Mapping freeze/thaw cycle in Turjusuq Park using active and passive data

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1. INTRODUCTION

Boreal and arctic regions form a complex land cover mosaic where vegetation structure, condition and distribution are strongly regulated by environmental factors such as soil moisture and permafrost.
The main purpose of our study is to map freeze/thaw cycle using passive and active data.

2. STUDY SITE

The experimental sites are located on Turjusuk Park near the Hudson Bay cost (Qc, Canada) in Nunavik region: Sheldrake and Nastapoka basins (**Fig.1**).
It is a zone of discontinuous permafrost located at the tree line.

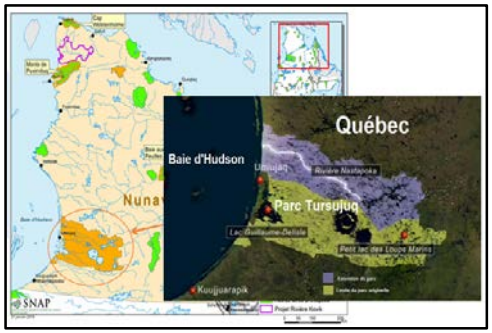


Fig.1. Study site, Turjusuk Park

3. DATA BASE

- ***In-situ data***

27 sites were selected to do analysis (**Fig.2**). They include 18 temporary Stations (SMAP project) and 9 CEN meteorological stations.

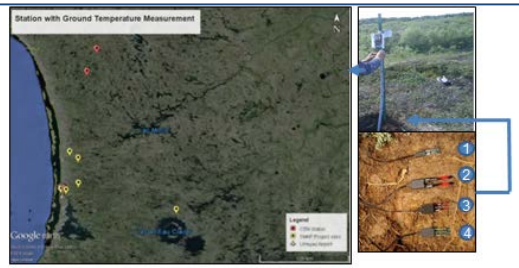


Fig.2. (a) Experimental sites , (b) Sensors installation

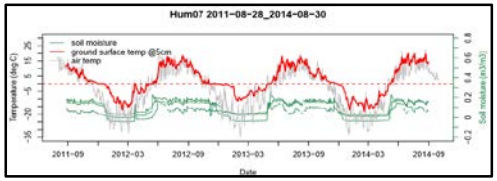


Fig.2.Temperature and soil moisture profile

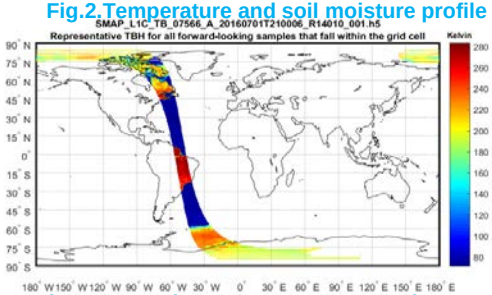


Fig.3. SMAP data SMAP_L1C_TB, 36 km

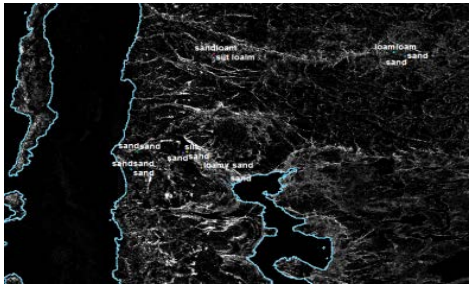


Fig.4. PALSAR data, 30m

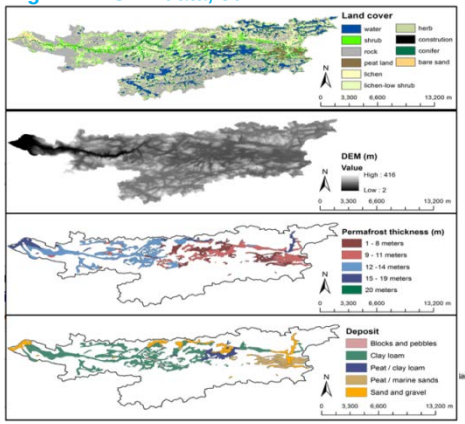
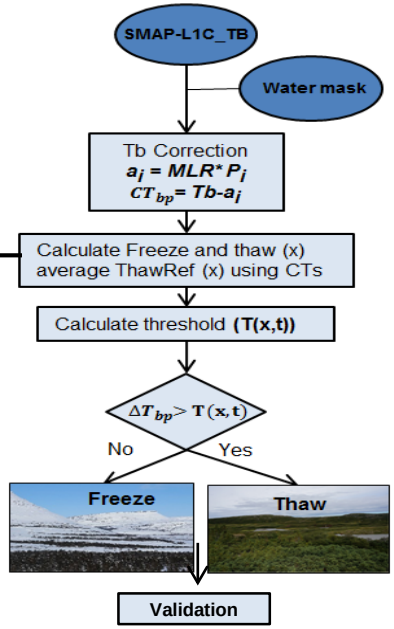
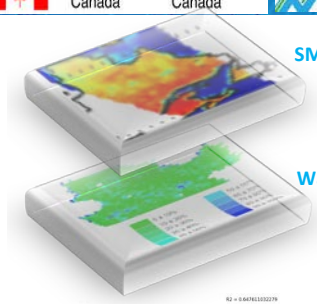
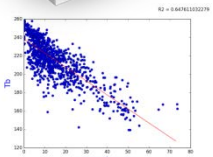


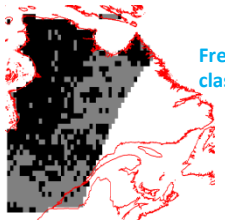
Fig.5. Land cover, DEM, Permafrost thickness (m) and Deposit

3. METHODOLOGY & RESULTS



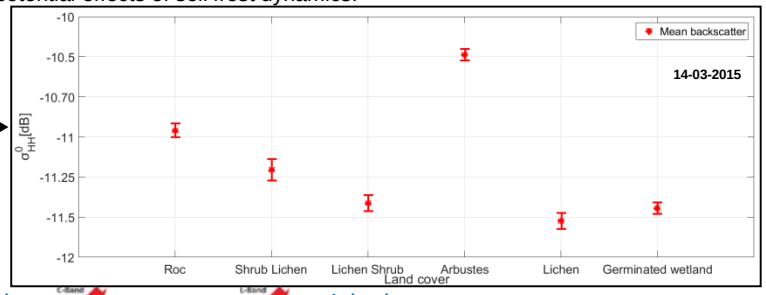


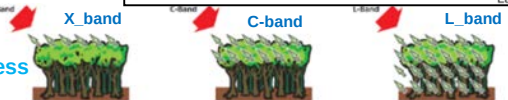




4. FUTURE STEP

- **Dynamic seasonal threshold** will be applied to improve freeze thaw mapping.
- With PALSAR, RADARSAT-2, and SENTINEL we will examine active passive synergies and assess sub-grid heterogeneity in surface state and potential effects of soil frost dynamics.





Interaction vegetation/ X, C and L band