
Cape-Fear project at the Eastern North American Margin (ENAM): Mass Transport Processes, gas occurrences and associated coastal hazards.

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Résumé

Along the Eastern North American Margin (ENAM), Mass Transport Processes (MTP) transfer major sediment masses from the lower margin towards the oceanic 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 were likely active during the last Glacial Maximum/early 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 electro-magnetic measurements. We also collect 5 jumbo cores (~9-11 m length), 9 gravity cores (~4-6 m length) and conduct in-situ thermal measurements at 8 sites. Together with legacy data and previous geophysical surveys (carry on in 2014 and 2015), the CFSL area is now broadly documented. These large datasets are ideal for studying pre-conditioning and triggering mechanisms of MTP in the ENAM Margin, the Atlantic Margins and similar rifted margins around the world.

We will present preliminary post-cruise analyses of these new dataset, which includes sub-surface observations of MTP, free-gas and gas hydrate occurrences, as well as discuss about the marine and coastal hazards implications at the ENAM.

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Mots-Clés: Mass Transport Processes, Rifted Margin, gas and gas hydrate occurrence