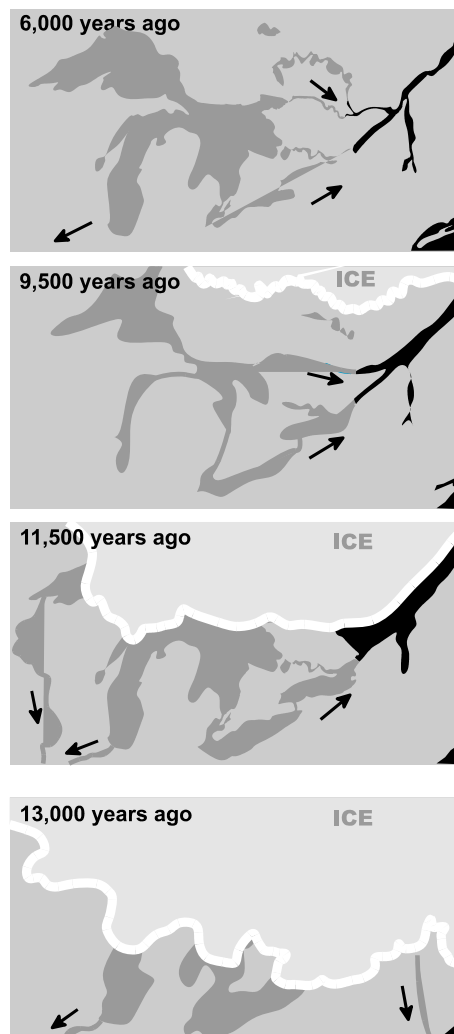


b18 Ice-margin lakes < outburst floods, climate events >

The lake was Itasca and the stream, a twelve-inch-deep rush of cold clarity over humps of boulders, was the Mississippi River. I crossed it in five steps. ... The name 'Itasca,' despite its Indian sound, came from two Latin words, *veritas caput* ('true head'), that Henry Rowe Schoolcraft assembled. —Heat Moon.¹

In North America, east-west trending terminal and recessional moraines left by the Laurentide ice sheet derange preglacial drainage where it was naturally north across the Canadian shield or into the St. Lawrence Seaway. There the north-sloping lie of the land caused ice-margin lakes to form during the retreat (**Figure b18.1**) and, earlier, during the advance of the Laurentide ice sheet. Depending on the location of the ice margin, overflow from these meltwater filled ice-margin lakes was variously to the Spokane (*see* Topic b19), Mississippi, Hudson, and St. Lawrence drainage systems. Freshwater floods, which covered over the sea surface where, otherwise, ocean currents rise and vent heat, could explain abrupt climate-change events. Garry K. C. Clarke in 2002 noted that “On several occasions the ice dam formed by the Laurentide ice sheet was penetrated and massive outburst floods were routed to Hudson Bay and to the Arctic Ocean. In terms of released water volume the largest of these outburst floods was associated with the Kinohjévis [also the geographic name of an outlet] stage of Glacial Lake Agassiz. The impounded volume has been estimated as 163,000 km³ and the timing of the outburst coincides with the early Holocene cooling event at 8,200 BP.”² □

Figure b18.1³
Stages in the retreat of the Laurentide ice sheet at the end of the Wisconsin glacial.



Land is above sealevel where, formerly, in the area of the St. Lawrence River (estuary), the weight of Wisconsin ice had depressed it to below sealevel. To the south, the sea floods the margin of North America and the shoreline of Long Island, NY, is established.

The ice mass keeps the ice-unloaded and rebounding land to the south, tilted toward it. Drainage is east to the Champlain sea.

The Laurentide ice sheet weights down the land. Periglacial lakes Duluth and, east of it, Algonquin drain south (to the Mississippi). The eastern margin is flooded by the Champlain sea.

The Laurentide ice sheet blocks the pre-glacial northward direction of drainage. Dammed meltwater creates lakes Chicago and, east of it, Warren. The spillway for these is to the south (to join the Mississippi). The Hudson valley drains south.