

## Snow Monitoring at the Kouchibouguac National Park, New Brunswick (1974–1998)

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### ABSTRACT

The main goal of our work is to present the method used to verify the validity of the data from the Kouchibouguac National Park and we want to provide an example of the snow dynamics for a typical winter in the Park. Kouchibouguac National Park is located on the east coast of New Brunswick and the area covered is 238.8 km<sup>2</sup>.

Snow is an important factor in the Kouchibouguac that influences many phenomena in the ecosystem. The annual mean snow precipitation is 208 cm. Kouchibouguac National Park decided to start a snow monitoring program in 1974. The data collected are collected by the Warden Service at every two weeks. Nine representative sites were selected and every site has two parts: one site in an open area, and another in a closed area (forested area). Since 1974 the data collection starts with the first snow and ends with melting of the snow. Generally, this period extends four months and starts at the end of December and finishes at mid-April.

The purpose of that monitoring is to provide information about the snow conditions (quantity and types of snow).

For this study, we use data from three different sources :

1. Data of the snow type and snow depth from 1974 to 1998; those data come from the Warden Service;
2. Temperatures (minimum and maximum), daily precipitation (solid and liquid), and the total accumulation of snow on the ground from 1974 to 1995; those data come from an automatic station (managed by Environment Canada) that is located in the park;
3. Detailed data from two snow surveys in 1997 and in 1998.

All these data were made uniform to conform to the International classification for seasonal snow on the ground (1985).

A problem in these studies is that we have subjective data, like the snow type from the Warden Service, and, on the other hand, some objective data, like the meteorological data from Environment Canada. The challenge is then to obtain a good degree of uniformity among the different sources. A good way to verify the validity and the conformity is to make comparisons between the sources using graphics. Once the comparisons were done, we could describe the principal snow conditions for every winter and for a typical winter that include the dynamics of the snow accumulation.

The typical snow conditions that can be observed in the Park generally start with some snow in mid-November, but the snow accumulation on the ground really starts in mid-December with colder weather. With the very low temperatures of January, there are slight snowfalls and then snow accumulation tends to be stable. The slightly higher temperatures of February mean greater snowfalls and then increase the quantity of snow on the ground. The maximum thickness of snow on the ground occurs at the beginning of March and can be explained by all the accumulation of the previous months. The final melt of the snowpack starts at the end of March, but some snowfalls can occur in April. We can also say that the mean snow thickness surveyed by the Warden Service and the temperatures that can be derived from its stratigraphy generally conform with the snow data and temperatures surveyed by Environment Canada.

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