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Tree-ring based climate and streamflow reconstructions for the Chic-Choc and McGerrigle mountains of the Gaspésie interior

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In order to detect if anthropogenic climate change is affecting a region's climate, we need long instrumental records of at least 100-150 years to establish baseline conditions. We also need long regional climate records to understand natural multi-centennial climate variability because this natural low-frequency climate variability can be mistaken for anthropogenic climate change. Unfortunately, in large portions of Québec and the boreal forest biome in general, these long records do not exist. Instrumental climate records from the interior of the Gaspé Peninsula are particularly short, with the longest climate and streamflow records only beginning around 1970. Tree-ring-based climate reconstructions provide one way to infer this lost climate data, being the sole practical fashion to infer annual or even sub-annual resolution data for this region. Mountainous regions are known to be sensitive early responders to anthropogenic climate change. The Chic-Choc and McGerrigle Mountains of the interior of the Gaspesie have been relatively little studied by dendroclimatologists. We present here preliminary results from 6 northern white cedar (*Thuya occidentalis*) sites of a major river valley as well as 3 black spruce sites (*Picea mariana*) and 1 balsam fir site (*Abies balsamea*) at the tree line of three mountains in the region. Sampling occurred in the summer of 2017 and 2018 in the *Parc national de la Gaspésie*. The tree ring chronologies from the 6 valley cedar sites and the 2 black spruce tree line sites collectively extend 456 years into the past and demonstrate a significant summer streamflow signal. Processing from the 2018 field season demonstrate a January temperature signal at tree line black spruce and balsam fir sites, as well as a late summer temperature signal at the black spruce sites. A June precipitation signal is observed in three of the valley tree-ring chronologies as well as a May precipitation signal in three of the tree line sites. The chronologies from this project are hence suitable for use in tree-ring based climate reconstructions, in this region where instrumental climate data is so lacking. Such climate reconstructions could be useful for wildlife management in the *Parc national*, particularly for that of the highly endangered caribou and the important salmon fisheries of the Sainte-Anne River. Additionally, we have rediscovered an old growth cedar stand that was briefly studied in the 1980s. This old growth stand is of interest in the park for conservation purposes and helps extend our reconstructions farther into the past.

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