

# Blowing Snow in the Cariboo Mountains of British Columbia



A WC2N theme II contribution from:

Stephen Déry, Amir Yadghar, Bruce Ainslie,  
Peter Jackson, Andy Clifton, Shane MacLeod,  
and Matt Beedle

# Motivation/Background



- **Blowing snow is important for glacier mass balance (e.g., Jaedicke 2002).**
- **Wind, snow conditions & topography strongly influence mass redistribution (Lehning 2000; Pomeroy et al. 1997).**
- **Requires either dense monitoring networks or high-resolution modelling to quantify it.**



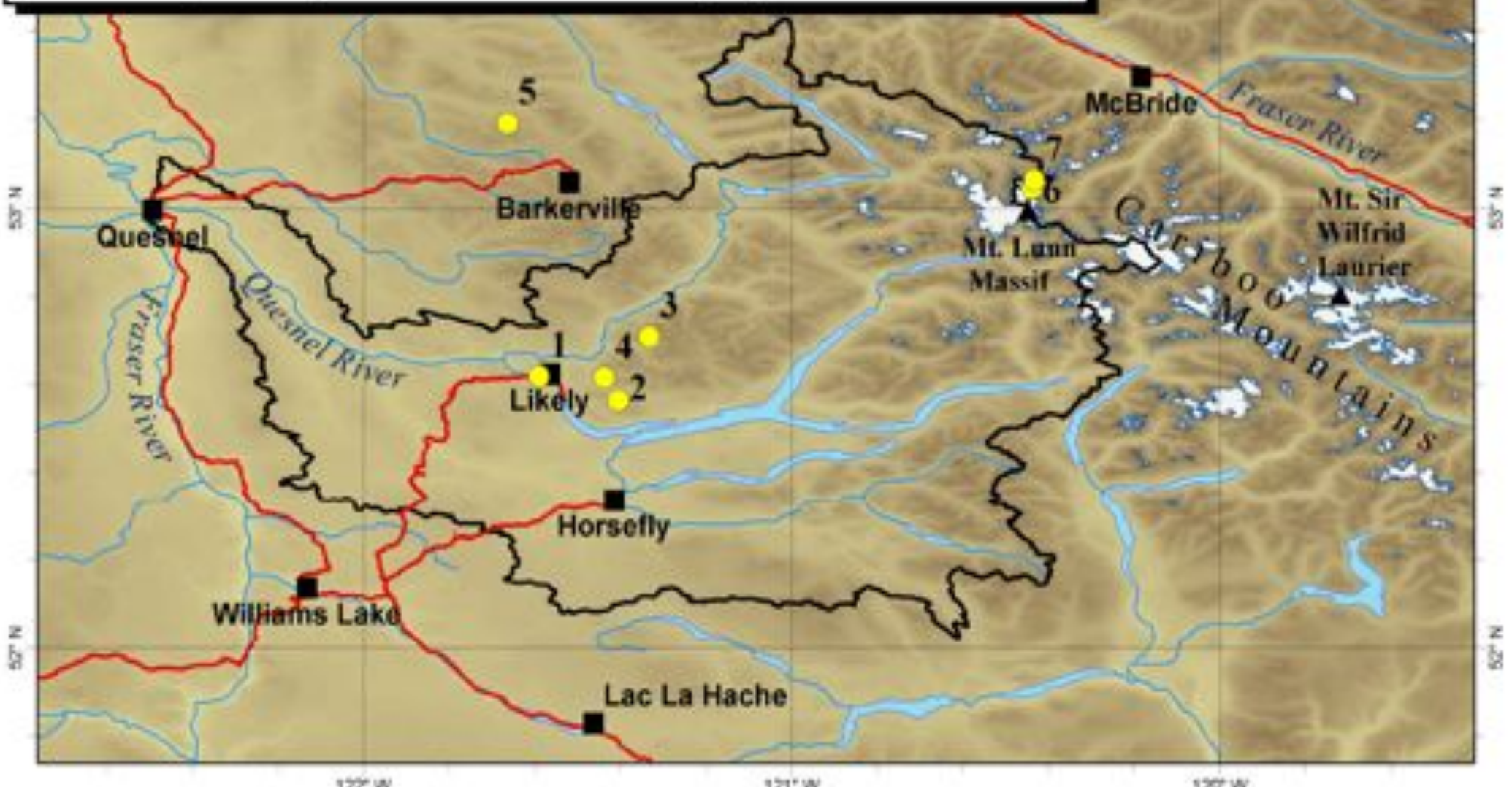
### Legend

- CAMnet Stations
- 1 QRRC
- 2 Spanish Mtn.
- 3 Browntop Mtn.
- 4 Blackbear Mtn.
- 5 Mt. Tom
- 6 Upper Castle Creek Glacier
- 7 Lower Castle Creek Glacier

**Elevation Value**

- 3600m
- 0m

- ▲ Summit
- Roads
- Water
- Glaciers
- Quesnel River Watershed



# Photographic evidence of blowing snow in the Cariboo Mountains



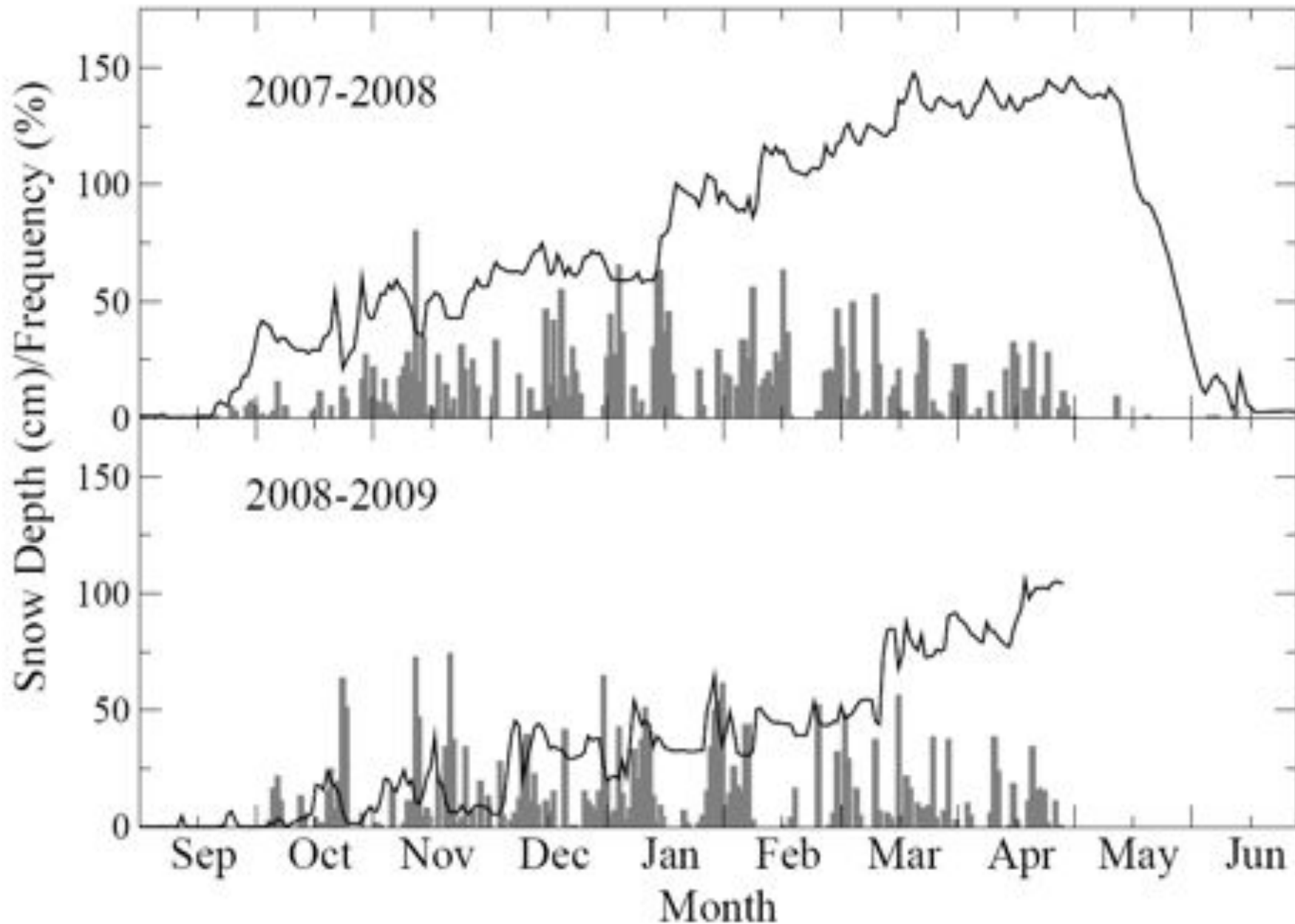
30 June 2007

**AWS**

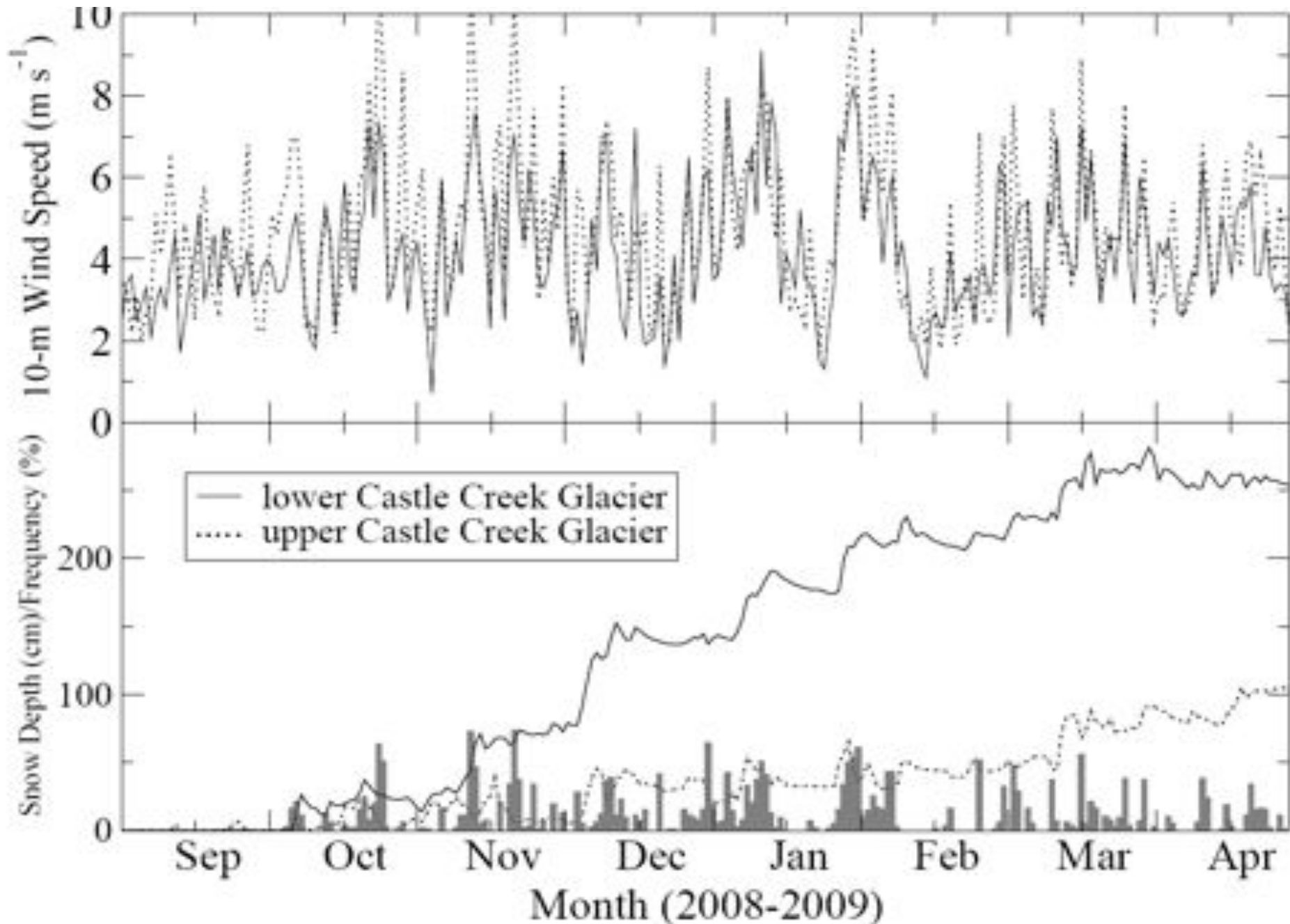


**16 September 2008**

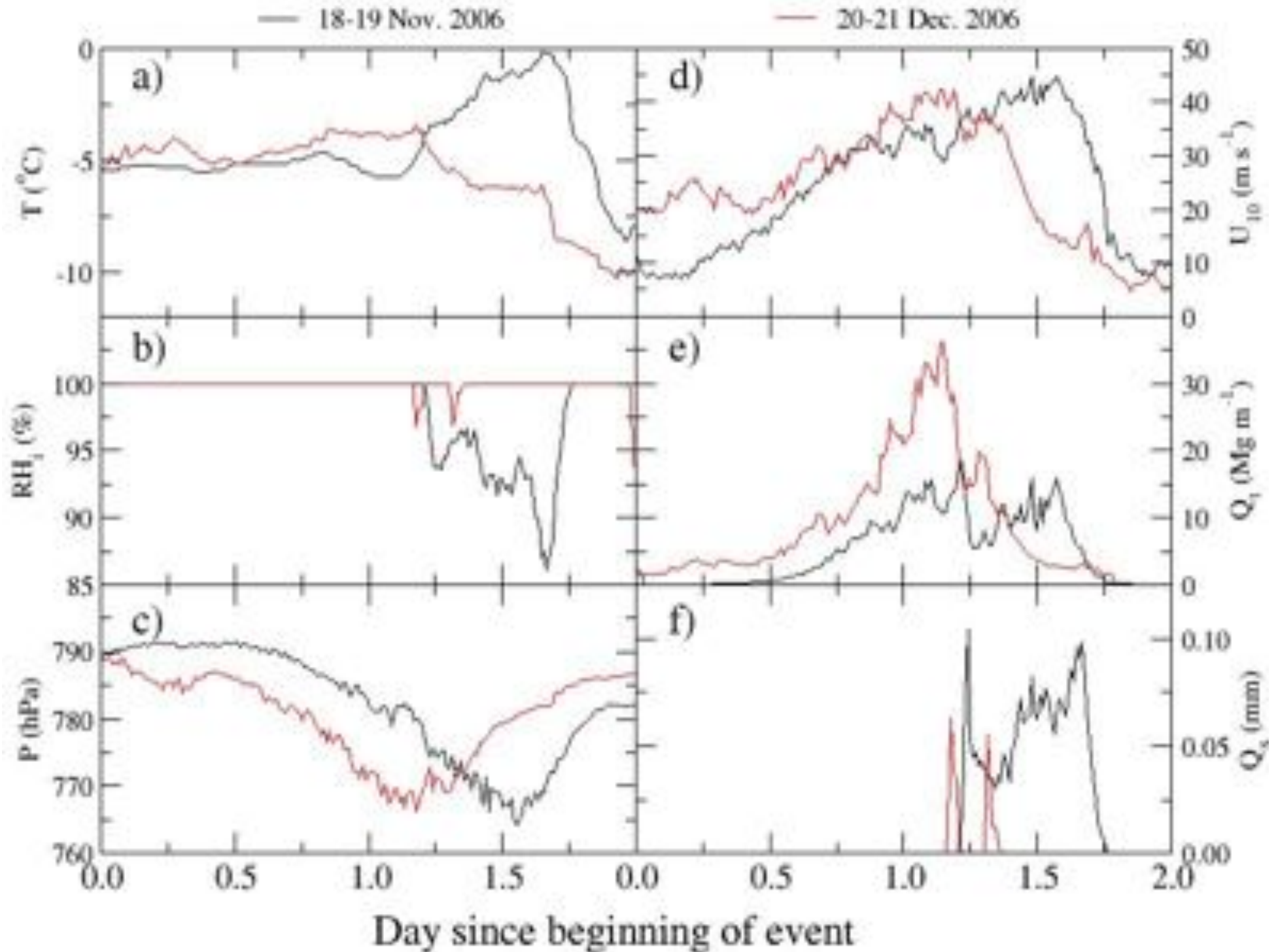
# Evolution of daily snow accumulation & blowing snow frequency at upper Castle Creek Glacier



# Evolution of daily winds, snow accumulation, & blowing snow frequency at Castle Creek Glacier

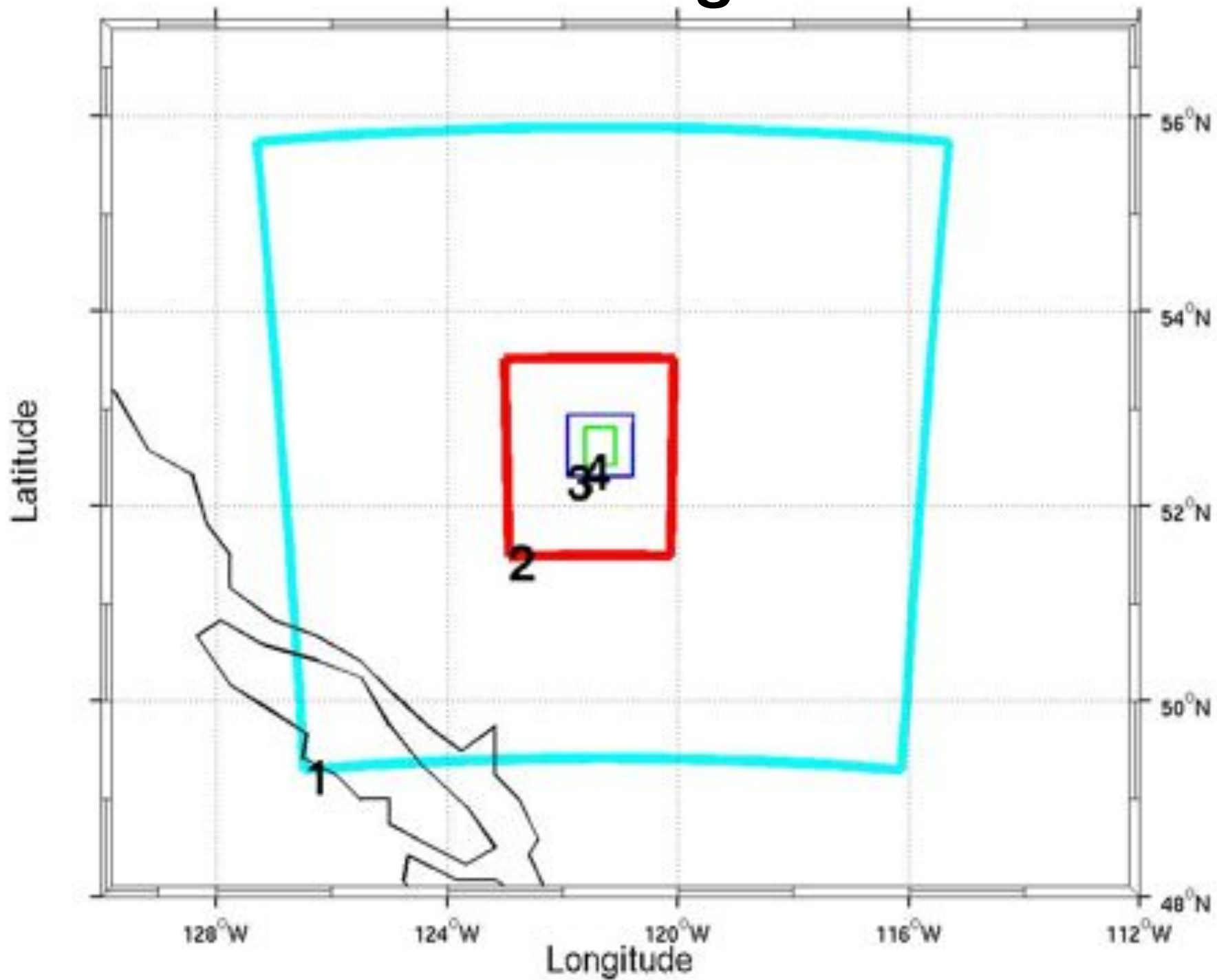


# Extreme blowing snow events

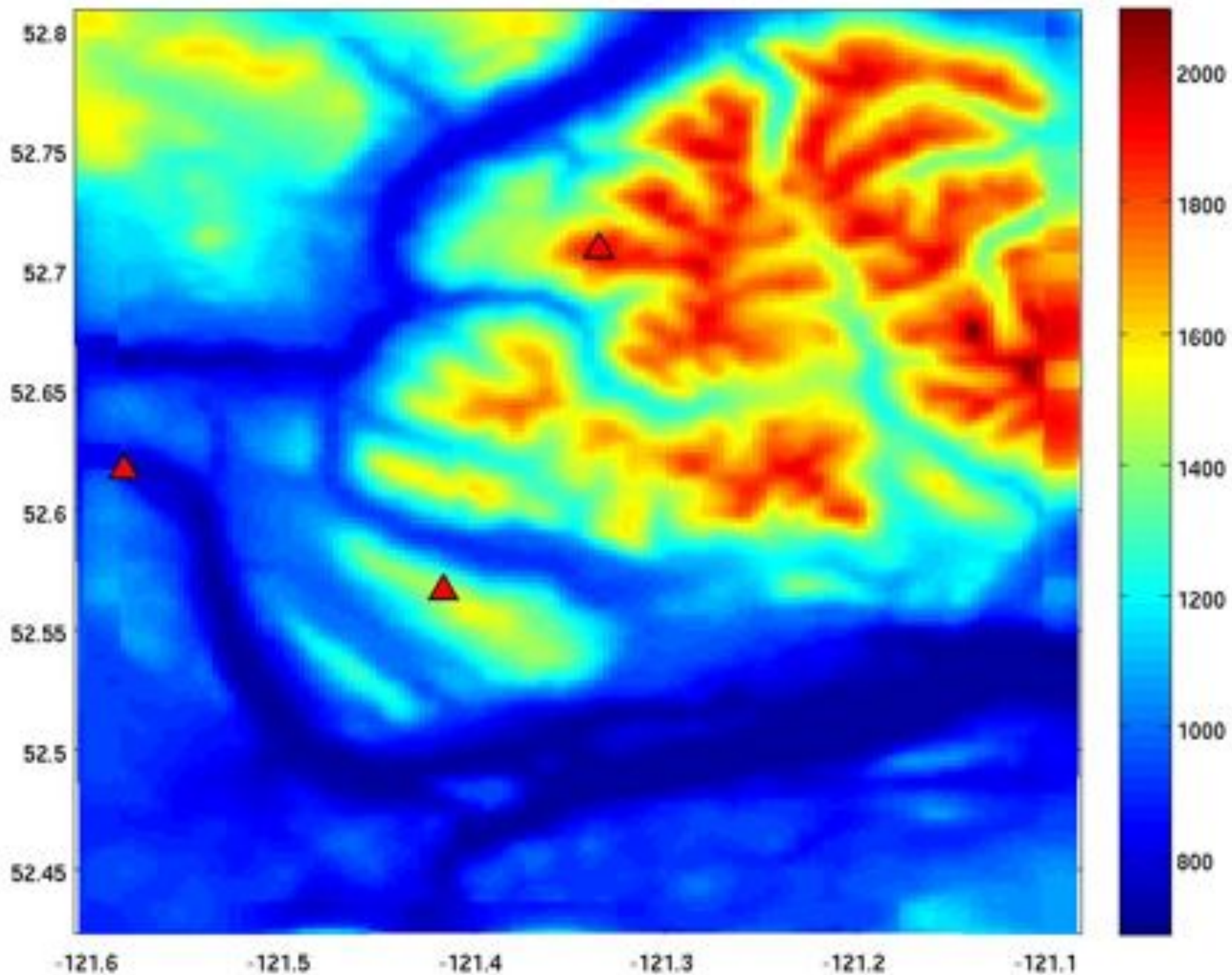




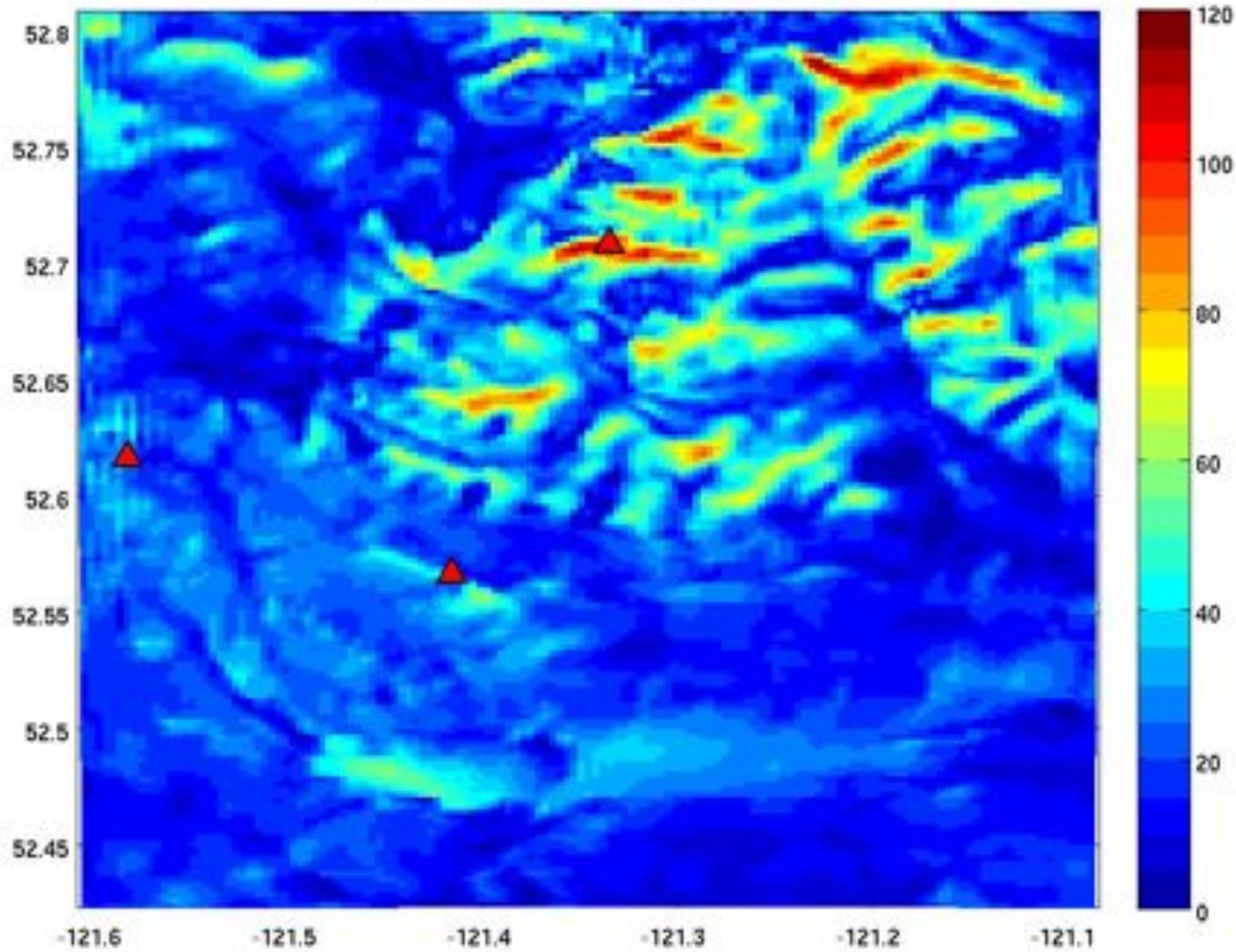
# RAMS modelling domain



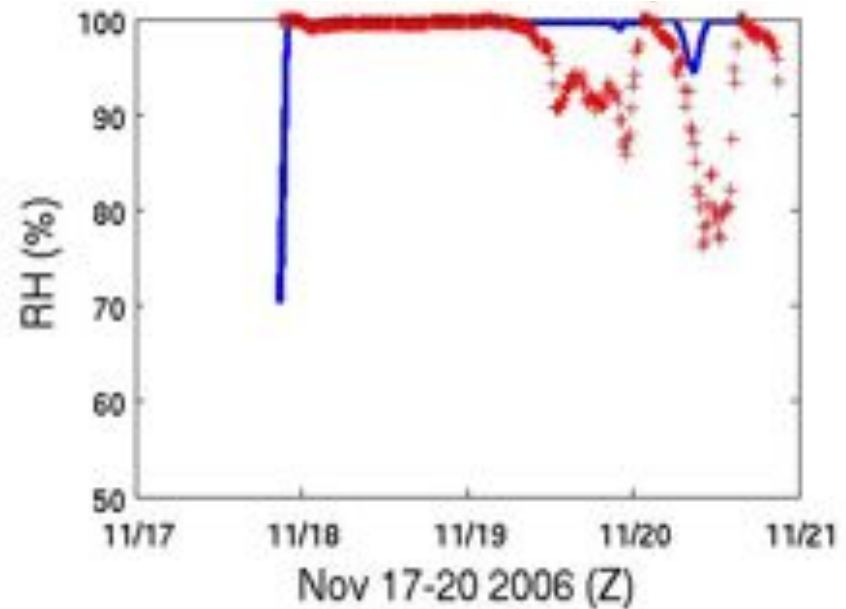
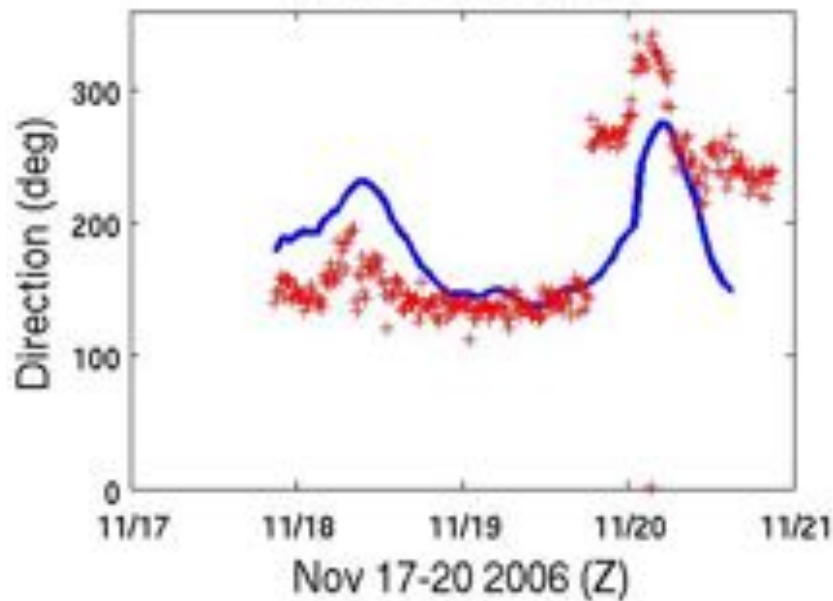
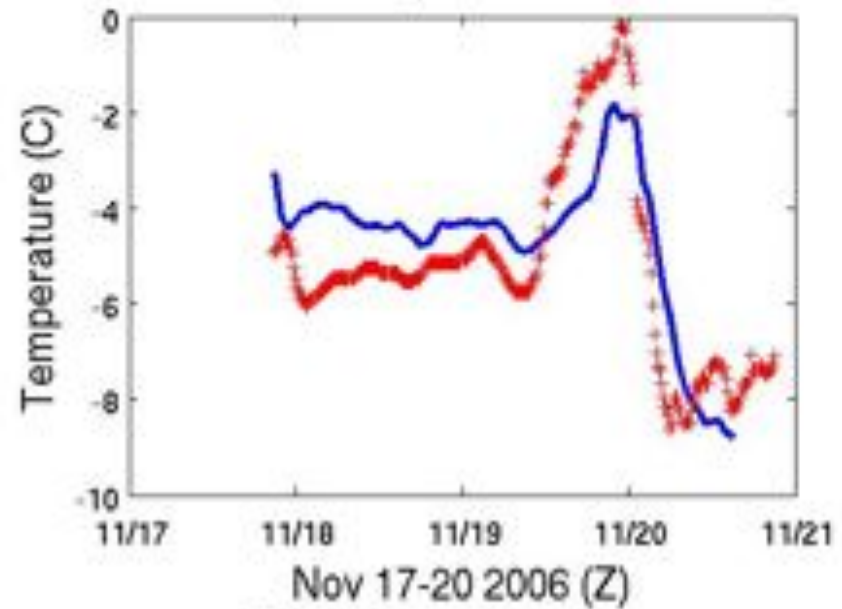
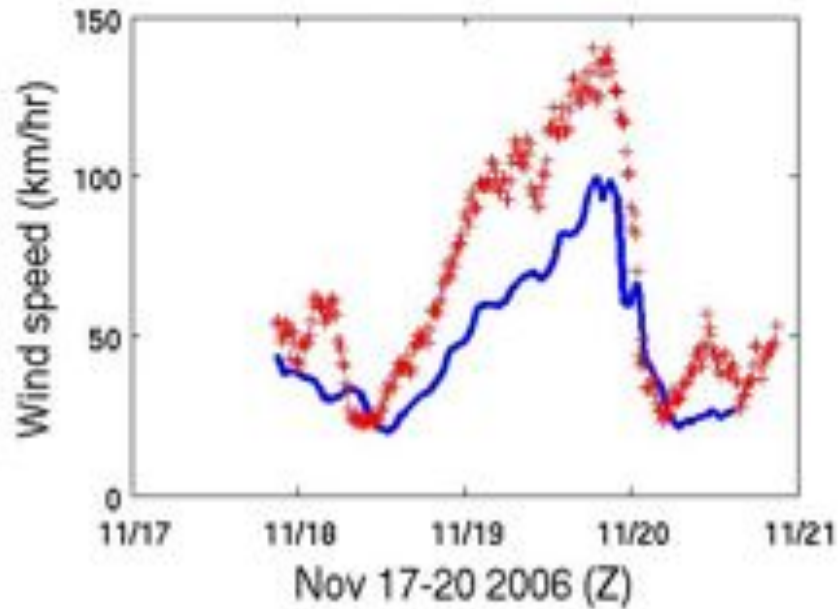
# Inner domain topography (m)



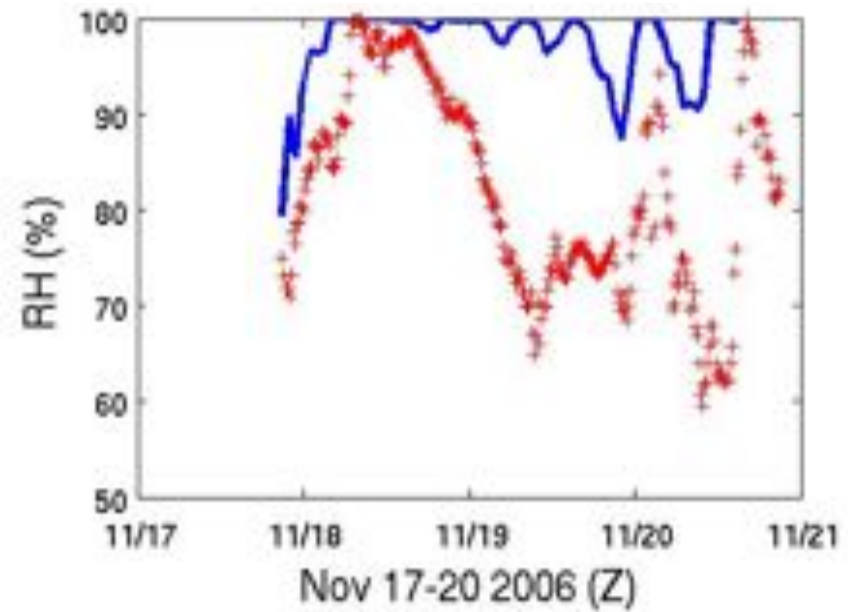
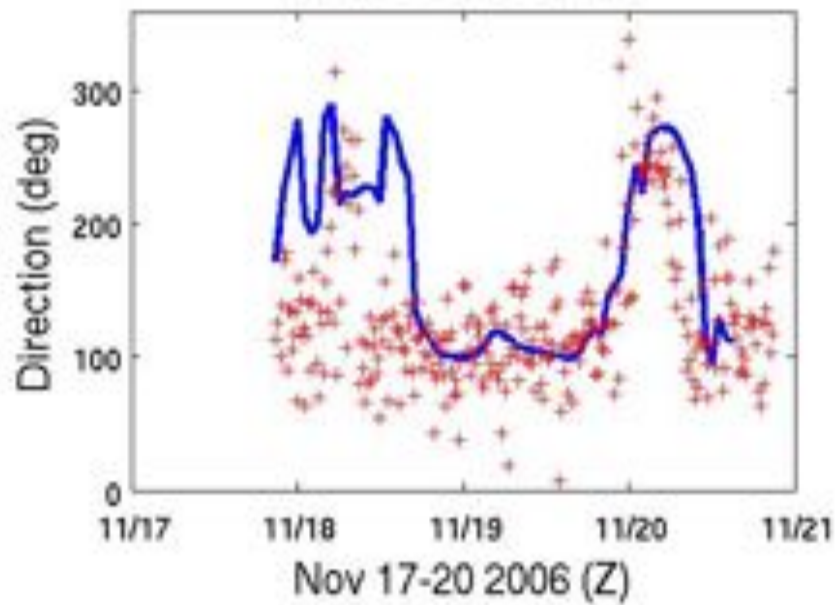
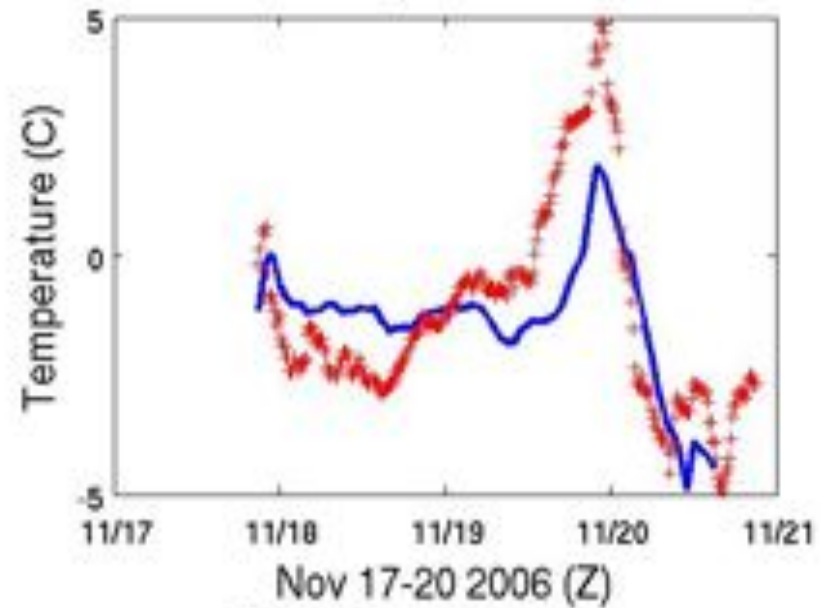
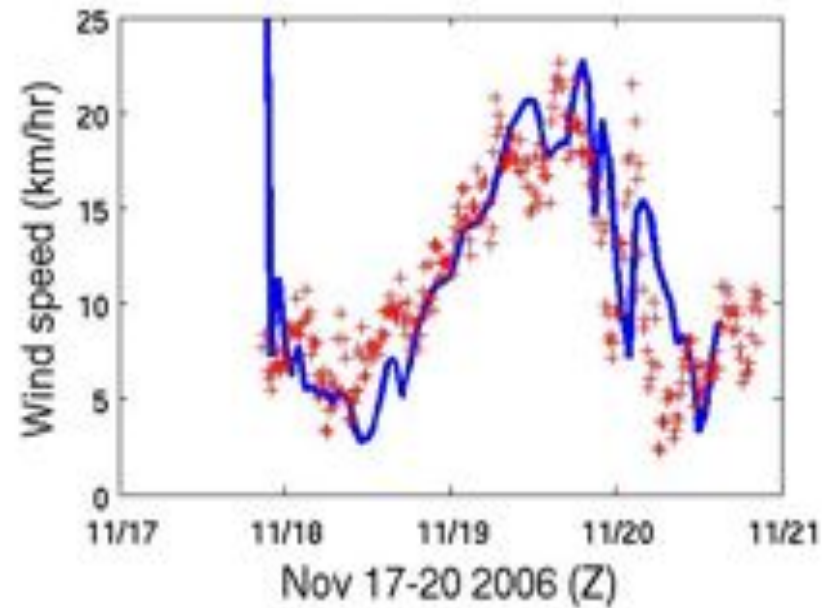
Surface wind speed (km/hr)  
November 19th 2006 1900Z



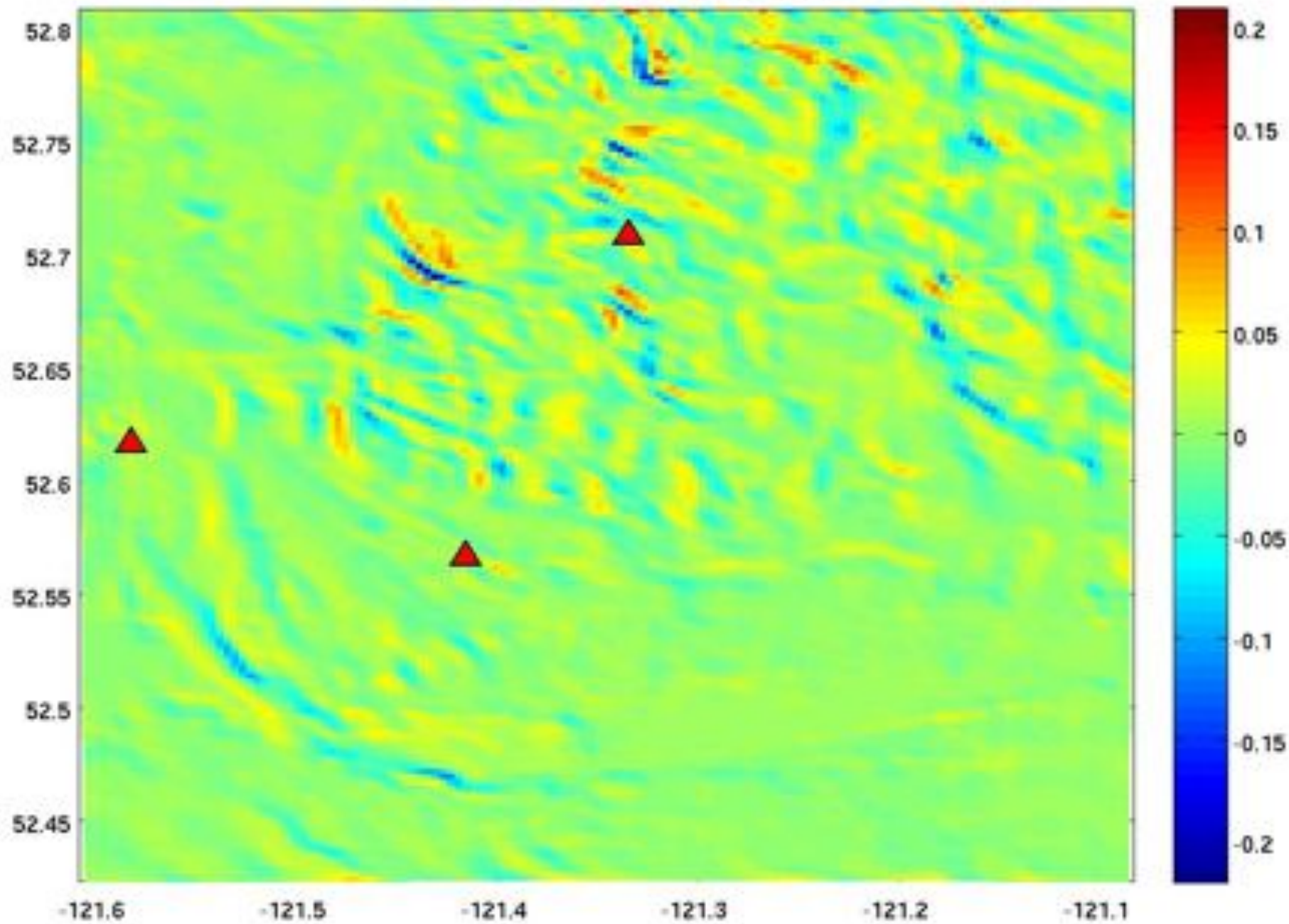
# Model validation: Browntop Mtn.



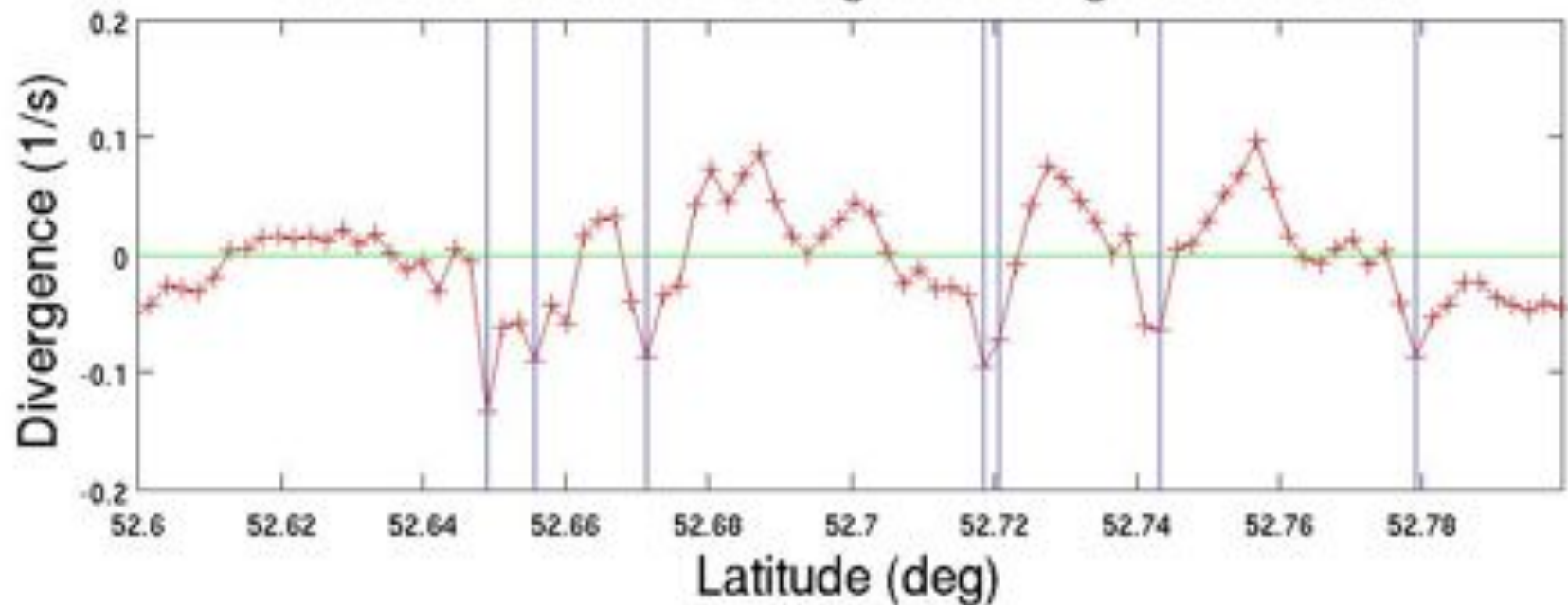
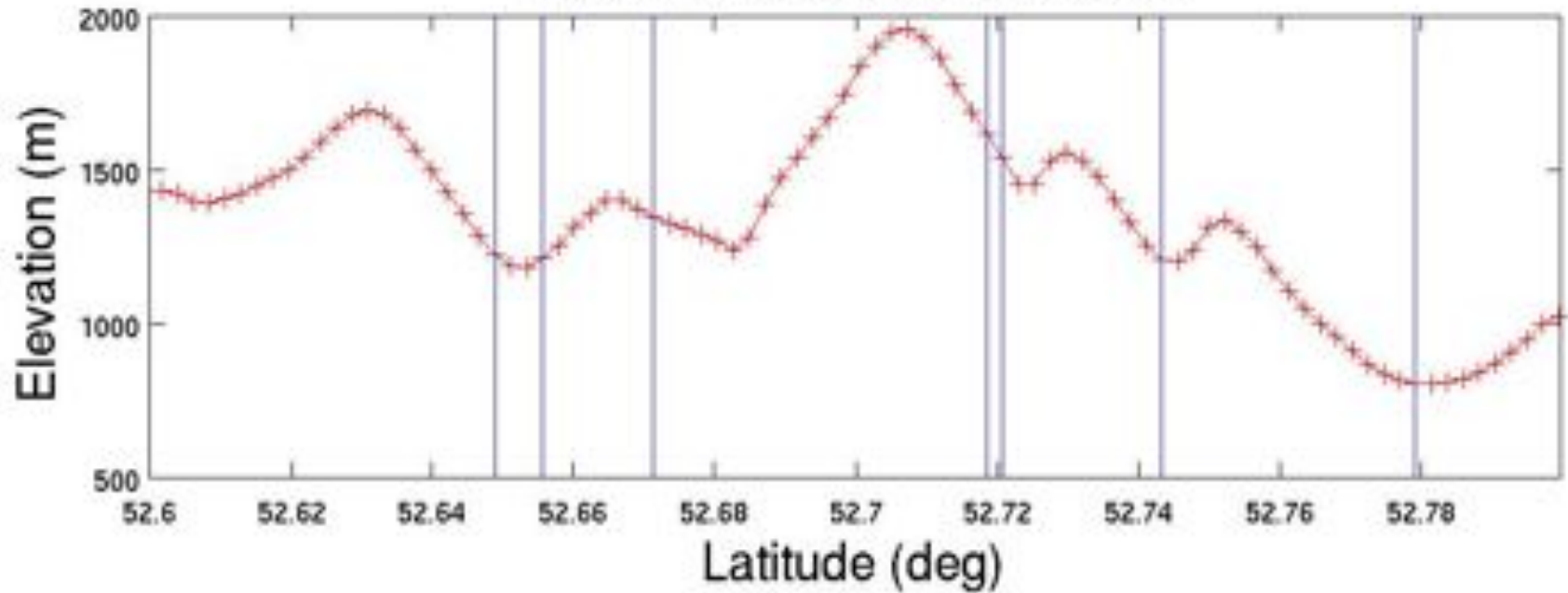
# Model validation: Spanish Mtn.



Surface wind divergence (1/s)  
November 19 2006 1900Z



# Elevation & surface divergence field along south-north transect



## Conclusions:

- Piekduk captures well blowing snow events, explaining rapid changes in snow depth at Castle Creek Glacier.
- RAMS simulates accurately the mesoscale environment of an extreme blowing snow event at Browntop Mtn in 2006.
- Next we will examine the spatial redistribution of snow along transect at Browntop Mtn using RAMS + Piekduk simulations.

**8 May 2009**



**Thanks to CFCAS for funding & NHG members for field work.**







**CAMnet on the web:  
<http://cam.unbc.ca/>**

