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► **To cite this version:**

Elie Viel, Céline Grall, Yael Kiro, Louis-Marin Bodiguel-Dupuis, Anne Bécel, et al.. Cape-Fear project at the Eastern North American Margin (ENAM): new insights from coring observations. 28eme Réunion des Sciences de la Terre, Géosciences Rennes; Observatoire de Rennes; Université de Rennes, Oct 2023, Rennes, France. hal-04797895

HAL Id: hal-04797895

<https://hal.science/hal-04797895v1>

Submitted on 22 Nov 2024

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Cape-Fear project at the Eastern North American Margin (ENAM) : new insights from coring observations.

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Résumé

Cape-Fear project at the Eastern North American Margin (ENAM) : new insights from coring observations.

Elie Viel, Céline Jo Grall, Yaël Kiro, Emma Le Gall, Hugh Daigle, Anne Bécél, Katherine Stelling, Louis-Marine Bodiguel-Dupuis, Ali Mohamed, Mason Farnsworth, Carlos Figueroa-Diaz, Eden Markovitz and all the scientific party of MGL2306 and MGL2307 cruise.

Along the Eastern North American Margin (ENAM), Mass Transport Processes (MTP) transfer major sediment masses from the lower margin towards the ocean basin. One emblematic example of MTP is the Cape Fear submarine landslide (CFSL), offshore North Carolina. The CFSL is a thick (> 1 km) sequence of Mass Transport Complexes that are likely active during the Holocene and since the Miocene/Oligocene. The most recent landslide sequence appears retrogressive, and > 20 m scars are observed on the seafloor today.

New data have been freshly acquired on the continental rise and slope near the CFSL on the R/V Marcus G. Langseth in between May 8th and June 10th 2023, in the frame of the collaborative international US-NSF project OCE-2140398. This project involves several international universities and institutions including UT Texas, Columbia University, USGS, the CNRS (LIENSs) and the Weizmann Institute.

We collect ~ 4000 km of 2D high-resolution multichannel seismic (MCS) data along with bathymetry, Chirp sub bottom echo-sounding profiles, water column data, gravity and electromagnetic measurements. We also collect 5 jumbo cores (~9–11 m length), 9 gravity cores (~4,5–6 m length) and conduct in situ thermal measurements at 8 sites. Together with legacy data and previous geophysical survey carry on (in 2014 and 2015) the CFSL is now an area broadly documented. These datasets are ideal to study preconditioning and triggering mechanisms of MTP in the ENAM Margin, the Atlantic Margins and similar rifted

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margins around the world.

We here present preliminary post-cruise analyses of core data, including physical measurements (Multi Sensor Core Logger MSCL) and pore-fluid analyses. We will further discuss the fluid content of sediment at the near-surface.

Mots-Clés: Mass Transport Processes, sub surface pore fluid content