



**SMALL STATES
CONFERENCE ON
SEA LEVEL RISE**
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**GLOBAL SEA LEVEL RISE: A STATEMENT
FROM THE ISLAND OF BARBADOS**

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1.0 INTRODUCTION

The island of Barbados, like other concerned States, is deeply committed to the global search now underway, for a better understanding of the nature of contemporary climatic changes and their effect on sea level rise. Barbados, a small island of barely 430 sq. km., depends heavily on its coastal assets as a major national resource. We recognise our obvious vulnerability to the threat of global sea level rise, and are fully aware of its potentially disruptive influence on our socio-economic development. Barbados therefore welcomes the opportunity to participate in this Small States Conference on Sea Level Rise, and expresses its appreciation to the Government of the Maldives and other international agencies, on whose initiative this meeting is convened.

2.0 IMPORTANCE OF COASTAL ZONE TO NATIONAL DEVELOPMENT

As in the case of most small islands, Barbados has limited natural resources, but fortunately has been endowed with a relatively productive, exploitable coastal zone. The coast is used in a variety of ways by different interest groups. Fishing for example, has been a traditionally important occupation, and continues to provide a livelihood for many individuals.

Private housing, tourist accommodations and recreational facilities occupy a substantial portion of the island's west and south coasts.

There are nearly continuous 'ribbons' of development stretching from north of Bridgetown, the capital to just north of Speightstown, and from east of the capital to Oistins, on the south coast. Unique habitats of scientific and educational interest can also be found on the coast. These include Animal Flower Cave in the north, Folkestone Underwater Park to the west and Graeme Hall Swamp on the south coast. The swamp at Graeme Hall contains the last substantial remnants of mangroves on the island (Figure 1).

Industry has also found its way on the Barbados littoral. The establishments include a flour mill, an oil refinery, a rum refinery, and a power generation plant. These in turn utilize the coast for the daily discharge of their effluent and waste. The coast is also used as a waste disposal outlet for domestic effluent from private residences and hotels. Figure 2 is a partial inventory of land uses along the Barbados coasts.

3.0 SOME IMPLICATIONS OF SEA LEVEL RISE FOR BARBADOS

Unfortunately, there is no long-term tide gauge data available for Barbados, from which eustatic change can be calculated. Hence, the estimated rate of sea level rise has to be inferred from geological, geomorphological and oceanographic evidence. The problem is further complicated because of crustal emergence at a rate of approximately 0.3m/1000 year. The most recent estimates available suggest a mean sea level rise of approximately 0.6 mm/year (Bird, 1982).

BARBADOS — LOCATION OF MAJOR COASTAL LAND USE ACTIVITIES

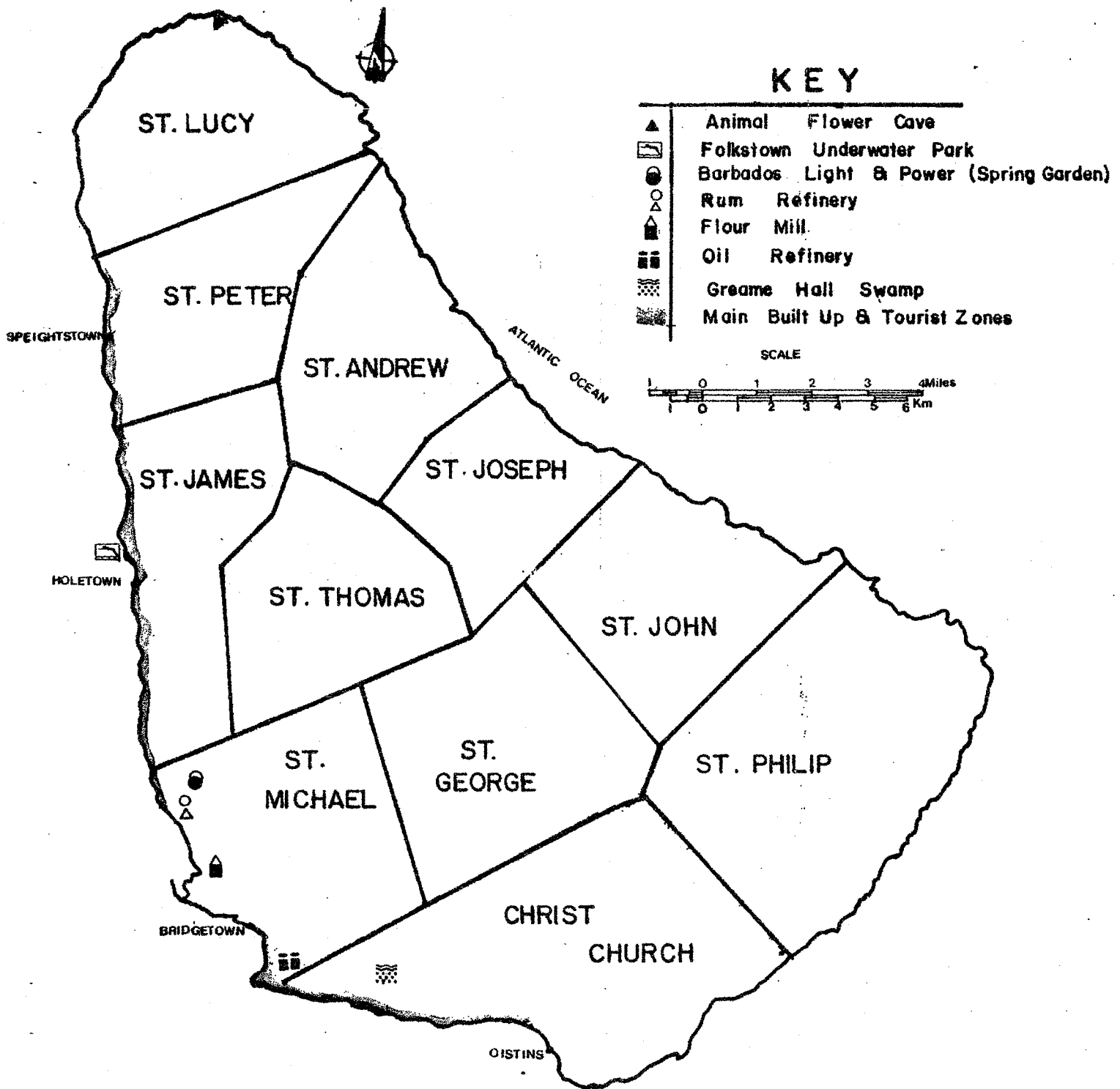


FIGURE 1

FIGURE 2

A COASTAL LAND-USE INVENTORY FOR BARBADOS

FISHING	Cast Netting from Beach Seining Potting Bottom Lining Sea-egg Harvesting and Preparation Market Sites Beaching and Mooring Boats Boat Building Jetties, Wharves etc.
HOUSING	Private Cottages and Residences Govt. Low-Cost Housing Traditional Villages
TOURISM	Hotels Condominiums Guest Houses Specialty Shops Boutiques Night Clubs Other Ancillary Services e.g. Restuarants, Taxi Stands
RECREATION	Sport Fishing Sailing Parasailing Scuba Diving Snorkelling Water Skiing Surfing Swimming Sun Bathing Picnicking
MARINE/ SCIENTIFIC RESERVES	Folkestone Underwater Park Animal Flower Cave Graeme Hall Swamp (mangrove)* Inch Marlowe/Chancery Lane Swamps (Aquatic Vegetation/Bird Sanctuaries)*
INDUSTRIAL	Rum Refining Flour Milling Cement Manufacturing Oil Refining Power Generation
TRANSPORT AND MARINE SERVICES	Coastal Highways Port Facilities Coast Guard Harbour
WASTE DISPOSAL	Industrial Effluent Domestic Sewage and Treatment Runoff from Inland Drainage Systems
COASTAL DEFENCES	Groynes Gabions Revetments Retaining Walls etc.
LOCAL CRAFT	Harvesting of Coral Shell Collection Itinerant Vendors (Souvenirs to Tourists)
OTHER	Small-scale Sand Mining Public Accesses

*Potential/Planned Use.

(Source: Nur

While this rate is small in comparison with estimates from elsewhere, a rise of this magnitude could have a disproportionately great effect on the Barbados shoreline, given the narrow beaches and relatively gentle beach slope. The most likely scenario would be increased beach erosion, associated with a rapidly encroaching sea. There would also be a higher incidence of flooding of the sand terrace and coastal plain, causing damage to infrastructure and property. Consequently, the island's tourism product, which is largely coastal, would be seriously jeopardised. The economic and social implications would be great, since tourism is the country's number one foreign exchange earner¹ and employs over 25,000 persons.

At present more than 25 per cent of the island's population lives within 2.0 km. of the coast. In the event that regional projections for sea level rise were to materialise (i.e. 20.0cm by the year 2025 - UNEP, 1988), these populations would be at great risk and massive resettlement would be necessary. In our island where physical space is already scarce, any such requirement would clearly place additional stress on existing land resources.

The scenario is even more daunting when it is considered that Barbados lies close to the main Atlantic hurricane tracks. It is projected that if a hurricane should strike the island,

¹ Gross receipts from tourism in the years 1986-1988 were BDS\$ 647 327, \$757 244 and \$918 230 respectively (Source: Barbados Board of Tourism)

coinciding with high tide, 2-metre waves could reach as far as 80m inland on sections of the low-lying south coast (Coastal Conservation Pre-Feasibility Report 1984). Wave run-up, erosion and flooding under these conditions would be greatly exaggerated by sea level rise. The consequences of such an eventuality would be disastrous for the island.

Similarly, the possible negative impact of sea level rise on coral reef growth rates, as predicted, is also of immediate concern. The coral reefs provide a habitat for various species of fish; they absorb, reflect and dissipate incoming wave energy to our coasts; and they are a source of sediment for the beach sediment system. Our reefs are already under pressure from other man-induced stresses, so that any additional negative force would only lead to further deterioration.

Furthermore, Barbados a low, coral limestone island, is almost one hundred per cent dependent on its groundwater supplies for domestic, industrial and agricultural purposes. If projected widespread inundation of global coastal zones were to occur (UNEP 1988; Day and Templett 1989; Vellinga 1989), saltwater intrusion would be a likely result around the Barbados coasts. While the "costs" of such an event cannot be computed with any precision at the present time, it would almost certainly be disruptive to every sector of the island's economy.

SOME INITIAL RESPONSES

The Government of Barbados has taken certain initial steps which, it is hoped, will place the island in a better position to cope with the threat of sea level rise. A Pre-Feasibility Coastal Conservation Study was undertaken in 1983 to assess the status of the Barbados Coast, to identify causes of beach and shoreline deterioration and to make recommendations for a better approach to coastal management. The next phase of this programme will see the commencement of a Feasibility Study in 1990, to be conducted with assistance from the Inter-American Development Bank. Appropriate methods of coastal protection will be designed, tested and evaluated, and a comprehensive coastal management policy will be devised.

Earlier this year, the Coastal Conservation Unit, the executing agency for the upcoming Coastal Conservation Feasibility Study, installed an electronic tide and water level meter, to monitor sea level rise. It is our intention to become part of the Intergovernmental Oceanographic Commission Global Sea Level Observing System (GLOSS), and certain initiatives have been taken to make this a reality. Contact has already been made with the Permanent Service for Mean Sea Level (PSMSL - U.K.) and we are currently awaiting instructions, with respect to the format required, for data submission.

Barbados will continue to be an active participant in regional and international fora on sea level rise and related issues. At the same time, we affirm our interest in becoming part of any meaningful global network for information exchange

and consultation. For it is recognised that the issues at hand are global in scope and complex; there are no easy solutions to the threat of sea level rise. While inevitably we must seek to develop 'coping strategies' at the national level, it is clear that their effectiveness will depend, to a great extent, on the quality of (and access to) relevant, scientific information generated internationally. It is therefore Barbados' view that a global and cooperative approach is not merely desirable, but absolutely necessary.

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