The Canadian Arctic Seabed: Navigation and Resource Mapping

Summary

Project Leader

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This project undertakes the core seabed mapping component of the ArcticNet research program. Underway acoustic mapping of the seabed relief, sediment distribution and shallow subsurface sediments are the prime datasets used by researchers to understand the geological processes shaping the seafloor, to assess natural hazards and coastal habitats and to reconstruct the history of past climatic changes. These mapping results are applied to specific projects in this proposal including : Marine geohazards to hydrocarbon development: Canada has potentially huge economic benefits to gain by having access to the natural resources of the Arctic Archipelago region. Exploitation in this manner however, can only proceed in a safe and responsible manner, by managing the potential detrimental impacts to the environment. A key requirement is to be able to assess potential natural hazards that might result in harmful affects both to persons and the environment. Natural hazards such as underwater landslides, collapse of offshore structures built on gassy seabeds and the impacts of glacial and sea ice must be known and their risk managed. Opening new shipping lanes and improving navigational charting: Despite previous focused mapping programs in the bottleneck regions, the Archipelago region remains sparsely mapped with shipping normally restricted to narrow singular corridors that may be ice covered. Because the Amundsen is operating a multipurpose mission throughout the region, there is a golden opportunity to simultaneously map uncharted regions to provide alternate pathways. Past to present evolution of sea-ice regime: Understanding past climatic history is the key to predicting potential future ramifications of a changing sea ice regime. To responsibly plan adaptation strategies, we need to be able to predict future climatic responses and their consequences. It is also the key to understanding the nature of these changes-i.e. are they part of a natural cycle or induced by present excess of greenhouse gases. The mapping is an essential precursor to designing seabed sampling strategies to recover undisturbed sediments.

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Publications

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Blasco, S., Bennett, R., Brent, T., Burton, M., Campbell, P., Carr, E., Covill, R., Dallimore, S., Davies, E., Hughes-Clarke, J., Issler, D., MacKillop, K., Mazzotti, S., Patton, E., Shearer, J., White, M., 2011, State of Knowledge: Beaufort Sea Seabed Geohazards Associated with Offshore Hydrocarbon Development, Geological Survey of Canada, Open File 6989, 335 p., Published

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