

BELIZE'S BARRIER REEF COMPLEX

Extracted from:

Perkins J. 1983. The Belize Barrier Reef Ecosystem: An Assessment of its Resources, Conservation Status and Management.

The Barrier Reef

The Belize barrier reef, the second longest in the world and longest in the western hemisphere, extends 220 km from the Belize/Mexican border in the north to the Sapodilla Cayes in the south. Along Ambergris Caye (to its extreme north), it is only a few hundred meters offshore whereas it is over 40 km (25 miles) offshore at Placencia (in the south). Seaward of the barrier reef, the continental margin is a series of discontinuous marine ridges with NNE-SSW orientation. Two of these ridges have coral atolls upon them known as Glovers and Lighthouse Reefs that are separated by waters between 360-1100 m deep. Seaward of the marine ridge supporting these atolls is an encarpment descending more than 4,000 m into the Cayman Trough (trench).

The Atolls

There are a total of three atolls in Belize, *Glover's Reef, Lighthouse Reef and Turneffe Islands*. They were formed on tiers of submarine ridges, which accounts for their general outline and their conspicuous NE-SW orientation. They are separated from the barrier reef by waters 360-1100 m deep.

They are ring reefs, enclosing a lagoon, whose seaward sides drop abruptly into abyssal waters of more than 1000m. They are found on submerged volcanic rims. The amount of wave exposure and wind generated currents vary among the atolls, creating differences in coral zonation. Although each has good spur and groove systems in its windward side, only Lighthouse and Glover's Reef are comparable because Turneffe, being protected by Lighthouse Reef, bears more resemblance to mangrove-sand cayes inside the barrier reef (Stoddart, 1962)

Turneffe Island Atoll lies approximately 9-23 km from the barrier reef on the second submarine ridge on the continental shelf. At 850 sq. km, it is the largest atoll, some 48 km long and up to 16 km wide, and consists primarily of mangrove islands surrounding a shallow lagoon with few coral patches (Rath, 1995). It has a segmented rim with 23 cuts most of which are less than 50 m wide and about 2-4 m deep (Stoddart, 1962). Its central lagoon is shallow and dotted with mangrove cayes. The blanketing of the easterly trade winds by Lighthouse Reef has probably permitted large mangrove-sand cayes to form around the perimeter of Turneffe.

Lighthouse Reef Atoll is located east of Turneffe and lies on the third submarine ridge. It is 126-200 sq. km, some 40 km long and 7.2 km wide, with a well-developed reef crest and three major channels (Stoddart, 1962) *(To the north it has a well-developed rim that*

is pierced by three inlets). The lagoon is 6-8 m deep and has frequent coral patches (although fewer in number than Glover's Reef), six sand and mangrove cayes, and the famous Blue Hole (under water cave). This blue hole is a favorite of scuba divers and is about 144 m deep.

Glover's Reef is located approximately 45 km east of Dangriga and 25 km east of barrier reef, and lies on the third submarine ridge. It is 26 km long and 20 km wide, and possesses the best-developed reef structure of all Belize's atolls. It is unique due to the depth of the lagoon (a maximum of 43 m, and averaging 27-37m), which has over 700 patch reefs and coral pinnacles. There is a chain of six cayes along the southeastern rim. It has an almost entirely emergent peripheral reef crest except in three places where it is broken by channels.

Fringing Reefs

Fringing reefs occur close to the mainland in waters with salinities between 25-40 ppt. They are restricted to the coastal area between Placencia and Punta Ycaos at the northern entrance to Port Honduras (J. Black, pers. comm.). Relatively few coral species are present and these reefs are dominated by species tolerant to variable salinity and highly turbid conditions.

Fringing reefs are distinct in that relatively few coral species are present and communities are dominated by hardy *Porites* and *Siderastrea* that can tolerate variations in salinity and highly turbid conditions (York, 1971). The location of these reefs probably corresponds with the areas where sediments are wash away most efficiently (Glynn, 1973).

Patch Reefs

Numerous patch reefs can also be found on the Barrier Platform, and the central lagoons of the atolls and faroes. They range from small clumps of coral heads to zone areas up to 80 m in width (James and Ginsburg 1978). Patch reefs are nearly absent in the northern shelf lagoon but abundant in the southern shelf lagoon.

Faroes

These reef structures also called shelf atolls are one of the two principal reef types found within the southern shelf lagoon; the other is the patch reef. Faroes are an unusual reef type in the Caribbean. They resemble actual atolls in shape but are only found in the barrier reef lagoon.

Zonation of Belize's Coast

Approximately half of Belize's national territory is under the sea. The mainland has 280 km (168 miles) of coastline. From north to south, Belize's coastline is a plain of low relief.

The extent and diversity of highly productive tropical coastal and marine ecosystems that are characteristic of Belize are exceptional in the Caribbean. These include coastal lagoons, mangroves, sea grass beds and coral reefs.