The development of softwood tree-ring chronologies in Nova Scotia: a tool for palaeoclimate reconstruction, archaeological, and heritage building research

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To date, dendrochronology has not been used to develop climate models in any of the four Atlantic Provinces of Canada. There are no published tree-ring chronologies in spruce or Eastern White Pine, and the one fourteen-tree Eastern Hemlock tree-ring chronology shows some possible erratic signals in the mid-19th century. No archaeological sites and no heritage structures have been previously dated using tree-rings in eastern Canada. Yet with Newfoundland and Nova Scotia jutting well

out into the Atlantic Ocean, there is a real potential for tree-rings to serve as a record, not only of onshore climate, but also of climate imposed by oceanographic changes offshore. Thus the tree-rings of the Atlantic Provinces represent an integrated year-by-year climate archive that is quite unsurpassed and unexplored.

This paper reports on the initial development of softwood tree-ring chronologies in south-central Nova Scotia. A large collection of heritage building samples has been assembled, ranging from the charred beams of St. George's Round Church in Halifax, salvaged after the disastrous 1995 fire, to the massive timbers of Colonel McHaffey's large hand-hewn barn at Windsor Forks. Samples from a dozen heritage structures have been supplemented with a few 'cookies' from living trees. Surprisingly, it has been easier to get samples from heritage structures than to obtain the co-operation of lumber companies and samples from living trees.

Spruce has been found to cross-date with Eastern Hemlock, but not with Eastern White Pine. A 410-year composite spruce/hemlock tree-ring chronology has emerged to date (1572–1982). A slightly longer Eastern White Pine chronology should soon be anchored. The common intraspecies growth trends suggest that the growth of spruce and hemlock over a large area of south-central Nova Scotia has responded to common climatic factors over the past four centuries. In contrast, the tree-ring width records from Eastern White Pine (*Pinus strobus*) are responding to different climatic factors. Over 100 years of temperature and rainfall records exist in the area to allow us to sort out which species are responding to which climatic factors. The first heritage structure of an unknown age has now been dated in Nova Scotia; disassembled, piled on a flatbed truck, and shipped off to the United States to be reassembled in the bars, rec rooms, and casinos of America.