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**Correlating Lake Agassiz floods to the  
onset of the 8.2 ka cold event**

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In 1999, outburst floods from glacial Lake Agassiz, then

dated at 8.47 cal ka, that flowed through Hudson Bay and Strait into the Labrador Sea, suppressing thermohaline circulation, were linked to the initiation of the 8.2 cal ka cold event recorded in Greenland ice; events with a radiocarbon chronology offset by 200–300 years. These high-energy drainages entrained glacial sediments enriched in detrital carbonate (DC) derived from Paleozoic carbonate bedrock. These sediments subsequently rained out over the floodwater trajectory to produce distinct beds of enhanced (5–50%) DC content. Sediment cores collected along the eastern Canadian margin, to south of the Grand Banks contain such beds, indicating that the flood trajectory was not directly into the Labrador Sea. Thus Agassiz waters reached far south enough to be transported in the North Atlantic Current to the Nordic seas, suppressing North Atlantic deepwater production.

The residence time of dissolved carbon in the North Atlantic is dependent on the rate of Gulf Stream transport and the duration of annual sea-ice cover, which regulates atmosphere-ocean CO<sub>2</sub> exchange. Reservoir corrections are applied to biogenic carbonate based on the age of modern (pre-bomb) shells, and incorporate modern sea-ice cover duration (5–6 months). Transfer function analysis of dinoflagellate assemblage data indicate that Early Holocene sea-ice duration along the eastern Canadian margin was up to 11 months, a difference that increases corrections by up to -200 years. Also, carbon-atom exchange would occur when glacial-derived fresh water (depleted in radiocarbon, the 'hard-water effect') and ocean waters mix; and between the oceans carbonate system and suspended DC sediment 'old' (Paleozoic) carbon, both of which could increase the reservoir correction. These factors and findings raise confidence in the conclusion that ice-dam failure and rapid flooding of glacial Lake Agassiz played a significant role in initiating abrupt climate change at 8.2 cal ka.