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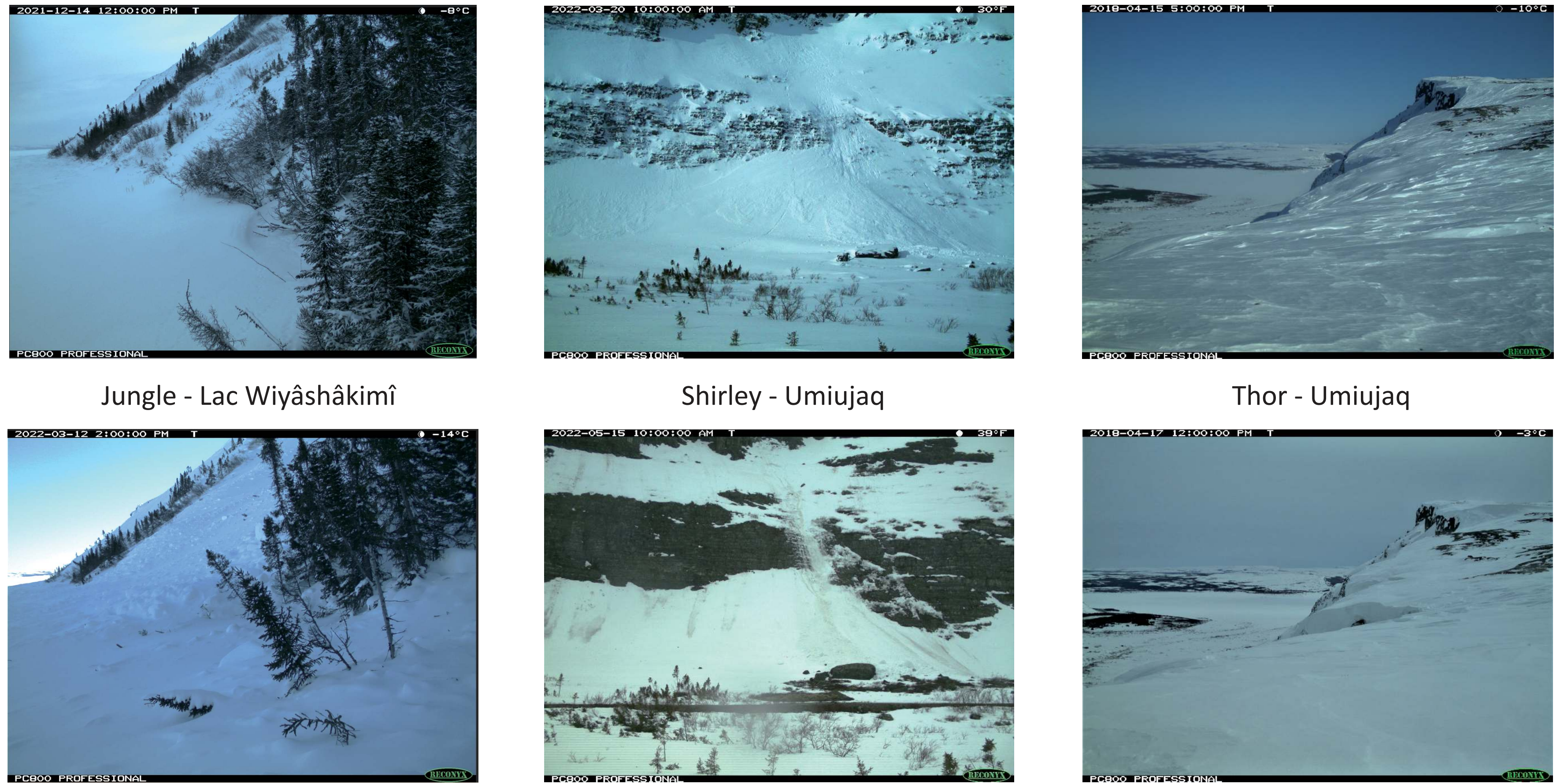
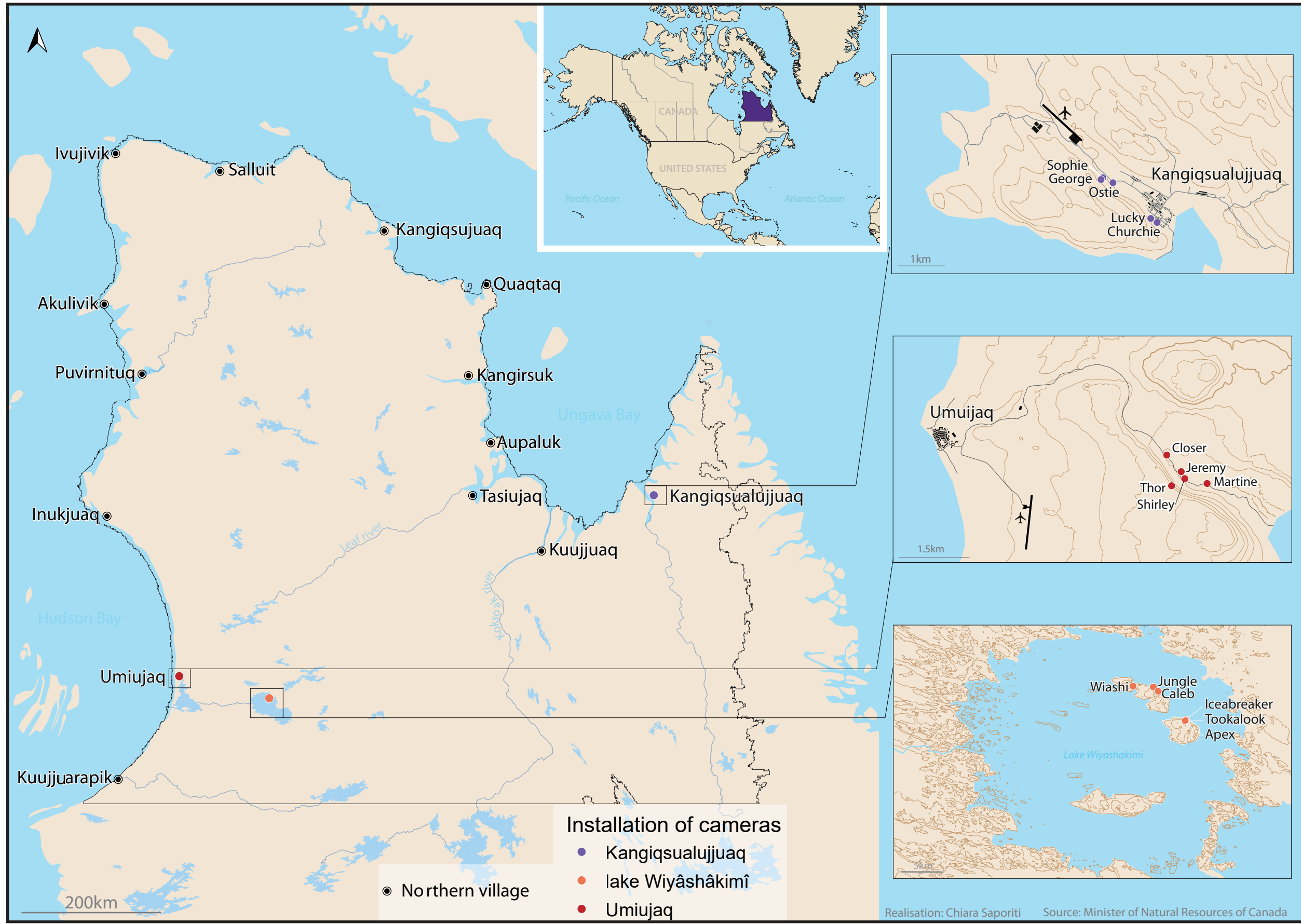
Towards a portrait of avalanche hazard in Nunavik

Chiara Saporiti^{1,5}, Claire Morillon^{2,5}, Jérémy Grenier^{3,4}, Najat Bhiry^{3,4}, Beatriz Funatsu⁵, Armelle Decaulne⁵

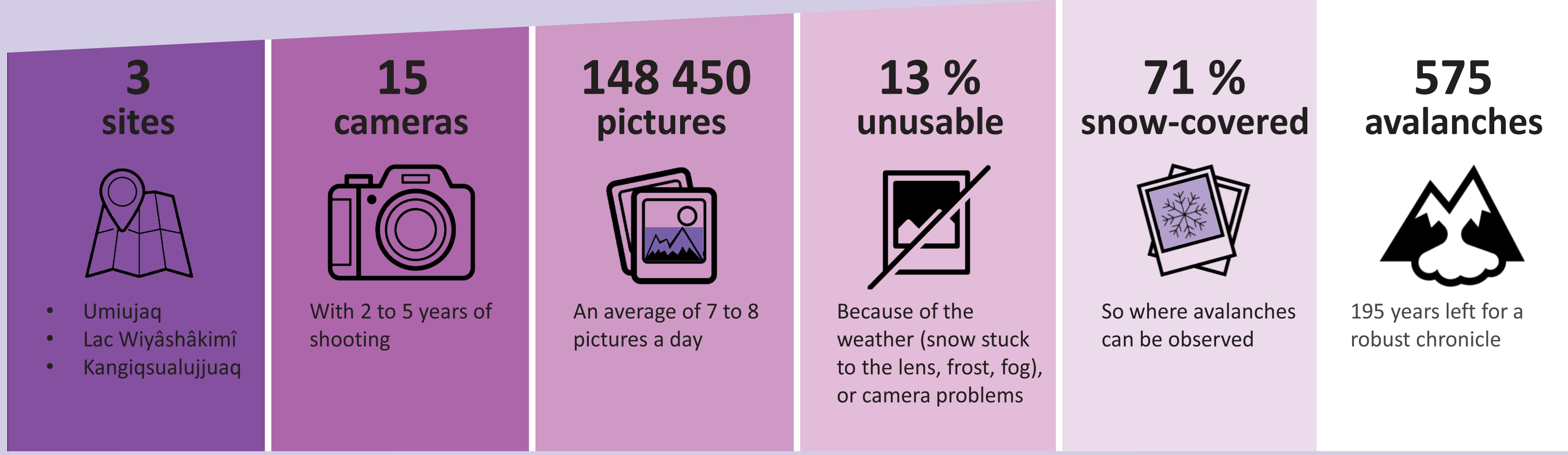
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GENERAL CONTEXT



DATA IN FIGURES



January 1999, a deadly avalanche occurred in the village of Kangiqsualujuaq (northern east Nunavik): 9 people killed (including 5 children), 25 injured. This tragic event led to the gradual awareness of local population and scientific community on the avalanche risk in the northern Quebec region.

Since 2015, a team from OHMI-Nunavik is interested in studying slope dynamics at different sites.

3 sites were chosen and were equipped in 2017 with automatic time-lapse cameras (type Reconyx™ Hyper Fire2):

- Umiujaq,
- Wiyâshâkimî meteorite crater lake,
- Kangiqsualujuaq.

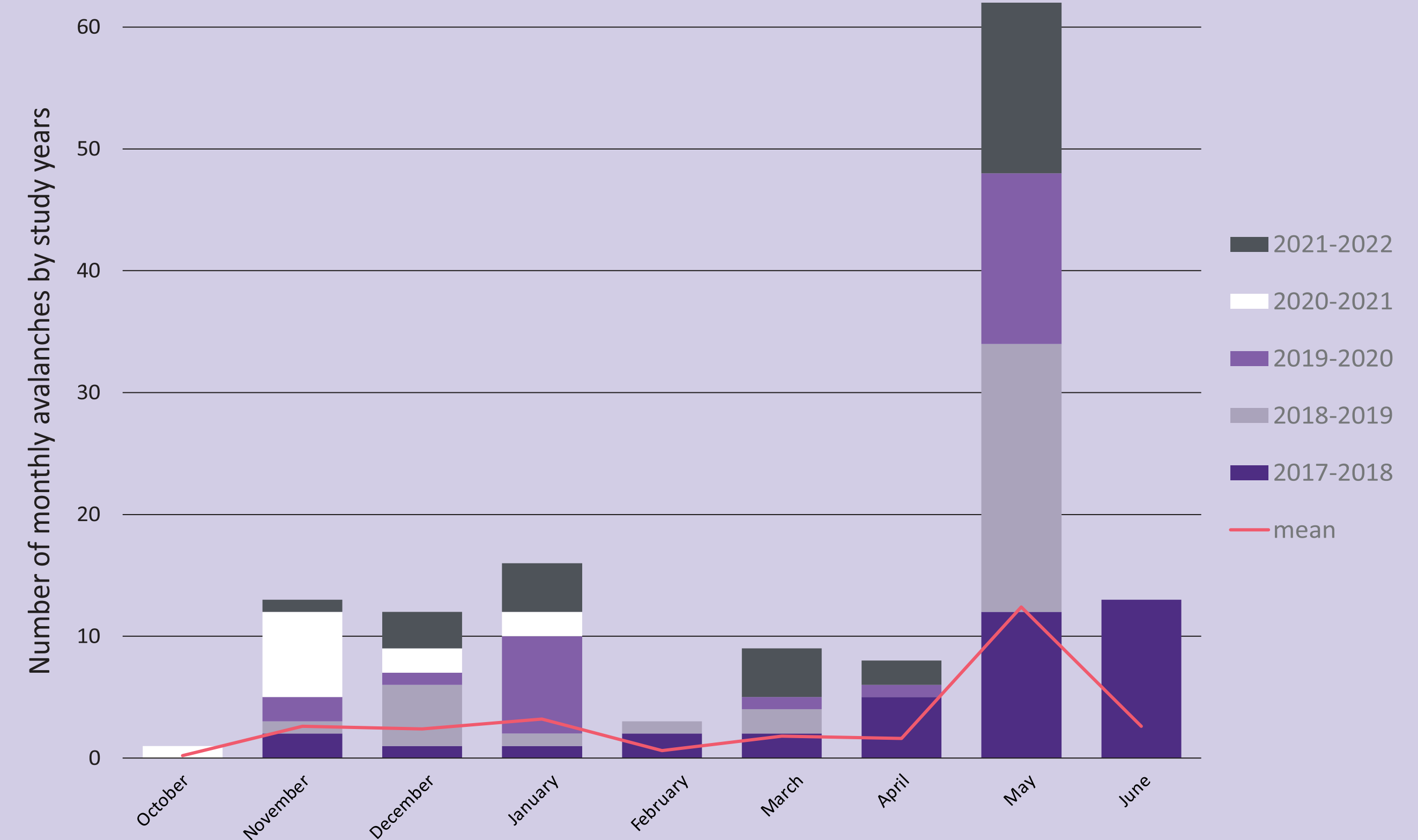
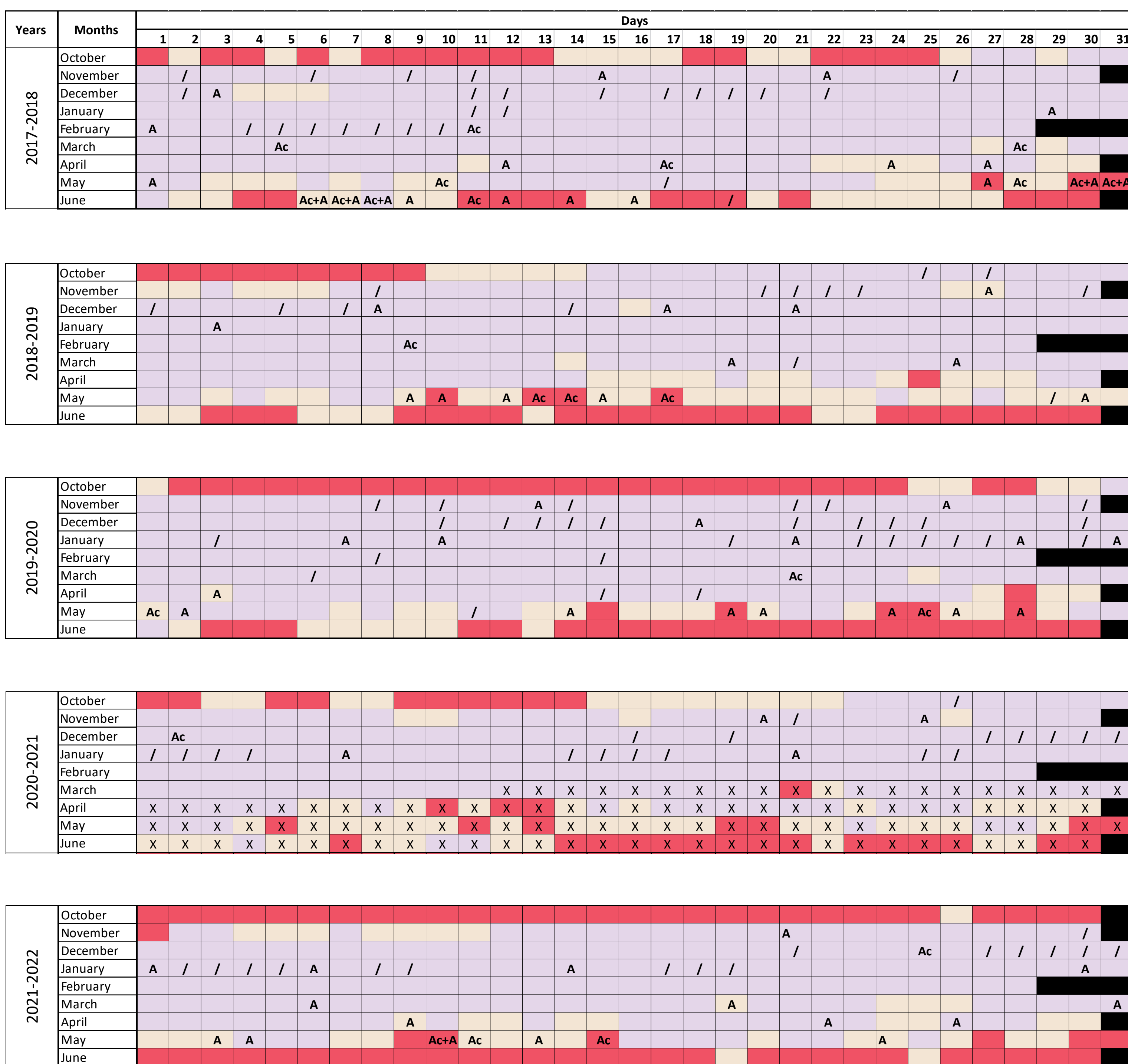
Operating year-round and recording pictures every hour, for an average of 7 hours per day, these cameras have helped to **identify avalanche paths** and **avalanche occurrences**.

These sites were chosen because of the presence of the **avalanche hazard** and its potential impact on the local population.

For Umiujaq and the Wiyâshâkimî lake, recent development of **tourist activities** in the national park Tursujuq, established in 2013, led to more traffic on local roads, especially during spring, season of high frequency avalanches with potential important runoff.

- The avalanche deposits visible on the pictures enable to establish:
- a winter and spring **calendar of occurrence**,
 - an estimate of **runout distances**,
 - the delimitation of the **contours of avalanches**,
 - **weather conditions** during the triggering phase.

ZOOM ON CAMERA SHIRLEY OPERATING SINCE 2017

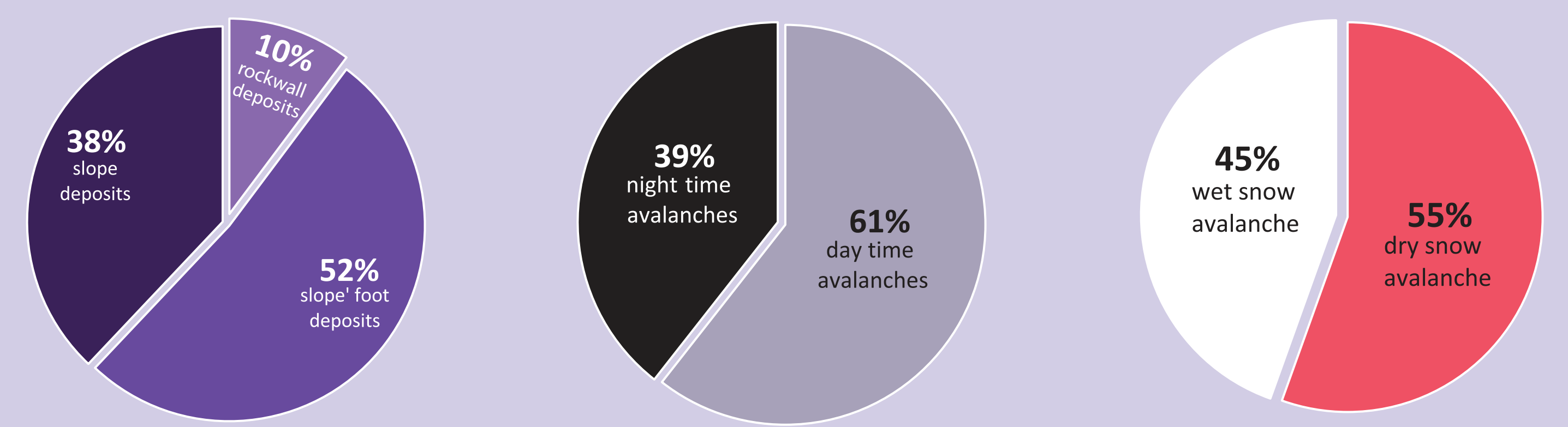


Shirley camera, located in the site of Umiujaq, captured the most active avalanche paths since 2017, recording a total of **137 avalanches** in 5 years.

The **travel distance** is used to estimate whether the avalanche hazard represents a risk to human activities. On Shirley, **more than 50 %** of the observed avalanche deposits extended to distal slope, at the foot of the slope, beyond the 10 % inflection point.

Winter and spring calendars enable a first correlation of temperature variations and occurrence of avalanches:

- avalanches are mostly triggered following an **increase in temperature** in previous days. It explains the monthly occurrence in May, as the daily temperature becomes mostly positive.
- **daily temperature variations** also trigger avalanche events as they occurred during **day time**, the time during which the population is more likely to frequent these areas



Seasons	Avalanches	Legend
Strictly positive daily temperature	A	X Data not usable due to a breakdown or theft
Strictly negative daily temperature	Ac	/ Data not usable due to weather conditions
Both positive and negative daily temperature		