A new, high quality regional dataset covering 22,469 km² is enabling the identification of important petroleum system elements in the underexplored Orphan Basin, offshore eastern Canada. Block evaluations for the upcoming license rounds can be performed with confidence with this multi-sensor broadband seismic data and its reliable pre-stack attributes. The most recently acquired part of this regional dataset is the North Tablelands survey, acquired in 2019 as an extension of the Tablelands and Long Range surveys, which were shot in 2017–2018 by PGS and TGS.

Fast-track data was delivered just five weeks after the last shot of the North Tablelands survey. A full integrity volume is available now and provides a single, continuous high-resolution seismic dataset available for licensing early next year, encompassing the Long Range, Tablelands and North Tablelands surveys.

Figure 1: Regional line through the Long Range, Tablelands and North Tablelands surveys and key exploration wells showing the horst and graben structure of the Orphan Basin. Relative acoustic impedance is overlaid on the Top Cretaceous to Base Jurassic interval into the grabens resolving detailed structures and revealing additional opportunities characterized by low relative acoustic impedance.

Figure 2: (a) Location of the Long Range, Tablelands and North Tablelands 3D surveys; (b) Locator map looking north across the surveys. The amplitude extraction on the seafloor demonstrates the modern day depositional directions. The white line shows the track of the 2D seismic section below.

Orphan Basin, Canada: From Regional Prospect Screening to Reliable Reservoir Attributes Estimation

20 km

+ +

- -

220 km

Top Jurassic

Top Cretaceous

Margaree

Lona

Great Barasway

Orphan High

East Orphan Basin

East Orphan Basin

PGS

Top Jurassic

Top Cretaceous

Margaree

Lona

Great Barasway

Orphan High

East Orphan Basin

PGS

Top Jurassic

Top Cretaceous

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Lona

Great Barasway

Orphan High

East Orphan Basin

PGS
First oil in the Jeanne d'Arc Basin was produced in 1997 from the Liberator Field and since then the world-class oilfield has produced 3.8 billion barrels. While Rose and North Annamet have come on-stream, while oil production from the Liberator Field started in 2017. The striking features of Grand Banks alone are estimated to hold recoverable reserves of 9.4 Bbls and 3.8 Tcf of natural gas. The 2009 Mizzen oil discovery in the Penobscot Basin, estimated at 200 Mbo recoverable reserves, proved the existence of a world-class resource reserve, sourced by prolific late Jurassic source rock, into an area where it was previously untested. This was followed by the Barasway discovery in 2013 by Harpoon and the Big North Field. The Bar of Viking appraisal of the Orphan Basin was successful in 2015 as it was the basin’s discovery in the same area in 2016. The Bay de Verde appraisal of Bay du Nord was started in 2008 and was successful in 2009. The pre-stack data was fit for purpose and AVO/AVA compliant 

Prospective Orphan Basin

Open Access in Prospective Basins

Eastern Canada is one of the most promising deepwater exploration areas in the world, where the implementation of state-of-the-art imaging technology is critical to develop a more detailed local subsurface understanding. In the Orphan Basin, new 500 Hz GeoStreamer data was obtained in 2018, with subsurface data fit for purpose and AVO/AVA compliant 

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