Acquiring Seismic Data in the Arctic Realm

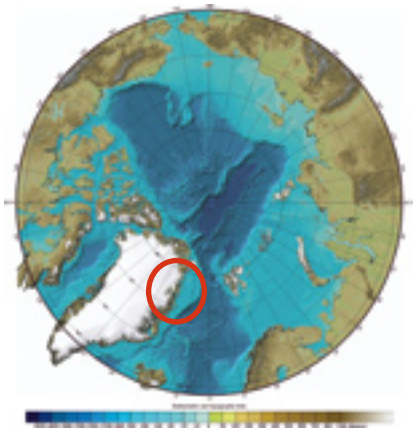


Photo: TGS

Towing the streamer in thin ice.

"We have just completed one of the most demanding seismic acquisition programmes we have ever undertaken", says Jørn Christiansen, principal advisor to TGS.

During the entire summer Christiansen and his staff closely watched ice conditions off the coast of northeast Greenland. The offshore basin covers a huge area that is believed to contain vast amounts of hydrocarbons.

The most recent assessment carried out by the USGS indicates that northeastern Greenland may be a very important future petroleum province. If the mean estimate of 31 BBOE were discovered to be true, this huge basin would rank 19th among the world's 500 known petroleum provinces (GEO ExPro 05/2007; www.geoexpro.com).

So far, however, there are only a few seismic lines and no wells to prove or disprove the high expectations resulting in part from the USGS data. The only seismic data is from the 1990's.

The Kalaallit Nunaat Marine Seismic (KANUMAS) project was a seismic reconnaissance survey in the extreme northern frontier areas offshore from eastern and western Greenland. The project was financed by six major oil companies (BP, Exxon, Japan National Oil Company, Shell, Statoil, and Texaco). In all, 4071 km of seismic data were acquired off northeast Greenland, and 1323 km off central east Greenland.

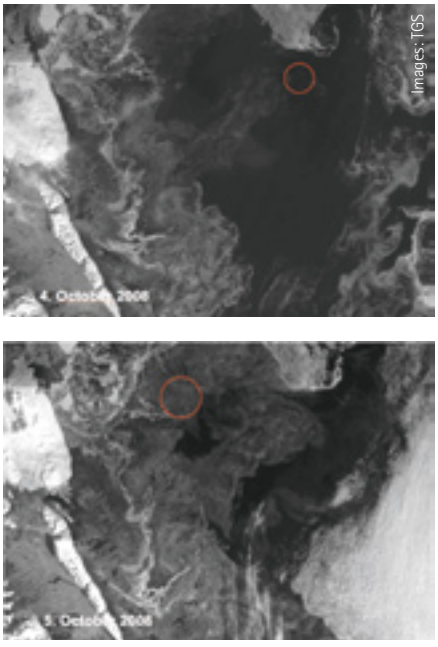
The normal situation is that the sea is closely packed with ice drifting southward from the North Pole, making it impossible to acquire seismic data. This year, however, proved to be better than average, and in September the decision was made to go to the icy waters off Greenland. Close to one month of 2D surveying with a 6000m streamer in extreme conditions was accomplished before conditions deteriorated.

"In one day the larger part of the survey area, more than 200,000 km^2, froze. It was time to leave".

"Nevertheless, as we went south we acquired data, maximizing the results of this venture into the far north", says Jørn Christiansen.

Shooting was done by the vessel *Geo Arctic*, operated by Fugro. The equipment used was tailor-made for this venture.

"They did a tremendously good job", Jørn Christiansen says.



Images: TGS

The two photos clearly demonstrate the change in ice conditions from one day to the next. The red circle shows the position of the seismic vessel.

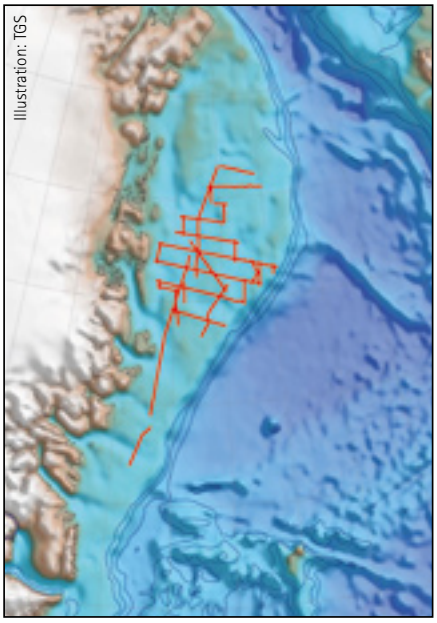


Illustration: TGS

TGS acquired 2850 km of seismic data in September and October 2008.