

EGU22-5990

<https://doi.org/10.5194/egusphere-egu22-5990>

EGU General Assembly 2022

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Geomorphometry of the deep Gulf of Mexico

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The Gulf of Mexico is characterized by a high geodiversity that influences hydrodynamics patterns and drives biological and human uses of the seafloor. In 2017, the United States Bureau of Ocean Energy Management released a 1.4-billion-pixel bathymetric dataset of the deep northern Gulf of Mexico, with a pixel size of about 12m. The computational power required to analyze this dataset has limited its use so far. Here, geomorphometry was used to characterize the seafloor of the deep northern Gulf of Mexico at multiple spatial resolutions. Flat areas and slopes cover more than 70% of the studied area, yet thousands of smaller morphological features like peaks and pits were identified. Spatial comparisons confirmed that analyses at different spatial scales capture different features. A composite product combining seafloor classification at multiple scales helped highlight the dominant seafloor features and the scale at which they are best captured.