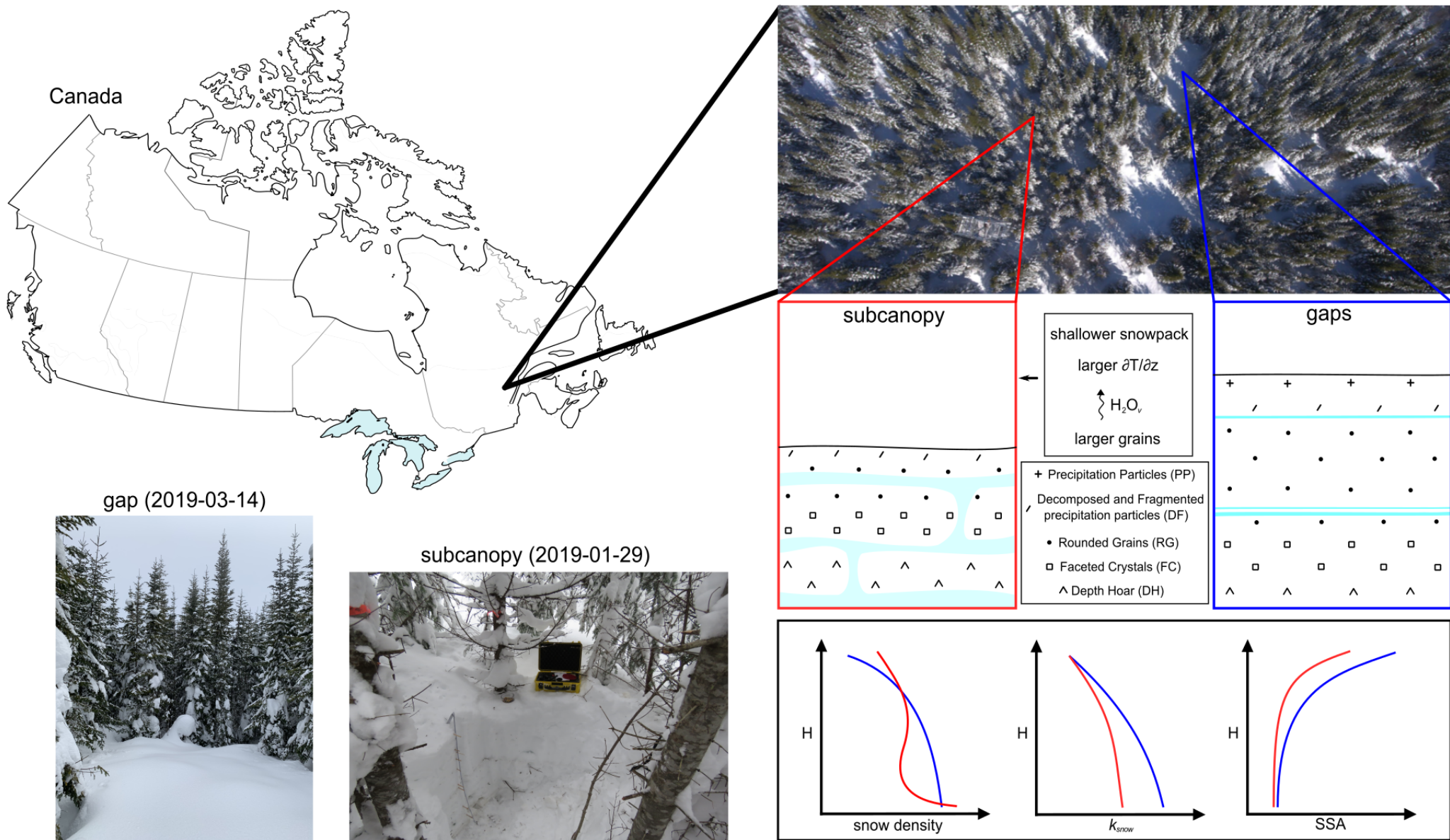


EGU21-3539: A Detailed and in Situ Assessment of the Snowpack Physical Properties in a Humid Boreal Forest

CR5.1 : Modeling and measuring snow processes across scales

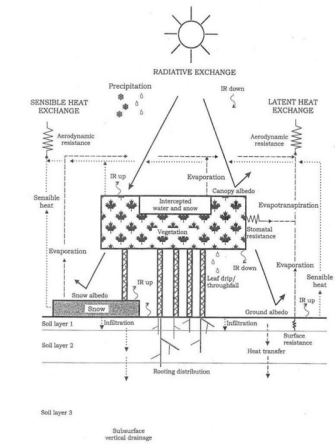
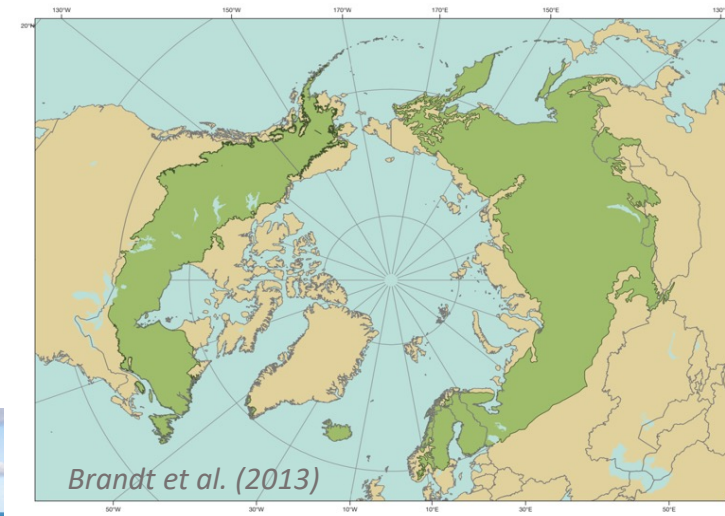


What is snow in a discontinuous forest?



Why is it important?

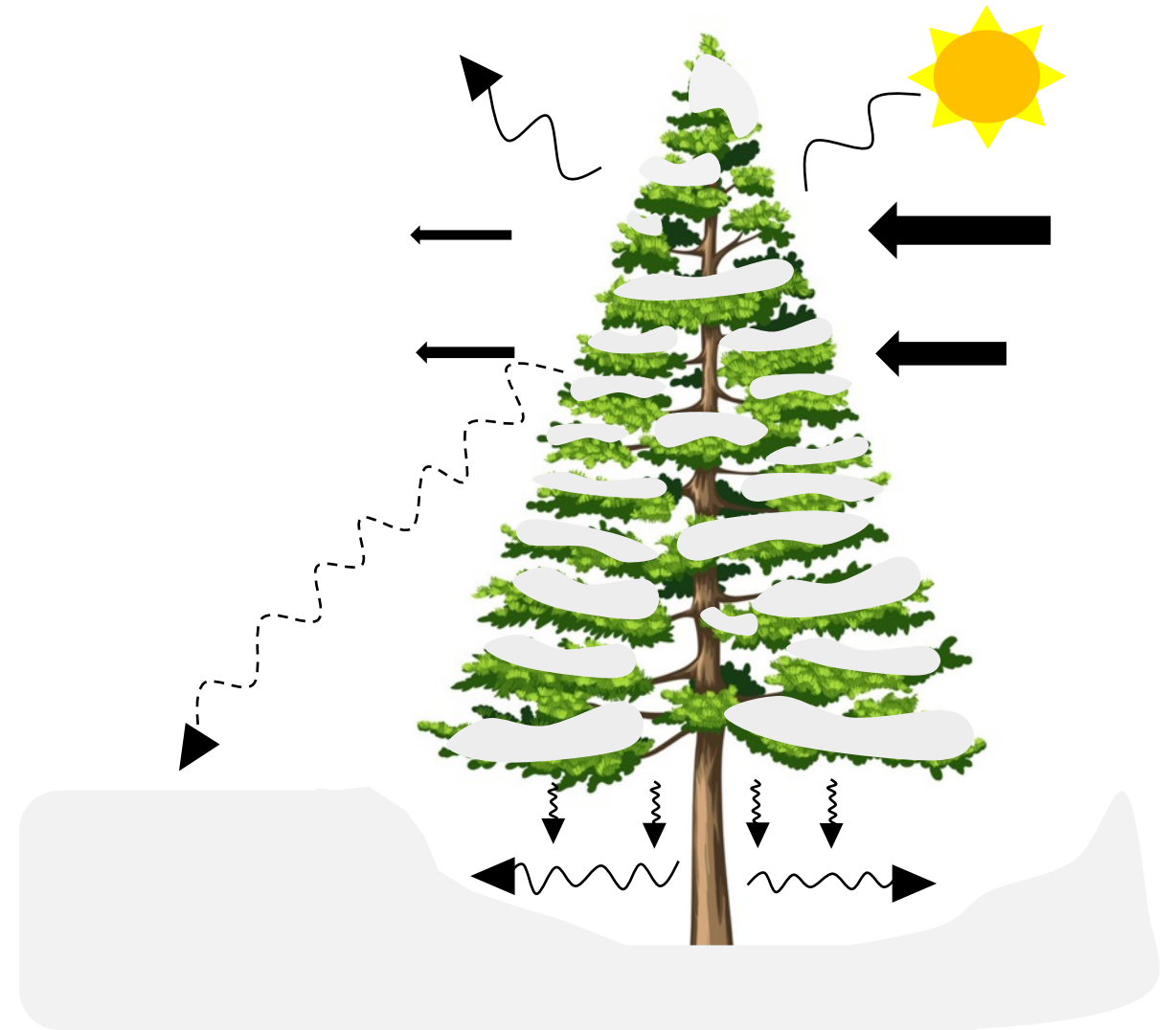
- large extent
- hydropower production
- flood forecasting
- hydrological and climate models



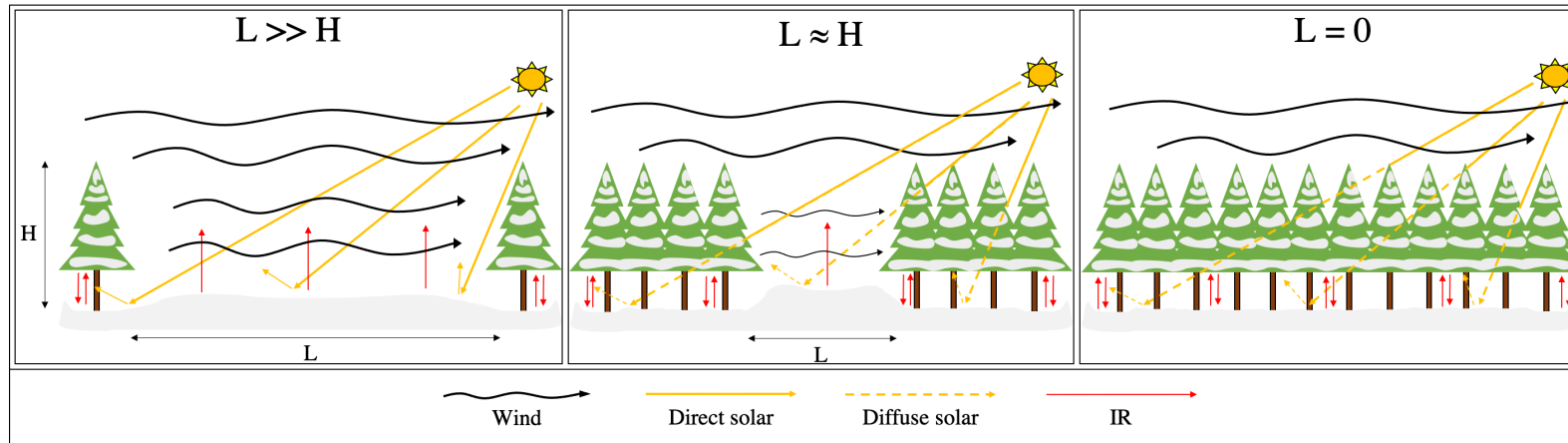
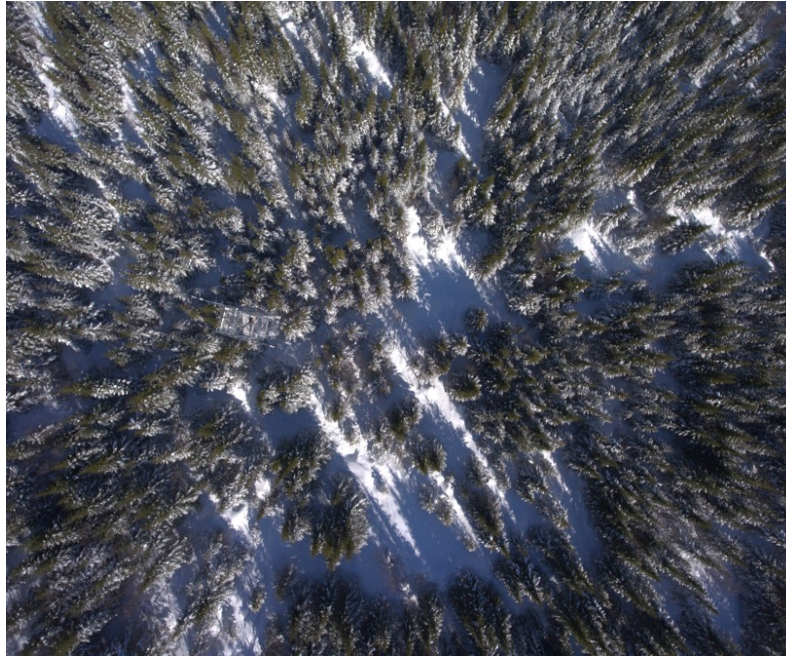
Schematic diagram of CLASS v. 3.4
(Verseghy et al., 2009)

Snow-forest-atmosphere interactions

- Solid and liquid water interception
- Solar radiation reflection and extinction
- IR radiation emission
- Wind attenuation

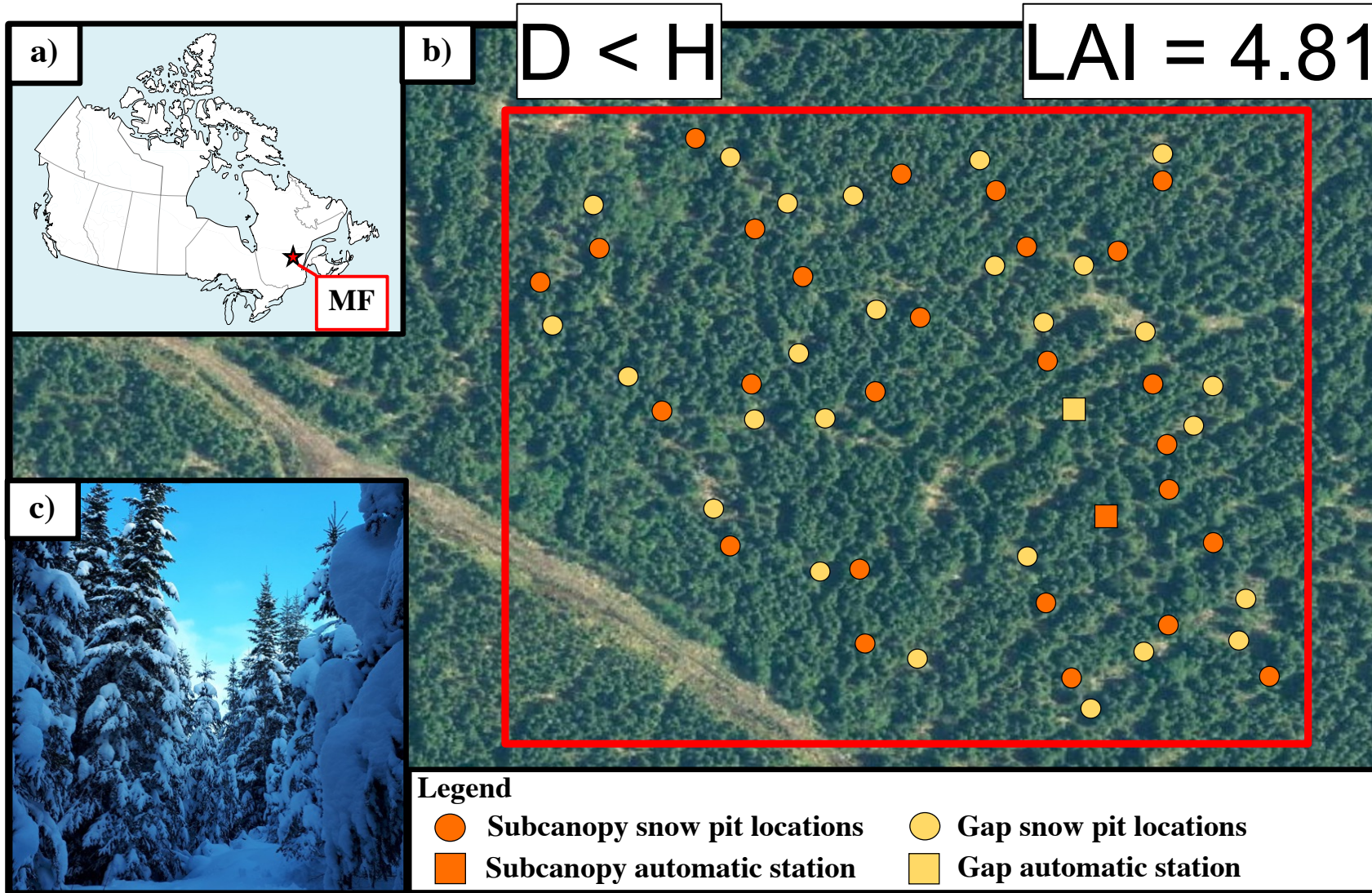


Complexity of discontinuous forests



**How does snow evolve in a
discontinuous evergreen forest?**

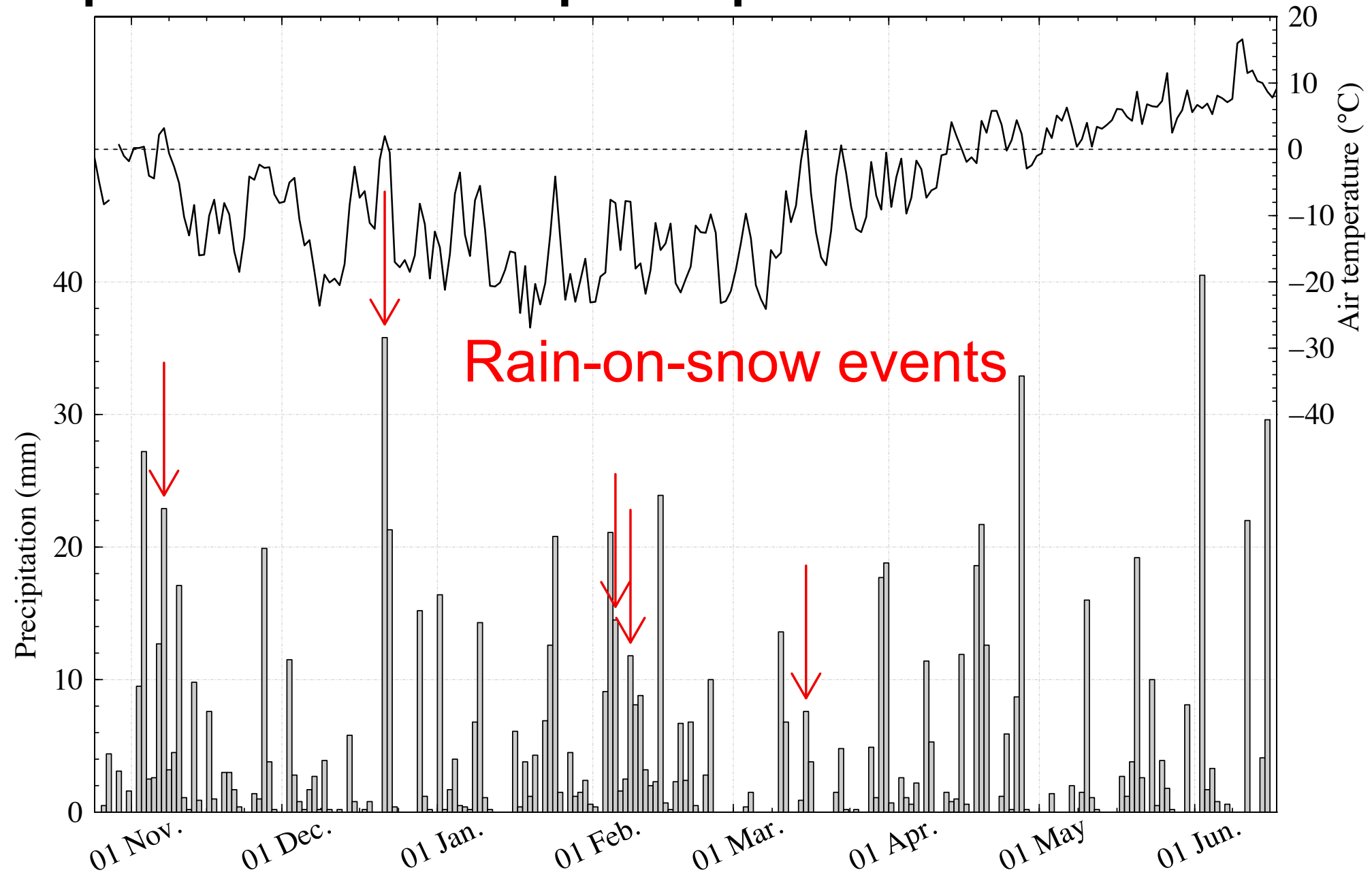
Study site and measurements



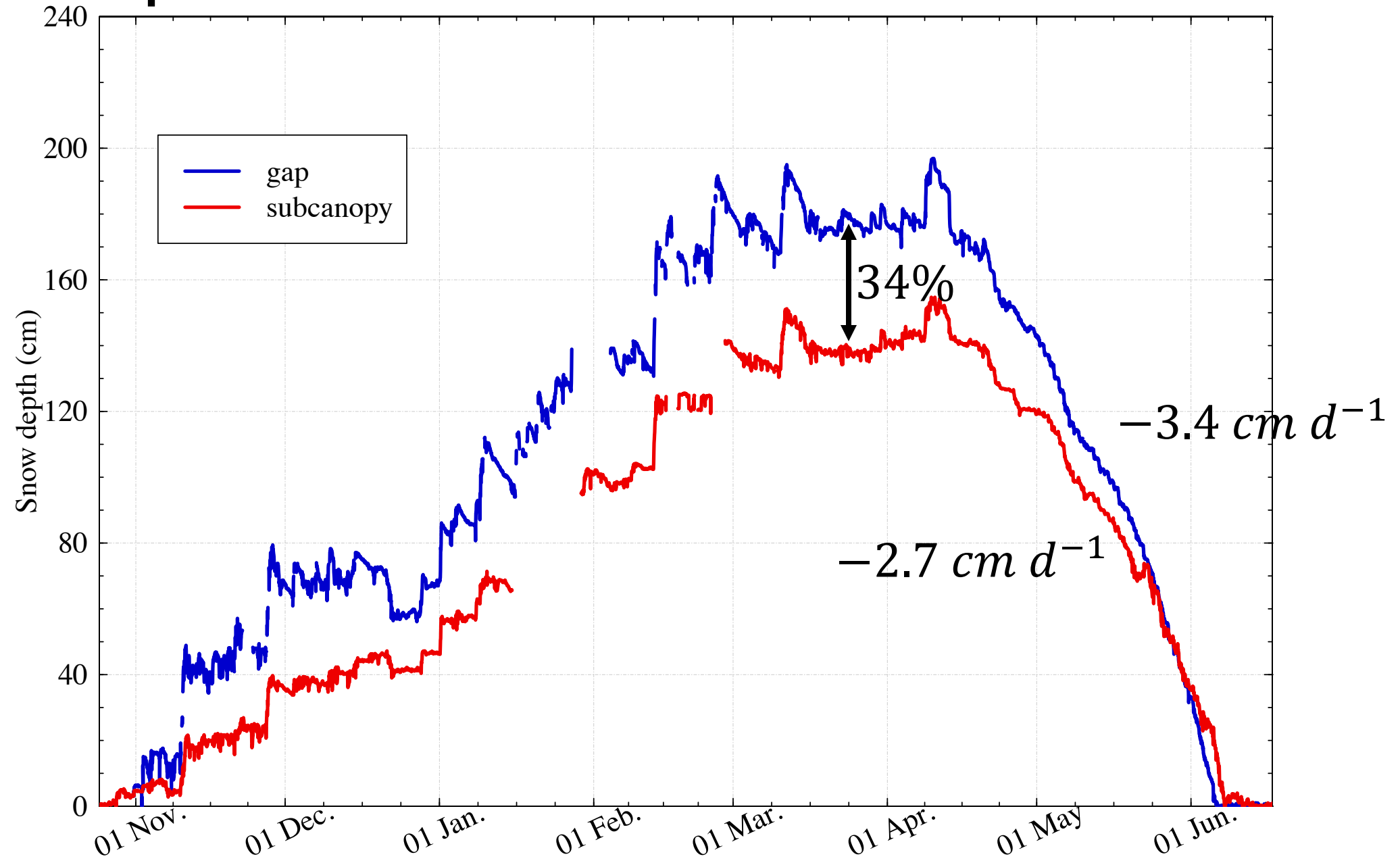
(a) Location of the Montmorency Forest (MF) in eastern Canada. (b) Aerial view the study area (c) Photograph taken on 5 December 2018 showing a view of the canopy from the ground.

- Winter 2018-19
- Montmorency Forest (47.29°N, 71.17°W)
- Manual and automatic measurements
- Snow depth
- Stratigraphy
- Snow density
- Thermal conductivity
- Specific surface Area

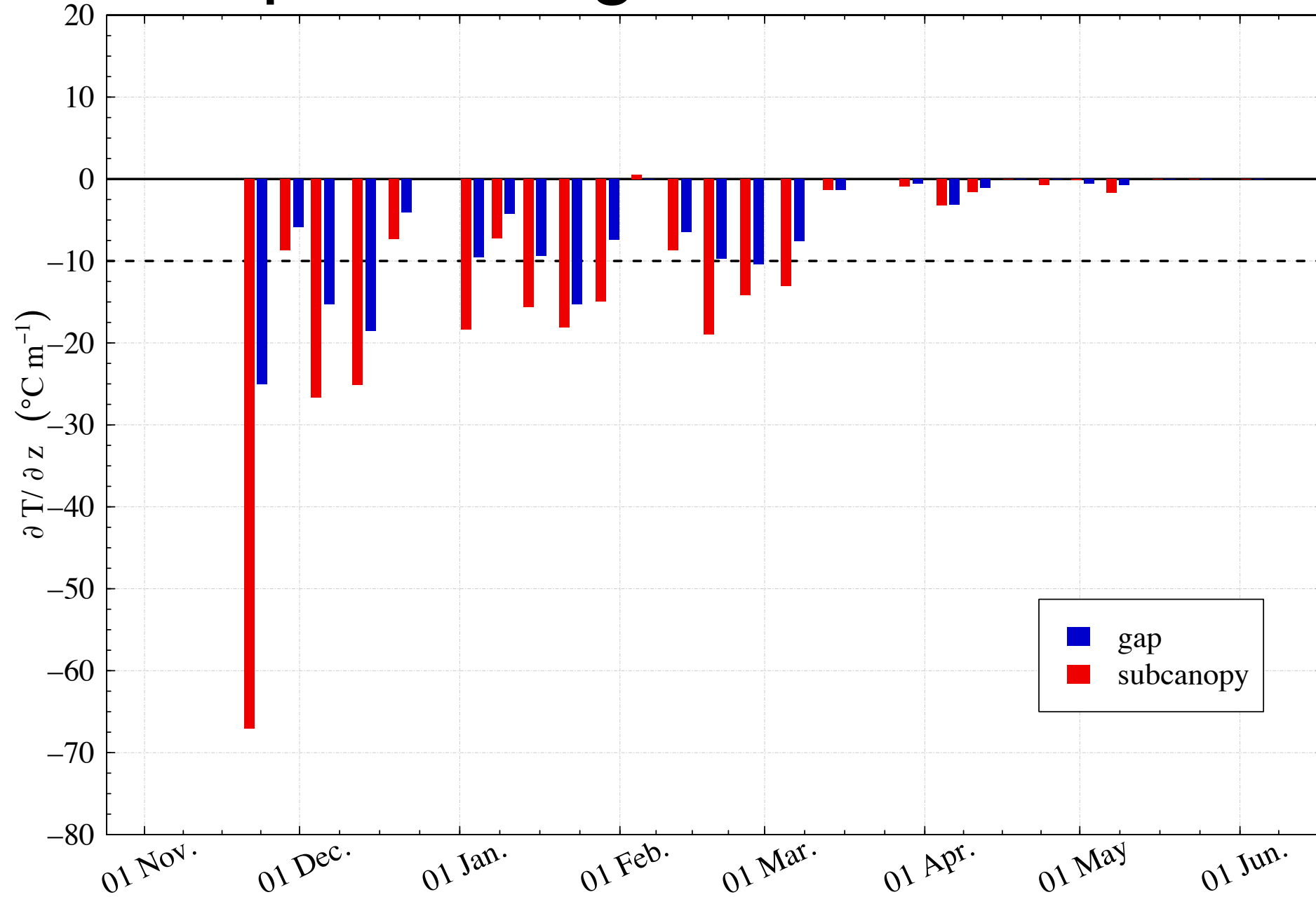
Air temperature and precipitation



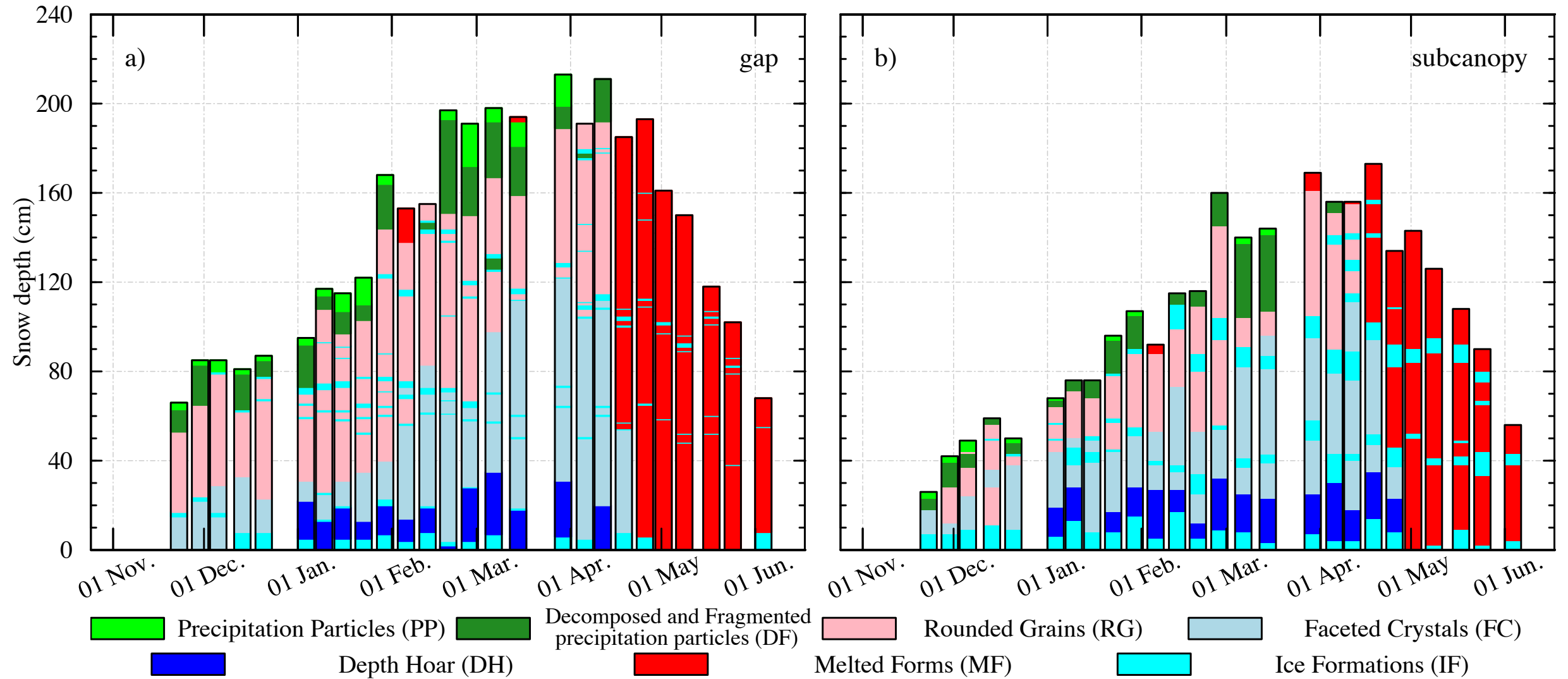
Snow depth



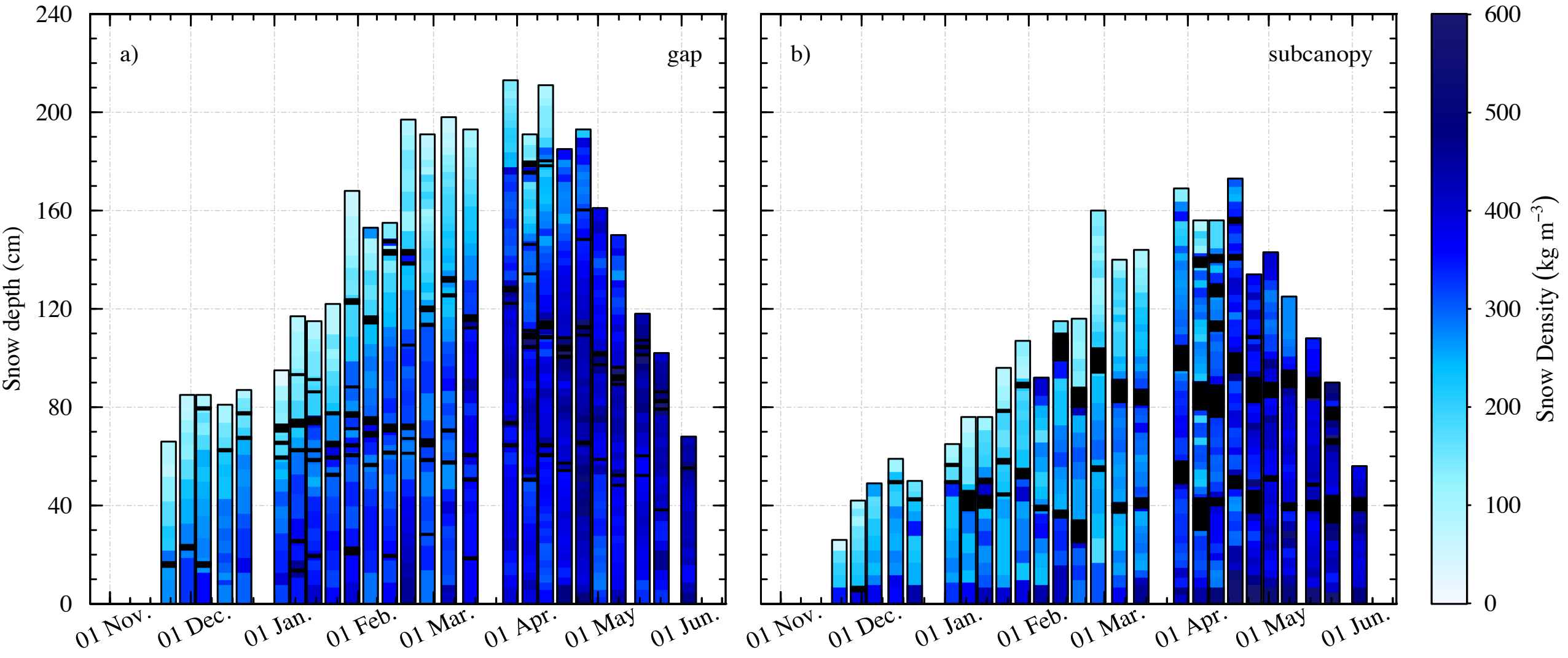
Vertical temperature gradient



Stratigraphic profiles

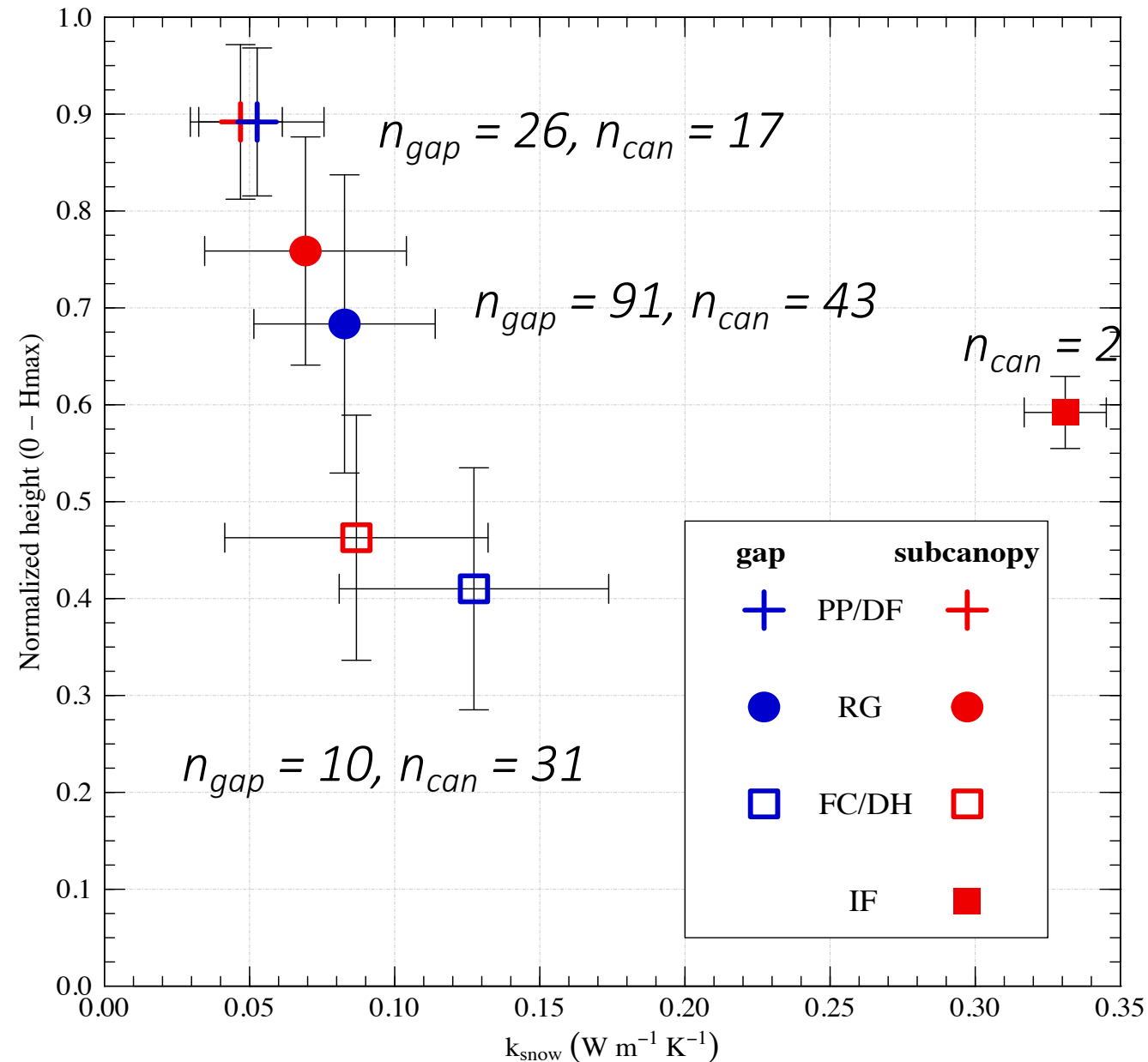


Snow density profiles

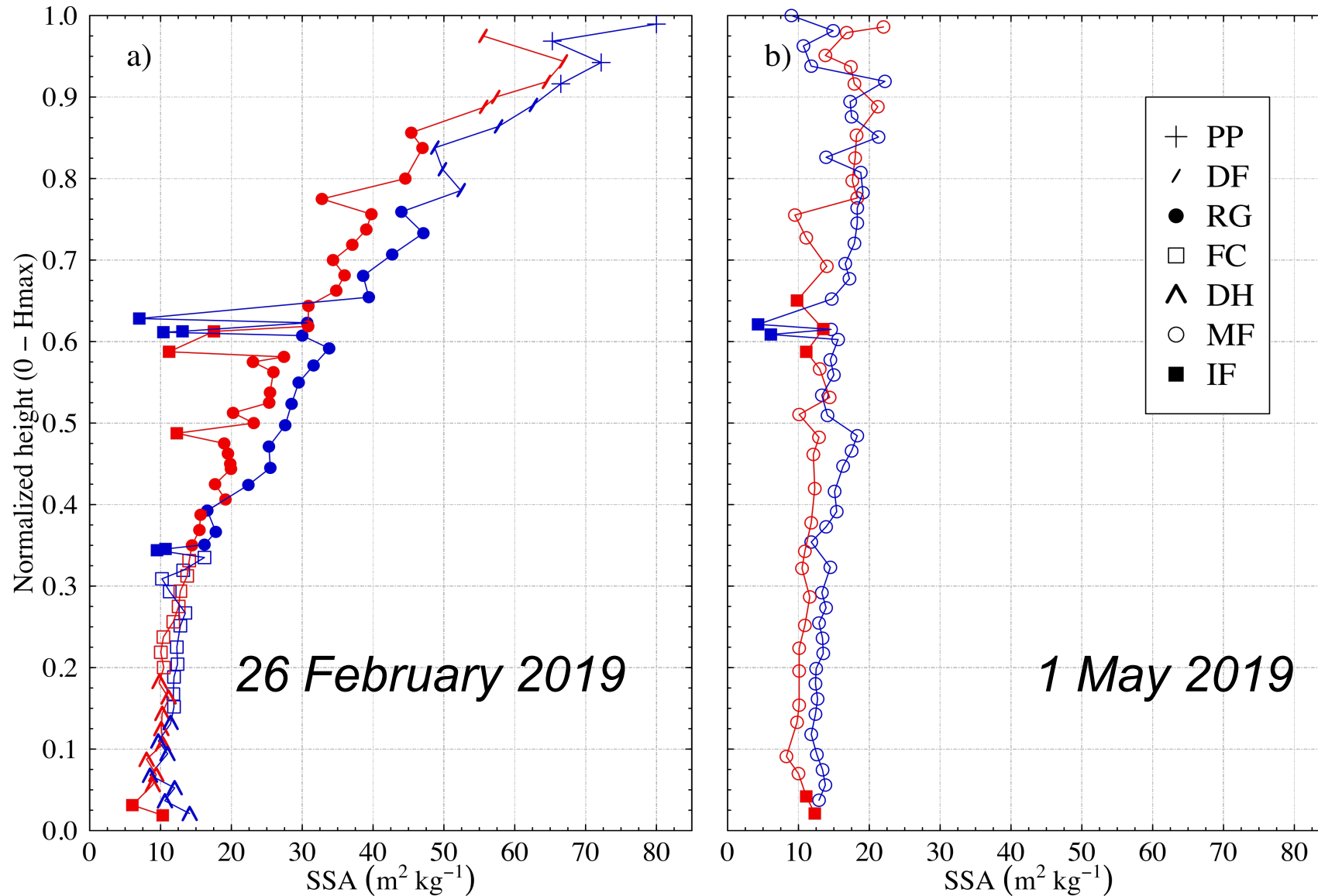


Black bars correspond to ice formations

Effective thermal conductivity of snow



Specific surface area of snow



Summary

- More snow accumulates inside the gaps than in the subcanopy;
- The temperature gradients are stronger in the subcanopy;
- Upward water vapor fluxes are enhanced in the subcanopy;
- Grains are larger and there are more faceted and depth hoar crystals in the subcanopy;
- Snow density, effective thermal conductivity and the SSA are smaller in the subcanopy.

