

DETERMINATION OF THE VULNERABILITY OF NUNAVIK COMMUNITIES TO GLOBAL WARMING, AND DEVELOPMENT OF AN ADAPTATION STRATEGY



PROJECT LENGTH
3 years • Completed in 2007

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CONTEXT

Several Nunavik villages have been built on ground made of loose sediments, including a number of facies that contain considerable amounts of ice – making potential permafrost thaw a real risk for a large number of infrastructures. Events such as the landslide at Salluit in 1998 have already demonstrated the potential vulnerability of infrastructures, and then of communities. When combined with the urban development required for a rapidly growing population, the problem calls for a solid, effective adaptation strategy.

OBJECTIVES

- Identify land at risk for construction.
- Pinpoint areas that are the least sensitive to the establishment of residential areas and infrastructures.

RESULTS

Based on aerial photographs and site inspections, the layout of sediment deposits and landforms of 11 villages were interpreted, making it possible to establish “morphosedimentological” maps. Mapping units were then assembled into relatively easy-to-understand maps that provided initial zoning categories reflecting the extent to which conditions were appropriate for construction. The three categories that emerged were as follows: (1) land able to support structures; (2) land presenting limitations on construction, requiring special foundation methods, or necessitating more in-depth investigation before construction work could begin; and (3) land unsuitable for construction.

IMPACT

The use of the above-mentioned maps as a tool for community land-development planning was a simple, but fundamental, initial means of adapting to global warming. The selection of land suitable for construction will make it possible to avoid a number of problems related to anticipated permafrost degradation. As the maps are less than perfect, however, it is recommended that land-use characterization efforts be continued in order to improve their accuracy.

PARTNERS

- Kativik Regional Government (KRG)
- Ministère de la Sécurité publique (MSP)
- Ministère des Transports du Québec (MTQ)
- Société d'habitation du Québec (SHQ)
- Société Makivik

FUNDING

- Climate Change Action Fund
- Ouranos

TEAM

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PROJECT OVERVIEW

- A complete list of sectors at risk in the 14 communities concerned was established.
- Our understanding of relationships between permafrost degradation and geotechnical impacts (subsidence, horizontal displacement of the active layer, etc.) was improved.