ice core temperature proxy record scaled by 1.5. The Gulf of St. Lawrence region may have been the locus of increased snowfall and amplified cooling during the Younger Dryas, and during previous cold periods, as a result of deflection of the jet stream by semi-permanent high pressure cells over the LIS and sea-ice covered North Atlantic ocean.

Late-glacial ice advances in Maritime Canada

Rudolph R. Stea[1], Robert J. Mott[2], John Gosse[3], and James Fastook[4]

1. Nova Scotia Department of Natural Resources, P.O. Box 698, Halifax, NS B3J 2T9, Canada ¶ 2. Geological Survey of Canada, 601 Booth Street, Ottawa, ON K1A 0E8, Canada ¶ 3. Department of Earth Sciences, Dalhousie University, Halifax, NS B3H 3J5, Canada ¶ 4. University of Maine, Orono, ME 04469, U.S.A.

Maritime Canada can be considered a canary in the coal mine of climate change, especially at the end of the last glaciation, when it was situated between the Laurentide Ice Sheet (LIS) and the North Atlantic. Three ice advance events at the end of the last (Wisconsinan) glaciation are recorded in the stratigraphy of this region. Starting about 17.0 ka (all calibrated ages) there was a major period of ice retreat, followed by readvances of several local ice caps with terrestrial and marine margins. The oldest, termed the Chignecto Phase, is dated between 15.2 and 16.0 ka and is roughly correlative with the Port Huron event of the mid-continent and the "oldest" Dryas in Europe. After this there is evidence for a short-lived re-advance dated about 13.5 and 14.0 ka (Shulie Lake Phase) correlative with the "older" Dryas.

The next major event was the advance of remnant glaciers during the Younger Dryas (YD) termed the Collins Pond Phase (~13 ka). A paleosol formed during the warming phase is preserved under surface tills, best exposed during an excavation for the Sable Island Gas Pipeline in 1999. The YD glacier margin is marked by ice-marginal lakes north of the Cobequid Highlands of Nova Scotia, and a series of glacial lakes dammed against the highland-rimmed west coast of Cape Breton Island. A 30–40 km re-advance of an ice cap centred around Prince Edward Island in the Gulf of St. Lawrence is indicated. These paleosol sites and 20 other buried wood and peat organic horizons throughout Nova Scotia allow an accurate reconstruction of YD glacier limits and provide a robust radiocarbon chronology of deglaciation.

The University of Maine Ice Sheet Model (UMISM) was used to analyze the conditions necessary for a field-based conceptual model of paleo-ice dynamics in the Gulf of St. Lawrence. The model produced a strikingly similar configuration to the empirical glaciation model of the Collins Pond Phase using a slightly modified modem climate and the GRIP