# Mass Transport Processes on the SW Newfoundland Slope, Eastern Canada: Model for Deep Water Sediment Transport

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Date: Wednesday, June 10

Time: 8:30 am - 12:30 pm

Location: Exhibition Hall

Speakers: Giles, Michael,  Mosher, David, Giles, Michael K., Nedimovic, Mladen, Piper, David

Track: Student Presentations II (AAPG)

Description: The modern seafloor geomorphology of Canada's eastern continental slope shows evidence for significant channel development and sediment mass failure. Newfoundland's SW slope is an active exploration frontier and location of the tsunami-inducing 1929 Grand Banks Landslide. Knowing this history and the geological processes responsible for sculpting the modern seafloor, a better understanding of exploration constraints and geohazards in the area can be gained. Analysis of recently acquired multibeam and seismic reflection data from Newfoundland's SW slope provides evidence for successive mass failures at a variety of scales. The occurrence of stacked and regionally extensive mass failures suggests that this is an integral process for slope sedimentation in this area but the circumstances that lead to their emplacement are not fully understood. A number of factors are recognized in the region that potentially contributes to failure initiation: 1) the area overlies a paleo-transform margin with higher seismicity compared to other regions of the Canadian east coast margin. Ground accelerations due to earthquakes play a critical role in initiating sediment mass failures; 2) The Laurentian Channel acted as a major ice outlet during Quaternary glaciations. High sedimentation rates due to glacial outwash created thick, rapidly deposited sediment packages on the upper slope, potentially generating higher pore pressures and sediment underconsolidation; 3) Recognition of buried sedimentary bedforms interpreted from seismic data suggest sandy intervals underlie St. Pierre and Halibut Slope areas. Listric faults extending from surface escarpments to these sediment packages indicate these intervals may act as detachment surfaces, perhaps in response to generation of overpressures during seismicity; and 4) The presence of gas hydrate, recognized as a bottom simulating reflector, was noted in the Halibut Slope region and free gas is evident in cores recovered from St. Pierre Slope. Generation of gas within sediment reduces its strength properties setting up a situation for potential mass-failure. It is unclear which of these processes contributes to mass failure but in all likelihood it is a combination that establishes failure potential in the slope environment, where seismicity provides the critical catalyst. In any case, it is demonstrated that the process of mass-failure is a significant mechanism for delivering sediments from the shelf to deep water regions.

Speakers

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Mosher, David

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Organized and presented by:
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