

#### THESIS TITLE

*Slope dynamics and associated risks in a context of climate change in Nunavik, Canada: a spatialized geomorphological and meteorological approach*

#### DIRECTORS

Armelle Decaulne (CNRS, [armelle.decaulne@univ-nantes.fr](mailto:armelle.decaulne@univ-nantes.fr)) et Beatriz Funatsu ([beatriz.funatsu@univ-nantes.fr](mailto:beatriz.funatsu@univ-nantes.fr)), UMR 6554 LETG-Nantes

#### SUBJECT DESCRIPTION

The Arctic region is at the heart of climate concerns, being particularly sensitive to rising temperature, and triggering environmental changes sometimes leading to the displacement of indigenous populations still traumatized by sedentarization. Perceptions of climate change and the associated risks (melting permafrost, increased avalanche risk, watershed connectivity, food security, etc.) are important for the development and implementation of adaptation and mitigation actions aimed at reducing the vulnerability of Nunavik's indigenous populations.

As part of OHMi Nunavik's work, the combination of geomorphological and meteorological approaches to quantifying the role of climate change at high latitudes is essential to characterize the hazard and exposed stakes, in a territory home to Inuit indigenous populations with a rapidly growing population. This doctoral thesis will assess the nature of the processes at work on slopes and the diachronic development of coastal villages in Nunavik, northern Quebec. These spatial processes are linked to sedentarization and very recent urban development: distance from traditional seasonal camps, criteria for site selection, constrained or spontaneous village expansion, etc. The analysis of global warming and meteorological variability is also at the heart of this work, through the objective variables of temperature, precipitation and wind, but also through the more subjective aspects of phenology and the "telling" of changes by the Inuit who inhabit the territory. In particular, we'll be looking at the length of time sea ice is present, or river and lake ice freeze-up and break-up, the dates when snow appears and disappears, and so on.

This research is organized around a triptych with (i) geological, geographical, geomorphological aspects characterizing the hazard (slope topography and micro-topography; aerial and radar image analyses; analysis of the existing and reinforced automatic camera network; frequency and length of travel), (ii) the human aspects characterizing the situation(s) of vulnerability (seasonal travel trajectories, village extension plans and road infrastructures), and (iii) the climatic and meteorological aspects controlling the factors triggering hazards (e.g., avalanches), and its perceptions by the local inhabitants.

#### QUALIFICATIONS, SKILLS AND RESEARCH REQUIREMENTS

The candidate must hold a Master's degree, preferably in Physical Geography or Environmental Geosciences. Skills in field techniques are desirable (topometry, sampling, granulometric or sedimentological analysis, morphological measurements). Knowledge of spatially-referenced data acquisition and processing tools (GDP, dGDP, GIS, photo-interpretation, LiDAR, photogrammetry) and scientific programming (Python, R) is desirable. Candidates should have a keen interest in geomorphology, remote northern regions, team fieldwork in harsh conditions, and scientific and social curiosity in indigenous environments. Proficiency in English (reading, speaking, writing) is desirable.

#### APPLICATION START DATE

April 3, 2024 on the Sociétés, Temps, Territoires (STT) Doctoral School platform:  
<https://theses.doctorat-bretagne.fr/stt>

#### APPLICATION CLOSURE DATE

June 12, 2024

#### CANDIDATE AUDITION

June 28, 2024

#### APPLICATION DOCUMENTS

Candidates are invited to contact Armelle Decaulne ([armelle.decaulne@univ-nantes.fr](mailto:armelle.decaulne@univ-nantes.fr)) and Beatriz Funatsu ([beatriz.funatsu@univ-nantes.fr](mailto:beatriz.funatsu@univ-nantes.fr)), providing a single pdf file containing a letter of motivation detailing how the thesis project corresponds to their skills and professional strategy; a curriculum vitae; the Master's diploma with grades and marks; and a maximum of two letters of recommendation.