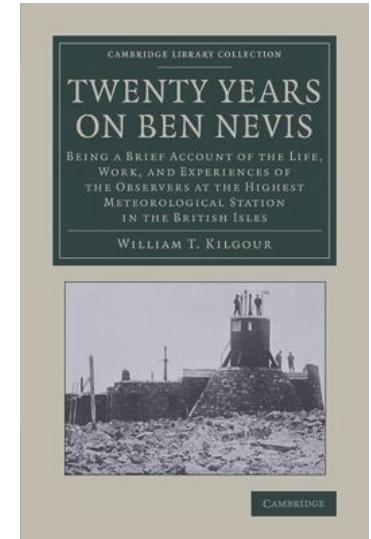
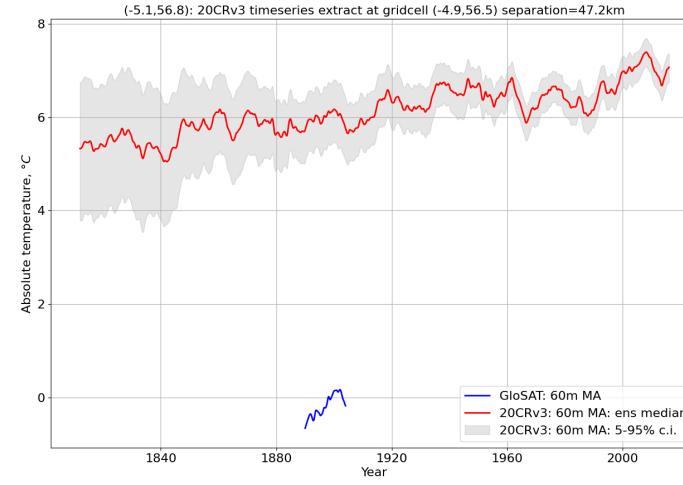
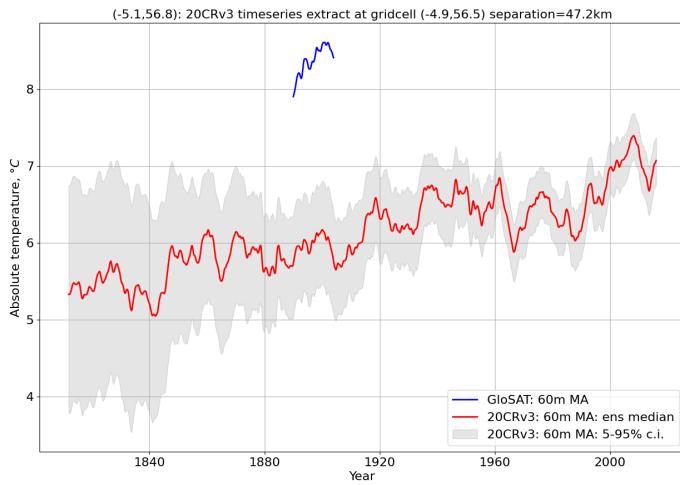
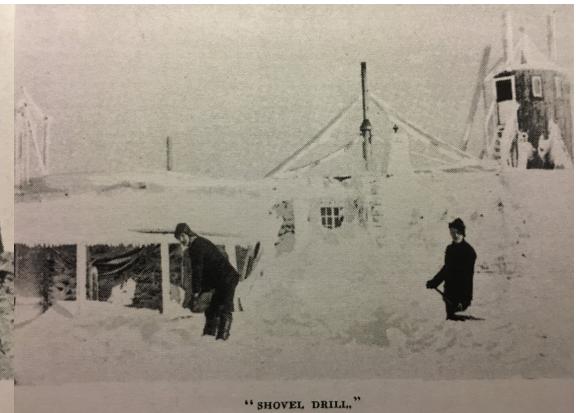
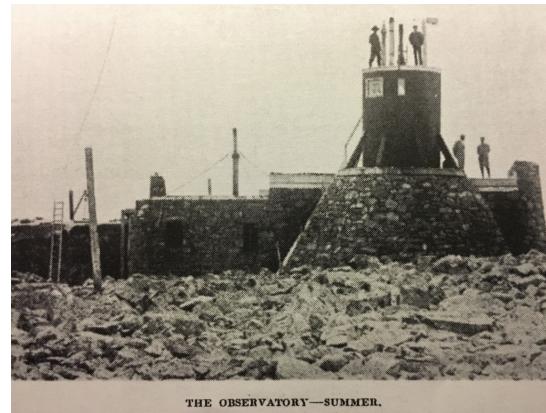
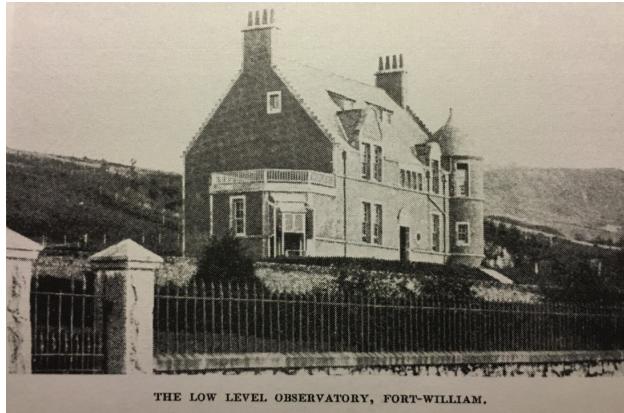


# How good is 20<sup>th</sup> Century Reanalysis at recreating observations during the Ulysses Storm >100 years ago ?

Michael Taylor  
CRU/ENV

# Parallel Observations during 'Twenty years on Ben Nevis'

## 1884-1904 twinned measurements at Fort William and at the Ben Nevis Observatory



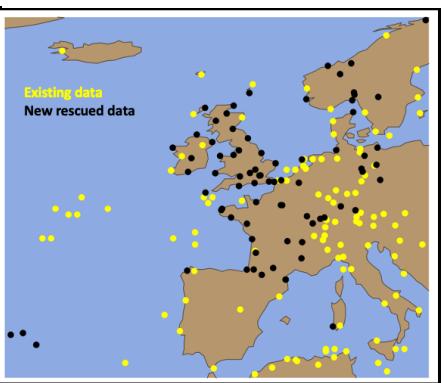
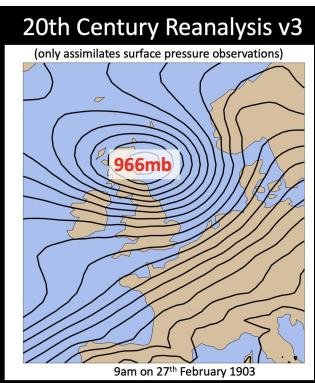
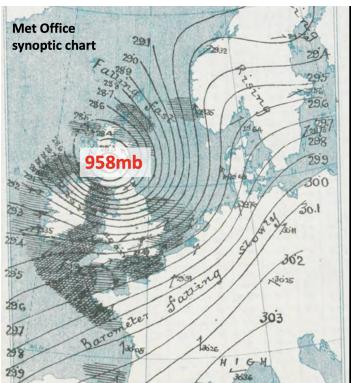
# Ulysses Storm: 27<sup>th</sup> of February 1903

## And they still took measurements!

The period 18<sup>th</sup>-27<sup>th</sup> February 1903 was a very stormy one with depressions from the Atlantic passing close-by the west coast of Ireland in a north easterly direction. The storm on the night of 26<sup>th</sup>-27<sup>th</sup> February was probably the most severe one to affect Ireland since "The Night of the Big Wind". It was reported that 2,000 trees were uprooted on an estate near Birr and 4,000 on an estate in Kilkenny. In the Phoenix Park, Dublin the storm uprooted a large number of trees (chiefly elms) estimated at 1,000 to 3,000, in different accounts. In parts of the country it was reported that whole woods were laid low. Damage to roofs, chimneys and whole buildings was correspondingly great.

Quotes from Ulysses referring to the storm: - O yes, J.J. O'Malley said eagerly. Lady Dudley was walking home through the park to see all the trees that were blown down by that cyclone last year and thought she'd buy a view of Dublin." (U7.700)

There was indeed a great storm on February 27th 1903. In Phoenix Park, this PC states, 2948 trees were blown down.



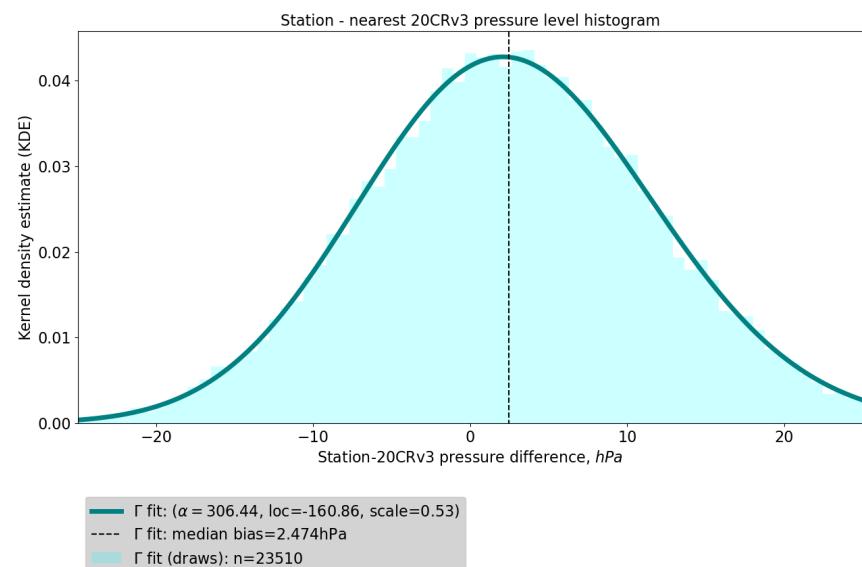
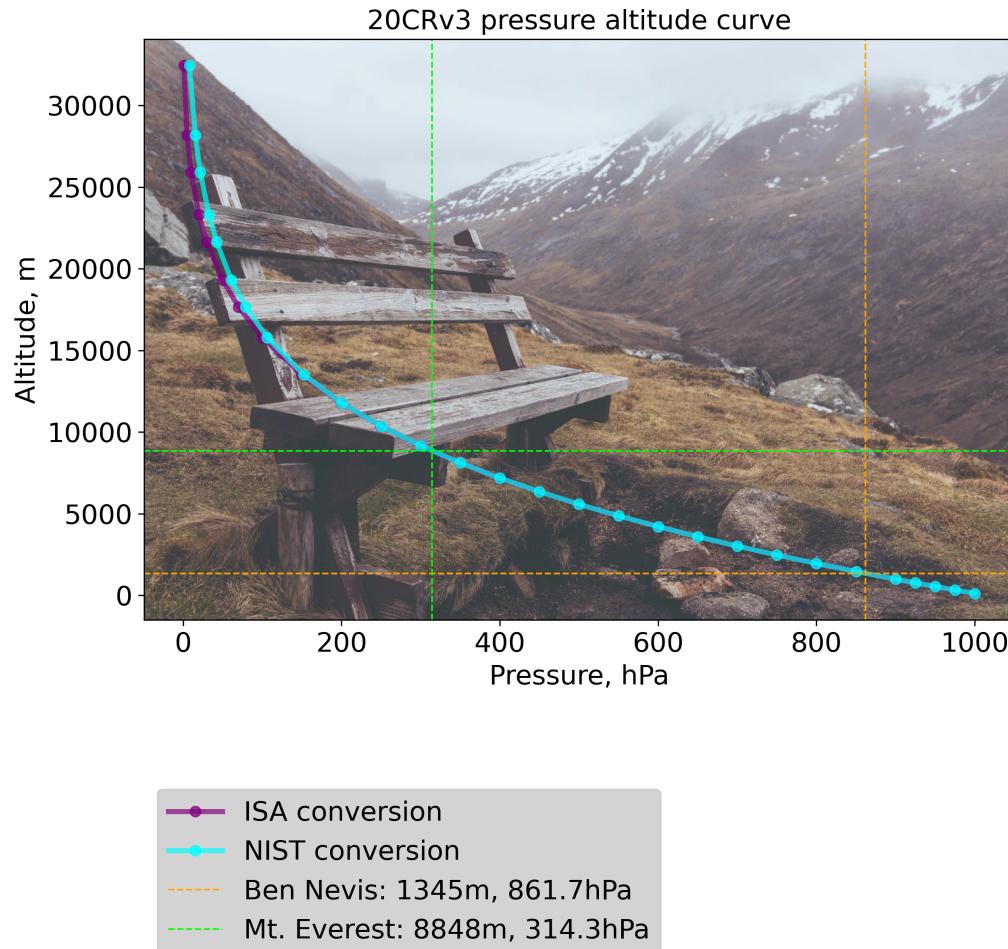
**DAILY WEATHER REPORT**  
for 8 a.m. on Friday, 27<sup>th</sup> February, 1903.  
Issued by the METEOROLOGICAL OFFICE, 68, Victoria Street, London. W. R. SHAW, Secretary.  
*2nd edition.*

STATIONS.	TESTIMONY EVENING (See note on last page)				THIS MORNING (See note on last page)				PAST 24 HOURS				WEALED. Max. Min. Wind. Hours. Rainfall. In.			
	REBOM.	TEMP.	WIND.	WEATHER	BAROMETERS		TEMPERATURES		WIND.		WEATHER			WEALED. Max. Min. Wind. Hours. Rainfall. In.		
					At 8 <sup>th</sup> M.S.L.	Change from 8 <sup>th</sup>	Dry Bulb	Wet Bulb	Change from 8 <sup>th</sup>	Temp. Max. Min.	Wind	Force to 12.	Force to 12.			
Hagaparanda ...	29-58	9	W	2	29-12	-47	32	9	+6	9	S	—	—	7	16	0-79
Hernosand ...	29-52	9	SW	2	29-12	-47	32	9	+6	9	S	—	—	8	12	0-62
Stockholm ...	29-64	38	S	2	29-12	-34	32	14	+1	W	N	—	—	9	14	0-64
Västerås ...	29-52	38	S	2	29-12	-34	32	14	+1	W	N	—	—	9	14	0-61
Karlstad ...	29-47	37	S	46	29-12	-35	32	14	+3	W	N	—	—	8	15	0-61
Färder (Santa Pjörd)	29-29	36	S	0	29-12	-36	32	17	+0	W	N	—	—	7	14	0-61
Böda ...	29-33	36	S	3	29-12	-36	32	17	+1	W	N	—	—	7	14	0-60
Christiansund ...	29-33	36	S	3	29-12	-36	32	17	+1	W	N	—	—	7	14	0-60
Skudeneshavn ...	29-41	36	S	2	29-12	-36	32	17	+0	W	N	—	—	6	14	0-60
Sumburgh Head ...	29-22	48	W	3	29-12	-37	32	17	+2	W	N	—	—	6	17	0-60
Stormyay ...	29-26	38	S	0	29-12	-37	32	17	+2	W	N	—	—	6	17	0-56
Malin Head ...	29-23	32	S	6	29-12	-37	32	17	+2	W	N	—	—	5	16	0-53
Blackhead Pt. ...	29-23	32	S	7	29-12	-37	32	17	+2	W	N	—	—	5	16	0-53
Valencia ...	29-12	SSE	8	7	29-12	-37	32	17	+2	W	N	—	—	4	16	0-53
Roche's Point ...	29-27	8	S	7	29-12	-37	32	17	+2	W	N	—	—	3	16	0-53
Portsmouth ...	29-20	32	S	14	29-12	-37	32	17	+2	W	N	—	—	3	16	0-53
Dover ...	29-19	32	S	14	29-12	-37	32	17	+2	W	N	—	—	3	16	0-53
Liverpool Obey ...	29-23	32	S	14	29-12	-37	32	17	+2	W	N	—	—	3	16	0-53
Holyhead ...	29-15	32	S	6	29-12	-37	32	17	+2	W	N	—	—	3	16	0-53
Pembroke ...	29-12	32	S	7	29-12	-37	32	17	+2	W	N	—	—	3	16	0-53
Selsey (St. Mary's) ...	29-30	32	S	9	29-12	-37	32	17	+2	W	N	—	—	2	16	0-53
Portland Bill ...	29-23	32	S	2	29-12	-37	32	17	+2	W	N	—	—	2	16	0-53
Dungeness ...	29-23	32	S	6	29-12	-37	32	17	+2	W	N	—	—	2	16	0-53
Wick ...	29-31	32	S	14	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Nairn ...	29-26	32	S	14	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Aberdeen ...	29-22	32	S	14	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Leith ...	29-22	32	S	8	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
North Shields ...	29-21	32	S	3	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Spurn Head ...	29-16	32	S	8C	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Yarmouth ...	29-19	32	S	8C	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Loughborough ...	29-16	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Oxford ...	29-16	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
London (Brixton) ...	29-16	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
The Scaw (Bagen) ...	29-18	40	W	14	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Cochrane ...	29-17	32	S	14	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
The Helder ...	29-17	32	S	14	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Brussels ...	29-12	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Brussels ...	29-03	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Berlin ...	29-12	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Frankfurt ...	29-12	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Munich ...	29-12	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
C. Gris Nez ...	3-02	32	S	6	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Brest ...	3-02	32	S	4	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Lorient ...	3-02	32	S	4	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Roscoff ...	3-02	32	S	4	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Biarritz ...	3-02	32	S	2	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Paris ...	3-07	48	SW	3	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Montpellier ...	3-07	48	SW	1	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Lyon ...	3-02	32	S	2	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Nice ...	3-03	32	S	1	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Perpignan ...	3-03	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Barcelona ...	3-09	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Lisbon ...	3-04	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Nazare (P. Indop.) ...	3-09	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53
Azores (P. Indop.) (Horta) ...	3-09	32	S	0	29-12	-37	32	17	+2	W	N	—	—	1	16	0-53

Ed Hawkins

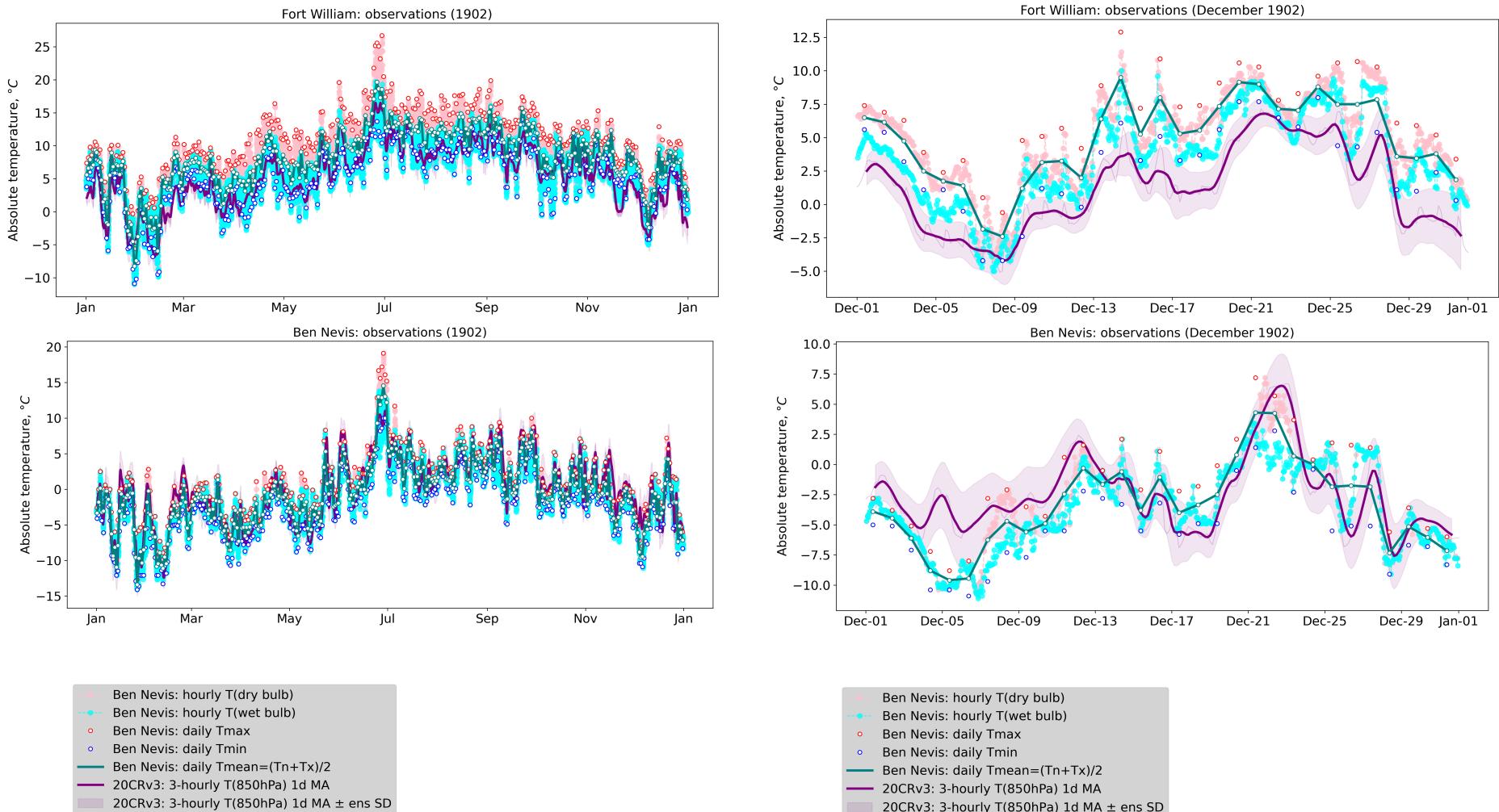
# Temperature on pressure levels at altitude

The case for using reanalysis at 850hPa



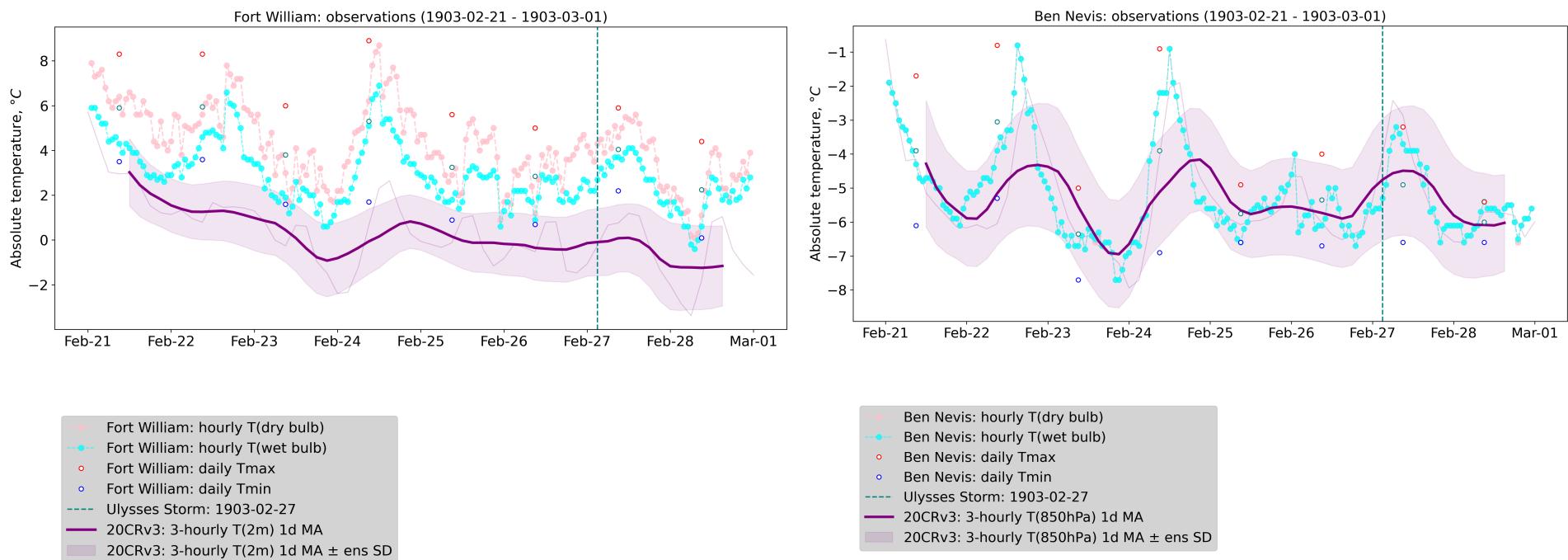
# Observation versus Reanalysis at 2m and at 850hPa

The observations versus 20CRv3 at the pressure altitude match quite well



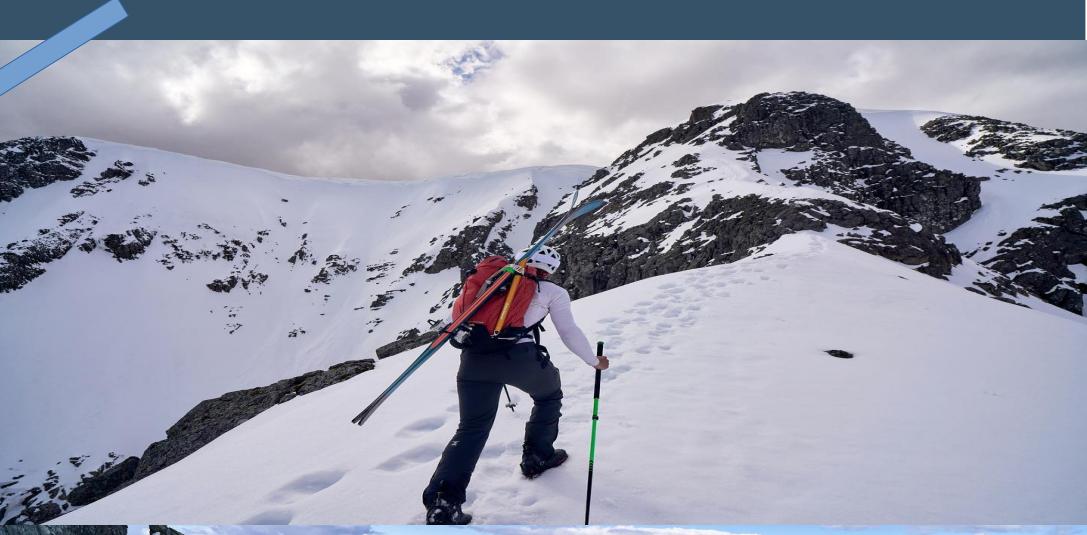
# What about the Ulysses Storm?

This is a tough one for the reanalysis! But some sign of baroclinic waves ?



# Ben Nevis continues to inspire – here's Iain Innes

He climbs up and skis down Ben Nevis (this is yesterday)!



# Many thanks

## Observations

From Ed Hawkins and Stephen Burt, University of Reading with data rescued by citizen science on Zooniverse

## NOAA / PSL

20CRv3 3-hourly t2m and t(hPa) 1836-2015:

[https://portal.nersc.gov/project/20C\\_Reanalysis/](https://portal.nersc.gov/project/20C_Reanalysis/)

## Codebase:

<https://github.com/patternizer/glosat-station-pressure-altitude>

<https://github.com/patternizer/glosat-weathermen> (not public yet)