

FORM REPLICA OF A SUBMERGED BARRIER
CHAIN WITH LAGOONAL BASIN OFF
SOUTH CAT CAY, BAHAMAS

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ABSTRACT

A form replica of a barrier chain and lagoonal basin at depths of 7-9 fathoms on the outer shelf off South Cat Cay, Great Bahama Bank, is described and illustrated by a contour chart with 1-fathom intervals. The configuration suggests a former seastand at about 8 fathoms, shown in a chart with a shoreline drawn at the 8-fathom contour. A channel that crosses the shelf west of the southern end of North Cat Cay is interpreted as having been formed by surface drainage during a very low seastand.

South Cat Cay forms a link in the chain of islands on the northwest side of the Great Bahama Bank. In the vicinity of South Cat Cay, the outer shelf which borders peripheral islands of the Great Bahama Bank is about 3.5 km wide and slopes gently but unevenly out to about 12 fathoms where it then descends more or less precipitously to the bottom of the Florida straits.

Closely spaced depth soundings were made at South Cat Cay in 1836-1839 during a British survey of anchorages and harbors on the northwest side of the Great Bahama Bank; their locations are shown on U.S. Navy Oceanographic Office chart 1854, Part E. Bathymetric contours constructed at one-fathom intervals on chart 1854(E) reveal a form replica of a barrier chain and lagoonal basin at chart depths of 7 to 9 fathoms (Fig. 1). The barrier-chain configuration is more clearly evident in Figure 2, in which the present 8-fathom contour is represented as a shoreline. In this figure, land contours are omitted, and bathymetric contours indicate depths at a sea level 8 fathoms lower than present day low water spring tides at South Cat Cay (springs rise is about 3 ft.).

Although the submarine configurations on the shelf off Cat Cay resemble barriers and lagoons along the coasts of the Gulf of Mexico and elsewhere, they are on a considerably smaller scale. However, their small size may be due to the relative narrowness of the Bahamian shelf and to less sediment being available for barrier construction. It is also possible that the linear forms are not barriers but are ancient beach or dune ridges, ancient or contemporary submerged bars, or coral reefs or banks. The topography off Cat Cay so closely resembles that of barrier and lagoon that this seems the best interpretation of its origin, but the possibility of the forms having a different origin should not be excluded.

From available information, it cannot be established with certainty whether "barriers" and "spits" identified in this paper in Figure 2 are

composed of loose sand or are lithified. A map showing distribution of bottom types along the western part of the Great Bahama Bank made by Newell *et al.* (1959) shows the shelf off South Cat Cay to have a rock bottom in the vicinity of the barriers and a sand bottom in the vicinity of the inner spits. However, because of the generalized nature and large scale

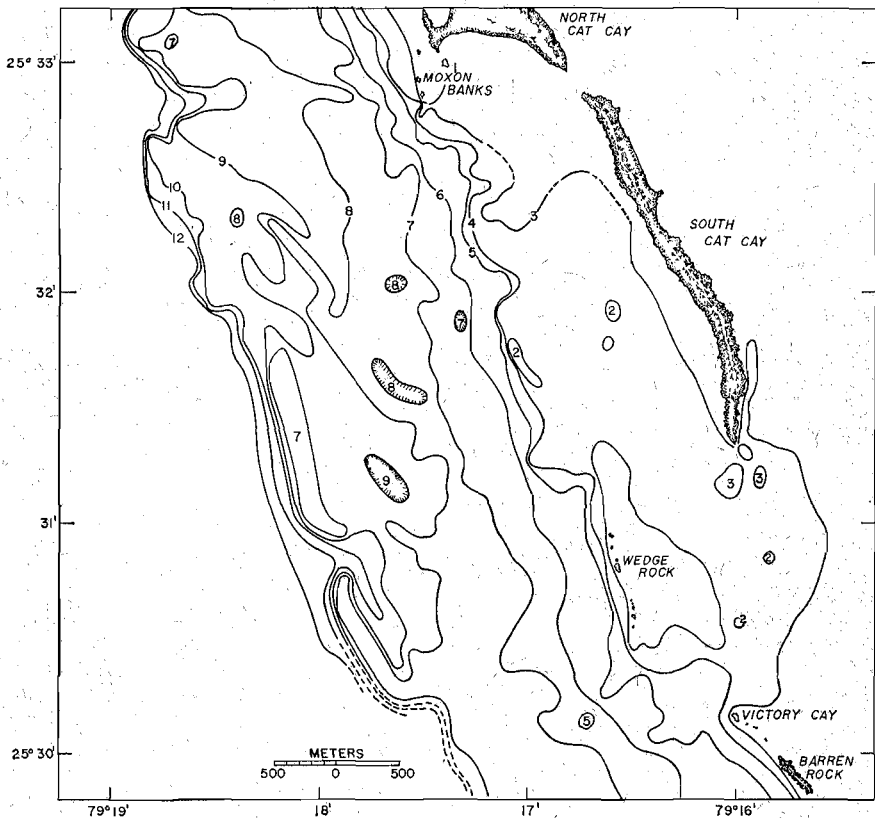


FIGURE 1. Bathymetry of shelf west of South Cat Cay, Bahamas from soundings on U.S. Navy Oceanographic Office Chart 1854 (E).

of this map it is best not to draw firm conclusions from it concerning the state of lithification of the topographic forms described here.

The 8-fathom shoreline shown in Figure 2 is interpreted as having developed when sea level was at that depth, and the topographic forms at the shoreline are considered to reflect a stillstand of the sea at about 8 fathoms. Curray (1962) found considerable evidence of a stillstand at about 9

fathoms in the Gulf of Mexico, which he interpreted as having occurred about 8000 years B.P., and it is possible that the form replica of barrier chain and lagoonal basin at South Cat Cay were formed at that time. On the other hand, Newell and Imbrie (1955, p. 8) interpreted discontinuous

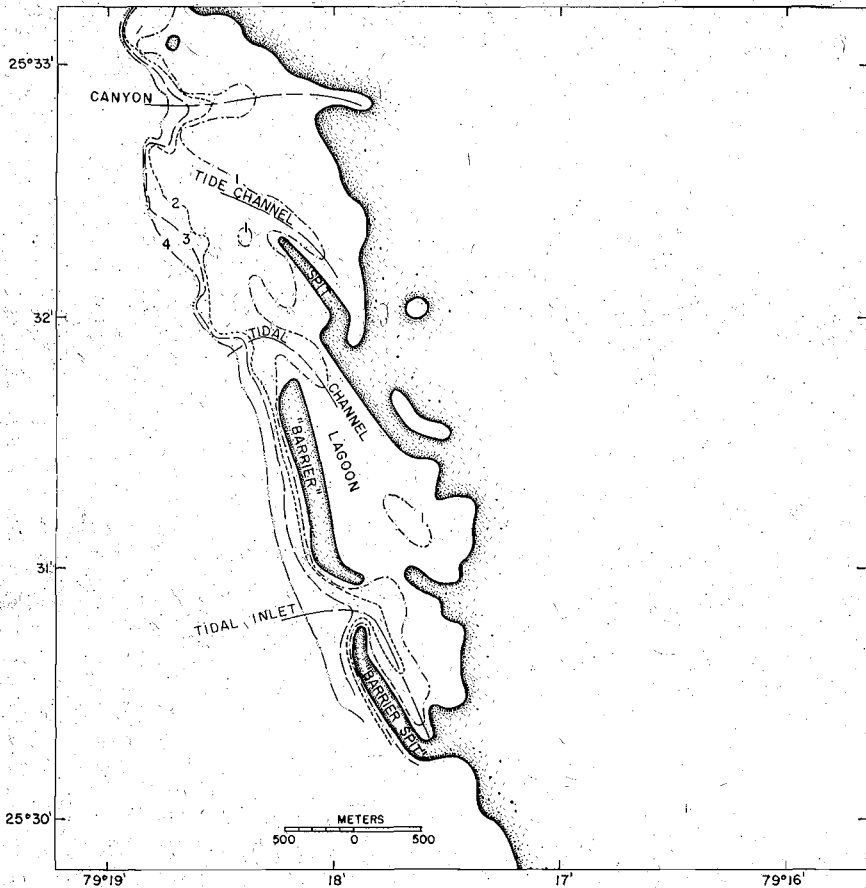


FIGURE 2. Bathymetry of shelf shown in Figure 1 with present 8-fathom contour represented as the shoreline.

low ridges along the western edge of the Great Bahama Bank, from Cat Cay north to Great Isaac Cay, as submerged beaches of Pleistocene age. The results of the present study suggest a seastand at 8 fathoms but do not permit determination of when it took place. Carbon 14 dating of samples from the topographic forms may be necessary to determine their age.

Another interesting topographic feature is present on the shelf west of the southern tip of North Cat Cay. This is a submerged channel that starts at about 8 fathoms depth on the inner shelf and is still discernible at 12 fathoms at the shelf edge (Fig. 2). The channel may have been carved by solution of the limestone platform by surface drainage during a very low seastand.

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SUMARIO

RÉPLICA DE UNA BARRERA SUMERGIDA CON LAGUNA, EN SOUTH CAT CAY, BAHAMAS

South Cat Cay es una de la serie de islas a lo largo del noroeste del Banco de Gran Bahama. Contornos batimétricos a intervalos de una brazas, derivados de la Carta 1854-E de la Oficina Oceanográfica de la Marina de los Estados Unidos, revela una forma réplica de una barrera y una cuenca lagunar a profundidades de 7 a 9 brazas al oeste de Cat Cay, como está indicado en la Fig. 1. La configuración es mostrada más claramente si un contorno de 8 brazas es dibujado como una línea de costa, como en la Fig. 2. Aunque esta configuración submarina recuerda las barreras y lagunas del Golfo de México y otras partes, es debido a una escala mucho menor, quizás, por la relativamente estrecha plataforma y una cantidad menor de sedimento disponible para la construcción de la barrera. También es posible que las formas lineares no sean barreras sino antiguas playas o banco de dunas o antiguas o contemporáneas barreras sumergidas, arrecifes de coral o bancos, pero la topografía recuerda tanto barreras y lagunas que esta interpretación parece la más probable. La línea de costa de 8 brazas, aunque se piensa que se desarrolló cuando el nivel del mar estaba a esa profundidad y es considerada como indicativo de una anterior plataforma marina a 8 brazas. Esto está en estrecho acuerdo con la evidencia de una plataforma fija aproximadamente a 9 brazas en el Golfo de México hace alrededor de 8000 años según reportado por Curray.

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