

ANALYZING CLIMATE DATA FOR IMPROVED CLIMATE MONITORING IN NORTHERN QUEBEC



CONTEXT

Historical and current field data are used in analyzing climate trends over time. Although northern Quebec is one of the regions that will be most severely affected by climate change, the observation data for that region are fragmentary and incompatible, in both temporal and spatial terms. The reason for this is the small number of stations covering the territory, owned by different institutions.

OBJECTIVE

Define an optimal climate observation network for northern Quebec on the basis of data from different suppliers and develop a method for estimating missing values.

ACHIEVEMENTS

A portrait of the climate from 1986 to 2005 was drawn up, in part using a method for estimating missing values developed by Ouranos. This method made it possible to recover some data, although the sparse network and temporal discontinuity of the data limited the number that could be recovered.

Temperature patterns were identified using interpolation and confirmed by comparison with known regional climatology.

On this basis, it appears that 4 to 8 additional stations would be enough to complete the network and more accurately interpolate data for the entire region.

The robustness of this “optimal network” and its capacity to measure future climatology were tested by using CRCM data for the 2010-2039, 2040-2069 and 2070-2100 periods. For each of the three periods in question, the spatial representativeness of the stations in the proposed network was adequate for northern climate monitoring.

OUTLOOK

The bases of the optimal network determined by analyzing temperature data will have to be decided upon with confirmation from data on various climatic parameters. The proposed methodology represents a first step toward a broader analysis. Other network configurations could also be studied by varying the number and locations of stations.

PROJECT LENGTH

1.5 years
Completed in 2007

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- Hydro-Québec
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FUNDING

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- Ouranos

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PROJECT OVERVIEW

Temperature data from various sources were used and analyzed in order to verify the coverage of existing meteorological stations. This analysis was then used to define an optimal climate observation network for the region. The representative nature of this future network was tested using data from the Canadian Regional Climate Model (CRCM).