

AGI AND MG3, WITH INVESTMENT BY NALCOR ENERGY,
ARE PLEASED TO ANNOUNCE A MULTICLIENT GEOCHEMICAL STUDY OVER THE
2017 LICENSE ROUND, OFFSHORE NEWFOUNDLAND AND LABRADOR, CANADA

OBJECTIVES: The key objective of the study (2016 Phase 2 Acquisition & Select 2015 Phase 1 Points) is to provide in-depth de-risking information on the presence and type of petroleum system off the Labrador slope and deep water areas related to the 2017 License Round (NL01_LS).

SCHEDULE: Offshore work completed Q3/Q4 2016 with results available Q2 2017.

This study aims to provide an in depth understanding of the hydrocarbon potential in the thick Mesozoic through Cenozoic depocenters of the Labrador South slope and deepwater region (expanding on the 2015 Phase 1 Program), in support of both the on-going licensing round and future exploration efforts (Figure 1).

The priority area was covered with a Multibeam bathymetry footprint from slope-break to toe of slope, with sea bed core sampling derived from features identified from this data as well as indications of potential leak points in the subsurface. These data are further augmented by an additional set of cores and heat flow measurements collected over the course of the 2015 acquisition program.

While the area is currently undrilled, exploration success on the shelf has produced three gas discoveries (Hopedale, North Bjarni and Gudrid pools; orange polygons on Figure 1) as well as an oil show in the North Leif I-05 well just west of the priority area. Over the 2019 license round area (blue polygon on Figure 1) several samples from 2015 survey exhibited anomalous hydrocarbon response suggestive of a petroleum system in the slope to deepwater.

The critical questions for the region are, does the proven Lower Cretaceous petroleum system on the shelf extend into the slope and deepwater, and is there evidence of other source rock influence outboard of the shelfal depocentres?

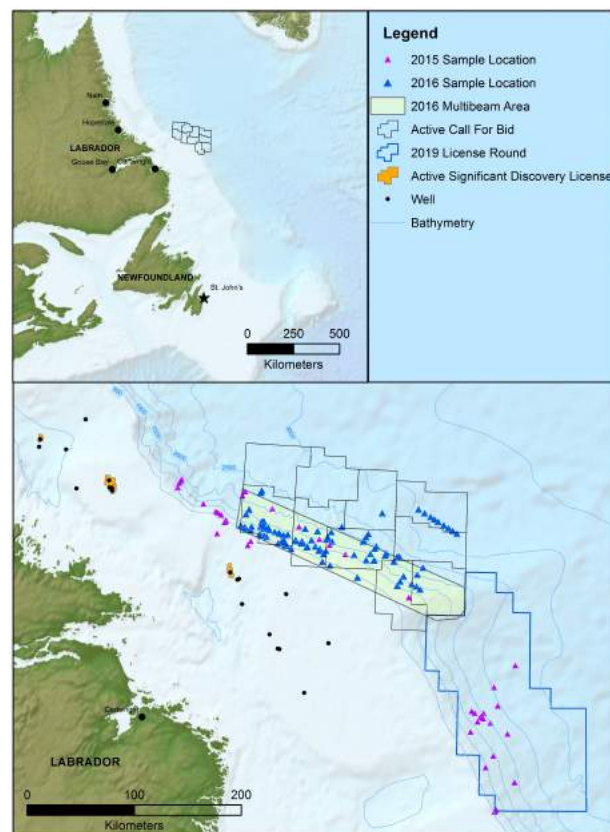


Figure 1: Newfoundland and Labrador - Eastern offshore regions. 2015 Sampling (magenta triangle) locations highlight the vast distance in the regional survey. Thick Tertiary-aged depocentres are highlighted in green. 2016 target areas are outlined by the grey polygons.

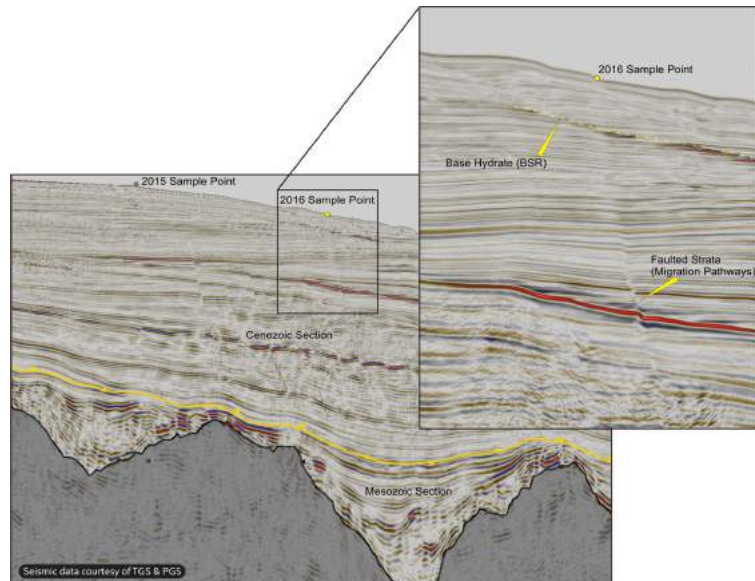
Project Objectives

The key objective of the 2016 survey was data acquisition in support of the 2017 License round and augmenting the Phase 1 Program completed in 2015. This includes Multibeam coverage of the shelf

to toe of slope over the NL01_LS license round AOI, which was used to assist in identifying 85 sea bed sampling locations for analysis of hydrocarbon presence and characterization. Pre-screening of target areas was also conducted using regional 2D seismic data to identify potential leak-prone regions via subsurface indicators (Figure 2).

Petroleum systems along the eastern margin of Newfoundland and Labrador are well established on shelfal regions to the west, and over shelf and deep water of the Ophan/Flemish Pass basins to the south. Mature source rocks have been proven along the entire expanse of the margin by producing regions in the Jeanne d'Arc, recent oil discoveries around the Mizzen and Bay du Nord area, gas discoveries off Labrador, as well as oil shows on the Labrador shelf and north in West Greenland. There is increased uncertainty due mainly to the lack of exploration wells, however, as one moves from the shelf into slope and deep water areas offshore Labrador.

Risk hinges dominantly on fluid phase (oil vs. gas) and to a lesser extent mature source rock presence. The key objective of this sampling effort and associated study (as in the 2015 program), is to de-risk the eastern margin hydrocarbon system through macro-seep sampling (fluid phase) and biomarker identification (age/type of source), as well as assessing risk of known seismic derived AVO leads (charge and migration) through micro-seep sampling.



Multibeam Bathymetry & Main Sample Location Selection

Eighty-five locations on the sea floor were cored, each with a 6 metre core barrel followed by samples taken for conventional (head space gas, liquid phase hydrocarbons) and passive (adsorbent AGI samplers) geochemical analyses (Figure 3).

Multibeam (MBES) bathymetry was collected over slope/toe of slope of the 2017 AOI region in a

water depth range from 300m to 3000m. These data aided the selection of sampling locations based on observed sea bed features at each of the 85 core locations. This produced a high-resolution sea floor surface map, shown in part in Figure 4, and available as part of the multi-client dataset.

Figure 3: Left - Multibeam bathymetry over sample location (pock mark associated with potential fault-related scarp). Right - samples and core sleeve from location at left.

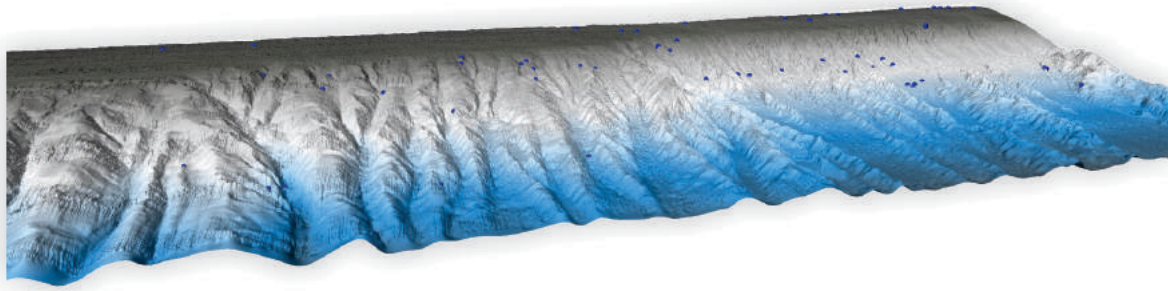


Figure 4: 3D perspective view of a portion of the regional sea bed bathymetry data and coring location points (blue dots) acquired in 2016 over the upcoming Labrador South bid round.

Deliverables

Geochemistry reporting includes AGI analysis of all cores to identify hydrocarbons present in the C₂-C₂₀ range (reported in nanogram units) and conventional geochemistry on all samples (headspace gas, solvent extract GC, with GC-MS and isotopes on selected samples). Both AGI and conventional results were used to select samples for additional analyses such as 12 samples for isotopes and 18 samples for biomarkers. Conventional and AGI geochemistry results suggest liquid hydrocarbon signatures in some samples (Figure 5). Full analyses and reporting is available now.

Typical vessel reporting deliverables are available as PDF (Field report, Technical and Operations Report, Interpretation and Results Reports, and Charts), and final processed data deliverables as Digital XYZ ASCII and GeoTIFF (Bathymetric data and contours [Digital AutoCAD format], water-column data, and sub-bottom profile data).

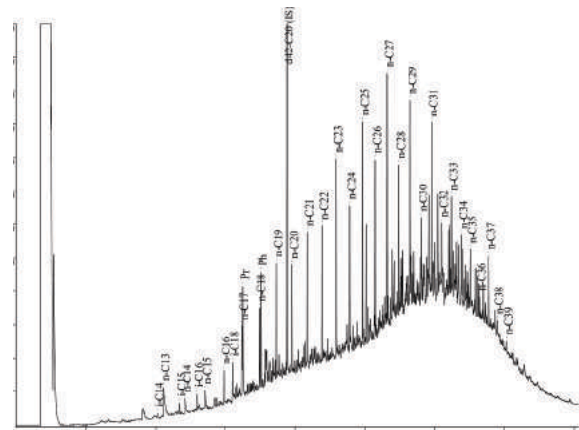


Figure 5: GC trace of a sample from 2016 dataset.

Program Details and Pricing

Please contact AGI for further information on this surface and seafloor sampling project.

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