

QUATERNARY REEF FRAMEWORKS IN BELIZE: PATTERNS AND SIGNIFICANCE

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Based on the analysis of 220 m of Holocene reef limestone in cores, three reef facies are distinguished in the Belize barrier and atoll reef system, Central America. These include (1) the coral facies with abundant *Acropora palmata* and members of the *Montastraea annularis* group, (2) the well-cemented coral grainstone to rudstone facies with *Millepora* sp. and *Agaricia* sp. predominating, and (3) the unconsolidated sand and rubble facies.

(1) The coral facies is characterized by cm- to dm-sized coral fragments. Apart from the taxa mentioned above, *Diploria* sp., *Porites* sp., *Siderastrea siderea*, *Agaricia* sp., *Acropora cervicornis*, and the hydrocoral *Millepora* sp. occur. It is not possible to distinguish between autochthonous and allochthonous corals in the core. Windward reef margins of the Belize Barrier Reef and the offshore atolls are dominated by *A. palmata*; leeward reefs are characterized by members of the *M. annularis* group. Occasionally, larger cavities in corals are observed to be colonized by cryptic microbialites or by an unidentified branched foraminifer. (2) The well-cemented coral grainstone facies contains cm- to dm-sized pieces of the foliaceous corals *Millepora* sp. and *Agaricia* sp. as well as fragments of the other coral taxa listed above. Crustose coralline algae, encrusting foraminifera such as *Homotrema rubrum*, and chips of *Halimeda* sp. are common. Small cm-sized coralline sponges and thecideine brachiopods are also found in this facies. Acicular aragonite and microcrystalline high-magnesium calcite are the most common cement types. (3) Unconsolidated sand and rubble consists largely of fragments of coral, coralline algae, and *Halimeda* sp.

Calculated Holocene reef accumulation rates based on radiometric dates between samples are highly variable and range from 0.56-9.07 m/k.y. with an average of 3.45 m/k.y. All reefs investigated belong to the „keep-up“ type.

The overall picture observed supports the contention that large parts of the reef „framework“ consist of allochthonous corals and not of reef corals preserved *in situ*. The degree of reef consolidation is negatively correlated with Holocene thickness indicating that slowly growing reefs are better cemented than fast growing ones, and that the degree of submarine cementation is a function of available time.

References:

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