Post-glacial sedimentation in the Saint John River Valley and comparison with First Nation oral history explaining the origin of the Reversing Falls, New Brunswick

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Examination and finite radiocarbon dating of core samples from the Grand Lake - Saint John River Valley (SJRV) denote changes in the depositional environment and timing of geological events. Four post-glacial geomorphic phases are recognized commencing with deglaciation and marine transgression across isostatically depressed terrain, forming the open-phase DeGeer Sea prior to 15 000 calyBP. During Phase II, ~14 000 to 8000 calyBP, isostatic rebound enabled the capture of sea water that was constrained due to glacial burial of previous fluvial outlets, developing the large inland DeGeer Sea that was slowly transformed to the freshwater Lake Acadia. Phase III, ~8000 to 3000 calyBP, is associated with a return to a fluvial-dominated SJRV system when a new outlet was established by down-cutting of the Reversing Falls gorge. Phase IV ~3000 calyBP to present, denotes establishment of estuarine conditions and flow 68 kms up-river, of brackish water from breaching of the Reversing Falls due to rising sea level and higher tides in the Bay of Fundy.

The four-phase geological model complements First Nation spoken histories for the region. The Wolastoqiyik (Maliseet) have always lived, hunted, and traded throughout the Saint John River drainage basin. Their oral history describes extensive flooding of land due to blockage of the Saint John River by a dam constructed by 'Big Beaver', and the subsequent return to a smaller lake (Grand Lake) after the smashing of the dam by 'Glooscap', an ever watchful legendary warrior and protector. The Mi'kmaq also have flood stories that talk about Ice Giants and rushing water that when considered with the scientific data, suggest an association between the geoscience model and aboriginal legends. These observations suggest that First Nation peoples may have been quick to explore the area as glaciers retreated, handing down observations of nature and terrain in a way that made the oral accounts understandable and memorable to subsequent generations.

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