

## **Benchmarking Arctic Plays Offshore East and West Greenland and Conjugate Margins**

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Recent Circum-Arctic Resource appraisals by USGS and others indicate that Greenland has an unproven world class hydrocarbon potential. However, only 6 exploration wells have been drilled offshore West Greenland and consequently petroleum plays in Greenland have mainly been defined on the basis of studies of excellent onshore outcrops. No wells have been drilled offshore East Greenland, and here exploration is still in its infancy. Proven plays from the conjugate margins to Greenland may, however, form a shortlist for the first exploration phase in these frontier regions.

In this presentation we focus on the main plays in the basins offshore East and West Greenland and bench-mark these plays towards the proven and un-proven plays on the conjugate Norwegian and Canadian margins. Bench-marking these plays may help to focus exploration and supporting de-risking of data-restricted leads.

In the Labrador Sea it is evident that the main proven Palaeozoic, Cretaceous-Palaeogene play types on the Canadian Labrador Shelf were never tested by the 6 wells offshore West Greenland. In addition, the onshore studies in West Greenland have opened up for new and possibly more prolific plays on both sides of the Labrador Sea, as well as in Baffin Bay.

The widespread continental shelf areas offshore NE Greenland are ice covered most of the year and geological data are presently restricted to aeromagnetic and gravity surveys, an irregular grid of vintage 2D lines and recent 2D seismic lines acquired by TGS NOPEC. The play models thus have to rely on detailed outcrop descriptions in the exposed rift basins along the East Greenland margin. Additional information from the conjugate shelf area along the Norwegian margin may elucidate similarities and difference in the geological evolution on the two sides of the rift. This may form the basis for future exploration offshore NE Greenland.

In the onshore part of the East Greenland rift basins rotated Jurassic fault blocks form spectacular analogues to the main Jurassic rift plays of Mid-Norway. The stratigraphic framework provides a one-to-one correlation and sequence stratigraphic analysis suggests that the sand systems share common depositional history. Play analysis may be extended to the Permian and Cretaceous and Palaeogene successions by integrating data from onshore geology and exploration successes offshore Norway.