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Abstract

The present work presents the results of the investigation of sedimentary deposits in the mouth of Babitonga Bay / SC and the Internal Platform adjacent, focusing on the Holocene and Upper Pleistocene, in order to propose a model for the geological evolution of the bay. For this purpose, 106 km of high-frequency seismic data (CHIRP data, with frequency between 0.5 - 7.0 kHz), collected in the southern portion of the mouth of the main channel of the bay, were analyzed. The coastal plain adjacent to the surveyed area, located on the northern coast of Santa Catarina, is composed of marine-beach sediment deposits established during the Quaternary, where sandy ridges, coastal lagoons and dunes are found. From the data analysis, 5 seismostratigraphic units were identified, which reveal the succession of depositional environments from the end of the Pleistocene to the present. The first unit is the acoustic basement, which is interpreted as igneous rocks, due to the irregularity of the surface that defines this unit. Inside the bay and close to the headlands, the basement is close to the surface. Then, Unit II, with transparent seismic facies, represents the Pleistocene sedimentary deposits, which was excavated by the local drainage system and subsequently capped by Unit III. This new unit consists of continuous, high-amplitude reflectors. Unit III is formed by transgressive deposits in the region, where the morphostratigraphy of a barrier-lagoon system is observed in the Internal Platform, while the filling of channels is observed inside the bay. Characterized by internal parallel and/or subparallel reflectors, Unit IV reveals characteristic high-sea level deposits, such as tidal flats and estuarine deposits, in the interior of the bay, and as sandy barriers at the mouth. Finally, present throughout the survey, Unit V is the current deposition and consists of high intensity and continuous internal reflectors. Bottom marks occur in this unit. Based on these findings, an evolutionary model based on the last episode of marine regression in the Pleistocene is proposed. In this model, channels within the bay excavated the Pleistocene deposit as they flowed over the exposed platform. With the transgression of the sea, these channels were filled, while the coastal environment advances towards the continent, and a barrier-lagoon system is established in the Internal Platform adjacent to the bay mouth, where a flood tidal delta occurs. Then, with the high marine base level, estuarine deposits were formed within the bay, capping the channels that was filled during the transgression. Meanwhile, the barrier-lagoon system on the Inner Platform had been abandoned, being filled by marine sediments. Finally, current sedimentation sets in and bottom marks occur in locations with more intense flow.