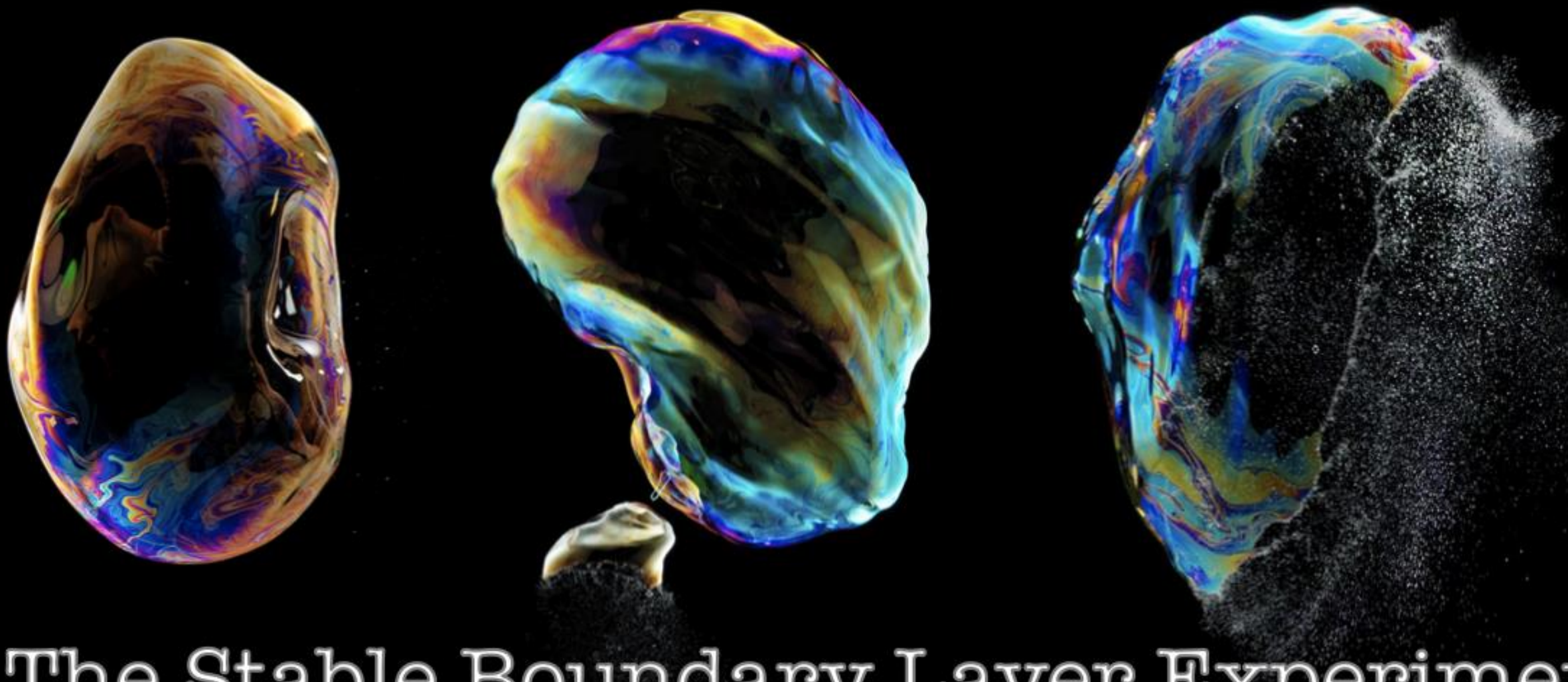
STABX

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND



The Stable Boundary Layer Experiment

.geog.canterbury.ac.nz/research/stabx/stabx.shtml

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Peyman Zawar-Reza, *Dept. of Geography*

Other participants:
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Ben Jolly, PhD student, *Dept. of Physics*

About STABX

Broad Research Objectives

- ✧ Mountain weather and climatology
- ✧ Complex terrain atmospheric boundary-layers

Teaching Objectives

- ✧ Data and original science to use in classroom
- ✧ Student participation in fieldwork

STABX - Research Objectives

✧ Understand the driving phenomena behind the conditions that create, maintain and eventually break up the mountain stable boundary layer (SBL)

- Identify the sources and modes of oscillation (1-3 metres above the surface) that cause the disturbance and break up of strongly stratified boundary layers

✧ Establish a climatology of intermontane BLs in order to understand the dynamic coupling of the intermontane BL with extra-mountain disturbances

Cass Basin in the middle of the Southern Alps

STABX - Domain

✧ Extensive observational network

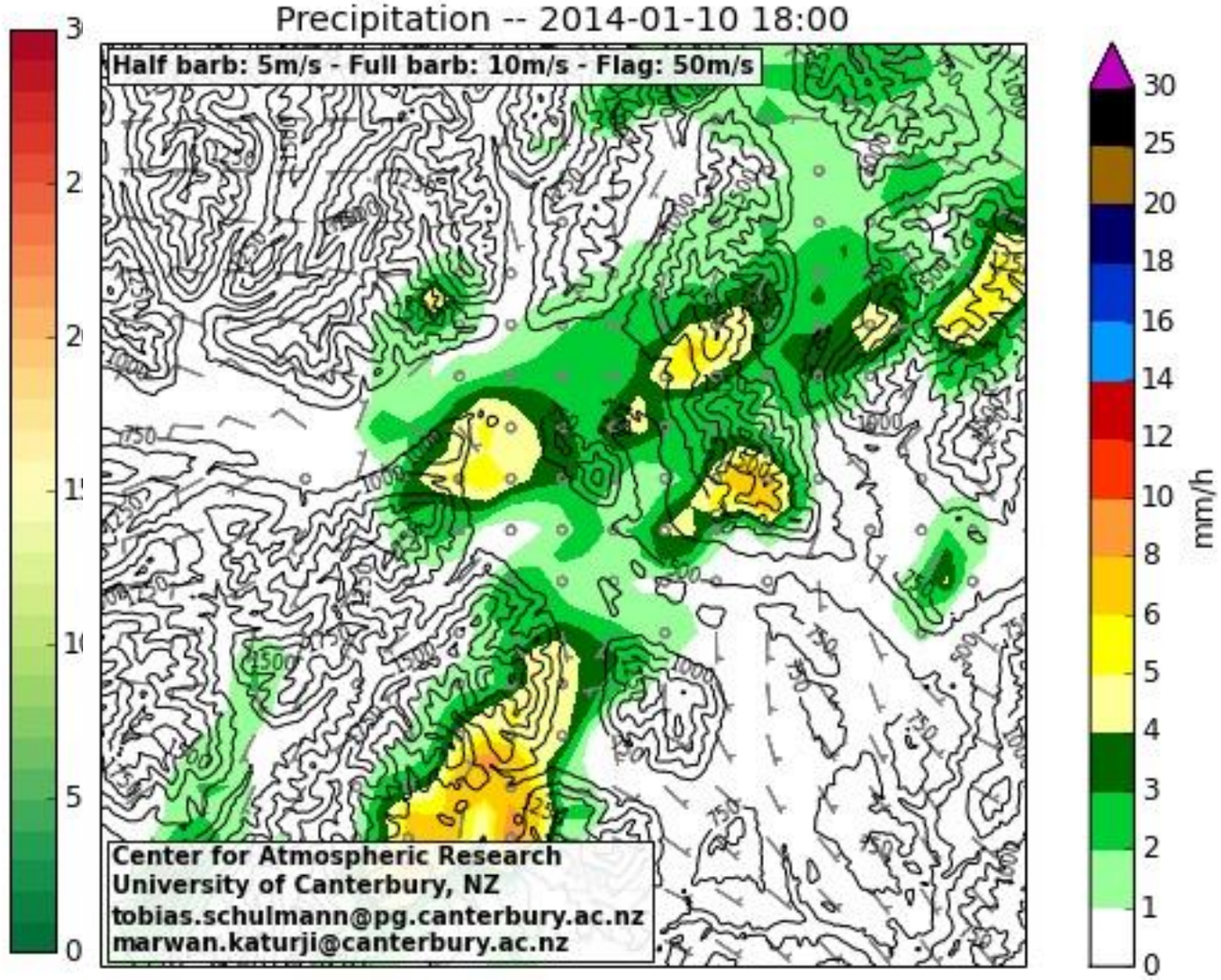
- Surface to ridge top wind velocity and temperature
- Along slope air and soil temperature
- Very sensitive surface pressure measurements (piezoresistive sensors, 0.03 hPa resolution)

✧ Numerical weather prediction and reanalysis modeling

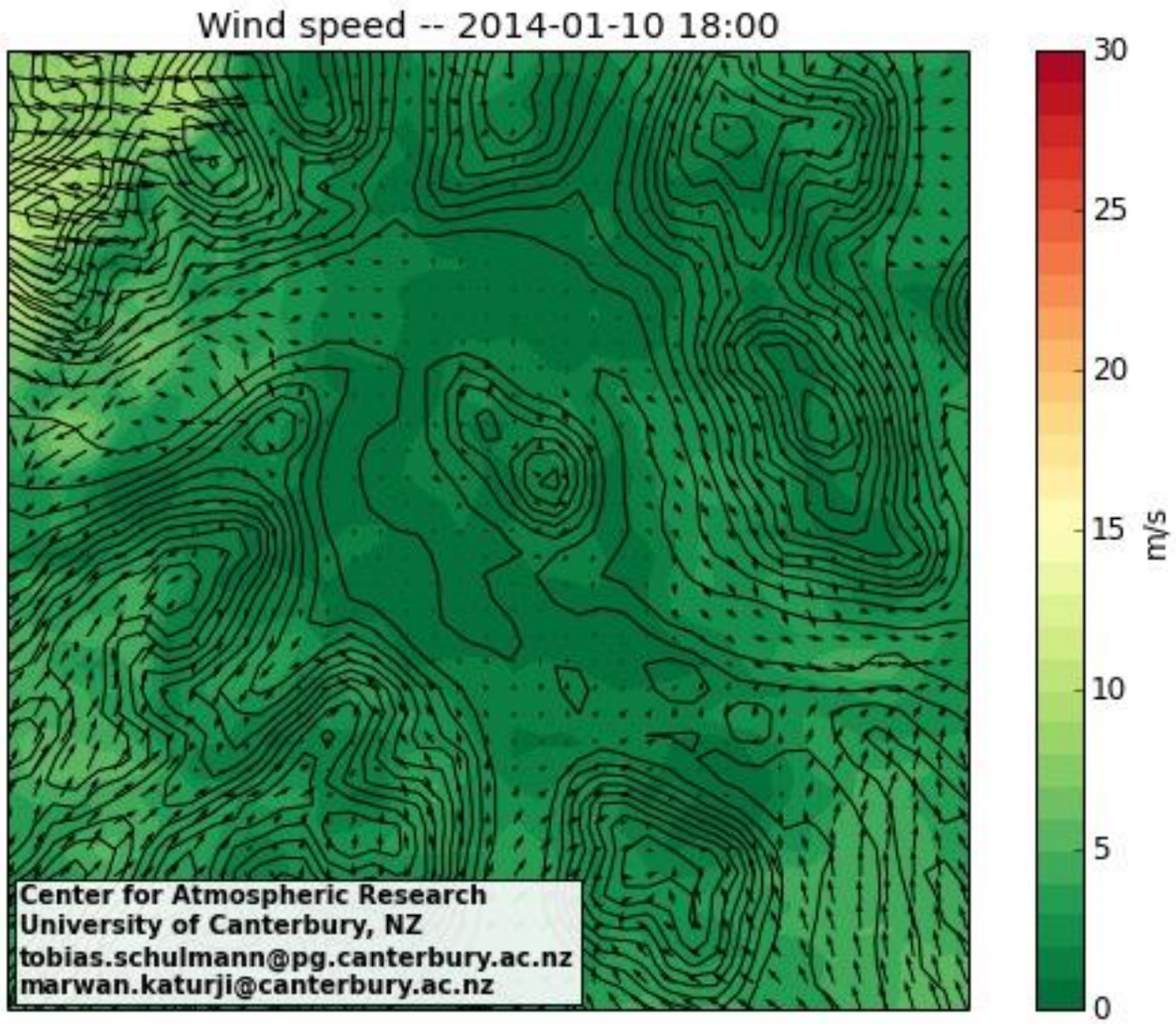
- Using the ARPS model to provide an operational mountain forecast and as a reanalysis tool

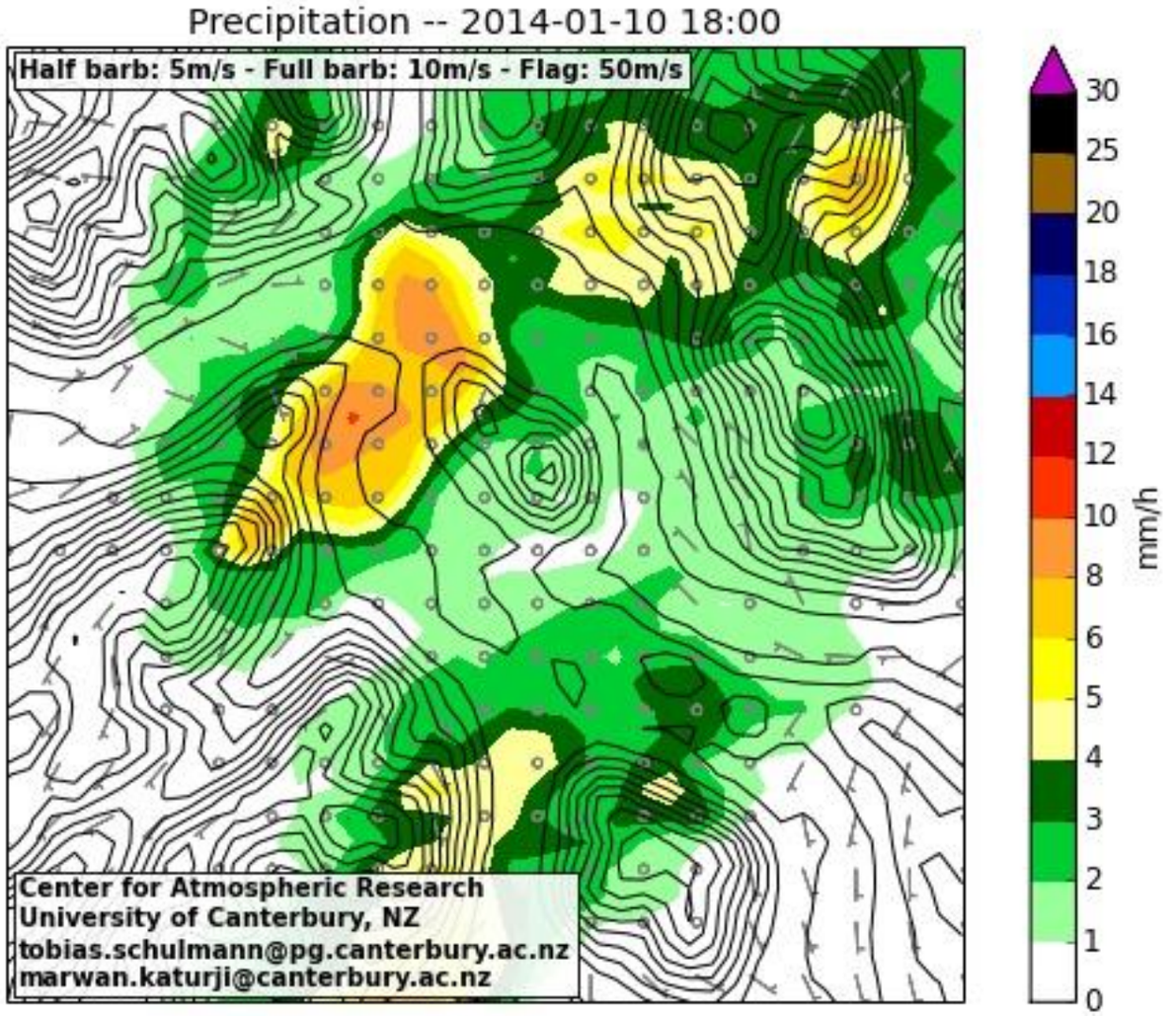
Currently operational at 500 m spatial resolution and soon to be posted on the STABX website

1000 m resolution

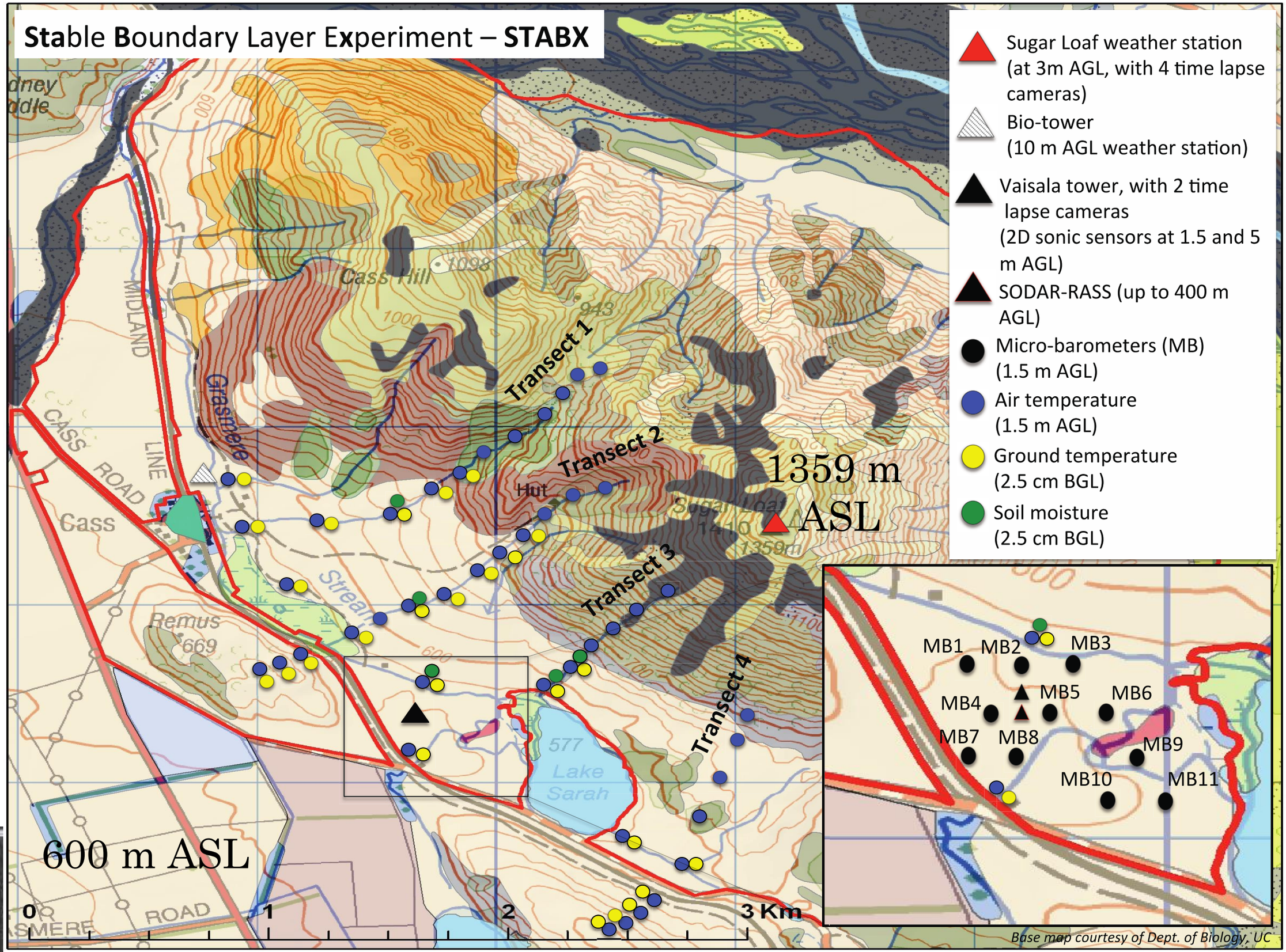


500 m resolution





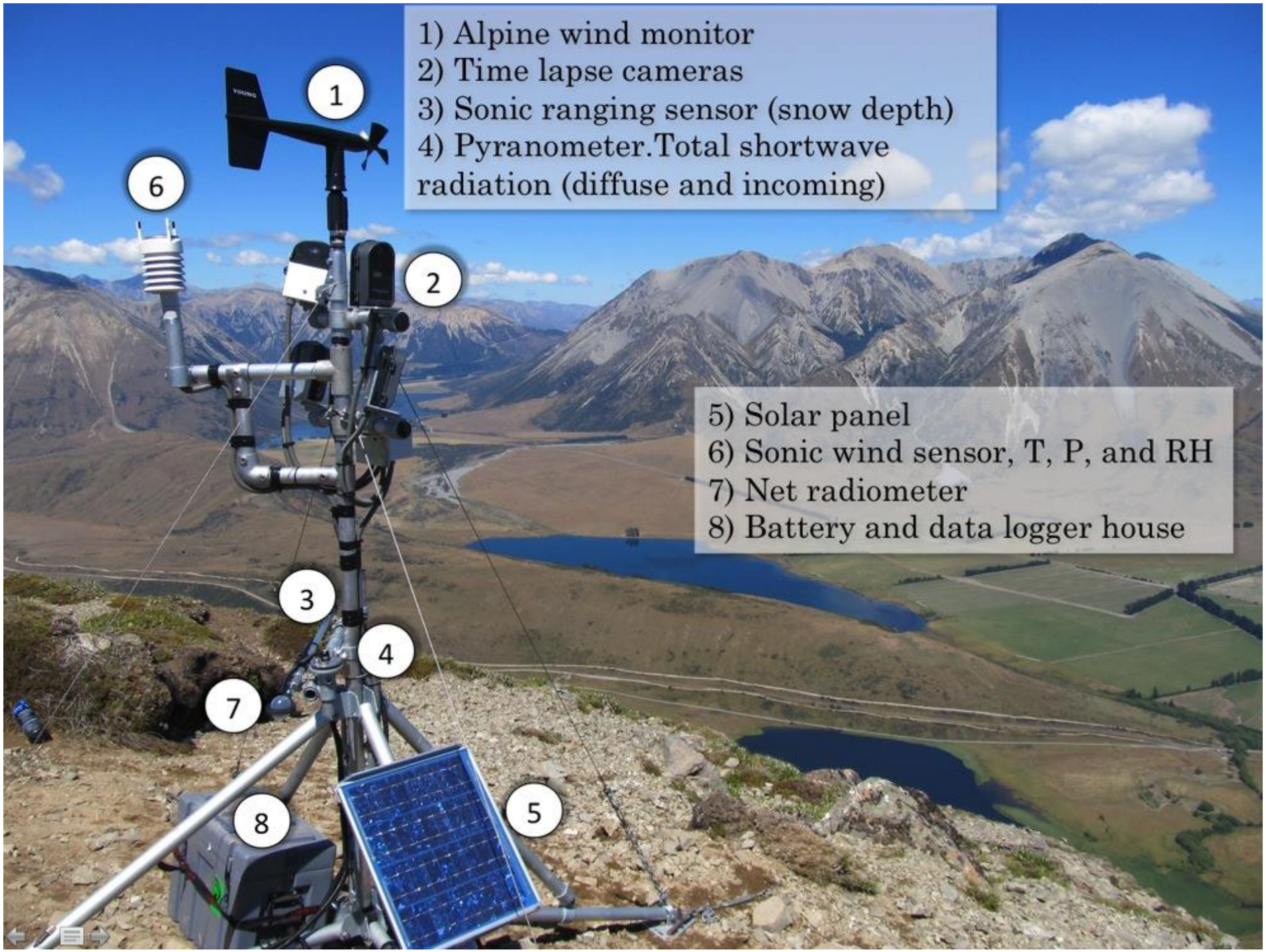
STABX – Observational Network



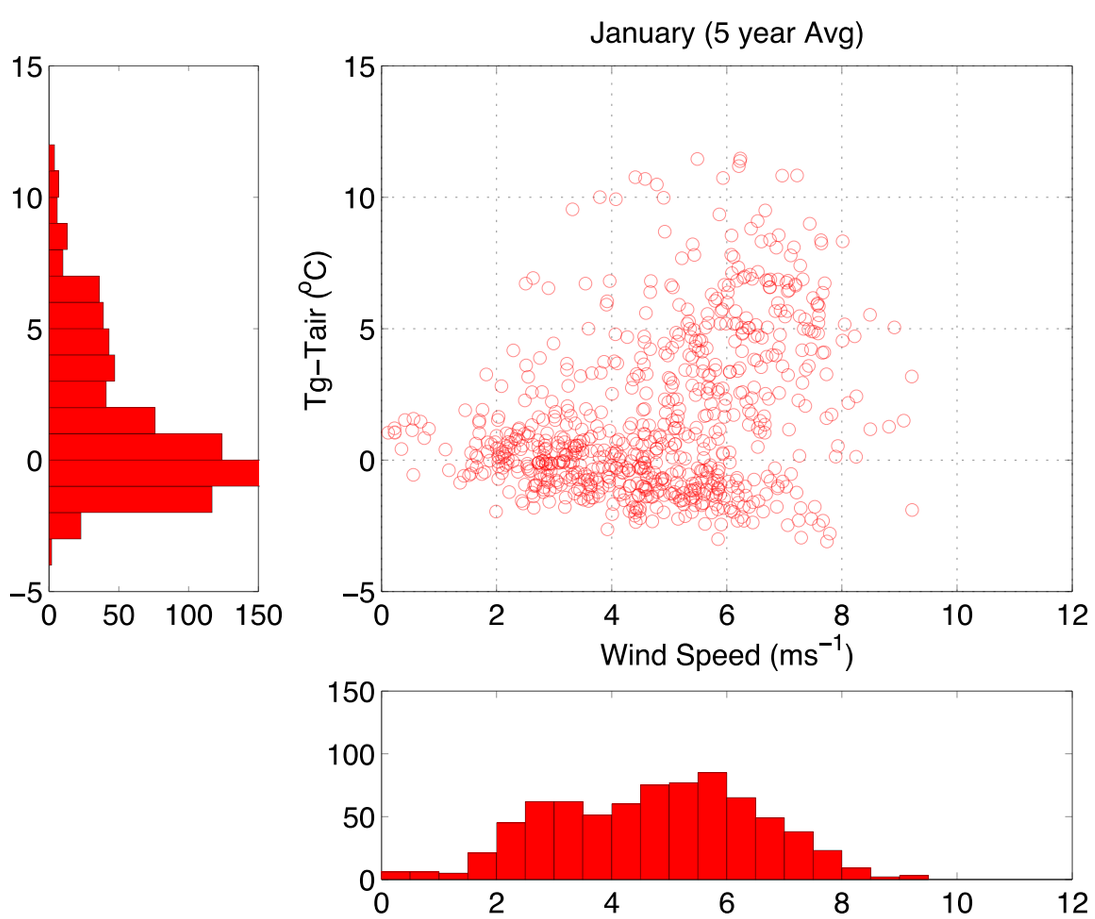
STABX – SODAR-RASS system

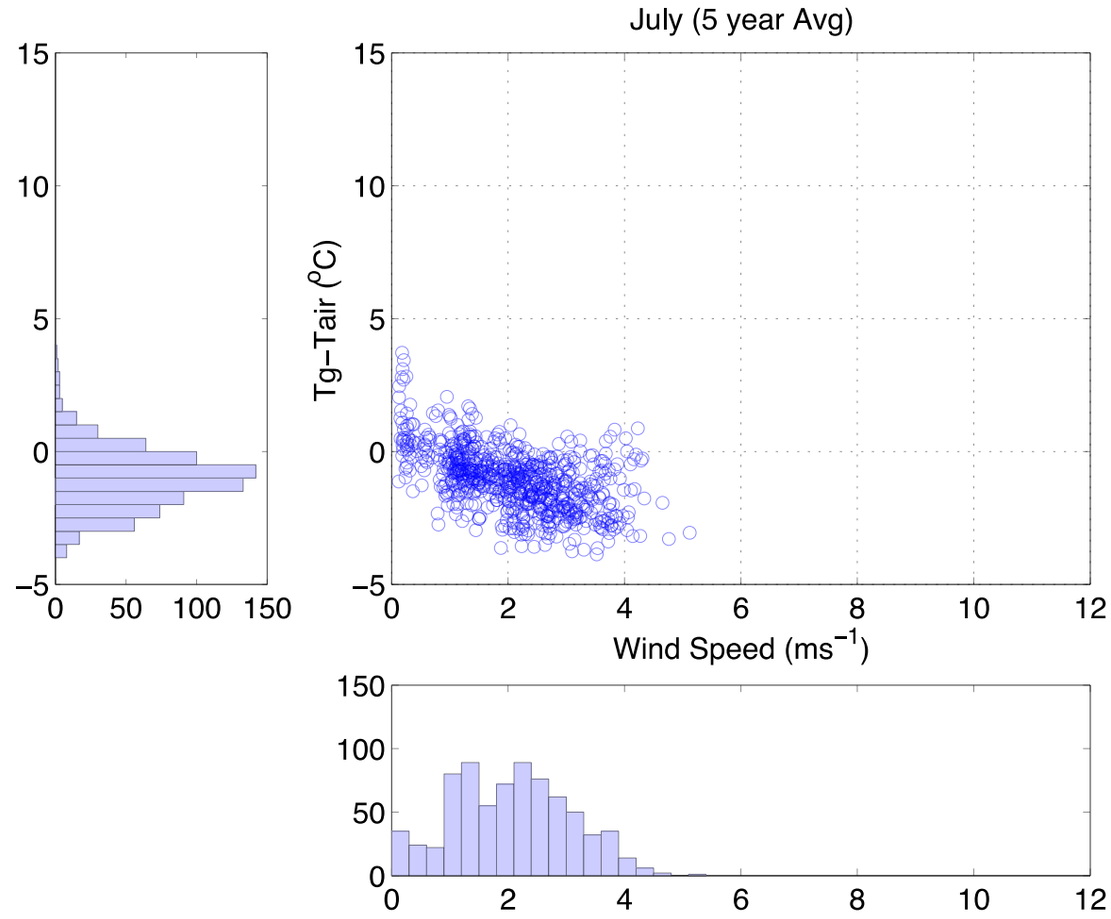
Scintec, effective height range: 400 m AGL, 5 m interval

STABX – SugarBaby, 1359m ASL



STABX – Near-surface temperature inversion





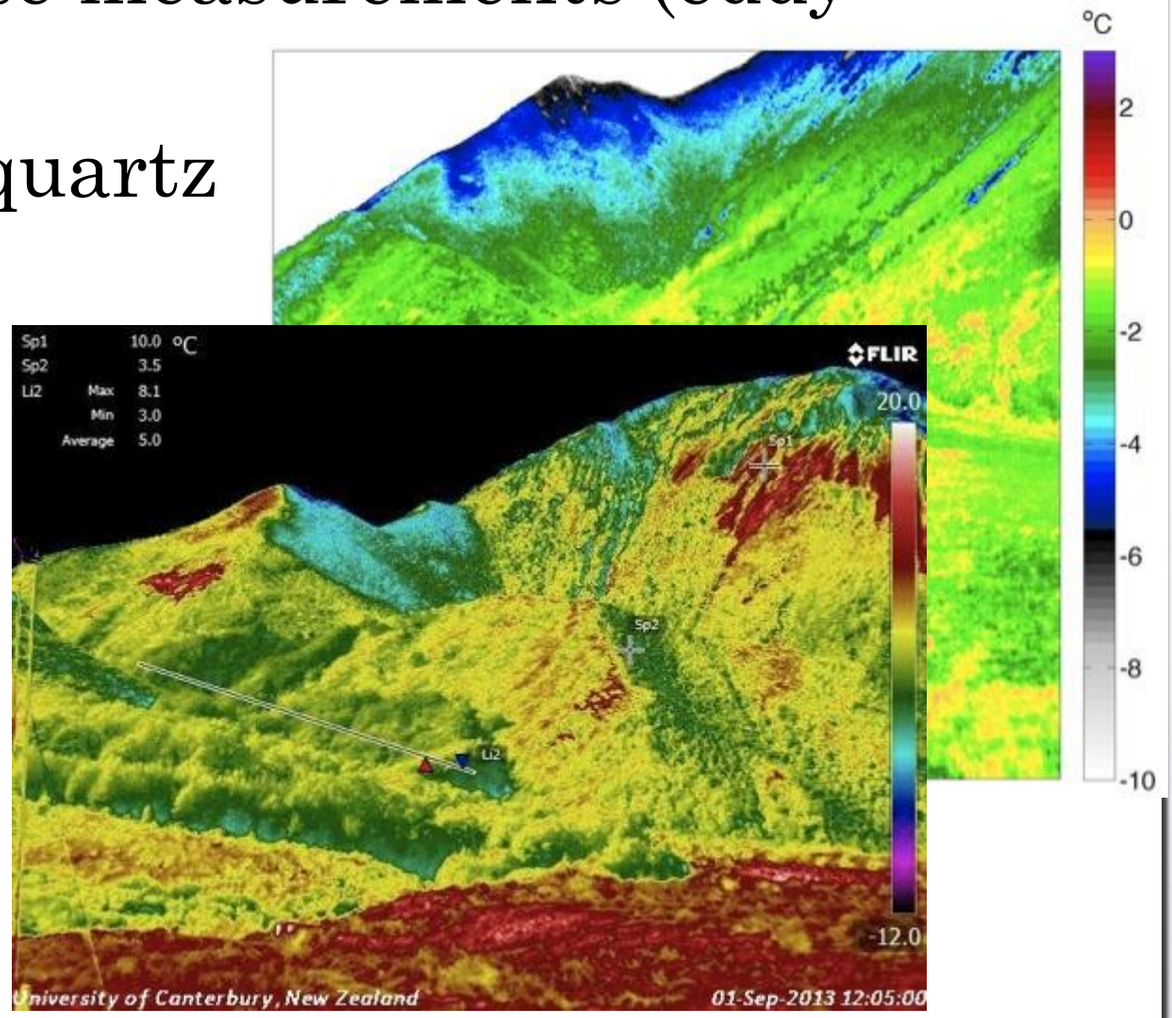
Tg: 10 cm soil temperature

Tair: 1.5 m air temperature

STABX – Intensive observations, winter 2014

- ✧ Targeting very quiescent and transitional periods
- ✧ Additional surface observations from an infrared camera
- ✧ Additional surface energy balance measurements (eddy covariance system)
- ✧ Additional deployment of a Digiquartz from Paroscientific.

Nanoresolution pressure measurements
Accuracy +/- 0.08 hPa
Purpose: onsite calibration of piezoresistive sensors



www.youtube.com/watch?v=SbOqXRFZGtI
www.youtube.com/watch?v=0685TIPVtLk

Thank You