
**Seabed geological and geohazard investigations,
Canadian Beaufort Sea outer shelf and upper slope**

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In 2009, hydrocarbon exploration in the Canadian Beaufort Sea shifted from the inner to outer shelf and upper slope. A collaborative project among the Geological Survey of Canada, ArcticNet and the oil industry was initiated to investigate seabed geohazards in water depths of 70 to 1200 m. The CCGS Amundsen icebreaker, outfitted with hull mounted multibeam and subbottom profilers and box, gravity and piston coring capability, served as the survey platform. GSC research focused on establishing a regional geohazard framework and identifying potential seabed instability conditions that could adversely affect exploration drilling activities using dynamically positioned and/or anchored drilling structures.

Late Wisconsinan glaciogenic deposits consisting of subaqueous outwash overlain by glaciomarine sediments thicken down slope to over 100 m. A thin Holocene veneer of recent mud less than 2 m thick overlies the older deposits. Within these sediments several instability conditions and features have been identified. These include seabed scouring by ice keels, submarine slides, mass transport channels and fans, low strength sediments, subsea permafrost, active mud volcanoes, pockmarks, shallow gas and faults. Continuing research is focused on mapping the spatial distribution of observed geohazards and determining the temporal frequencies of active vs. relict instability features.