

## **Petroleum Source Potential in the West Disko Area, Offshore West Greenland: Regional Evidence from Multiple Data Sets**

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Recent licensing rounds demonstrate renewed interest in Offshore West Greenland where exploration began in the 1970's. While still early in the exploration cycle, it is important to demonstrate the potential for thermally mature petroleum source rocks. Due to sparse well control, regional data were utilized to evaluate this potential in the West Disko License area. Evidence for hydrocarbon charge includes onshore oil seeps, offshore slicks detected by satellite, DHI's on seismic, hydrocarbon fluid inclusions, and a show in an offshore well. In addition, source rocks outcropping on the Nuussuaq Peninsula and penetrated by wells attest to sections with good generative potential. Numerous onshore oil seeps occur along the coasts of Nuussuaq and Disko Is. These seeps were verified by the Geological Survey of Denmark and Greenland as part of a systematic sampling effort conducted in the field over a number of years. Analysis of these samples by GEUS characterize the oils as belonging to 5 distinct families whose sources range in age from Cretaceous to Paleocene. Organic-rich, potential source rocks of these ages outcrop in western Greenland and the eastern Canadian Arctic. A notable source rock interval is the Cenomanian-Turonian section, interpreted to be the source for the 'Itilli-type' seeps. High resolution satellite data acquired during the summer of 2009 over the West Disko License Blocks has revealed a number of low quality anomalies attributed to possible oil seepages. It is intriguing that some of the anomalies have been observed in the same general area on earlier satellite images and occur in close proximity to seismically mapped features. To date, a total of six wells have been drilled offshore West Greenland. Although there have been no discoveries, the Kangamiut-1 well reported taking a gas kick. Fluid inclusion stratigraphy indicates dry and wet gas responses in four wells. Immature to low maturity source rocks identified from drill cutting analysis can be correlated to more mature kitchen areas using seismic data. In the West Disko area, 2D basin modeling indicates that Paleocene and Cretaceous source rocks should be mature today or as early as the Neogene. This regional compilation of data from multiple sources supports the existence of thermally mature source rocks in the lightly explored, West Disko license area.