

Daily Operational and Science Report

UT-GOM2-2 Coring Expedition

Terrebonne Basin, Gulf of Mexico Outer Continental Slope

1. DATES: 24-September-2023 to 28-September-2023 **FINAL REPORT**

2. DESCRIPTION OF OPERATIONS: Scientists completed working at Geotek Coring, measuring physical properties, collecting geomechanical samples, splitting whole core, scanning and describing the core, and sampling from the split core. All samples, supplies, and equipment were packed. Details are below.

- Sept 24-27:
 - The microbiology team arrived, setup equipment, and sub-cored all cryo-cores. Sub-cores were divided for cell counts at JAMSTEC and DNA extraction at Oregon State.
 - All remaining core sections from conventional and conventionalized core were weighed. MDW (e.g. moisture and density with grain size, XRD, and other basic properties) and GEOM (e.g. geomechanics plus permeability, porosity, and other physical properties) whole rounds were cut, whole rounds were weighed again, table vane and fall cone measurements were made (one per section), and thermal conductivity measurements were made (at least one per core).
 - Gas hydrate was uncovered while sub-coring and splitting cryo-cores. See picture below. All remaining core sections were split, imaged including color spectrophotometry, laid out and described. Smear slides were created and reviewed. Rinds of cryo-cores were also split and described.
 - All remaining sections were sampled for a range of further measurements (e.g. TOC, CHNS, grain size, moisture and density, XRPD, X-ray fluorescence, rock magnetism, anomalies of magnetic susceptibility, and paleontology).
 - Archival halves of sections continued to be logged, measuring magnetic susceptibility and x-ray fluorescence.
 - UW researchers finished squeezing the remaining pore water whole rounds.
- Sept 27-28
 - Researchers packed up samples and supplies.
 - 31 individual containers of mainly samples were shipped to eight labs.
 - Equipment and supplies were consolidated into six pallets and prepped for shipping.
 - First round draft of the Expedition Methods was completed.

3. Forward Look:

- Archival and working halves of all conventional and conventionalized core will be shipped to UT Austin with Whole Rounds and bagged samples for testing at UT
- Pro-log Core Processing Lab and Pore Water Lab will be returned to Pro-Log.

4. Science



Geotek Extracting a cryo-core from the liquid nitrogen depressurization chamber



Gas Hydrate (white chunks) in core section H002-11CS-1 from pressure core H002-11CS cored from the Orange sand. This section was cryogenically frozen before depressurization. The section was then kept at -80 C until it was sub-cored for cell counts and DNA extraction at Salt Lake City.



Left: Joel Johnson (UNH) preparing a smear slide. Right: Ann Cook (Ohio State) and Tim Collet (USGS) extracting samples from split core.



Steve Phillips (USGS) and Rachel Coyte (Ohio State) measuring the volume of produced gas and capturing gas samples for assessments of dissolved gases, hydrate saturation, and gas composition including hydrocarbons, isotopes of Carbon, and Nobel gases.