PART D
OCTOBER 2020

PART D: SUB-AREAS ACTION BRIEFS

D1. INTRODUCTION

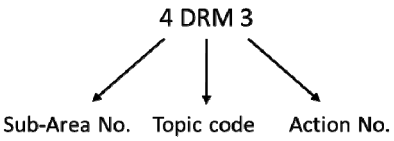
As identified in Part A, the CZMA includes eight Sub-Areas (Figure D.1), five of them are located in the Atlantic coast (Sub-Areas 1, 2, 3, 4 and 5) whilst the other three are located in the Caribbean coast (Sub-Areas 6, 7 and 8). These take into consideration the unique features and characteristics that are present within each Sub-Area. Importantly, the boundaries adopted reflect the unique risk exposure variances that the recent CRMP technical studies (Baird 2017) have identified.

Figure D.1. Sub-Areas of the Coastal Zone Management Area.

The following text focuses on presenting the issues, challenges and opportunities facing each of the Sub-Areas and in turn providing a detailed Action brief. The Actions proposed pay due cognisance to the analysis of local characteristics and issues undertaken and as informed by field visits carried out during the preparation of the Plan. They also reflect, where appropriate, the general guidance presented in Part C.

For each Sub-Area, the information presented is structured as follows:

- Main theme: short title describing the major characteristics of the Sub-Area.
- Sub-Area description and context: description of the Sub-Area including land use and main economic activities, environmental and landscape resources, coastal risks and future planning scenarios.
- Main issues and strategic objectives: identification of key issues for coastal management and strategic objectives based on the current situation of the Sub-Area.
- Development Planning and Setbacks at Sub-Area scale: application of the General Guidance (section C3). This section also includes detailed maps including the delineation of appropriate setbacks *for new (planned) constructions/developments*.
- Action brief: a set of Actions to achieve the strategic objectives considering all national guidance topics. These Actions have been coded to indicate the geographic area, topic and the action number.



SUB-AREA 1: SOUTH POINT TO KITRIDGE POINT

Main themes

BIODIVERSITY AND LANDSCAPE RESOURCES FOR ECO-TOURISM AND RESIDENTIAL USES.

CLIFF COLLAPSE AND COASTAL EROSION.

Sub-Area description and context

This Sub-Area covers the southeast coast and represents an area of fairly barren cliff top. There are a number of older settlements increasingly being overtaken by residential sub-divisions most of which have low levels of occupancy. This is an extensive and mostly undeveloped urban land reserve and an important recreation area.

The western section is dominated by the presence of Cobblers Reef along the nearshore area whilst Long Beach, which, with its backing of dunes, forms a barrier that protects a lagoon system at Inche Marlowe and Chancery Lane Swamp. These areas are highly valuable from the biodiversity conservation perspective. Chancery Lane and the nearby Barbados Defence Force Paragon are designated as Natural Heritage Area under the Barbados System of Parks and Open Spaces (PDP, 2017).

The Sub-Area, which is over 10km in length also commands high landscape value with the marine zone from Kitridge Point to Crane Beach being classified (within the PDP 2017) as a "Natural Heritage Area" plus the coast being classified as a "Coastal Landscape Protection Zone". The natural beauty of pocket beaches, locally named as "secret beaches" (such as a Bottom Bay), constitute an important well-being related resource for local recreation and for tourists to escape from crowded beaches along the Caribbean coast.

Detailed representation at Sub-Area scale is presented in the sub-section *"Description maps of Sub-Area 1"* that includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 1 is exposed to, which for here include coastal erosion, storm surges and cliff collapse. The loss of beach value, related to the reduction of beach width, due to erosional processes, affects all beaches in this Sub-Area; and this situation will most likely be exacerbated by sea level rise in the future. In addition to this, there are building constructions that are threatened by cliff collapse, including key developments such individual residencies and commercial assets including the Crane Hotel complete despite it having specially engineered foundations. Storm surges may flood the coastal stretch between Silver Sands and Chancery Lane thus impacting on infrastructure plus also individual recreational usage (health and safety etc).

Figure D.2. Ad-hoc coastal protection schemes at Crane Beach

For the medium and long term, this Sub-Area is expected to continue to be popular for future urban and tourism developments as it has been classified within the PDP (2017) as being an "Urban Corridor" within the new Growth Management Framework. The protection of biodiversity and landscape, by any decision maker, should therefore be encouraged wherever possible, to help encourage climate compatible and sustainable development within this Sub-Area for the benefit of the wider economy and local communities alike.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Residential and recreational area for Barbadians. • Development challenges linked to protection of natural resources and coastal landscape. • Development challenges linked to protection of the lagoon system between Inch Marlowe and Chancery Lane. • Cobblers and Fathom Reefs important for biodiversity. • Private developments (i.e.: Wyndham Grand Resort at Sam Lords Castle) may block beach access. • Major sargassum issue along this Sub-Area. • Small areas of wetland and coastal woodland present. • Severe erosion problems at Crane beach.	• Enforce setbacks lines for landscape and protection of wetlands. • Implement the PDP policies in Natural Heritage Area. • Develop new environmental-friendly economic opportunities that involve and benefit local communities in the Sub-Area (job creation, affordable housing and the reduction of poverty). • Ensure equitable access to coastal resources. • Control pollution and waste to the coast and marine environment. • Promote the awareness and involvement of local communities and private developers in ICZM and DRM.

Development Planning and Setbacks at Sub-Area scale

Setback recommendations are presented within a collection of maps provided in the sub-section entitled *"Setback maps of Sub-Area 1"*. These recommendations adhere closely to the National Guidance "Development Planning and Setbacks" (see section C3) for Sub-Area 1. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000.

This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) applies only to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
DRM and CCA	1DRM1	Conduct a comprehensive study to analyse coastal erosion in The Crane beach	CZMU		Short term, immediate		Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
DRM and CCA	1DRM2	Elaborate and implement a DRM Plan with emphasis in cliff collapse warning and evacuation.	CZMU	DEM		Under the frame of the National DRM Plan, this local plan should include (at least) the provision of warning signpost for pedestrians and swimmers, and evacuation plan in beaches and buildings in case of cliff collapse.	Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
DRM and CCA	1DRM3	Encourage (or through regulations) the need to plant indigenous vegetation to help stabilise slopes.	CZMU	NCC, DEM			Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Beach Management	1BM1	Prepare a beach management plan for Sub-Area 1 focused on landscape protection, maintenance of natural values of “secret beaches”, and zoning for water sports.	CZMU	MTI, NCC, TCDPO	Medium term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Beach Management	1BM2	Propose sustainable and environmental friendly tourism and recreational activities as coastal trail (i.e.: Inche Marlowe to Salt Cave), bike lane along the road to access secret beaches, etc.	CZMU	MTI, NCC	Medium term, immediate	If facilities are need for economic activities, only soft structures should be promoted. Rationalise car parking and promote public transportation to visit this area.	Outcome 2 - Coastal resources are protected and effectively managed
Beach Management	1BM3	Review with NCC the adequacy of recreational facilities for Foul beach and other beaches in this Sub-Area	CZMU	NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Beach Management	1BM4	Improve road signage to facilitate beach access.	CZMU				Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	1S1	Prepare and distribute guidelines to enforce Landscape Setback in Sub-Area 1 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate	Guidelines should explain why coastal landscape is important as coastal resource and attraction for visitors and recommendations for setback enforcement.	Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	1S2	Prepare and distribute guidelines to enforce Conservation Setback in Sub-Area 1 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	1S3	Organize meetings with key stakeholders to raise awareness on coastal resources and landscape.	CZMU	TCPDO, NCC, developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	1S4	Organize bilateral meetings with TCPDO to review existing applications and evaluate landscape and environmental impacts.	CZMU	TCDPO	Short term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	1BIO1	Analyse the aptitude of Cobblers Reef to be designated as Marine Protected Area.	CZMU	NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	1BIO2	Analyse the aptitude of Inche Marlowe to be designated as Natural Heritage Conservation Area.	CZMU	PDP, NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	1BIO3	Propose Salt Cave Point (Gemswick) as a Natural Heritage Conservation Area.	CZMU	PDP, NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	1BIO4	Promote the extension of the sewage treatment programme in Chancery Lane.	CZMU	BWA, EPD	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	1BIO5	Promote mangrove / coastal woodland restoration program.	CZMU	NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed

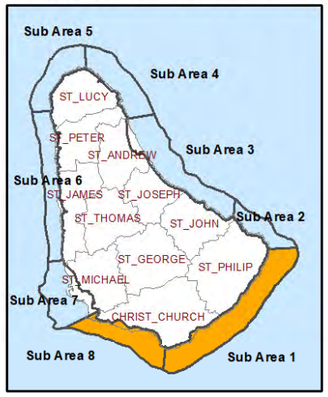
TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
Public Awareness and Stakeholder Participation	1PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	1PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	1PA3	Promote local recreational beach use and involvement in economic activities related to the beach plan and tourism opportunities.	CZMU	MTI			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	1PA4	Improve signs to raise awareness on natural resources and valuable landscape.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased

Table D.1. Action brief for Sub-Area 1.

Description maps of Sub-Area 1

SUB AREAS 1, 8 - SHEET A1

COASTAL ZONE MANAGEMENT SUB AREAS



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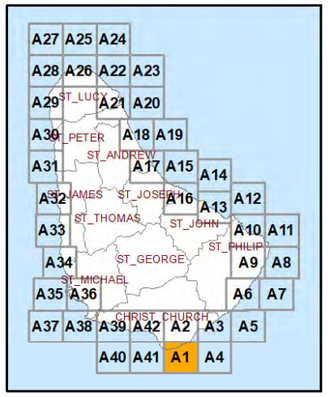

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve

Restricted areas

Planned Marine Areas

Environmental characteristics

Turtle nesting area

Coral reefs

Wetlands

Seagrass

Mangroves

Agriculture

Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)

Accreting Coast (Natural)

Stable Coast (Natural)

Dynamically Stable Coast (Natural)

Coastal Cliff

Eroding Coast (Engineered)

Accreting Coast (Engineered)

Stable Coast (Engineered)

Artificial Coast

Coastal classification division

Cliff failure

Very high

High

Medium

Low *(risk class)*

Flooding hazard

Storm surge 100 years

Storm surge + Sea Level Rise (IPCC 2019)

Tsunami 100 years

N

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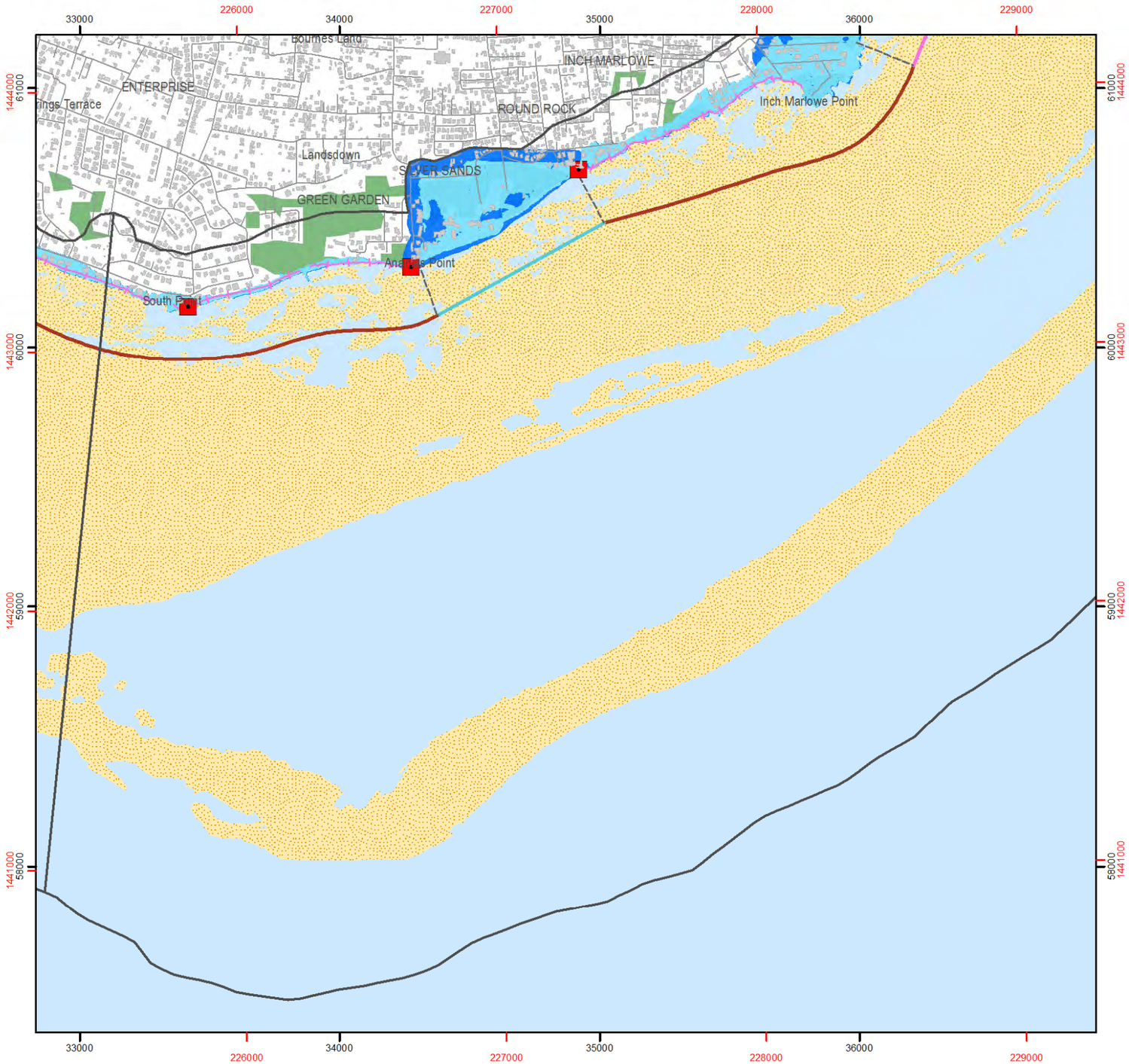
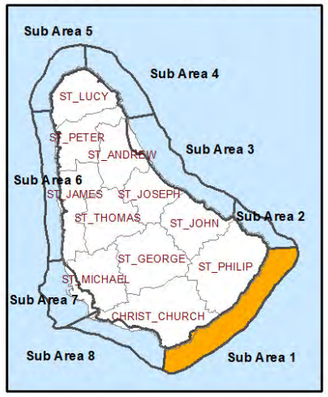


SUB AREA 1 - SHEET A2

COASTAL ZONE MANAGEMENT SUB AREAS



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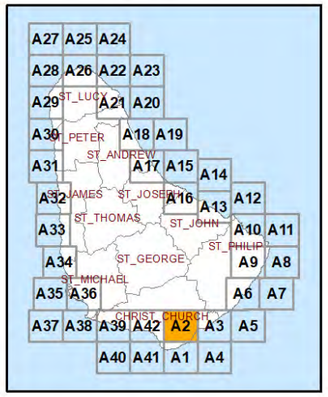

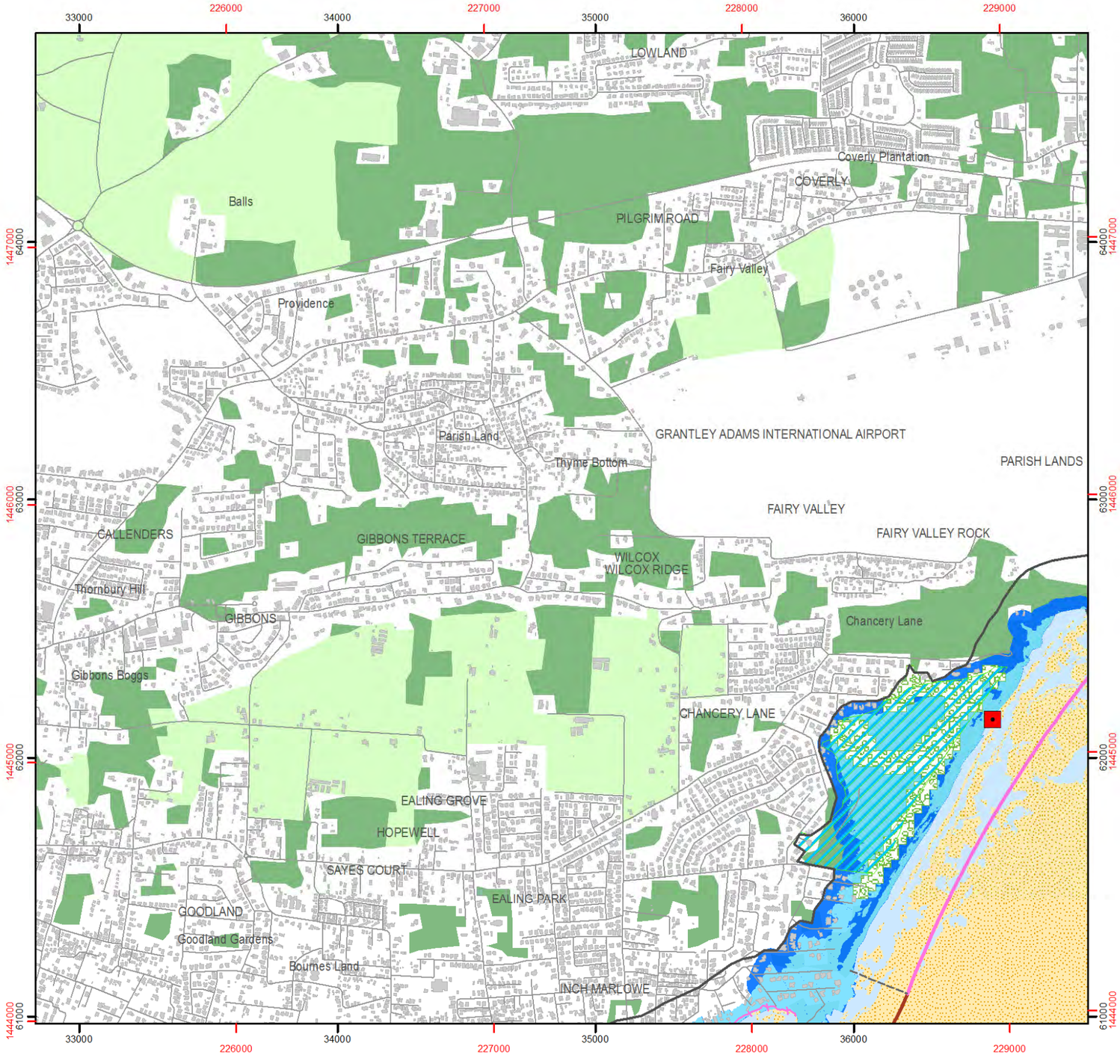

Coastal Zone Management Area

Natural and restricted areas

- Folkstone reserve
- Restricted areas
- Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

- Very high
- High
- Medium
- Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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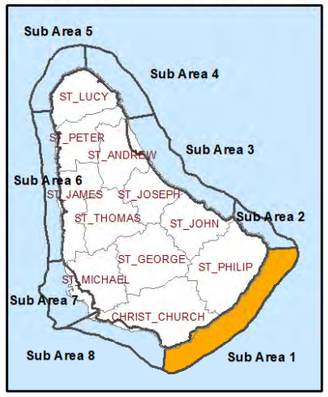
SUB AREA 1 - SHEET A3

COASTAL ZONE MANAGEMENT SUB AREAS



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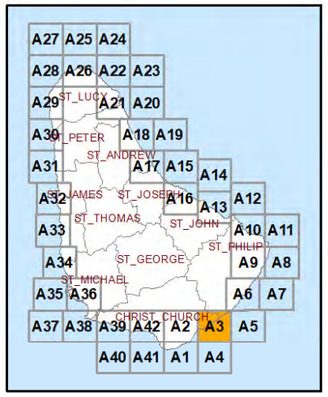

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

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Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

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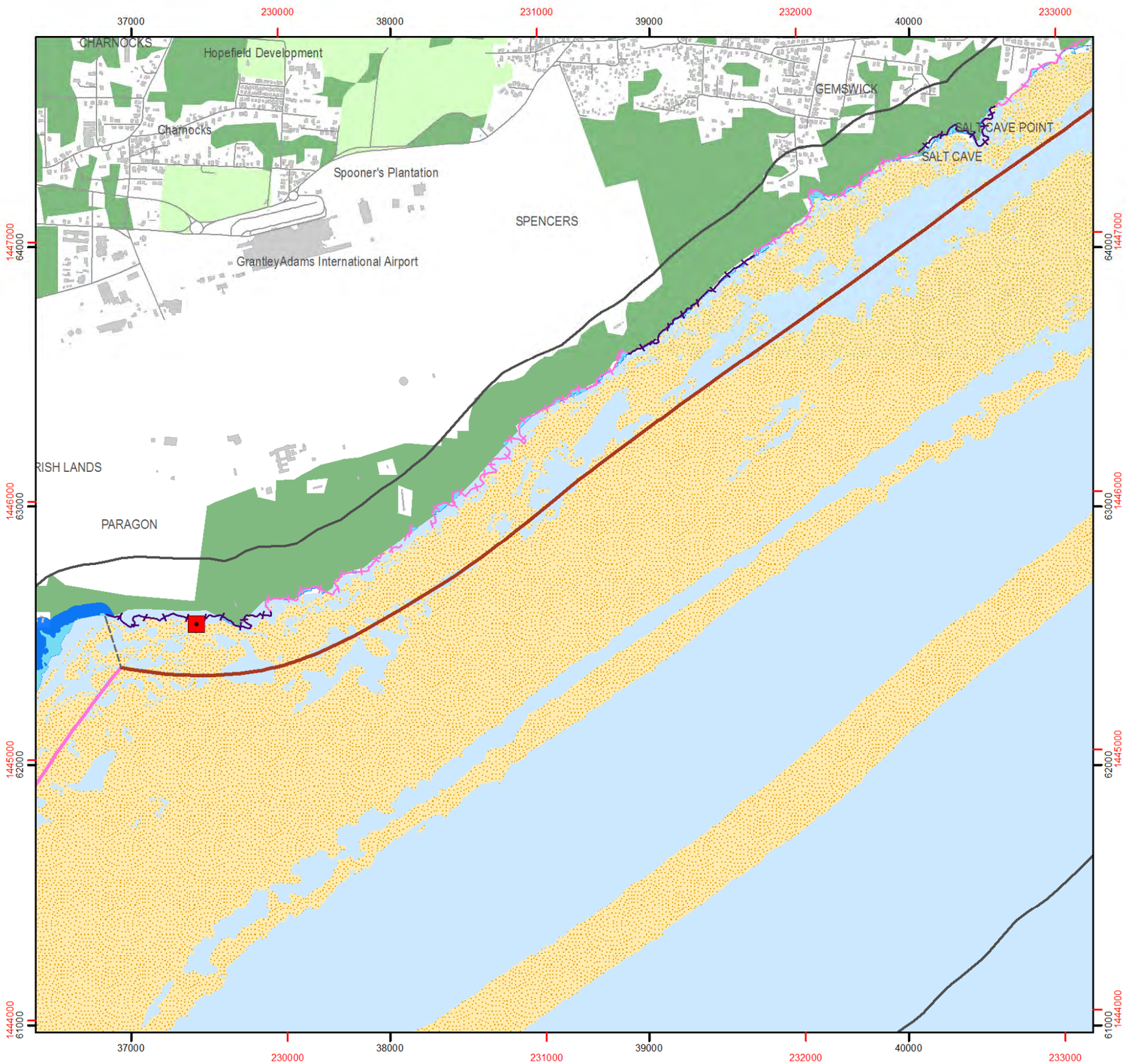
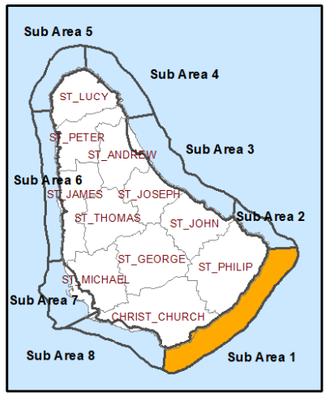


SUB AREA 1 - SHEET A4

COASTAL ZONE MANAGEMENT SUB AREAS



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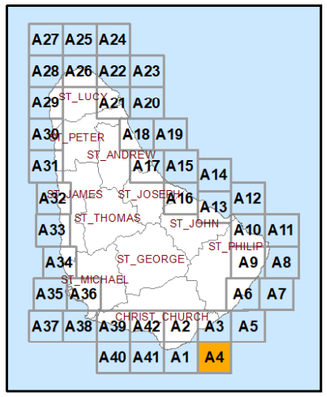

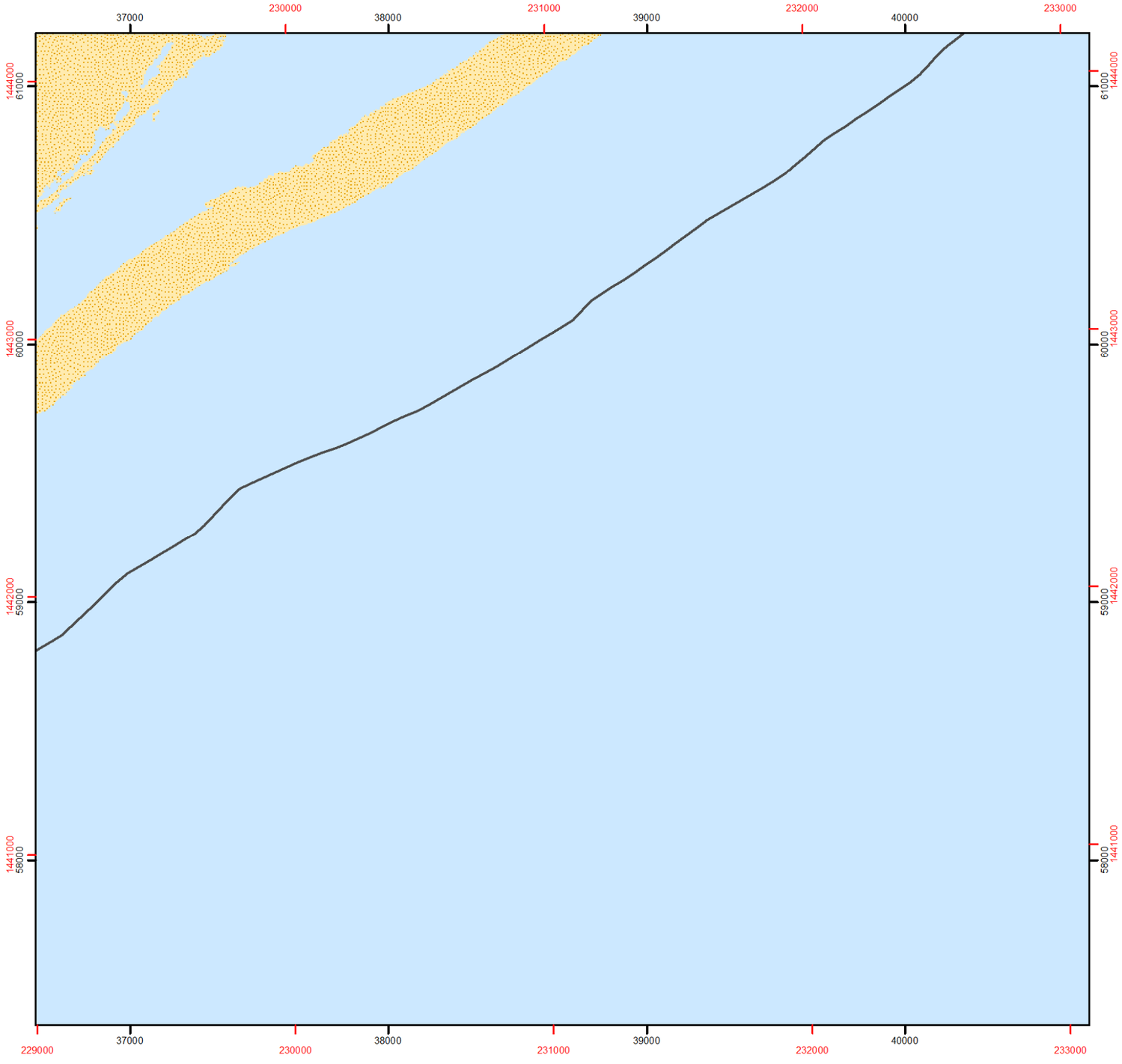

Coastal Zone Management Area

Natural and restricted areas

- Folkstone reserve
- Restricted areas
- Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

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- Artificial Coast
- Coastal classification division

Cliff failure

- Very high
- High
- Medium
- Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

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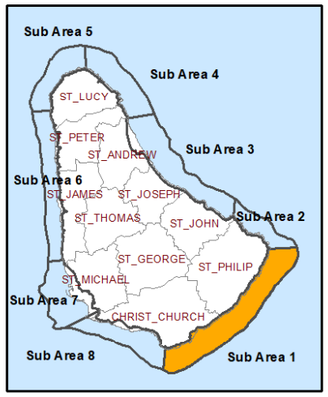
SUB AREA 1 - SHEET A5

COASTAL ZONE MANAGEMENT SUB AREAS



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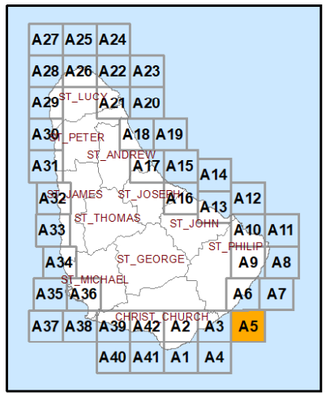

Coastal Zone Management Area

Natural and restricted areas

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- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

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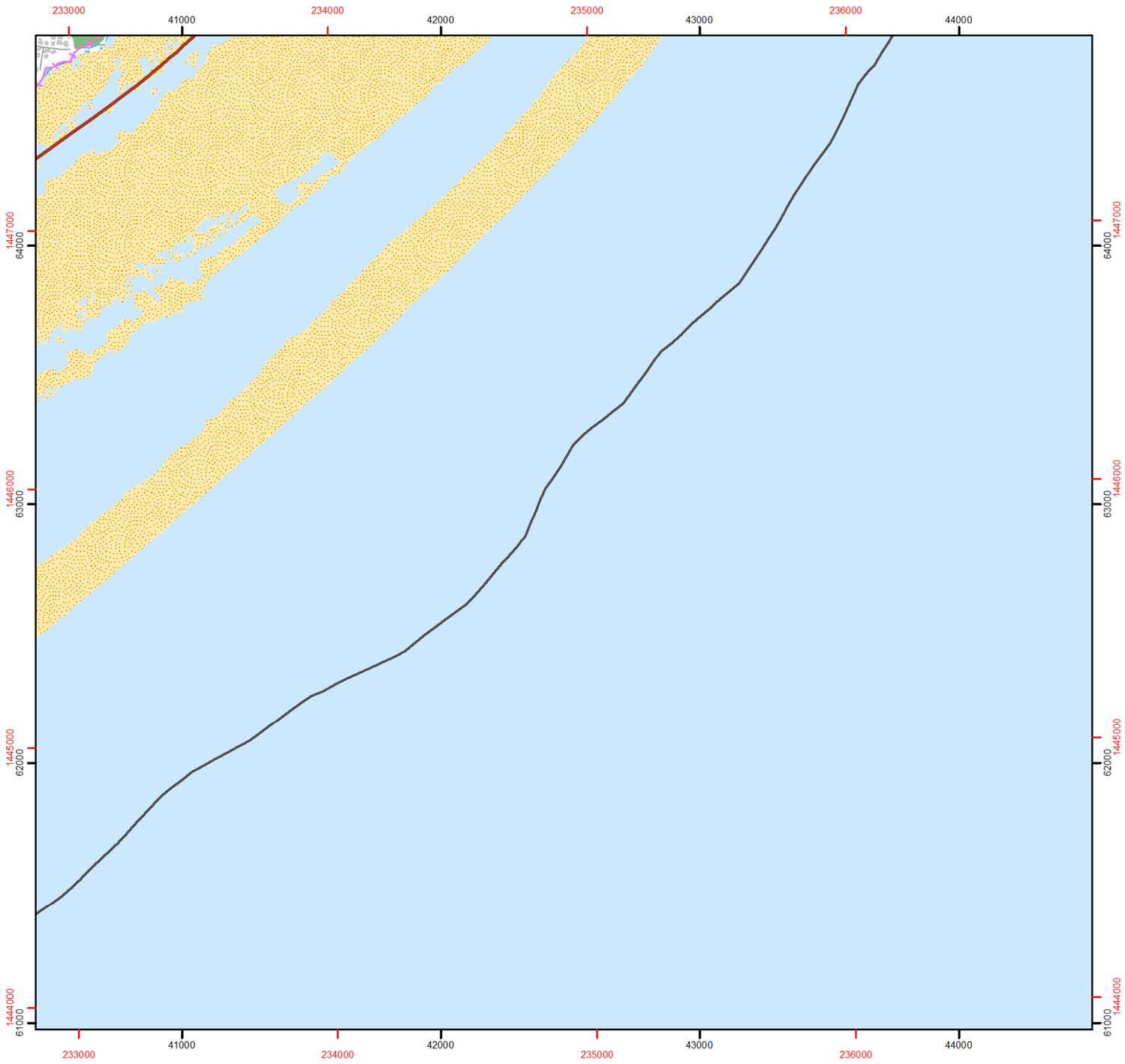

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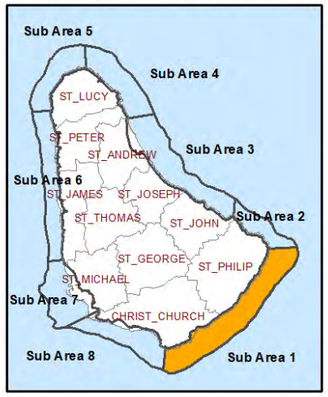
COASTAL ZONE MANAGEMENT SUB AREAS



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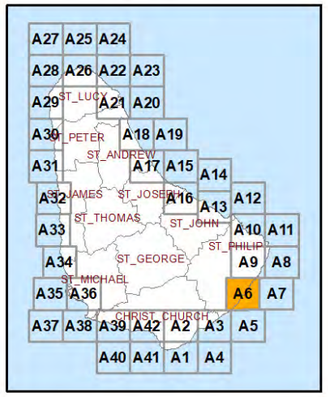

Coastal Zone Management Area

Natural and restricted areas

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Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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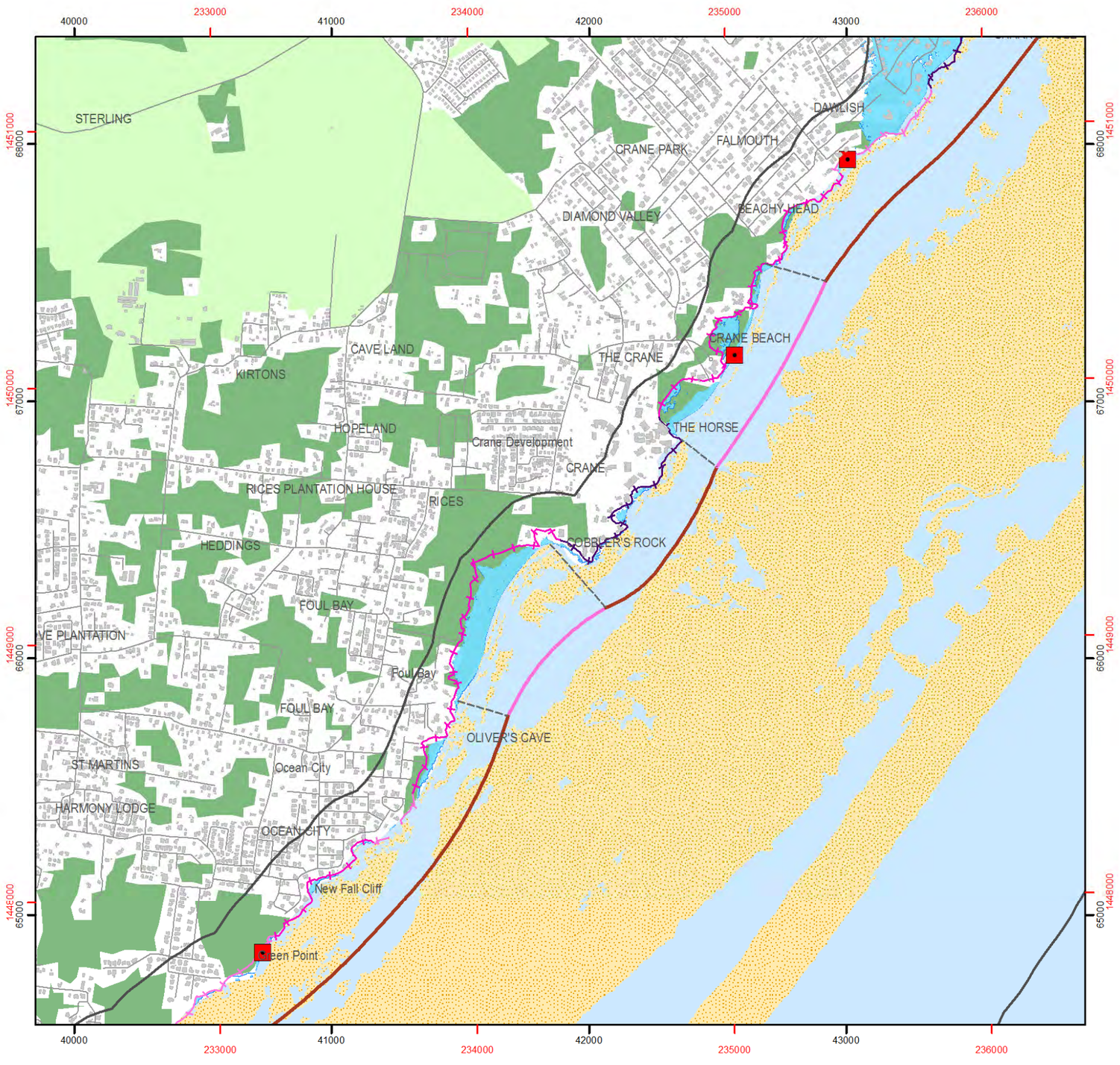
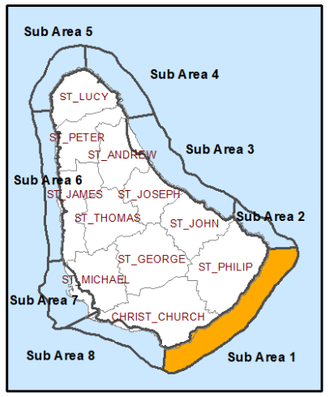


SUB AREA 1 - SHEET A7

COASTAL ZONE MANAGEMENT SUB AREAS



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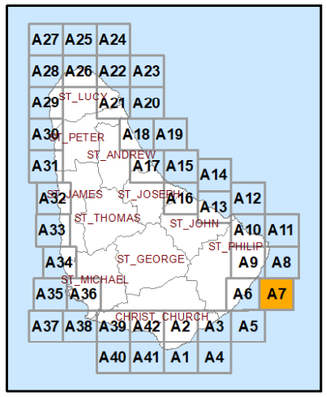

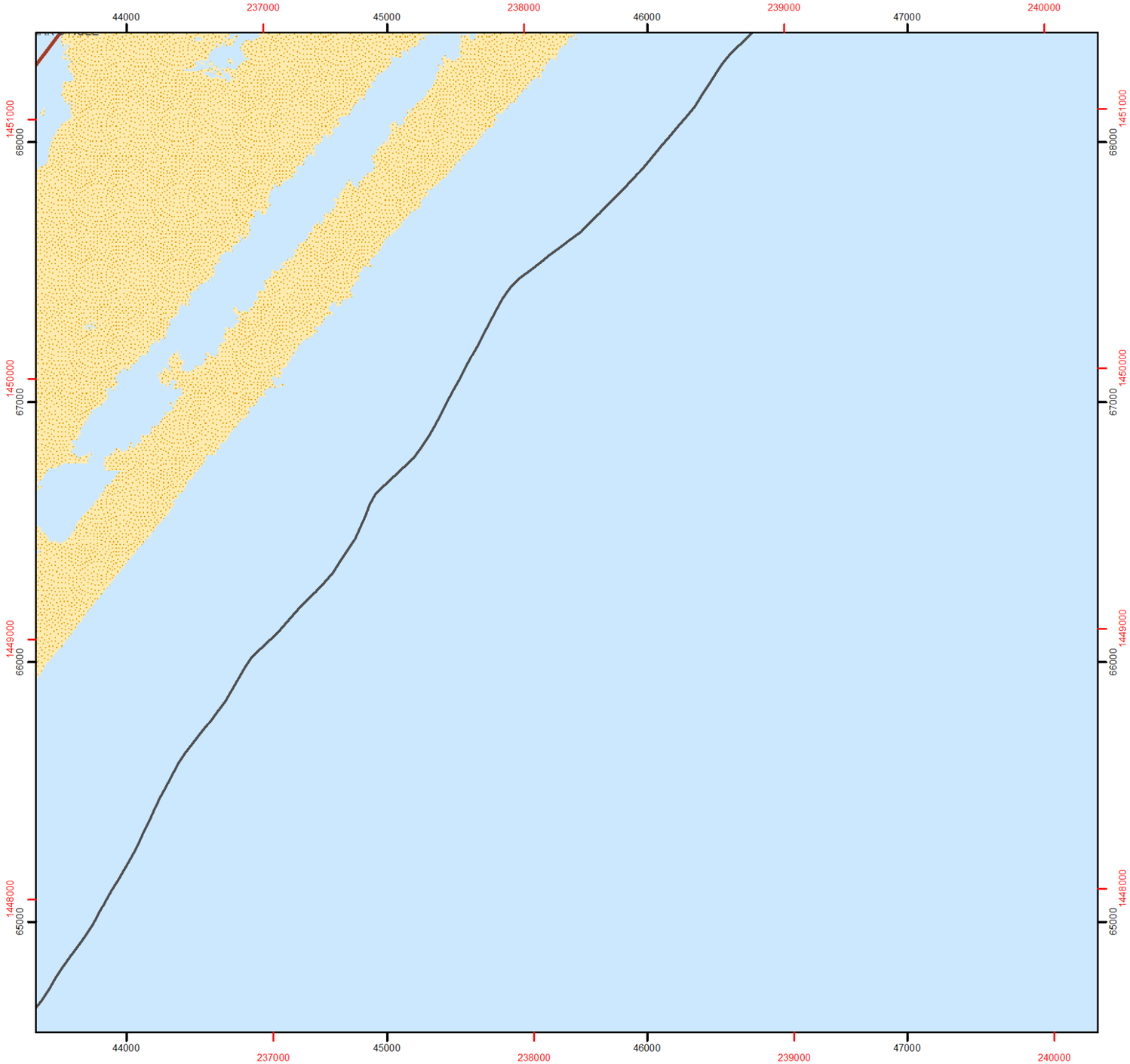

Coastal Zone Management Area

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Coastal classification division

Cliff failure

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High
Medium
Low *(risk class)*

Flooding hazard

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Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

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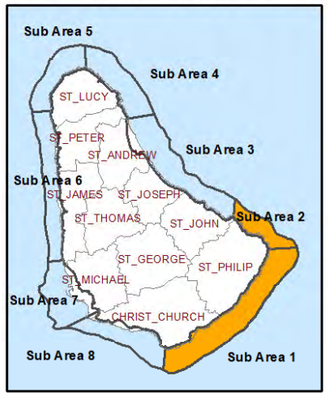
SUB AREAS 1, 2 - SHEET A8

COASTAL ZONE MANAGEMENT SUB AREAS



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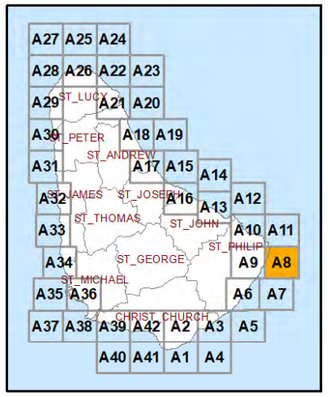

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

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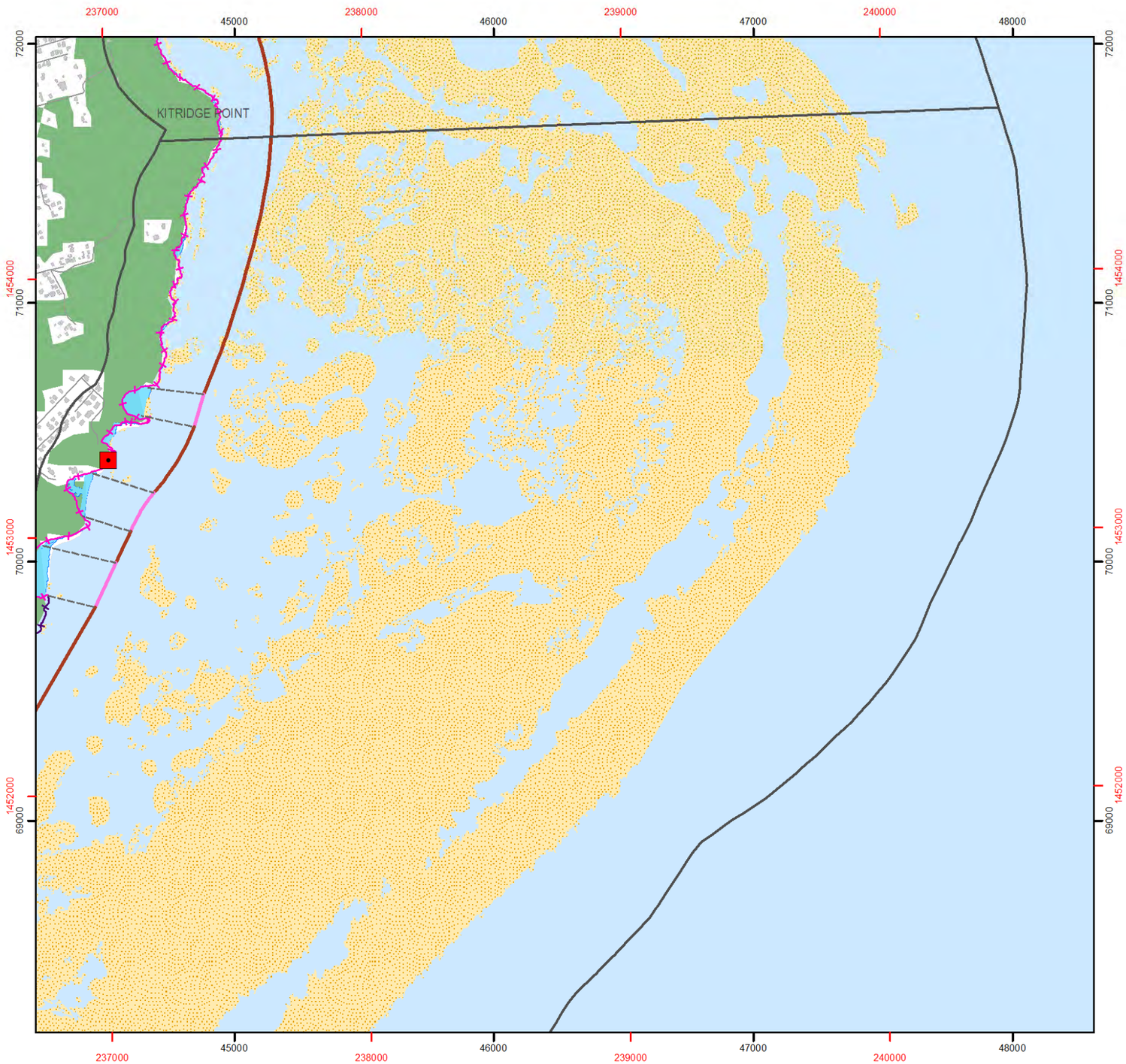
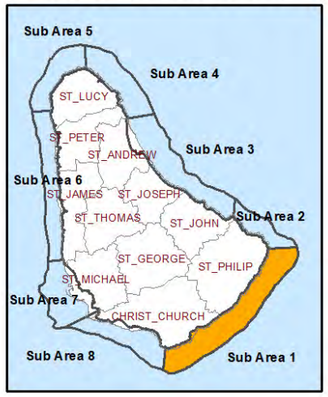
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 1 - SHEET A9

COASTAL ZONE MANAGEMENT SUB AREAS



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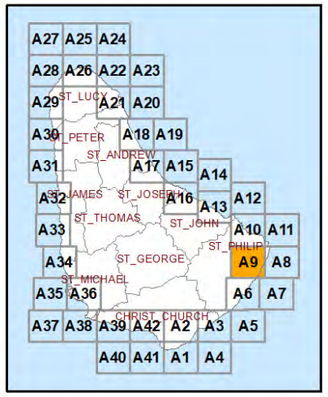

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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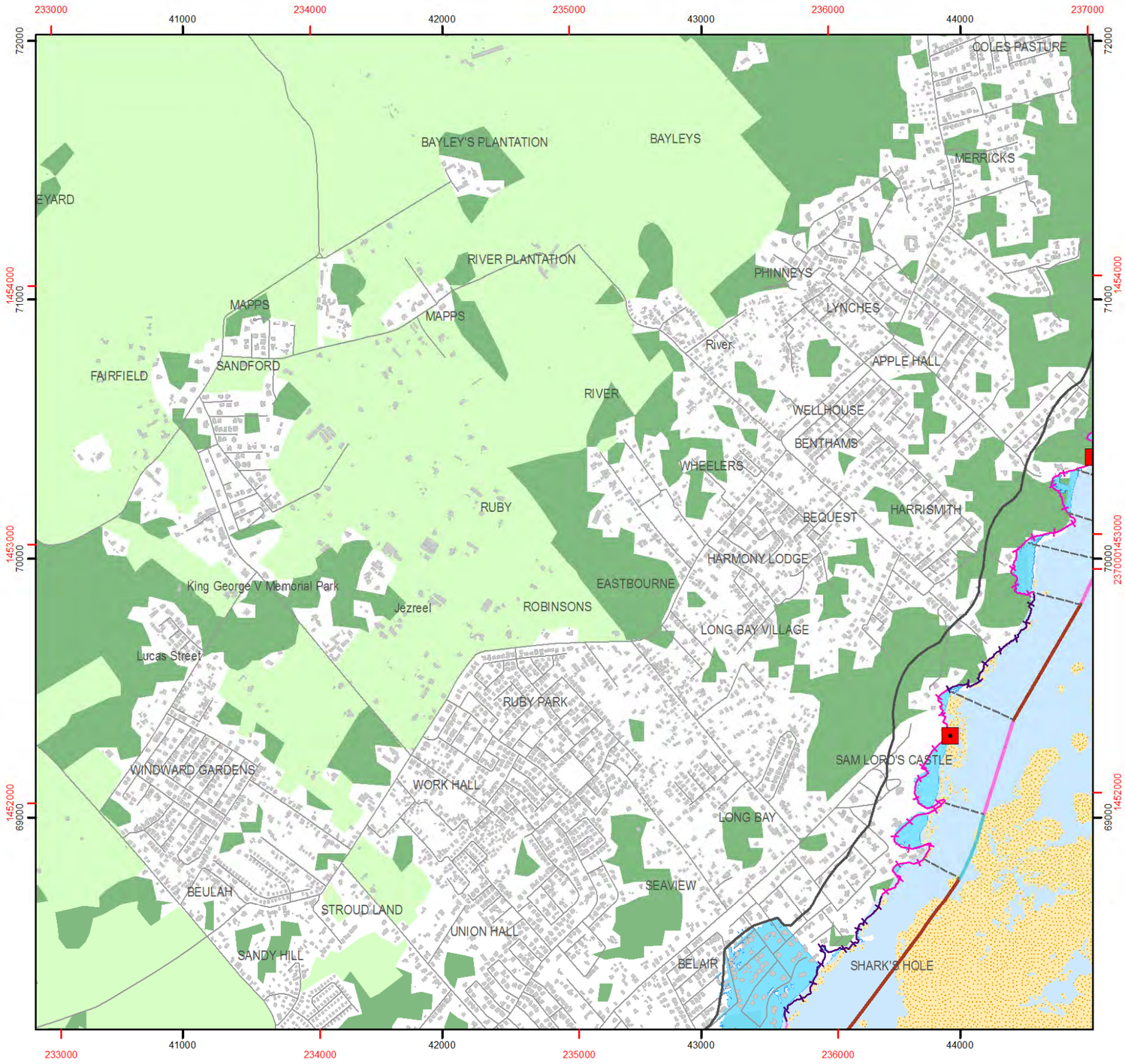
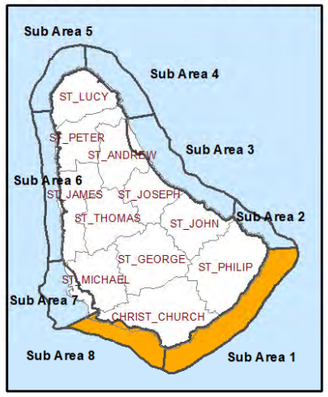
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



Setback maps of Sub-Area 1

SUB AREAS 1, 8 - SHEET A1

COASTAL ZONE MANAGEMENT SUB AREAS



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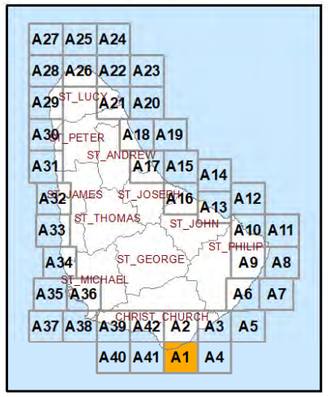

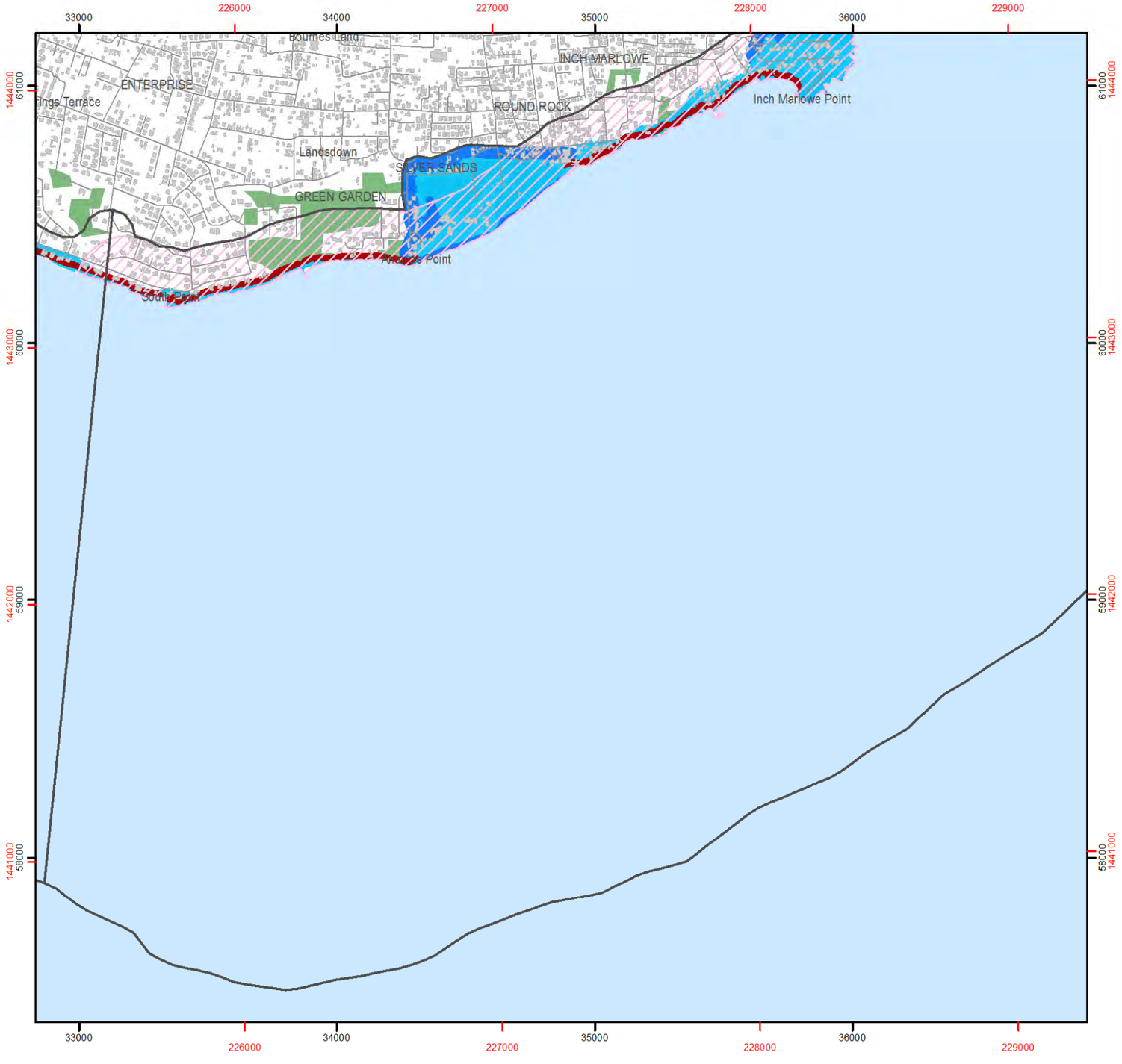

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

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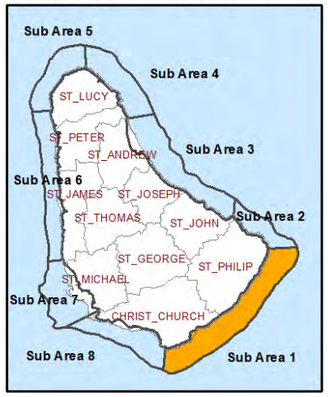
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A2

COASTAL ZONE MANAGEMENT SUB AREAS



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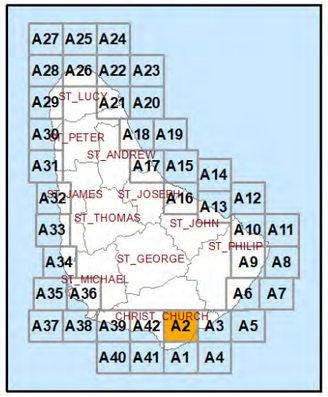

Coastal Zone Management Area ——

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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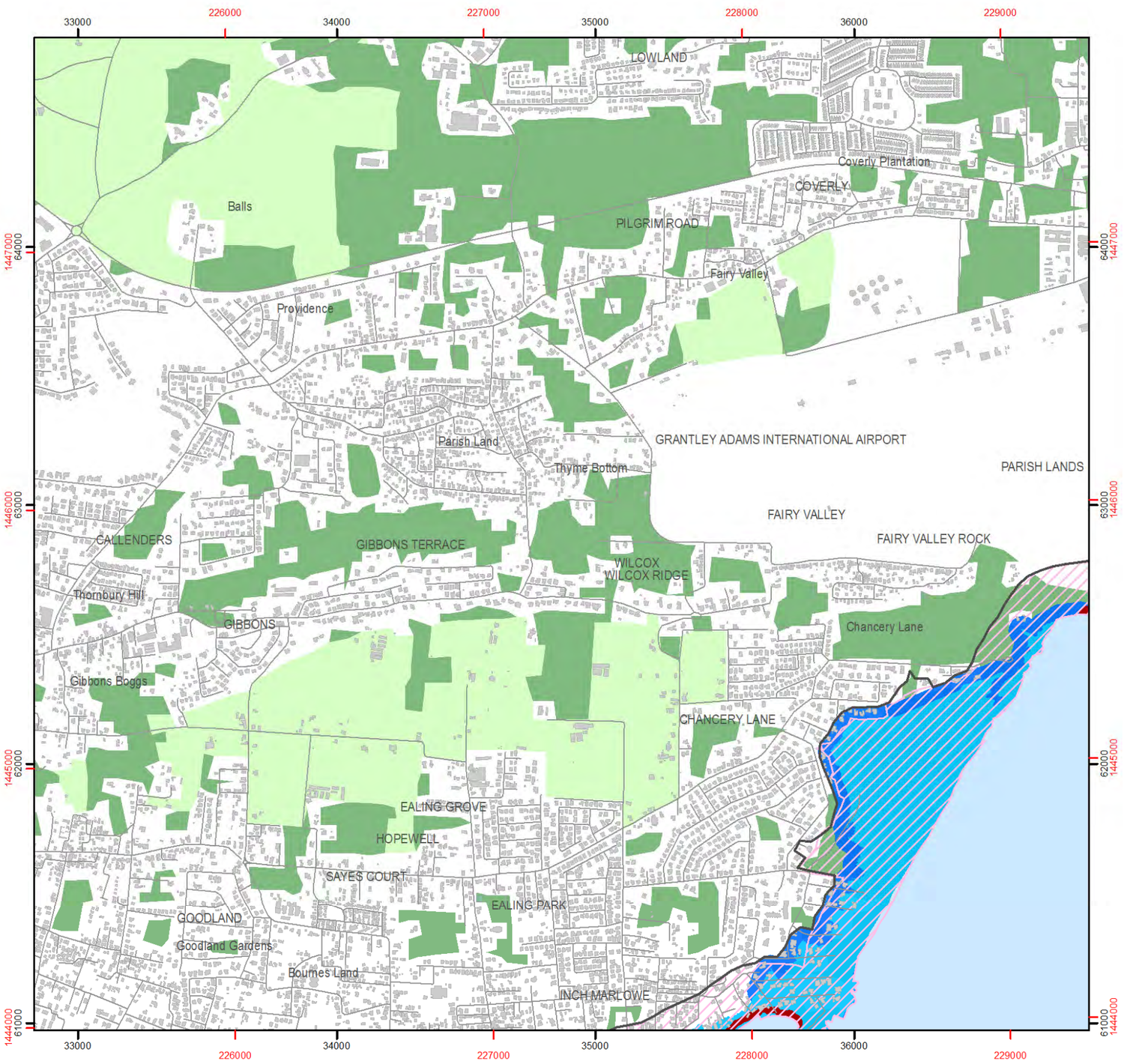

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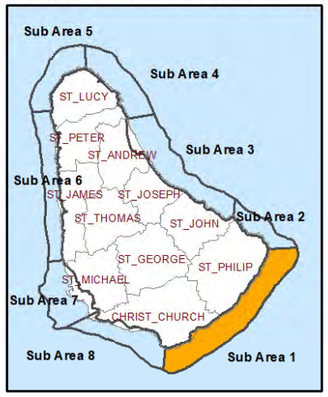
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A3

COASTAL ZONE MANAGEMENT SUB AREAS



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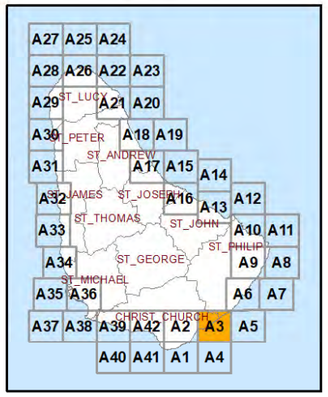

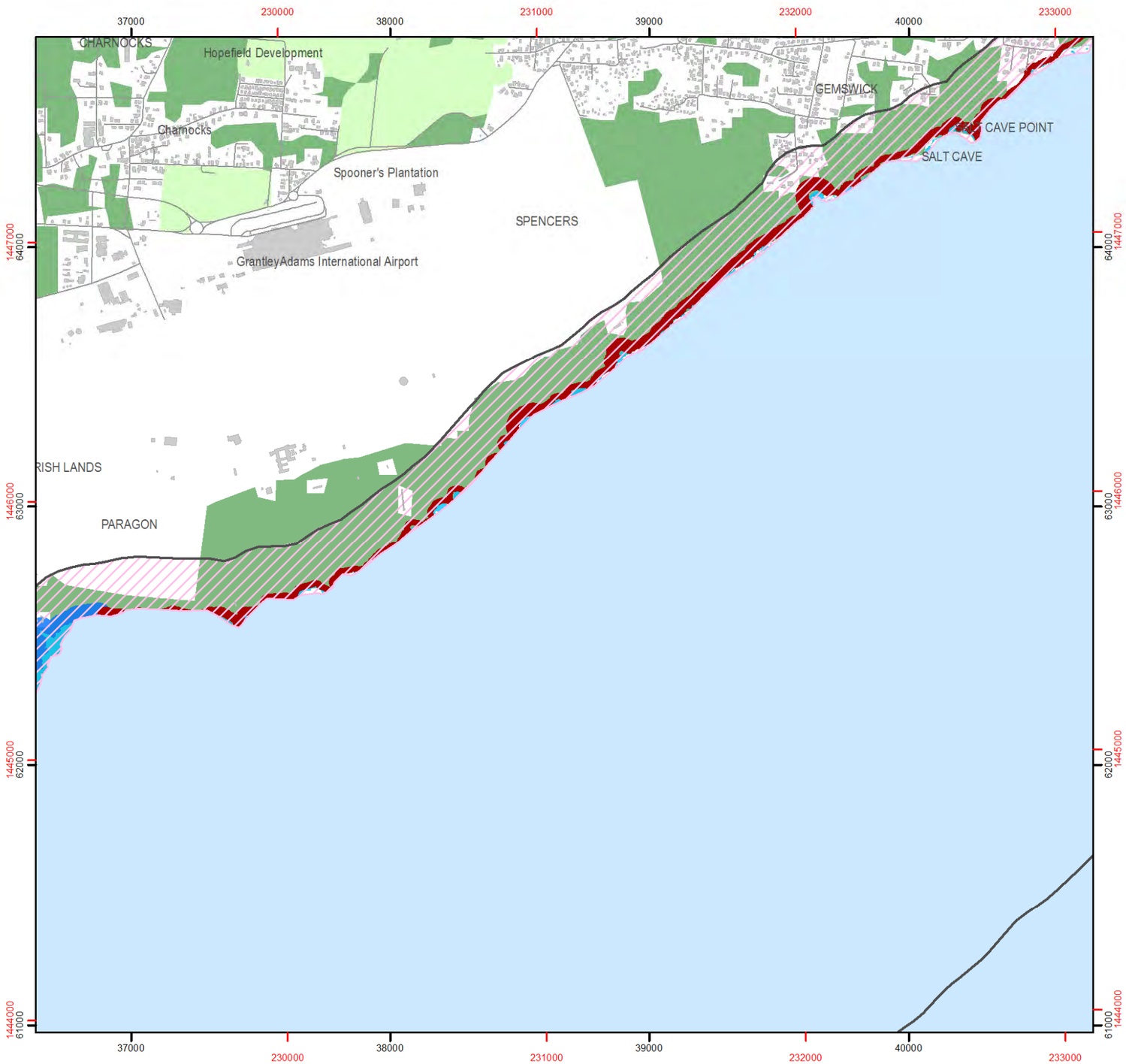

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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N

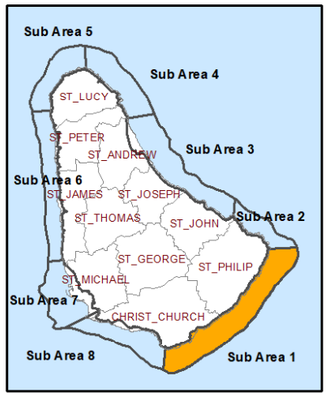
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A4

COASTAL ZONE MANAGEMENT SUB AREAS



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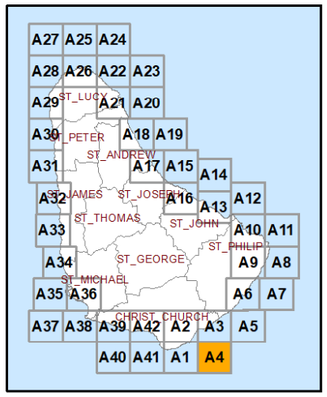
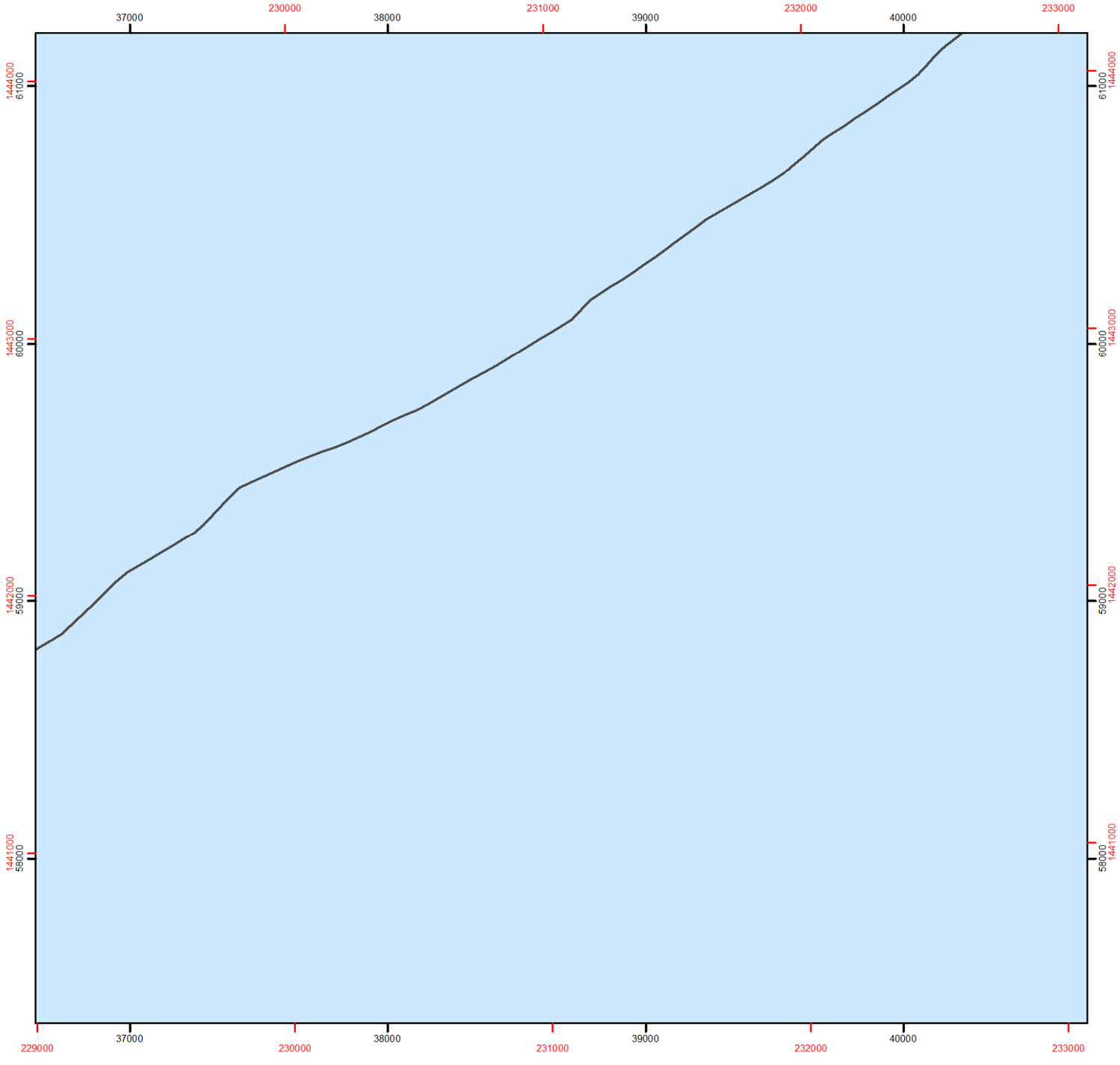




Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

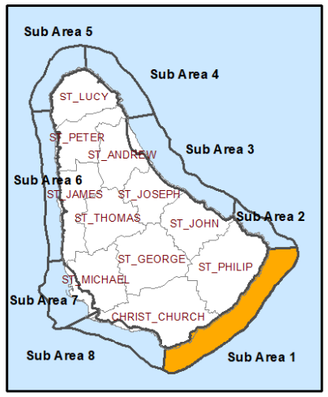
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A5

COASTAL ZONE MANAGEMENT SUB AREAS



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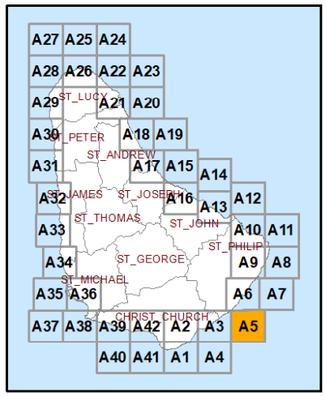
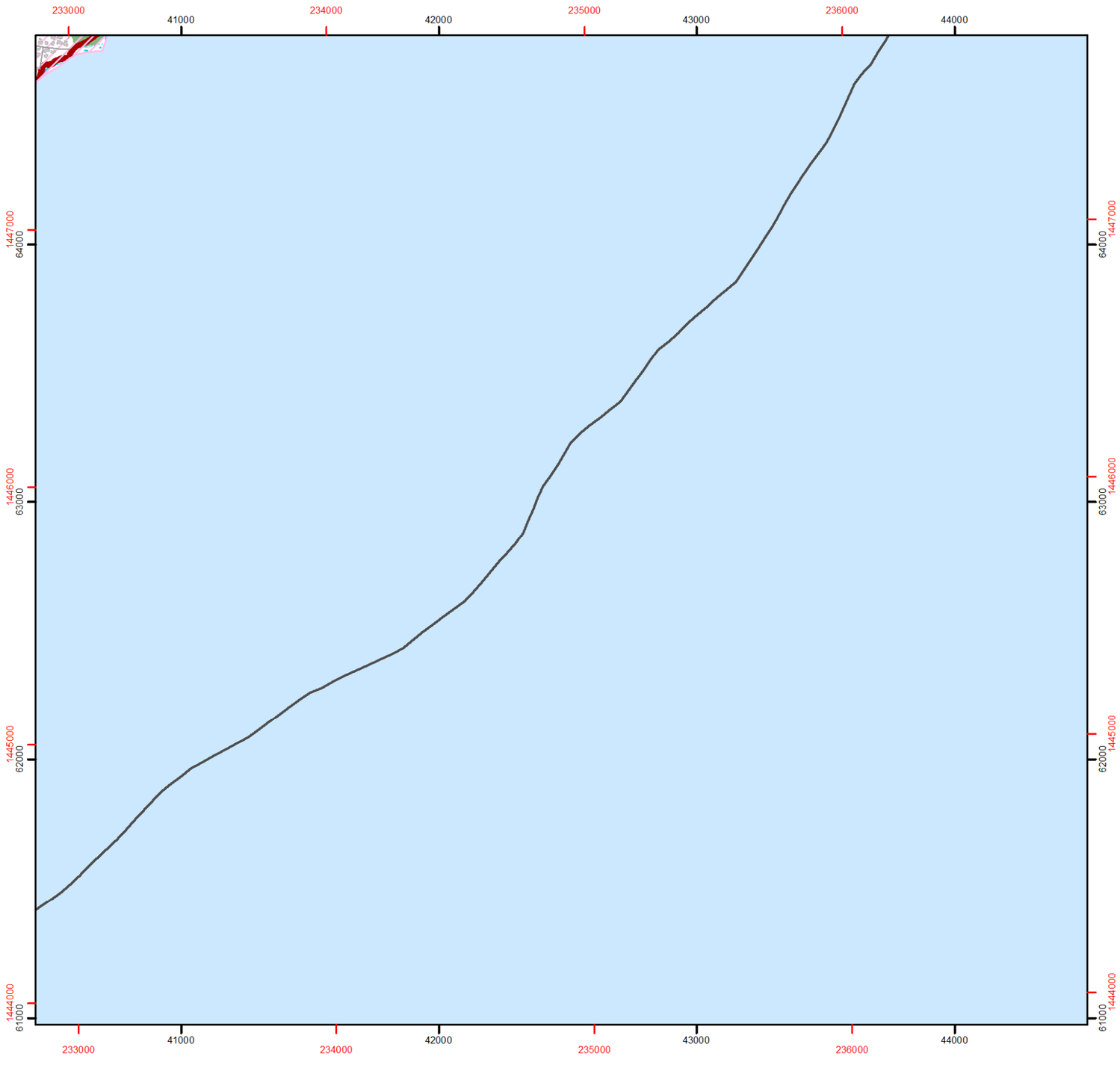




Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

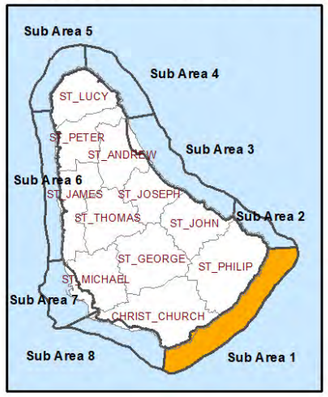
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A6

COASTAL ZONE MANAGEMENT SUB AREAS



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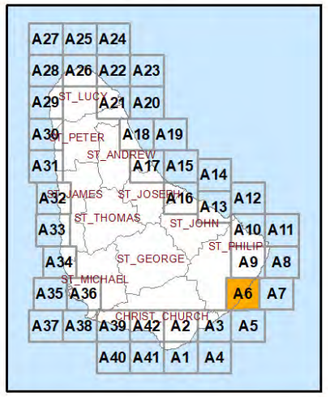

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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N

SCALE: 1:18,000

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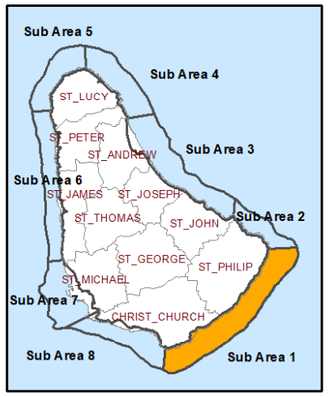
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A7

COASTAL ZONE MANAGEMENT SUB AREAS



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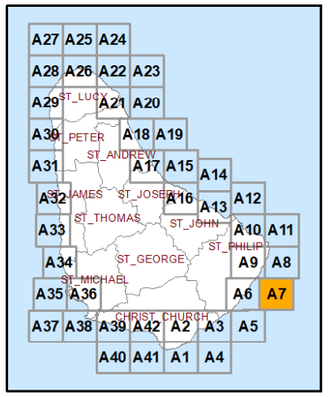

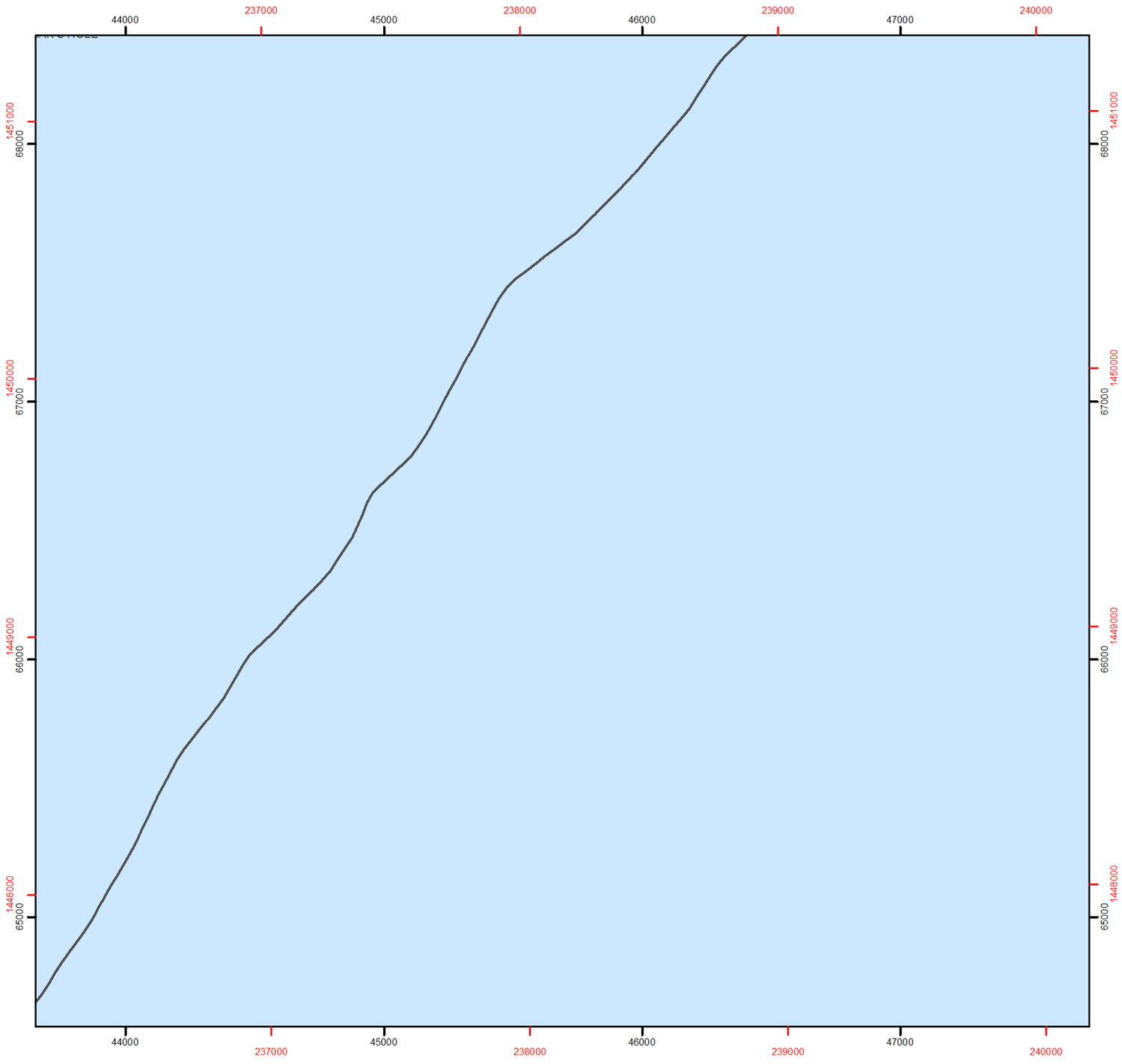

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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N

SCALE: 1:18,000

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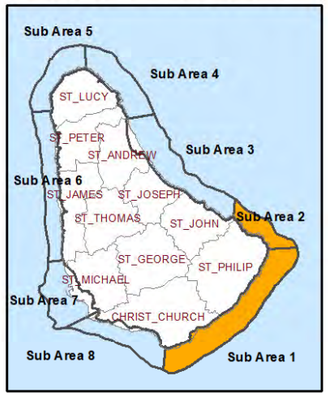
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREAS 1, 2 - SHEET A8

COASTAL ZONE MANAGEMENT SUB AREAS



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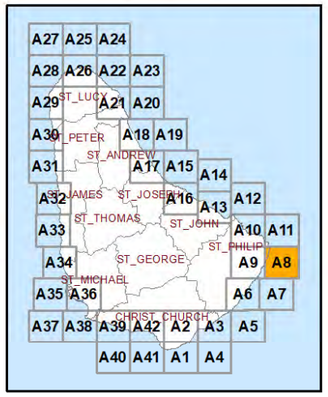

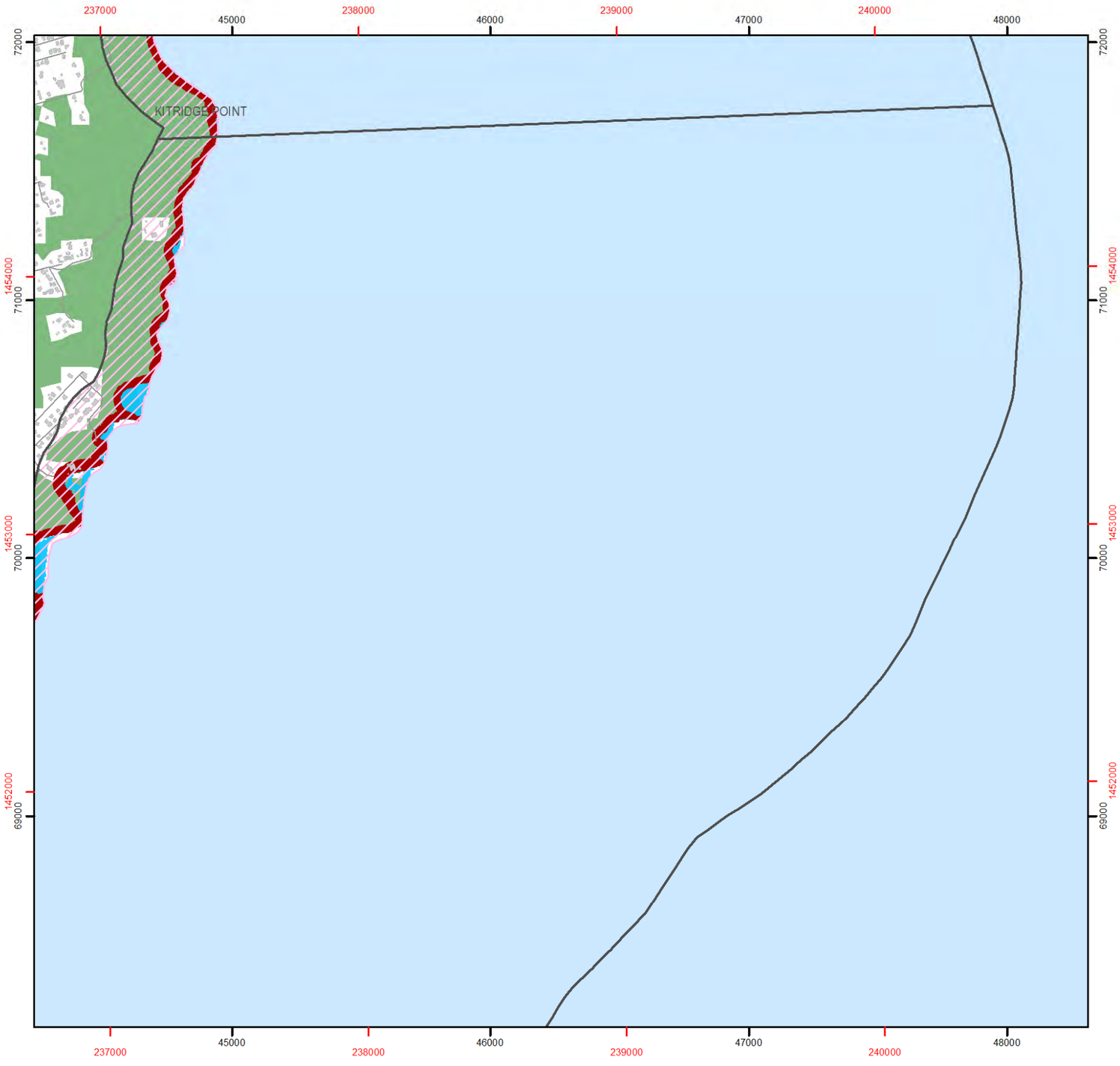

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
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N

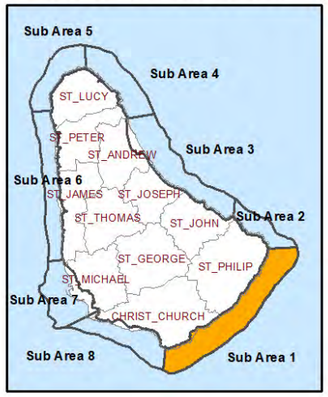
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 1 - SHEET A9

COASTAL ZONE MANAGEMENT SUB AREAS



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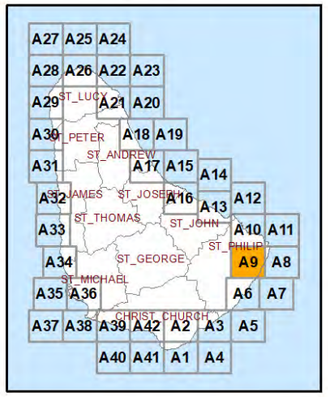

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
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SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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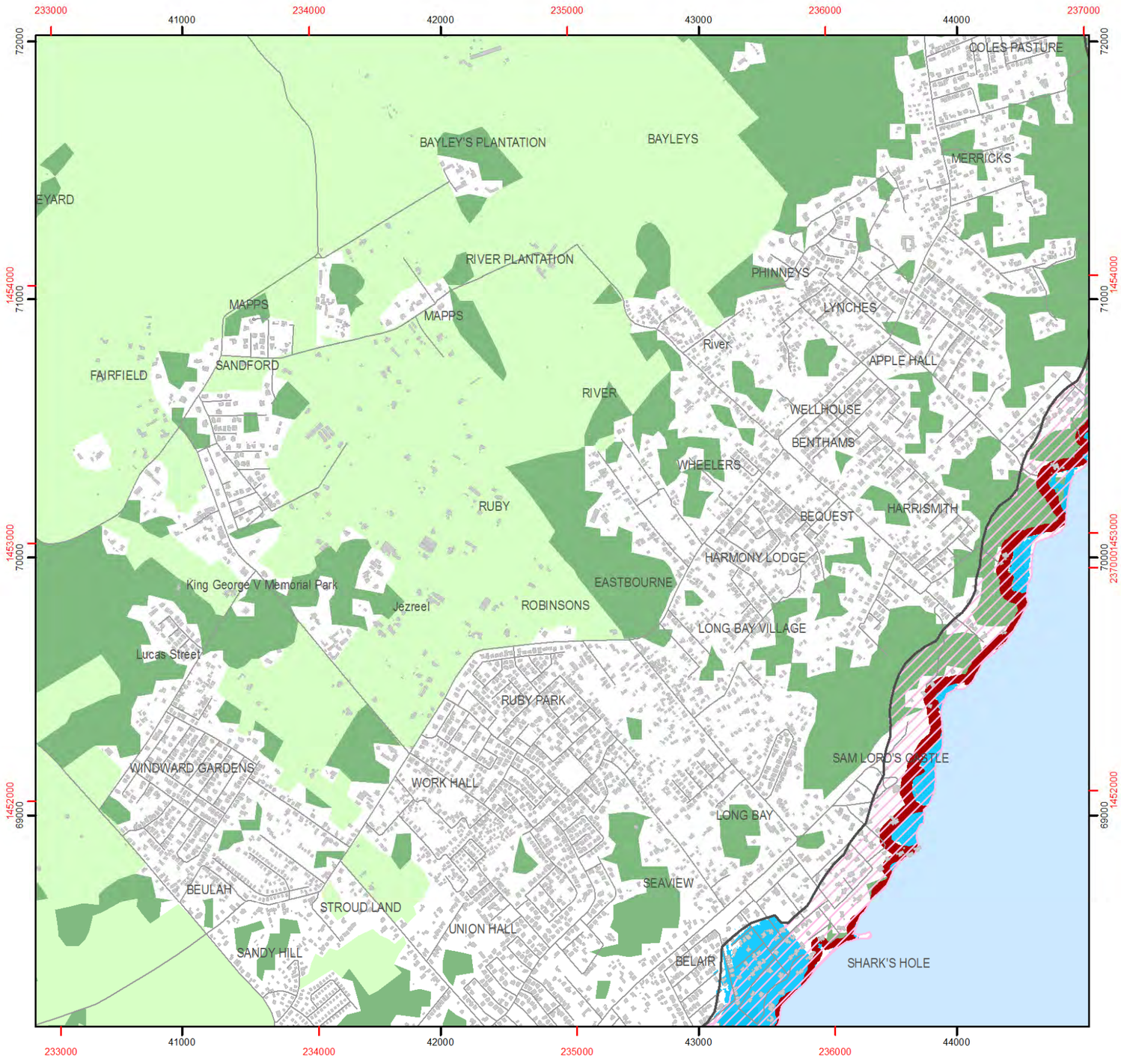


SUB-AREA 2: KITRIDGE POINT TO CONSET POINT

Main themes

RURAL CHARACTER AND FISHERIES ARE COMPATIBLE WITH PLANNED DEVELOPMENT.

LOW LEVELS OF COASTAL RISKS.

Sub-Area description and context

Sub-Area 2 is a short section along the east coast spanning from Kitridge Point to Conset Bay. The main settlements in the area include Sealy Hill, Whitehaven and Bayfield, surrounded by small scale agricultural holdings. Skeete's Bay is an important base for local fishermen who operate trap fisheries out on the nearby reefs as well as targeting deep slope pelagic fish stocks. Actions are required to rehabilitate the fish market which is currently in an abandoned state.

The main landscape features of the rocky coastline are Ragged Point and Skeete's Bay. The whole coastline of Sub-Area 2 is classified with the PDP (2017) as a "Coastal Landscape Protection Zone". The marine habitats in the nearshore environment are comprised of coral rubble and supported algal beds.

Detailed representation at a Sub-Area scale is presented within the subsection entitled "*Description maps of Sub-Area 2"* which includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 2 is exposed to.

The coastal risk assessment results (from CRMP outputs) indicate low level of coastal hazard risks, with Skeete's Bay likely to be exposed to significant 1:25 year return period storm surge hazards. Cliff collapse induced risk is classified as being medium for most of the Sub-Area.

Figure D.3 Sargassum in the near of Skeete´s Bay.

The area from Kitridge Point to Skeete´s Bay is expected to host new urban and tourism developments within the medium and long term, as it has been classified as Urban Corridor in the new Growth Management Framework (PDP, 2017).

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Valuable coastal landscape. • Presence of sargassum. • Challenges regarding public access to the coast. • Potential conflicts between new tourist and local recreational uses in Skeete´s Bay.	• Maintain the rural landscape and character whilst encouraging local coastal economy through support to fisheries. • Ensure access to the coast and to sustain local recreational beach use.

Development Planning and Setbacks at Sub-Area scale

Setback recommendations are presented within a collection of maps provided in the sub-section entitled “Setback maps of Sub-Area 2”. These recommendations adhere closely to the National Guidance “Development Planning and Setbacks” (see section C3) for Sub-Area 2. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000.

This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) applies only to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

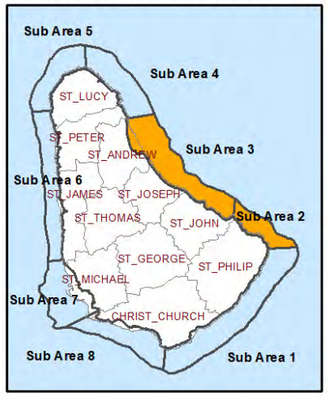
TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
Beach Management	2BM1	Propose sustainable and environmental friendly tourism and recreational activities as coastal trail (i.e.: Inche Marlowe to Salt Cave), bike lane along the road, etc.	CZMU	MTI, NCC	Medium term, immediate	If facilities are need for economic activities, only soft structures should be promoted. Rationalise car parking and promote public transportation to visit this area.	Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	2S1	Prepare and distribute guidelines to enforce Landscape Setback in Sub-Area 2 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate	Guidelines should explain why coastal landscape is important as coastal resource and attraction for visitors and recommendations for setback enforcement.	Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	2S2	Prepare and distribute guidelines to enforce Cliff Collapse Setback in Sub-Area 2 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate		Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Development Planning and Setbacks	2S3	Organize meetings with key stakeholders to raise awareness on coastal resources and landscape.	CZMU	TCPDO, NCC, Developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	2S4	Organize bilateral meetings with TCPDO to review existing applications and evaluate landscape and environmental impacts.	CZMU	TCDPO	Short term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	2BIO1	Promote improved fisheries schemes for Skeete´s Bay.	CZMU	MMABE, Fishermen community			Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	2PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	2PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	2PA3	Promote local recreational beach use.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased

Table D.2. Action brief for Sub-Area 2.

Description maps of Sub-Area 2

SUB AREAS 2, 3 - SHEET A10

COASTAL ZONE MANAGEMENT SUB AREAS



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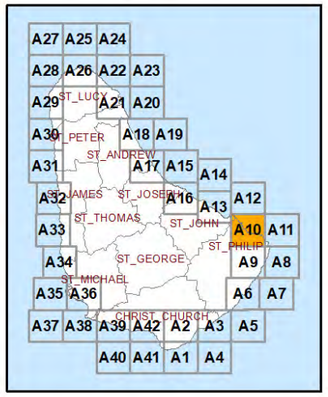


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area | Coral reefs | Wetlands | Seagrass | Mangroves | Agriculture | Natural vegetation

Coast and cliff classification

Eroding Coast (Natural) | Eroding Coast (Engineered)
Accreting Coast (Natural) | Accreting Coast (Engineered)
Stable Coast (Natural) | Stable Coast (Engineered)
Dynamically Stable Coast (Natural) | Artificial Coast
Coastal Cliff | Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years | Storm surge + Sea Level Rise (IPCC 2019)

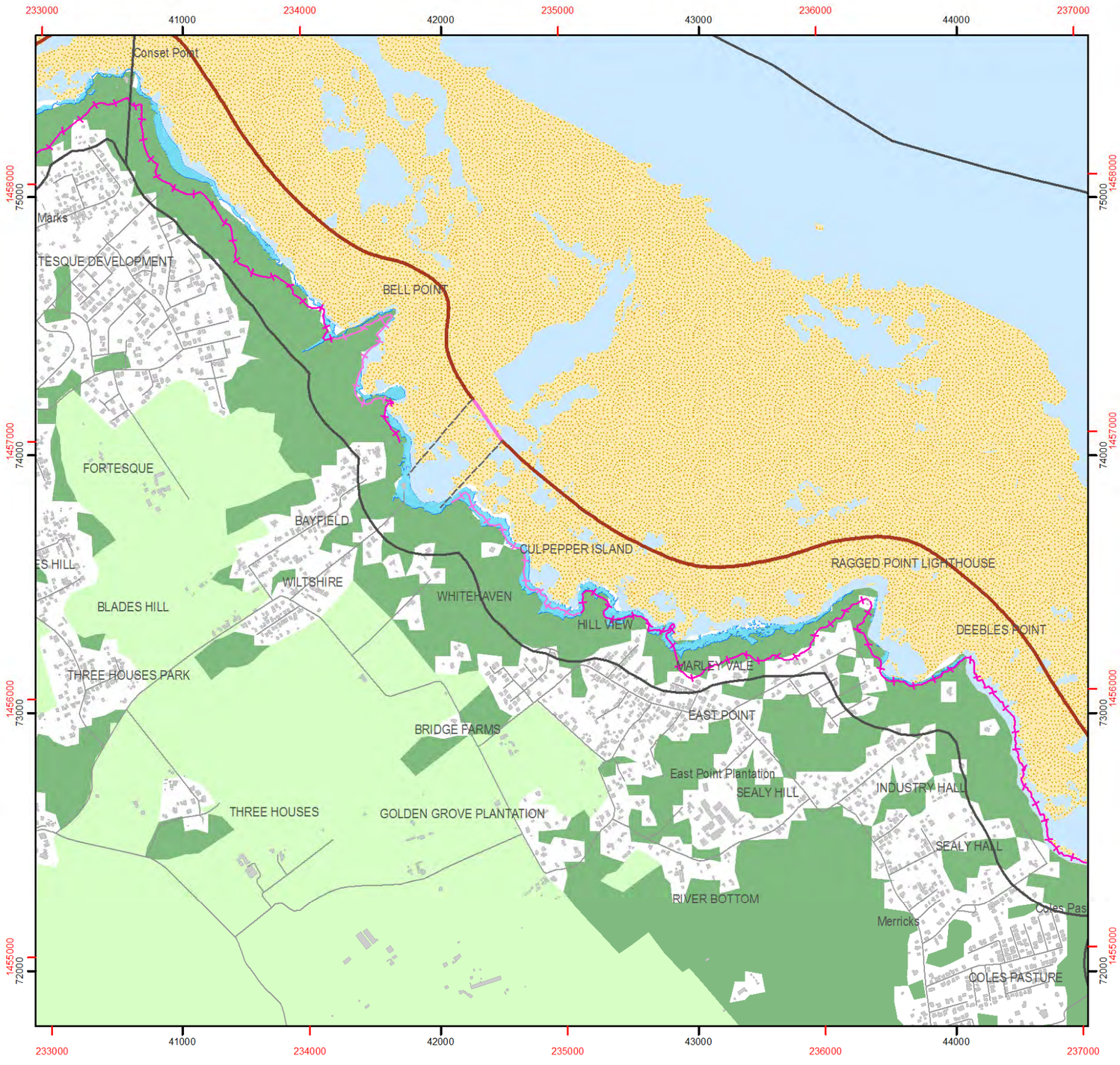
Tsunami 100 years

N

SCALE: 1:18,000

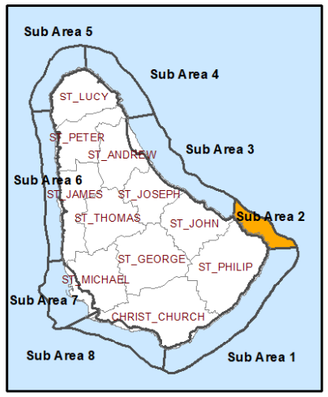
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 2 - SHEET A11

COASTAL ZONE MANAGEMENT SUB AREAS



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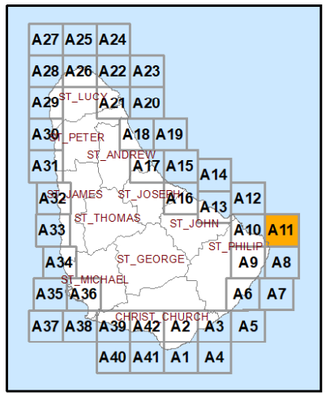

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

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- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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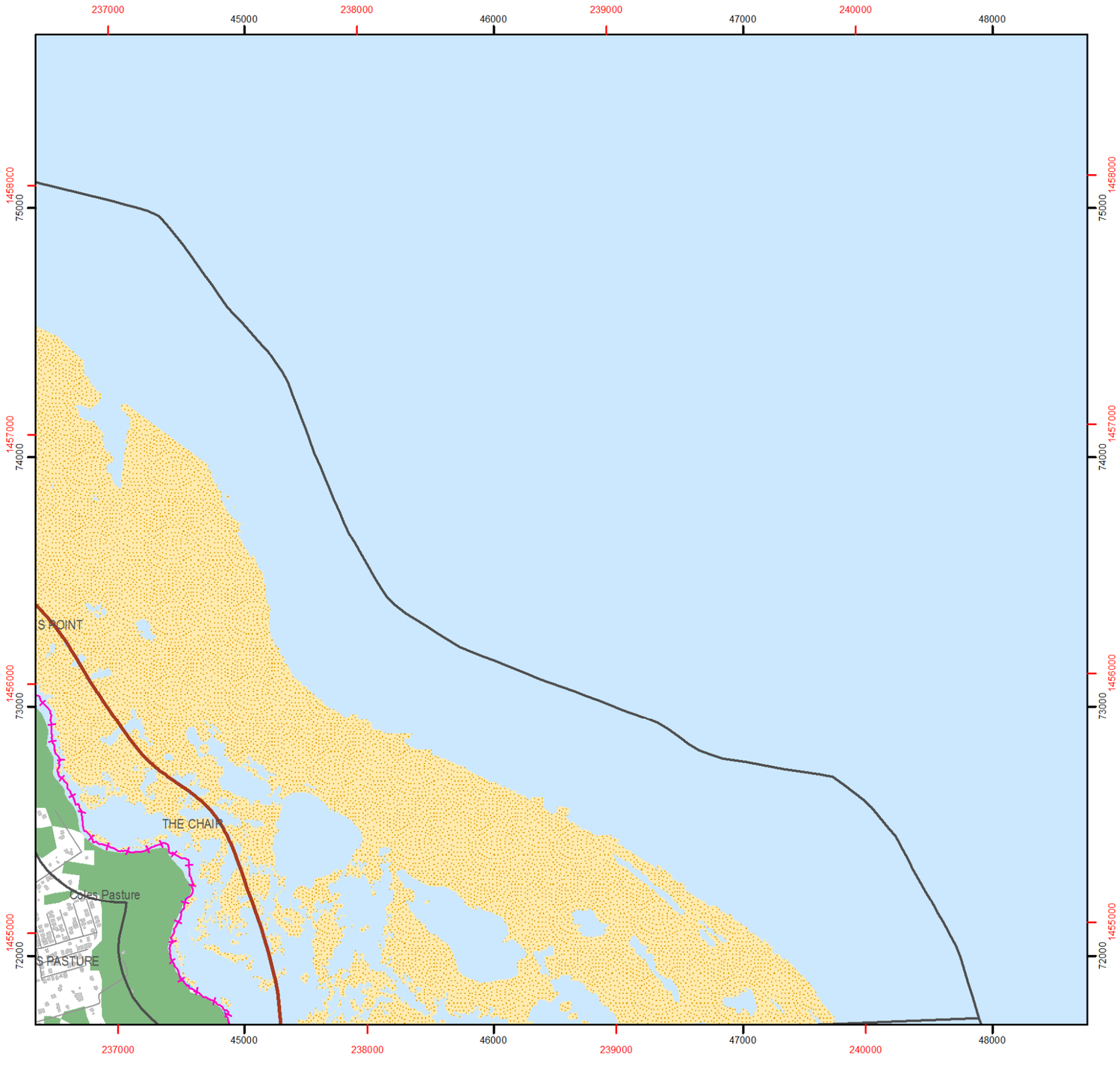
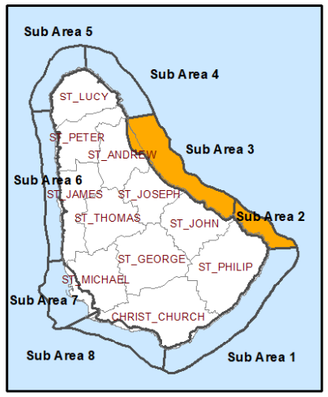


SUB AREAS 2, 3 - SHEET A12

COASTAL ZONE MANAGEMENT SUB AREAS



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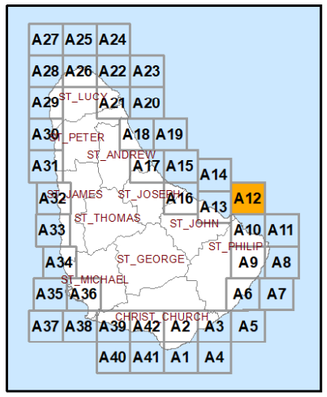
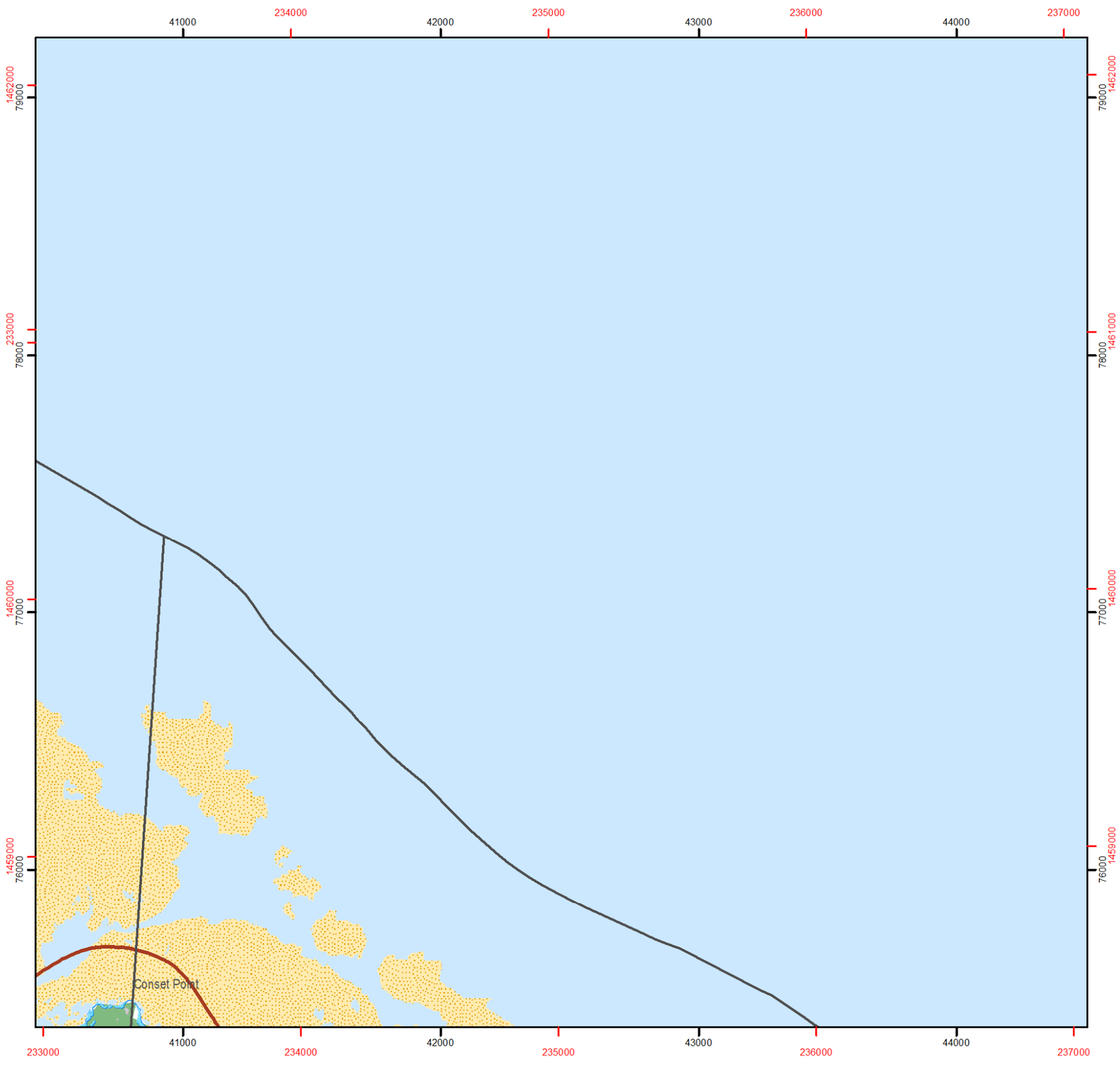




Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

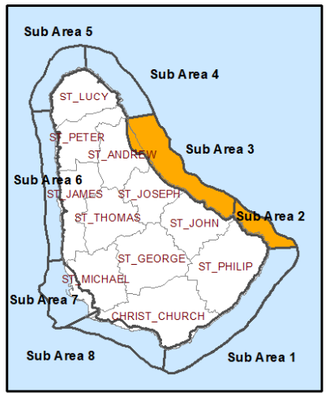
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

Setback maps of Sub-Area 2

SUB AREAS 2, 3 - SHEET A10

COASTAL ZONE MANAGEMENT SUB AREAS



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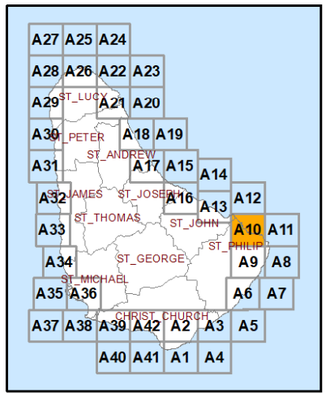


Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

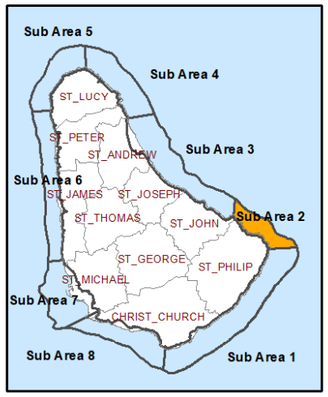
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 2 - SHEET A11

COASTAL ZONE MANAGEMENT SUB AREAS



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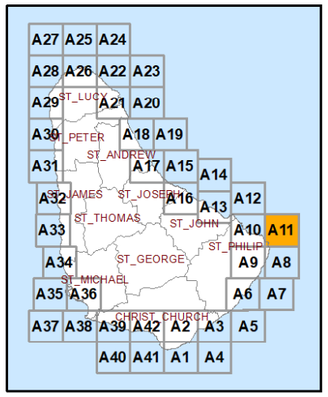
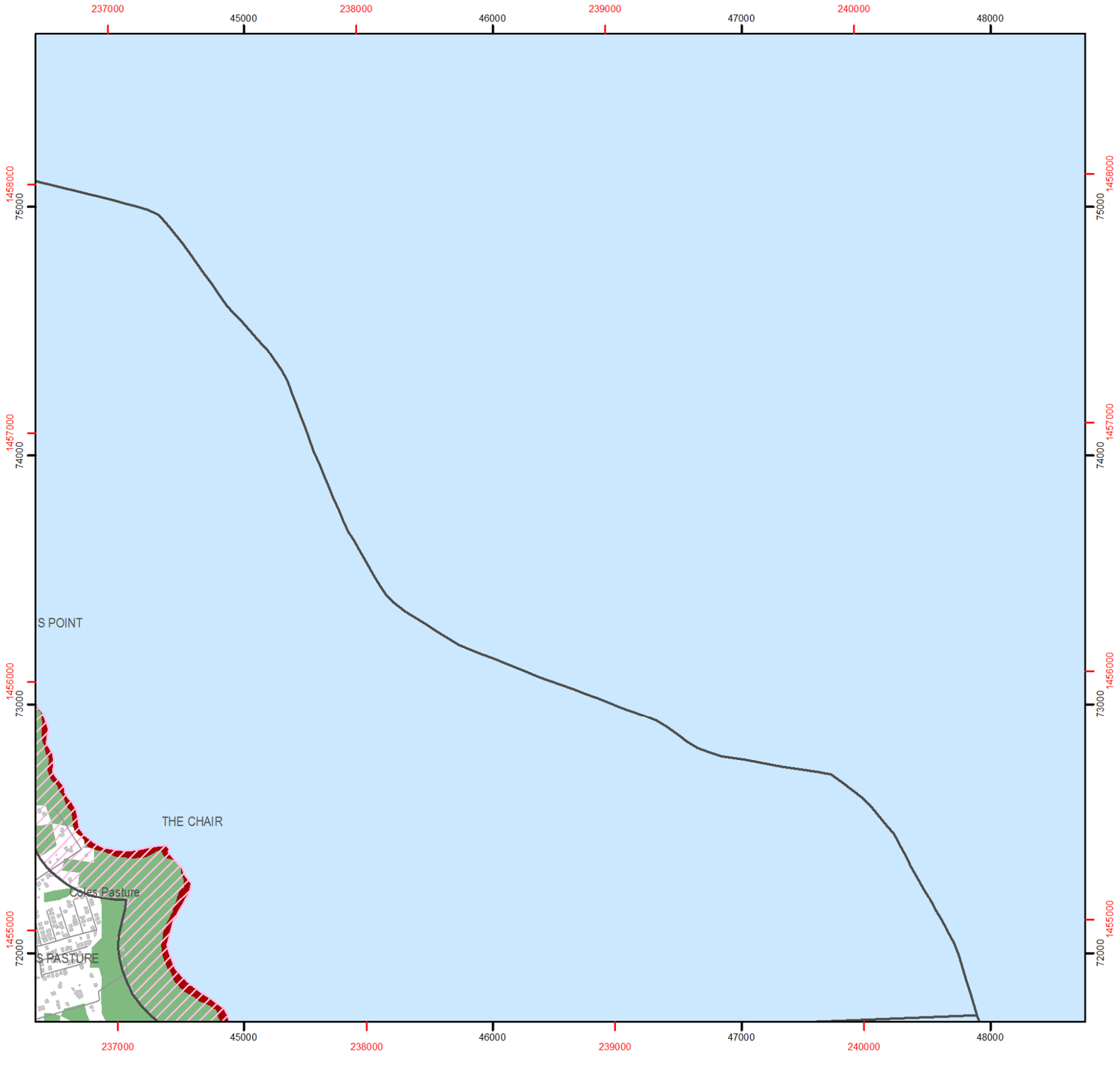




Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

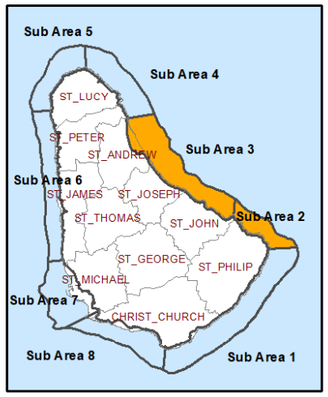
SCALE: 1:18,000

0 130 260 390 520 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREAS 2, 3 - SHEET A12

COASTAL ZONE MANAGEMENT SUB AREAS



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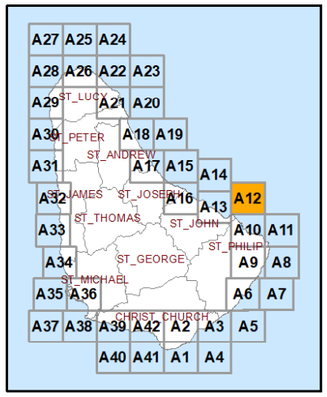
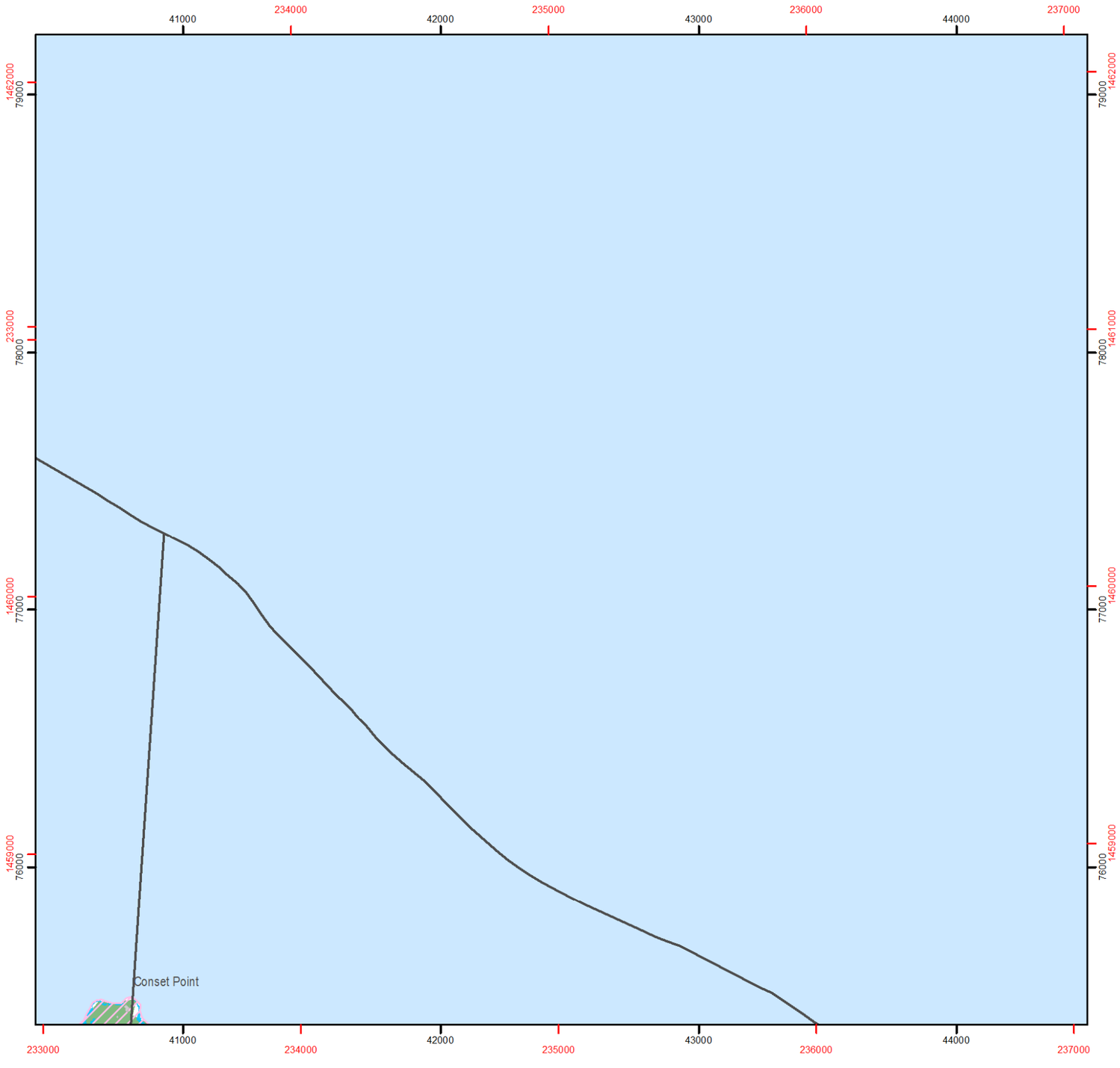




Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB-AREA 3: CONSET POINT TO THE CHOYCE

Main themes

LANDSCAPE AND NATURAL VALUES FOR RECREATION.
DIFFERENT COASTAL HAZARDS AT SPECIFIC LOCATIONS.

Sub-Area description and context

This Sub-Area covers most of the coastline of the Barbados National Park (PDP, 2017). Sub-Area 3 possesses a less homogeneous pattern of land use when compared to other parts of the Plan area. It is a predominantly rural area with agricultural land surrounding the main settlements of Bathsheba and Belleplaine. Conset Bay and Tent Bay are important bases for fishing activity. The scenic attributes and undeveloped nature has made this Sub-Area particularly attractive for recreation and commands high potential for tourism development including experienced water sporting enthusiasts including surfers. In addition, sand extraction activities continue to take place in the area through to a much reduced level over recent years as the dune area of Walker's Quarry is now being restored into Walker's Reserve.

The Sub-Area contains more topographical variety when compared to the other parts of the coast. It consists of sloping areas that occur between the main escarpment and the coast which is quite heavily eroded. The Natural Park and their Natural Heritage Conservation Areas host a mix of woodland, cliff scenery, bays, beaches, water bodies and upland areas. The long sandy beach which extends from Morgan Lewis to Windy Hill represents one of the most striking coastal landforms. As other Sub-Areas in the Atlantic coast, the presence of Sargasso is a major issue in this area. The seabed of the nearshore environment is dominated by predominantly sandy sediment eroded from the Scotland District.

Detailed representation at Sub-Area scale is presented in subsection *"Description maps of Sub-Area 3"* that includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 3 is exposed to.

Due to the low level of development in this area, results of the assessment of coastal risk do not indicate a high-risk level to communities along this coast. Despite this, and considering recent sea-level rise projections (IPCC, 2020), flooding risk in the areas between Conset Bay and Bath, Martin´s Bay and from Tent Bay to The Choyce continues to be possible. Coastal erosion is also reported from Chalkey Mount to Hill Crest, and along the coast of Bath and Conset Bay. At Conger Rocks, cliff collapse induced risk is classified as being very high.

Figure D.4. Boulder in Bathsheba.

In the new Growth Management Framework (PDP, 2017) the coast of this sub-Area is mostly classified as Natural Park or Natural Park Village except for Bathsheba that constitutes a Community Core. The PDP also states that no new development should be permitted on the seaward side of Ermy Bourne Highway.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Valuable sea and landscapes and natural resources in the National Park. • Presence of sargassum. • Potential for nature tourism and recreational activities. • Licensed sand extraction from dune area. • Potential storm surge risk considering las projections of sea-level rise.	• Conserve and enhance the character and quality of the landscape, natural and cultural features of the Natural Park. • Restore and enhance coastal ecosystems, including beaches, wetlands, gullies and marine ecosystems through Ecosystem-based Adaptation interventions. • Support and enhance heritage tourism that benefits local communities is economically viable, and is compatible with the environmental quality of the area. • Enforce sufficient setback to allow for safety, to preserve the character of the coastal landscape and retain views to the sea. • Provide opportunities for informal recreation and promote an understanding and enjoyment of the special qualities of the National Park.

Development Planning and Setbacks at Sub-Area scale

Setback recommendations are presented within a collection of maps provided in the sub-section entitled “Setback maps of Sub-Area 3”. These recommendations adhere closely to the National Guidance “Development Planning and Setbacks” (see section C3) for Sub-Area 3. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000.

This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) applies only to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

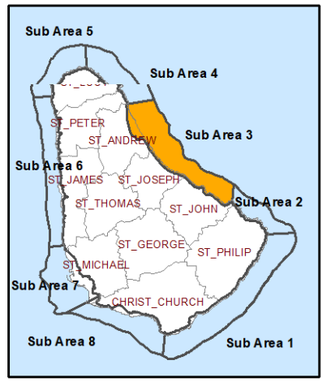
TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
Beach Management	3BM1	Elaborate a Plan to promote environmentally friendly tourism and recreational activities (i.e.: coastal trails, bike lanes, interpretation routes, etc.) and upgrading existing walks facilities.	CZMU	MTI, NCC	Medium term, immediate	If facilities are need for economic activities, only soft structures should be promoted. Rationalise car parking and promote public transportation to visit this area.	Outcome 2 - Coastal resources are protected and effectively managed
Beach Management	3BM2	Develop and implement a Beach Management Plan for the National Park.	CZMU	TCDPO, NCC, Walkers Reserve	Medium term, continuous	The beach plan in this area is to protect the natural beauty and recreation opportunities for Barbadians.	Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	3S1	Prepare and distribute guidelines to enforce Landscape Setback in Sub-Area 3 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate	Guidelines should explain why coastal landscape is important as coastal resource and attraction for visitors and recommendations for setback enforcement. They should include the provision of PDP related to the seaward of Ermy Bourne Highway.	Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	3S2	Organize meetings with key stakeholders to raise awareness on coastal resources and landscape.	CZMU	TCPDO, NCC, Developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	3BIO1	Prohibit sand extraction from dunes.	CZMU	TCDPO	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	3BIO2	Promote improved fisheries schemes for Conset and Tent Bay	CZMU	MMABE, Fishermen community			Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	3BIO3	Promote monitoring of water quality at Green and Long Pond	CZMU	NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	3BIO4	Promote the protection of leatherback turtles	CZMU	NCC	Medium term, continuous		Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	3BIO5	Participate into restoration projects to provide advice on how to protect coastal resources and processes from an EbA.	CZMU	NCC, Walkers Reserve			Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	3PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	3PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	3PA3	Promote local recreational beach use.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Non-living Resource Exploration and Exploitation	3REE1	Formalise CZM Regulations to designate incipient dunes, beach and fore-dunes as areas in which removal of vegetation or sand is prohibited in Belleplaine and Walkers Savannah.	CZMU	SCU, EPD, NCC, NRD	Short term		Outcome 4 - ICZM is delivered through a coordinated governance arrangement
Non-living Resource Exploration and Exploitation	3REE2	Promote restoration of the incipient dunes, beach and fore-dunes as compensatory measures to developers that perform extraction activities in Belleplaine and Walkers Savannah.	CZMU	SCU, EPD, NCC, NRD	Short term		Outcome 2 - Coastal resources are protected and effectively managed

Table D.3 Action brief for Sub-Area 3.

Description maps of Sub-Area 3

SUB AREA 3 - SHEET A13

COASTAL ZONE MANAGEMENT SUB AREAS



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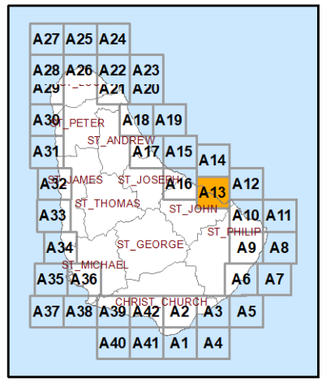


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

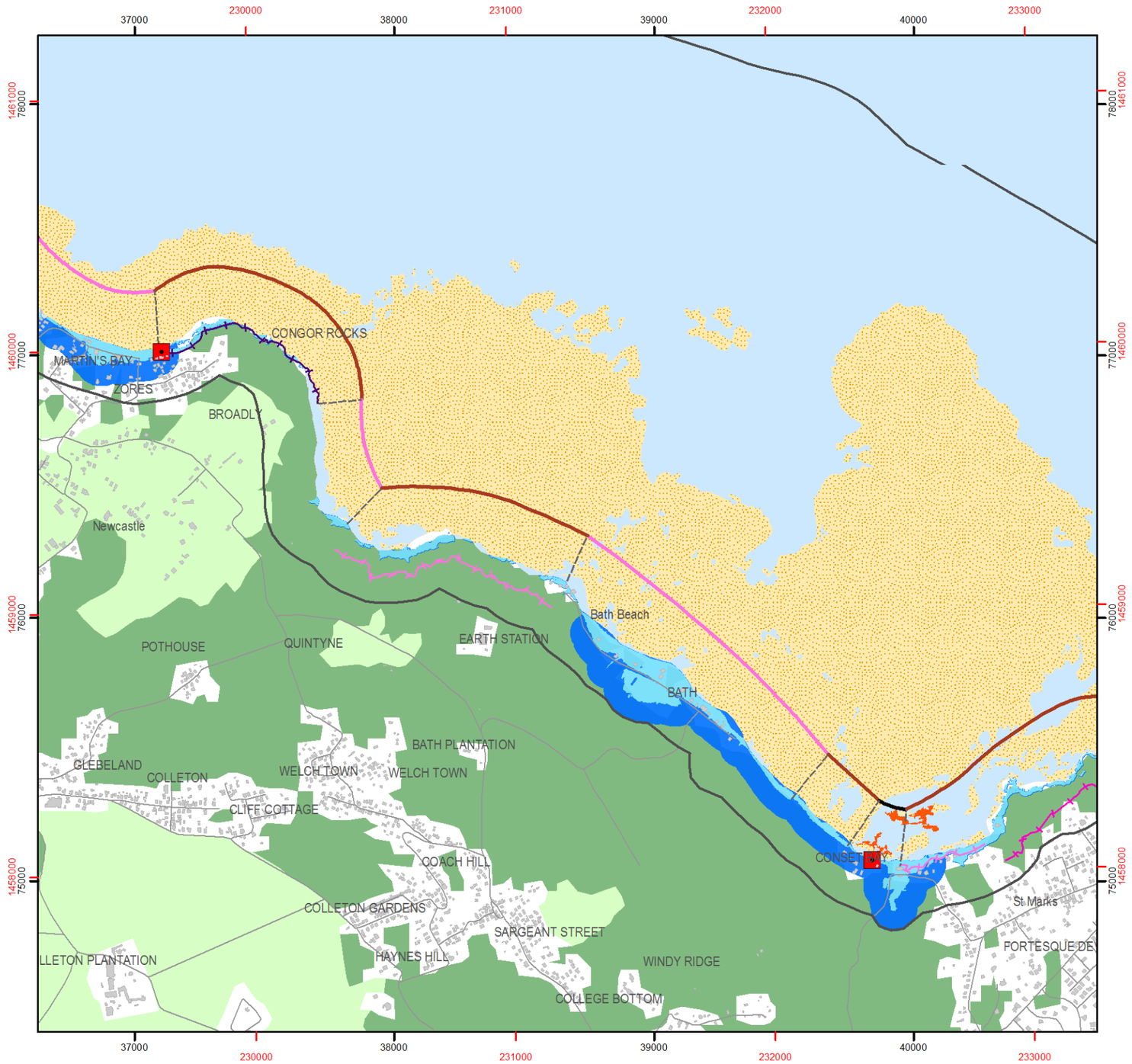
Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

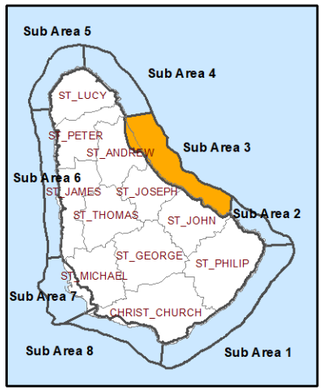
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 3 - SHEET A14

COASTAL ZONE MANAGEMENT SUB AREAS



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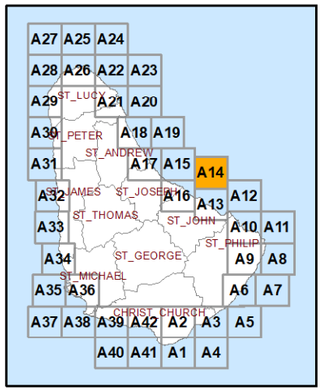


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

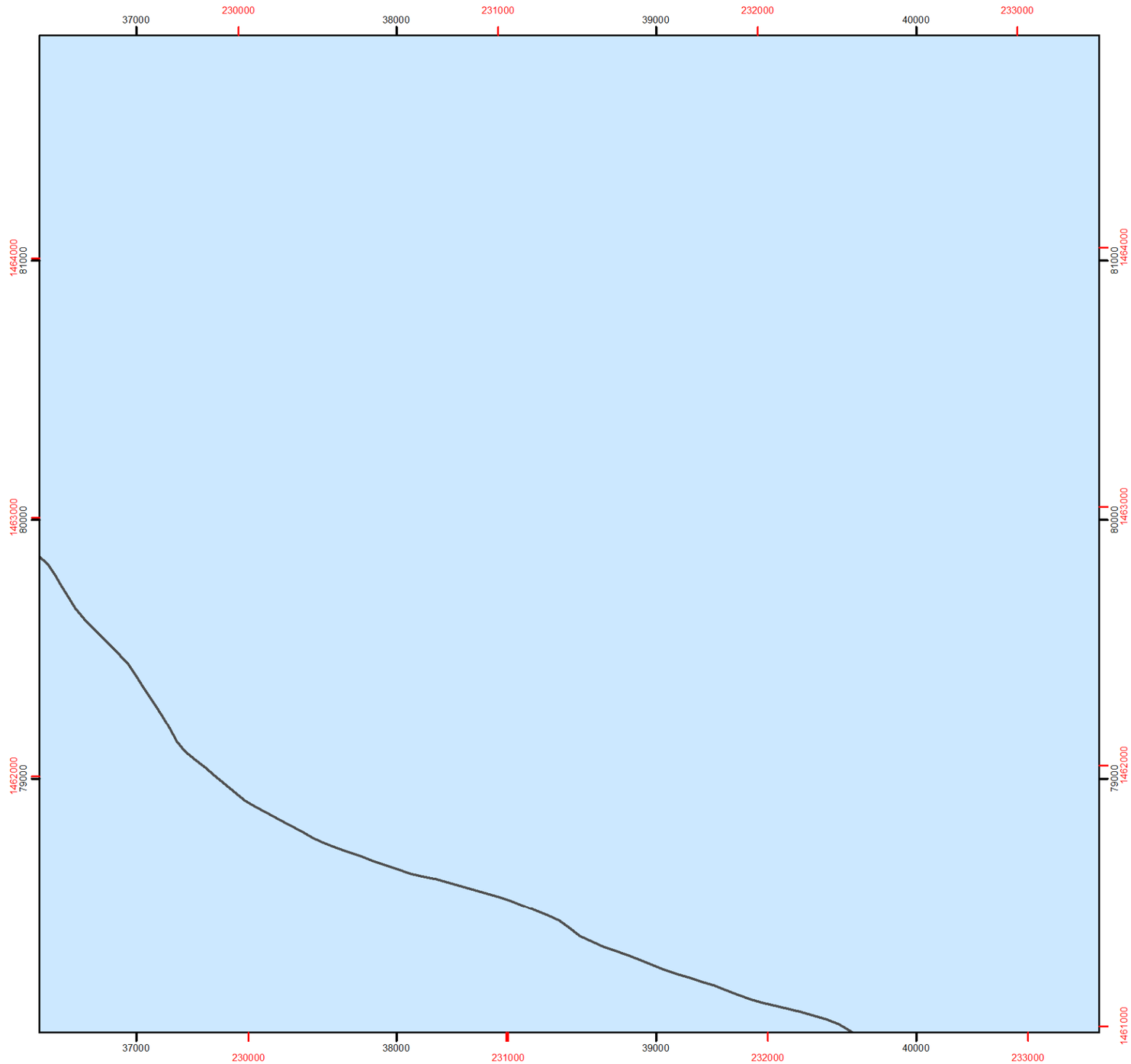
- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

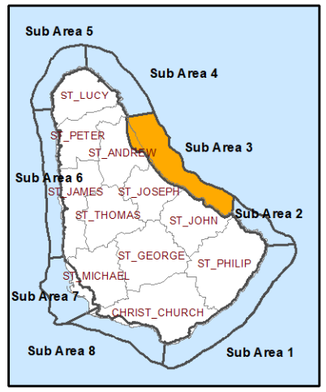
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid
  WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red:
  UTM Zone 21, WGS84 datum



SUB AREA 3 - SHEET A15

COASTAL ZONE MANAGEMENT SUB AREAS



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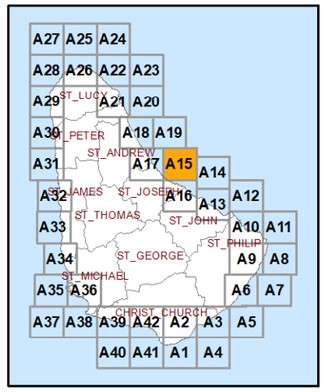


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

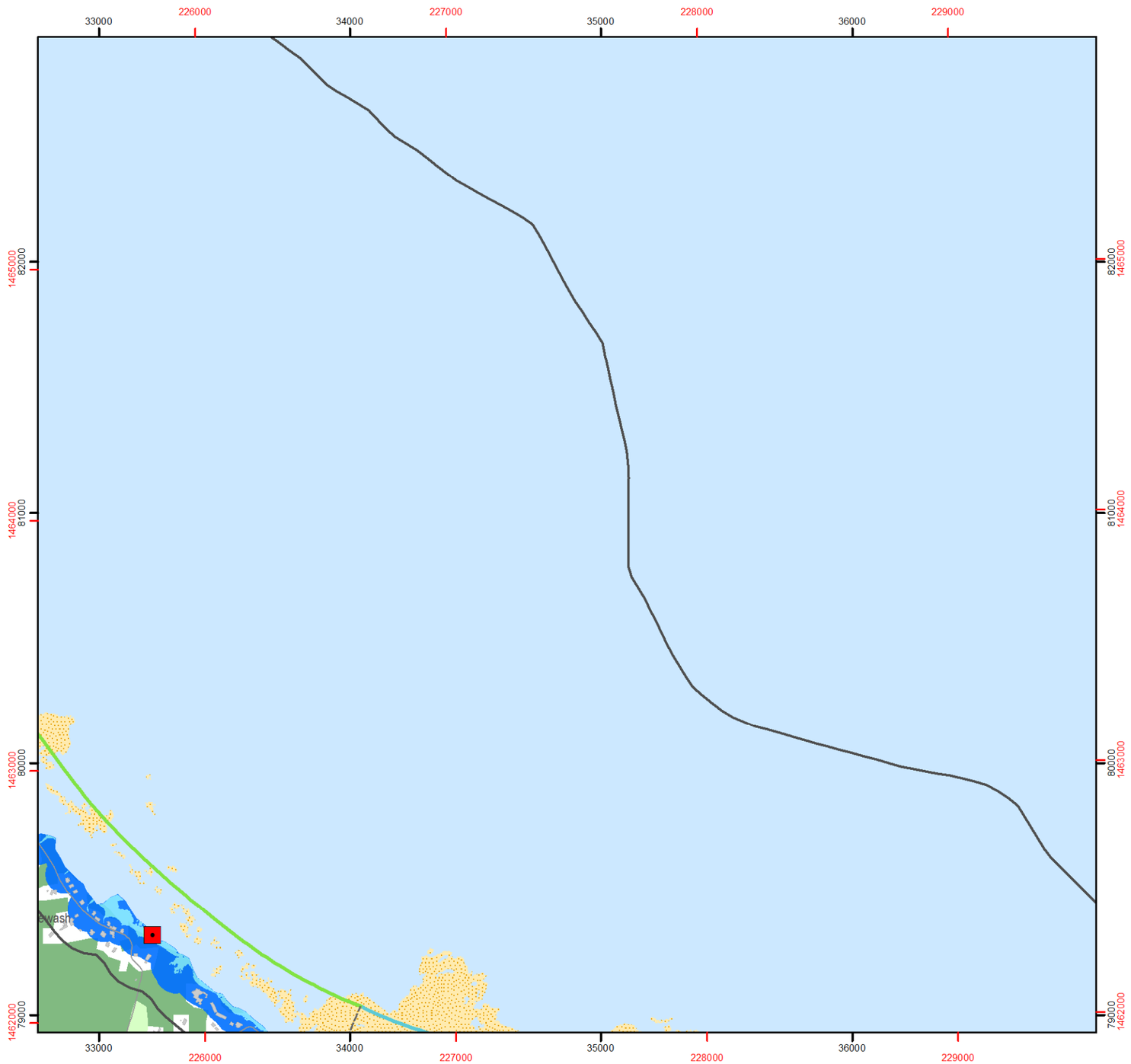
Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

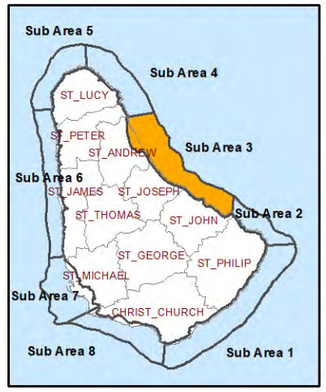
0 130 260 390 520 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 3 - SHEET A16

COASTAL ZONE MANAGEMENT SUB AREAS



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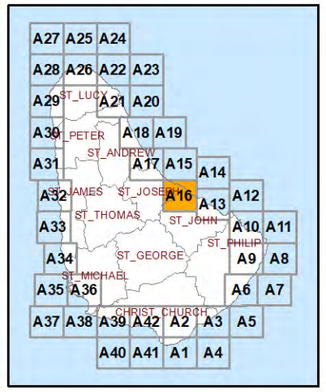


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve

Restricted areas

Planned Marine Areas

Environmental characteristics

Turtle nesting area

Coral reefs

Wetlands

Seagrass

Mangroves

Agriculture

Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)

Accreting Coast (Natural)

Stable Coast (Natural)

Dynamically Stable Coast (Natural)

Coastal Cliff

Eroding Coast (Engineered)

Accreting Coast (Engineered)

Stable Coast (Engineered)

Artificial Coast

Coastal classification division

Cliff failure

Very high

High

Medium

Low *(risk class)*

Flooding hazard

Storm surge 100 years

Storm surge + Sea Level Rise (IPCC 2019)

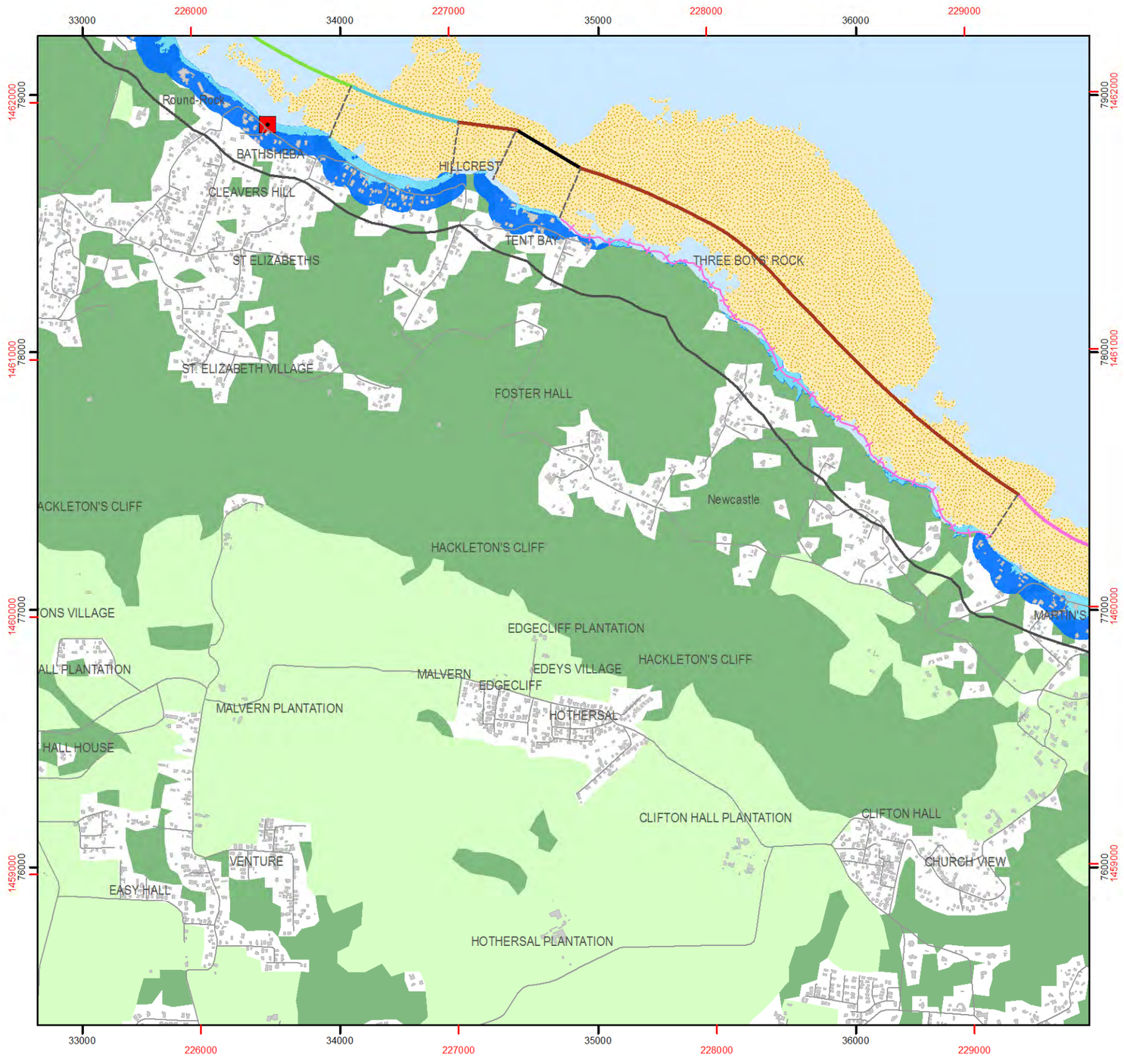
Tsunami 100 years

N

SCALE: 1:18,000

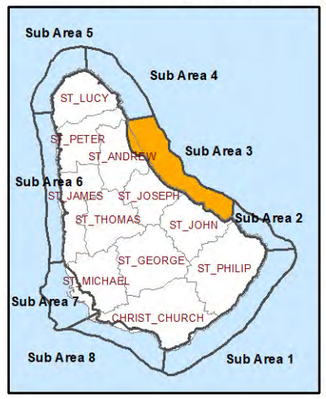
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 3 - SHEET A17

COASTAL ZONE MANAGEMENT SUB AREAS



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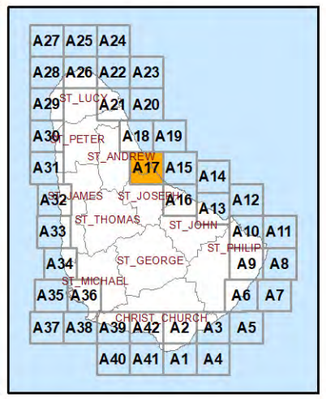


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

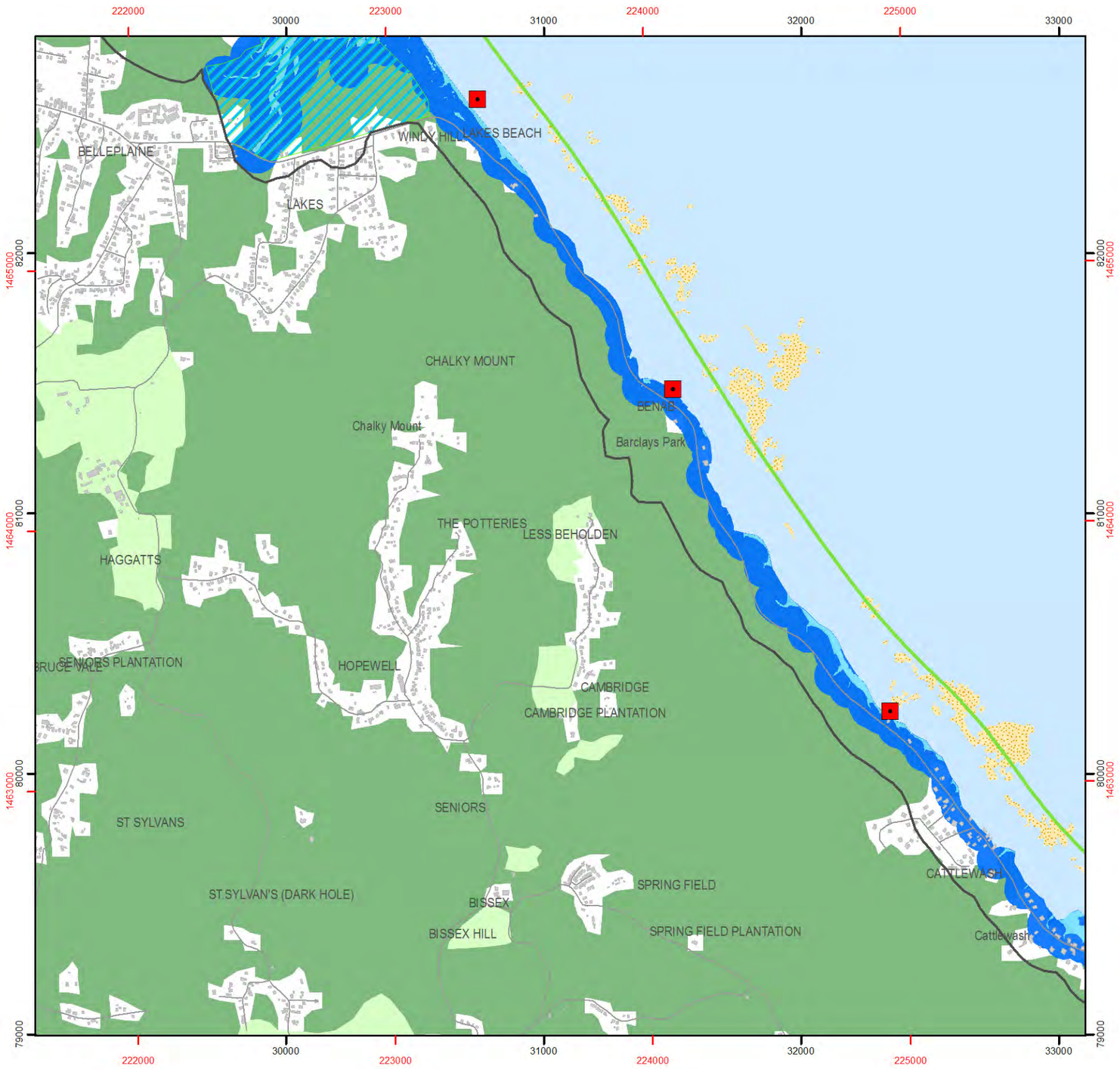
- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

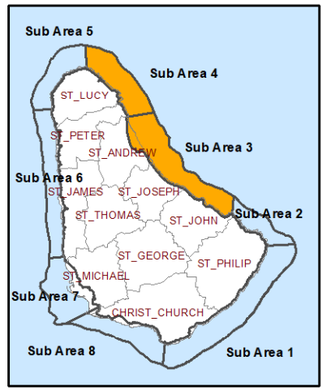
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREAS 3, 4 - SHEET A18

COASTAL ZONE MANAGEMENT SUB AREAS



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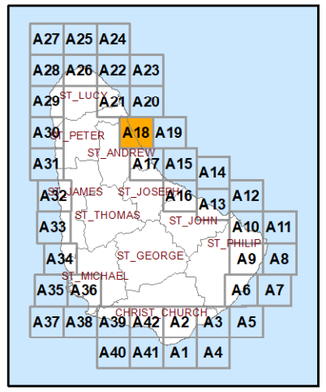


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area | Wetlands | Agriculture

Coral reefs | Seagrass | Natural vegetation

Mangroves

Coast and cliff classification

Eroding Coast (Natural) | Eroding Coast (Engineered)

Accreting Coast (Natural) | Accreting Coast (Engineered)

Stable Coast (Natural) | Stable Coast (Engineered)

Dynamically Stable Coast (Natural) | Artificial Coast

Coastal Cliff | Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years | Storm surge + Sea Level Rise (IPCC 2019)

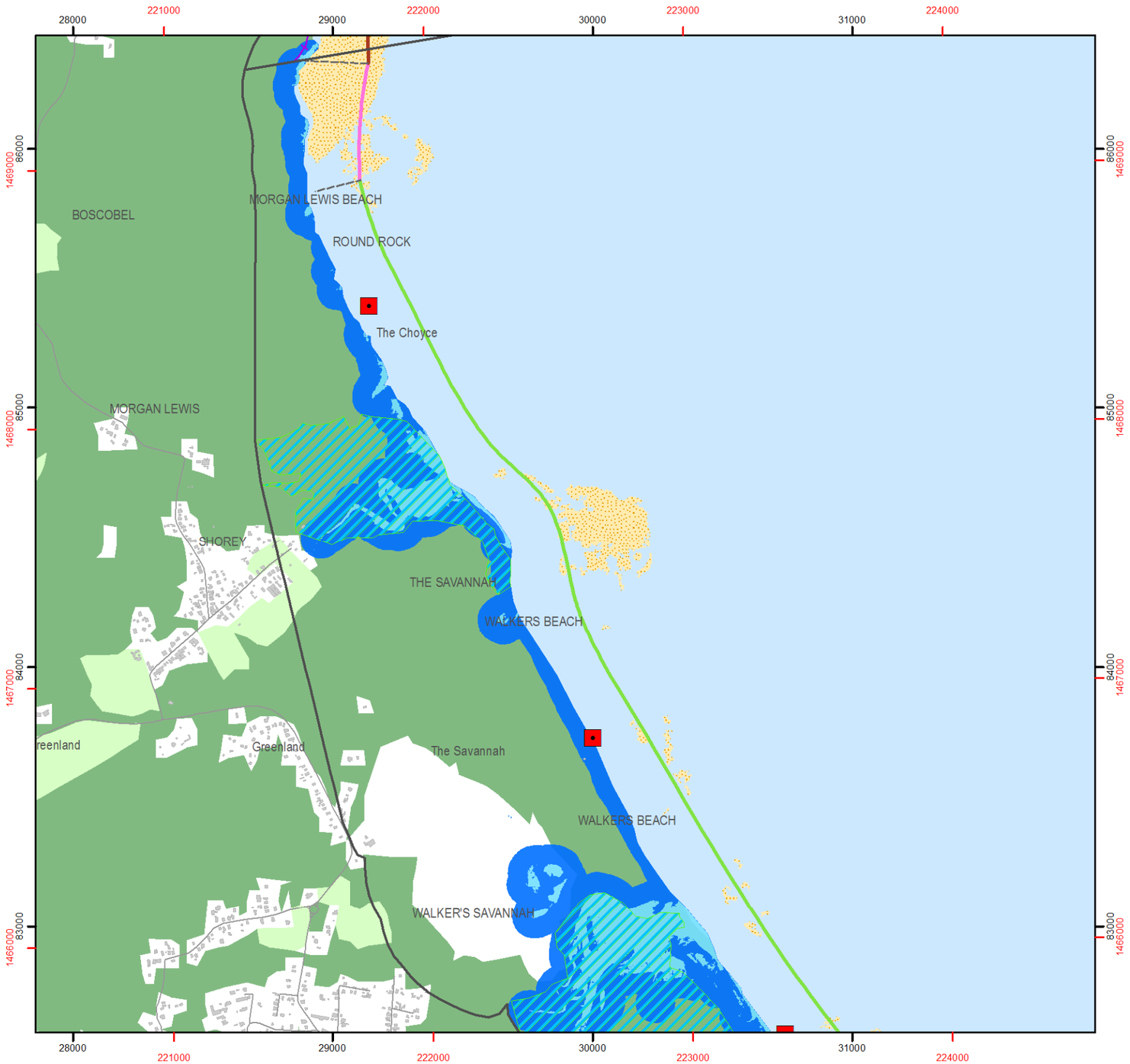
Tsunami 100 years

N

SCALE: 1:18,000

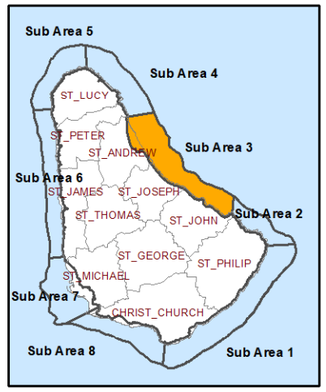
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 3 - SHEET A19

COASTAL ZONE MANAGEMENT SUB AREAS



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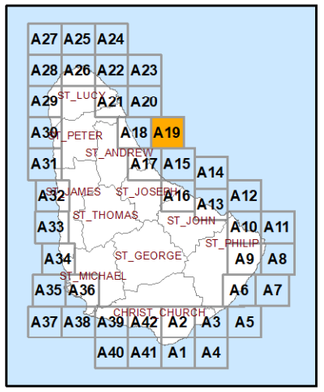


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Eroding Coast (Engineered)
Accreting Coast (Natural)
Accreting Coast (Engineered)
Stable Coast (Natural)
Stable Coast (Engineered)
Dynamically Stable Coast (Natural)
Artificial Coast
Coastal Cliff
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

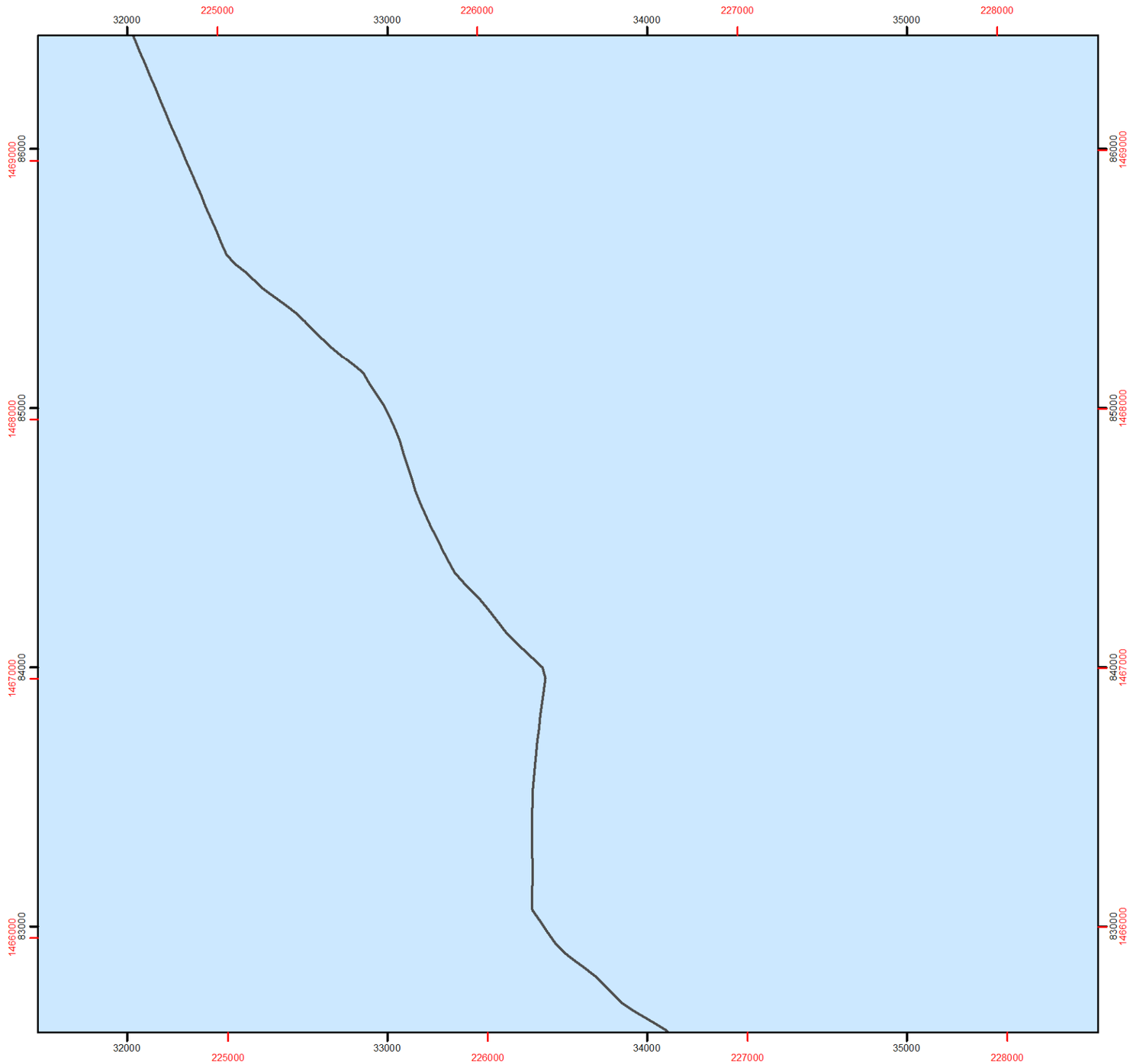
Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

0 125 250 375 500 mts

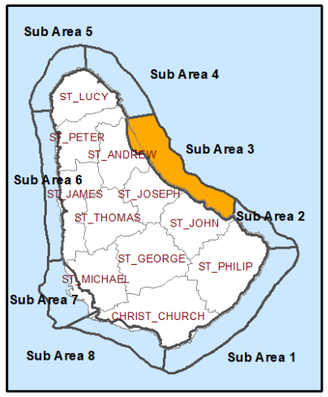
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



Setback maps of Sub-Area 3

SUB AREA 3 - SHEET A13

COASTAL ZONE MANAGEMENT SUB AREAS



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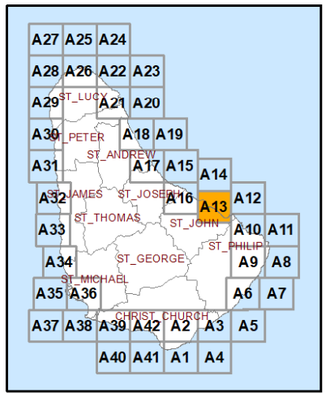


Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

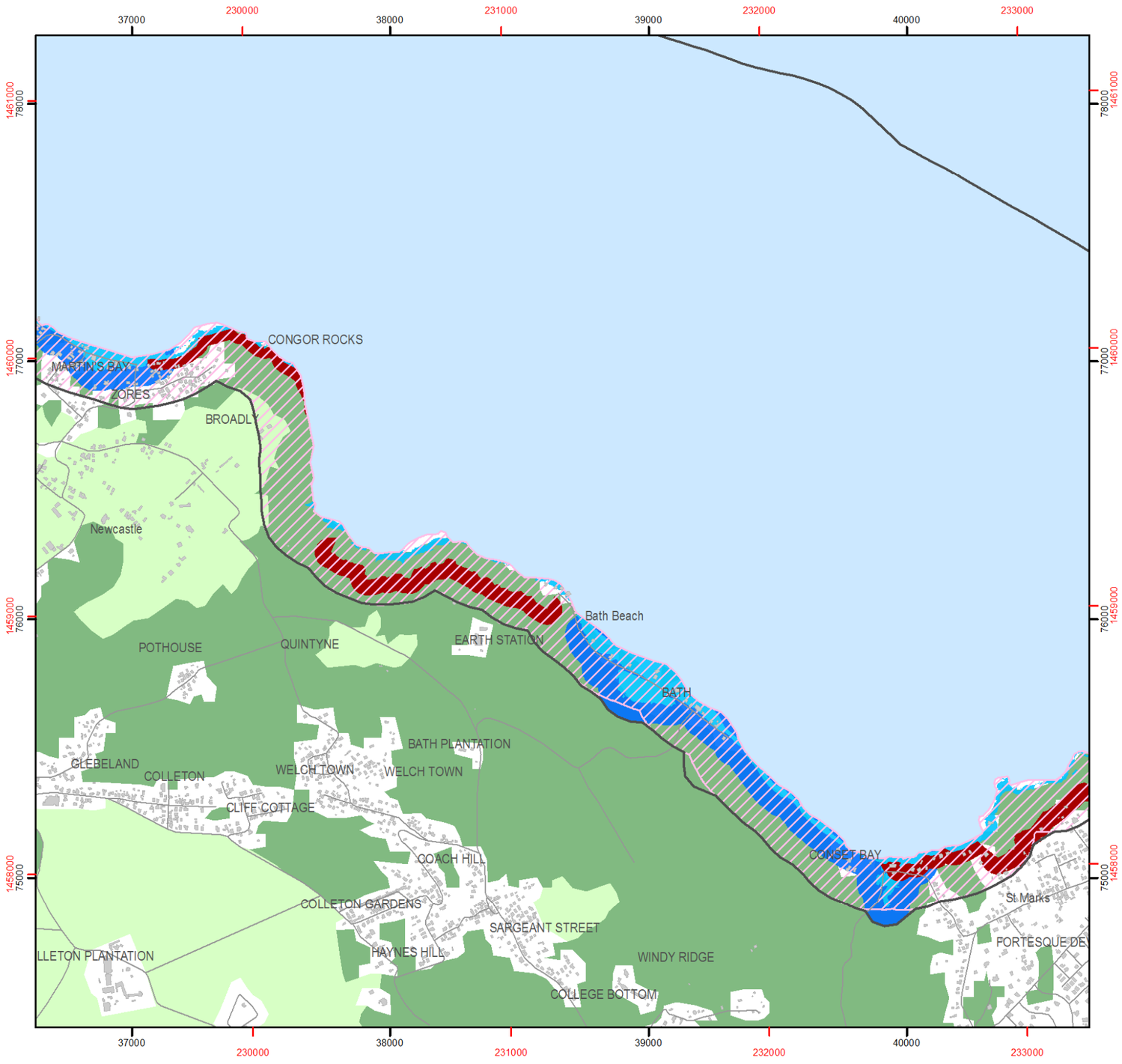
Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

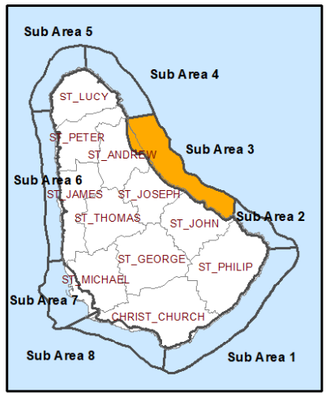
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 3 - SHEET A14

COASTAL ZONE MANAGEMENT SUB AREAS



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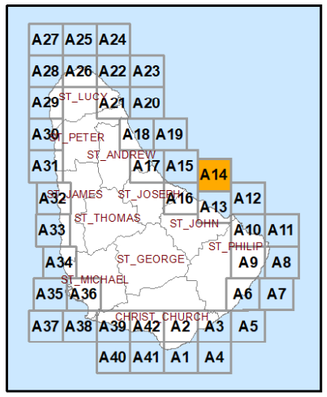
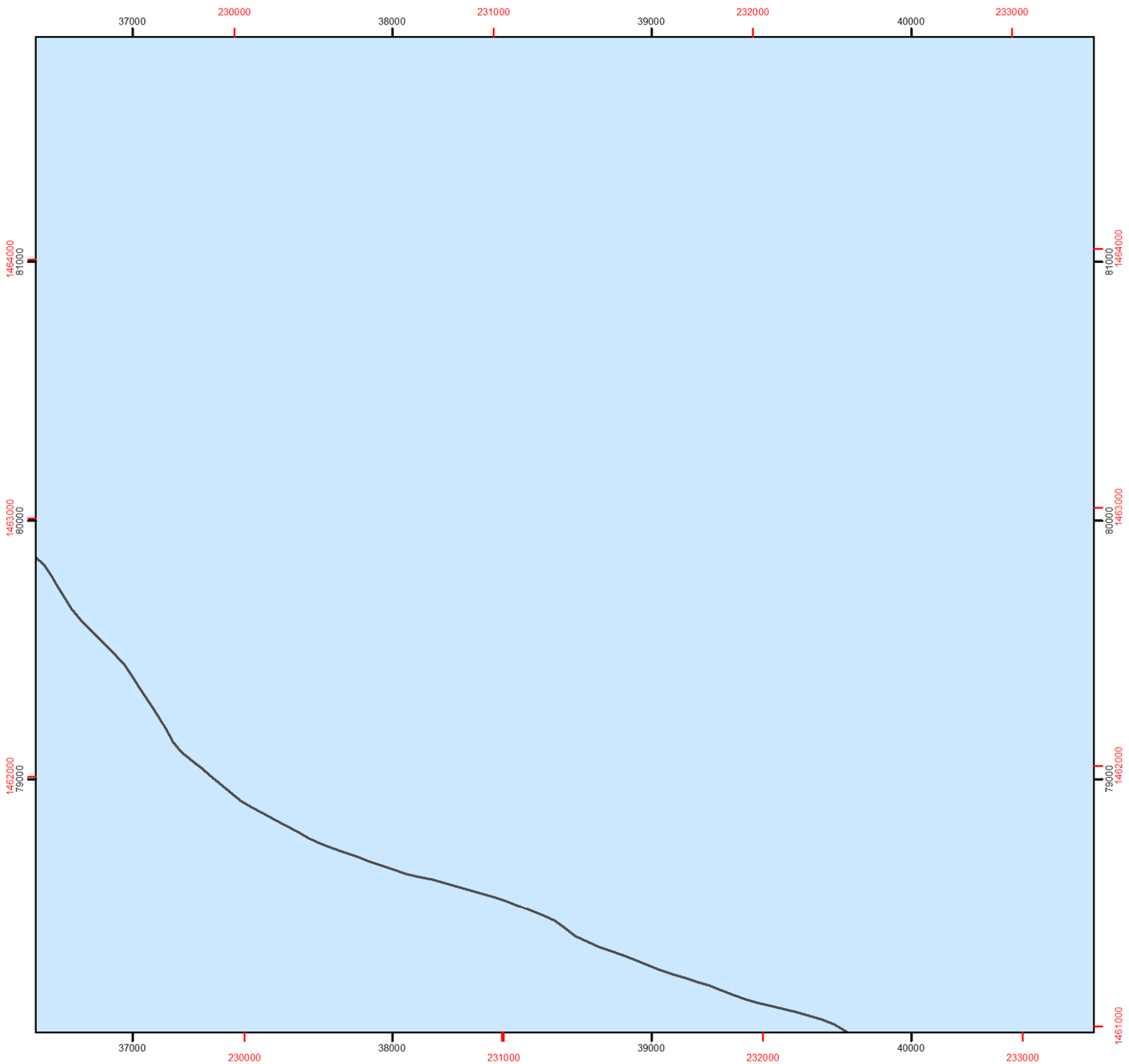




Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

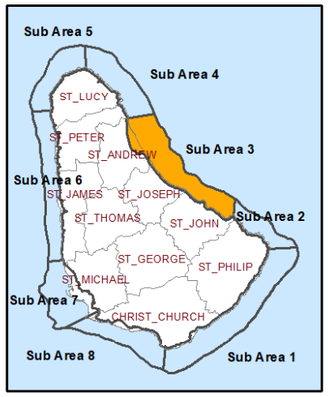
SCALE: 1:18,000

0 125 250 375 500 mts

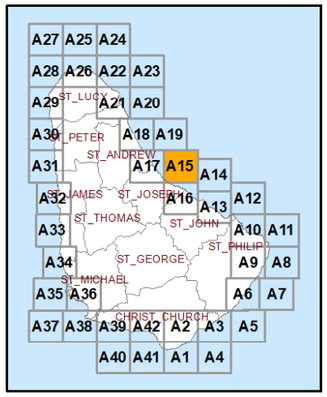
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

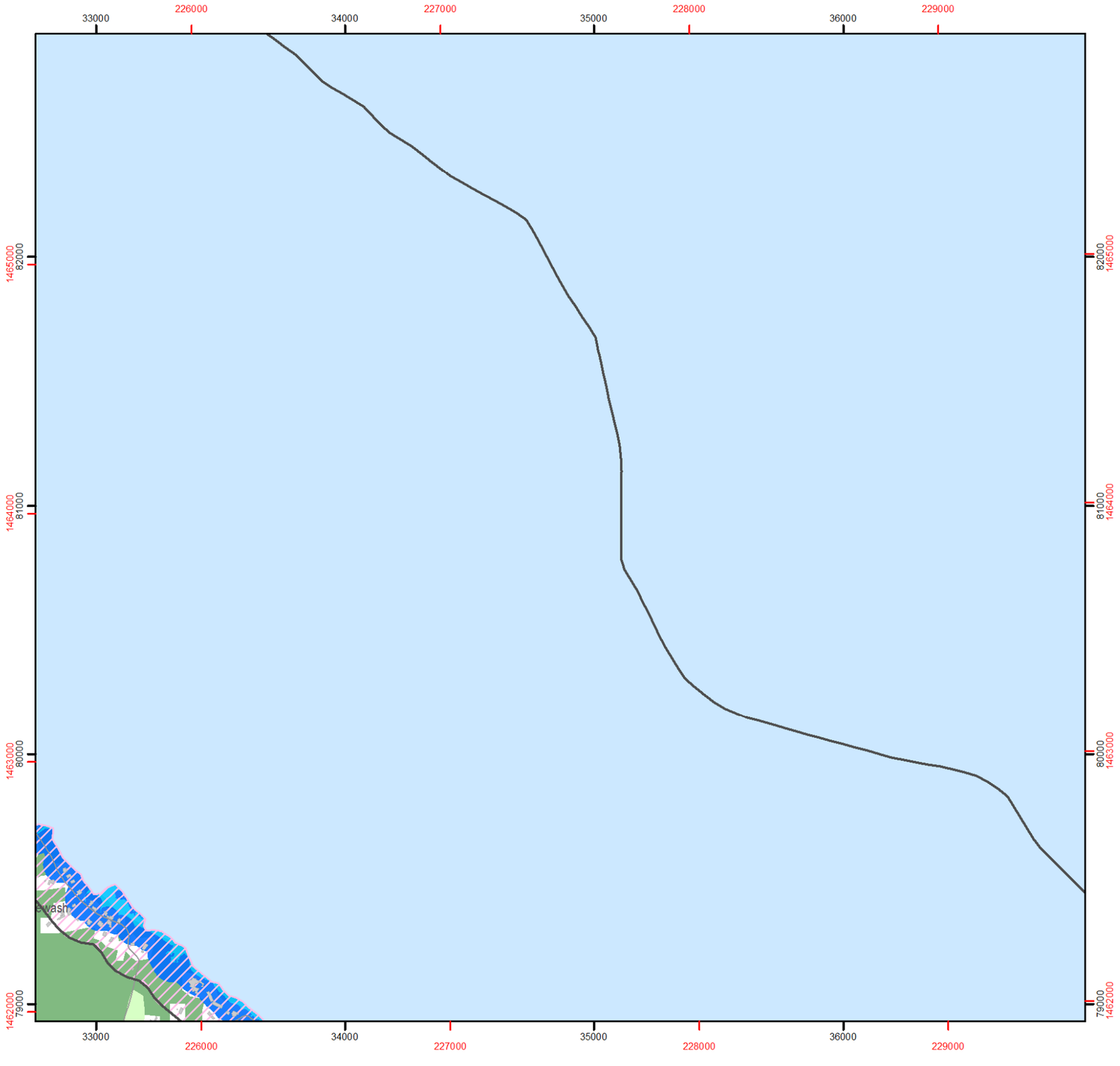
SUB AREA 3 - SHEET A15

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX





Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

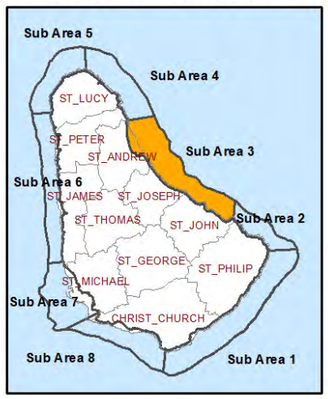
SCALE: 1:18,000

0 130 260 390 520 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 3 - SHEET A16

COASTAL ZONE MANAGEMENT SUB AREAS



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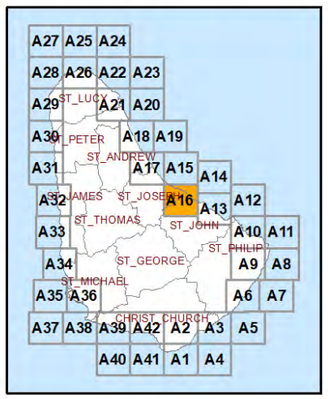

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

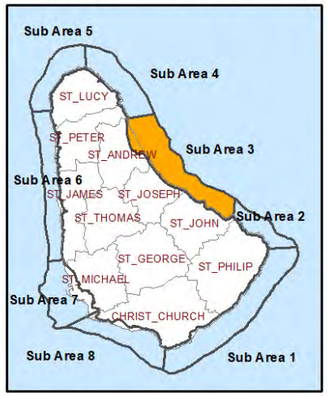
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 3 - SHEET A17

COASTAL ZONE MANAGEMENT SUB AREAS



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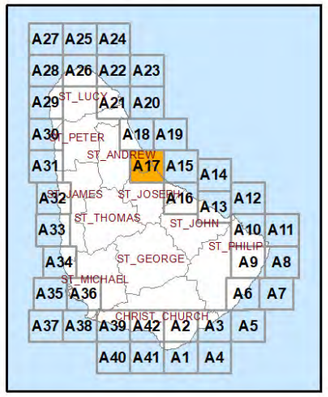

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

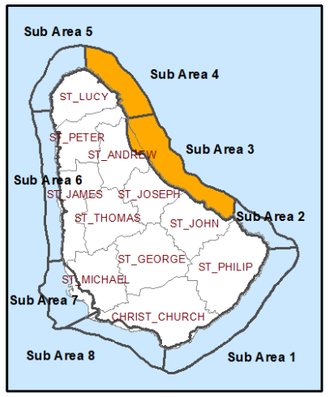
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREAS 3, 4 - SHEET A18

COASTAL ZONE MANAGEMENT SUB AREAS



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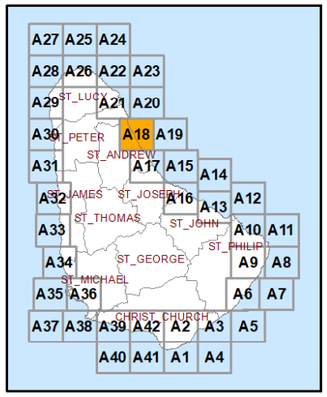

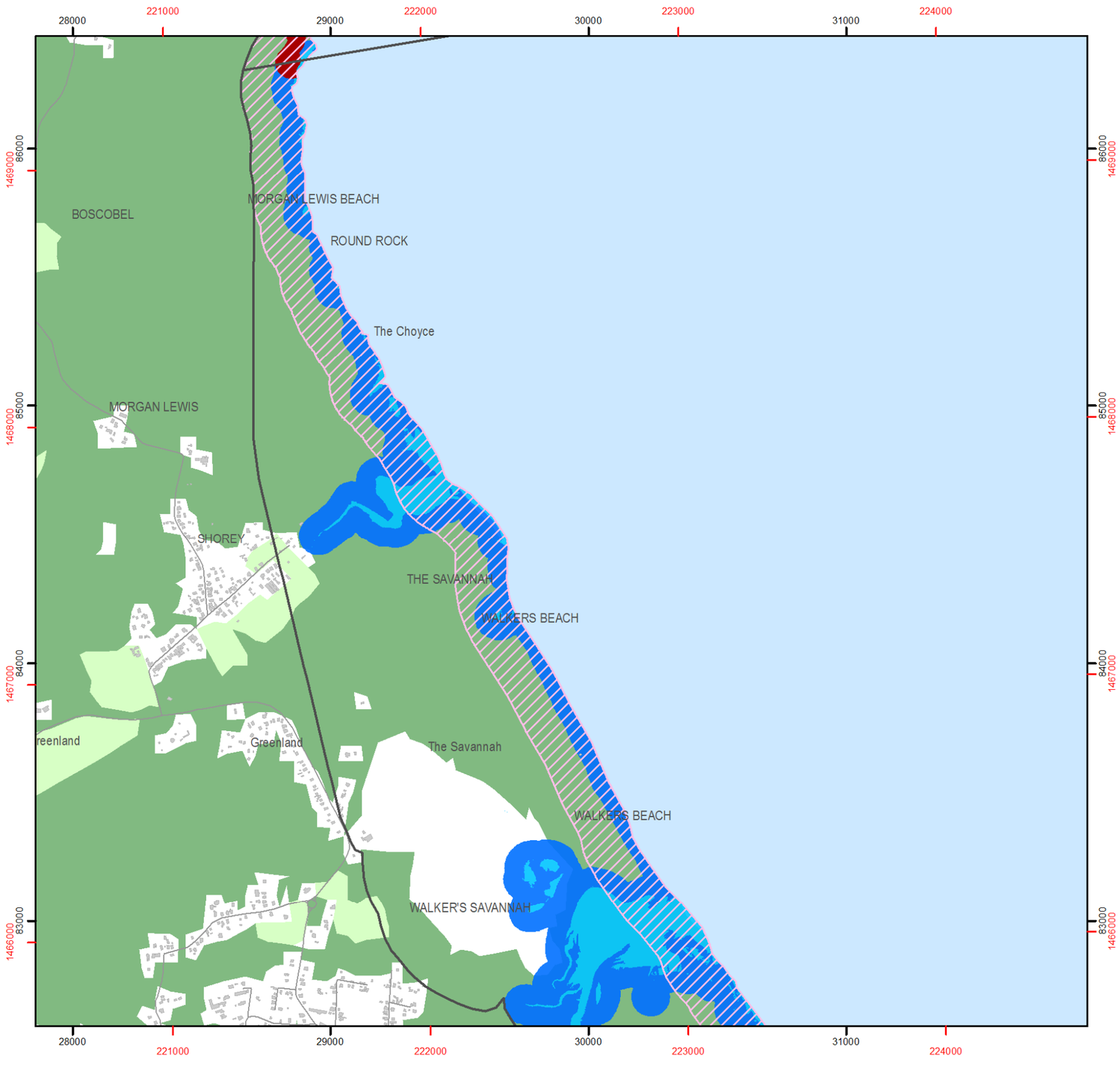

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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N

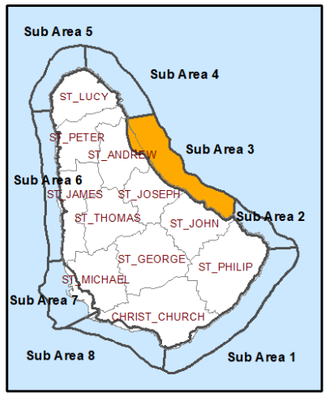
SCALE: 1:18,000

0 125 250 375 500 mts

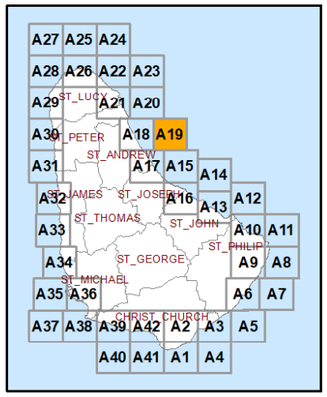
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

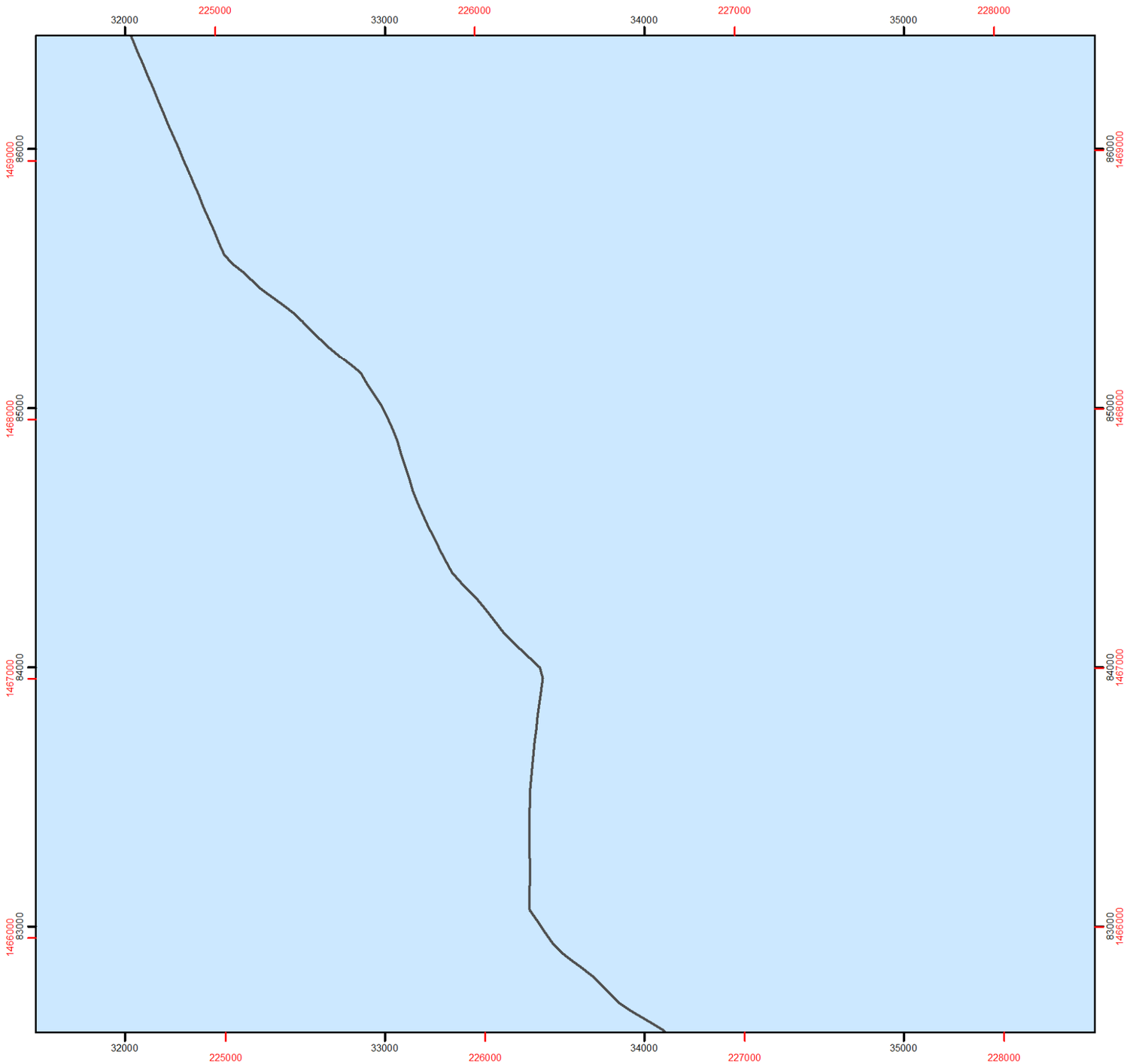
SUB AREA 3 - SHEET A19

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX





Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
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N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB-AREA 4: THE CHOYCE TO NORTH POINT

Main themes

WILDERNESS CHARACTER AND GEOLOGICAL INTEREST.
RISKS DUE TO CLIFF COLLAPSE.

Sub-Area description and context

The coastal stretch of Sub-Area 4 falls in totality within the National Park (Growth Management Framework - PDP, 2017). North Point lies at the boundary between the Caribbean and Atlantic coasts of Barbados on the northernmost point of the island. Apart from the main settlements of Boscobelle and Rockfield which are predominantly surrounded by rural areas with some agricultural land, there is limited built development within the Sub-Area. Popular yet informal recreation and relaxation tends to be focused at River Bay, Pico Teneriffe and Gay's Cove.

The Sub-Areas coastline is mostly very exposed to the elements and as a consequence it possesses a fairly barren cliff-top landscape. The coastal scenery is characterised by impressive high cliffs that are interspersed by a number of small bays and pocket beaches. All cliff classification “types” in Barbados are represented within this Sub-Area. The nearshore environment is comprised of coral rubble, algal and gorgonian pavements. Further offshore, in the vicinity of The Choyce, a large marine “canyon” acts as a sediment sink, trapping material that is being transported by currents either southwards from North Point, or northwards from Bathsheba.

Detailed Sub-Area scale information is presented within subsection “Description maps of Sub-Area 4” that includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 4 is exposed to.

Figure D.5. Geological formations at Little Bay.

Cliff collapse risk assessment results (obtained from the CRMP study) indicate that approximately the half of the coastline is classified as being medium to very high risk, with the highest risk areas being located between The Choyce and Rocky Bay. Coastal erosion is especially significant close by North Point Surf resort.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Presence of unique geological formations. • Important ecological and landscape value. • Presence of sargassum. • Potential for tourism and recreational activities. • Cliff collapse risk.	• Protect geological formations and coastal landscape (i.e. Little Bay). • Enforce setbacks to ensure safety of people, buildings and infrastructures; and to retain the wild and rugged character of the coastline. • Enhance heritage tourism that benefits local communities, is economically viable, and is compatible with the environmental quality of the area. • Provide opportunities for informal recreation and promote an understanding and enjoyment of the special qualitie of the National Park.

Development Planning and Setbacks at Sub-Area scale

Setback recommendations are presented within a collection of maps provided in the sub-section entitled *"Setback maps of Sub-Area 4"*. These recommendations adhere closely to the National Guidance "Development Planning and Setbacks" (see section C3) for Sub-Area 4. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000.

This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) applies only to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

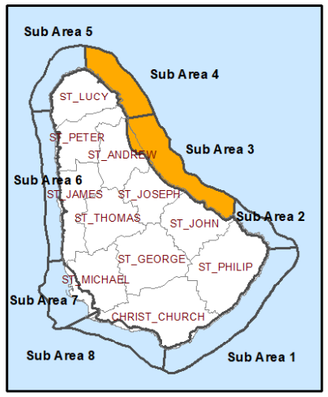
TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
Development Planning and Setbacks	4S1	Prepare and distribute guidelines to enforce cliff collapse Setback in Sub-Area 4 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate	Guidelines based on GSI.	Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Development Planning and Setbacks	4S2	Organize meetings with key stakeholders to raise awareness on coastal resources and landscape.	CZMU	TCPDO, NCC, Developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	4BIO1	Elaborate a plan to improve geological heritage awareness.	CZMU		Medium term, immediate	For instance, create a coastal geology trail, improve geological heritage education, and enhance viewing areas and access to these at Choyce/Pico Tenerife.	Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	4BIO2	Elaborate guidelines for removal of sargassum in rocky/cliff areas, in collaboration with NCC.	CZMU	NCC	Medium term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	4PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	4PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased

Table D.4. Action brief for Sub-Area 4.

Description maps of Sub-Area 4

SUB AREAS 3, 4 - SHEET A20

COASTAL ZONE MANAGEMENT SUB AREAS



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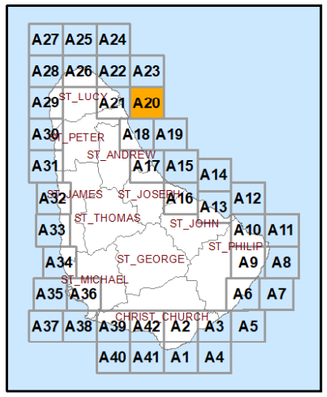
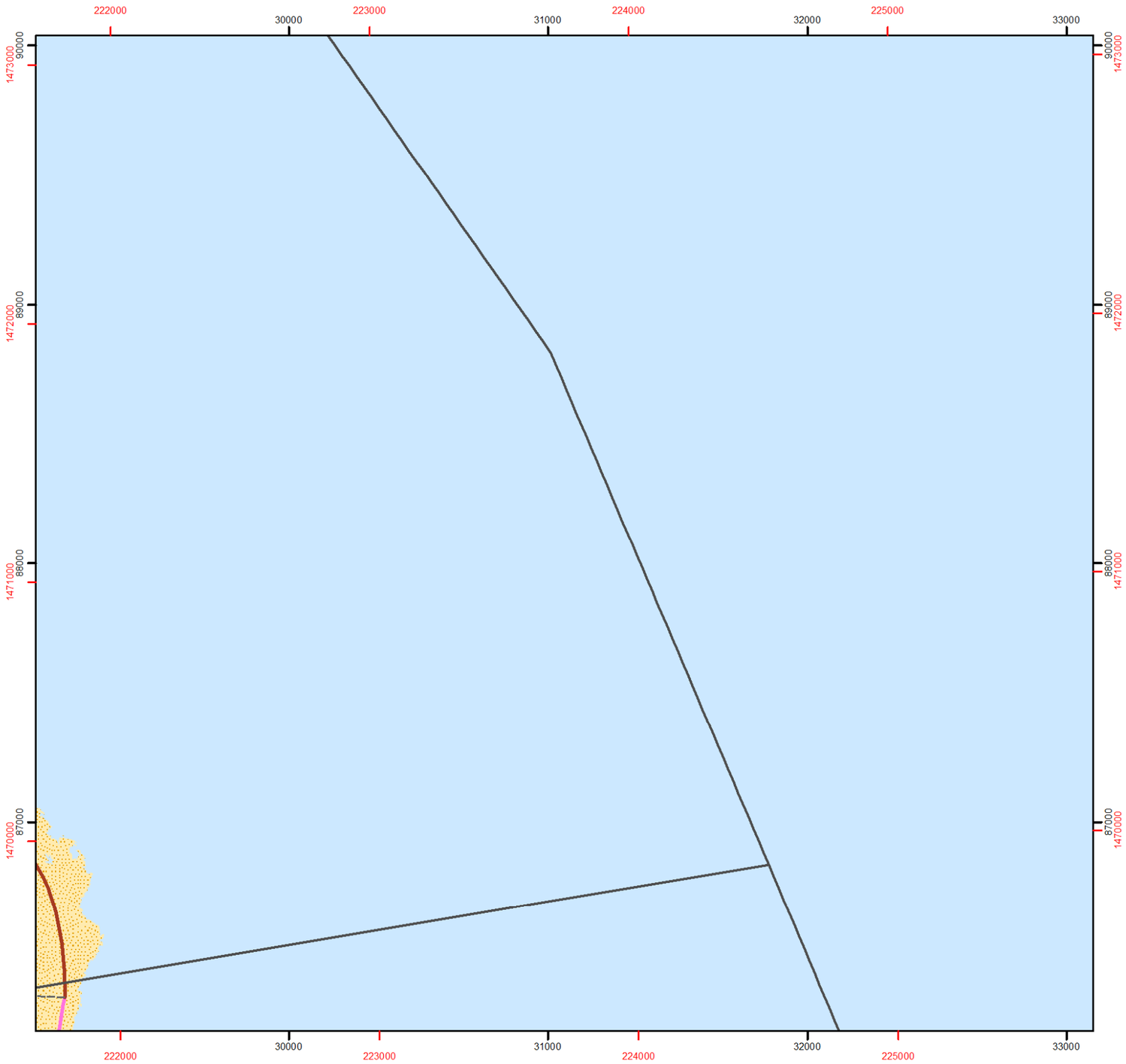




Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

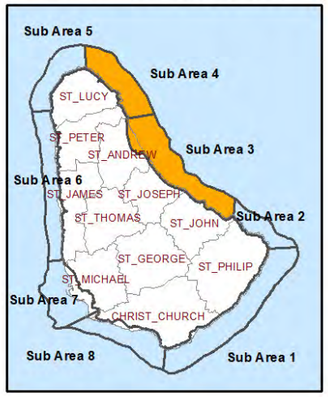
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREAS 3, 4 - SHEET A21

COASTAL ZONE MANAGEMENT SUB AREAS



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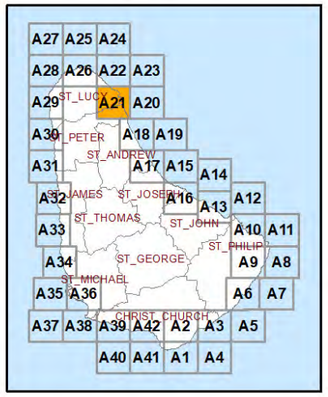

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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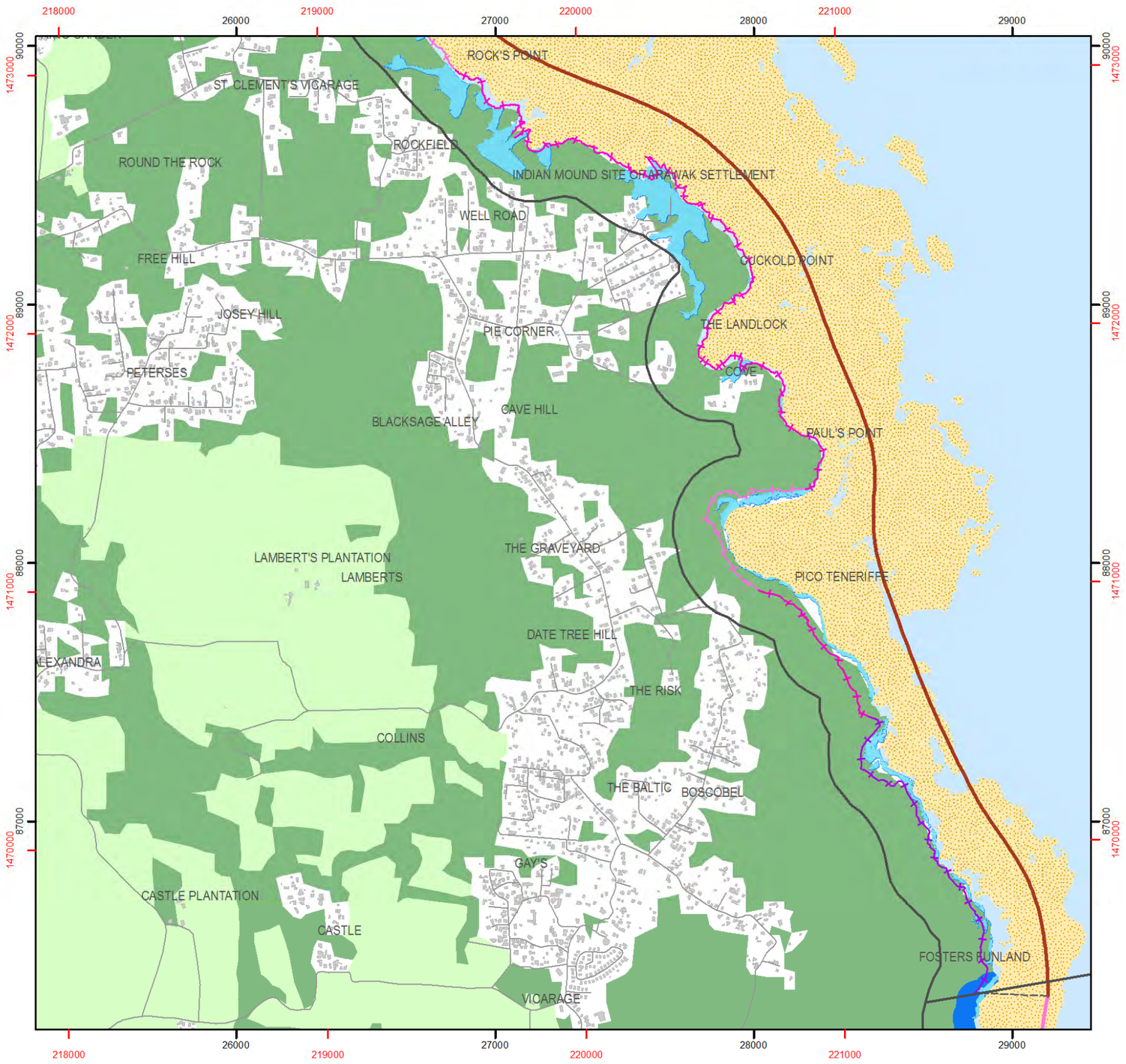
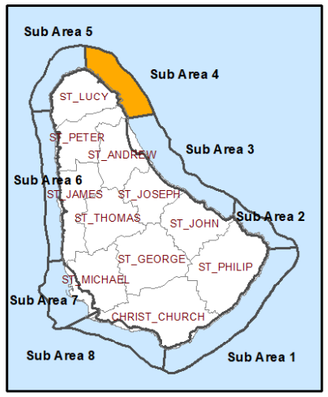
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 4 - SHEET A22

COASTAL ZONE MANAGEMENT SUB AREAS



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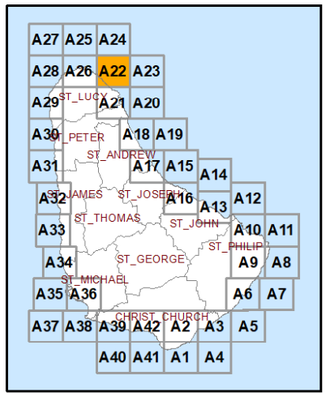

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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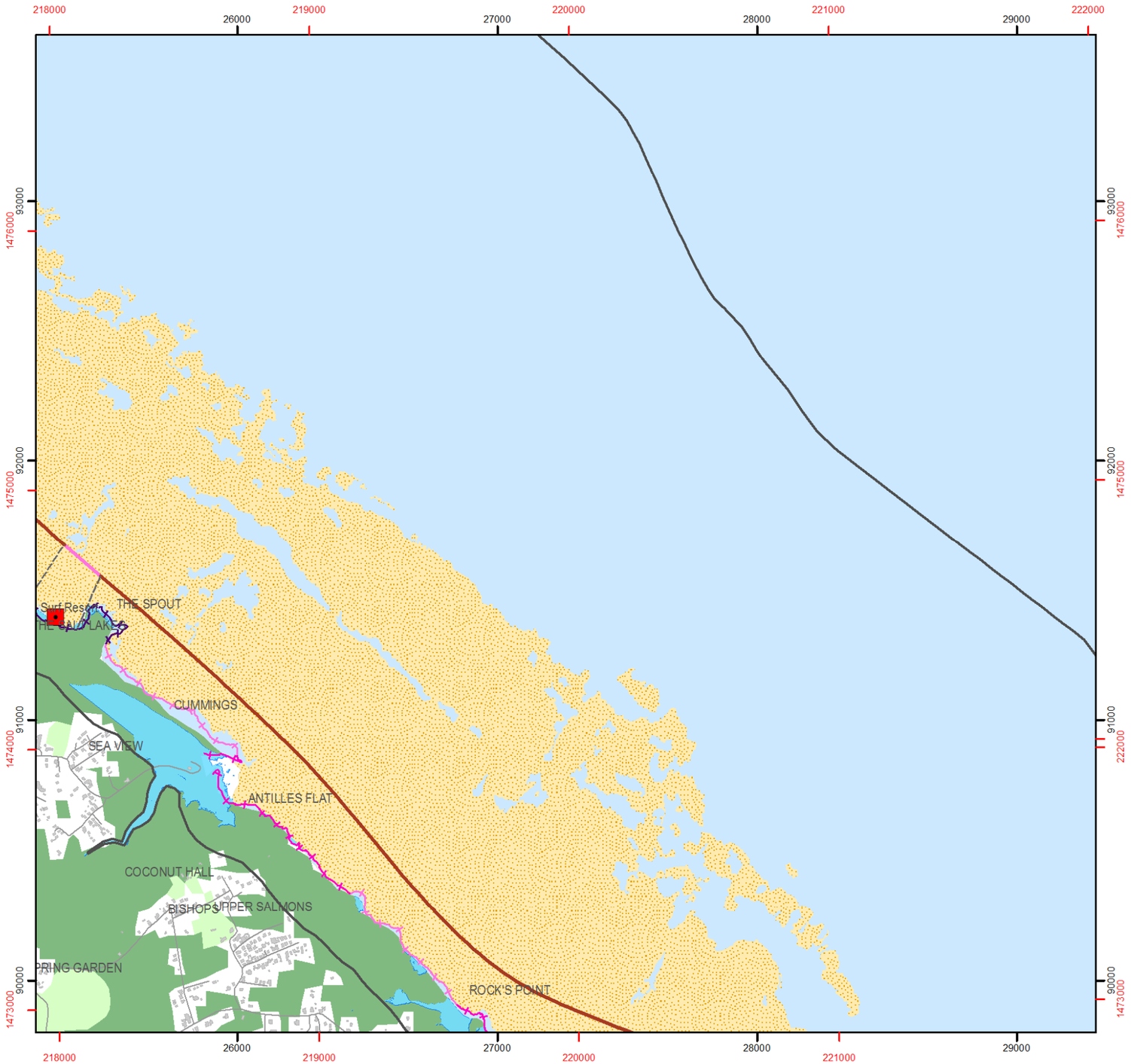
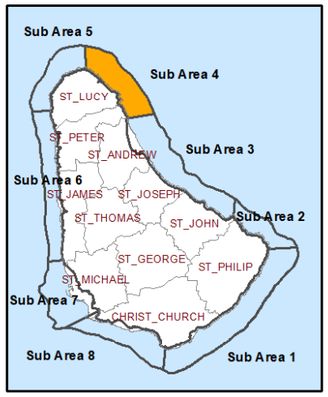
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 4 - SHEET A23

COASTAL ZONE MANAGEMENT SUB AREAS



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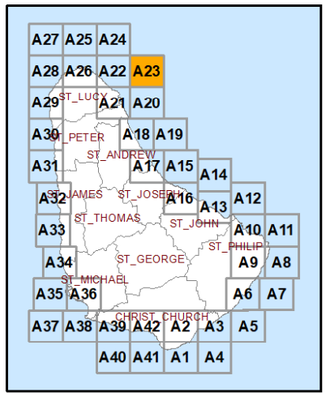


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

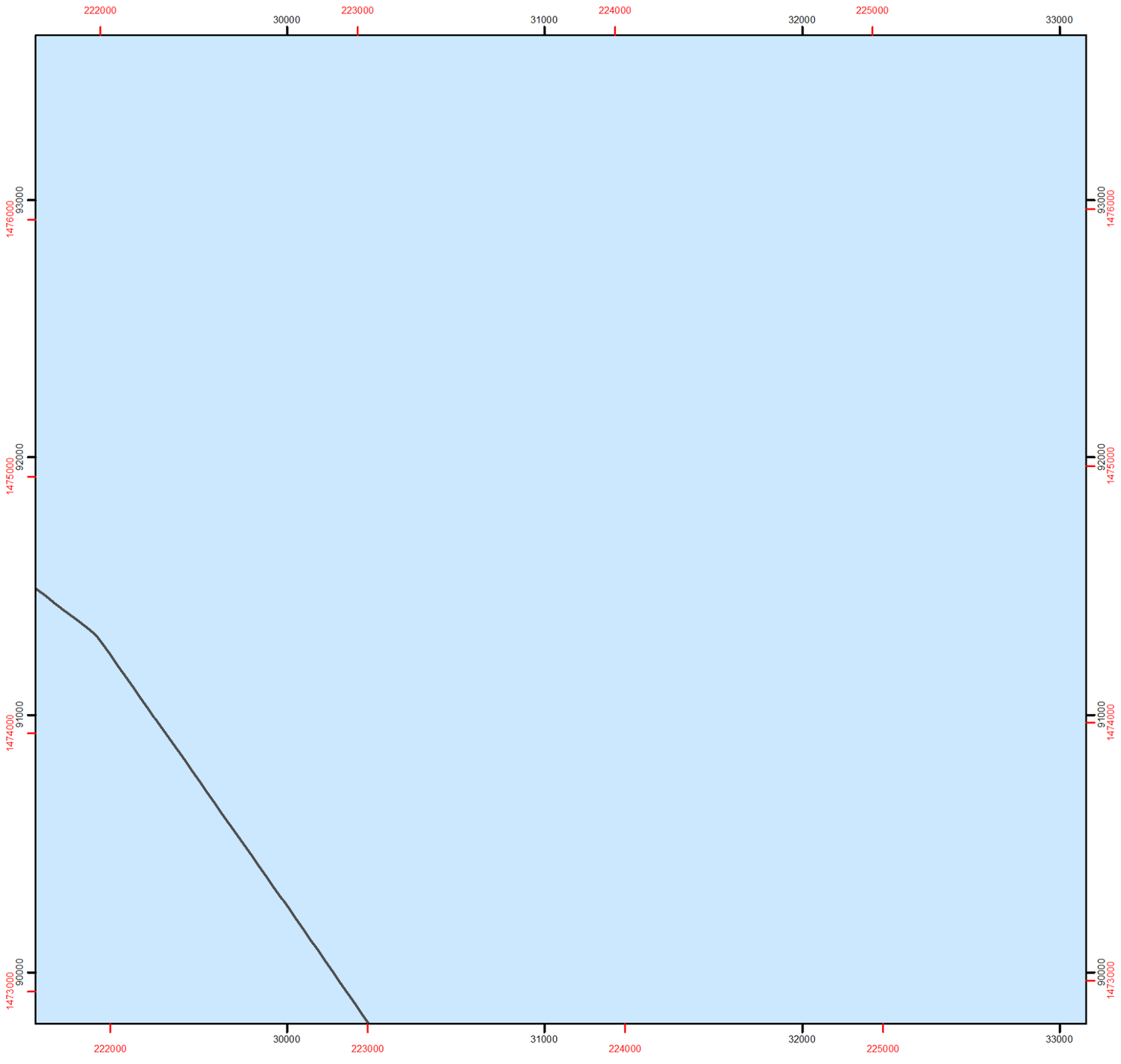
Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

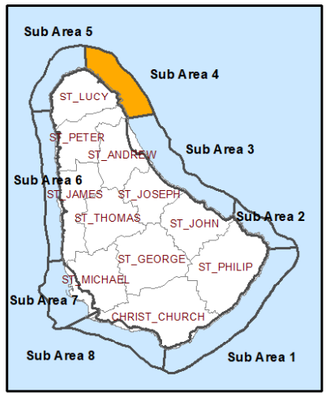
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid
  WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red:
  UTM Zone 21, WGS84 datum



SUB AREA 4 - SHEET A24

COASTAL ZONE MANAGEMENT SUB AREAS



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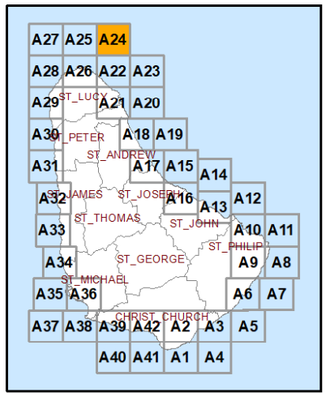

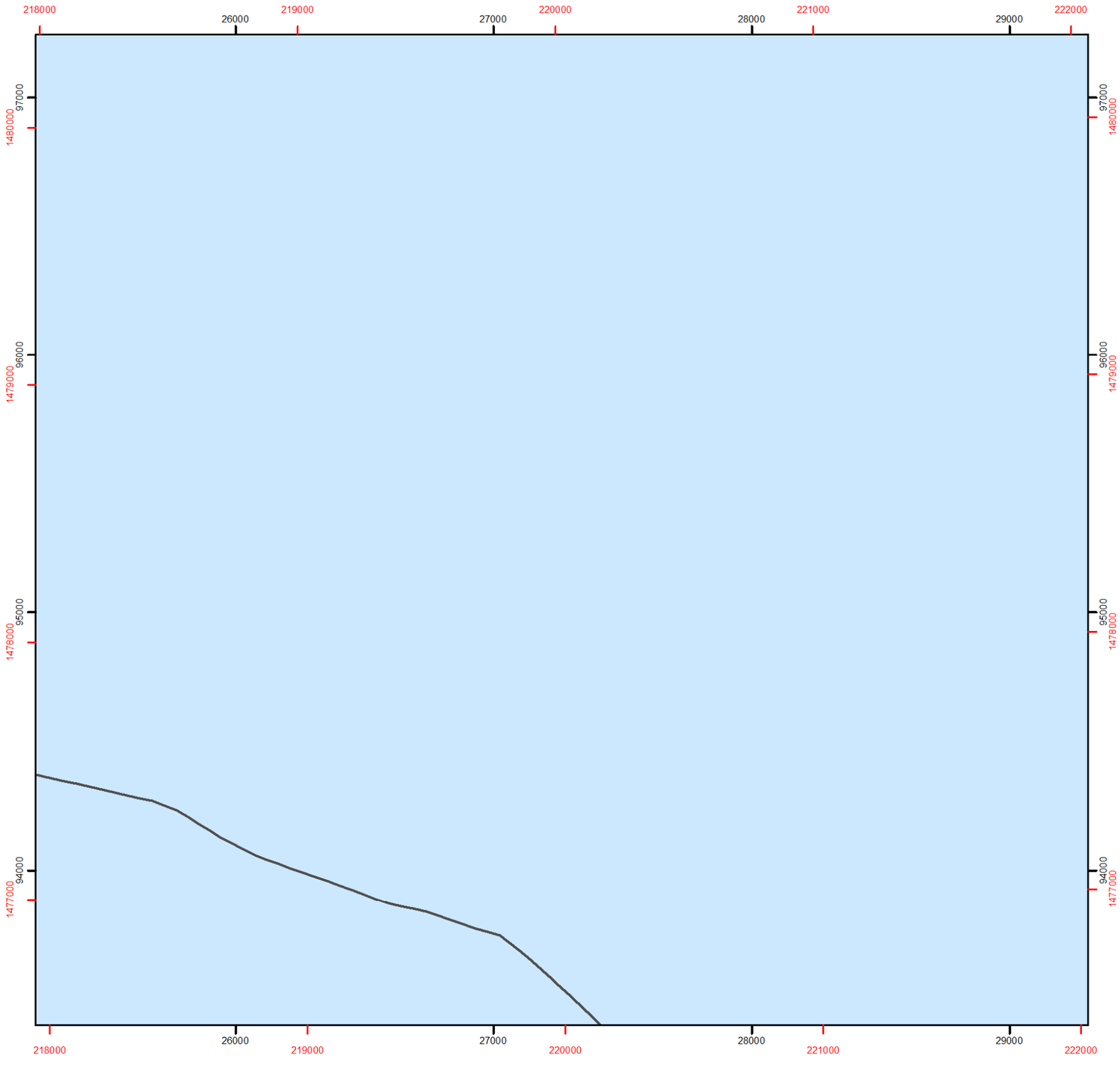

Coastal Zone Management Area

Natural and restricted areas

- Folkstone reserve
- Restricted areas
- Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
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- Artificial Coast
- Coastal classification division

Cliff failure

- Very high
- High
- Medium
- Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

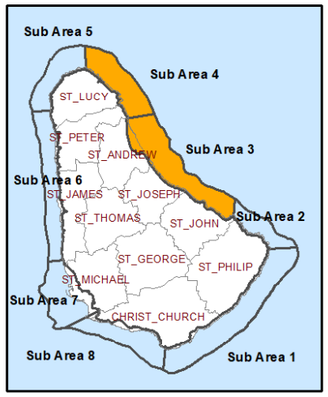
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid
  WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red:
  UTM Zone 21, WGS84 datum

Setback maps of Sub-Area 4

SUB AREAS 3, 4 - SHEET A20

COASTAL ZONE MANAGEMENT SUB AREAS



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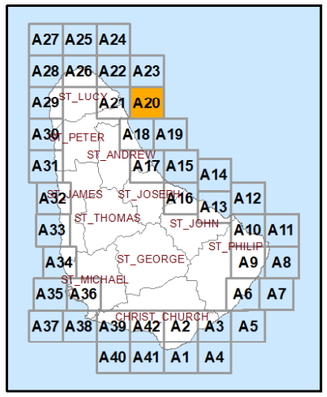
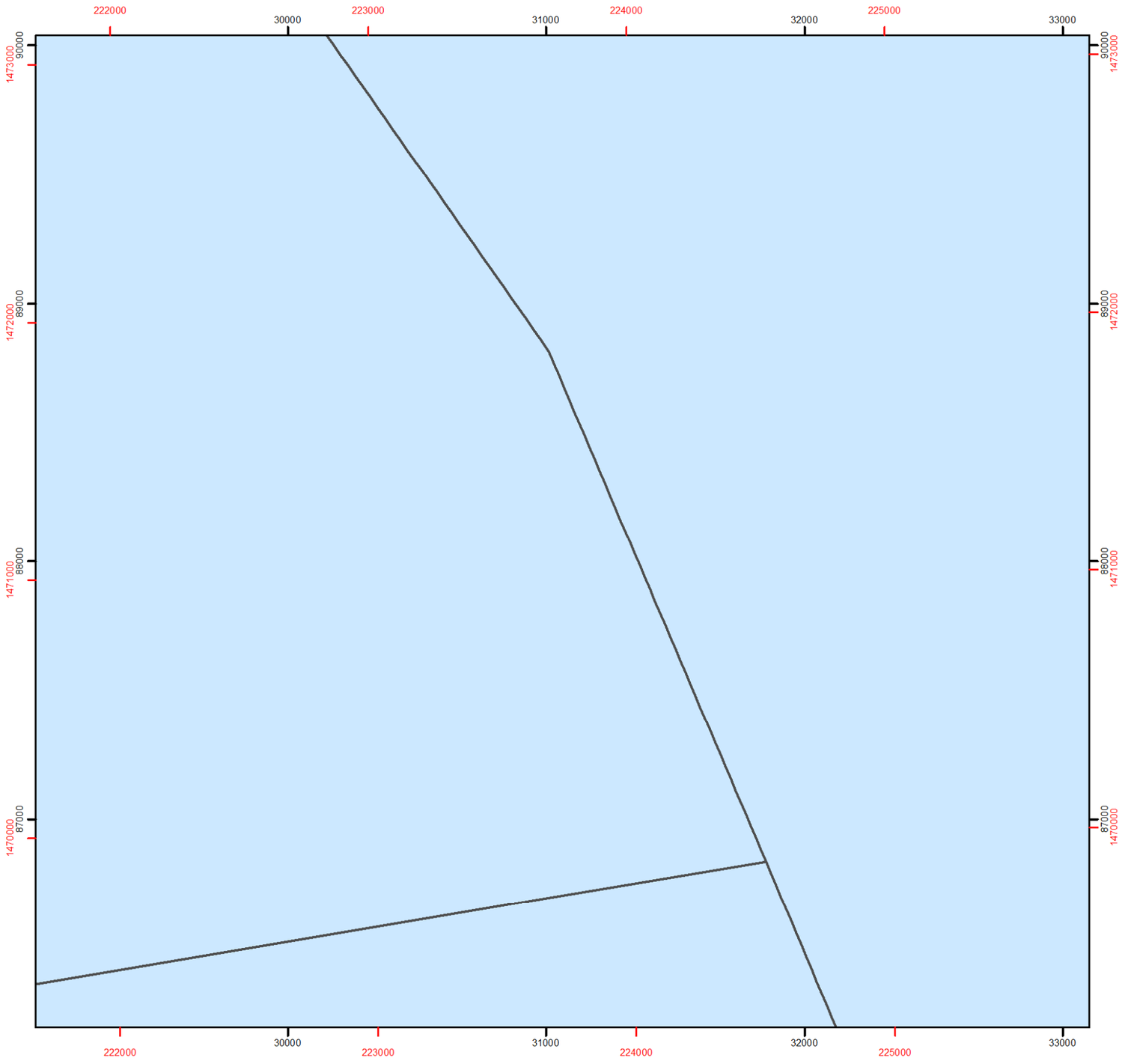




Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

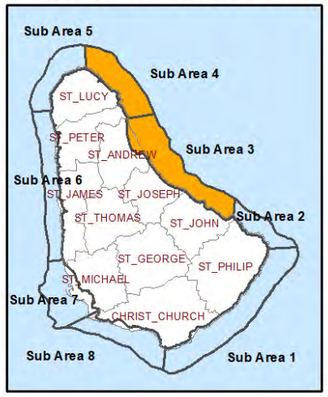
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREAS 3, 4 - SHEET A21

COASTAL ZONE MANAGEMENT SUB AREAS



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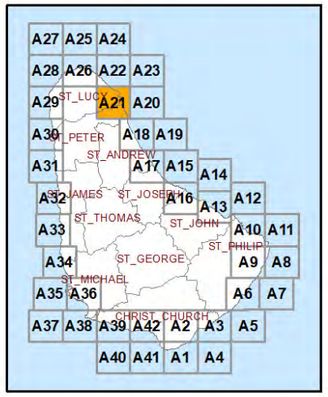

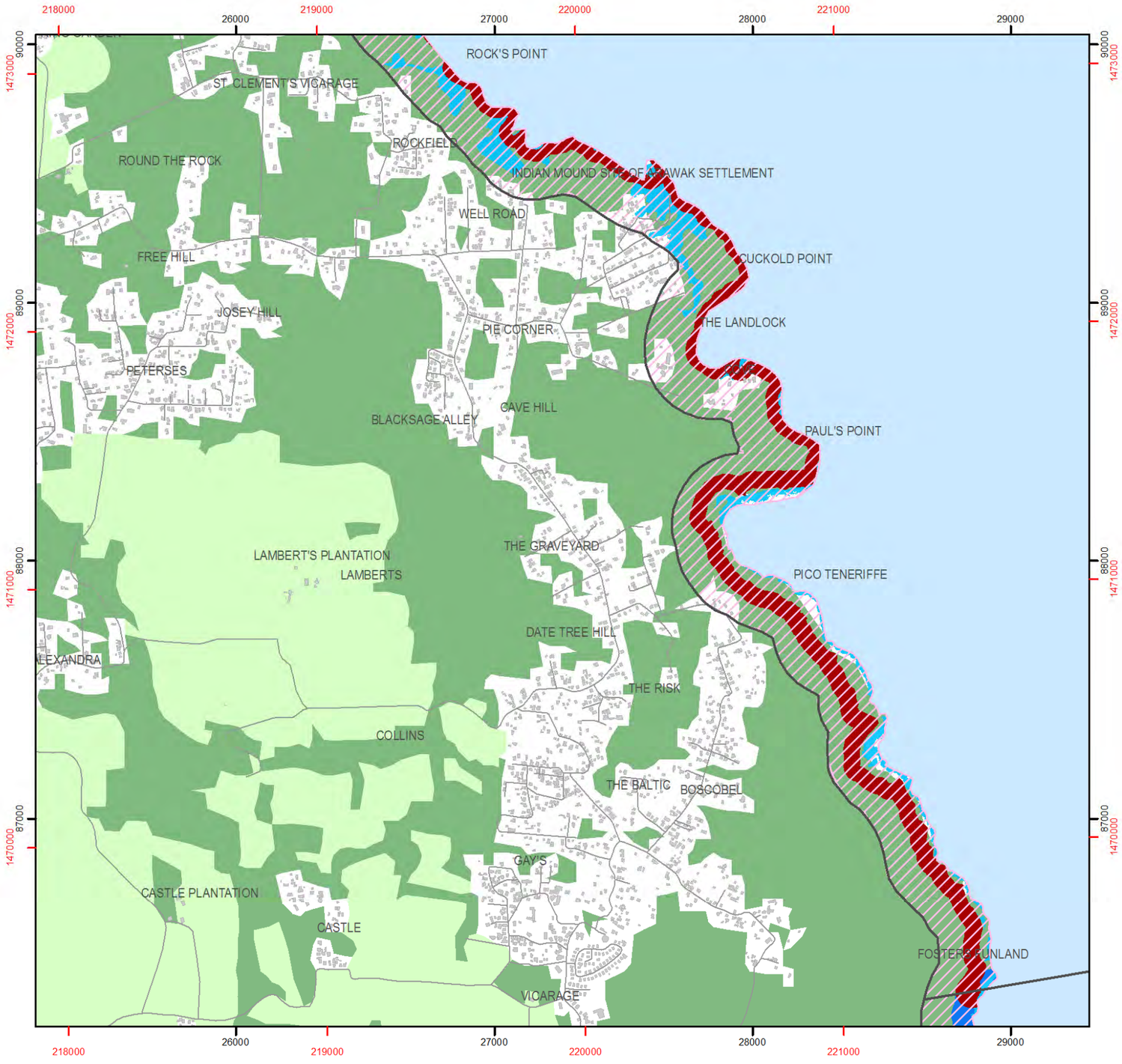

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

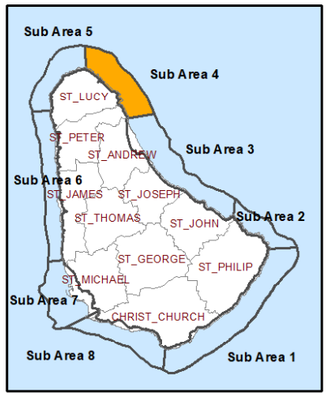
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 4 - SHEET A22

COASTAL ZONE MANAGEMENT SUB AREAS



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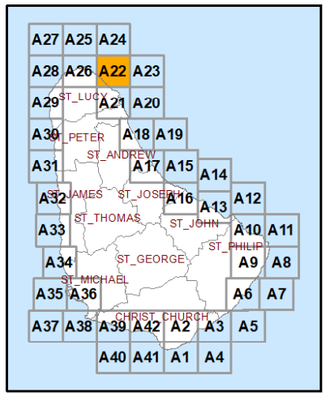

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
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N

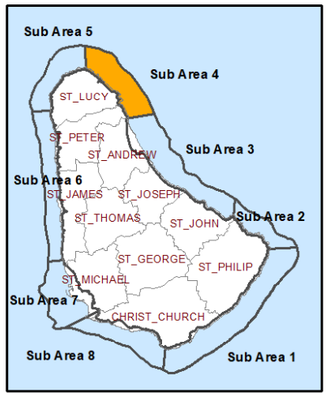
SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREA 4 - SHEET A23

COASTAL ZONE MANAGEMENT SUB AREAS



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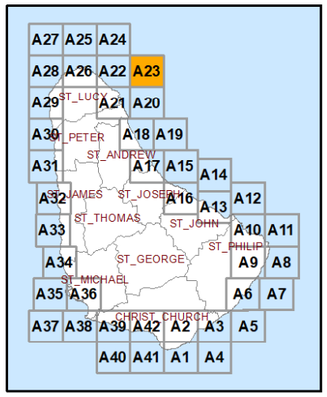

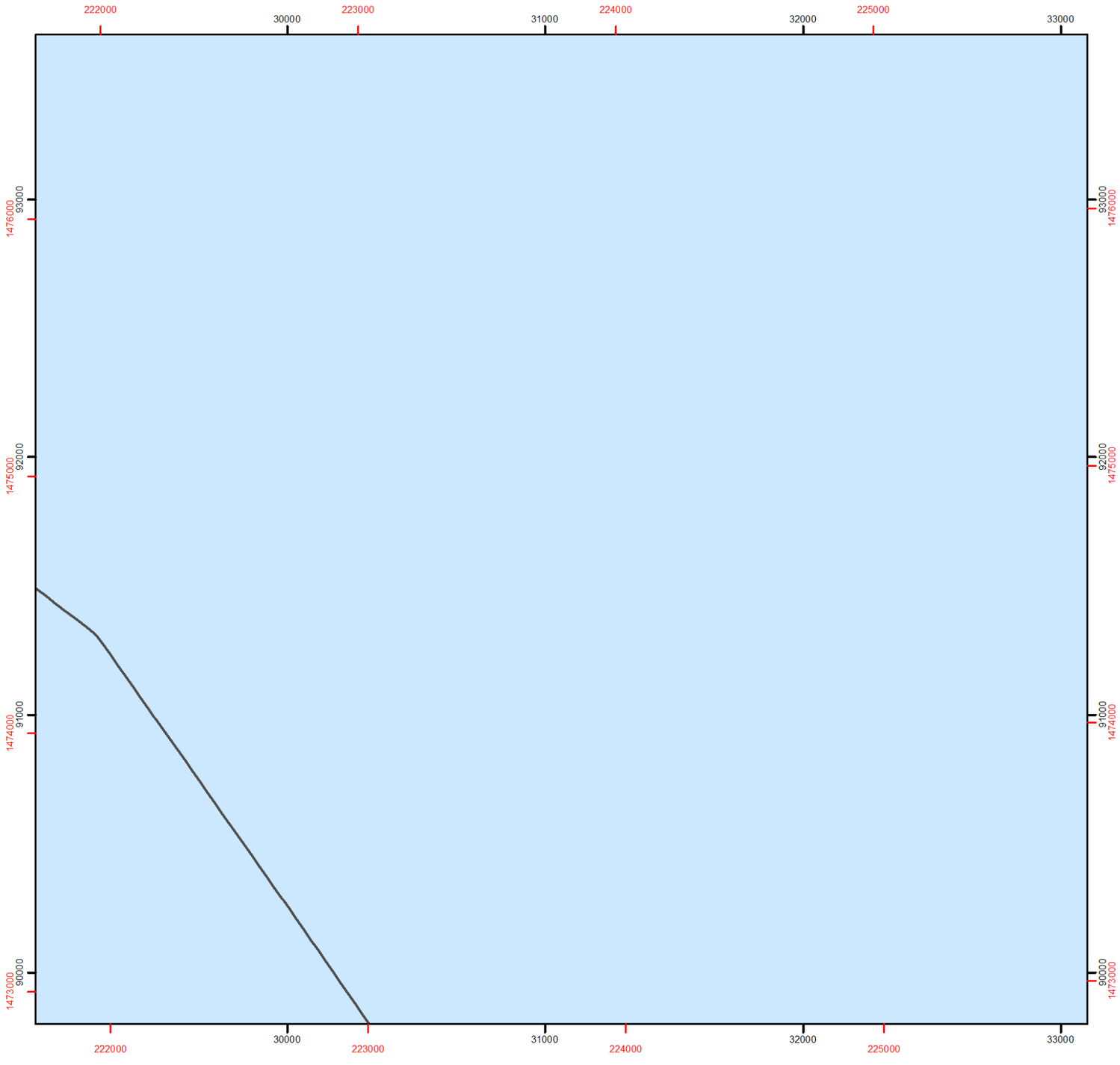

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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N

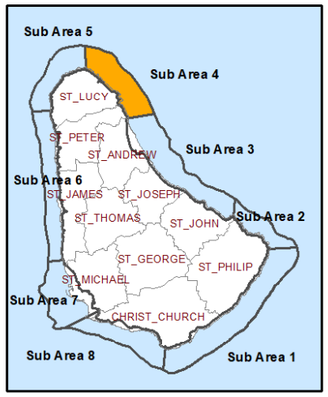
SCALE: 1:18,000

0 125 250 375 500 mts

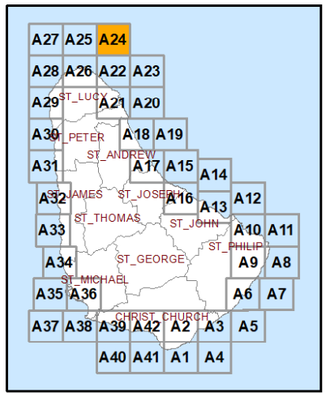
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

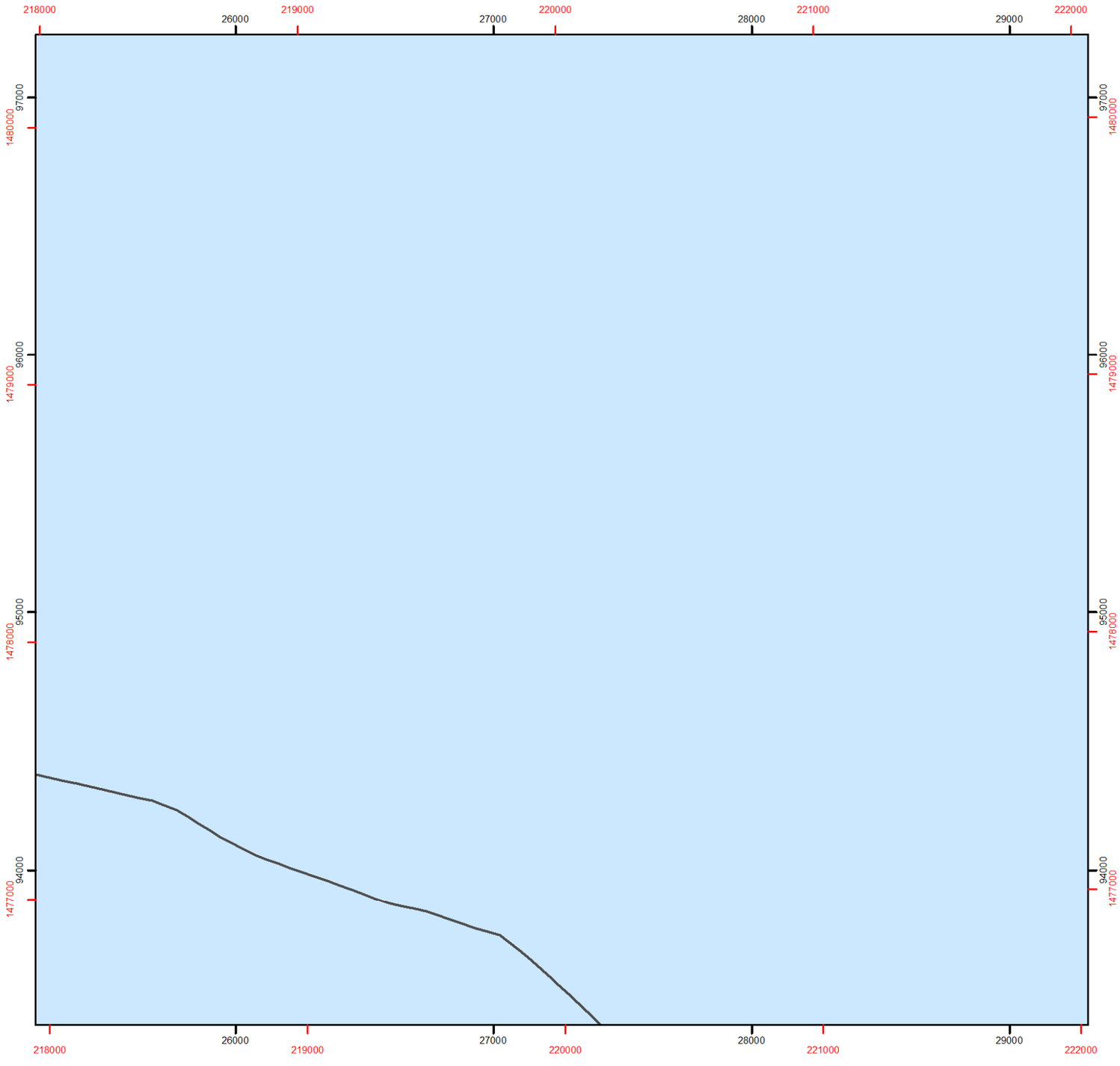
SUB AREA 4 - SHEET A24

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX





Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB-AREA 5: NORTH POINT TO MAYCOCK´S BAY

Main themes

WILDERNESS CHARACTER AND GEOLOGICAL INTEREST.
RISKS DUE TO CLIFF COLLAPSE.

Sub-Area description and context

Sub-Area 5 covers the north-west section of the island. The principal settlements are Archers, Greenidge, Crab Hill and Bromefield. There is some agricultural land in the north-west corner, which is used to grow sugar cane, but the area closest to the coast is used for little other than small scale grazing. An important feature along the southern section of this coast is the cement plant and associated quarry that operates at Checker Hall.

Much of the scenery of this Sub-Area comprises cliff top vegetation which is known locally as 'rab' land. The coastal stretch has high landscape value, being classified by the PDP (2017) as a Coastal Landscape Protection Zone. The Growth Management Framework (PDP, 2017) classifies this coastal area as National Park in the northern part and Stable Suburban and Rural Working Landscape between Crab Hill and Maycock´s Bay. The marine environment is very exposed at and around North Point though further south, where there is more shelter, and here areas of hard coral reef have developed giving the sea bed a different characteristic to that experienced along the east coast.

Detailed information of this Sub-Area scale is presented in the subsection entitled “Description maps of Sub-Area 5” which includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff collapse and flooding inundation (and climate change related) hazards that Sub-Area 5 is exposed to. At Harrisons and Cluffs, the risk of building damage as a consequence of cliff collapse over the next fifty years represents a key economic planning consideration for developers in this Sub-Area.

Figure D.6. Cliffs in Sub-Area 5.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Presence of unique geological formations. • Important ecological and landscape value. • Cliff collapse risk.	• Protect geological formations and coastal landscape. • Enhance heritage conservation. • Provide opportunities for informal recreation. • Provide opportunities for biodiversity conservation and education. • Enforce setbacks to ensure safety of people, buildings and infrastructures; and to retain the wild and rugged character of the coastline.

Development Planning and Setbacks at Sub-Area scale

Setback spatial information at a regional scale is presented within a collection of maps provided in subsection entitled *"Setback maps of Sub-Area 5"*. This follows the application of the National Guidance "Development Planning and Setbacks" (section C3) for the Sub-Area 5. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000. This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) only applies to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
Development Planning and Setbacks	5S1	Prepare and distribute guidelines to enforce cliff collapse Setback in Sub-Area 5 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate	Guidelines based on GSI.	Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Development Planning and Setbacks	5S2	Prepare and distribute guidelines to enforce Landscape Setback in Sub-Area 5 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	5S3	Organize meetings with key stakeholders to raise awareness on coastal resources and landscape.	CZMU	TCPDO, NCC, Developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	5BIO1	Elaborate a plan to improve geological heritage awareness.	CZMU		Medium term, immediate	For instance, create a coastal geology trail, improve geological heritage education, and enhance viewing areas and access to the coast.	Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	5BIO2	Promote the rehabilitation of cultural resources to promote heritage and environmental tourism.	CZMU			For instance: Harrison Point Lighthouse, Ruins of the Maycocks Bay fort and Stroud Point.	Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	5PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	5PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	5PA3	Promote cultural and environmental awareness in this Sub-Area	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased

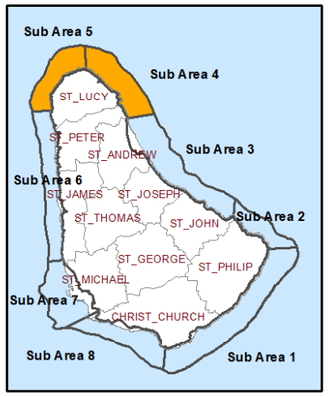
Table D.5. Action brief for Sub-Area 5.

Table D.5. Action brief for Sub-Area 5.

Description maps of Sub-Area 5

SUB AREAS 4, 5 - SHEET A25

COASTAL ZONE MANAGEMENT SUB AREAS



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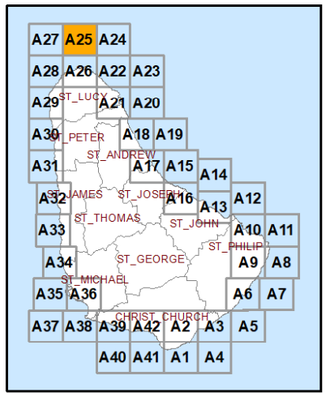

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve

Restricted areas

Planned Marine Areas

Environmental characteristics

Turtle nesting area

Coral reefs

Wetlands

Seagrass

Mangroves

Agriculture

Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)

Accreting Coast (Natural)

Stable Coast (Natural)

Dynamically Stable Coast (Natural)

Coastal Cliff

Eroding Coast (Engineered)

Accreting Coast (Engineered)

Stable Coast (Engineered)

Artificial Coast

Coastal classification division

Cliff failure

Very high

High

Medium

Low *(risk class)*

Flooding hazard

Storm surge 100 years

Storm surge + Sea Level Rise (IPCC 2019)

Tsunami 100 years

N

SCALE: 1:18,000

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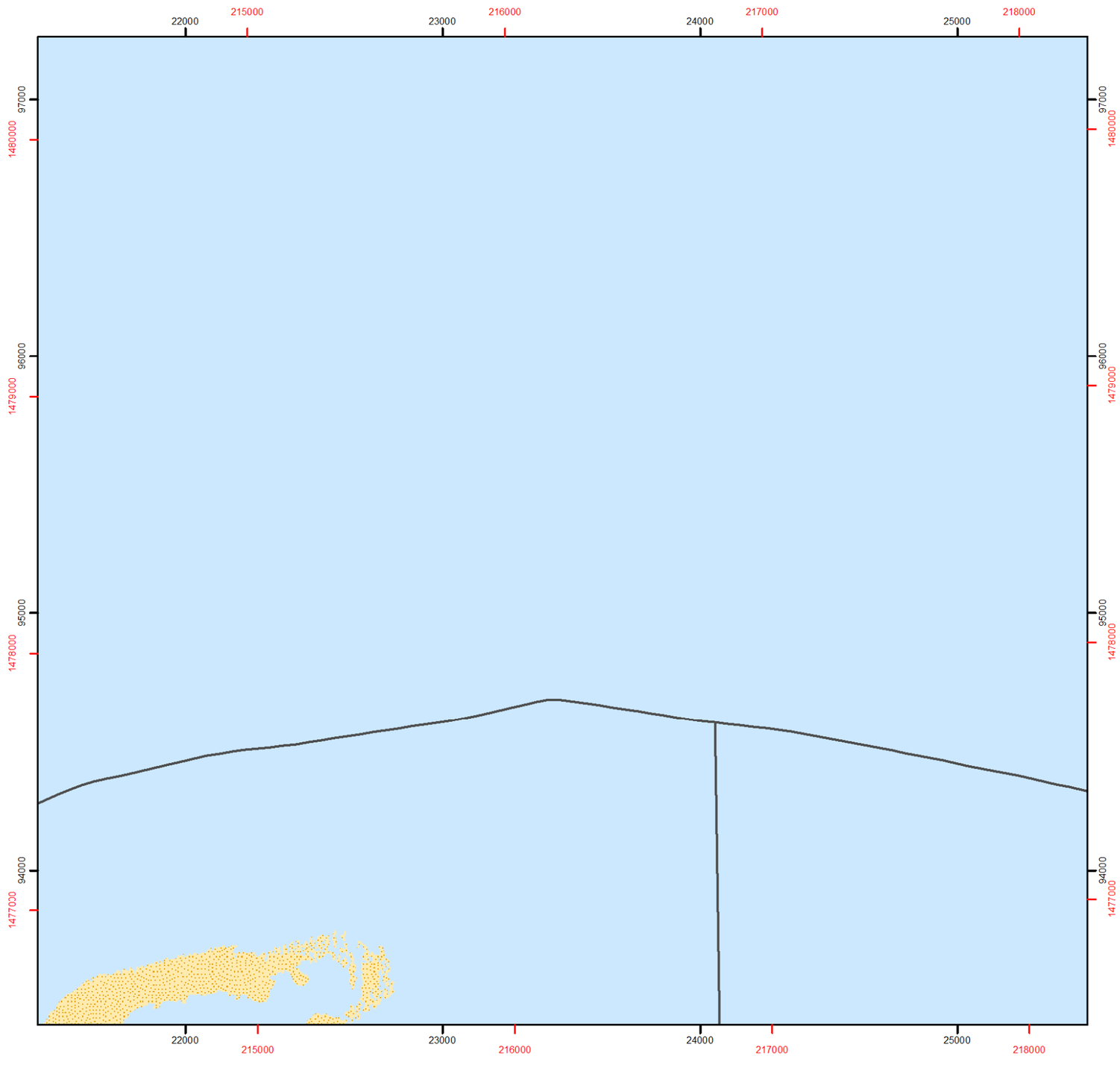
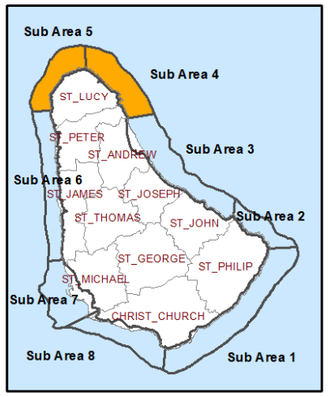
  WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red:
  UTM Zone 21, WGS84 datum



SUB AREAS 4, 5 - SHEET A26

COASTAL ZONE MANAGEMENT SUB AREAS



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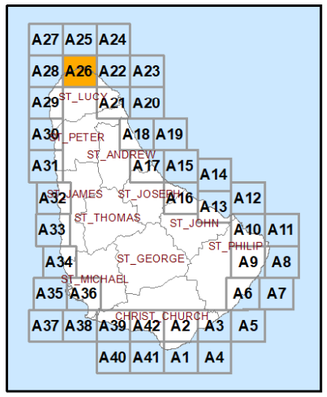

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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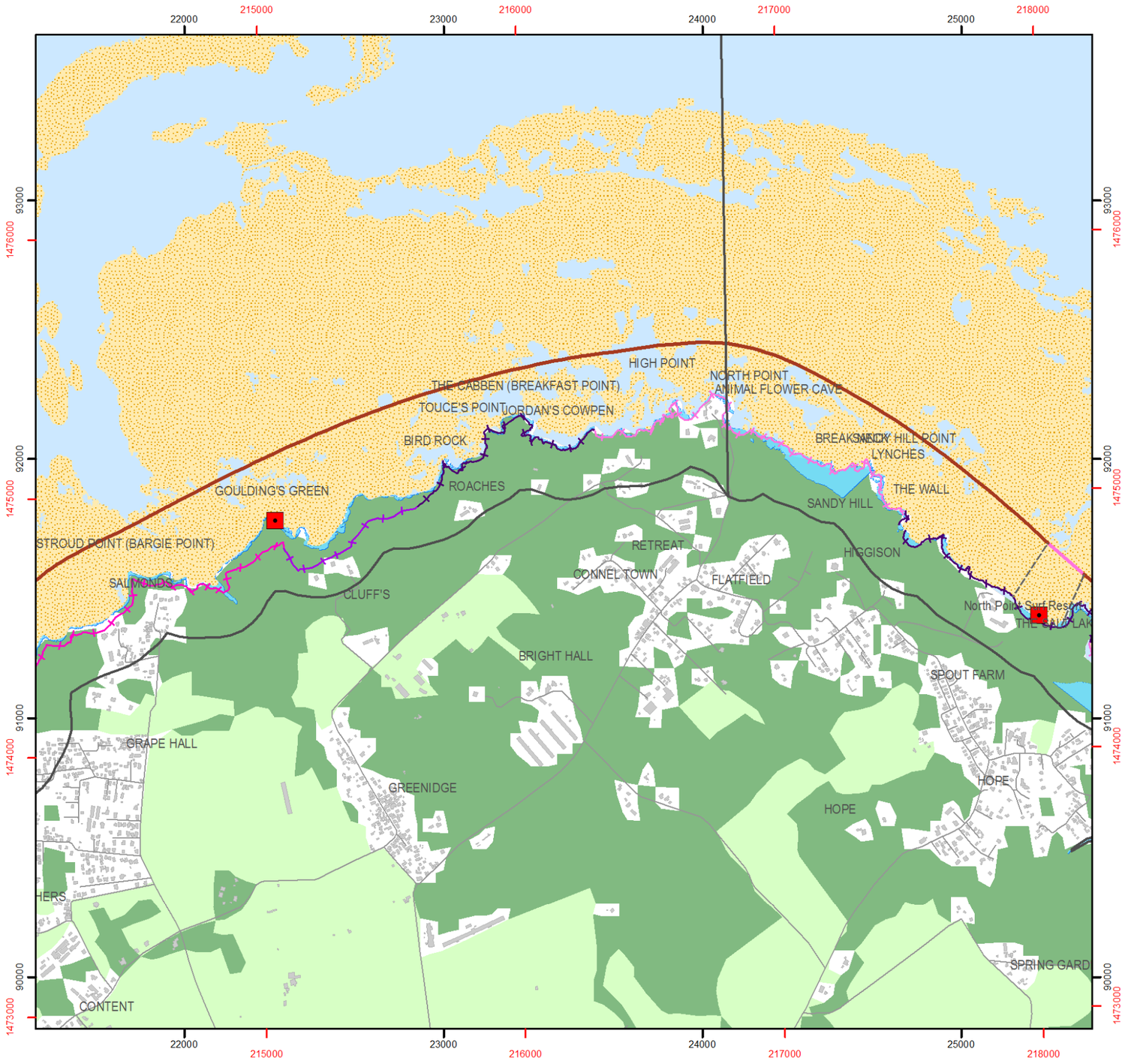
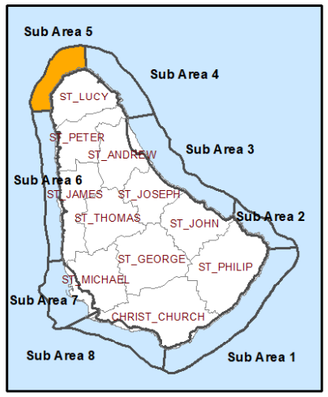


SUB AREA 5 - SHEET A27

COASTAL ZONE MANAGEMENT SUB AREAS



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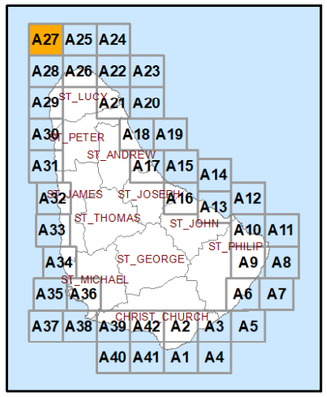

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve

Restricted areas

Planned Marine Areas

Environmental characteristics

Turtle nesting area

Coral reefs

Wetlands

Seagrass

Mangroves

Agriculture

Natural vegetation

Coast and cliff classification

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Stable Coast (Natural)

Dynamically Stable Coast (Natural)

Coastal Cliff

Eroding Coast (Engineered)

Accreting Coast (Engineered)

Stable Coast (Engineered)

Artificial Coast

Coastal classification division

Cliff failure

Very high

High

Medium

Low *(risk class)*

Flooding hazard

Storm surge 100 years

Storm surge + Sea Level Rise (IPCC 2019)

Tsunami 100 years

N

SCALE: 1:18,000

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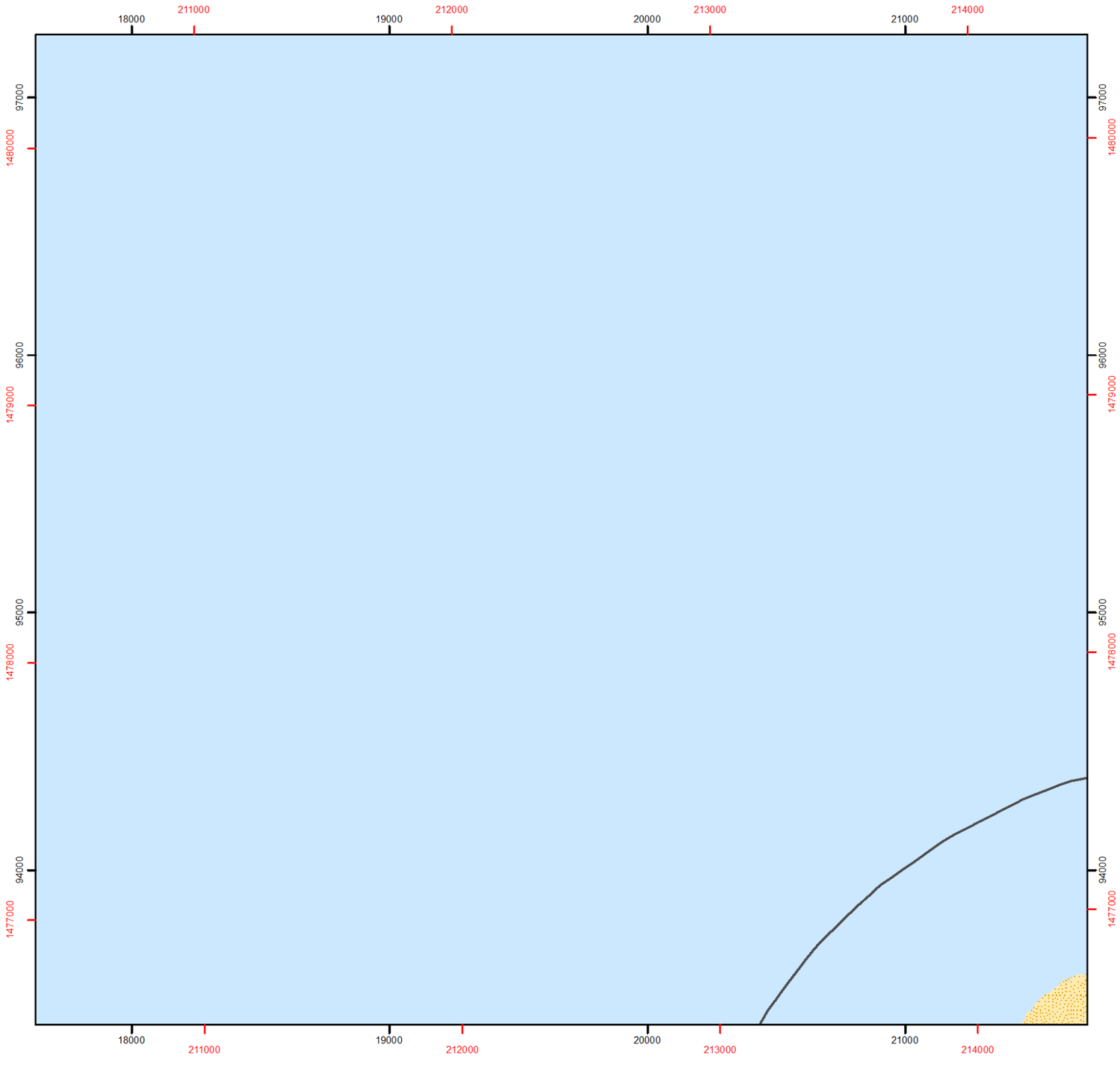
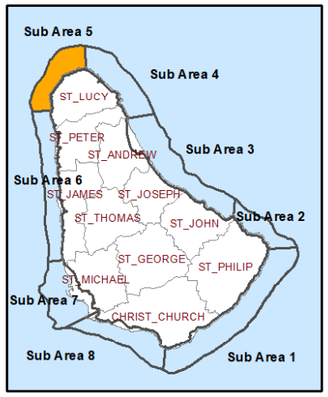


SUB AREA 5 - SHEET A28

COASTAL ZONE MANAGEMENT SUB AREAS



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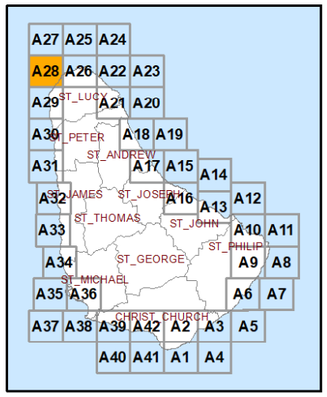

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

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- Coastal Cliff
- Eroding Coast (Engineered)
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- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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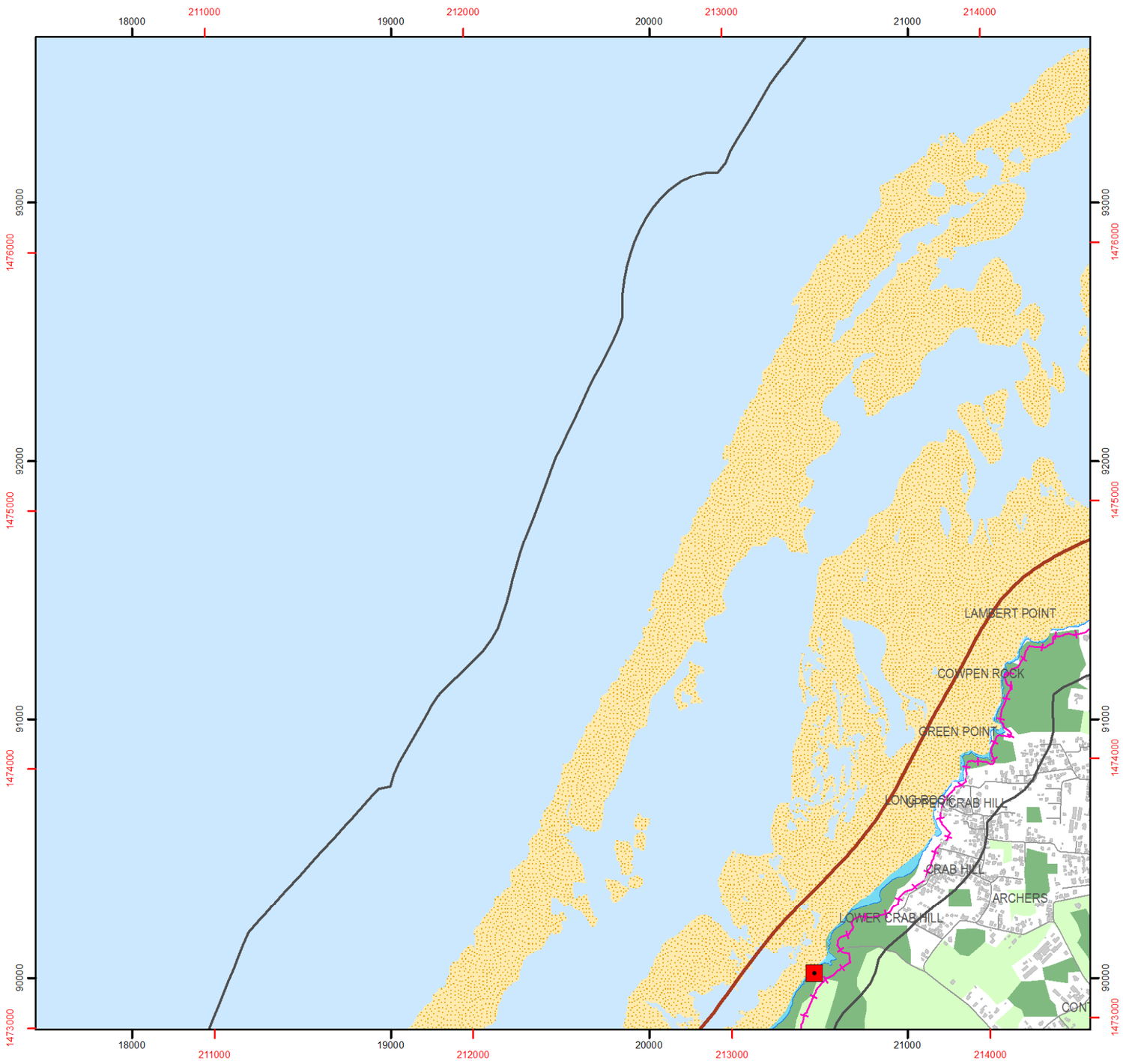
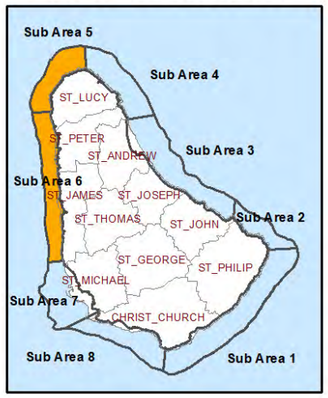


SUB AREAS 5, 6 - SHEET A29

COASTAL ZONE MANAGEMENT SUB AREAS



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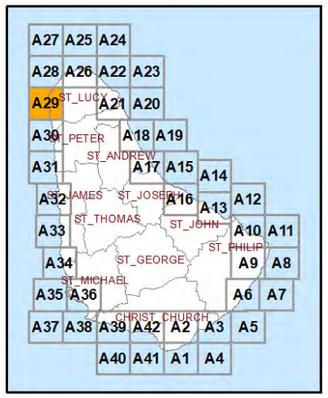

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
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- Eroding Coast (Engineered)
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- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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- Coordinate System: Barbados National Grid
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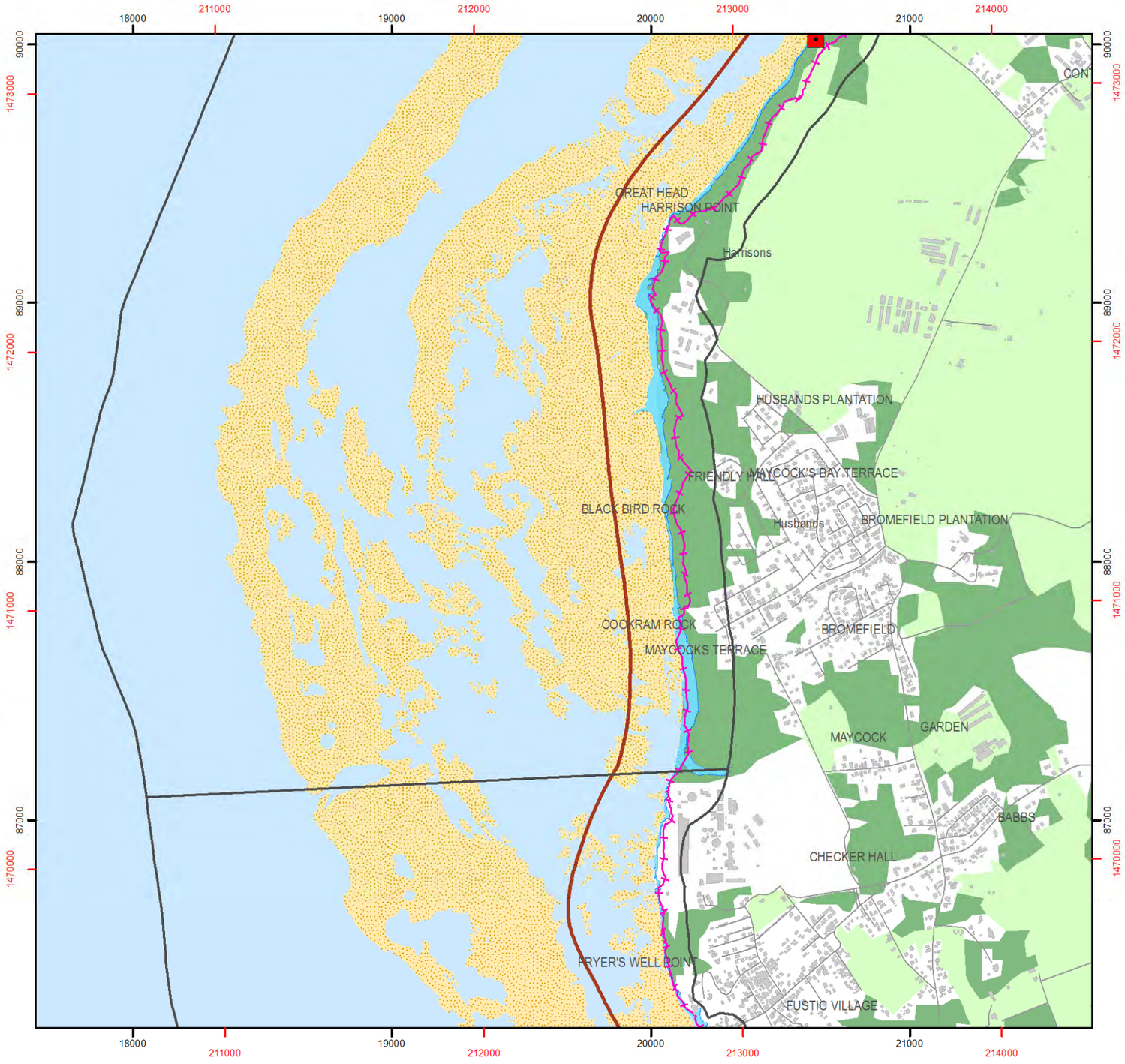
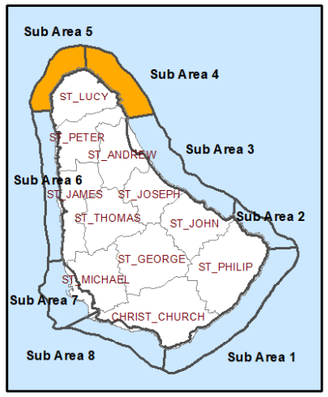


Setback maps of Sub-Area 5

SUB AREAS 4, 5 - SHEET A25

COASTAL ZONE MANAGEMENT SUB AREAS



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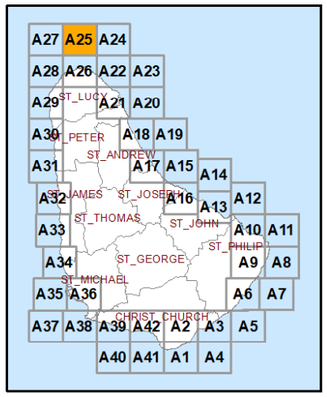

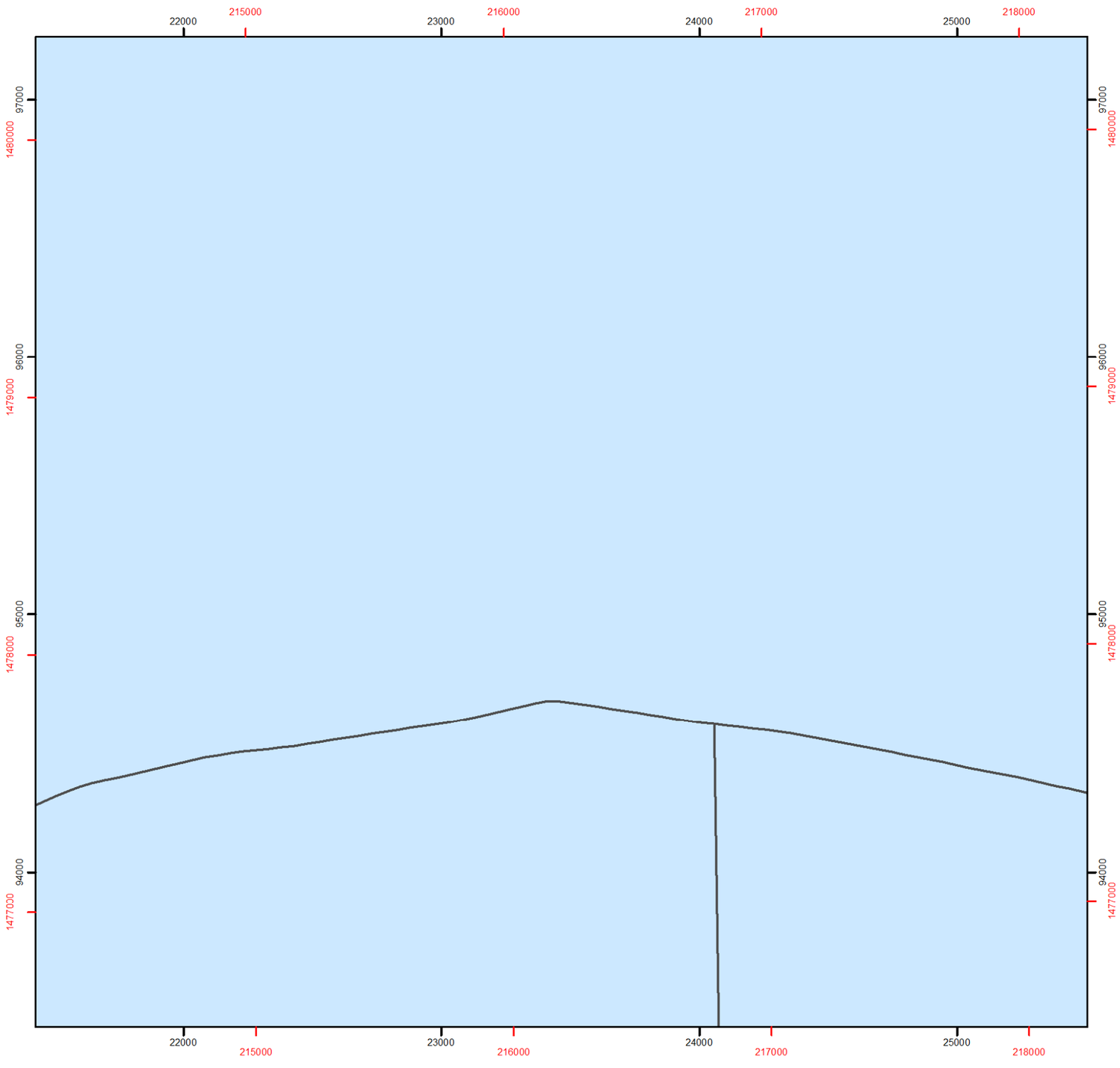

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

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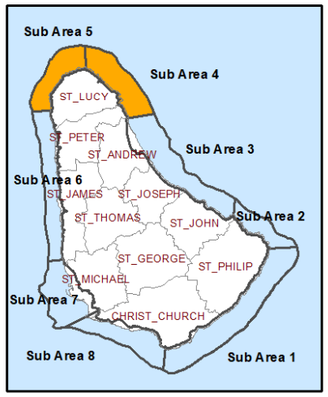
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum

SUB AREAS 4, 5 - SHEET A26

COASTAL ZONE MANAGEMENT SUB AREAS



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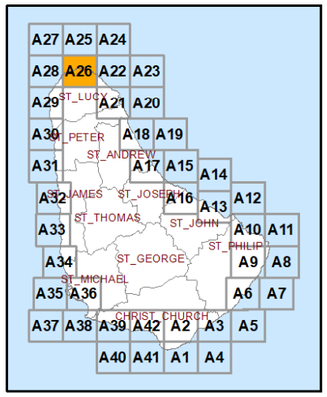

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

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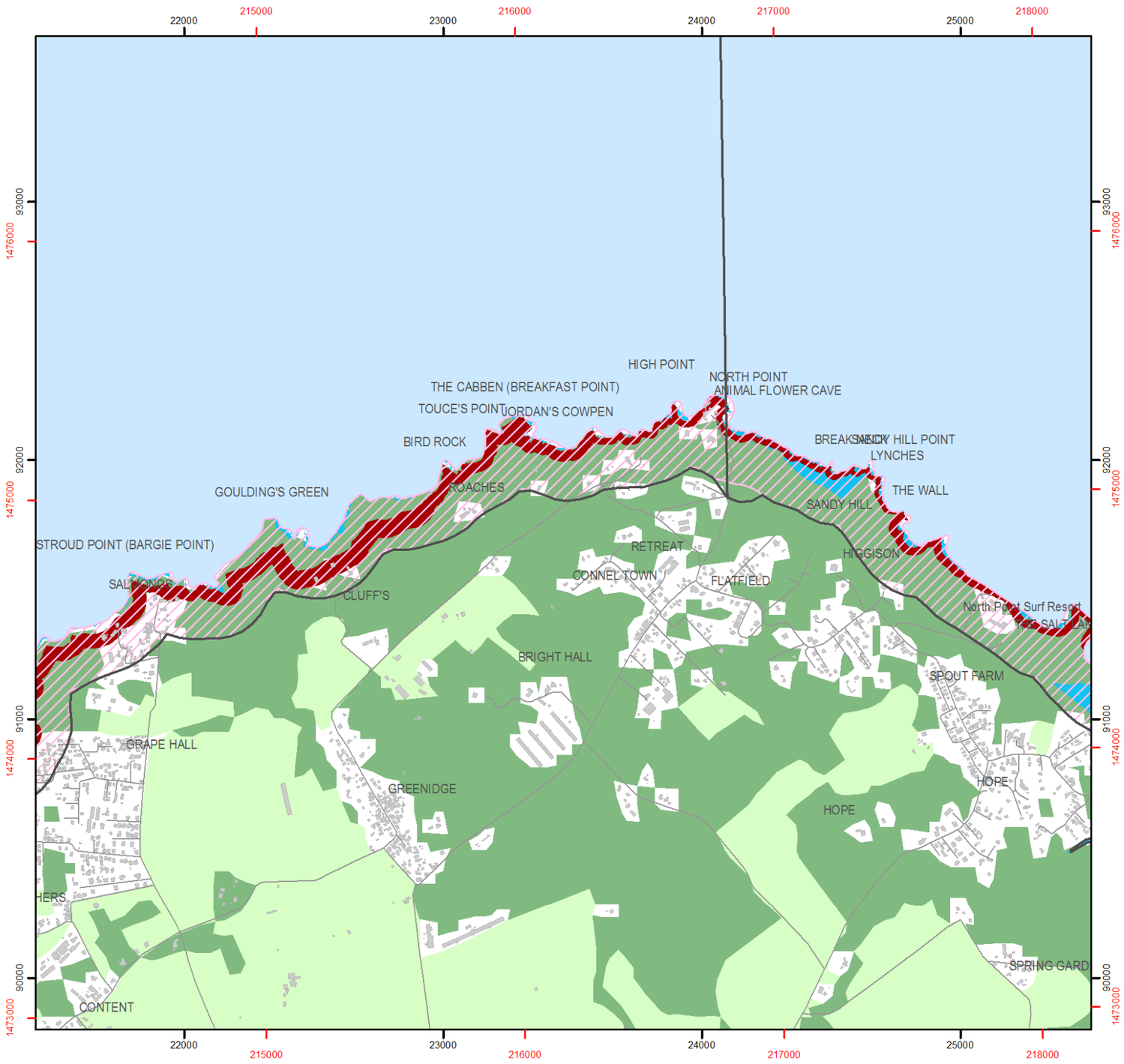
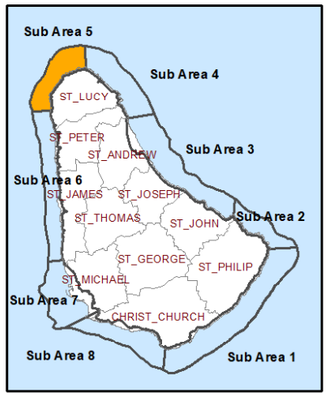


SUB AREA 5 - SHEET A27

COASTAL ZONE MANAGEMENT SUB AREAS



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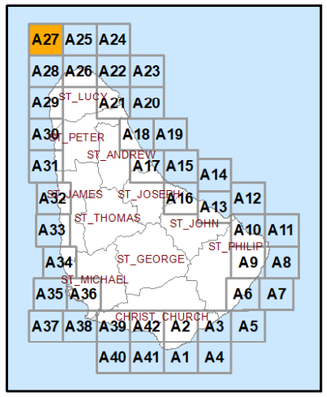

Coastal Zone Management Area

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SCALE: 1:18,000

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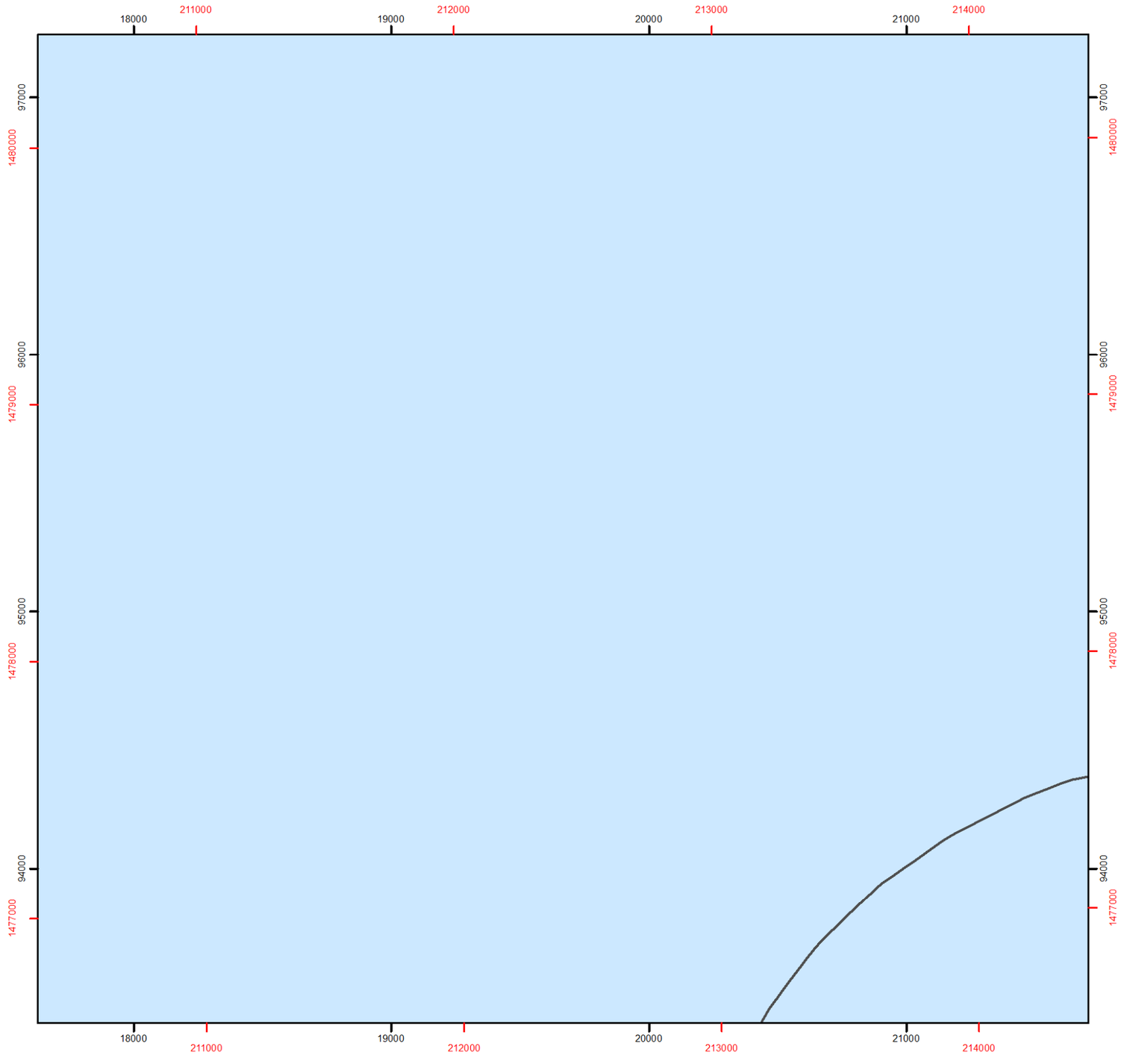
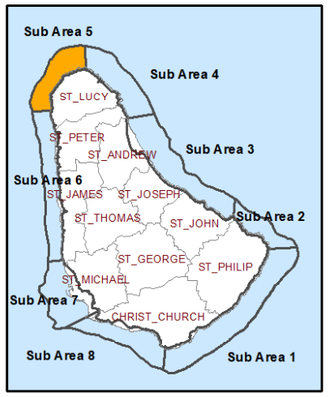


SUB AREA 5 - SHEET A28

COASTAL ZONE MANAGEMENT SUB AREAS



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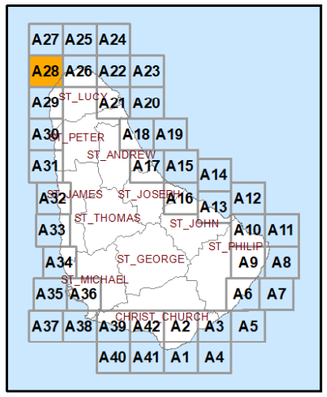

Coastal Zone Management Area

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SCALE: 1:18,000

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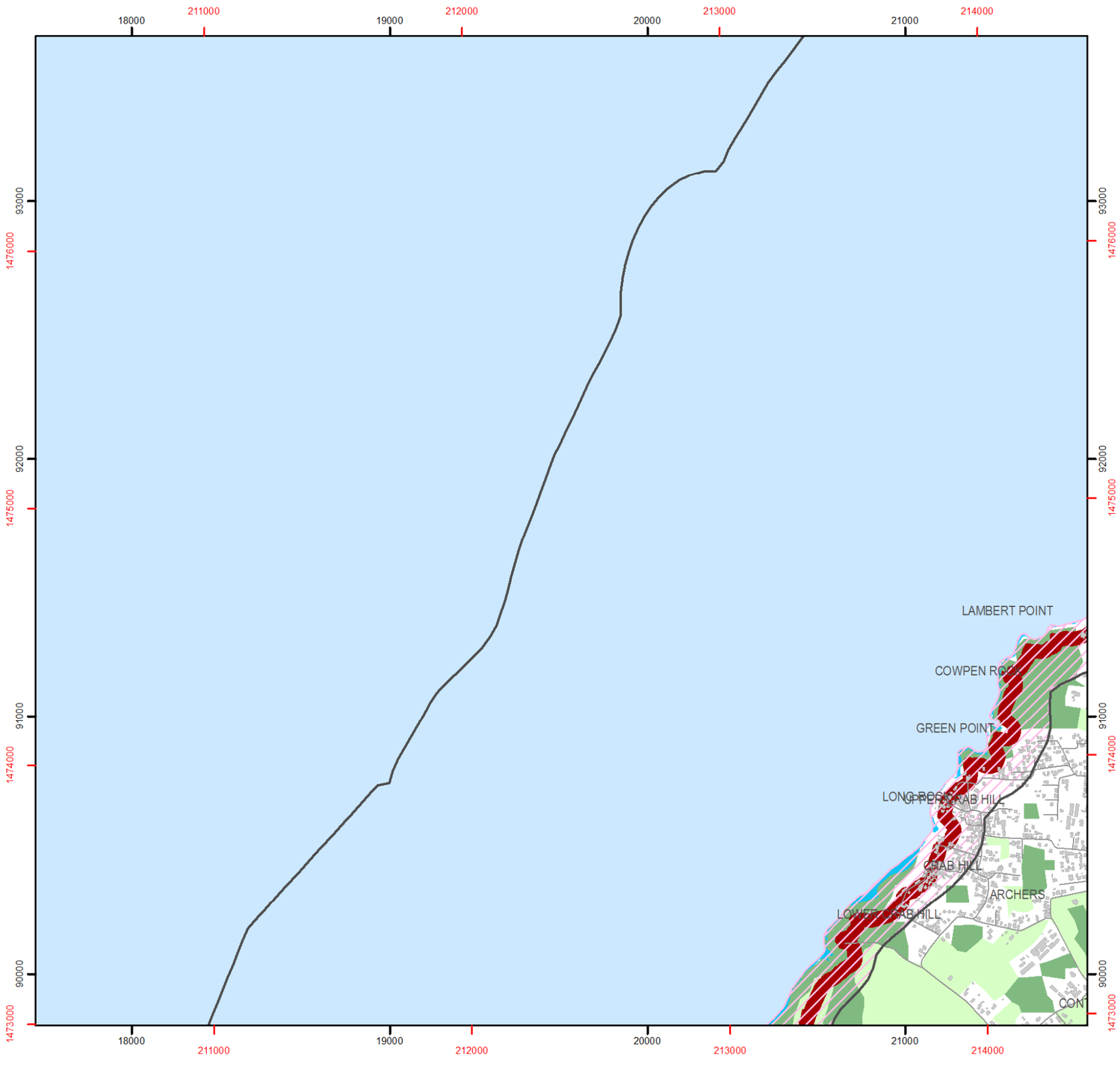
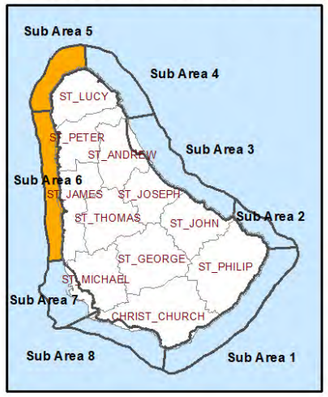


SUB AREAS 5, 6 - SHEET A29

COASTAL ZONE MANAGEMENT SUB AREAS



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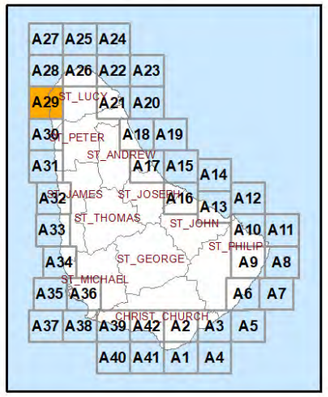

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

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SCALE: 1:18,000

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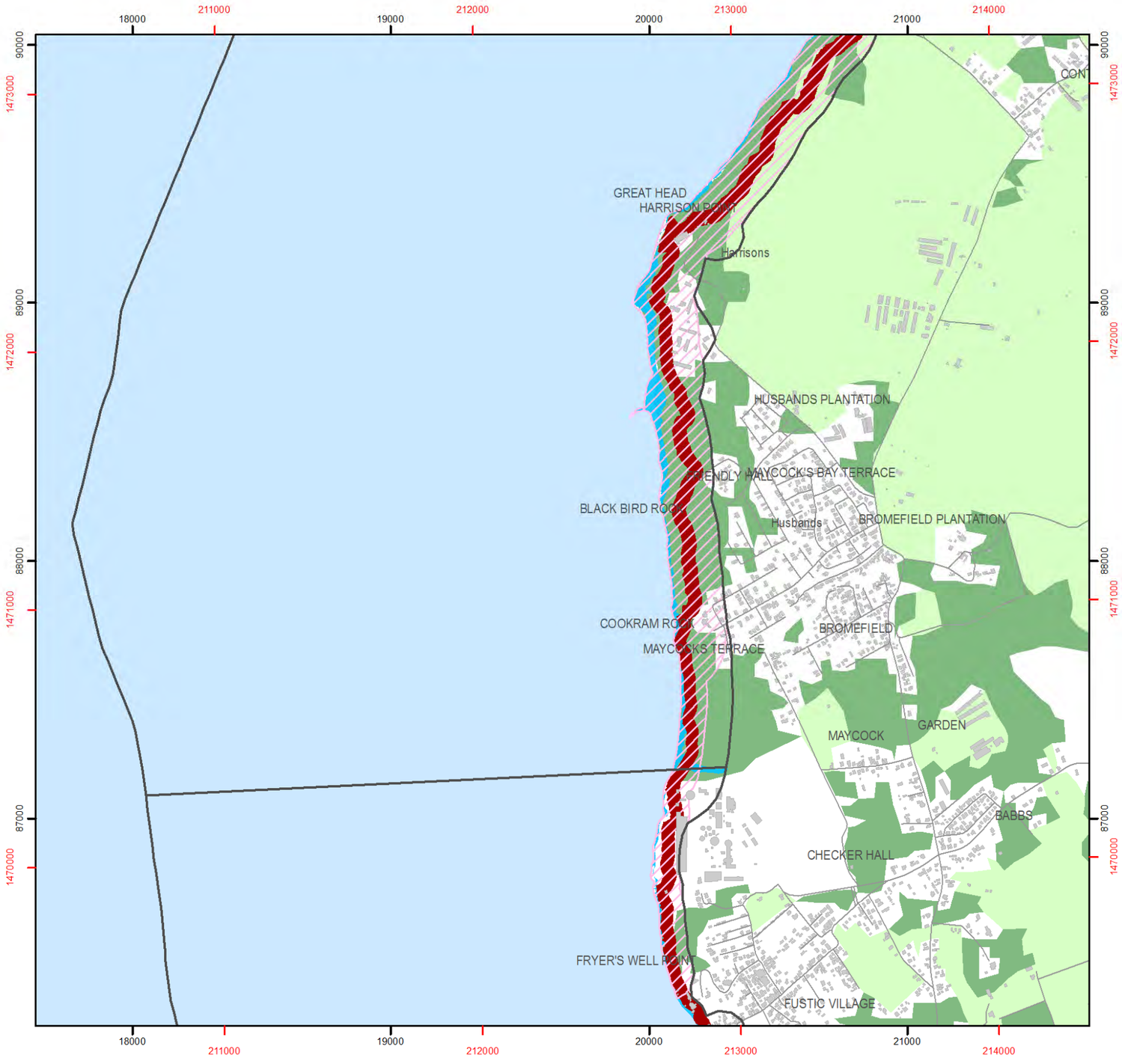


SUB-AREA 6: MAYCOCK´S BAY TO BATT´S ROCK

Main themes

INTENSE TOURISM ACTIVITIES AND ENVIRONMENTAL DEGRADATION.

COASTAL EROSION AND FLOODING.

Sub-Area description and context

This Sub Area extends along the leeward west coast of the island. Land use immediately adjacent to the coast is principally focused on tourism and residential development incorporating the regional centres of Speightstown and Holetown with a high population density that increases the closer in proximity to Bridgetown that is situated to the southern part of this Sub-Area. Hotel development dominates large sections of the seaward side of the coast road where constructions are built very close to the shoreline.

The shoreline is relatively straight and characterised by generally narrow beaches located within numerous small bays commonly separated by fringing reef headlands. At a number of locations, small lagoons have formed as a resulting of the ponding of surface and groundwater separated from the sea by barrier beaches (the Holetown "Hole"). These may either discharge slowly through the sand barrier or during breaches of the barrier beach during larger rainfall events. In the nearshore the most distinctive feature is the bank barrier reef which lies parallel to the coast between 800-1000m offshore.

The Sub-Area contains turtle nesting sites, through these are threatened by the high human usage experienced in the area. The Folkestone Marine Park and Reserve (potentially to be expanded from Fitts to Weston, as a PD defined "Natural Heritage Marine Areas NHCA") is located north to Holetown and contains coral habitats interspersed with areas of sand and rubble and a few seagrass beds. The PDP also designates the Heywoods Mangrove Swamp as Natural Heritage Conservation Area.

Detailed representation at Sub-Area scale is presented in subsection entitled *"Description maps of Sub-Area 6"* that includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 6 is exposed to. Recent studies within the CRMP (Baird, 2018) indicate that coastal hazards such as high winds, swell waves and storm surges occur along the whole coastline. Cliff collapse also occurs at Mount Standfast and Fitts. Severe losses of beach (through erosion exacerbated by climate change) is estimated along the whole Sub-Area. The UNESCO funded consultancy *Community Tsunami Inundation and Evacuation Maps for Select ICG/Caribe EWS Member States* (IHCantabria and EDANYA, 2020) reveal tsunami hazard in the pilot area from Mullins to Shermans.

Figure D.7. Recreational area at Folkstone Marine Park

The Growth Management Framework (PDP, 2017) classifies this coastal area as Urban Corridor with Community Cores at Speightstown and Holetown.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Intense urban and tourism development on the coastline. • Growing threat of inflatable beach recreation equipment and overwater restaurants/bungalows with no regulations in place. • Challenges related to access to the coast. • Turtle nesting and coral protection needs. • Water quality issues. • Severe beach erosion. • High-risk due to storm surge.	• Enforce setbacks to ensure safety of people, retain views to the sea, preserve environmental values and ensure access to the coast. • Ensure beach carrying capacity, environmental conservation and beach access. • Ensure bathing water quality. • Reduce current and coastal risks, especially due to storm surge and coastal erosion.

Development Planning and Setbacks at Sub-Area scale

Setback spatial information at a regional scale is presented within a collection of maps provided in subsection “Setback maps of Sub-Area 6”. This follows the application of the National Guidance “Development Planning and Setbacks” (section C3) for the Sub-Area 6. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000. This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) only applies to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
DRM and CCA	6DRM1	Identify and design mitigation measures for coastal flooding and erosion within the National DRM Plan.	CZMU	TCDPO	Short term, continuous.		Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Beach Management	6BM1	Evaluate existing beach enhancement intervention projects in the frame of the National Beach Management Plan.	CZMU, TCDPO			These projects include at least (i) project proposed at Clinketts, St Lucy, to protect the road at Sand Street; (ii) project proposed at old Speightstown Road; and (iii) on the west coast in the area between St. Peter's Bay and Mullins Beach.	Outcome 2 - Coastal resources are protected and effectively managed
Beach Management	6BM2	Elaborate a DRM Emergency Plan for beaches considering tourism assets articulated with the National DRM Plan and Beach Management Plan.	CZMU	TCDPO, DEM			Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Beach Management	6BM3	Improve facilities and ease of access at popular recreation areas as this area.	CZMU				Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	6S1	Enforce Coastal Setback on the shoreline.	CZMU	TCDPO, Developers	Short term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	6BIO1	Verify that Beach Management Plan provisions protect turtle nesting sites.	CZMU				Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	6PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	6PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	6PA3	Raise awareness on shoreline protection.	CZMU	TCDPO	Short term, continuous.		Outcome 6 - Research, understanding and knowledge outreach is increased

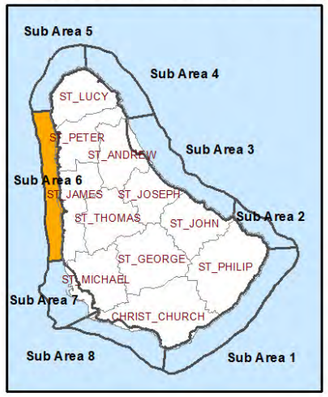
Table D.6. Action brief for Sub-Area 6.

Table D.6. Action brief for Sub-Area 6.

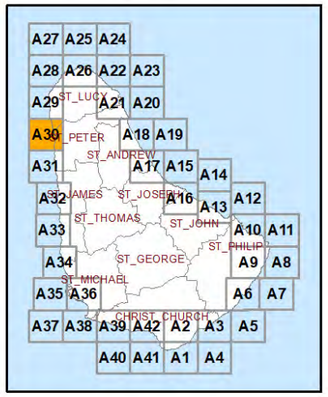
Description maps of Sub-Area 6

SUB AREA 6 - SHEET A30

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX



Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

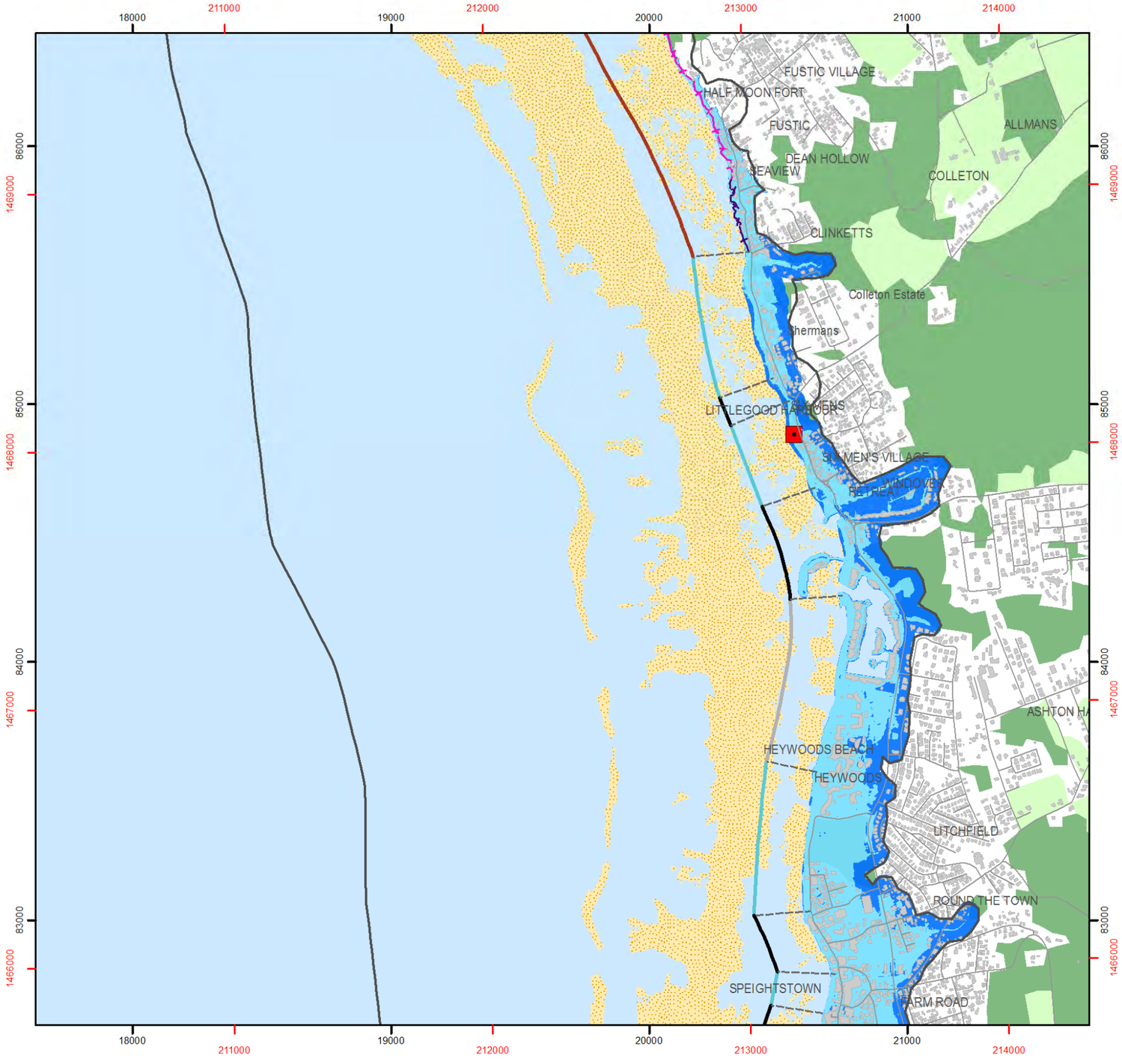
- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

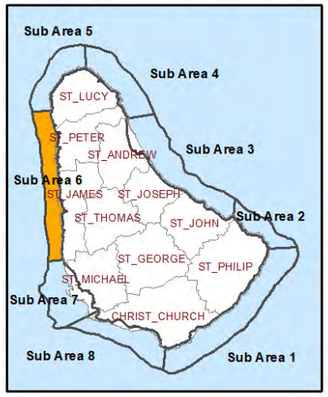
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 6 - SHEET A31

COASTAL ZONE MANAGEMENT SUB AREAS



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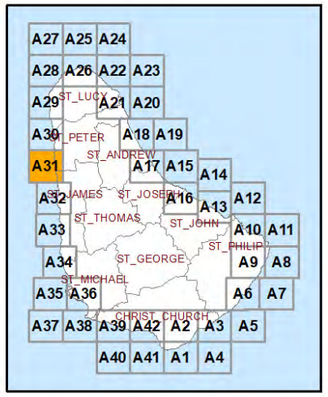

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area | Coral reefs | Wetlands | Seagrass | Mangroves | Agriculture | Natural vegetation

Coast and cliff classification

Eroding Coast (Natural) | Eroding Coast (Engineered)
Accreting Coast (Natural) | Accreting Coast (Engineered)
Stable Coast (Natural) | Stable Coast (Engineered)
Dynamically Stable Coast (Natural) | Artificial Coast
Coastal Cliff | Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years | Storm surge + Sea Level Rise (IPCC 2019)

Tsunami 100 years

N

SCALE: 1:18,000

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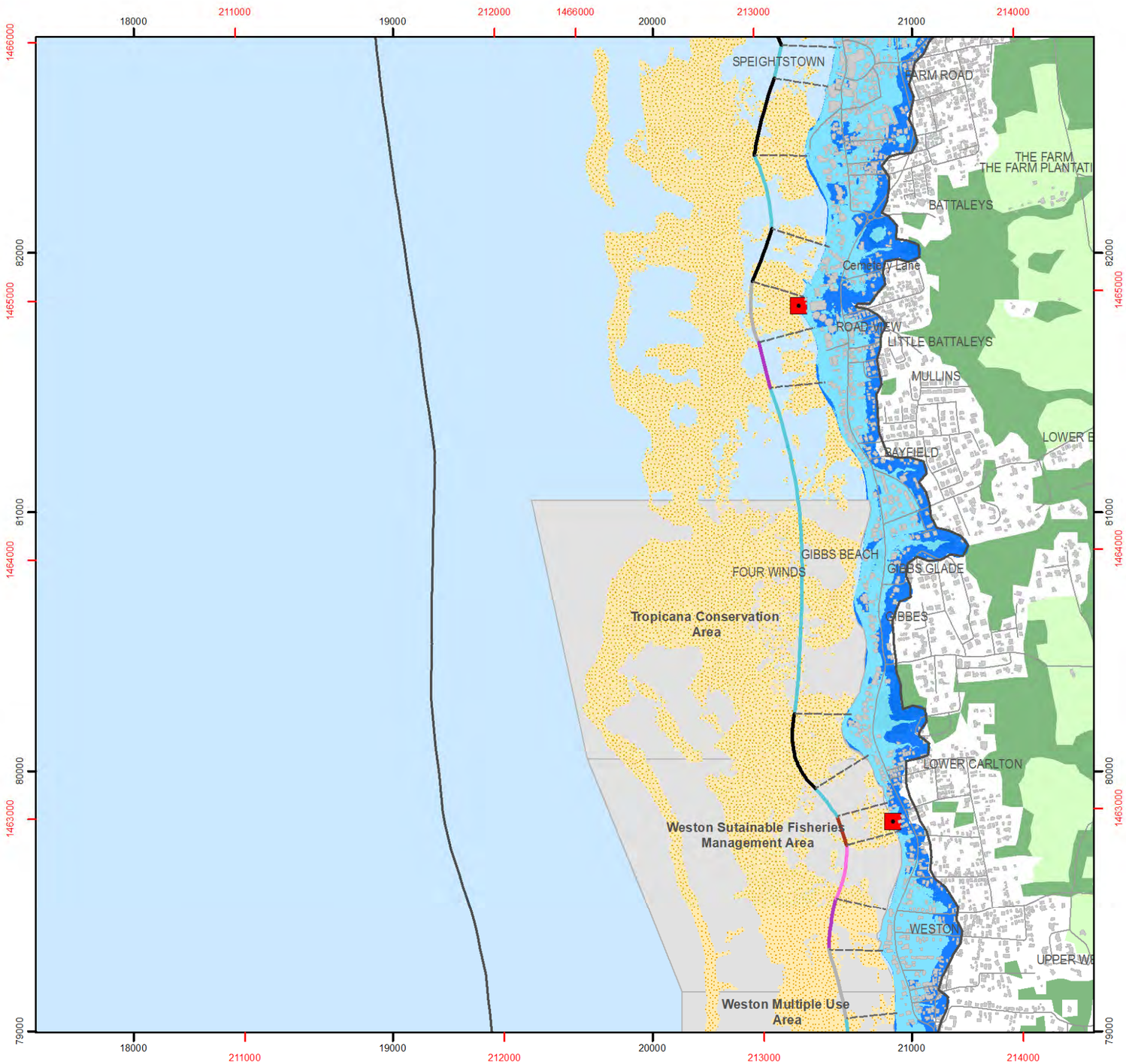
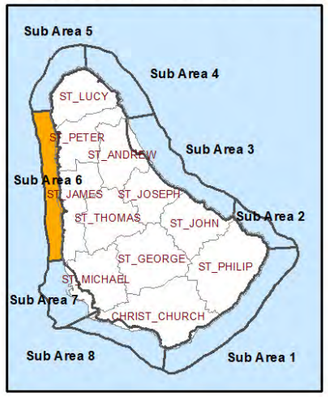


SUB AREA 6 - SHEET A32

COASTAL ZONE MANAGEMENT SUB AREAS



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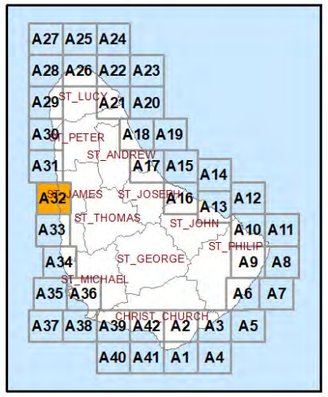

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

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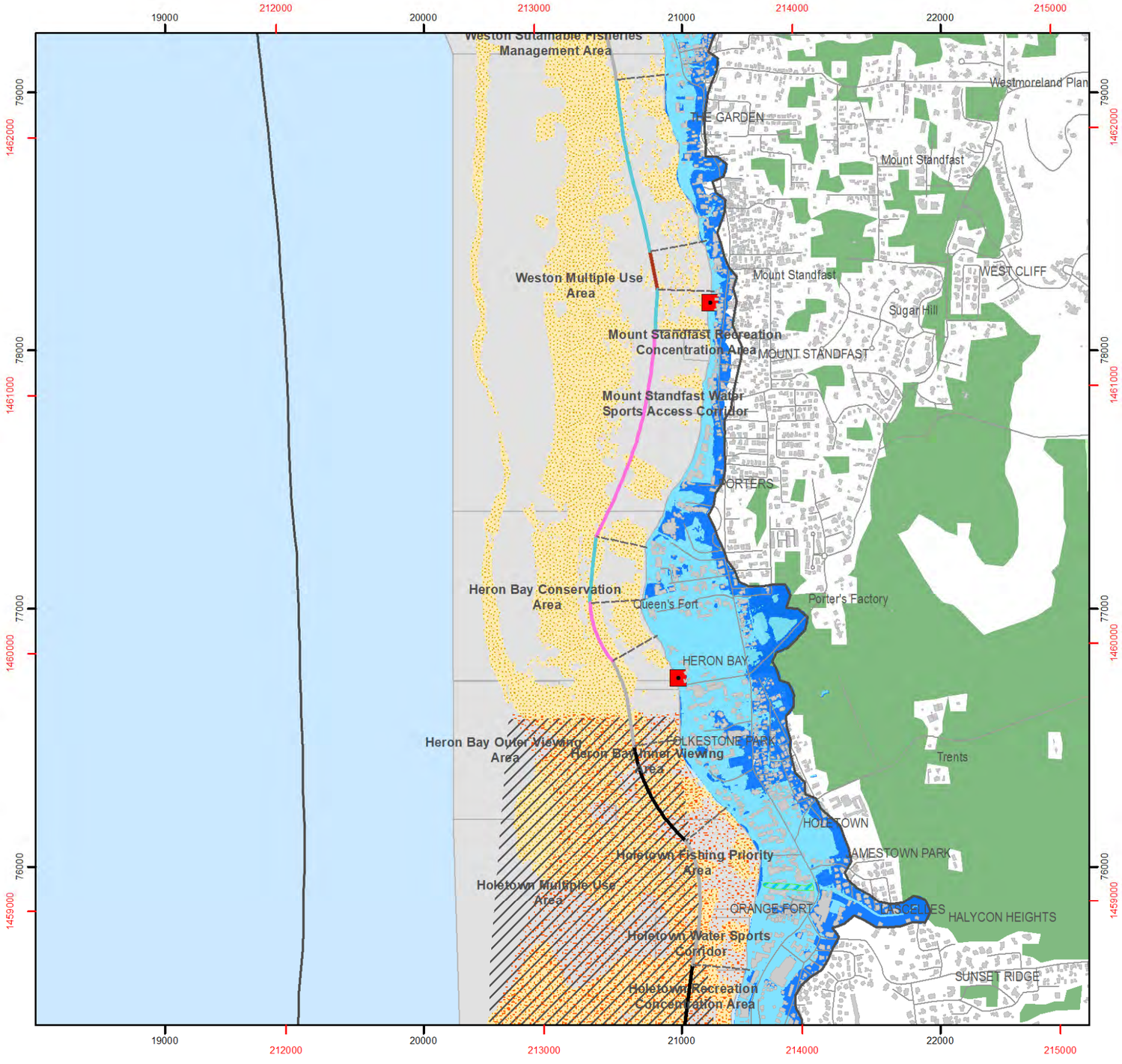
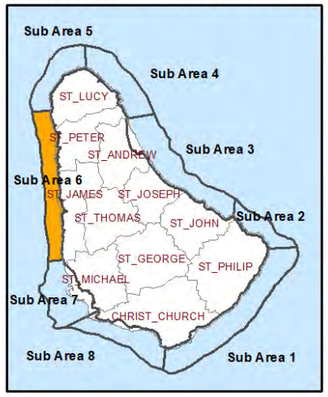
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 6 - SHEET A33

COASTAL ZONE MANAGEMENT SUB AREAS



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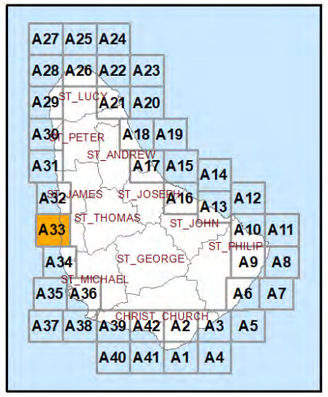


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

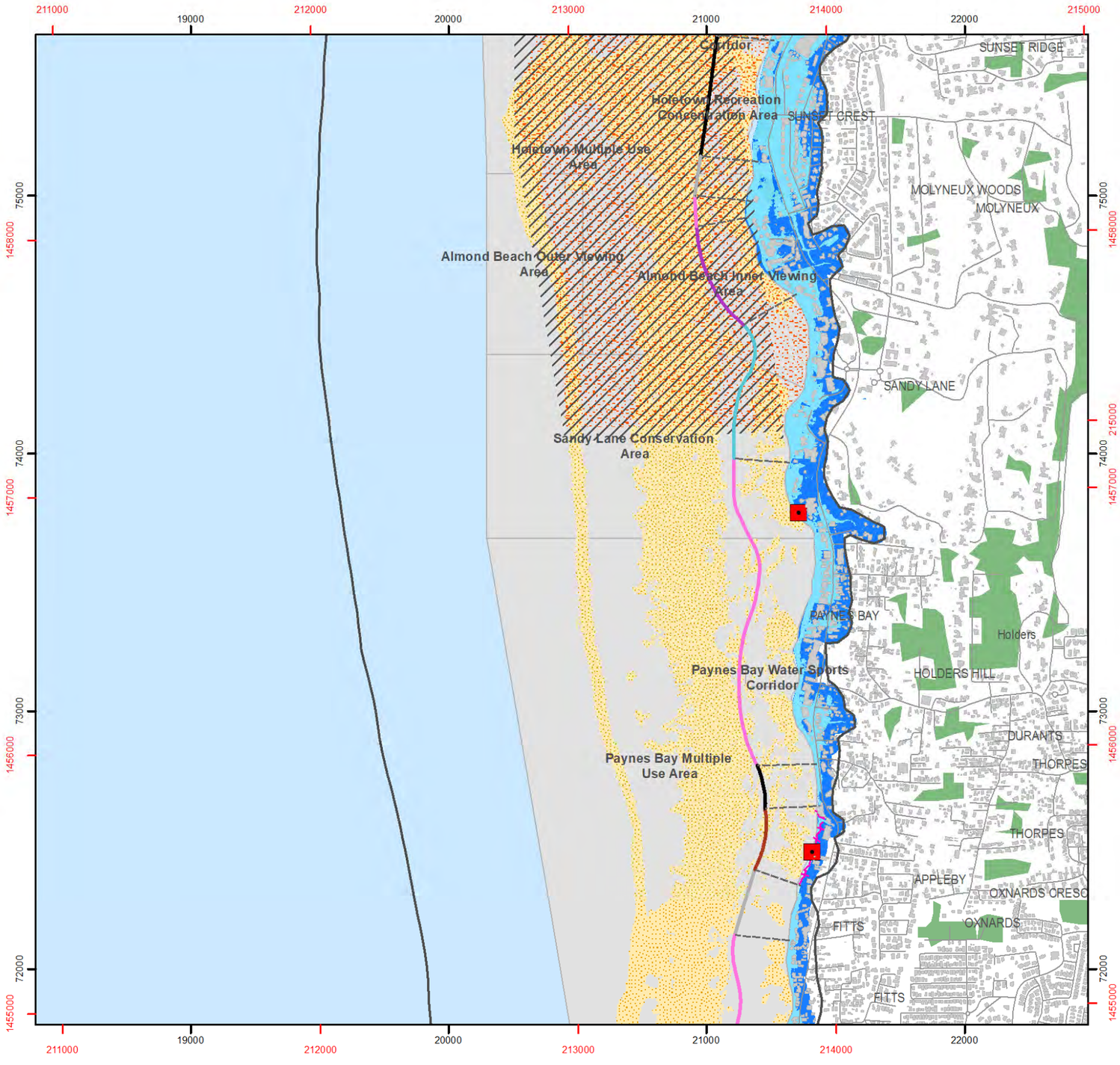
Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

0 125 250 375 500 mts

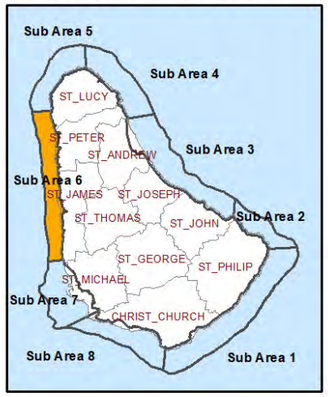
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



Setback maps of Sub-Area 6

SUB AREA 6 - SHEET A30

COASTAL ZONE MANAGEMENT SUB AREAS



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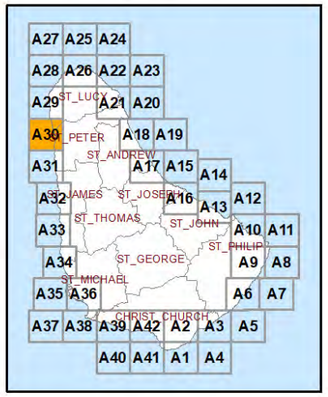


Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

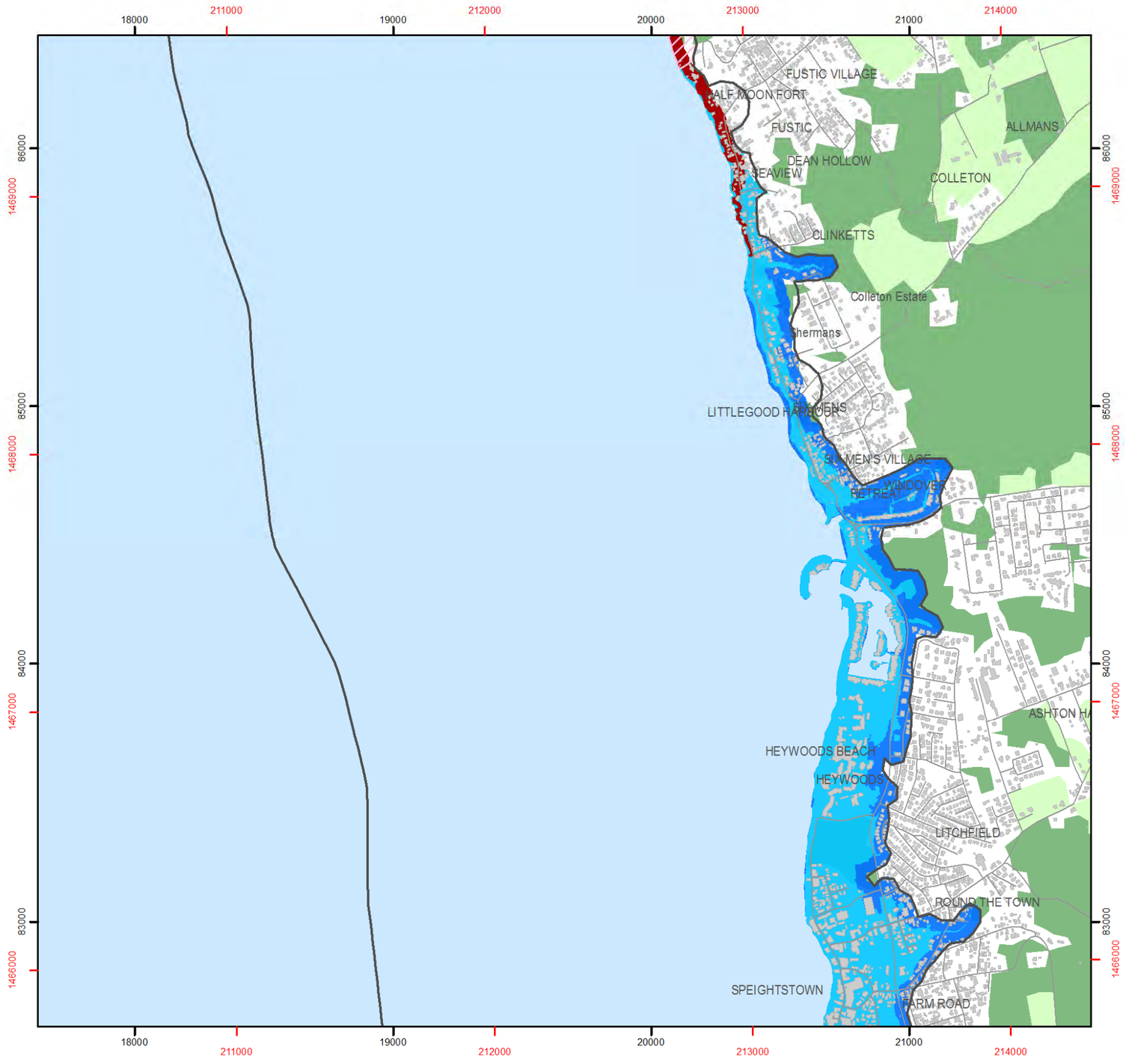
Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

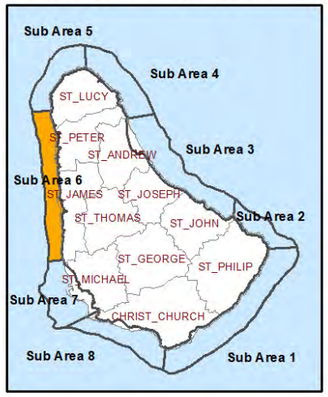
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 6 - SHEET A31

COASTAL ZONE MANAGEMENT SUB AREAS



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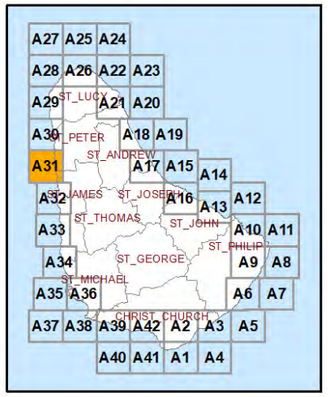

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
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N

SCALE: 1:18,000

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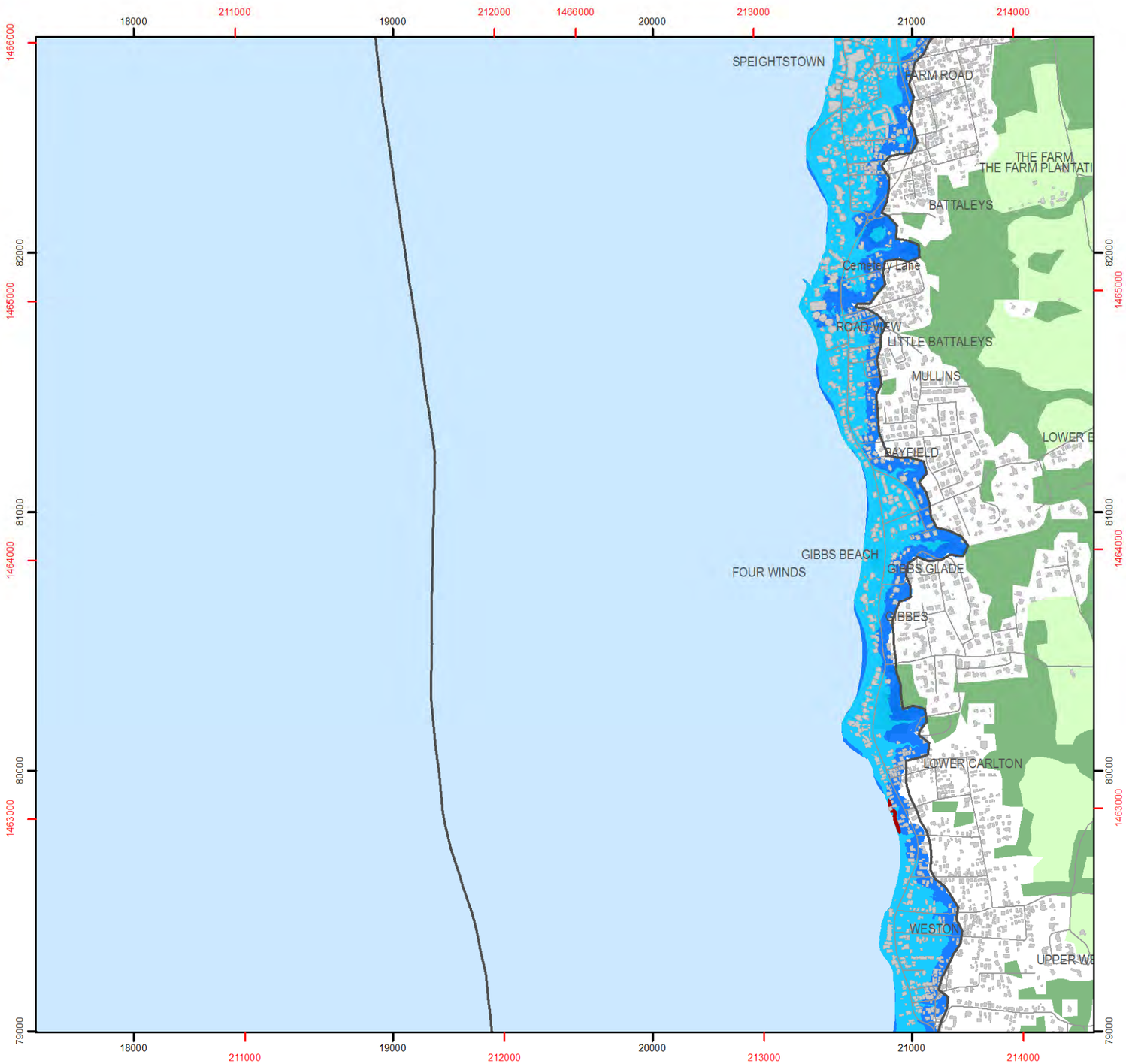
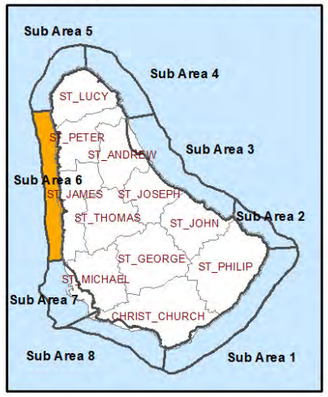
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 6 - SHEET A32

COASTAL ZONE MANAGEMENT SUB AREAS



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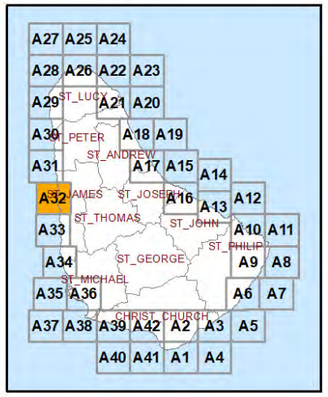


Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

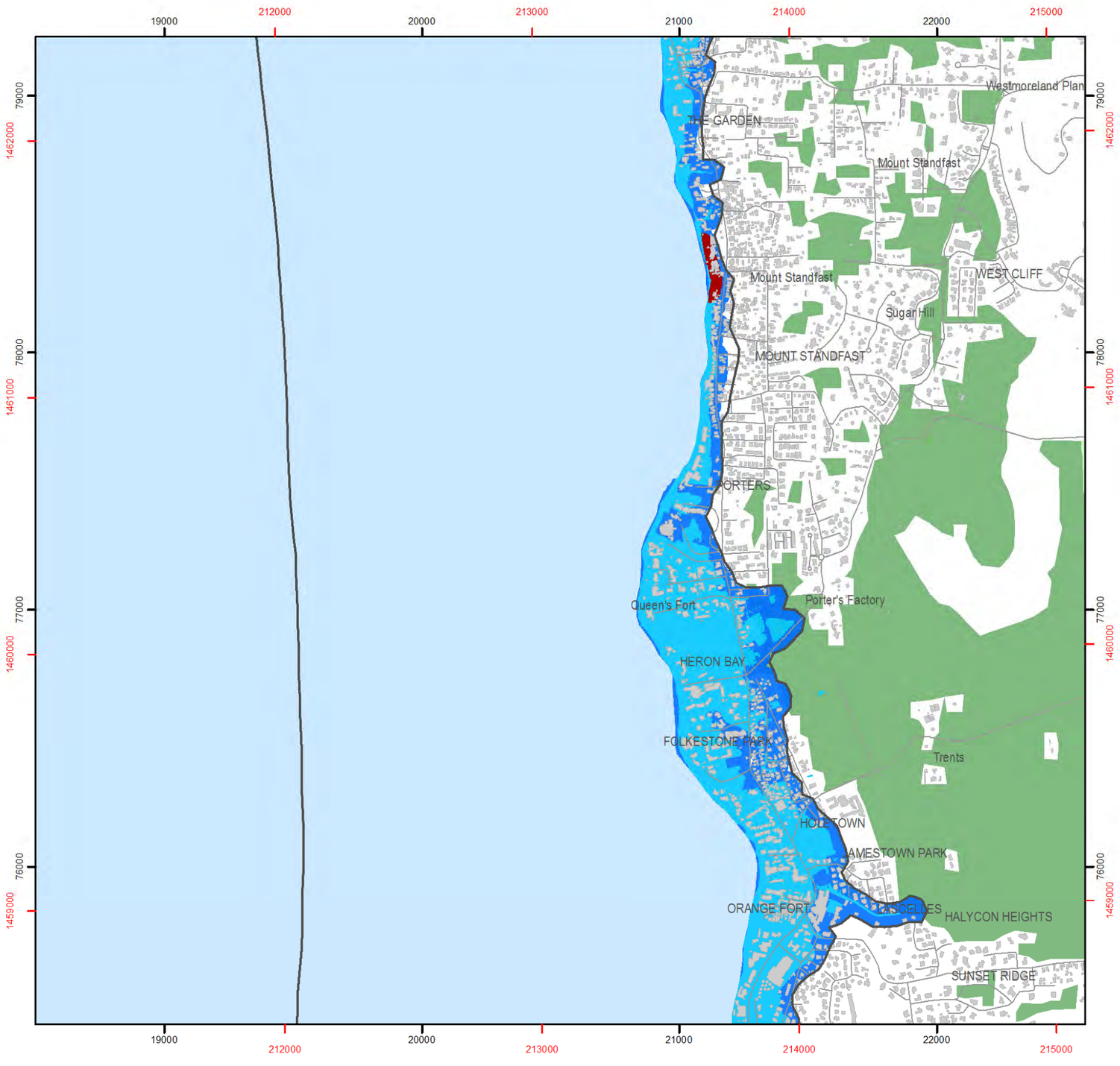
Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

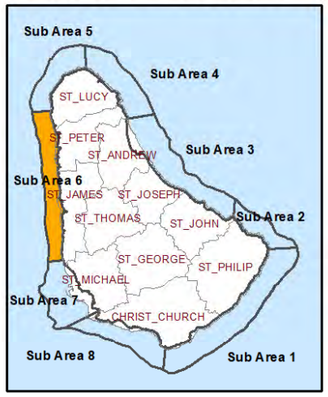
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 6 - SHEET A33

COASTAL ZONE MANAGEMENT SUB AREAS



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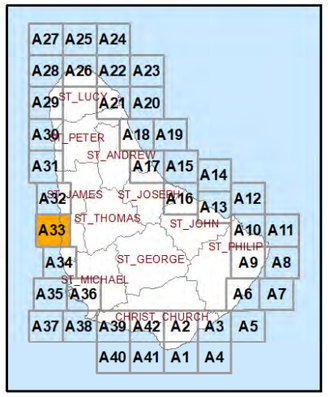


Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

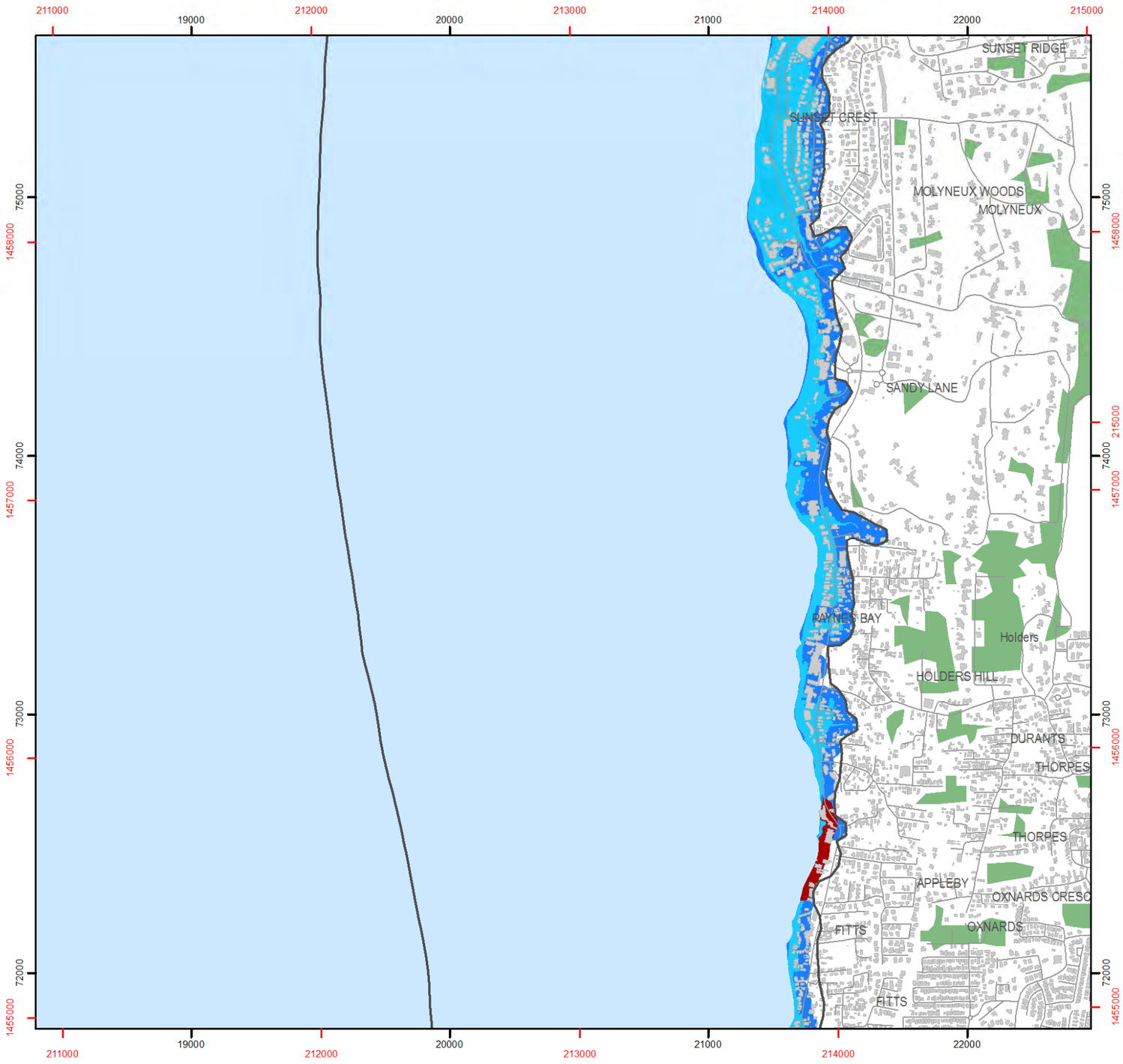
Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB-AREA 7: BATT´S ROCK TO NEEDHAM´S POINT

Main themes

COEXISTENCE OF URBAN AND PORT ACTIVITIES WITH ENVIRONMENTAL VALUES.

IMPORTANCE OF NATURAL AND RECREATIONAL AREAS FOR CLIMATE CHANGE ADAPTATION.

Sub-Area description and context

This sector of the coastline is predominantly south-west facing. Land use is dominated by the capital city of Bridgetown and surrounding suburbs which are important for industry and contains the Bridgetown Port and deep water harbour. The major coastal feature is the sheltered area of Carlisle Bay where the Constitution River discharges to the sea. The Bay provides a safe anchorage and is therefore used extensively by small craft for recreational purposes and is a focus for water sports.

Needham's Point forms the southern boundary of Carlisle Bay and offers some of the best views of Bridgetown. Carlisle Bay is a Natural Heritage Conservation Area (PDP, 2017). The central part of the Bay is a proposed Marine Reserve which will incorporate a number of wrecks that are popular dive sites.

Detailed representation at Sub-Area scale is presented in subsection entitled *"Description maps of Sub-Area 7"* which includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 7 is exposed to which include key hazards such as storm surges and potentially tsunami. In terms of coastal erosion, Brandon Beach represents a medium level of loss of beach value. Considering the latest projections of sea-level rise (IPCC, 2019) and the smooth slope of this area, storm surge events may cause extensive flooding areas in Sub-Area 7. In this regard, the recreational area behind the beach of Carlisle Bay plays an important role to reduce the potential impacts of flooding.

The Growth Management Framework (PDP, 2017) classifies the north part of this Sub-Area as Urban Corridor and the southern as Community Core.

Figure D.8. Carlisle Bay: view to Radisson and Hilton hotels.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Intense urban and port developments. • Hotel facilities on the shoreline. • Pressure to turtles due to diving/snorkelling activities. • Recreational area at Carlisle Bay, with importance for flooding risk reduction. • Potential Marine Park in Carlisle Bay. • Presence of endangered species of sea turtles. • Cultural and historical values as UNESCO sites. • Flooding risks due to storm surge and tsunami that may be highly exacerbated by sea-level rise.	• Enforce setbacks to ensure safety of people and new buildings, preserve environmental values and ensure access to the coast. • Adapt urban areas to climate change. • Ensure coastal development is sympathetic to the remaining areas of environmental importance and where possible soften the urban and industrial setting in terms of landscape quality. • Enhance a network of open spaces including beach access points, views and connections. • Protect, enhance and use the built heritage and environment of the area. • Improved management of the marine area and species. • Improved management of beach activities and uses.

Development Planning and Setbacks at Sub-Area scale

Setback recommendations are presented within a collection of maps provided in the sub-section entitled *"Setback maps of Sub-Area 7"*. These recommendations adhere closely to the National Guidance "Development Planning and Setbacks" (see section C3) for Sub-Area 7. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000.

This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) applies only to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

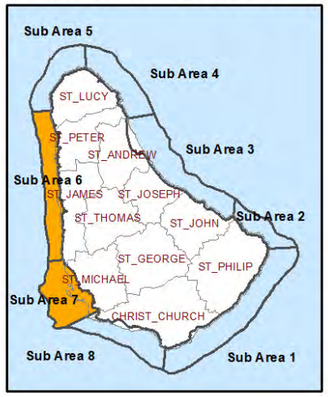
TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
DRM and CCA	7DRM1	Identify and design mitigation measures for coastal flooding and erosion within the National DRM Plan.	CZMU	TCDPO	Short term, continuous.		Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Beach Management	7BM1	Verify that Beach Management Plan provisions protect turtle nesting sites.	CZMU				Outcome 2 - Coastal resources are protected and effectively managed
Beach Management	7BM2	Elaborate a DRM Emergency Plan for beaches articulated with the National DRM Plan and Beach Management Plan.	CZMU	TCDPO, DEM			Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Beach Management	7BM3	Improve facilities and ease of access at popular recreation areas as this area.	CZMU				Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	7S1	Enforce Climate Change Setback.	CZMU	TCDPO, Developers	Short term, continuous		Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Coastal Biodiversity	7BIO1	Elaborate guidelines to improve the management of endangered species as marine turtles.	CZMU, NCC			Avoid feeding turtles to attract turtles for diving tours.	Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	7PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	7PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	7PA3	Raise awareness on shoreline protection.	CZMU	TCDPO	Short term, continuous.		Outcome 6 - Research, understanding and knowledge outreach is increased

Table D.7. . Action brief for Sub-Area 7.

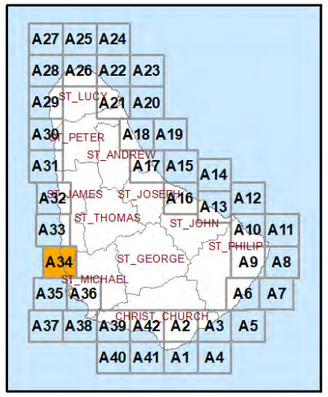
Description maps of Sub-Area 7

SUB AREAS 6, 7 - SHEET A34

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX



Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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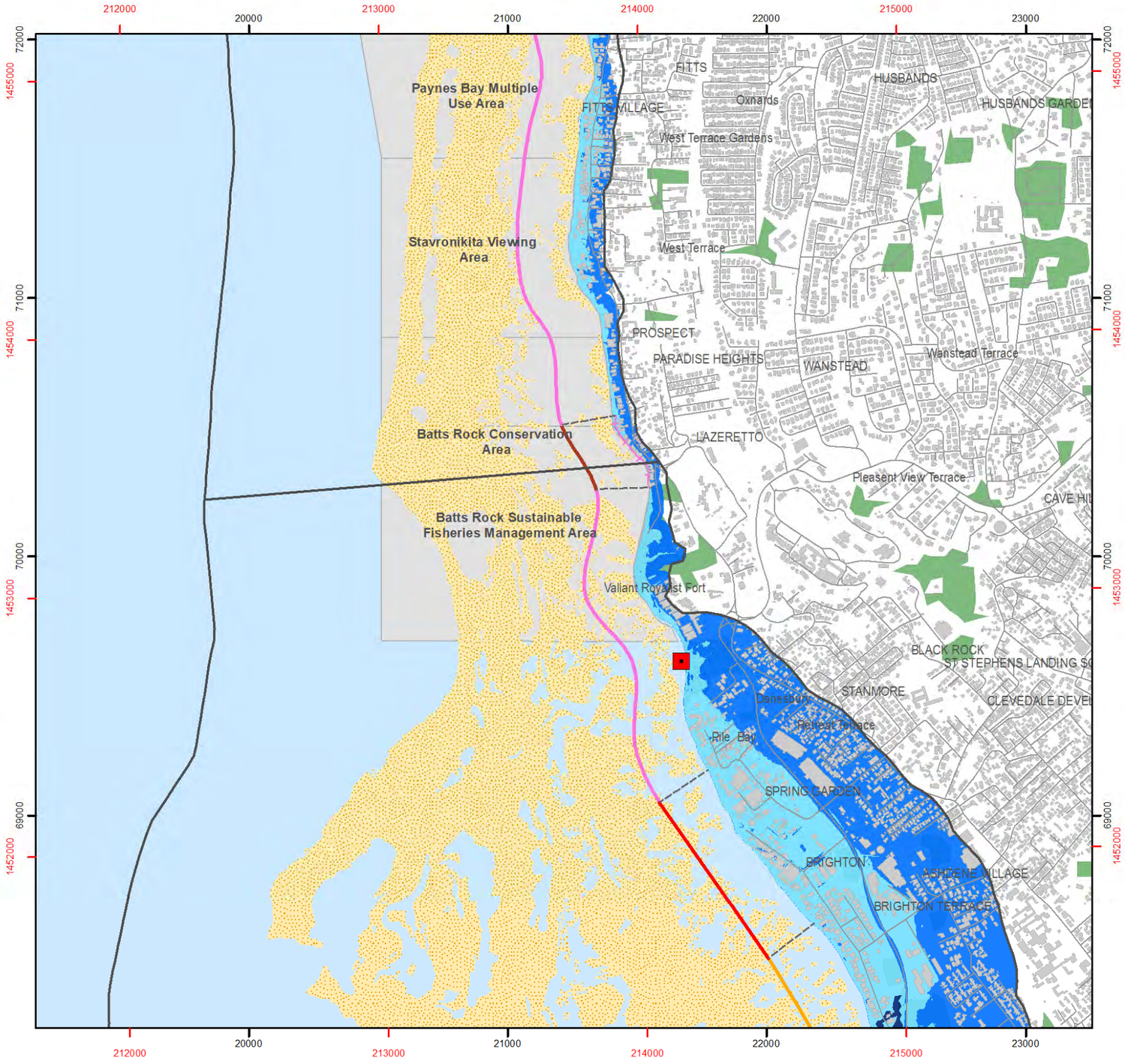
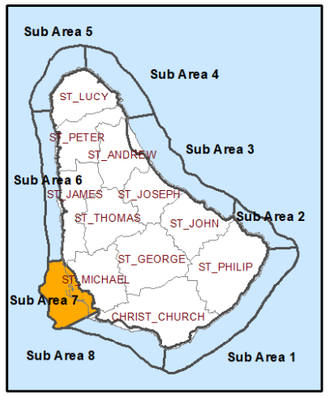
- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 7 - SHEET A35

COASTAL ZONE MANAGEMENT SUB AREAS



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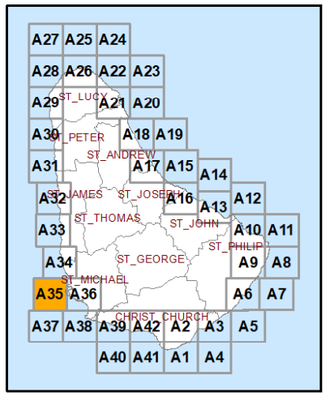

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve
Restricted areas
Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high
High
Medium
Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

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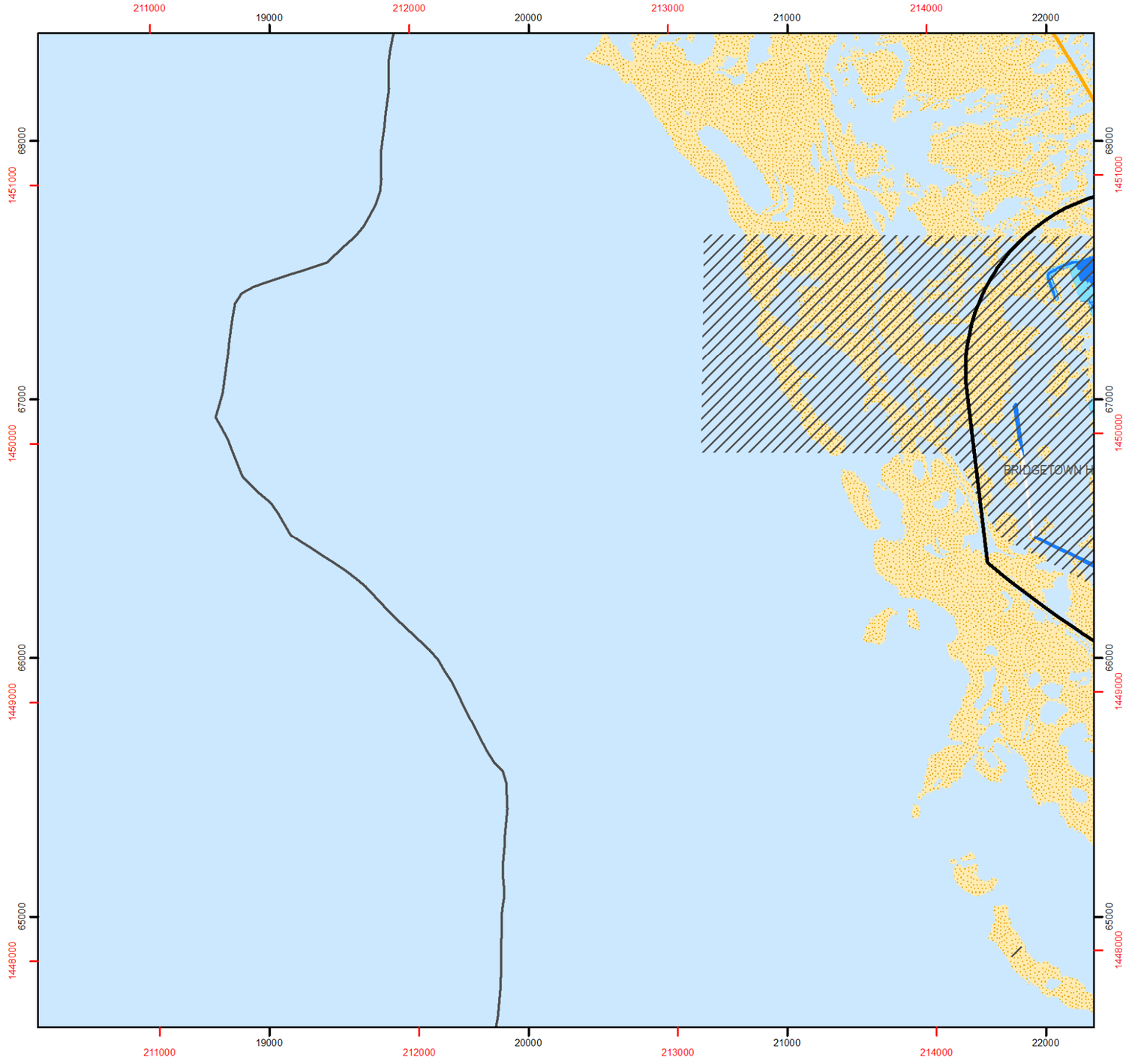
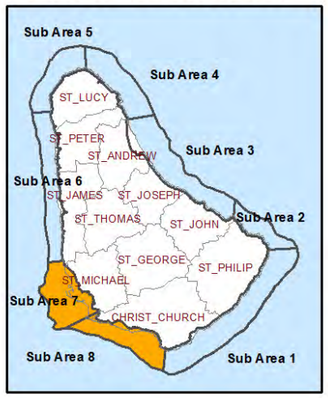


SUB AREAS 7, 8 - SHEET A36

COASTAL ZONE MANAGEMENT SUB AREAS



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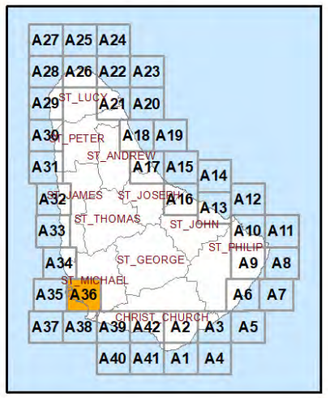

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
- Stable Coast (Natural)
- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

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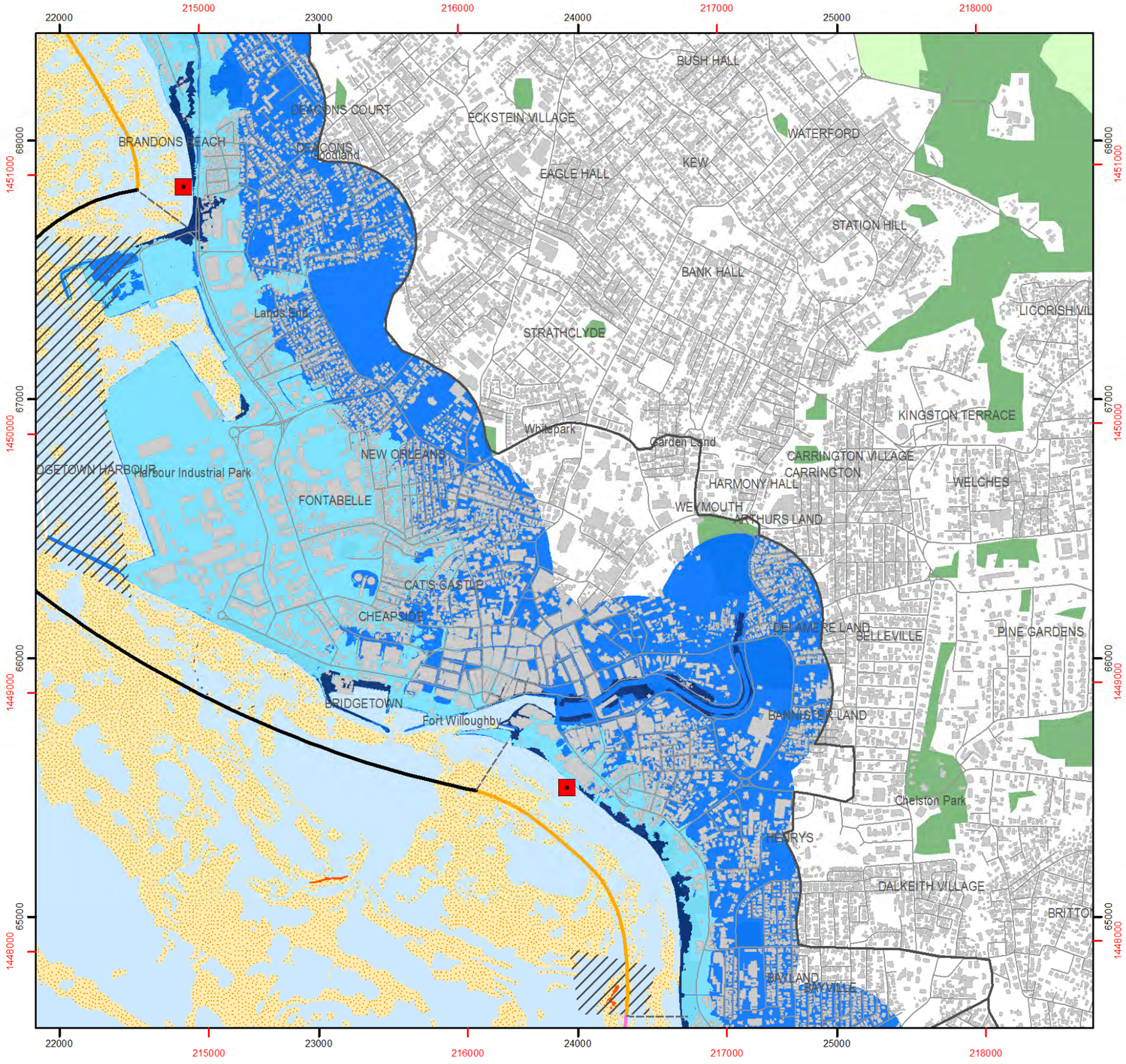
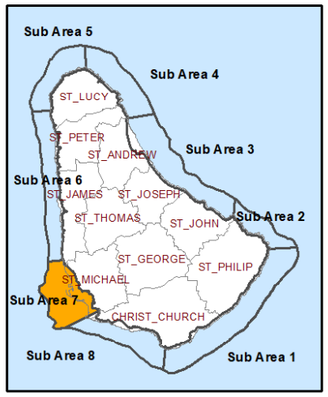


SUB AREA 7 - SHEET A37

COASTAL ZONE MANAGEMENT SUB AREAS



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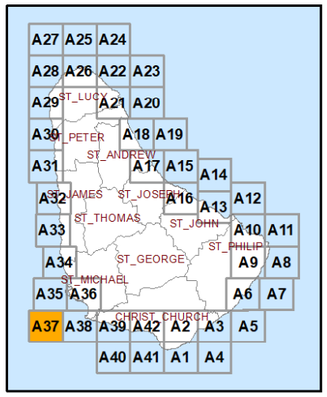

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
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Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

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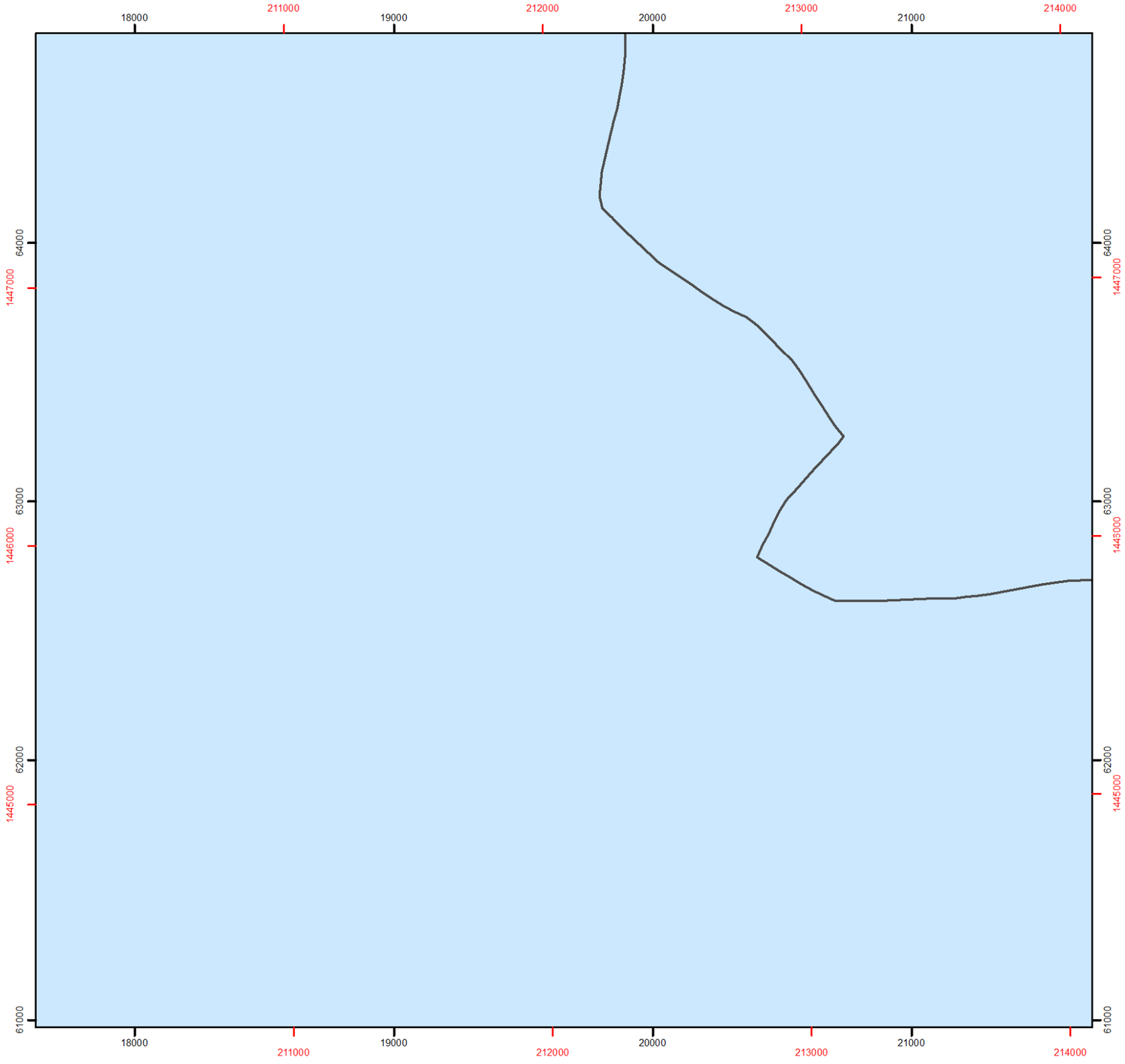
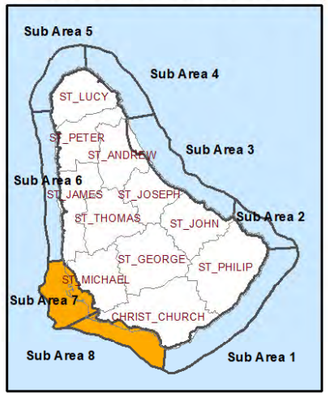


SUB AREAS 7, 8 - SHEET A38

COASTAL ZONE MANAGEMENT SUB AREAS



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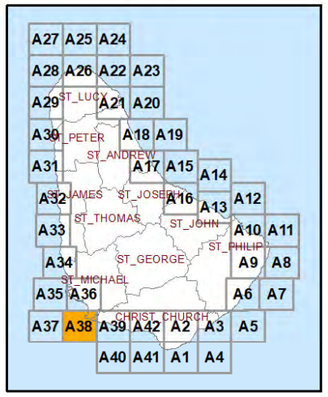

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve

Restricted areas

Planned Marine Areas

Environmental characteristics

Turtle nesting area

Coral reefs

Wetlands

Seagrass

Mangroves

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Dynamically Stable Coast (Natural)

Coastal Cliff

Eroding Coast (Engineered)

Accreting Coast (Engineered)

Stable Coast (Engineered)

Artificial Coast

Coastal classification division

Cliff failure

Very high

High

Medium

Low *(risk class)*

Flooding hazard

Storm surge 100 years

Storm surge + Sea Level Rise (IPCC 2019)

Tsunami 100 years

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid
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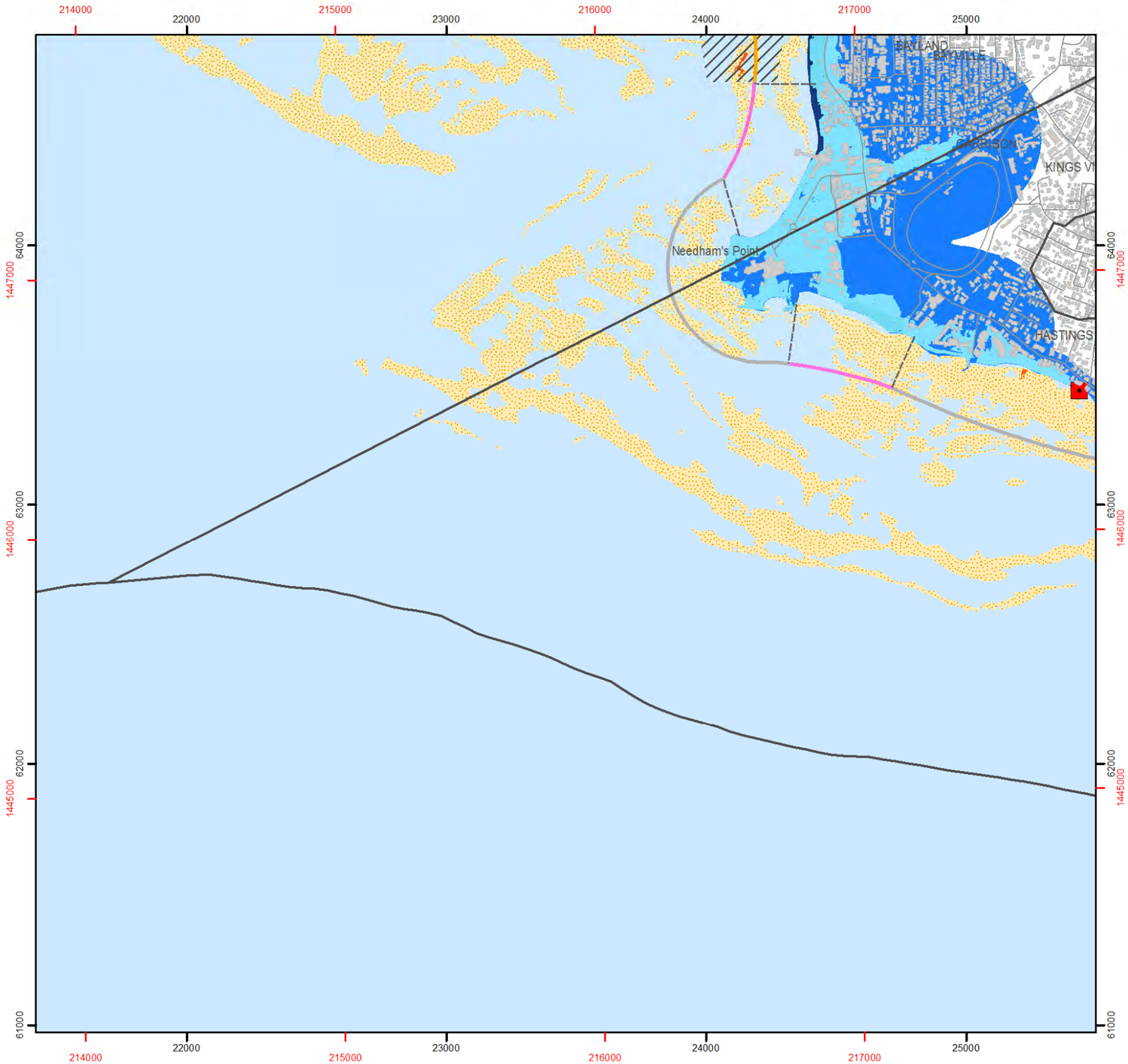
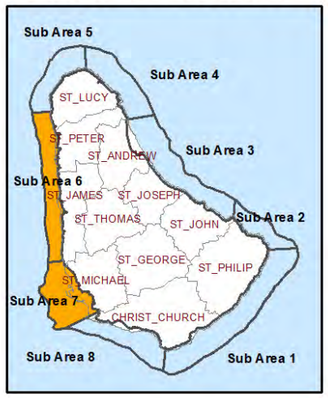


Setback maps of Sub-Area 7

SUB AREAS 6, 7 - SHEET A34

COASTAL ZONE MANAGEMENT SUB AREAS



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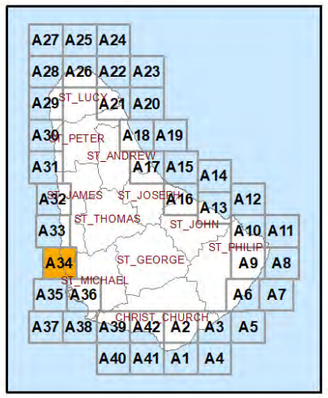

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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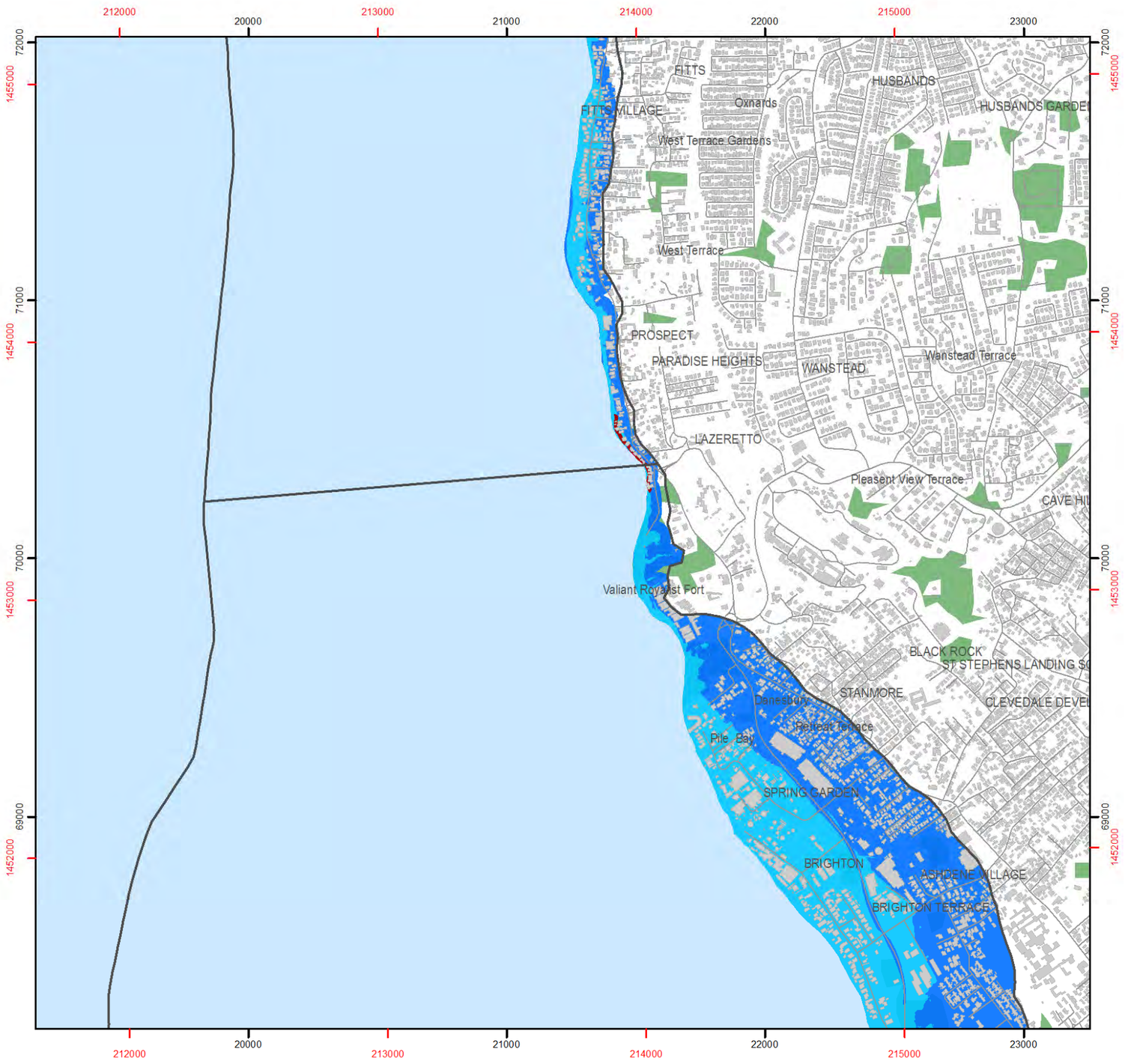
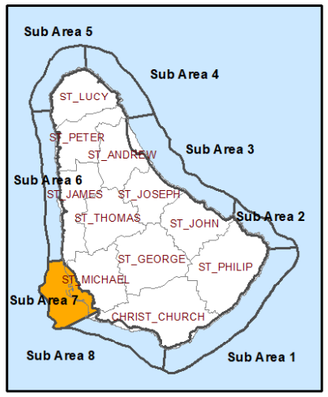


SUB AREA 7 - SHEET A35

COASTAL ZONE MANAGEMENT SUB AREAS



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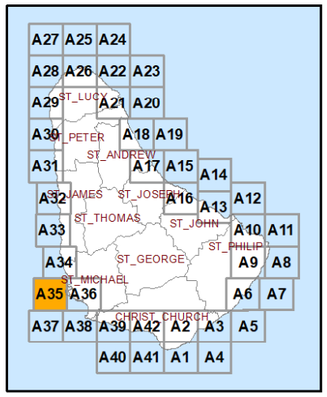

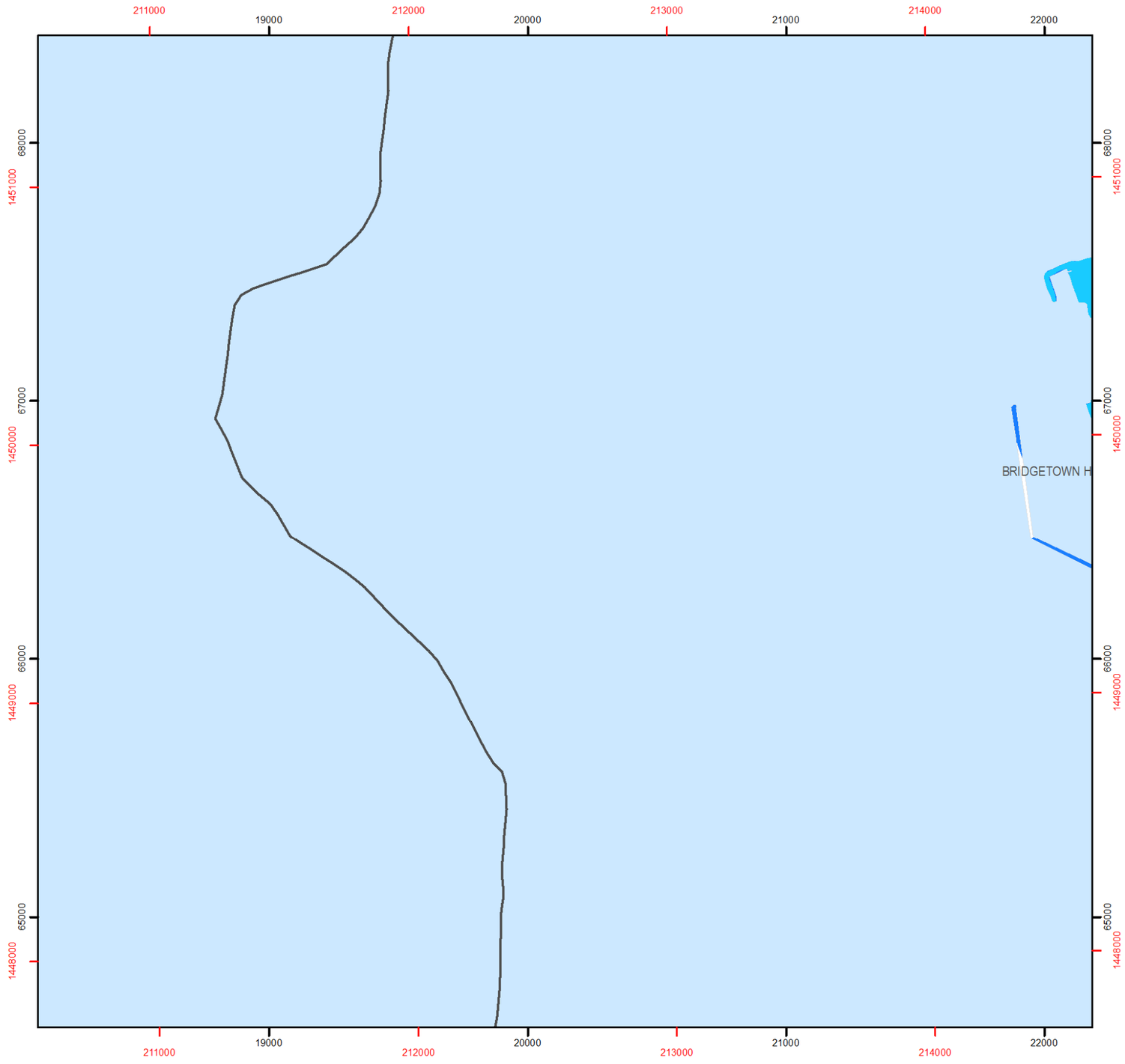

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
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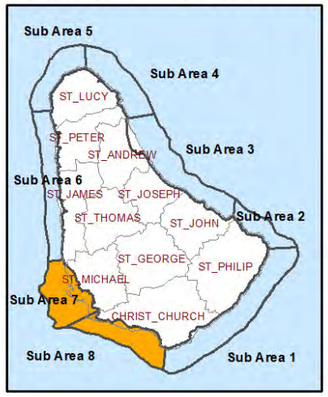
SUB AREAS 7, 8 - SHEET A36

COASTAL ZONE MANAGEMENT SUB AREAS



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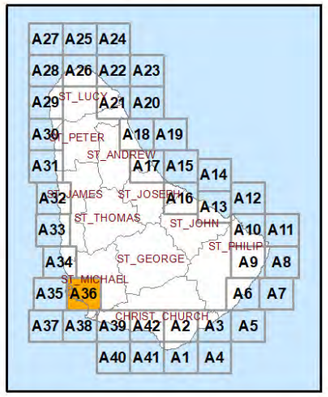

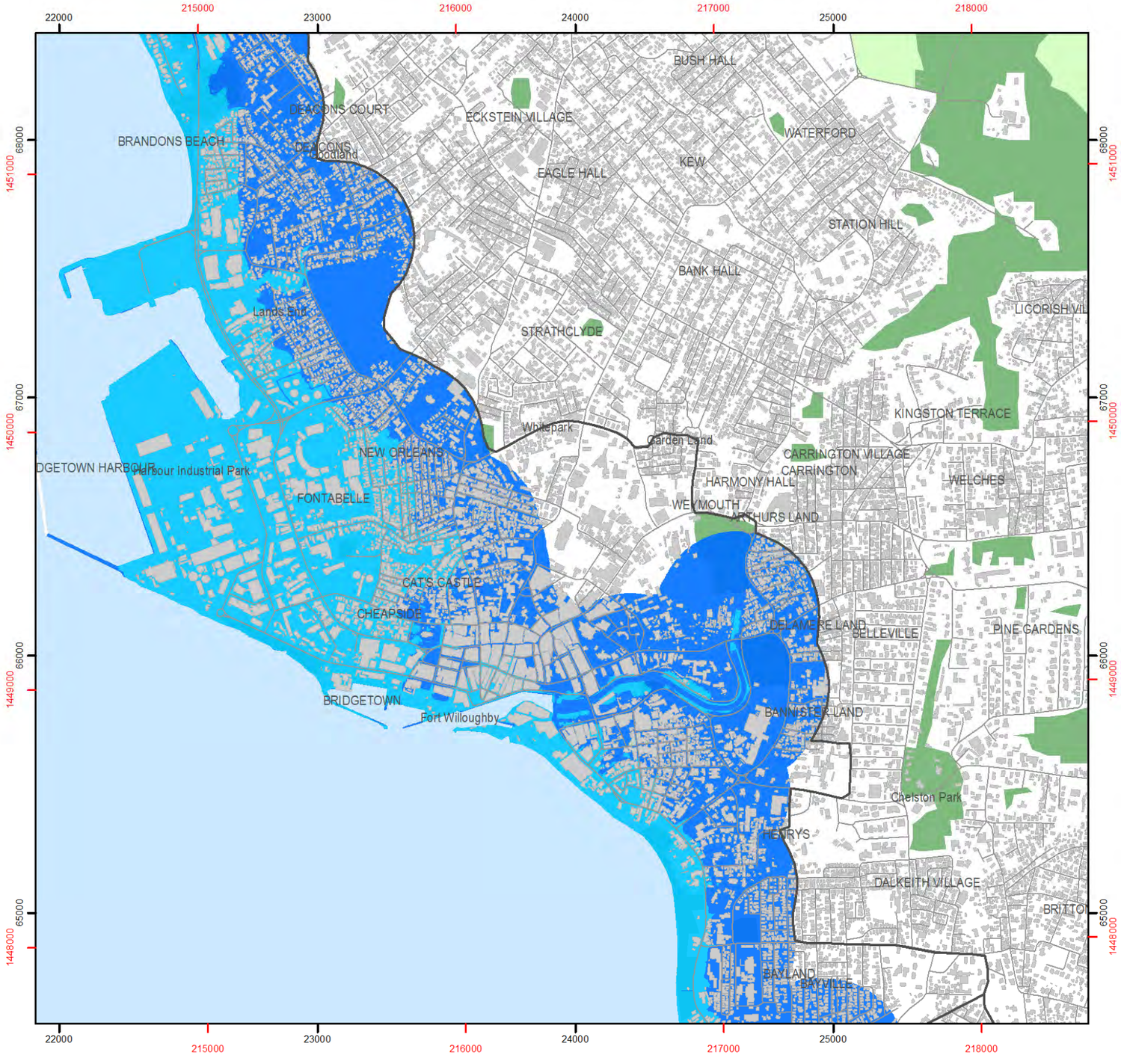

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

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SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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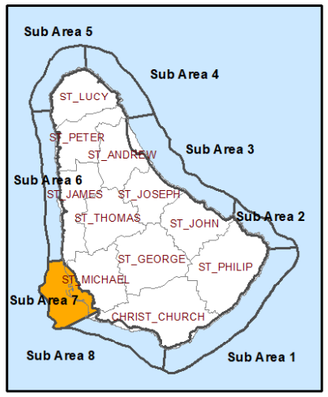
SUB AREA 7 - SHEET A37

COASTAL ZONE MANAGEMENT SUB AREAS



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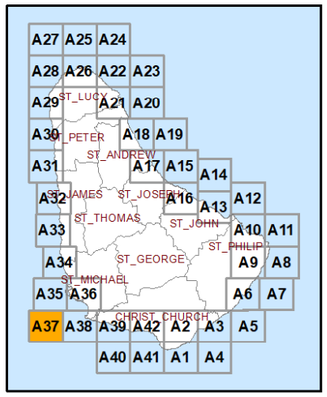

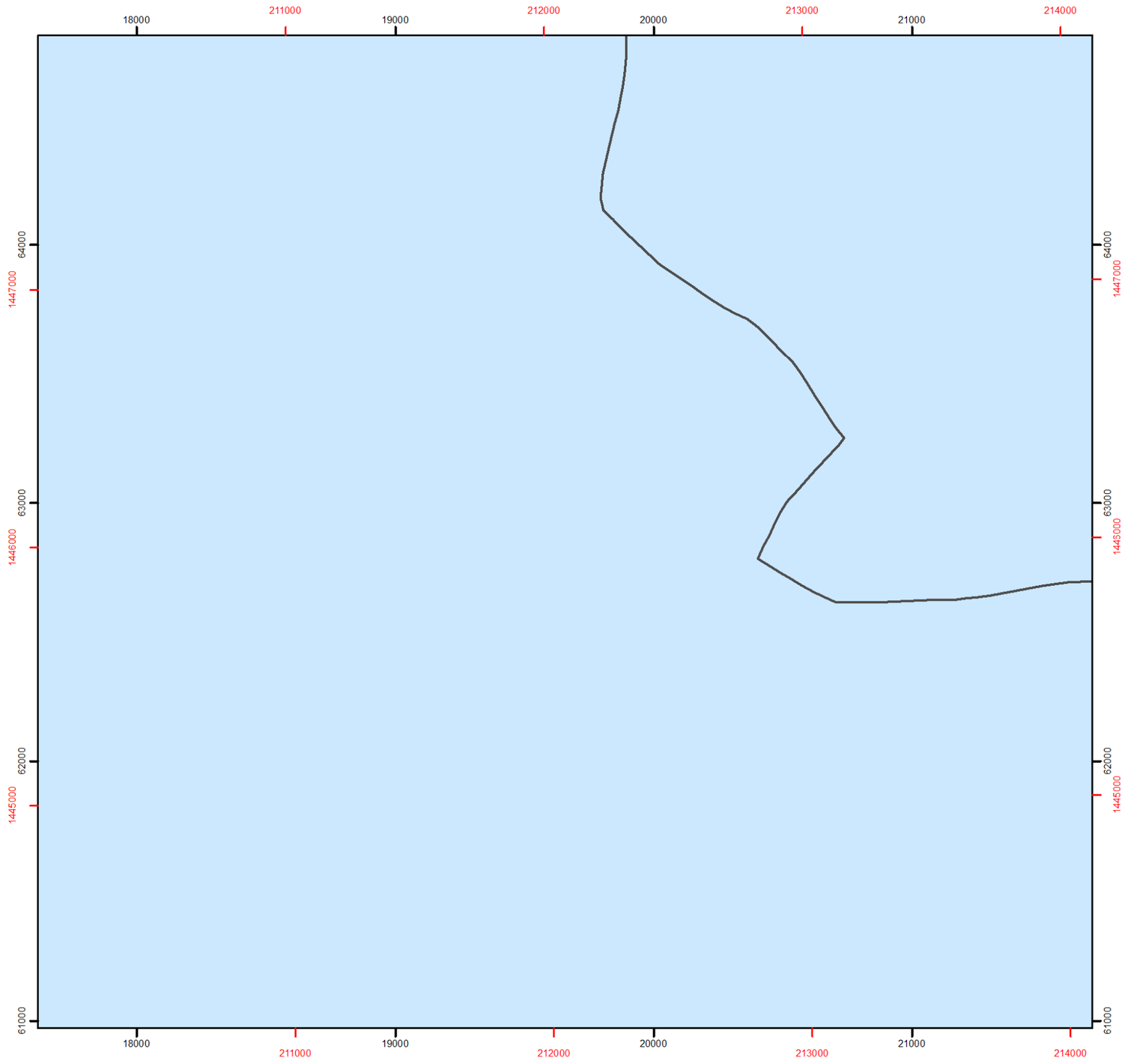

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

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SCALE: 1:18,000

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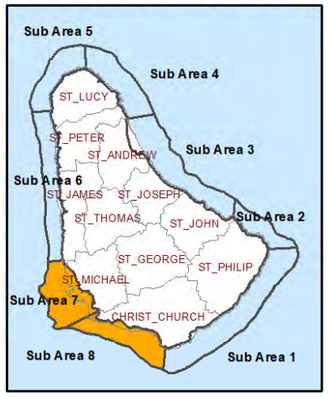
SUB AREAS 7, 8 - SHEET A38

COASTAL ZONE MANAGEMENT SUB AREAS



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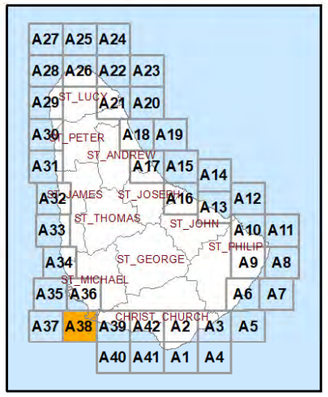

Coastal Zone Management Area

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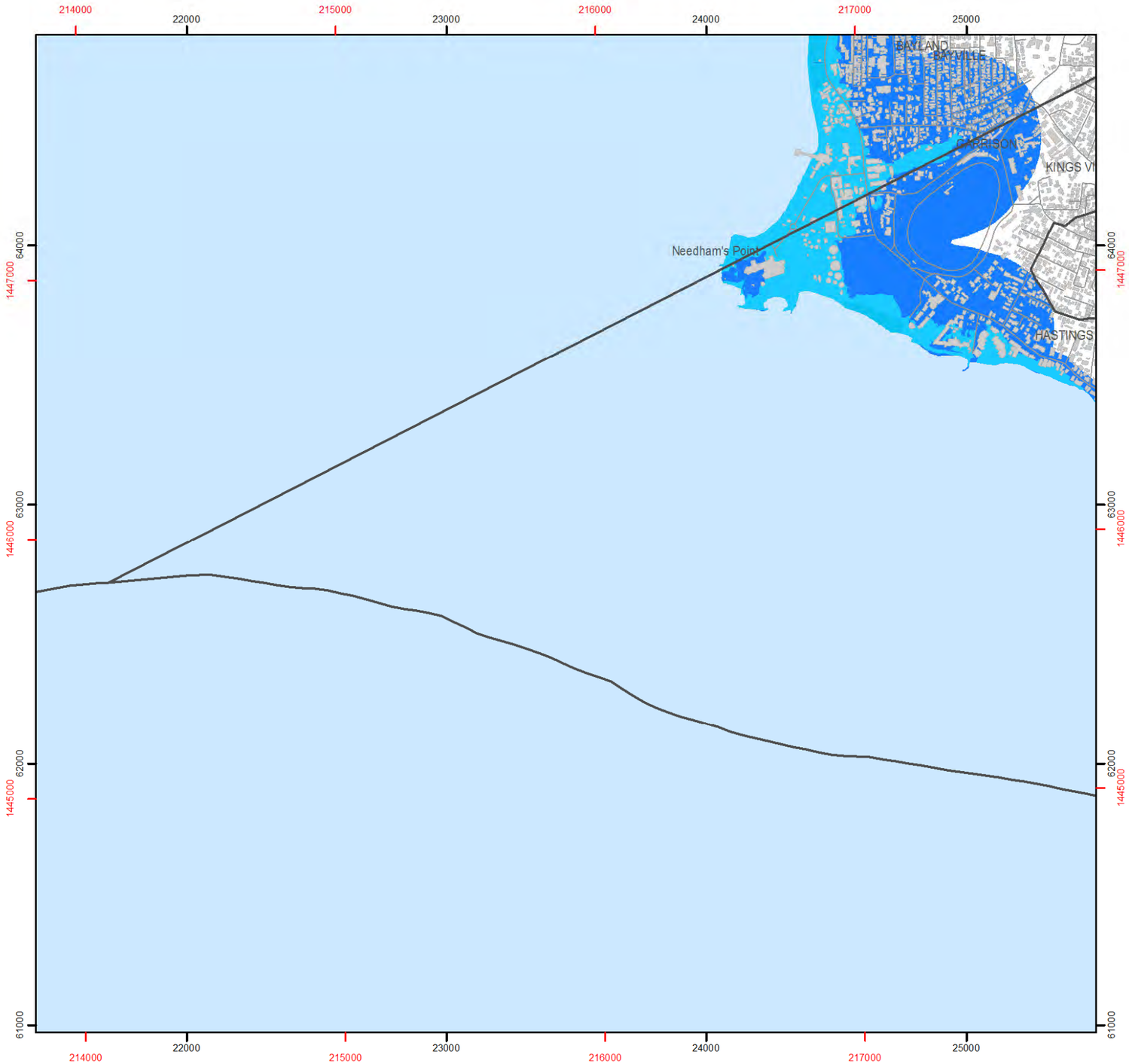


SUB-AREA 8: NEEDHAM´S POINT TO SOUTH POINT

Main themes

RESIDENTIAL DEVELOPMENT AND LOCAL FISHERIES TO SUPPORT SMALL SCALE TOURISM.
STORM SURGE AND CLIFF COLLAPSE.

Sub-Area description and context

This Sub Area extends along the south coast of the island and includes the broad sweep of Oistins Bay. It is principally a residential area though with a developing tourism focus. The Growth Management Framework (PDP, 2017) classifies this coastal area as Urban Corridor with a Community Core at Oistins. Oistins has in fact grown from a local fishing village to a regionally significant centre with a fish market complex that has become a growing recreational and tourist attraction. It is planned to reallocate fishing facilities and update urban planning in the area to avoid current conflict among different activities.

Graeme Hall Swamp is present in the Sub-Area and is one of the last remaining coastal wetlands in Barbados comprising an extensive inland swamp, a large beach area, seagrass beds, and an offshore reef complex. It is designated a Natural Heritage Conservation (PDP, 2017), together with the Graeme Hall Beach, sea grass beds and reef ecosystem. The shore is fringed by sandy beaches interspersed with degraded coral cliffs, broadening out into Oistins Bay in the eastern part of this Sub-Area. Most of the beaches occur in conjunction with coast protection structures, typically shore-perpendicular groynes.

Detailed representation at Sub-Area scale is presented in subsection entitled *"Description maps of Sub-Area 8"* that includes a collection of maps at a detailed scale (1:18,000) with specific information regarding natural and restricted areas, environmental characteristics, coastal and cliff classification and flooding inundation (and climate change related) hazards that Sub-Area 8 is exposed to. IN this regard, there are medium risk levels in the Sub-Area as a result of storm surge along the coastline which may be further exacerbated by sea-level rise as a consequence of the shallow topographic gradient se along the coast in the area of Needham´s Point. The cliff collapse assessment results indicate high cliff collapse risk at Keizer Hill and Kendal Point.

Figure D.9. Needham´s lighthouse.

Main issues and strategic objectives

KEY ISSUES	STRATEGIC OBJECTIVES
• Existence of valuable ecosystems. • Intense use of beaches. • Potential development of tourism. • Interest in re-developing Oistins area that may threat for local character. • Low protection of cultural heritage. • Conflicts between recreational, tourism and fisheries activities. • Flooding risks due to storm surge that may be highly exacerbated by sea-level rise.	• Enforce of setbacks lines protection of wetlands. • Enforce setbacks for climate change adaptation. • Implement the PDP policies in Natural Heritage Areas. • Support and enhance tourism that benefits and embraces local communities, is economically viable and respects local character. • Regulate beach uses considering beach carrying capacity to ensure protection of endangered species. • Improve facilities and ease of access at popular recreation areas. • Improve water quality.

Development Planning and Setbacks at Sub-Area scale

Setback recommendations are presented within a collection of maps provided in the sub-section entitled *"Setback maps of Sub-Area 8"*. These recommendations adhere closely to the National Guidance "Development Planning and Setbacks" (see section C3) for Sub-Area 8. This map provides the delineation of setbacks for this Sub-Area at a scale of 1:18000.

This planning related information should be used by public and private actors whom are involved in the management of the coast (i.e.: developers, owners and citizens). The setback guidance defined for the 4 separate setback categories (cliff, landscape, flood inundation and climate change) applies only to planned constructions/developments. It cannot be retroactively be enforced for existing developments.

Action brief

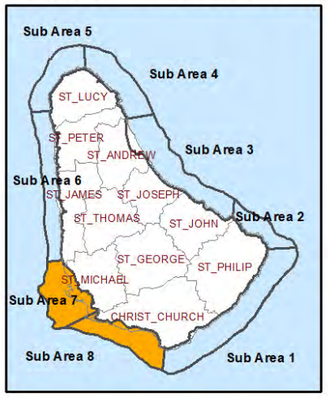
TOPIC	CODE	ACTION	LEAD ACTORS	OTHER ACTORS	TIME SCALE	COMMENTS	KEY POLICY OUTCOME
DRM and CCA	8DRM1	Elaborate and implement a DRM Plan with emphasis in cliff collapse warning and evacuation.	CZMU	DEM		Under the frame of the National DRM Plan, this local plan should include (at least) the provision of warning signpost for pedestrians and swimmers, and evacuation plan in beaches and buildings in case of cliff collapse.	Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Beach Management	8BM1	Consider carrying capacity, beach erosion estimations and existence of turtle nesting sites in Beach Management Plans.	CZMU		Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	8S1	Enforce Climate Change Setback.	CZMU	TCDPO, Developers	Short term, continuous		Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Development Planning and Setbacks	8S2	Prepare and distribute guidelines to enforce cliff collapse Setback in at Keizer Hill and Kendal Point.	CZMU	TCDPO, Developers	Medium term, immediate	Guidelines based on GSI.	Outcome 3 - Climate and disaster risk adaptive capacity is strengthened
Development Planning and Setbacks	8S3	Prepare and distribute guidelines to enforce Conservation Setback in Sub-Area 8 for developers and public agencies.	CZMU	TCDPO, Developers	Medium term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Development Planning and Setbacks	8S4	Organize meetings with key stakeholders to raise awareness on coastal resources.	CZMU	TCPDO, NCC, Developers	Medium term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Development Planning and Setbacks	8S5	Organize bilateral meetings with TCPDO to review existing applications and evaluate environmental impacts.	CZMU	TCDPO	Short term, immediate		Outcome 1 - Sustainable socioeconomic development is achieved
Coastal Biodiversity	8BIO1	Organize meetings with Town Planning to ensure that upcoming works respect traditional architecture and cultural character of Oistins village.	CZMU, TCPDO	Fishermen community			Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	8BIO2	Organize meetings with Town Planning to address drainage issues behind the Berinda Cox Fish Market and improved beach access issues down to Miami Beach.	CZMU, TCPDO				Outcome 2 - Coastal resources are protected and effectively managed
Coastal Biodiversity	8BIO3	Promote mangrove / coastal woodland restoration program.	CZMU	NCC	Short term, immediate		Outcome 2 - Coastal resources are protected and effectively managed
Public Awareness and Stakeholder Participation	8PA1	Identify local stakeholder at community level and private developers in the area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	8PA2	Conduct bi-yearly public meetings to identify new issues in the Sub-Area.	CZMU	All stakeholders in the Sub-Area and key institutions at national level			Outcome 6 - Research, understanding and knowledge outreach is increased
Public Awareness and Stakeholder Participation	8PA3	Promote cultural and environmental awareness in this Sub-Area.	CZMU				Outcome 6 - Research, understanding and knowledge outreach is increased

Table D.8. Action brief for Sub-Area

Description maps of Sub-Area 8

SUB AREAS 7, 8 - SHEET A39

COASTAL ZONE MANAGEMENT SUB AREAS



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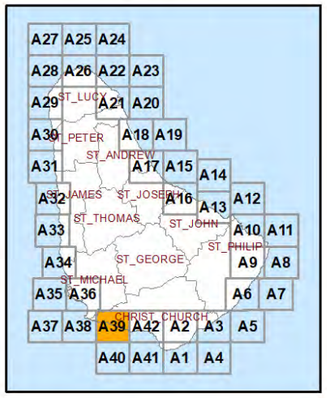


Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

Turtle nesting area
Coral reefs
Wetlands
Seagrass
Mangroves
Agriculture
Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)
Accreting Coast (Natural)
Stable Coast (Natural)
Dynamically Stable Coast (Natural)
Coastal Cliff
Eroding Coast (Engineered)
Accreting Coast (Engineered)
Stable Coast (Engineered)
Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

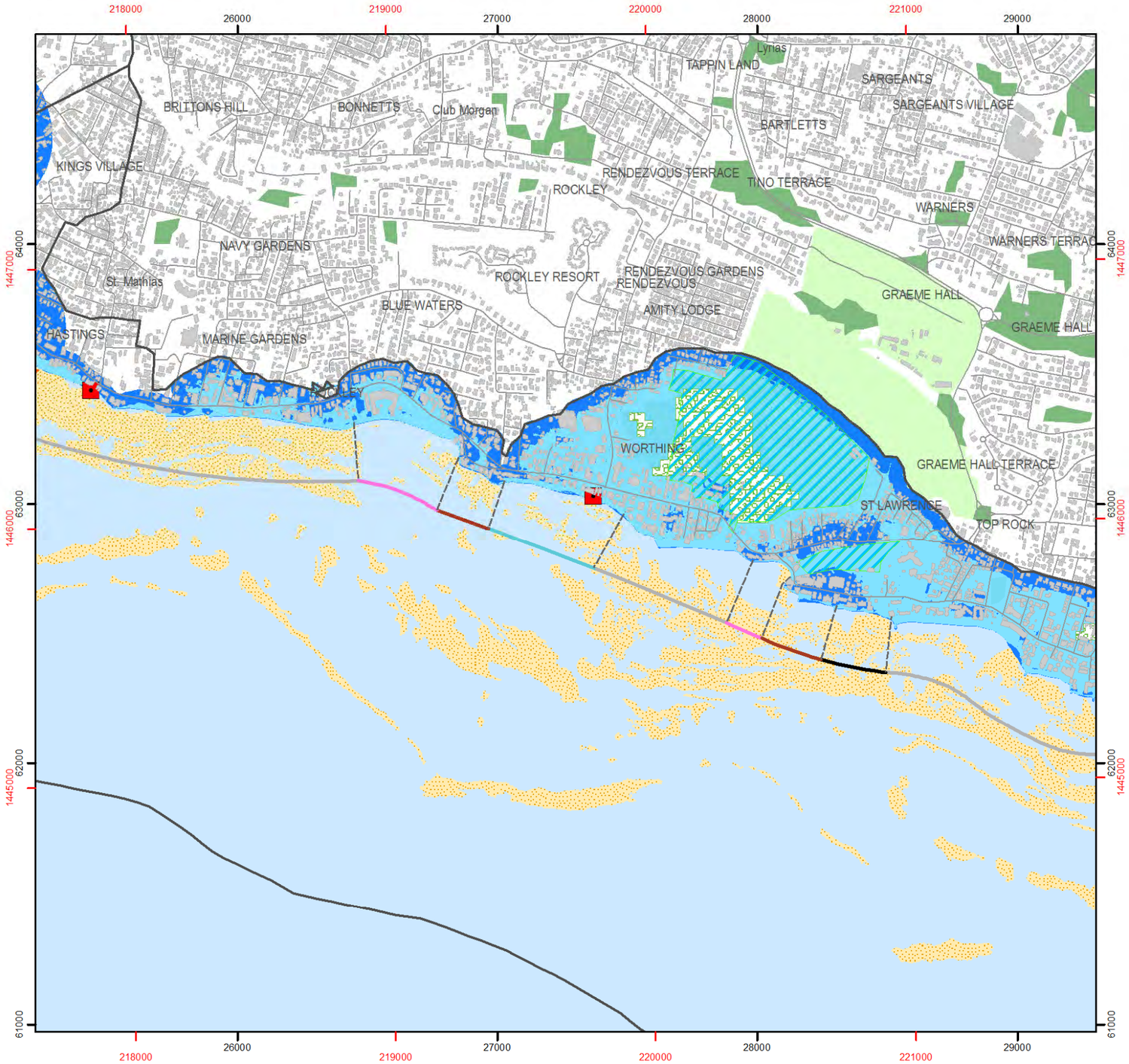
Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

SCALE: 1:18,000

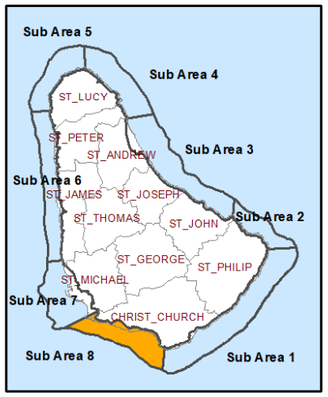
0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
- UTM grid and labels shown in red: UTM Zone 21, WGS84 datum



SUB AREA 8 - SHEET A40

COASTAL ZONE MANAGEMENT SUB AREAS



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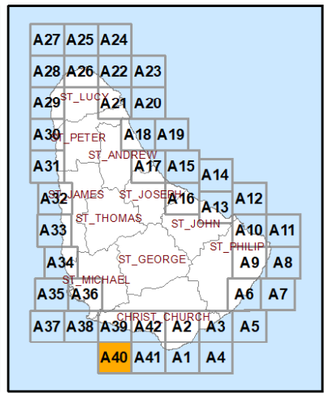

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve

Restricted areas

Planned Marine Areas

Environmental characteristics

Turtle nesting area

Coral reefs

Wetlands

Seagrass

Mangroves

Agriculture

Natural vegetation

Coast and cliff classification

Eroding Coast (Natural)

Accreting Coast (Natural)

Stable Coast (Natural)

Dynamically Stable Coast (Natural)

Coastal Cliff

Eroding Coast (Engineered)

Accreting Coast (Engineered)

Stable Coast (Engineered)

Artificial Coast

Coastal classification division

Cliff failure

Very high

High

Medium

Low *(risk class)*

Flooding hazard

Storm surge 100 years

Storm surge + Sea Level Rise (IPCC 2019)

Tsunami 100 years

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid
  WKID: 21292, Authority: EPSG
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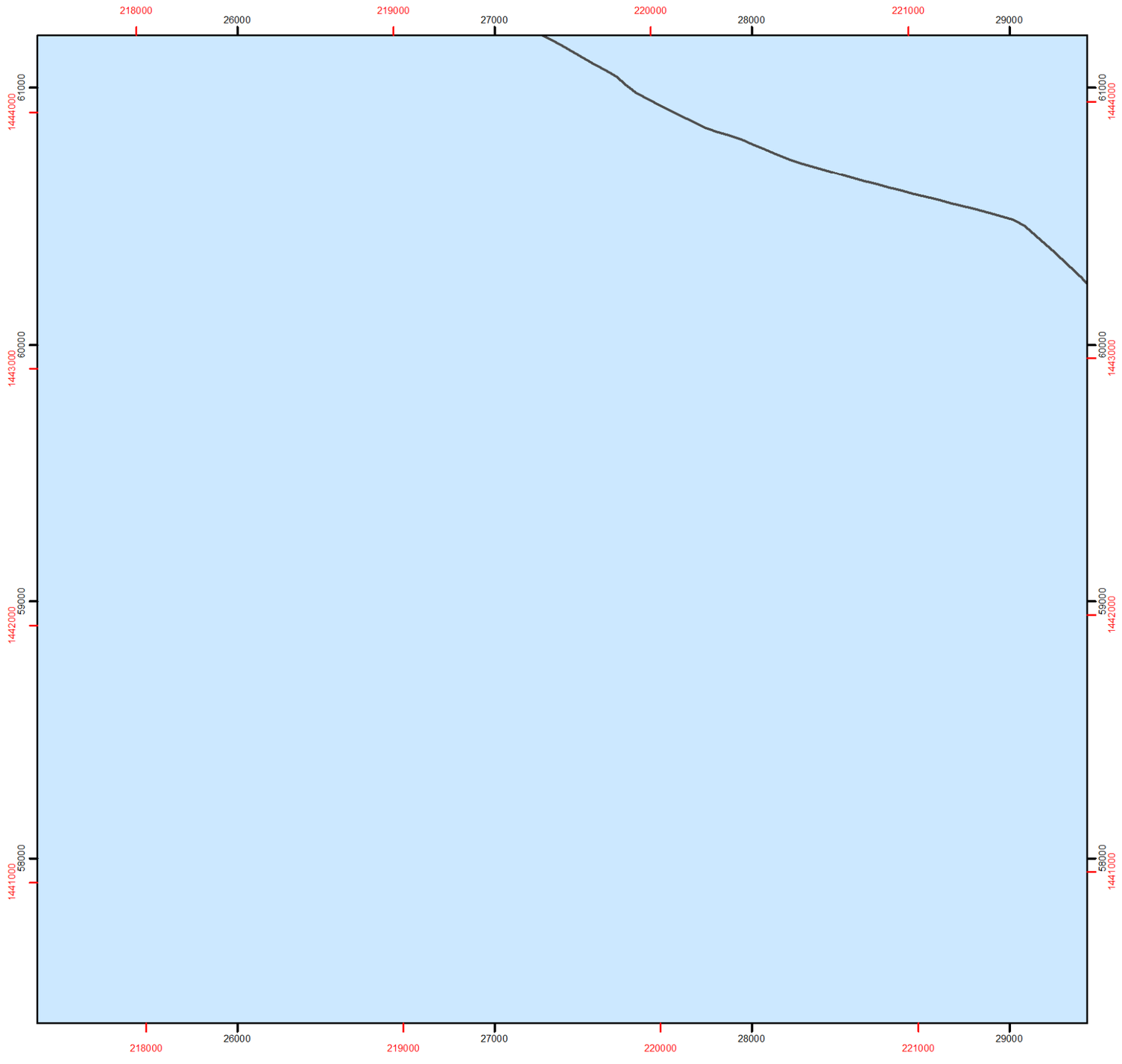
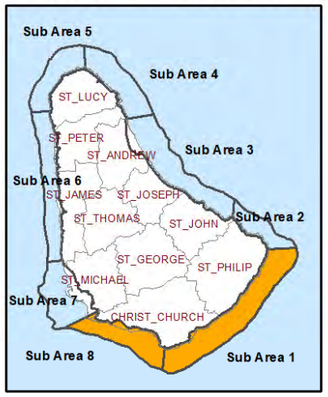
  UTM Zone 21, WGS84 datum



SUB AREAS 8, 1 - SHEET A41

COASTAL ZONE MANAGEMENT SUB AREAS



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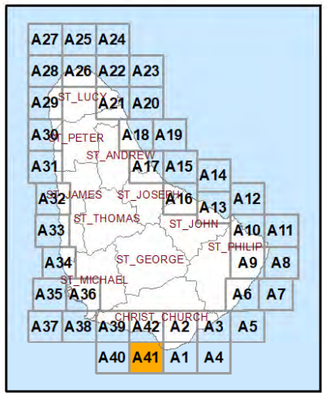

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

Environmental characteristics

- Turtle nesting area
- Coral reefs
- Wetlands
- Seagrass
- Mangroves
- Agriculture
- Natural vegetation

Coast and cliff classification

- Eroding Coast (Natural)
- Accreting Coast (Natural)
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- Dynamically Stable Coast (Natural)
- Coastal Cliff
- Eroding Coast (Engineered)
- Accreting Coast (Engineered)
- Stable Coast (Engineered)
- Artificial Coast
- Coastal classification division

Cliff failure

Very high | High | Medium | Low

Flooding hazard

- Storm surge 100 years
- Storm surge + Sea Level Rise (IPCC 2019)
- Tsunami 100 years

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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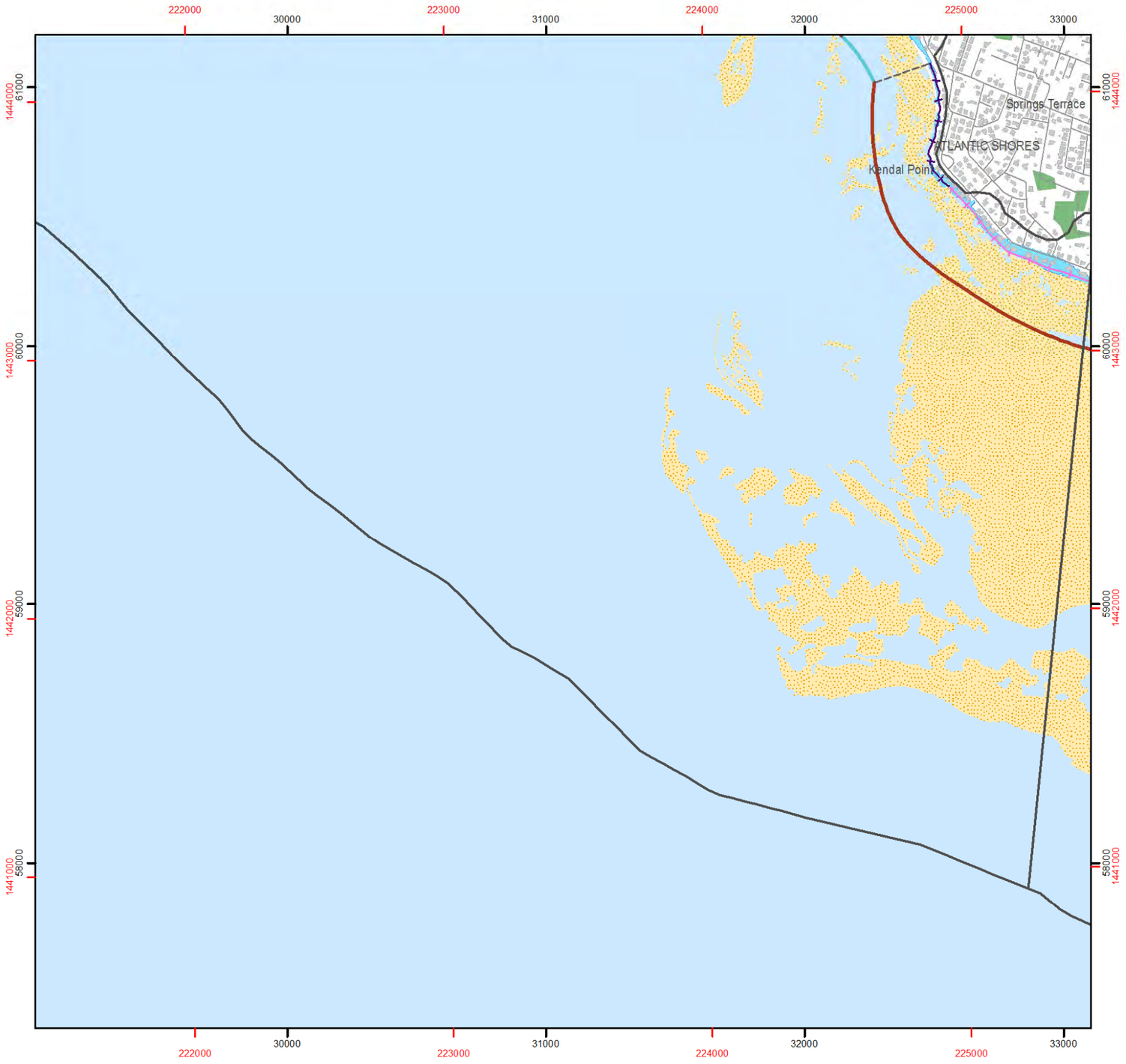
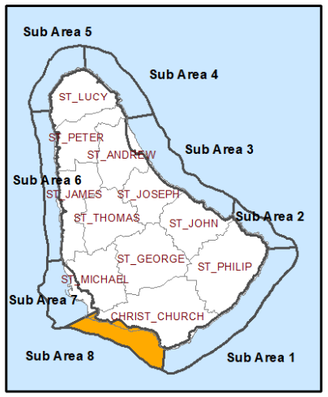


SUB AREA 8 - SHEET A42

COASTAL ZONE MANAGEMENT SUB AREAS



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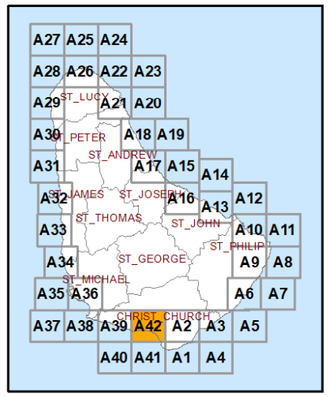

Coastal Zone Management Area

Natural and restricted areas

Folkstone reserve | Restricted areas | Planned Marine Areas

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Turtle nesting area
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Wetlands
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Mangroves
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Artificial Coast
Coastal classification division

Cliff failure

Very high | High | Medium | Low *(risk class)*

Flooding hazard

Storm surge 100 years
Storm surge + Sea Level Rise (IPCC 2019)
Tsunami 100 years

N

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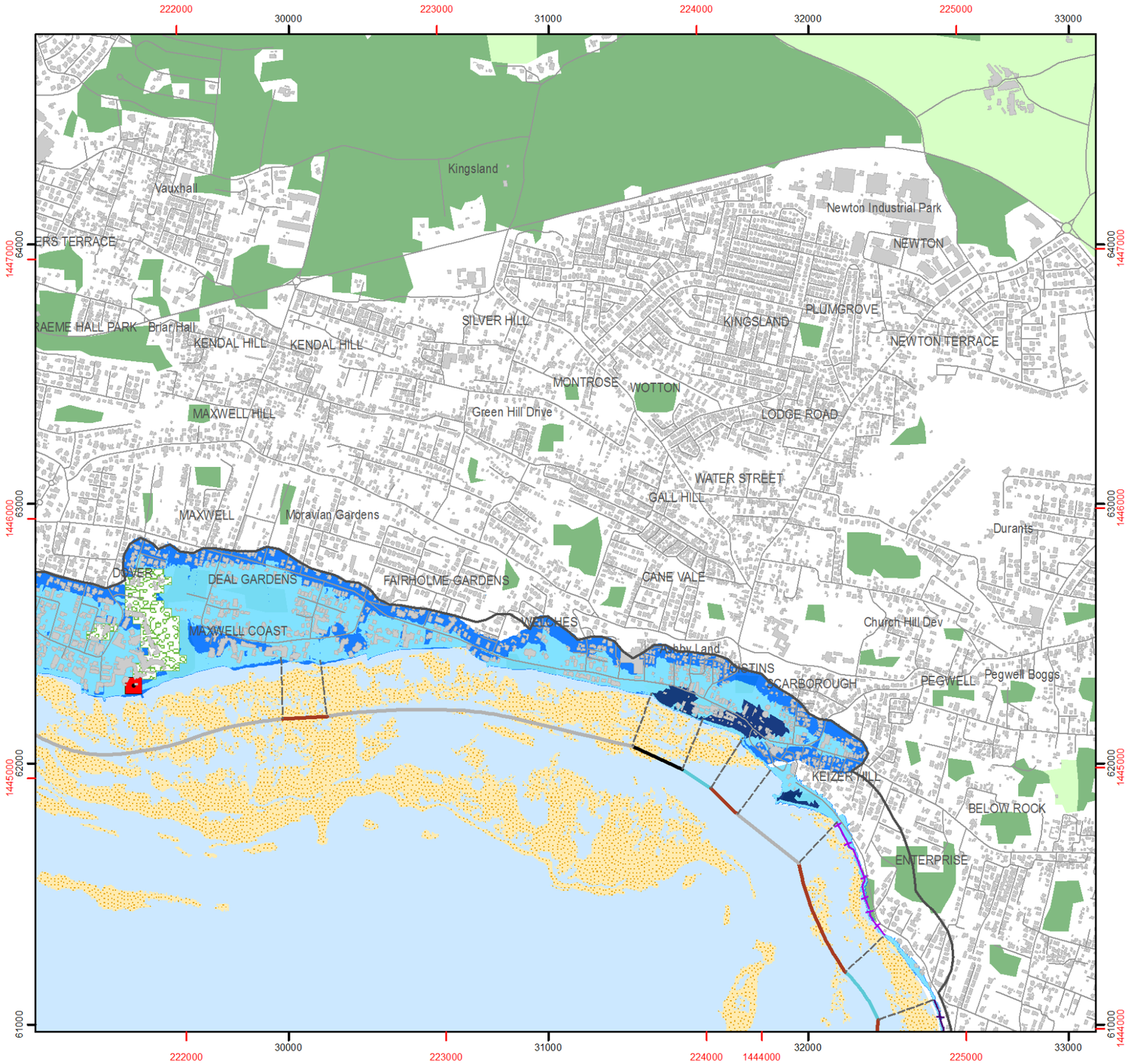
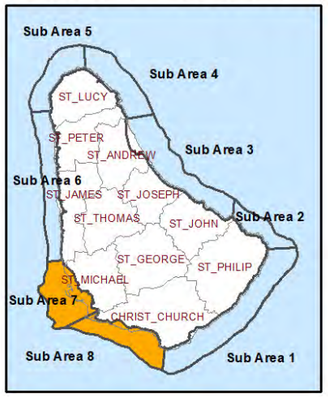


Setback maps of Sub-Area 8

SUB AREAS 7, 8 - SHEET A39

COASTAL ZONE MANAGEMENT SUB AREAS



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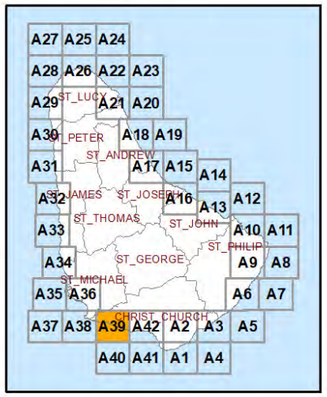

Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

Setback	Description
Minimum 30 m setback	30 m from the HWM
Flooding inundation setback	Variable: flooded area due to storm surge and tsunami (T=100 years), according to NCRIPP hazard assessment.
Climate change adaptation setback	Variable: flooded area considering last IPCC (2019) sea level rise projections.
Cliff collapse setback	Variable: total setback according to Geotechnical Survey Investigation study
Landscape setback	Variable: 100 m from coastline in rural areas, and 200 m from coastline in landscape protection areas, according to the CZMA delimitation criteria

N

SCALE: 1:18,000

0 125 250 375 500 mts

- Coordinate System: Barbados National Grid WKID: 21292, Authority: EPSG
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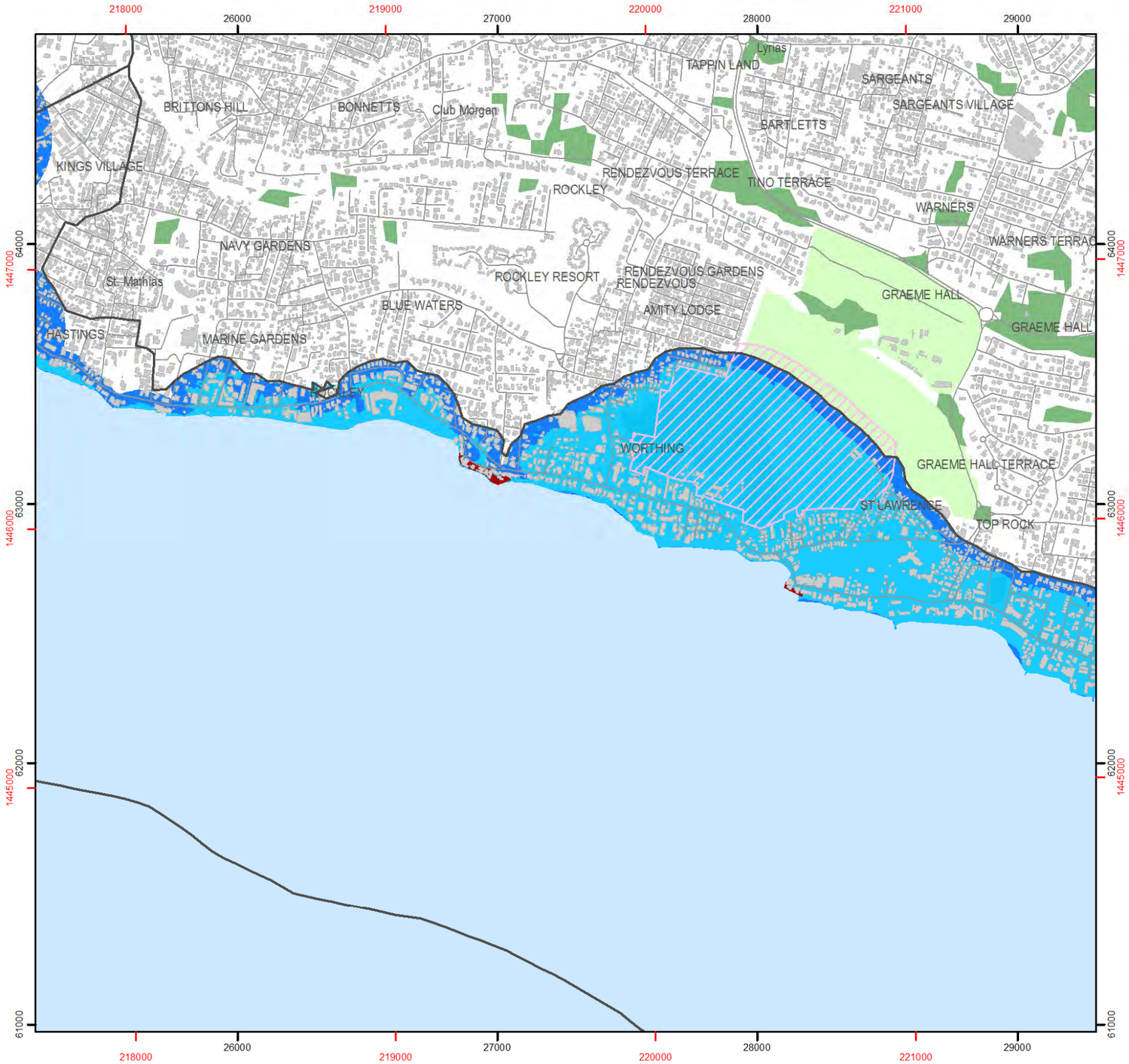
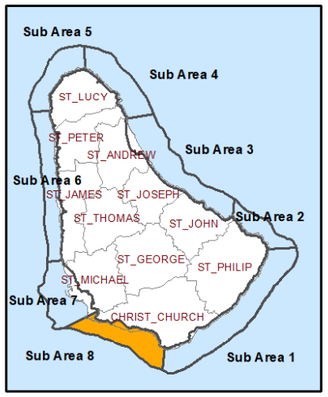


SUB AREA 8 - SHEET A40

COASTAL ZONE MANAGEMENT SUB AREAS



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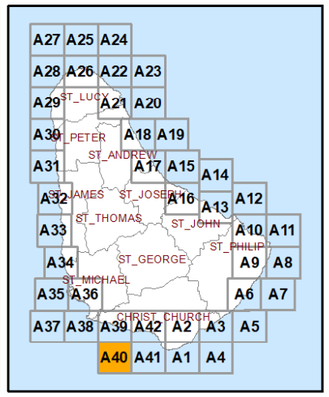

Coastal Zone Management Area

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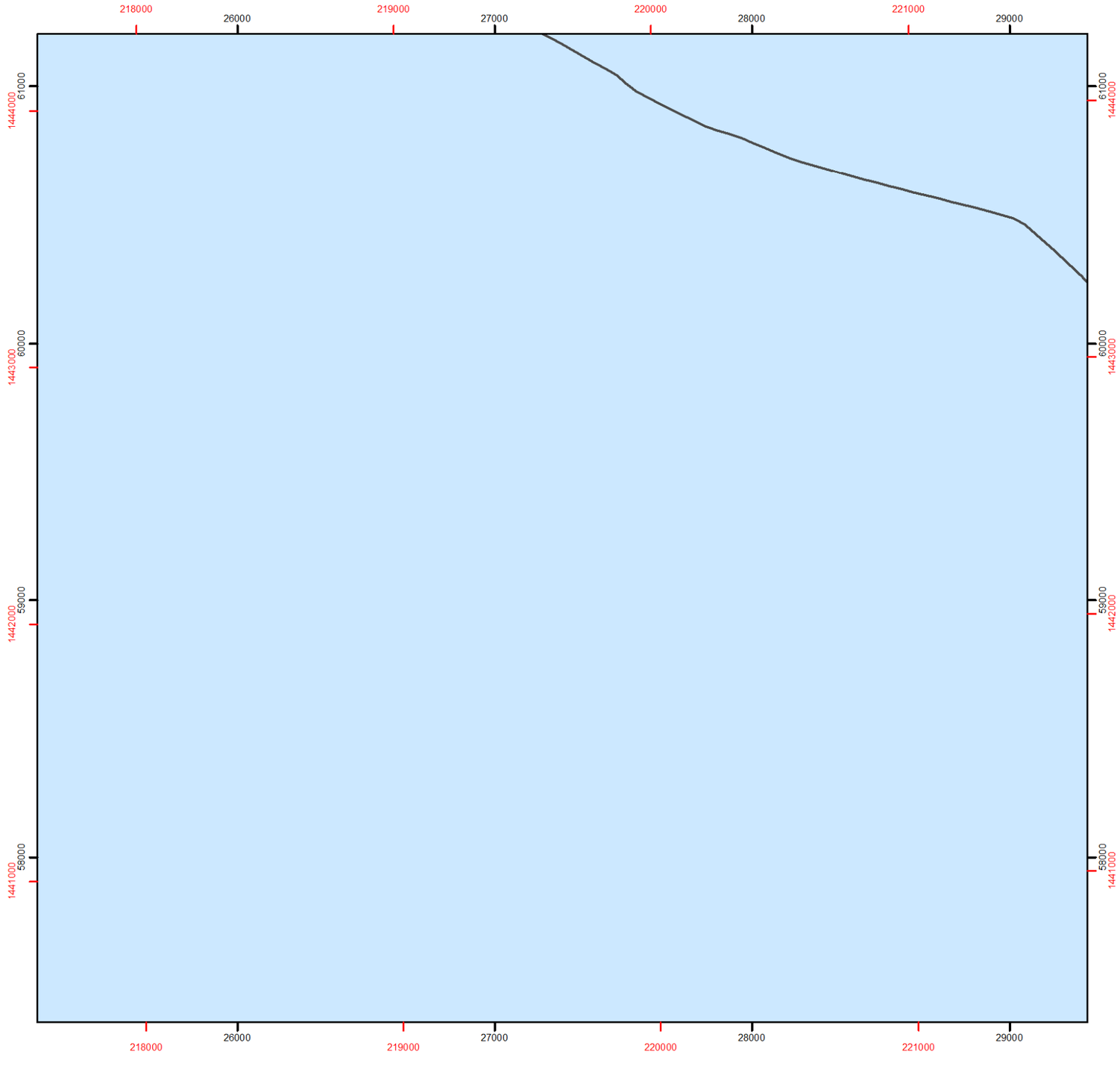
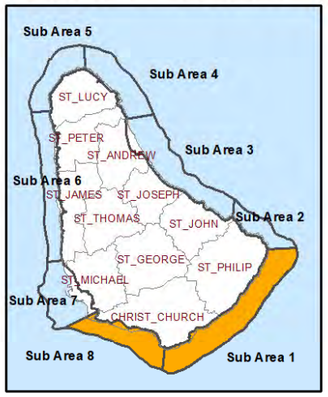
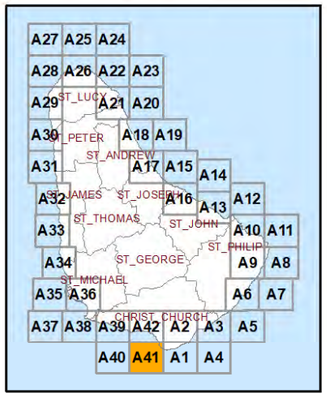


SUB AREAS 8, 1 - SHEET A41

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX



Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

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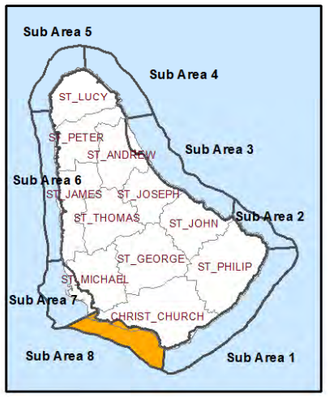
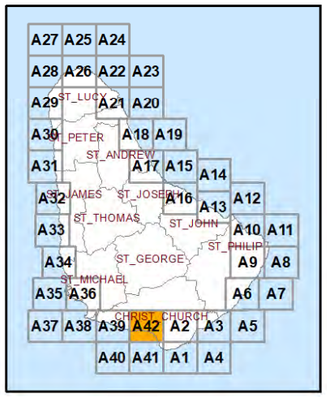
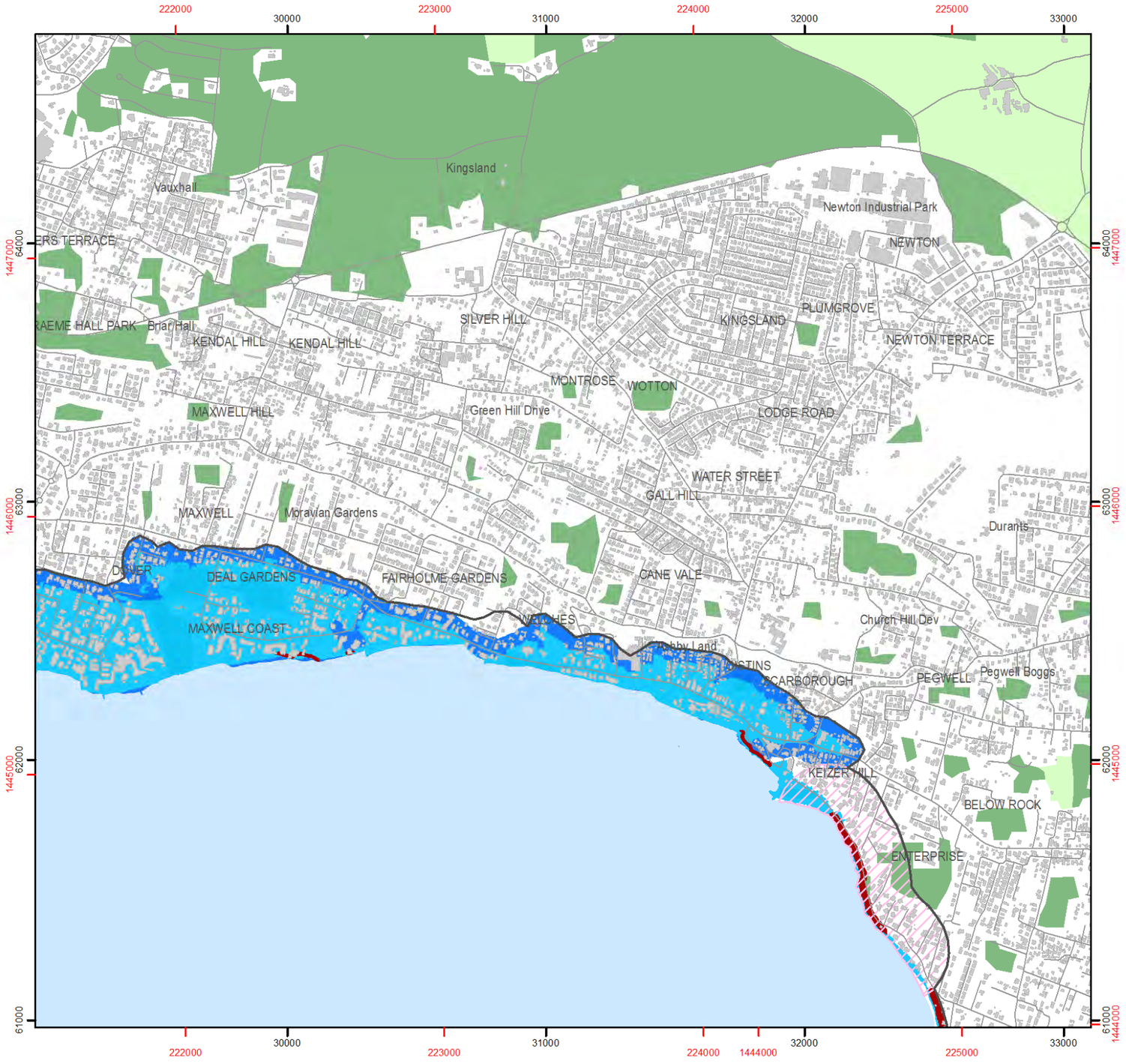
SUB AREA 8 - SHEET A42

COASTAL ZONE MANAGEMENT SUB AREAS



MAP INDEX





Coastal Zone Management Area

Flood inundation setback

Climate change adaptation setback

Cliff collapse setback

Landscape setback

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