

The Canadian Arctic Seabed: Navigation and Resource Mapping

Summary

Project Leader(s)

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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.

People

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Partners

BP Exploration Operating Company Ltd
Canadian Hydrographic Service (Central & Arctic Region)
Fonds québécois de recherche sur la nature et les technologies
Imperial Oil Resources Ventures Limited
Indian and Northern Affairs Canada - Northern Scientific Training Program
Kongsberg Maritime
Natural Resources Canada - Geological Survey of Canada
Natural Resources Canada - Geological Survey of Canada (Atlantic)
Natural Resources Canada - Geological Survey of Canada (Pacific)
Natural Sciences and Engineering Research Council of Canada
New Brunswick Innovation Foundation
University of New Brunswick

Publications

Articles Published in Refereed Publications

Barletta, F., St-Onge, G., Channell, J.E.T., Rochon, A, 2010, Dating of Holocene Western Canadian Arctic sediments by matching paleomagnetic secular variation to a geomagnetic field model, Quaternary Science Reviews, 29 :, p. 2315-2324, Published

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Beaudoin, J., Hiebert, J., Calder, B. and Imahori, G., 2009, Estimation of Sounding Uncertainty from Measurements of Water Mass Variability, *International Hydrographic Review*, No. 2., pp. 20-38, Accepted

Blasco, K.A., Blasco, S.M., Bennett, R., MacLean, B., Rainey, W.A., and Davies, E.H., 2010, Seabed geologic features and processes and their relationship with fluid seeps and the benthic environment in the Northwest Passage, Geological Survey of Canada, Open File 6438, 57 pp., Published

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Richerol, T., Rochon, A., Blasco, S., Scott, D.B., Schell, T.M., Bennett, R.J., 2008, Evolution of Paleo Sea-surface Conditions Over the Last 600 Years in the Mackenzie Trough, Beaufort Sea (Canada), *Marine Micropaleontology*,v.68, doi:10.1016/j.marmicro.2008.03.003, 6-20, Published

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Other Refereed Contributions

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J. Roger, M.J. Duchesne, P. Lajeunesse, G. St-Onge and N. Pinet, 2011, Imaging pockmarks and ring-like features in Hudson Bay from multibeam bathymetry data, GEOLOGICAL SURVEY OF CANADA OPEN FILE 6760, 19pp., Published

Non-Refereed Contributions

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Brucker, S., Janzen, T., Hughes Clarke, J.E., van der Werf, A. and Bartlett, J., 2008, COLLABORATIVE, MULTI-PURPOSE SEAFLOOR MAPPING IN THE CANADIAN ARCTIC ARCHIPELAGO, Arctic Change 2008 Annual Conference Proceedings, 1, Published

