
Marine evidence on the Northeast Newfoundland Shelf of outburst floods from glacial Lake Agassiz and the 8.2 cold event

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Previous studies have suggested a causative link between the rapid drainage of the combined waters of glacial lakes Agassiz and Ojibway impounded south of the Laurentide Ice Sheet in Hudson Bay and abrupt North Atlantic climatic cooling recorded in Greenland, ice beginning about 8.4 and culminating about 8.2 cal BP (ca. 7.7 and 7.5 ¹⁴C BP). Massive Agassiz outburst floods (about 5 Sv), initially discharged subglacially, are thought to have exited Hudson Strait into the Labrador Sea, and to have induced cold atmospheric conditions by curtailing thermohaline circulation (THC) there. A lack of evidence for THC in the Labrador Sea at that time raises questions about the proposed causative link.

Our findings of an Agassiz-age, calcite-rich bed of silt-sized detrital carbonate in two cores from Notre Dame Channel (NDC), a 500 m deep basin on the mid-northeast Newfoundland Shelf (NENS), together with a correlative carbonate bed on the shelf farther south close to Grand Bank, provides evidence of a routing mechanism linking Agassiz outflow and the climatic cooling via transport southward as plumes of low salinity water and suspended carbonate sediment in the outer Labrador Current. Possibly adjacent to, or south of Grand Bank, low-salinity waters may have dispersed into, and been transported by northward-flowing currents to areas of THC in the Norwegian-Greenland seas.

A 60–80 cm thick upper carbonate bed in the NENS shelf basin is tied to an origin in Hudson Bay (underlain by Paleozoic limestones) by its relatively high calcite content. Within the sediments are benthic foram species normally resident in upper slope habitats. This co-deposition is interpreted to imply that both sediment and forams were forced over a shelf-edge 330 m deep sill into the shelf basin during enhanced (Agassiz flood-driven) transport and swelling of the outer Labrador Current. Radiocarbon dates on planktic foraminifers (*N. pachyderma* s.) at the base and top of this bed are statistically identical, with a pooled age of 7710 ± 120 ¹⁴C BP, indicating rapid deposition. These ages are also identical to those of a redbed flood marker in Hudson Strait and the marine transgression in Hudson Bay, both closely-related to the age of the Agassiz outburst flood. This correlation is obtained by applying reservoir age corrections typical of Hudson Bay and Strait, consistent with the entrainment and advection of carbonate sediment and Hudson Bay waters by subglacial lake outburst floods, in Labrador Current surface plumes.

An underlying thinner bed (20–25 cm) of calcite-rich detrital carbonate in the NENS shelf basin, dating slightly less than 8980 ± 35 ^{14}C BP, is interpreted to originate with subglacial release into the Labrador Current of impounded and runoff melt water during retreat of the Noble Inlet ice advance across Hudson Strait. Re-evaluation of previously published results from cores collected on the Labrador Shelf corroborates the foregoing interpretations.