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

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### 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 Guaráras 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 Guaráras 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.