



SBGf Conference

18-20 NOV | Rio'25

Sustainable Geophysics at the Service of Society

In a world of energy diversification and social justice

Submission code: BQP7LNWKX8

See this and other abstracts on our website: <https://home.sbgf.org.br/Pages/resumos.php>

Geomorphological Mapping of the Continental Slope adjacent to Guaraíras Lagoon: Eastern Margin of Rio Grande do Norte

Ilca Cruz (UFRN), Helenice Vital (Federal University of Rio Grande do Norte), João Paulo Silva (Federal University of Rio Grande do Norte), Daniela Moreira (Federal University of Rio Grande do Norte)

Geomorphological Mapping of the Continental Slope adjacent to Guaraíras Lagoon: Eastern Margin of Rio Grande do Norte

Please, do not insert author names in your submission PDF file

Copyright 2025, SBGf - Sociedade Brasileira de Geofísica/Society of Exploration Geophysicist.

This paper was prepared for presentation during the 19th International Congress of the Brazilian Geophysical Society held in Rio de Janeiro, Brazil, 18-20 November 2025. Contents of this paper were reviewed by the Technical Committee of the 19th International Congress of the Brazilian Geophysical Society and do not necessarily represent any position of the SBGf, its officers or members. Electronic reproduction or storage of any part of this paper for commercial purposes without the written consent of the Brazilian Geophysical Society is prohibited.

Introduction

The eastern continental margin of the state of Rio Grande do Norte, located within the Pernambuco-Paraíba Basin, features a set of significant submarine landforms that are crucial for reconstructing the morphological evolution of the continental slope. Among these features, prominent incised submarine canyons extend between the regions of the Natal and Tibau do Sul. Despite their prominence, these structures remain understudied and not well known. This study aims to map the continental slope as part of the SeabedMap project, focusing on the identification, description, and geomorphological interpretation of the main features associated with the submarine canyon adjacent to Guaraíras Lagoon.

Method and/or Theory

Hydroacoustic data were acquired within the scope of the SeabedMap project. Survey was developed using multibeam systems EM 122 (operating at 12 kHz) and EM 710 (operating between 70 and 100 kHz), deployed from hydro-oceanographic research vessel Vital de Oliveira. The bathymetric data were processed using specific software, enabling noise correction and the generation of high-resolution bathymetric chart and Digital Terrain Models (DTMs).

Results and Conclusions

Preliminary results reveal the presence of an incised submarine canyon adjacent to Guaraíras Lagoon (RN), with a predominant East-West (E-W) orientation and measuring approximately 29 kilometers (Km) in length. Three cross-sectional profiles were examined: Profile 1 – width: 2,2 km and depth: 547 m; Profile 2 – width: 9,8 km and depth: 1700 m; and Profile 3 – width: 4,6 km and depth: 2600 m.

The observed features suggest a possible structural control, possibly linked to ancient subaerial drainage systems formed during periods of marine regression. Additionally, the canyon's morphology also indicates a likely polygenetic origin, influenced by both tectonic and fluvial processes. Comprehensive mapping of these geological structures significantly enhances the understanding of the morphodynamic evolution of the Brazilian continental margin, providing essential insights for geological research and applications in coastal and offshore planning.