



NOAA at Summit - Temporary Atmospheric Watch Observatory

Baseline Climate Observatory, Vaisala-only 2005-2008, Logan+Vaisala 2008-onward



<http://www.esrl.noaa.gov/gmd/obop/sum/>

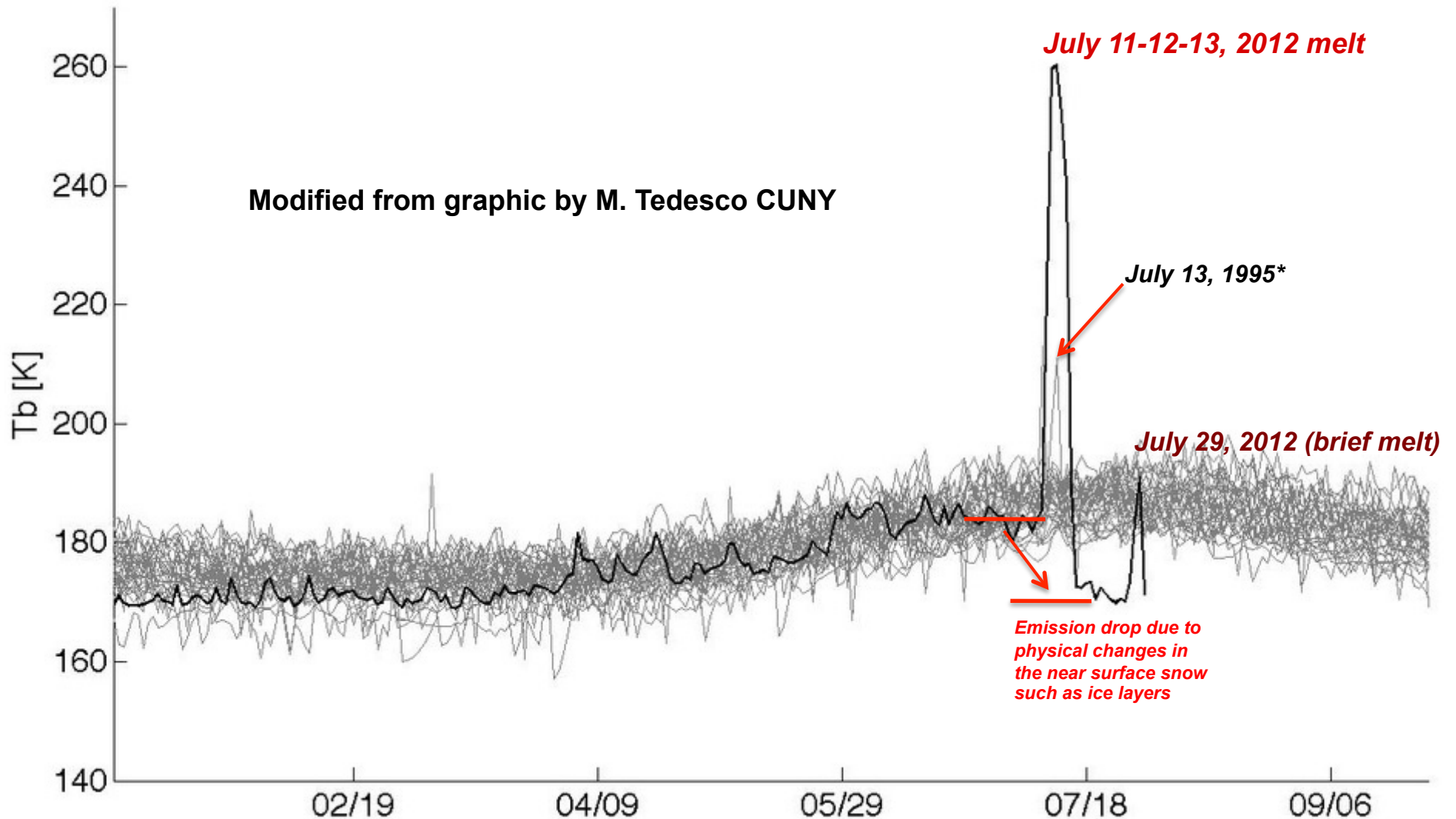
Two platinum resistance probes at 2 m, Cambridge housing, aspirated by milspec fan, availability of power & science techs year-round (Summit Camp) makes this possible

Photos courtesy of
Tom Mefford, NOAA



(Nearly) Unique Melting at Summit: a Microwave Perspective

<http://www.greenlandmelting.com/1/post/2012/08/the-unique-melting-at-summit-a-microwave-perspective.htm>
08/01/2012



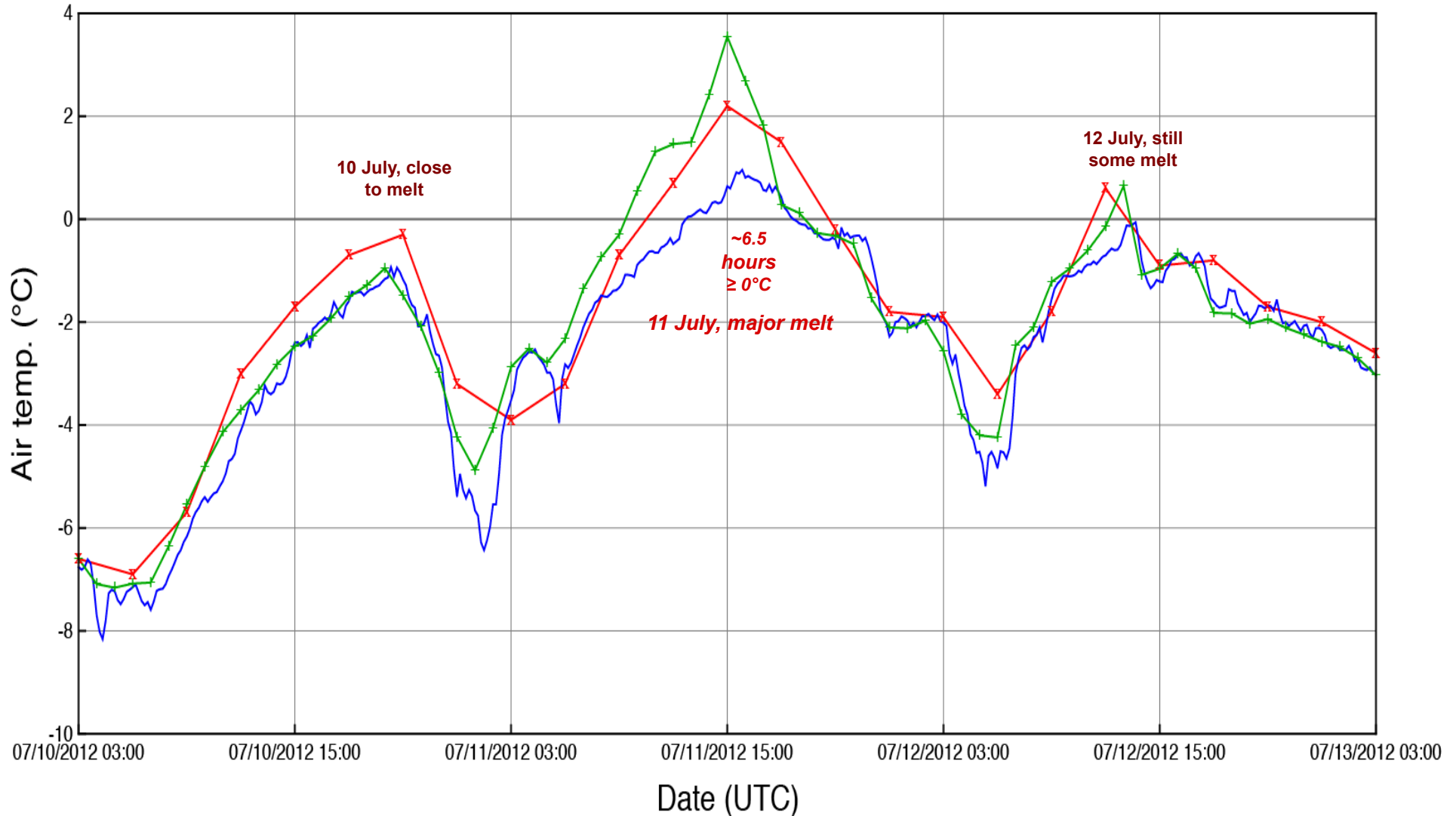
The plot below shows the 37V passive microwave brightness temperature (T_b) time series for the Summit pixel recorded by SSM/I sensors between 1979 and 2011 (the ensemble of gray lines) and the time series recorded during 2012 (black thick line).



Air Temperature Records for July 2012 melt at Summit



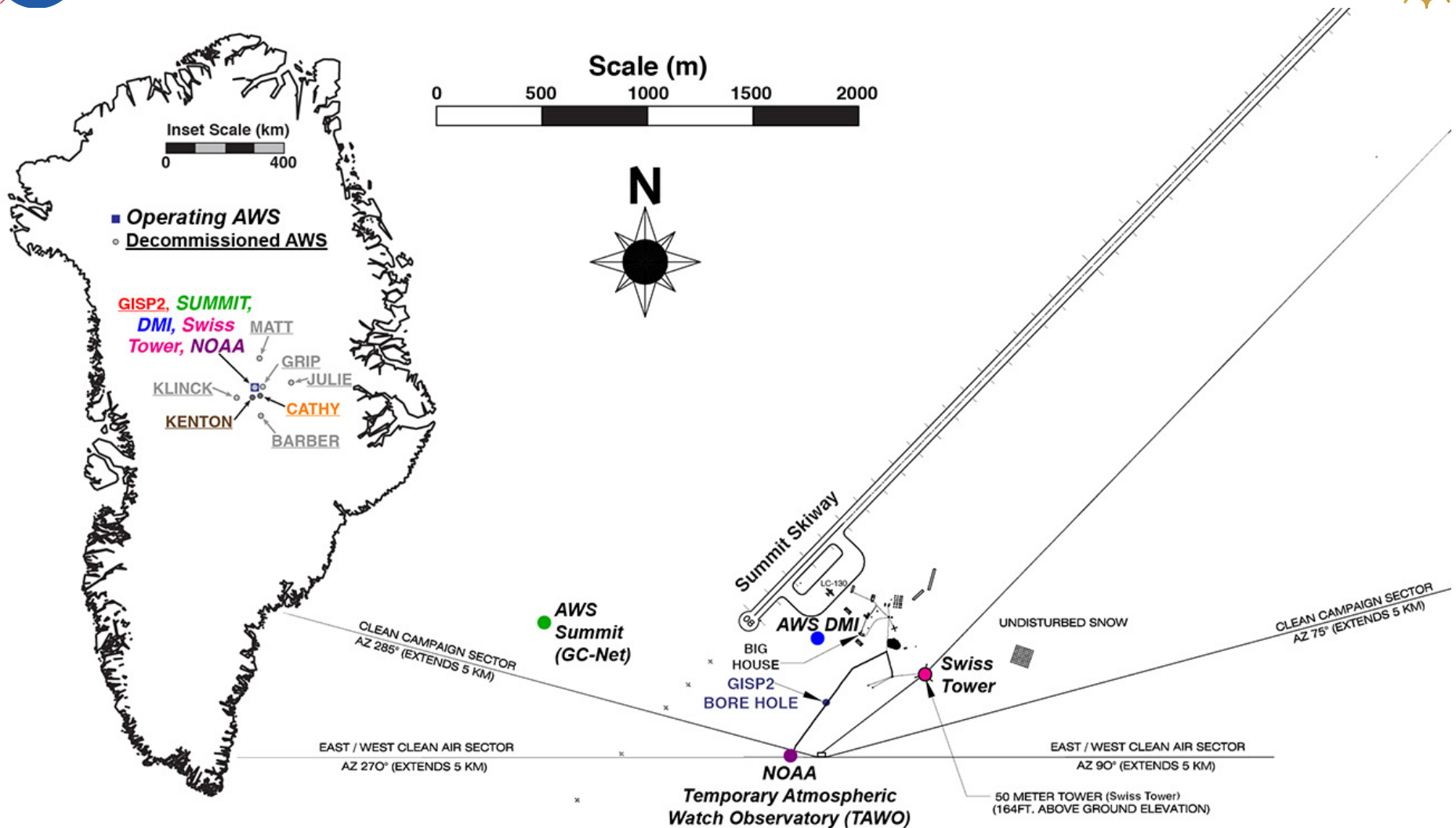
Logan (10-min.), DMI (3-hour), and GC-Net (1-hour) air temperatures



The plot shows 10 minute, and one and three hour ~2 m air temperatures at Summit Station, Greenland from active and passive shielded sensors during the main July warm event.



Air Temperature Records for the Summit Region



Map adapted from one provided by CPS/SCO/NSF

Work in progress needed to assess climate variability and change

Microwave and IR melt signals in July 2012 are constrained at Summit Station by NOAA data

Both sensor calibration and shield type can strongly influence in situ data and complicate trend analysis

Analyses for an improved long-term trend are continuing and also for IR sensor calibration

● **AWS**
GISP2



IR-derived Melt Extent on the Greenland Ice Sheet, 2012 vs. 2013

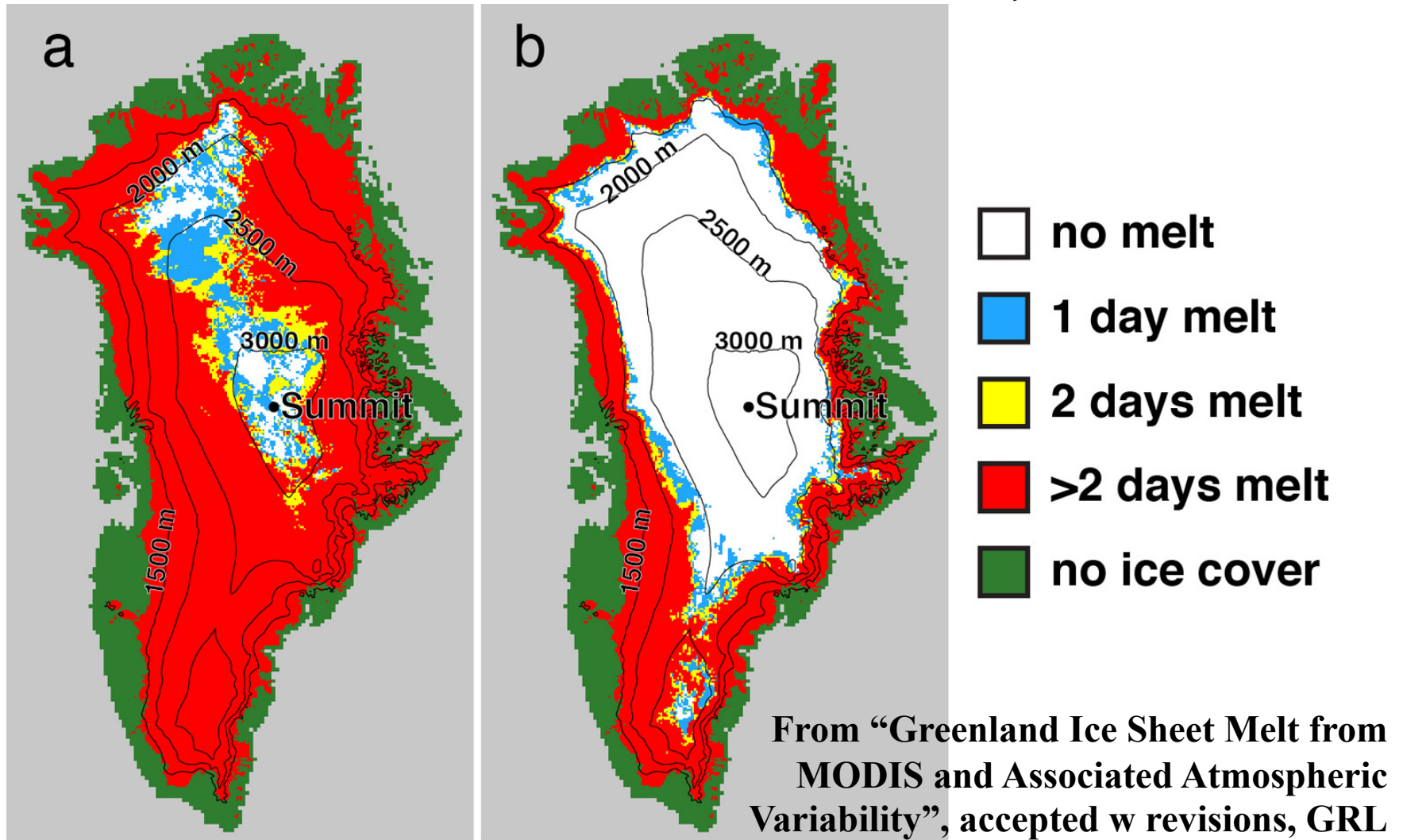


Figure 1. Extent of melt on the Greenland ice sheet for 2012 (Panel a) (days 1 – 366) and 2013 (Panel b) (days 1 - 243). The location of Summit, mentioned in the text, is shown. Elevation contours are shown at 1500, 2000, 2500 and 3000 m. As determined from MODIS-derived melt maps, a maximum of ~95 percent of the ice sheet surface experienced some melt in 2012 and only 49 percent of the ice sheet surface experienced some melt in 2013.



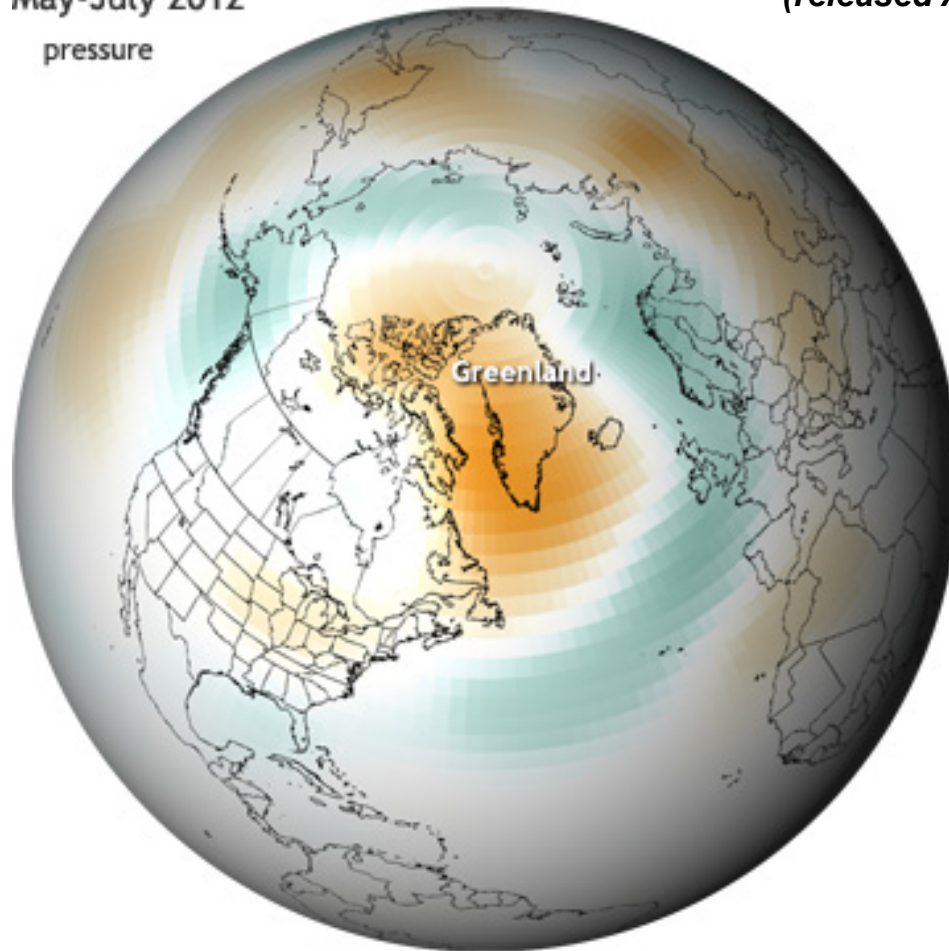
Summer Weighing Heavily on Greenland Ice Sheet

<http://www.climatewatch.noaa.gov/article/2012/summer-weighing-heavily-on-greenland-ice-sheet>

(released Aug. 2, 2012)

May-July 2012

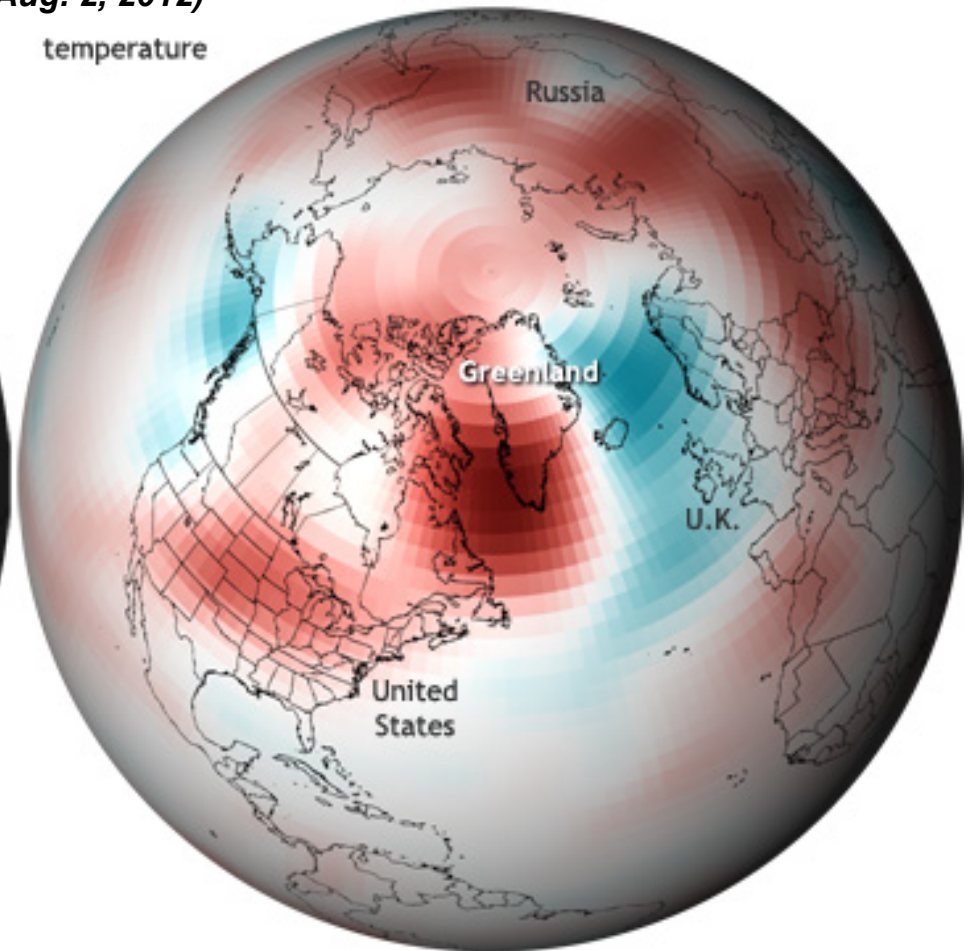
pressure



geopotential height anomaly at 700 mb (meters)



temperature



difference from average temperature at 700 mb (°F)



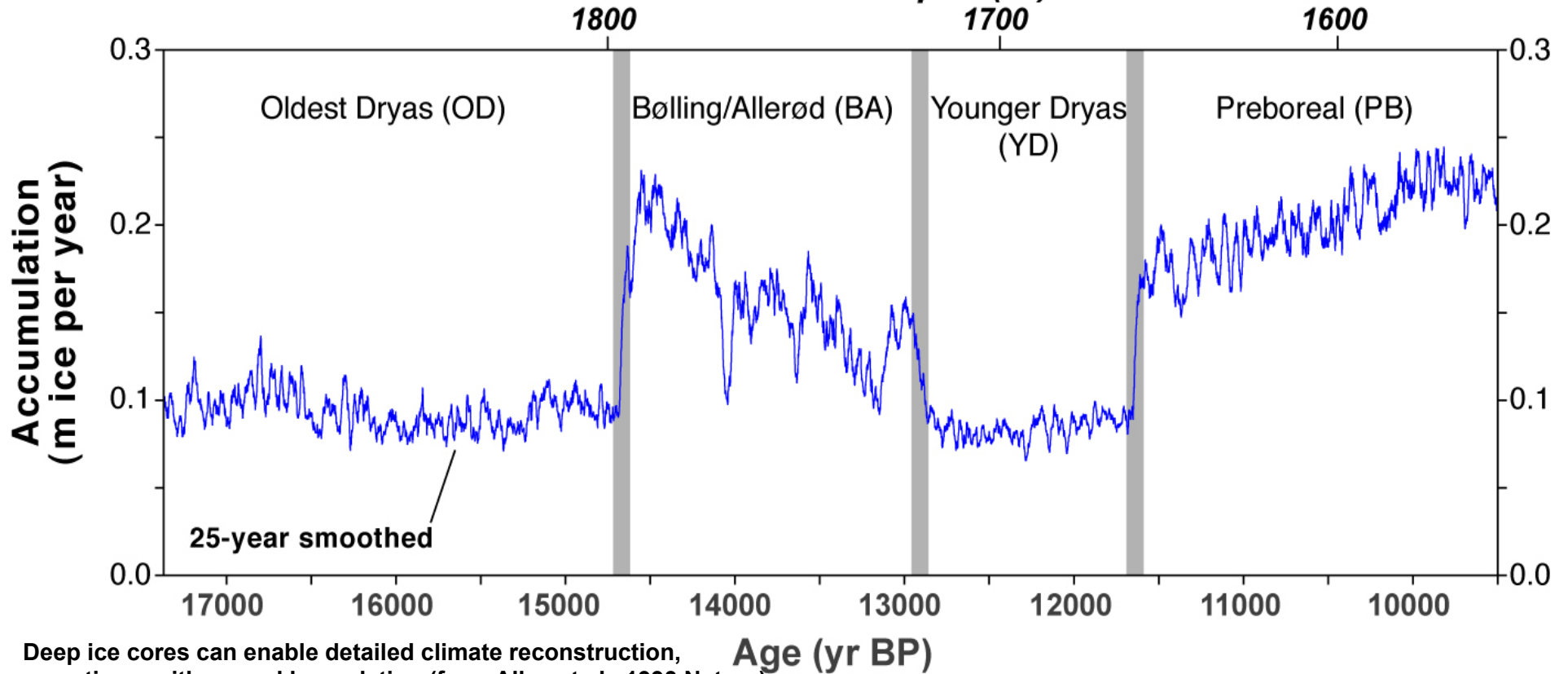
The map on the left shows the difference from average pressure at the 700 millibar pressure level from May-July 2012 compared to the 1981-2010 average. Gold colors indicate higher-than-average pressure. A large dome of high pressure 'camped' over Greenland and the Northwest Atlantic this summer. The influence on temperatures (map on right) was dramatic. Temperature anomalies at the same altitude were as much as 11 degrees Fahrenheit warmer than average over Greenland. Credit: text by Rebecca Lindsey and graphics by Dan Pisuit from NOAA reanalysis data.



Climate Records - The Present Is The Key To The Past (and Future?)

Earth scientists believe that by understanding the present as well as the recent past we can better predict and plan for the future. *But rapid change is possible.*

GISP2 Core Depth (m)



Deep ice cores can enable detailed climate reconstruction, sometimes with annual layer dating (from Alley et al., 1993 Nature).

