Post-glacial tsunami hazard for eastern North America: real or imagined?

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Few tsunamis have been documented along the coasts of eastern Canada (5900BC(?), 1755, 1864, 1848, 1914, 1929, 2004) and the U.S. (5900BC(?), 1755(?), 1926(?), mid-1930s, mid-1960s, 2004). Known large marine or near coastal earthquakes are limited to 1886, 1929 and 1933. Thus need we be concerned about tsunamis as a potential coastal hazard?

Very clear post glacial faults (pgfs) have been documented in Fennscandia with lengths of 50 km and throws up to 10 m; such faults would have had magnitudes > 8.0 – even up to 9. It is believed that pgfs occur in rapidly deglaciating areas where zones of differential crustal strain can build up to trigger a seismic release. If such pgfs are known in the Fennoscandian shield is there any reason why they might not occur in the Greenland or Canadian Shield during or soon after deglaciation? However in Canada until recently no pgfs have been identified. The Dec. 25, 1989 Lac Turquoise 6.3 magnitude earthquake in the Ungava area of N. Quebec broke the surface of the shield for 8.5 km with reverse throws up to 1.8 m. This appears to be a modest pgf. In north central Manitoba the pre-historic Holy Grail Fault is at least 20 km long and forms a very evident curvilinear fault scarp of at least 5 m height in

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Lake Agassiz varved clays. This pgf appears to have occurred beneath glacial Lake Agassiz raising the possibility that it was tsunamigenic and that Manitoba experienced Canada's first known tsunami! If pgfs can occur beneath a glacial lake can they occur below the ocean and cause tsunamis? Marginal marine channels are common off most glaciated coasts. These linear topographic lows are eroded by seaward-flowing continental ice sheets along the contacts between the onshore crystalline cratonic shield rocks and the offshore younger fringing sedimentary strata. Such marginal channels are known all around Canada's glaciated coasts, off Greenland and off Norway and may represent up to 100 m of glacially eroded rock giving rise to additional differential crustal strain during deglaciation. Alan Grant at the GSCAtlantic mapped apparent pgf fault scarps in the offshore Labrador Trough which is a pronounced marginal channel. These pgfs will have been tsunamigenic. The tsunamigenic Storegga Slide of 7900 y BP off NE Norway has moved ~20,000 cu km of continental slope sediment; no cause for the slide is known but to postulate an offshore, or coastal, pgf is a very reasonable suggestion. This then leaves us with the question of 'where might future pgfs occur indeglaciated areas in view of possible climate change or climate variability?' The coasts of Svalbard, Greenland, Baffin Island, Devon Is. and perhaps N. Labrador may all be the source of submarine pgfs that may be tsunamigenic or which may shake loose significant volumes of ocean floor, or continental slope sediments, to cause significant landslide tsunamis. In either case such events could threaten both the coasts of eastern N. America and parts of western Europe.