	—	—	—	9.2	—	—
Vacant	206.5	29.1	14.0	12.2	19.5	60.5	3.6	3.1	30.8	130.2	219.4
Vacant land	155.4	10.3	—	12.2	19.5	60.5	3.6	—	21.3	130.2	197.1
Vacant buildings	51.2	18.8	14.0	—	—	—	—	3.1	9.5	—	22.3
Commercial	32.5	10.6	11.01	2.9	10.8	27.2	66.8	16.4	9.1	10.2	27.0
Office	19.0	—	—	—	4.2	15.1	16.9	6.6	—	—	—
Retail	13.5	6.3	11.01	2.9	6.6	12.1	17.7	9.8	9.1	10.2	27.0
Mixed-use	—	4.3	—	—	—	—	32.2	—	—	—	—

Source: Department of Planning, Land Use Survey 2001

Map 7.1

LAND USE SURVEY, 2020



COASTAL AND MARINE RESOURCES

This Section includes information on various marine areas by name, location, activities permitted in these areas and the date they were established in Bermuda. It also provides information about Bermuda's fishing industry.

Marine Protected Areas by Category and Area

- Bermuda's total marine area covers 4,236.1 km^2, of which 7.0% or 294.7 km^2 is classified as protected marine area (Table 8.1 and Chart 8.1).
- There are 29 protected dive sites located in Bermuda covering an area of 13.9 km^2 (Table 8.2).
- A total of 12 marine parks have been established in Bermuda covering an area of 1.9 km^2 (Table 8.2).
- There are two fisheries seasonal protected areas that measure 153.4 km^2 (Table 8.2).
- Two coral reef preserves occupy a total of 131.1 km^2 (Table 8.2).

Fisheries

- Fish landings, excluding bait and shellfish, totaled 289.7 metric tonnes (mT) in 2020, a decrease of 5.5% from 2019 (Table 8.4).
- Tuna and pelagic group remained the most popular catch at 143.9 mT, a decrease of 10.2% from 2019.
- In 2020, 342 registered fishermen spent a total of 67,325 hours at sea. There was a 10.7% increase in registered fishermen which accounted for 1,543 less hours spent at sea (Table 8.5).

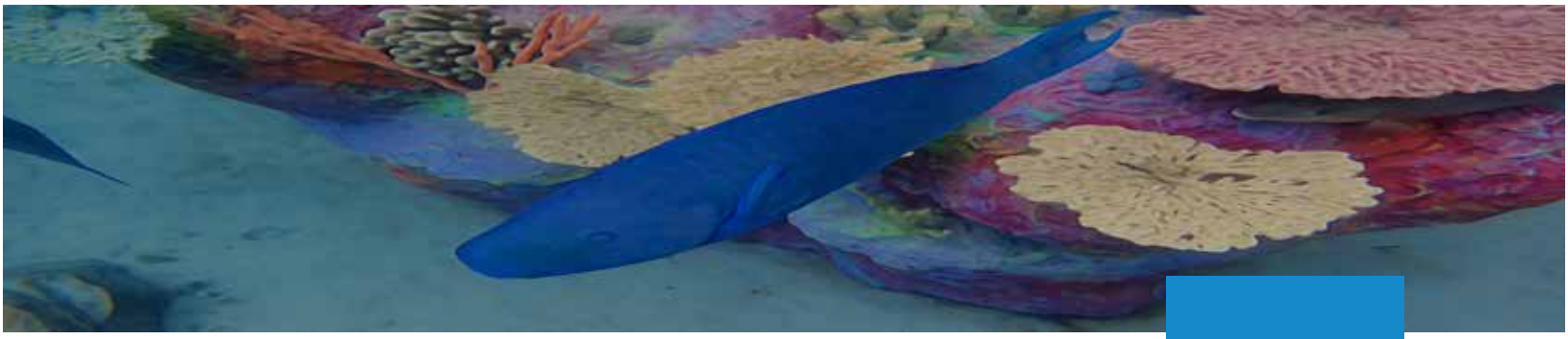


Table 8.1

TOTAL AND PROTECTED MARINE AREA, 2020

Indicator	
Total land and marine area (km^2)	4,289.7
Total marine area (km^2)	4,236.1
Protected marine area (km^2)	294.7
Protected marine area as a % of total marine area	7.0
Protected marine area as a % of total land and marine area	6.9

Source: Department of Planning

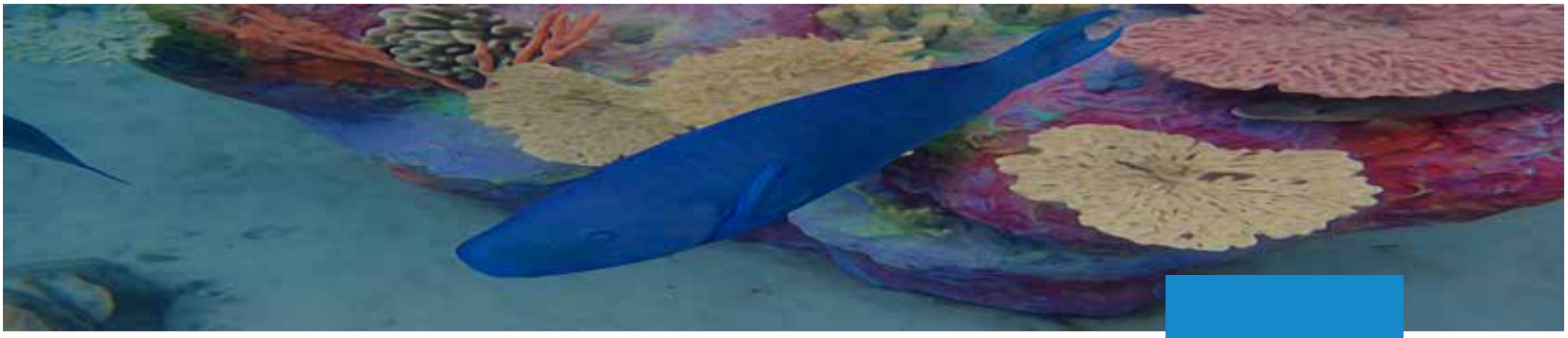
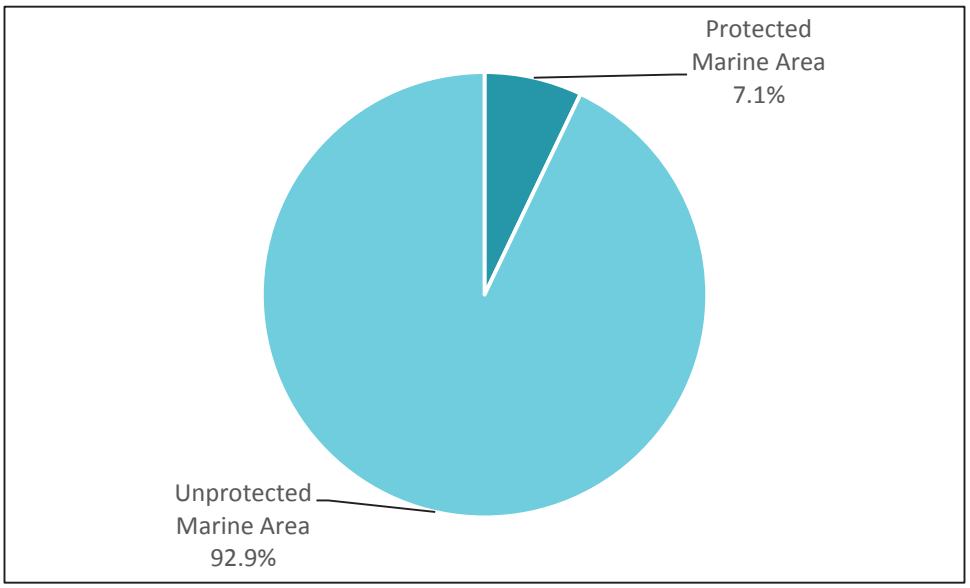


Chart 8.1

PROTECTED MARINE AREA AS A PERCENTAGE OF TOTAL MARINE AREA, 2020



Source: Department of Planning

Table 8.2

MARINE PROTECTED AREAS BY CATEGORY AND AREA, 2020

Marine Protected Areas	Area (km^2)	Marine Protected Areas: Protected Dive Sites	Marine Protected Areas (km^2)
Coral Reef Preserves			
Subtotal	131.1	Subtotal	13.9
North Shore Coral Reef Preserve	126.3	North Rock	3.1
South Shore Coral Reef Preserve	4.8	SW Breaker	1.1
		Eastern Blue Cut	1.1
Fisheries Seasonal Protected Areas		Pelinaion	0.8
Subtotal	153.4	Hermes	0.8
South Western Area	114.7	Constellation	0.8
North Eastern Area	38.7	Cristobal Colon	0.3
		NE Breaker	0.3
Marine Parks		Taunton	0.3
Subtotal	1.9	Aristo	0.3
Castle Island Marine Park	0.7	Mills Breaker	0.3
South Shore Marine Park	0.4	Cathedral	0.3
Cooper's Island Marine Park	0.3	Kate	0.3
Walsingham Marine Park	0.2	Tarpon Hole	0.3
John's Smiths Bay Marine Park	0.1	Marie Celeste	0.3
Tobacco Bay Marine Park	0.1	North Carolina	0.3
Spittal Pond Marine Park	0.1	Airplane	0.3
Church Bay Marine Park	0.0	Blanche King	0.3
Astwood Bay Marine Park	0.0	Darlington	0.3
Shelly Bay Marine Park	0.0	L'Herminie	0.3
Daniel's Head Marine Park	0.0	Lartington	0.3
Somerset Long Bay Marine Park	0.0	Montana	0.3
		Snake Pit	0.3
		Hog Breaker	0.3
		Caraquet	0.3
		Madiana	0.3
		Commissioner's Point	0.1
		Xing Da	0.1
		Vixen	0.0

Marine Protected Areas	Area (km^2)
Merged marine protected areas (no overlaps)[1]	294.7
Territorial area (net)[2]	4,236.1

Source: Department of Planning

[1] Total marine protected area does not equal to the sum of the sub-totals as it excludes any overlapping areas (5.26 km^2)

[2] Territorial area (net) means total water area and does not include the land area of 53.6 km^2.

Table 8.3.1

MARINE PROTECTED AREAS AROUND BERMUDA, 2020

Marine Protected Area/ No-Take Reserve	Year Established	Anchoring Permitted?	Scuba Diving Permitted?	No-Take Reserve?
North Shore Coral Reef Preserve	1966	Yes	Yes	Line fishing is permitted throughout this Preserve, as is lobster diving and spear fishing provided they are within the limits of the prevailing fisheries regulations. It is an offence to remove, damage or be in possession of plants or animals, whether dead or alive, which are attached to the coast, the seabed or any reef in this preserve.
South Shore Coral Reef Preserve	1966	Yes	Yes	Line fishing is permitted throughout this Preserve, as is lobster diving and spear fishing provided they are within the limits of the prevailing fisheries regulations. It is an offence to remove, damage or be in possession of plants or animals, whether dead or alive, which are attached to the coast, the seabed or any reef in this preserve.
Vixen (Wreck)	1973	No	Yes	Yes
The Eastern Area	Established in 1974 but in 1990 the area was expanded to the current size.	Yes	Yes	Seasonally protected area, no fishing from 1 May to 31 August. First act (1974) stated no fishing between 1 May and 15 August. This was amended in 1975 to 24 May and 15 August, in 1976 it was amended to 1 May and 15 August, in 1990 it was amended to 1 May and 30 September and finally in 1993 it was amended to 1 May and 31 August. Trolling for pelagic species is permitted seaward of the 30 fathom depth contour and shore fishing is also permitted.
The South Western Area	Established in 1974 but in 1990 the area was expanded to the current size.	Yes	Yes	Seasonally protected area, no fishing from 1 May to 31 August. First act (1974) stated no fishing between 1 May and 15 August. This was amended in 1975 to 24 May and 15 August, in 1976 it was amended to 1 May and 15 August, in 1990 it was amended to 1 May and 30 September and finally in 1993 it was amended to 1 May and 31 August. Trolling for pelagic species is permitted seaward of the 30 fathom depth contour and shore fishing is also permitted.

Source: Department of Environmental Protection

Table 8.3.2

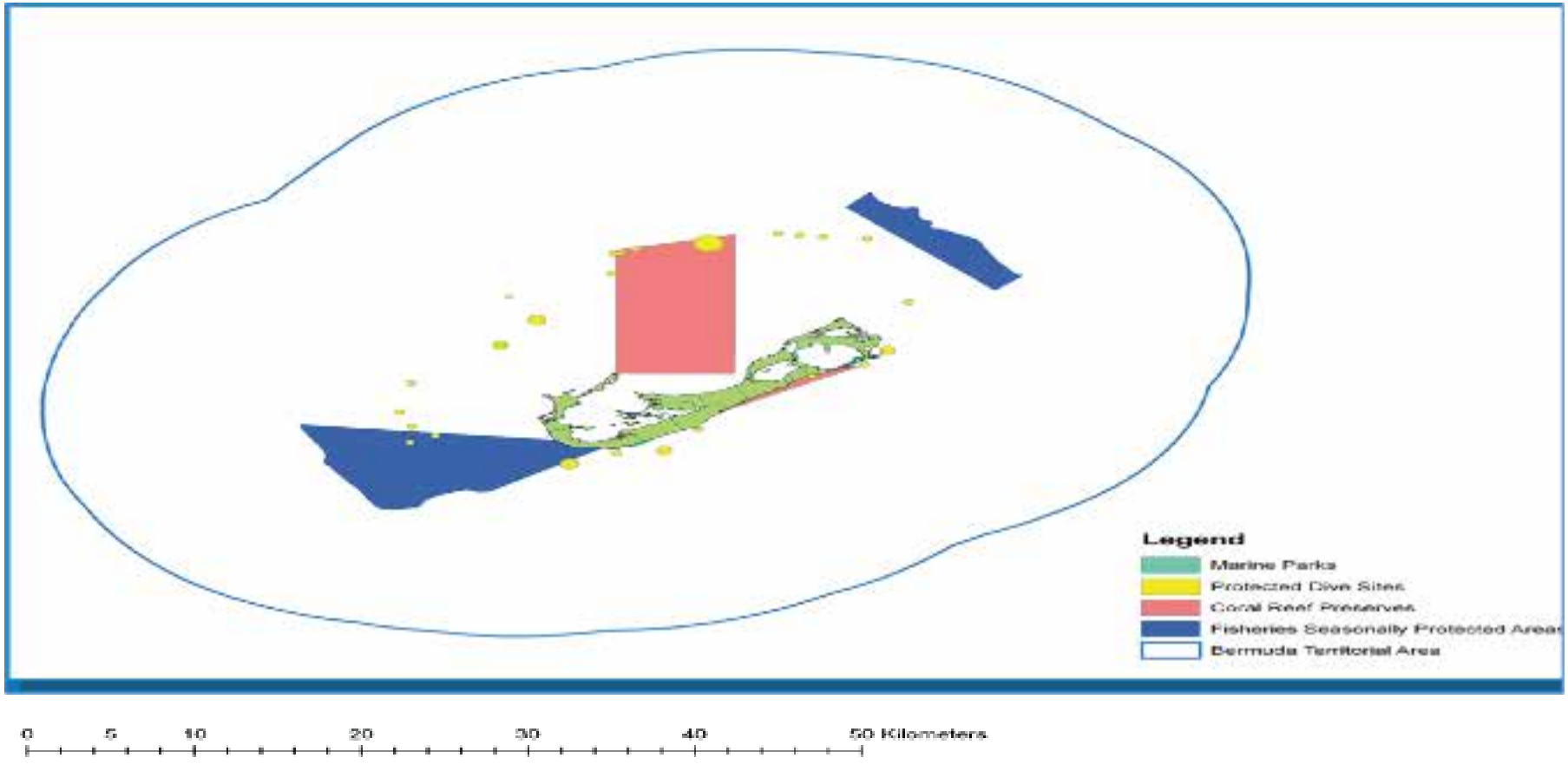
MARINE PROTECTED AREAS AROUND BERMUDA, 2020

Marine Protected Area/ No-Take Reserve	Year Established	Anchoring Permitted?	Scuba Diving Permitted?	No-Take Reserve?
Constellation (Wreck)	1988	No	Yes	Yes
South West Breaker Area	1988	No	Yes	Yes
Eastern Blue Cut	1989	No	Yes	Yes
Pelinaion and Rita Zovetta Wrecks)	1989	No	Yes	Yes
Kate (Wreck)	1989	No	Yes	Yes
Hermes and Minnie Bressleur	1989	No	Yes	Yes
North Rock	1990	No	Yes	Yes
The North Eastern Area	1990 It was merged in 2005 with the Eastern Area and redesigned.	Yes	Yes	Seasonally protected area, no fishing from 1 May to 31 August. Initially there was no fishing between 1 May and 30 September, but in 1993 this was amended to 1 May and 31 August. Trolling for pelagic species is permitted seaward of the 30 fathom depth contour and shore fishing is also permitted.
Walsingham Marine Reserve	1991	No	Yes	Yes
Commissioner's Pt. Area	1996	No	Yes	Yes
Xing Da (Wreck)	1997	No	Yes	Yes
Cristobal Colon (Wreck)	2000	No	Yes	Yes
North East Breaker	2000	No	Yes	Yes
Taunton (Wreck)	2000	No	Yes	Yes
Aristo (Wreck)	2000	No	Yes	Yes
Mills Breaker	2000	No	Yes	Yes
The Cathedral	2000	No	Yes	Yes
Tarpon Hole	2000	No	Yes	Yes
Marie Celeste (Wreck)	2000	No	Yes	Yes
North Carolina (Wreck)	2000	No	Yes	Yes
Airplane (Wreck)	2000	No	Yes	Yes
Blanche King (Wreck)	2000	No	Yes	Yes
Darlington (Wreck)	2000	No	Yes	Yes
L'Herminie (Wreck)	2000	No	Yes	Yes
Lartington (Wreck)	2000	No	Yes	Yes
Montana (Wreck)	2000	No	Yes	Yes
Snake Pit	2000	No	Yes	Yes
Hog Breaker	2000	No	Yes	Yes
Caraquet (Wreck)	2000	No	Yes	Yes
Madiana (Wreck)	2000	No	Yes	Yes

Source: Department of Environmental Protection

Map 8.1

MARINE PROTECTED AREAS, 2020



Source: Department of Planning

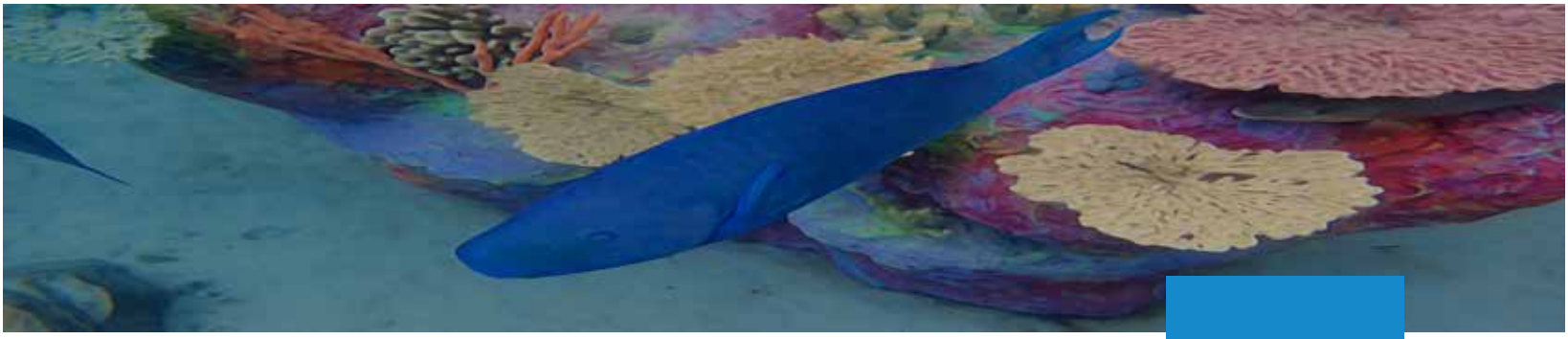


Table 8.4

QUANTITY OF FISH LANDINGS BY TYPE, 2016-2020

Species Group (mT)	Year				
	2016	2017	2018	2019	2020
Total including bait and shellfish	402.9	385.0	353.8	376.6	354.6
Percentage change (%)	+0.2	-4.4	-8.1	+6.4	-5.8
Total fish	331.9	320.7	295.5	306.6	289.7
Tuna and pelagic	142.8	151.5	133.9	160.2	143.9
Groupers	64.0	45.1	55.2	49.4	49.2
Jacks and related species	53.2	41.0	40.7	41.6	53.5
Snappers	47.9	53.5	42.1	37.1	27.3
Miscellaneous	18.8	25.2	20.6	15.3	14.3
Sharks	5.2	4.4	3.1	3.0	1.5
Bait	37.9	35.5	32.2	37.6	33.0
Shellfish[1]	33.1	28.8	26.2	32.4	31.9

Source: Department of Environmental and Natural Resources, Marine Management Section

[1] Shellfish includes spiny lobster.

Table 8.5

TOTAL CATCH BY HOURS AT SEA, AVERAGE CATCH OF FISHING AREA AND NUMBER OF REGISTERED FISHERMEN, 2016-2020

Indicators	Year				
	2016	2017	2018	2019	2020
Total catch[1] (mT)	402.9	385.0	353.8	376.6	354.6
Percentage change (%)	+0.2	-4.4	-8.1	+6.4	-5.8
Average catch of fishing area[2] (mT per km^2)	0.1	0.1	0.1	0.1	0.1
Total hours at sea	67,709.0	74,019.0	72,231.0	68,868.0	67,325.0
Percentage change (%)	-12.2	+9.3	-2.4	-4.7	-2.2
Total number of licences[3]	176.0	174.0	168.0	167.0	172.0
Percentage change (%)	-3.8	-1.1	-3.4	-0.6	+3.0
Total hours at sea per licence	384.7	425.0	430.0	412.0	391.0
Percentage change (%)	-8.7	+10.5	+1.2	-4.2	-5.1
Total registered fishermen	277.0	325.0	315.0	309.0	342.0
Percentage change (%)	-7.7	+17.3	-3.1	-1.9	+10.7

Source: Department of Environmental and Natural Resources, Marine Management Section

[1] Total catch include fish landings in addition to bait and lobster catches.

[2] Total fishing area is estimated as 4,236.1 km^2 (Department of Planning, see Table 8.1). Fishing area includes the fisheries seasonal protected areas (153.4 km^2) which are closed between May 1st and August 31st.

Computation: Average catch of fishing area = Total catch (mT) / Total estimated fishing area of 4,236.1 km^2.

[3] Some licences have a smaller ancillary vessel attached.

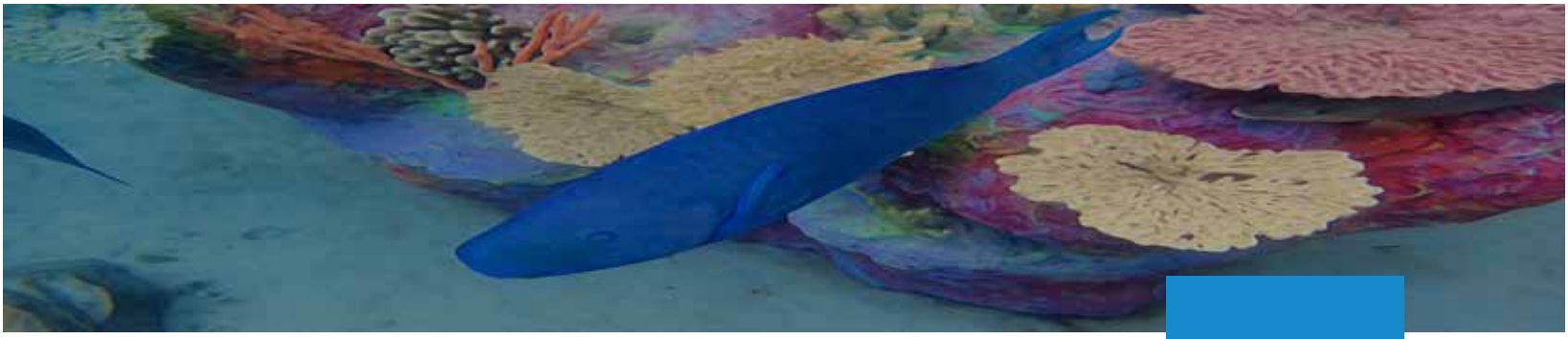
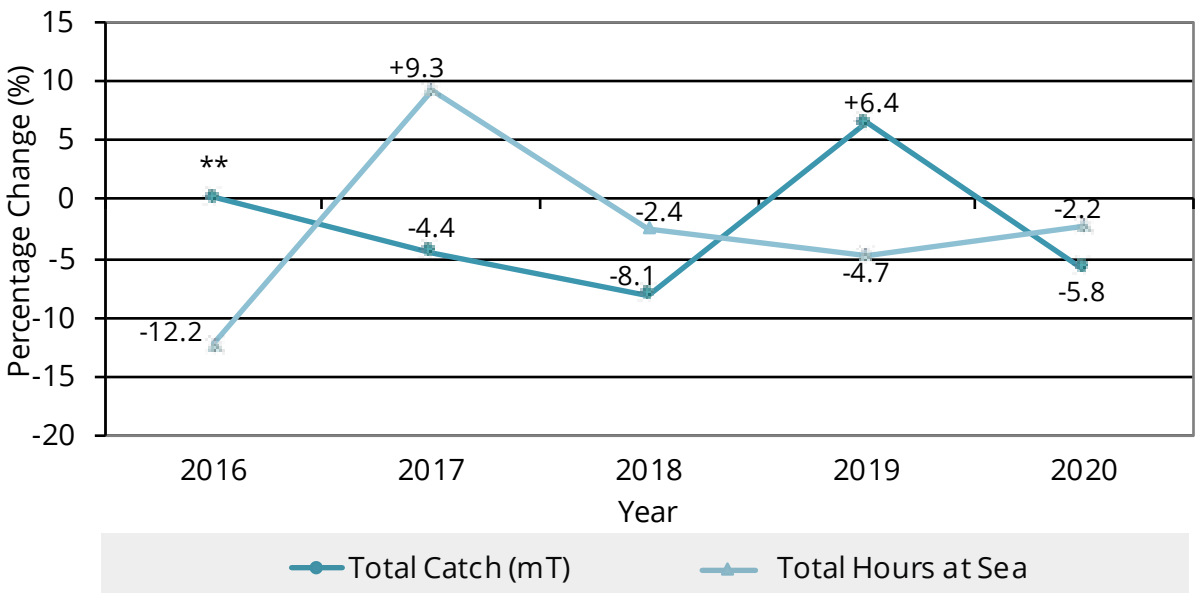


Chart 8.2

GROWTH IN TOTAL CATCH AND TOTAL HOURS AT SEA, 2016-2020



Source: Department of Environmental Protection, Marine Resources Section

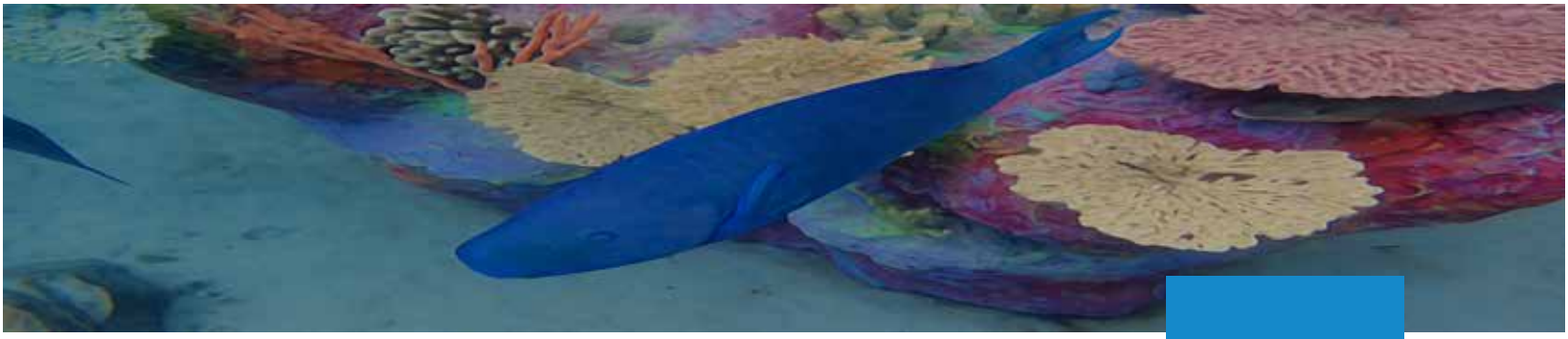
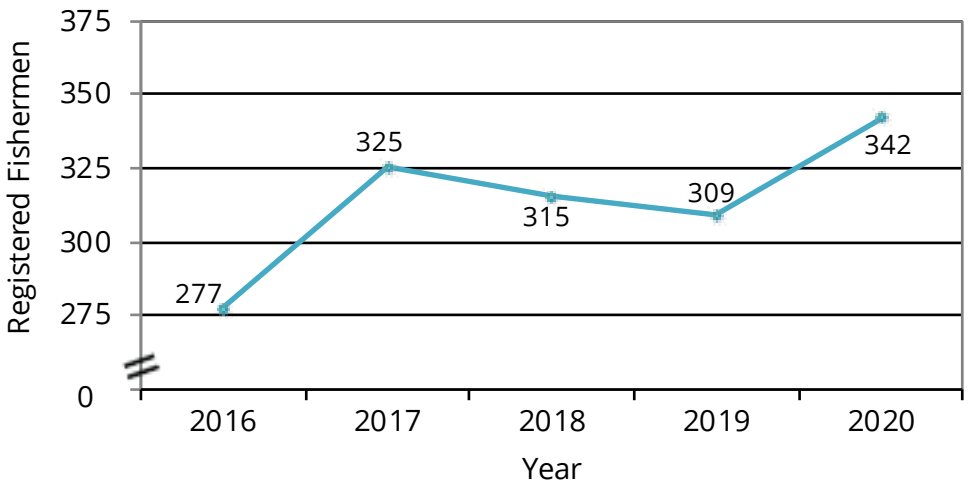


Chart 8.3

NUMBER OF REGISTERED FISHERMEN, 2016-2020



Source: Department of Environmental Protection, Marine Resources Section

Table 8.6

NUMBER OF HOUSEHOLDS AND POPULATION OF COASTAL AREAS FOR SELECTED CENSUS YEARS

	Census Years				
Indicators	1980	1991	2000	2010	2016
Number of households in coastal areas	18,449	22,430	25,148	26,923	28,192
Ten-year growth rate (%)	..	+21.6	+12.1	+7.1	+4.7
Population in coastal areas [1]	54,050	58,460	62,059	64,237	63,779
Ten-year growth rate (%)	..	+8.2	+6.2	+3.5	**

Sources: 1980 to 2016 Population and Housing Censuses

[1] Does not include the non-sheltered and institutionalized populations.

Note: Bermuda measures 1 mile at its widest point. Based on the standard definition of coastal area, the entire island will be considered coastal.

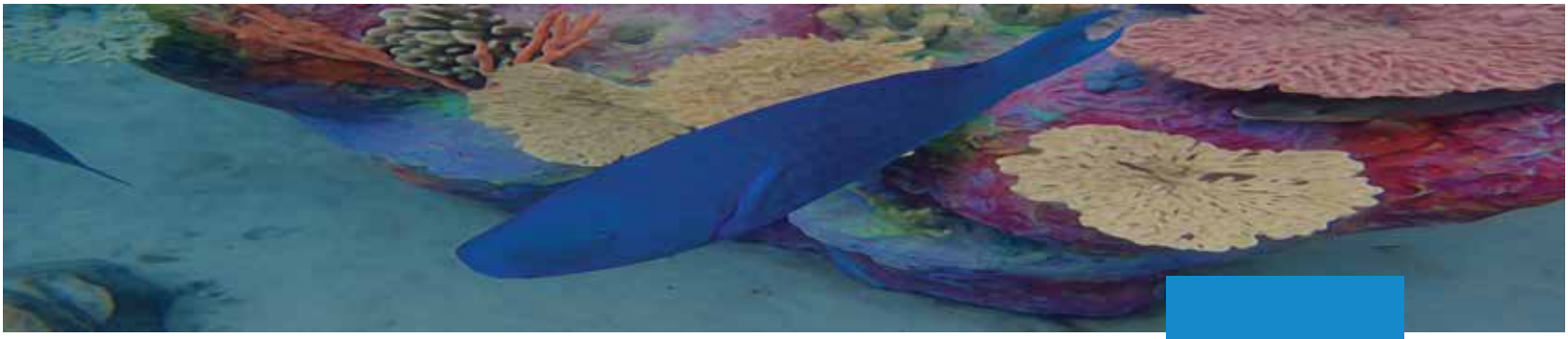
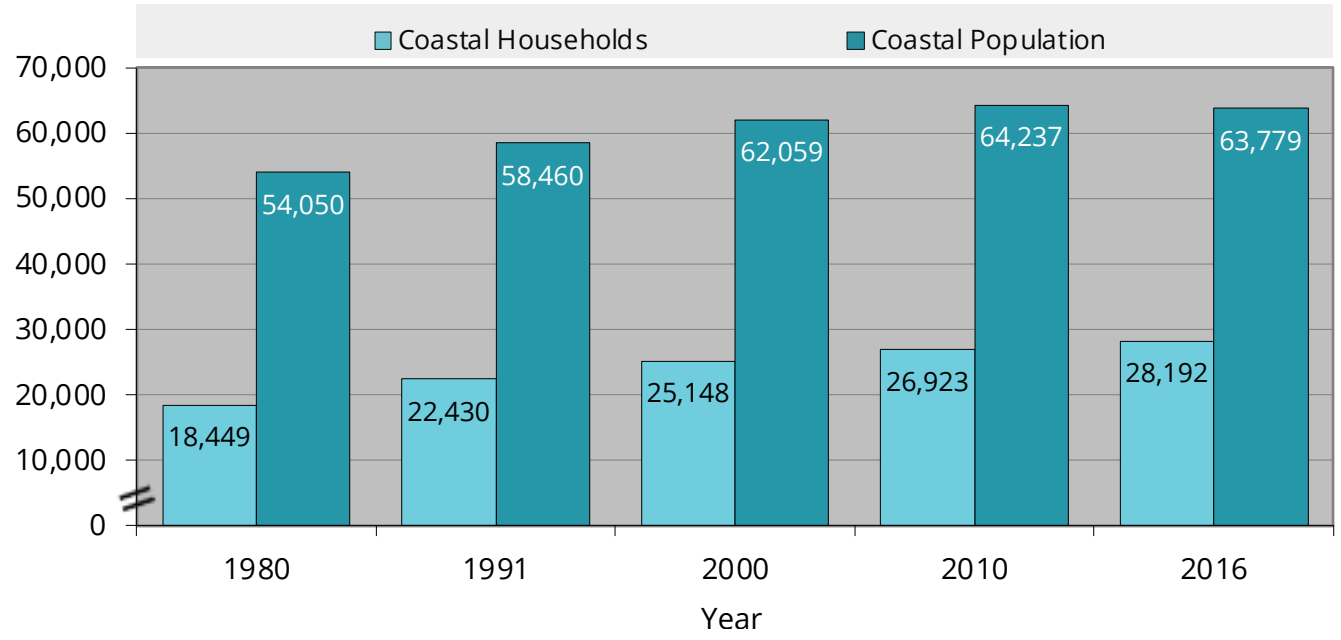


Chart 8.4

NUMBER OF HOUSEHOLDS AND POPULATION OF COASTAL AREAS FOR SELECTED CENSUS YEARS



Sources: 1980 to 2016 Population and Housing Censuses

BIODIVERSITY

The Biodiversity Section contains information on the protected land areas in Bermuda such as; protected coastal reserves, protected open space, historical cove areas and parks.

Protected Area: Land and Water

- Bermuda's protected area, inclusive of land and water, totals 319.6 km^2. This represents 7.5 percent of the total area (6.9% water and 0.6% land) (Table 9.1).
- As a proportion of the total land area (53.6 km^2), protected land area represents 46.5 percent or 24.9 km^2. Protected water area represents 7.0 percent of 294.7 km^2 of the total water area (Table 9.1).

NOTE TO READER

Biodiversity: the range of genetic differences, species differences, and ecosystem differences in a given area.

Land Area: is the total surface area of the country less that area covered by inland waters.

Protected Area: is legally established land or water area under either public or private ownership that is regulated and managed to achieve specific conservation objectives. A protected area, as adopted by the International Union for Conservation of Nature (IUCN), is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, natural and associated cultural resources and managed through legal or other effective means. It includes seven (7) categories which are:

Category Ia: Strict Nature Reserve
Category Ib: Wilderness Area
Category II: National Park
Category III: National Monument
Category IV: Habitat/Species Management Area
Category V: Protected Landscape/Seascape
Category VI: Managed Resource Protected Area

Total Area: Total area (of country) including area under inland water bodies, but excluding off-shore territorial waters (= total land area + water).

Source: CARICOM Environment Programme

Table 9.1

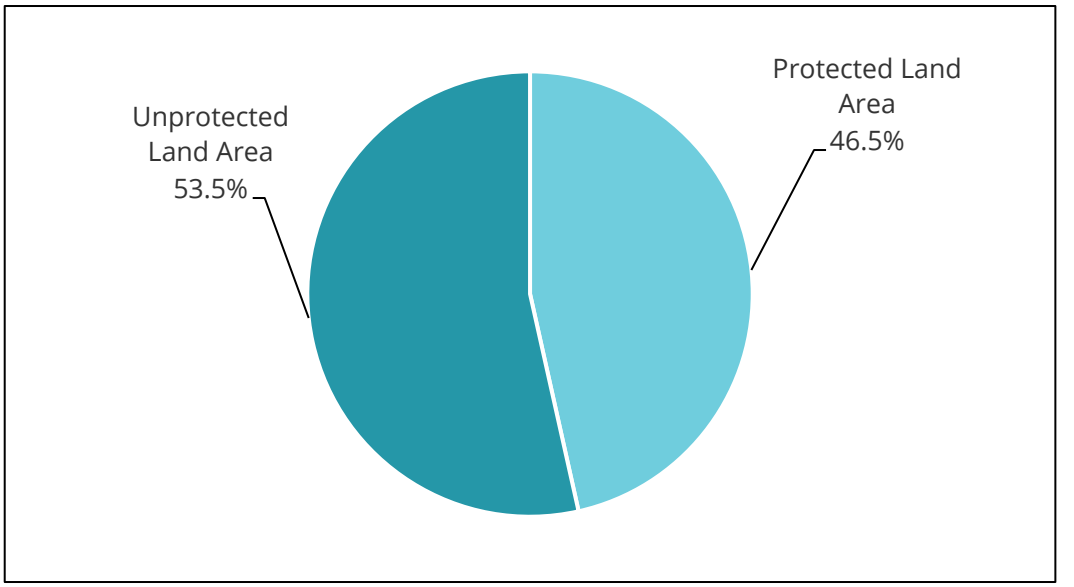
PROTECTED AREAS, 2020

Category	
Total area (km^2)	4,289.7
Total land area (low tide mark) (km^2)	53.6
Total water area (km^2)	4,236.1
Protected land area (km^2)	24.9
Protected land area as a % of total land area	46.5
Protected land area as a % of total area	**
Protected water area (km^2)	294.7
Protected water area as a % of total water area	7.0
Protected water area as a % of total area	6.9
Total protected area (land and water) (km^2)	319.6
Total protected area as a % of total area	7.5

Source: Department of Planning

Chart 9.1

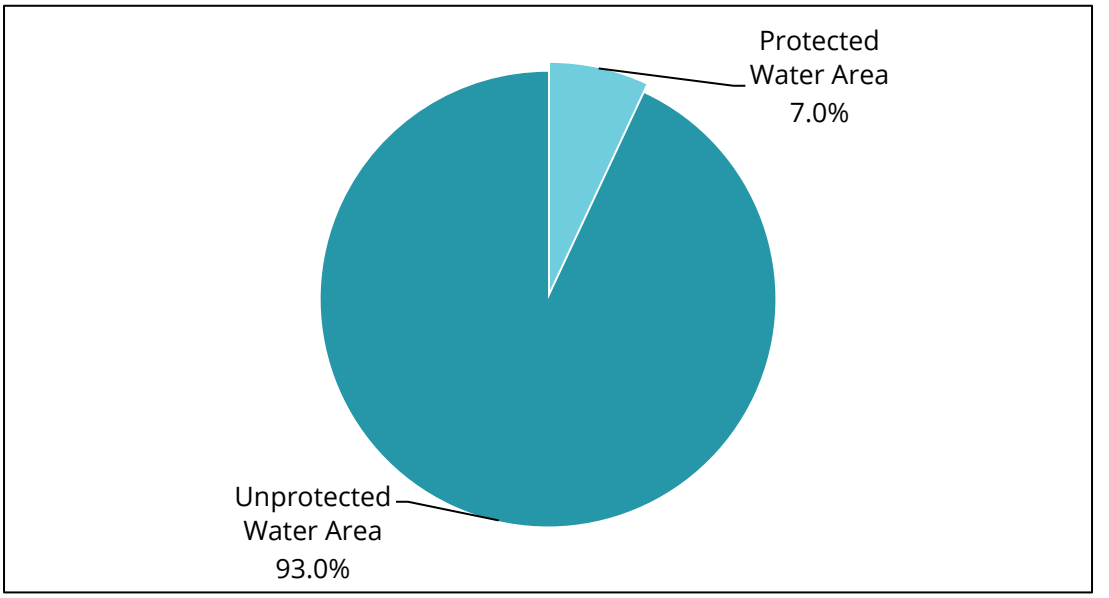
PROTECTED LAND AREA AS A PERCENTAGE OF TOTAL LAND AREA, 2020



Source: Department of Planning

Chart 9.2

PROTECTED WATER AREA AS A PERCENTAGE OF TOTAL WATER AREA, 2020



Source: Department of Planning

Table 9.2

PROTECTED AREAS BY CATEGORY AND AREA, 2020

Protected Area Category	Acres	km^2
Conservation base zones		
Open space reserve	1,298.1	5.3
Recreation	963.9	3.9
Park	884.6	3.6
Coastal reserve	823.3	3.3
Nature reserve	770.1	3.1
Sub-total	4,740.0	19.2
Conservation areas		
Woodland reserve	983.9	4.0
Agricultural reserve	731.6	3.0
Sub-total	1,715.5	6.9
Cave protection area	1,107.2	4.5
Historic protection area	201.1	**
Conservation base zone and conservation areas (no overlap)[1]	6,156.8	24.9
Overlapping area	1,670.1	6.8
Total terrestrial area (low tide mark)	13,430.4	53.6
Water resources protection area[2]	4,000.6	16.2

Source: Bermuda Plan 2008, Department of Planning

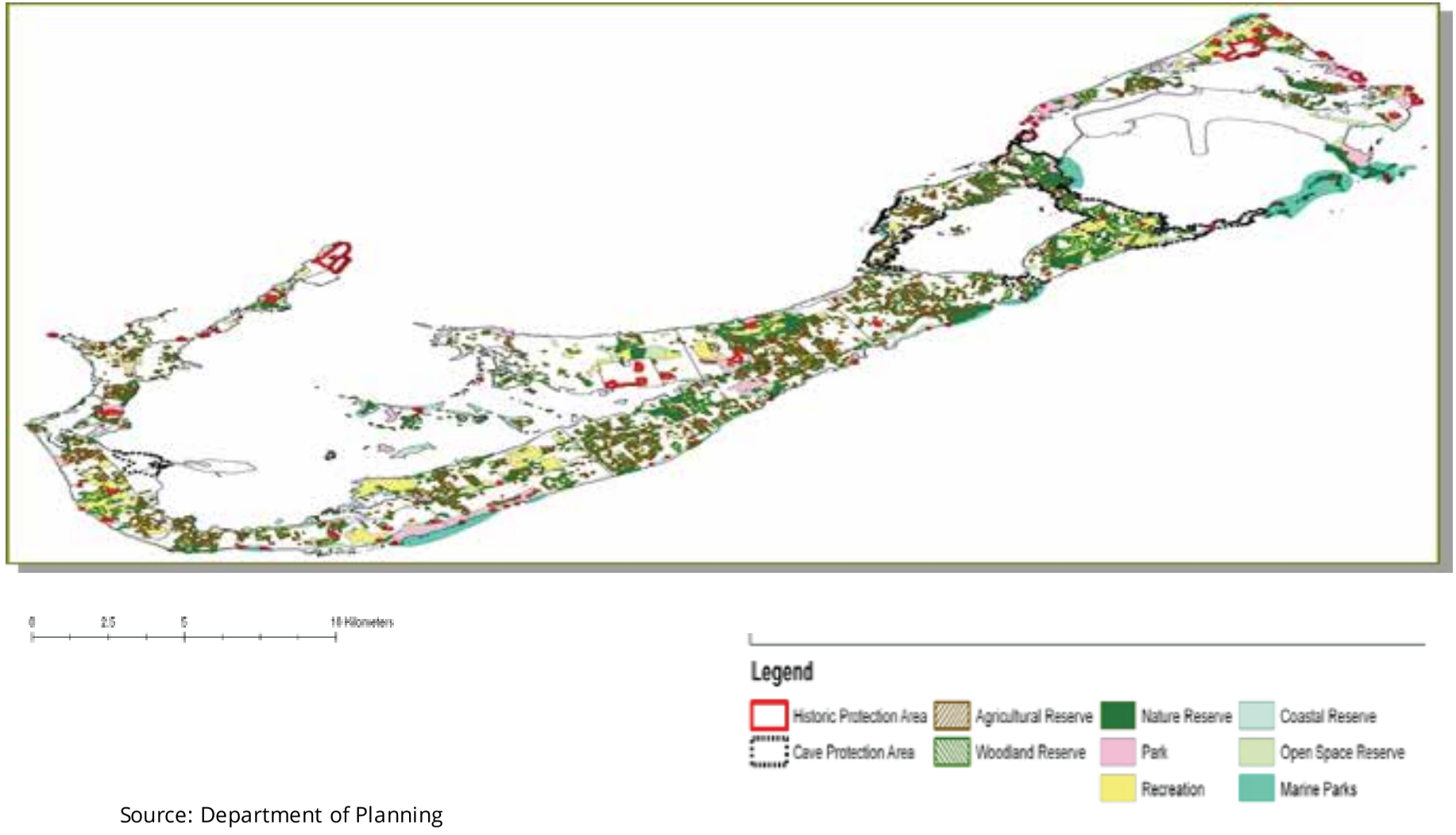
[1] Total protected area does not equal to the sum of the sub-totals as it excludes any overlapping areas (6.8 km^2) to avoid double counting.

[2] The Water Resources Protection Area is not considered as a "protected area" and hence has not been included in the 24.9 km^2 of protected area but is contained in the total terrestrial area of 53.6 km^2.

Note: 1 km^2 = 247.1 acres

Map 9.1

TERRESTRIAL PROTECTION AREAS INCLUDING MARINE PARKS, 2020



Source: Department of Planning

FORESTRY

The Forestry Section of the Environmental Statistics Compendium includes a table and chart with information on the forest area in Bermuda.

Forestry

- In 2020 Bermuda's total forest area was 4.2 km^2. This represents 7.8% of Bermuda's total land area and is inclusive of woodland reserves (Table 10.1).

NOTE TO READER

Forest: is land under forestry or no land use, spanning more than 0.005 km^2 (0.5 hectares); with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. Please include mangroves and forests on wetlands according to the above height and canopy coverage.

Land Area: is the land area excluding area under inland or tidal water bodies.

Protected Area: a protected area, as adopted by the International Union for Conservation of Nature (IUCN), is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, natural and associated cultural resources and managed through legal or other effective means.

Total Area: total area (of country) including area under inland water bodies, but excluding offshore territorial waters (= total land area + water).

Source: CARICOM Environment Program

Table 10.1

PROTECTED FOREST AREA AS A PERCENTAGE OF TOTAL LAND AREA, 2020

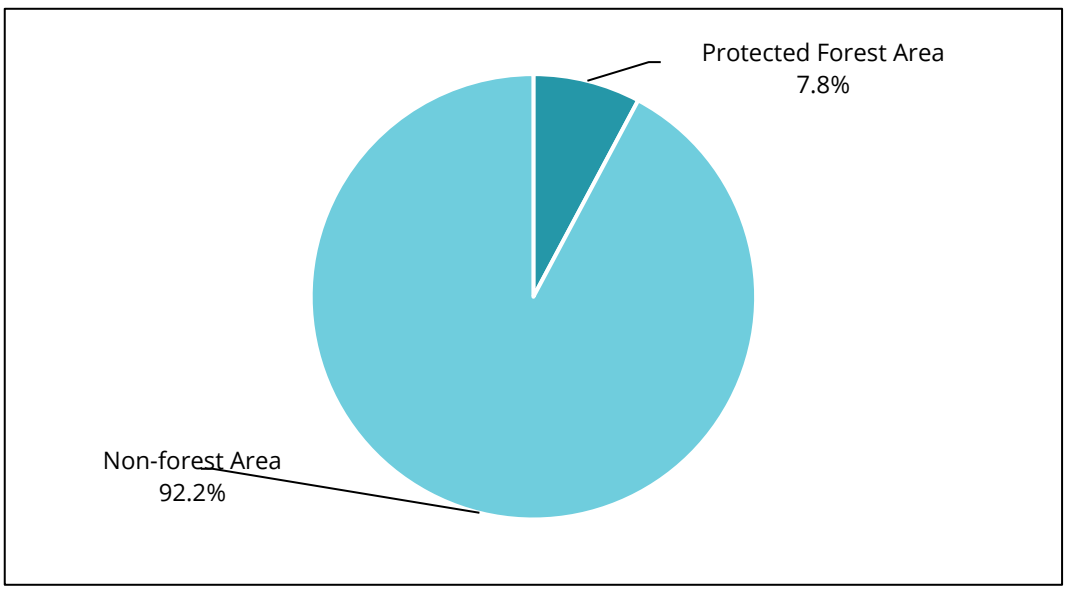
Protected Area Category	Area km^2
Total forest area	4.2 [1]
Total land area	53.6
Protected forest area as a % of total forest area	100.0
Protected forest area as a % of total land area	7.8

Source: Department of Planning

[1] This includes woodland reserves.

Chart 10.1

PROTECTED LAND AREA AS A PERCENTAGE OF TOTAL LAND AREA, 2020



Source: Department of Planning

AIR

The air quality in Bermuda is a valued part of its natural resources.

Air Emissions

- In 2019, the highest concentrated pollutant of air emissions from Tynes Bay waste to energy incinerator was NO^2 (353.3 mg/Nm^3). All pollutants increased from their previous year levels (Table 11.1).

Air Concentrations

- Bermuda contains five ambient air monitoring sites that are located across the island (Table 11.2).
- The maximum daily concentrations for the ambient air monitoring sites recorded pollutant concentration levels below Bermuda's limit, except for the pollutant PM10 (Table 11.3).

Table 11.1

ANNUAL AIR EMISSIONS FROM TYNES BAY WASTE TO ENERGY INCINERATOR, 2016-2020

	Year				
Pollutant	2016	2017	2018	2019	2020
VOCs (mg/Nm3)	**	2.0	**	**	..
NO2 (mg/Nm3)	274.4	242.9	322.7	353.3	..
SO2 (mg/Nm3)	36.5	43.8	1.7	69.4	..
Lead (mg/Nm3)	**	**	**	**	..
Particulate Matter (mg/Nm3)	3.9	8.1	2.8	39.6	..

Source: Department of Environmental Protection

Note: The data is captured through isokinetic sampling over a two day period each year and is reported normalised to 11% oxygen.

Table 11.2

AVERAGE CONCENTRATIONS FOR AMBIENT AIR MONITORING SITES, 2018-2020

	Pollutants	Units	Bermuda Limit (Clean Air Regulations 1993)	2018					2019					2020				
				Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetery Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS
Hourly	NO_2	$\mu g/m^3$	**400**	18.9	10.8	19.5	17.8	-	23.7	14.4	14.4	4.0	-	3.6	4.8	6.0	3.0	-
	SO_2	$\mu g/m^3$	**450**	1.1	10.3	8.9	2.8	-	3.4	0.4 ‡	5.1	3.8	-	1.4	-	2.4	2.4	-
	PM_{10}	$\mu g/m^3$	**-**	-	33.8	4.3	5.2	-	-	26.3	13.0	11.5	-	16.0	15.6	10.7	11.5	-
	$PM_{2.5}$	$\mu g/m^3$	**-**	6.1	10.6	14.2	13.1	-	5.9	11.8	-	-	-	4.9	12.1	-	-	-
	TSP	$\mu g/m^3$	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Hour	NO_2	$\mu g/m^3$	**200**	18.1	10.6	9.1	2.6	-	23.2	13.8	14.3	4.1	-	-	-	6.0	3.1	-
	SO_2	$\mu g/m^3$	**150**	1.3	10.3	4.3	5.1	-	3.0	0.4 ‡	5.1	3.9	-	-	-	2.4	25.0	-
	PM_{10}	$\mu g/m^3$	**50**	16.2	22.1	14.3	13.0	14.6	19.8	13.9	13.0	11.5	-	18.5	21.8	10.8	11.5	14.4
	$PM_{2.5}$	$\mu g/m^3$	**-**	6.0	10.0	-	-	-	5.6	12.4	15.6	-	-	-	-	-	-	-
	TSP	$\mu g/m^3$	**100**	16.3	27.3	-	-	-	-	-	-	16.6	-	-	-	16.1	16.8	-
1-year	NO_2	$\mu g/m^3$	**60**	18.5	-	19.5	17.8	-	23.2	-	14.2	3.9	-	3.6	4.8	6.0	3.0	-
	SO_2	$\mu g/m^3$	**30**	1.3	-	8.9	2.8	-	3.0	-	5.1	3.9	-	1.4	-	2.4	2.4	-
	PM_{10}	$\mu g/m^3$	**30**	18.8	13.9 †	14.3	13.0	17.4	19.5	13.8	13.2	11.6	16.4	13.4	13.6	10.8	11.5	16.6
	$PM_{2.5}$	$\mu g/m^3$	**-**	6.0	-	-	-	-	5.6	-	-	-	-	4.9	12.1	-	-	-
	TSP	$\mu g/m^3$	**60**	19.5	29.5	-	-	-	-	-	15.5	15.8	-	-	-	-	-	-

Source: Department of Environmental Protection

- Not Required or Not determined as part of the current protocols.

Note: Amount in red shows that the limit according to the 1993 Clean Air Regulation was exceeded.

Note: East Broadway monitoring station had a new PM-2.5 sensor installed in November 2017.

† - The second PM-10 BAM-1020 sensor operated at East Broadway station, which is

Table 11.3

MAXIMUM CONCENTRATIONS FOR AMBIENT AIR MONITORING SITES, 2018-2020

	Pollutants		Bermuda Limit (Clean Air Regulations 1993)	2018					2019					2020				
				Prospect	East Broadway	Cemetry Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetry Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS	Prospect	East Broadway	Cemetry Lane (BDA#1) (Belco-Operated ISO14001)	Langton Hill (BDA#2) (Belco-Operated ISO14001)	BIOS
Hourly	NO_2	µg/m^3	**400**	85.3	84.3	298.2	114.7	-	119.5	90.1	272.1	116.4	-	36.8	37.6	271.3	86.9	-
	SO_2	µg/m^3	**450**	27.7	73.2	71.9	270.6	-	131.1	22.3	88.8	186.8	-	37.3	9.5	65.5	272.8	-
	PM_{10}	µg/m^3	**-**	-	262.0	98.7	224.3	-	-	273.0	75.2	87.0	-	112.0	202.0	94.8	225.1	-
	$PM_{2.5}$	µg/m^3	**-**	129.5	-	-	-	-	48.4	-	-	-	-	261.8	63.0	-	-	-
	TSP	µg/m^3	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Hour	NO_2	µg/m^3	**200**	65.3	43.2	95.1	34.7	-	85.0	49.5	110.6	50.7	-	-	-	91.9	55.4	-
	SO_2	µg/m^3	**150**	7.9	27.9	25.2	50.3	-	17.7	5.2	33.2	73.4	-	-	-	30.2	130.2	-
	PM_{10}	µg/m^3	**50**	62.7	87.0	75.7	38.3	85.5	53.1	48.3	47.0	43.8	52.3	44.2	46.4	40.7	51.5	46.4
	$PM_{2.5}$	µg/m^3	**-**	24.0	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-
	TSP	µg/m^3	**100**	73.0	66.7	41.7	35.7	-	73.0	-	37.9	30.2	-	-	-	28.3	29.7	-
Total number of exceedances of the limits set in the Clean Air Regulations 1993 over each year				1	1†	1	0	1	1	0	0	0	1	1 **	0	0	0	0

Source: Department of Environmental Protection

- Not determined as part of the current protocols.

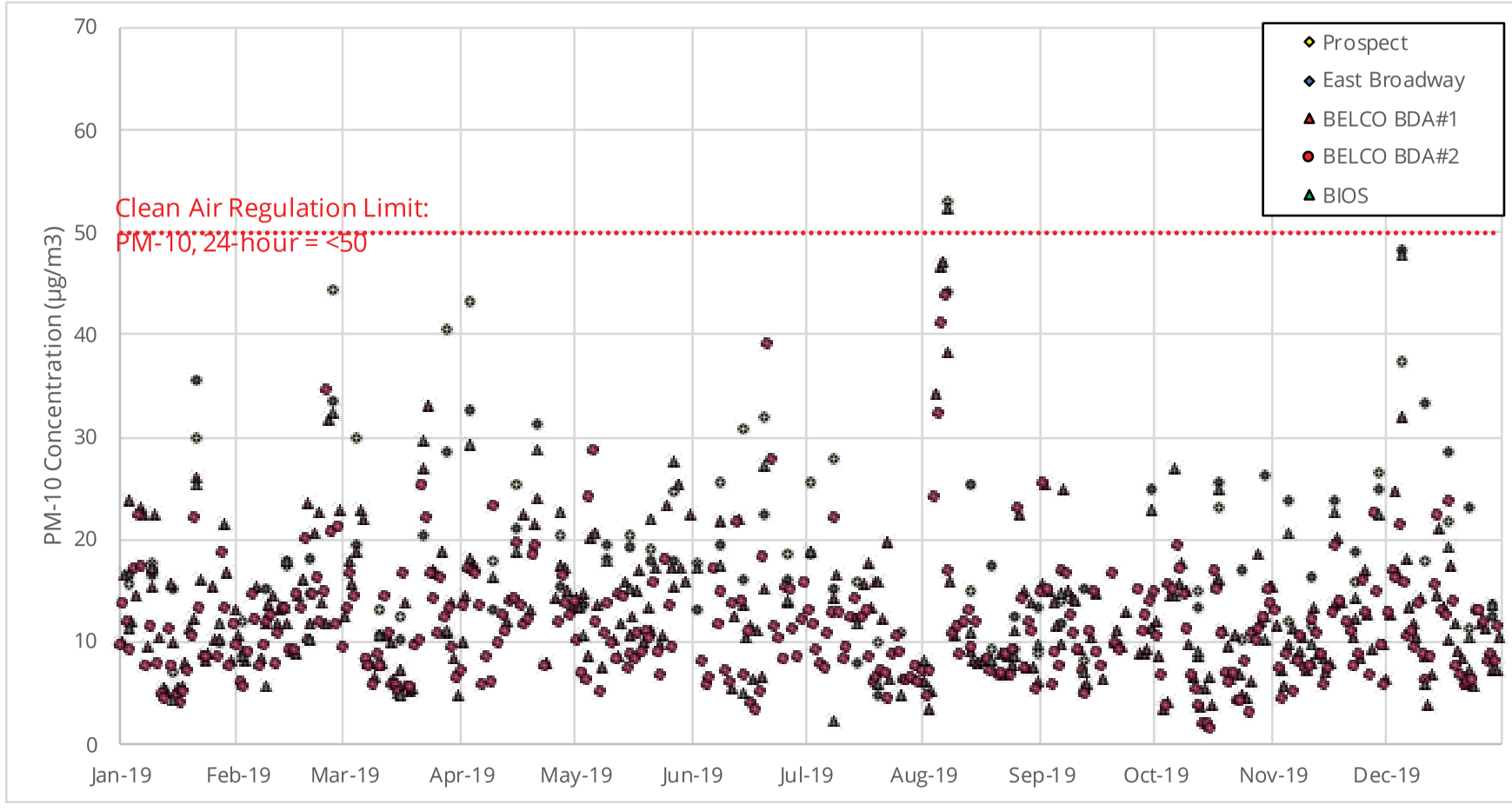
Note: Amounts in red show that the limit according to the 1993 Clean Air Regulation was exceeded.
* 10 of the 17 exceedances occurred before calibration highlighted a problem with the instruments.

† A second PM_{10} sensor at East Broadway that uses a US EPA Federal Equivalent Method

** A second PM10 sensor at prospect monitoring that uses a US EPA Federal Equivalent Method records one exceedance of the 24-hour PM10 limit at 51.0/m3 on the 31st July 2020.

Figure 11.1

24-HOUR AVERAGE PM_{10} CONCENTRATION, 2019



Source: Department of Environmental Protection

WASTE

The Waste Section comprises of information regarding the generation and disposal of solid waste in Bermuda.

- In 2019, the amount of waste totaled 86,400 mT. This represents a decrease of 7.9% over the 93,800 mT of waste in 2018 (Table 12.1).
- In 2019, 400 mT of waste was recycled, 11,000 mT was composted, 65,000 mT was incinerated to generate electricity and approximately 10,000 mT was land-filled (Table 12.2).
- There were 80 container loads of materials recycled in 2019. Eight container loads of special waste items were processed and exported for the United States recycling market (Chart 12.1).
- Bermuda exported 1,698,000 pounds of hazardous waste in 2019 (Table 12.3).

NOTE TO READER

Household Waste: is waste that comes from a private dwelling, being a dwelling that is not considered as commercial premises; or waste from premises operated by a charity registered under the Charities Act 1978.

Waste: is any article or substance (including scrap metal or other surplus arising from the application of a process) which is not liquid and either requires to be disposed of as being unwanted, broken, worn out, contaminated or otherwise spoilt or useless, or in relation to a particular person, has been discarded by.

These definitions are taken from the *Waste and Litter Control Act, 1987*

Table 12.1

GENERATION OF WASTE BY SOURCE, 2016-2020

Indicator (1,000 mT)	Year				
	2016	2017	2018	2019	2020
Total amount of waste	89.8	95.7	93.8	86.4	..
Waste from households	29.9	31.9	31.3	28.8	..
Waste from other origins	59.9	63.8	62.5	57.6	..

Source: Department of Works and Engineering, Waste and Enforcement Section

Chart 12.1

ESTIMATED EXPORT OF RECYCLABLE WASTE, 2019

Source: Department of Works and Engineering, Waste and Enforcement Section

**All Glass is reused on-island as a drainage medium.

Table 12.2

MANAGEMENT OF MUNICIPLE WASTE, 2016-2020

Indicator (1,000 mT)	Year				
	2016	2017	2018	2019	2020
Total amount of waste	89.8	95.7	93.8	86.4	..
Amounts going to:					
Recycling	1.6 e	1.0	1.5	0.4	..
Composting	18.0 e	18.0 e	13.0	11.0	..
Incineration	60.2	66.6	69.3	65.0	..
Landfilling	10.0 e	10.0 e	10.0 e	10.0 e	..

Source: Department of Works and Engineering, Waste and Enforcement Section

Table 12.3

MANAGEMENT OF SPECIAL WASTE, 2016-2020

Indicator (1,000 lbs)	Year				
	2016 e	2017 e	2018	2019	2020
Stock of hazardous waste at the beginning of the year	115.0 r	115.0 r	110.0	248.0	..
Hazardous waste generated during the year	600.0	525.0	1,500.0	1,800.0	..
Hazardous waste exported during the year:					
Recycling	400.0	310.0	633.0	642.0	..
Incineration	10.0	5.0	-	-	-
Landfilling	190.0	215.0	729.0 *	1,056.0 *	..
Total Hazardous Waste	600.0	530.0	1,362.0	1,698.0	-
Stock of hazardous waste at the end of the year	115.0 r	110.0 r	248.0	350.0	..

Source: Department of Works and Engineering, Waste and Enforcement Section

* Increase in Landfilling of Special Waste is the result of the export of a large backlog of asbestos to the USA where it is being landfilled in Title D regulated landfill facilities.

Table 12.4

MANAGEMENT OF WASTE BY TYPE, 2016-2020

Indicator	Year				
	2016 e	2017	2018 e	2019 e	2020
Total (%)	100.0	100.0	100.0	100.0	..
Paper, paperboard	29.0	27.0	27.0	27.0	..
Textiles	17.0	4.0	4.0	4.0	..
Plastics	13.0	19.0	19.0	19.0	..
Glass	9.0	13.0	13.0	13.0	..
Metals	6.0	5.0	5.0	5.0	..
Other inorganic material	9.0	8.0	8.0	8.0	..
Organic material	17.0	24.0	24.0	24.0	..

Source: Department of Works and Engineering, Waste and Enforcement Section

Between 2006 and 2017, the Waste Management Section of the Ministry of Public Works conducted four waste audits. e = estimated data based on previous years data.

WATER

Water is an essential ingredient for all life and is used in the production of almost all goods. It is therefore vital to monitor the state of water resources and to ensure sustainable use of this important commodity.

- In 2020, the total volume of precipitation in Bermuda was 65.5 mio m3/y (Table 13.1). This represents a 12.6% decrease from the level received in 2019.

NOTE TO READER

Actual Evapotranspiration: total actual volume of evaporation from the ground, wetlands, natural water bodies and transpiration of plants.

Internal Flow: total volume of river run-off and groundwater generated over the period of a year, in natural conditions, exclusively by precipitation into a territory. It is equal to the precipitation less actual evapotranspiration.

Precipitation: total volume of atmospheric wet precipitation (rain, dew, etc.) falling on the territory of the country over one year.

Regular Freshwater Resources 95.00% of the Time: a portion of the total freshwater resource that can be depended on for annual water development during 19 out of 20 consecutive years, or at least 95.00% of the years included in longer consecutive periods. This item yields information about the average annual long-term availability of freshwater for use in human activities.

Renewable Freshwater Resources: equal internal flow plus any inflow of surface and groundwaters.

Sources: United Nations Statistics Division (UNSD) and United Nations Environment Programme (UNEP)

Table 13.1

RENEWABLE FRESHWATER RESOURCES, 2016-2020

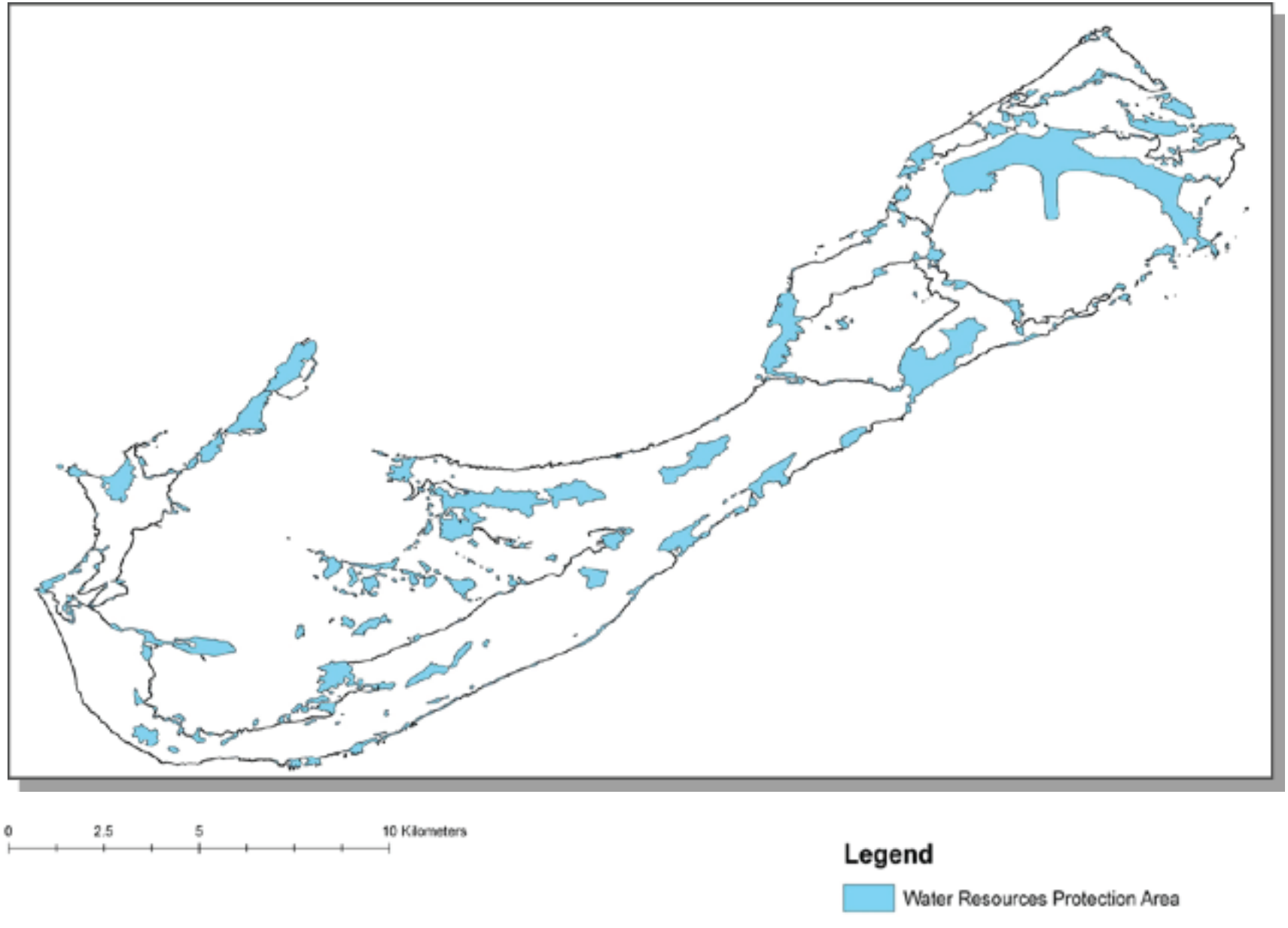
Category (mio m3/y)	Year				
	2016	2017	2018	2019	2020
Precipitation[1]	98.8	72.6	75.0	74.9	65.5
Actual evapotranspiration	67.2	49.4	51.0	50.9	44.6
Internal flow	31.6	23.2	24.0	24.0	21.0
Renewable freshwater resources	4.7	3.5	3.6	3.6	3.1
Regular freshwater resources 95.00% of the time	2.6	2.6	2.6	2.6	2.6

Source: Department of Environmental Protection

[1] Bermuda is frost-free; precipitation consists of rainfall only. Precipitation = annual rainfall in m (from BWS), multiplied by land area of 53.7 sq. km.

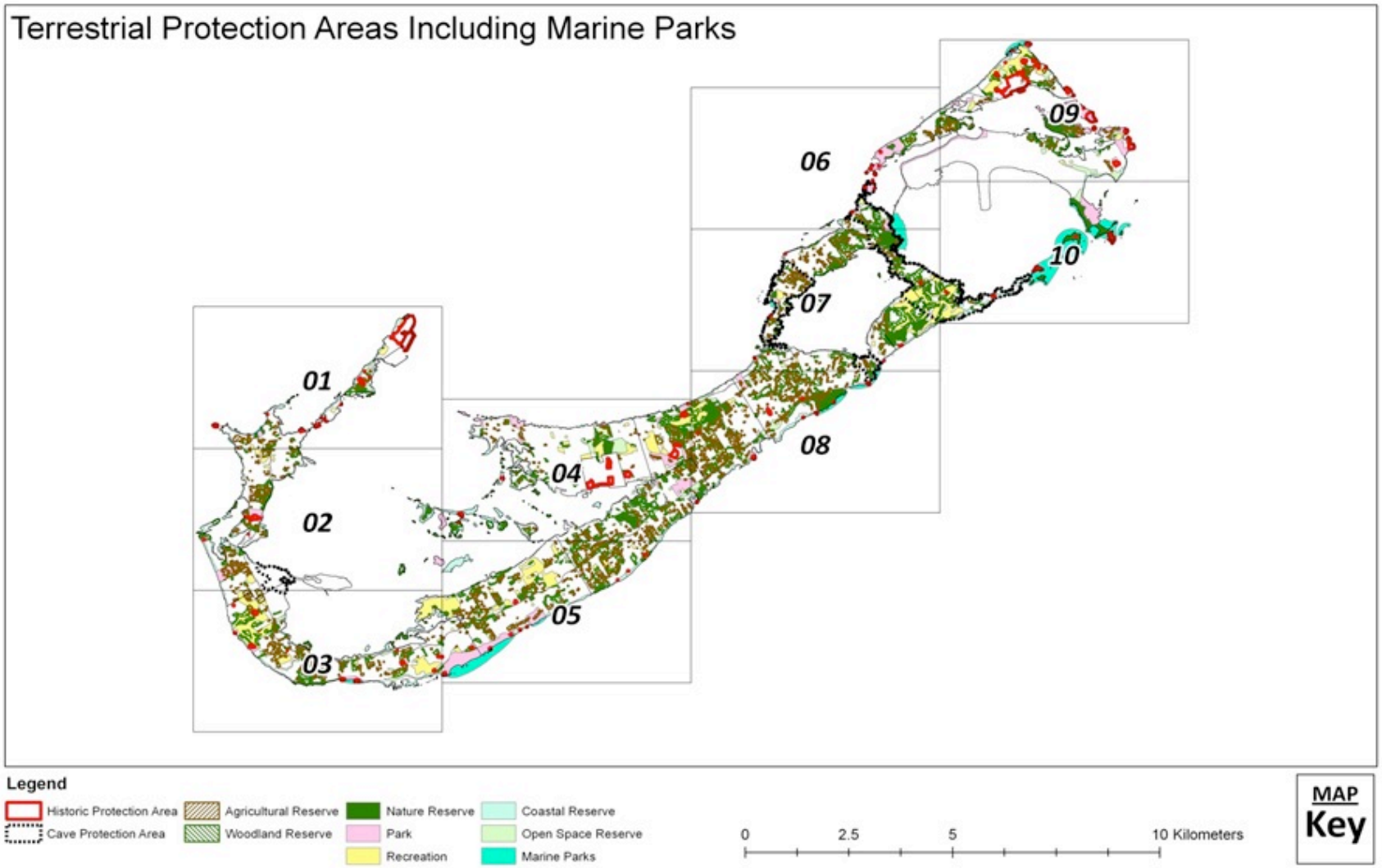
Map 13.1

WATER RESOURCES PROTECTION AREAS, 2020

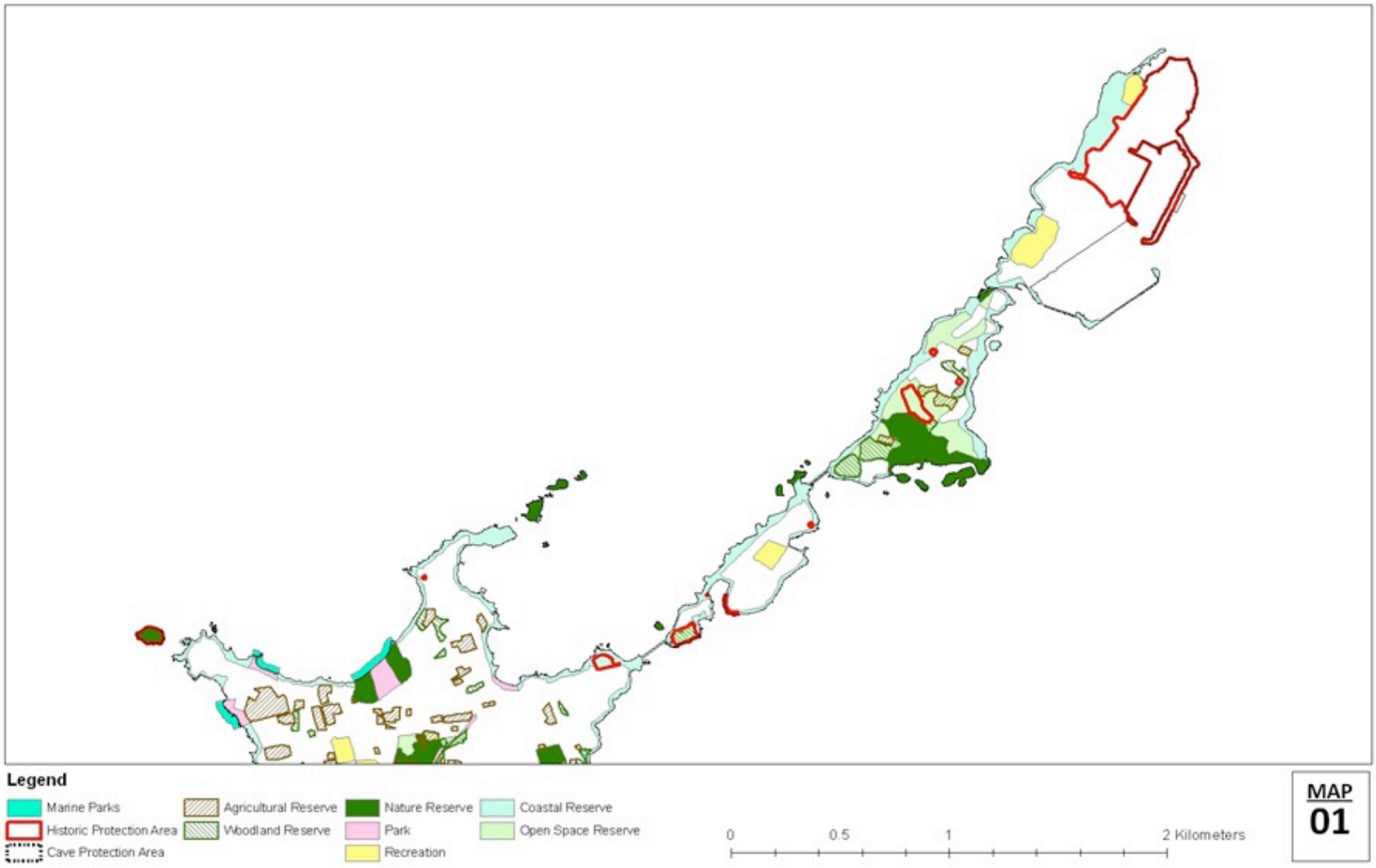


Source: Department of Planning

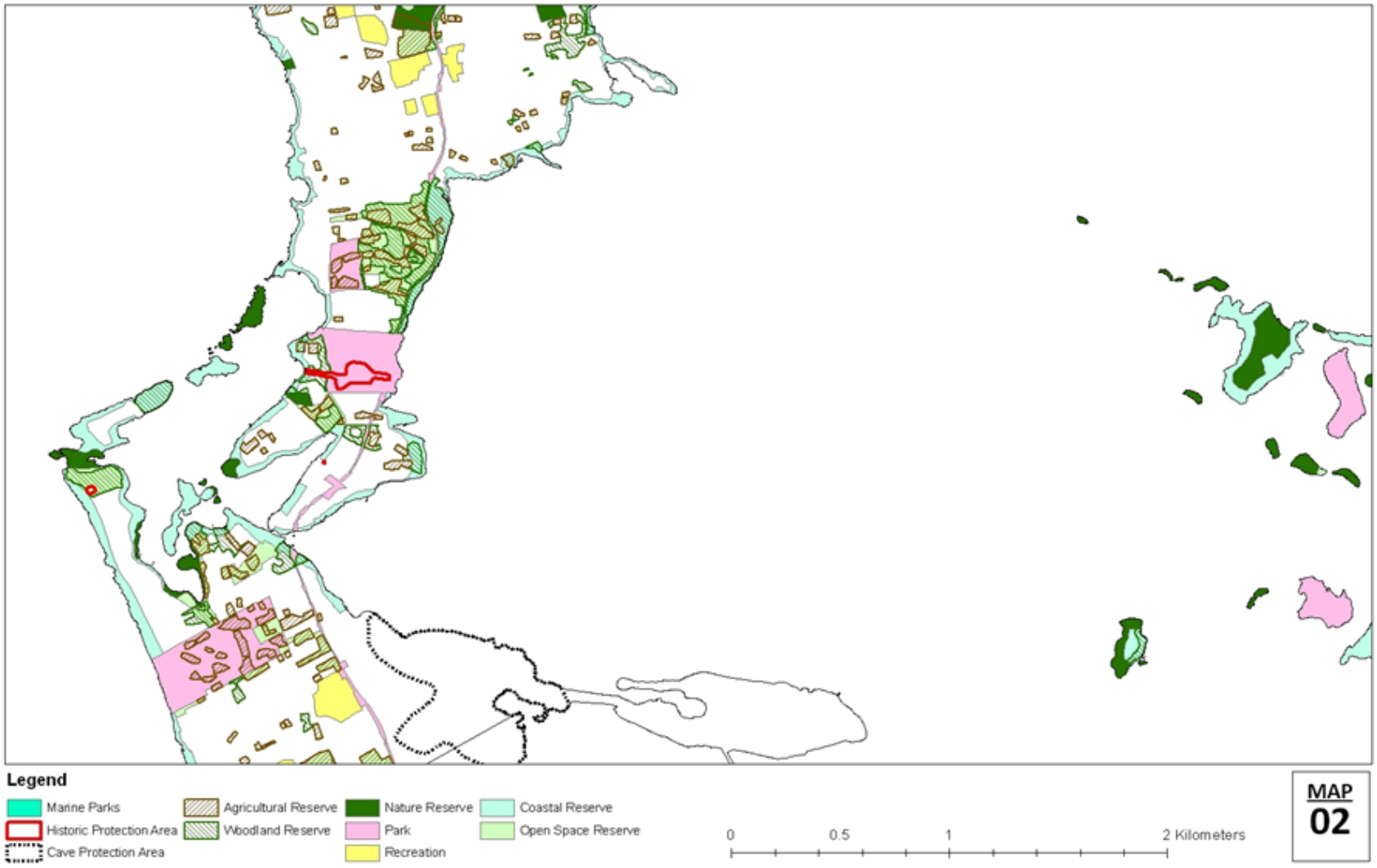
ANNEX



Source: Department of Planning

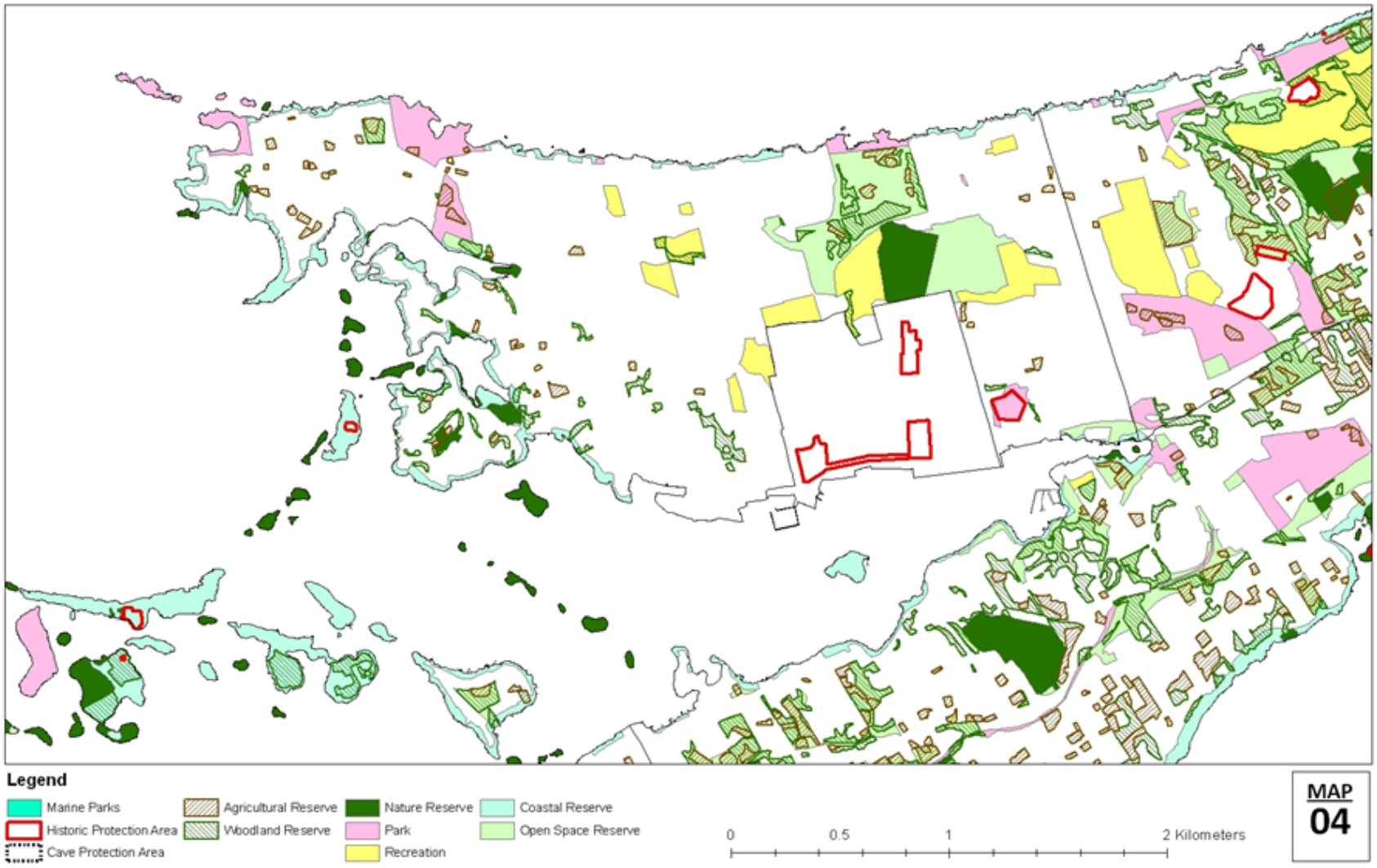


Source: Department of Planning



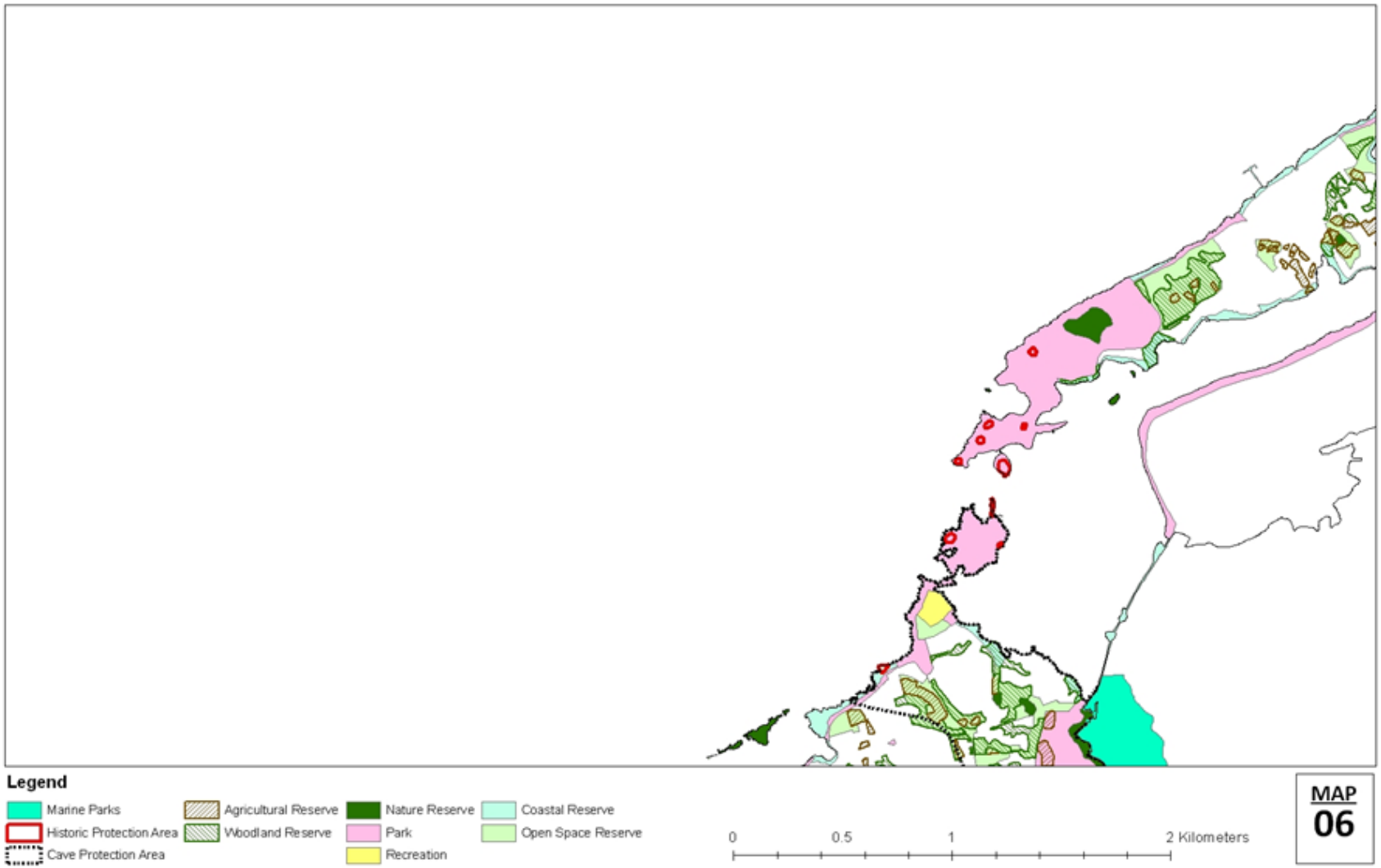
Source: Department of Planning

Source: Department of Planning

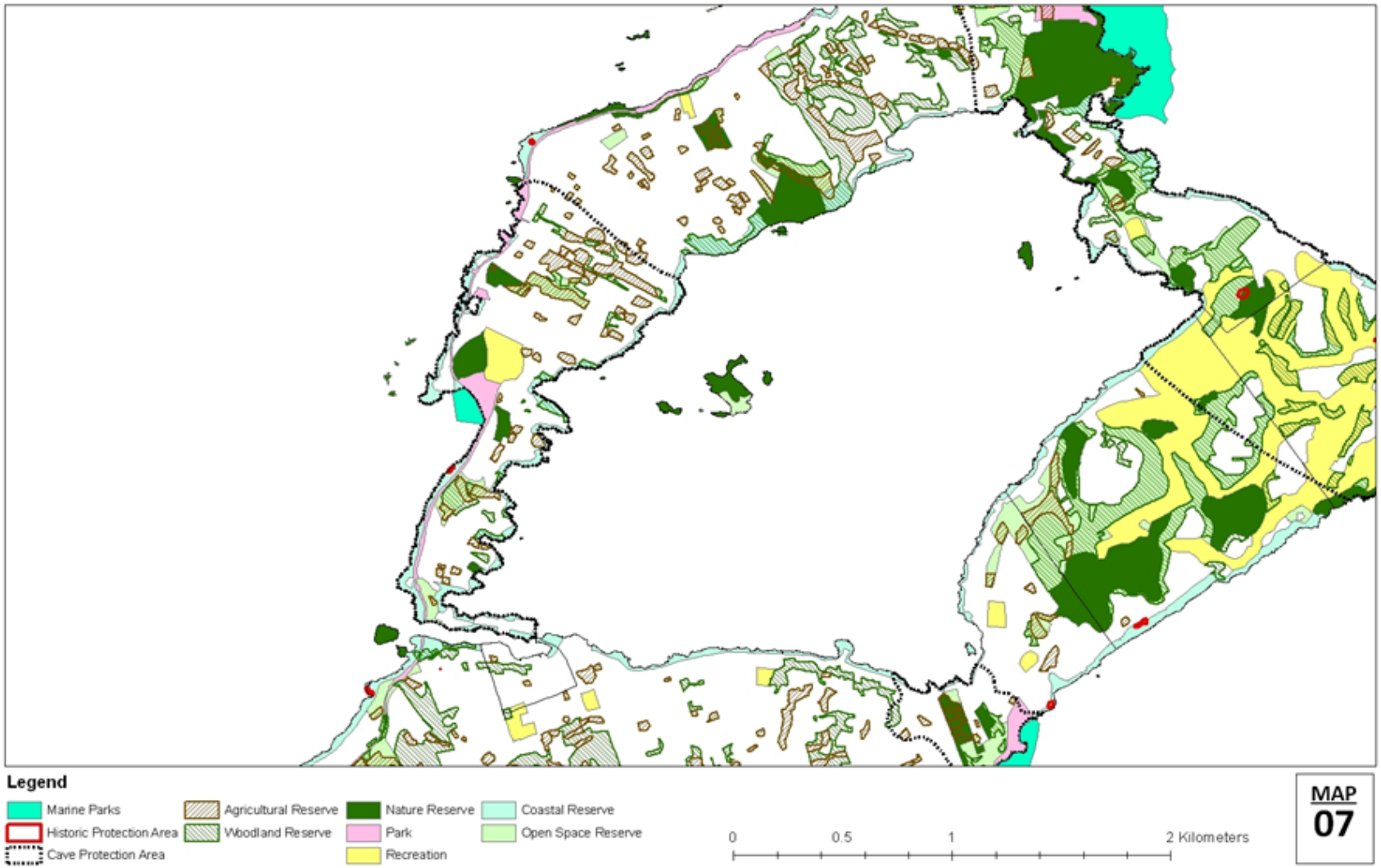


Source: Department of Planning

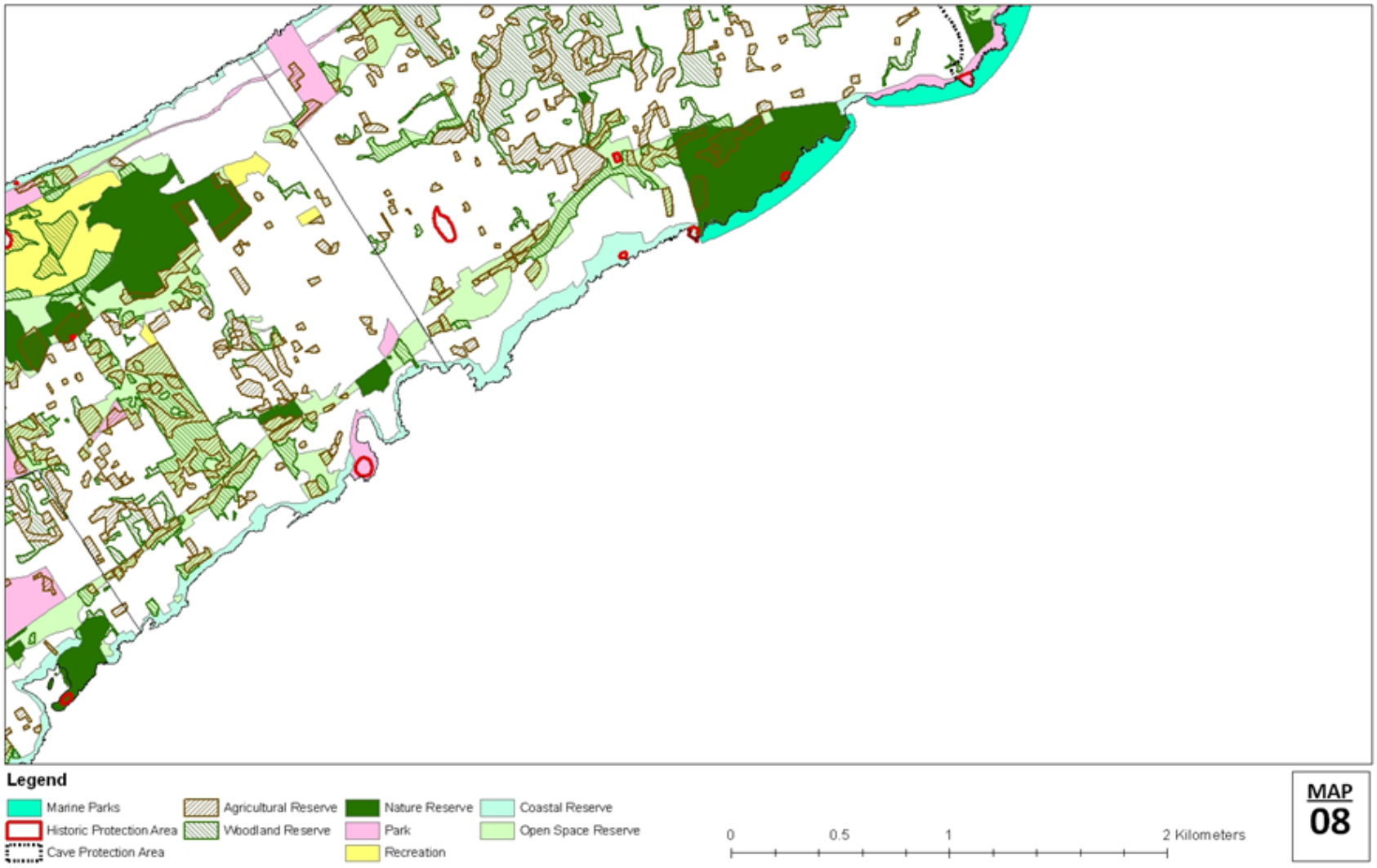
Source: Department of Planning



Source: Department of Planning

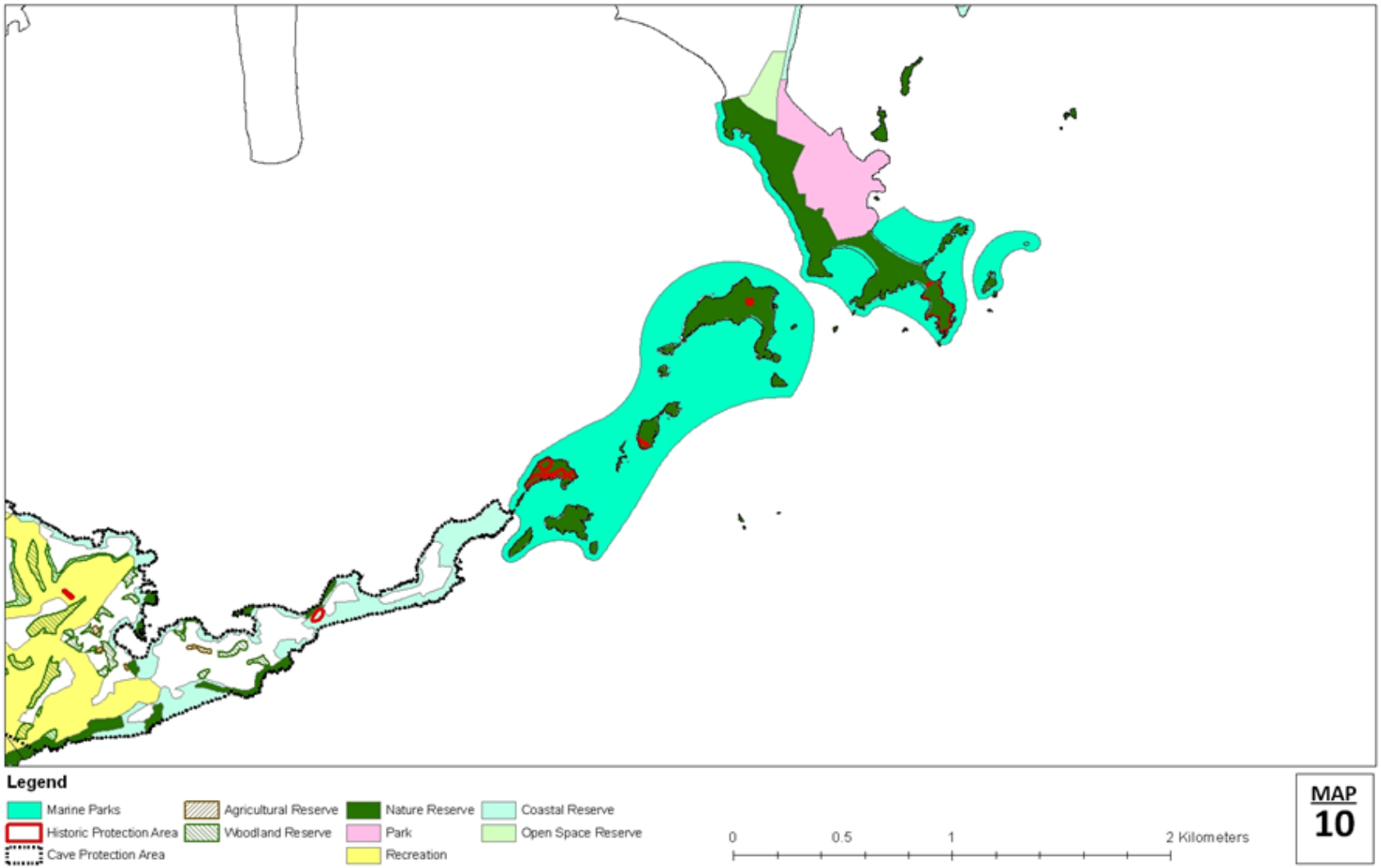


Source: Department of Planning



Source: Department of Planning

Source: Department of Planning



Source: Department of Planning

GOVERNMENT OF BERMUDA

Department of Statistics