

WeatherRescue.org

Rescuing millions of lost weather observations
using volunteer citizen scientists



Ed Hawkins, Stephen Burt,
Marjory Roy, Harriett Richardson,
Philip Brohan & 4000+ volunteers

Ben Nevis summit (1883-1904)





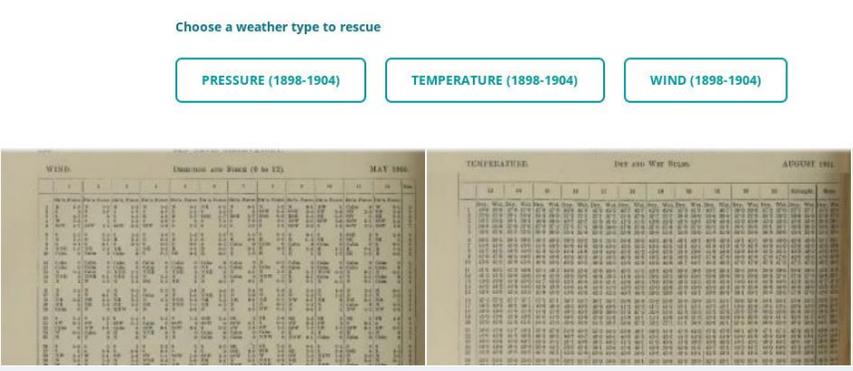
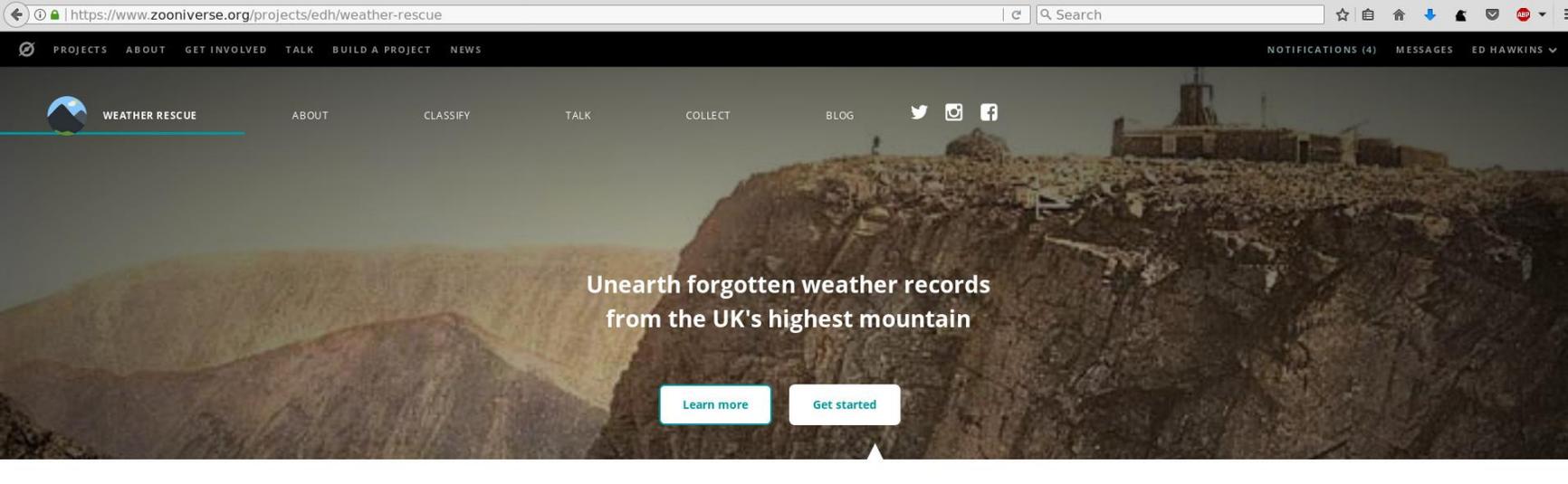
TEMPERATURE.

DRY AND WET BULBS.

JANUARY 1898.

	1		2		3		4		5		6		7		8		9		10		11		12		For Day.	
	Dry.	Wet.	Max.	Min.																						
1	28.5	28.5	27.7	27.7	27.1	27.1	27.0	27.0	26.2	26.2	24.9	24.9	23.1	23.1	23.1	23.1	22.4	22.4	28.0	28.0	29.7	29.8	26.1	26.0	29.7	23.1
2	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	24.9	24.9	25.0	25.0	24.5	24.5	25.0	25.0	25.2	25.0	26.0	25.7	26.0	25.8	26.5	24.5
3	26.0	25.0	26.0	24.4	26.0	24.1	26.0	24.1	25.0	24.0	25.0	23.2	25.0	23.8	24.6	23.0	24.0	23.5	26.0	24.6	26.8	25.9	26.5	25.1	28.8	22.0
4	30.3	30.3	31.0	31.0	30.0	30.0	29.1	29.1	28.6	28.6	29.8	29.3	30.8	30.0	31.8	31.8	29.9	29.9	28.6	28.6	28.5	28.5	28.0	28.0	31.8	26.1
5	24.5	24.5	22.7	22.7	22.0	22.0	22.2	22.2	23.5	23.5	23.8	23.8	23.4	23.4	23.2	23.2	22.8	22.8	23.8	23.8	25.1	25.9	23.9	24.1	29.6	22.0
6	30.9	30.9	32.7	32.0	34.0	34.0	34.2	34.2	34.4	34.4	33.8	33.8	32.8	32.8	32.0	32.0	33.0	33.0	33.0	33.0	31.0	31.9	28.0	28.0	34.4	24.0
7	23.9	23.9	24.1	24.1	23.1	23.1	21.4	21.4	21.7	21.7	22.2	22.1	21.7	21.6	21.2	21.1	21.7	21.6	22.2	22.1	23.1	23.1	23.1	23.1	25.1	21.2
8	26.1	26.1	27.0	27.0	27.0	27.0	27.5	27.5	27.8	27.8	28.1	28.1	29.5	29.5	30.0	30.0	29.7	29.7	30.3	30.3	29.5	29.5	29.6	29.6	30.3	26.1
9	26.8	26.8	26.5	26.5	26.7	26.7	25.7	25.7	25.3	25.3	25.9	25.9	25.1	25.1	24.9	24.9	24.3	24.3	24.7	24.7	25.1	25.5	25.1	25.1	26.8	24.1
10	25.4	25.4	25.6	25.6	26.1	26.1	26.7	26.7	27.0	27.0	27.2	27.2	28.0	28.0	28.6	28.6	29.4	29.4	30.0	30.0	31.0	31.0	31.8	31.8	32.0	25.4
11	28.4	28.4	28.4	28.4	28.0	28.0	28.8	28.8	28.2	28.2	28.9	28.9	31.0	31.0	31.8	31.8	32.0	32.0	32.0	32.0	32.0	32.0	33.0	32.3	36.0	28.0
12	35.1	35.1	35.1	35.1	36.0	36.0	36.0	36.0	32.2	32.2	30.2	31.8	30.2	30.2	29.8	29.8	29.0	29.0	28.8	28.8	28.5	28.5	29.0	29.0	36.0	26.1
13	30.6	30.6	32.2	32.0	33.0	33.0	34.6	34.6	34.1	34.1	33.5	33.5	33.0	33.0	33.5	33.5	33.0	33.0	32.8	32.8	33.4	33.4	32.0	32.0	34.6	30.0
14	29.2	29.2	29.2	29.2	29.1	29.1	29.5	29.5	30.0	30.5	30.5	30.5	30.6	30.6	30.8	30.8	31.0	31.0	31.3	31.3	31.9	31.9	32.0	32.0	32.2	29.1
15	31.0	31.0	30.5	30.5	31.0	31.0	30.8	30.8	30.5	30.5	30.4	30.4	29.8	29.8	28.9	28.9	28.2	28.2	27.4	27.4	27.0	27.0	27.1	27.2	31.0	25.8
16	27.8	27.8	28.0	28.0	28.0	28.0	27.2	27.2	27.0	27.0	27.0	27.0	26.6	26.6	26.4	26.4	27.0	27.0	29.0	29.0	30.0	30.3	31.0	31.2	31.9	26.4
17	32.0	32.0	32.0	32.0	32.0	32.0	31.8	31.8	32.0	32.0	31.9	31.9	31.9	31.9	31.8	31.8	31.9	31.9	32.0	32.0	32.0	32.0	32.0	32.0	32.8	31.8
18	32.0	32.0	31.7	31.9	31.6	31.8	30.2	30.2	30.0	30.0	30.9	30.9	31.1	31.1	31.8	31.8	32.0	32.0	33.0	33.0	33.5	33.5	34.0	34.0	34.9	29.9
19	36.0	36.0	37.1	37.1	37.7	37.7	37.0	37.0	36.0	36.0	35.6	35.6	35.6	35.6	36.2	36.2	36.8	36.8	37.0	37.0	37.5	37.5	37.8	37.8	37.9	24.7
20	24.7	24.7	24.6	24.6	24.9	24.9	24.8	24.8	24.1	24.1	24.2	24.2	25.1	25.1	26.1	26.1	25.9	25.9	26.1	26.1	26.6	26.8	26.8	26.9	26.9	24.1
21	26.2	26.3	26.4	26.4	26.1	26.1	26.6	26.6	26.7	26.8	27.5	27.5	26.1	26.1	24.9	24.9	25.3	25.3	25.3	25.3	25.1	25.1	25.1	25.1	27.5	23.7
22	31.1	31.1	32.0	32.0	32.0	32.0	34.0	33.5	34.6	34.6	31.8	31.8	29.9	30.8	25.9	25.9	24.6	24.6	23.1	23.1	23.7	23.5	24.0	23.5	34.6	23.1
23	25.4	25.4	26.1	26.1	26.0	26.0	26.0	26.0	28.6	28.6	28.0	28.0	31.5	31.0	31.0	31.0	31.2	31.2	31.0	31.0	31.2	31.2	32.0	31.8	32.0	25.4
24	31.0	31.0	31.3	31.3	31.6	31.6	31.3	31.3	30.7	30.7	30.9	30.8	30.9	30.9	31.0	30.8	30.4	30.1	31.0	30.8	30.8	30.8	30.5	30.5	32.0	29.5
25	31.0	31.0	31.1	31.1	31.4	31.4	31.3	31.3	30.7	30.7	30.3	30.0	30.0	29.8	30.0	30.0	30.2	30.0	30.2	30.0	30.7	30.5	30.5	30.4	31.9	30.0
26	30.9	30.8	31.3	31.0	31.4	31.4	31.6	31.4	31.8	31.8	32.0	32.0	32.0	32.0	31.8	31.8	32.1	32.1	32.0	32.0	32.1	32.1	32.0	32.0	33.5	30.9
27	33.9	33.8	33.9	33.9	34.0	34.0	34.6	34.6	35.0	35.0	35.1	35.1	35.7	35.7	36.0	36.0	36.0	36.0	36.0	36.0	35.9	35.9	35.5	35.5	36.0	30.9
28	30.4	30.4	30.4	30.4	29.7	29.7	29.0	29.0	28.5	28.5	27.8	27.7	27.1	27.1	27.1	27.1	27.6	27.6	27.8	27.8	28.1	28.1	32.5	32.5	34.4	27.1
29	34.3	34.1	34.3	34.2	34.2	34.1	34.0	34.0	34.1	34.1	33.0	33.0	34.0	33.7	33.7	33.6	34.3	34.3	34.0	34.0	33.7	33.6	34.3	34.3	37.3	33.0
30	34.0	34.0	33.1	33.1	33.0	33.0	32.5	32.4	33.3	33.2	32.0	32.0	32.6	32.6	33.0	32.5	33.0	33.0	32.5	32.5	32.7	32.6	34.6	34.5	39.0	32.0
31	28.8	28.8	27.0	27.0	25.9	25.9	25.2	25.2	25.3	25.3	25.6	25.6	24.8	24.8	25.6	25.6	25.6	25.6	26.5	26.5	27.5	27.4	28.0	27.9	37.2	24.8
MEAN.	29.4	29.4	29.5	29.4	29.6	29.5	29.4	29.3	29.3	29.3	29.1	29.1	29.2	29.1	29.1	29.0	29.0	29.0	29.4	29.3	29.7	29.7	29.7	29.6	32.4	26.6

1.5 million hourly observations of temperature, pressure, wind & rainfall for Ben Nevis and Fort William were published on 2000 pages

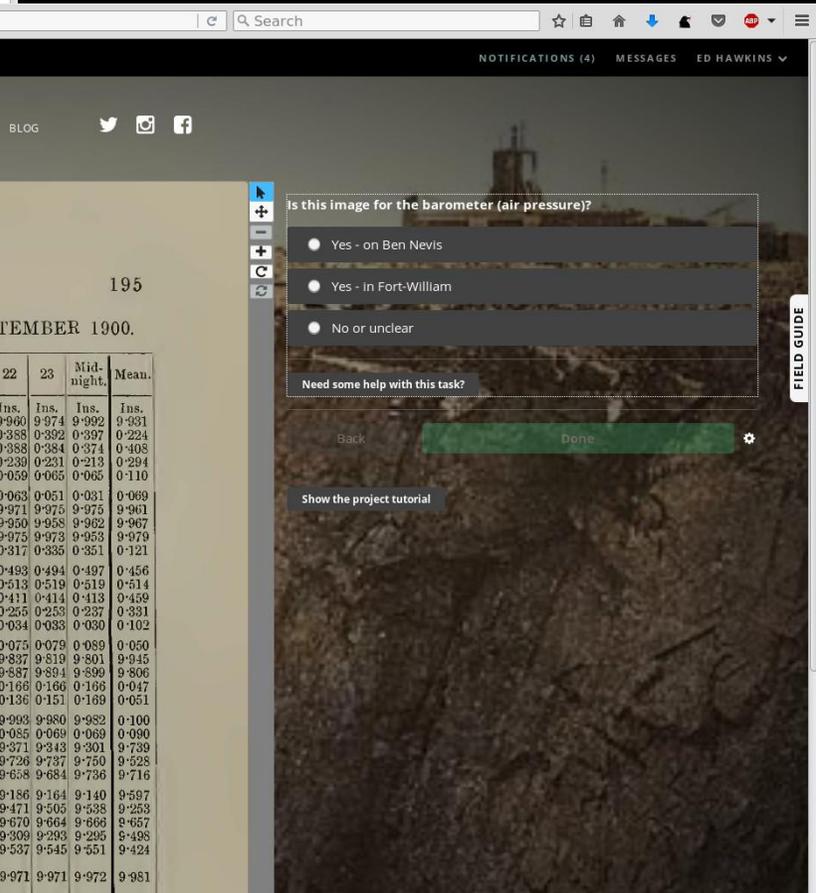


**3500+ volunteers
took just 3 months
to rescue 1.5M
observations**

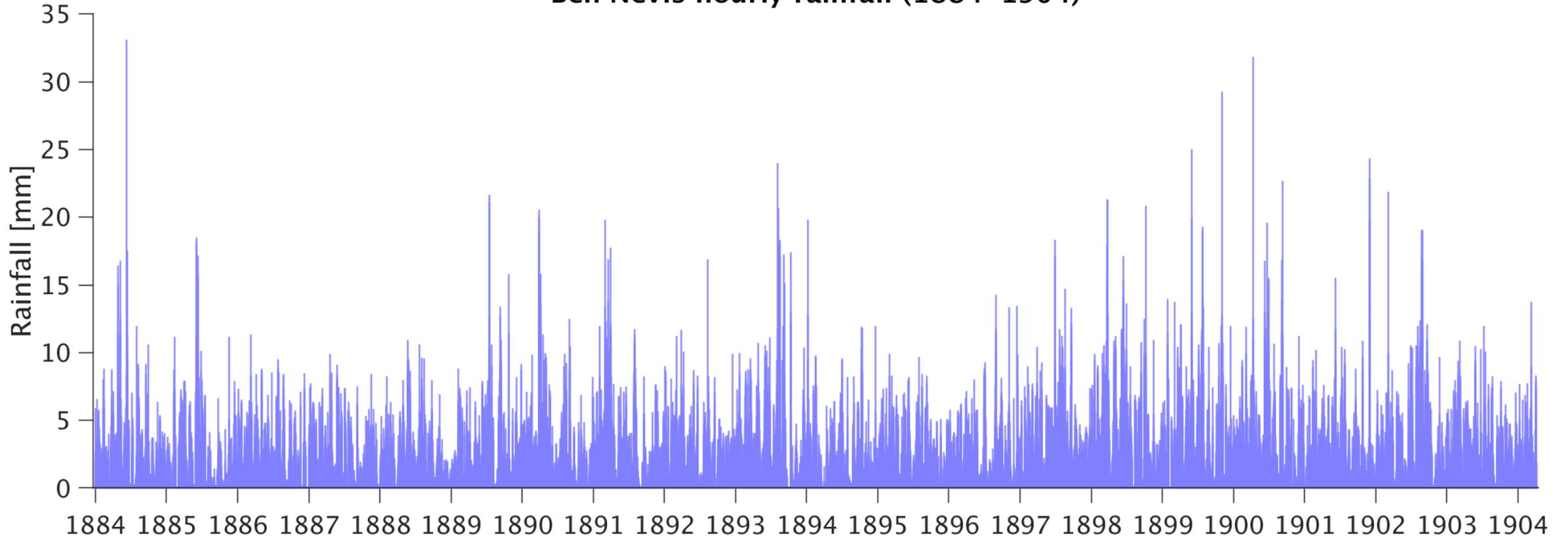
Fort-William Observatory. 195

BAROMETER. REDUCED TO 32" AND SEA LEVEL. SEPTEMBER 1900.

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Mid-night.	Mean.	
1	0.066	0.049	0.044	0.041	0.041	0.035	0.033	0.043	0.029	0.027	0.016	0.012	0.010	0.004	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.007	0.027	0.045	0.057	0.065	0.099	0.129	0.157	0.185	0.213	0.222	0.244	0.250	0.262	0.274	0.284	0.294	0.308	0.330	0.359	0.380	0.388	0.392	0.397	0.224
3	0.065	0.401	0.339	0.401	0.493	0.469	0.424	0.431	0.434	0.435	0.432	0.428	0.430	0.417	0.411	0.406	0.402	0.394	0.394	0.392	0.389	0.388	0.384	0.374	0.408
4	0.069	0.191	0.180	0.164	0.156	0.153	0.156	0.162	0.150	0.138	0.129	0.117	0.105	0.079	0.063	0.047	0.043	0.047	0.051	0.049	0.058	0.059	0.065	0.065	0.110
5	0.001	0.059	0.061	0.063	0.065	0.069	0.077	0.087	0.089	0.085	0.083	0.085	0.082	0.077	0.077	0.075	0.067	0.059	0.063	0.065	0.061	0.063	0.051	0.031	0.069
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MEAN.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



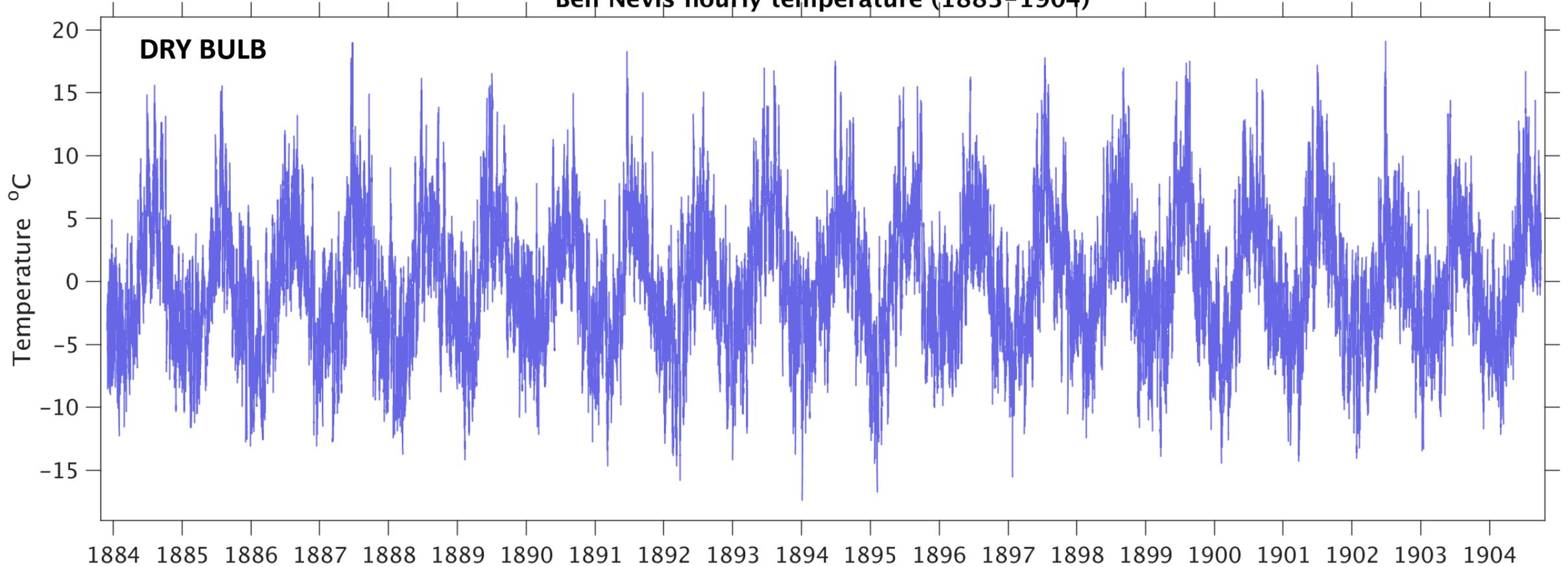
Ben Nevis hourly rainfall (1884-1904)



Also hourly data for:

- ❖ temperature (wet & dry bulb), humidity, pressure & wind force
- ❖ both Fort William (sea level) and Ben Nevis summit (1345m)

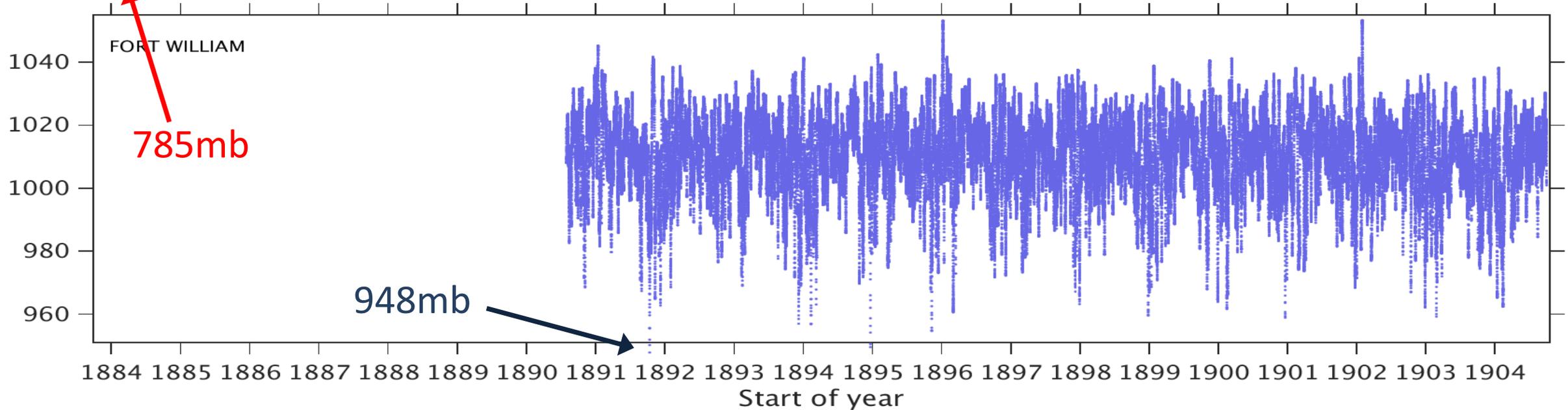
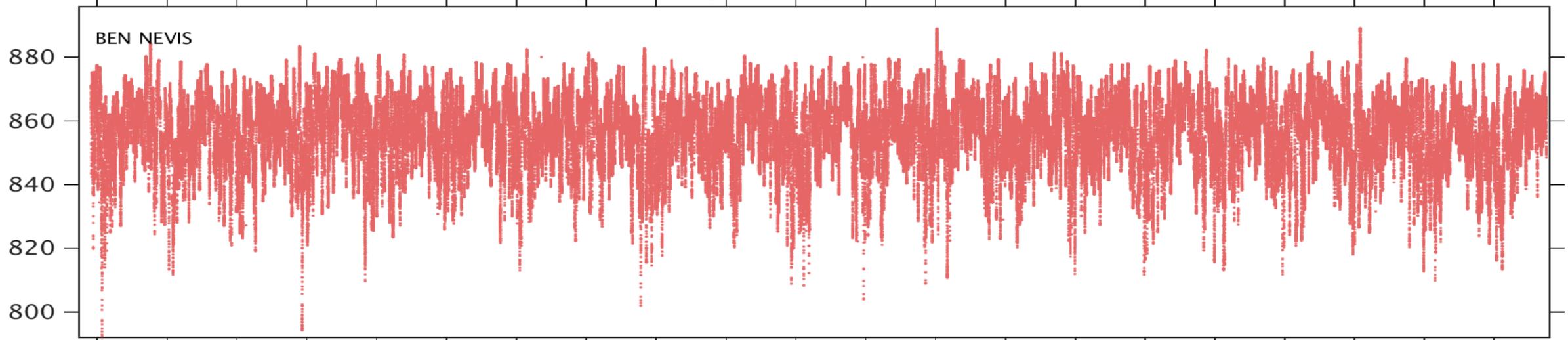
Ben Nevis hourly temperature (1883-1904)



Also hourly data for:

- ❖ temperature (wet & dry bulb), humidity, pressure & wind force
- ❖ both Fort William (sea level) and Ben Nevis summit (1345m)

Hourly atmospheric pressure [millibar]

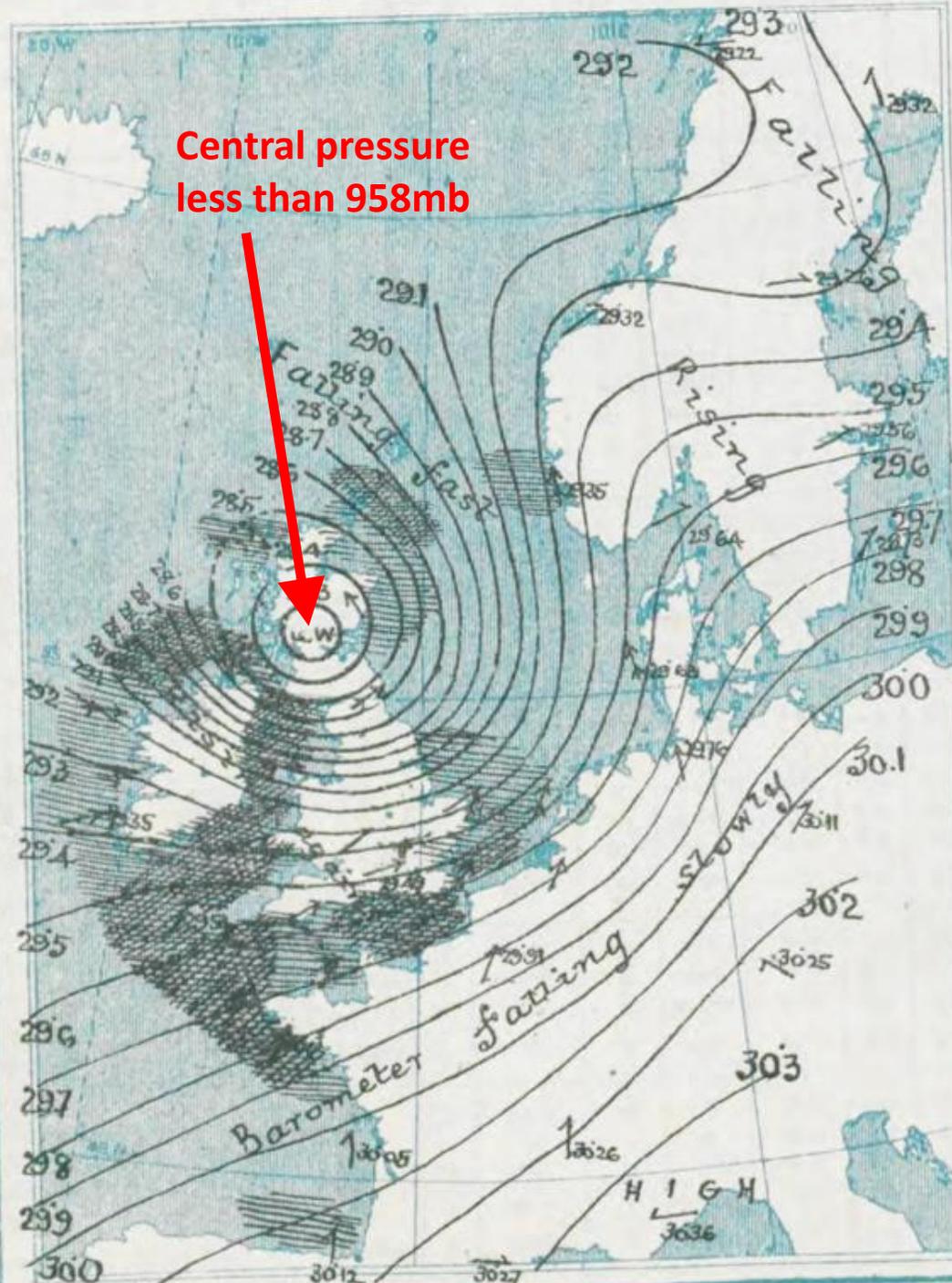


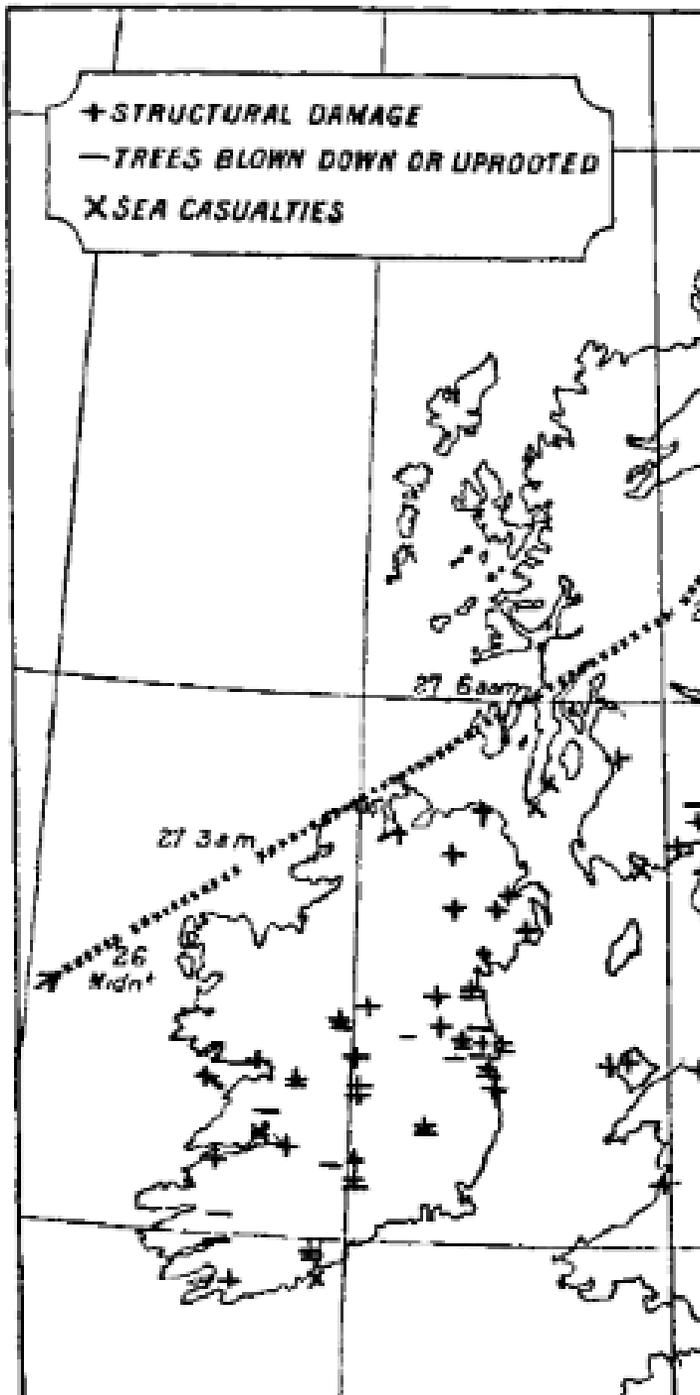
WeatherRescue.org – phase 2

DAILY WEATHER REPORT

for 8 a.m. on *Friday, 27th February, 1903.* *2nd edition.*
 Issued by the METEOROLOGICAL OFFICE, 63, Victoria Street, London. W. N. SHAW, Secretary.

STATIONS.	YESTERDAY EVENING. (See note on last page.)					THIS MORNING. (See note on last page.)										PAST 24 HOURS.			
	BAROM.		TEMP.		WIND.	BAROMETR.		TEMPERATURE.				WIND.		Sea (0 to 9.)	Temp.		Sun- shine. Hours.	Rainfall. In.	
	At 99° and M.S.L.	Dry Bulb.	Dirac.	Force (0 to 12.)	Weather	At 99° Fahr. and M. S. L.	Change since Yester- day.	Dry Bulb.	Wet Bulb.	Change since Yester- day.	Dirac.	Force (0 to 12.)	Weather.		Max.	Min.			
	Ins.	°				Ins.	Ins.	°											
SCANDINAVIA.																			
Haparanda ...	29.58	19	W	2	0	29.32	-55	32	?	+15	S	2	3	?	16	*	0.79		
Hernösand ...	29.54	34	SW	2	+	29.26	-42	34	33	+12	W	2	0	?	22	*	0.20		
Stockholm ...	29.64	38	S	2	+	29.56	-34	38	36	+1	WSW	4	0	45	30	*	0.16		
Karlstad ...	29.75	40	S	4	+	29.73	-30	38	36	+3	SW	4	0	45	30	*	0.16		
Wärmland ...	29.47	37	S	4	+	29.57	-27	36	34	-1	SW	2	0	40	37	*	0.24		
Færder (X'ania Fjord)	29.39	40	SSW	5	0	29.53	-18	39	37	0	WSW	6	0	40	37	*	0.20		
Bodö ...	29.26	39	ESE	4	0	29.22	-11	36	34	+1	E	4	0	39	36	*	0.20		
Christiansund ...	29.23	41	SW	3	0	29.32	-03	37	35	-2	WSW	2	0	48	36	*	0.16		
Skudesnaes ...	29.41	40	S	6	+	29.34	-05	39	38	-4	SSE	8	0	43	37	*	0.16		
BRITISH ISLANDS.																			
Sumburgh Head	29.22	41	W	3	0	28.81	+12	37	37	-4	SE	7	+	43	37	*	0.06		
Stornoway ...	29.26	38	WSW	3	0	28.86	-40	37	36	+2	SE	5	+	43	34	3.0	0.59		
Malin Head ...	29.37	38	SW	6	0	28.65	-53	40	40	+4	NW	9	+	42	35	*	0.30		
Blacksod Pt. ...	29.22	42	SE	5	+	29.13	-22	40	38	+2	WNW	6	0	48	36	*	0.53		
Valencia ...	29.12	45	SSE	8	+	29.35	-22	45	41	+3	WSW	7	0	47	40	1.5	0.43		
Roches Point ...	29.38	47	S	7	+	29.37	-21	43	40	+5	WNW	4	0	52	40	1.0	0.42		
Parsonstown ...	29.40	42	SE	4	+	29.21	-26	41	38	+7	W	4	0	50	?	4.5	0.36		
Donaghadee ...	29.55	42	SW	2	0	28.58	-70	40	40	+4	WNW	9	+	47	32	*	0.80		
Liverpool Obsy.	29.72	41	WSW	4	0	29.05	-42	46	40	+7	WSW	10	+	50	39	*	0.14		
Holyhead ...	29.62	44	S	6	0	29.09	-37	45	43	+5	W	10	+	45	38	*	0.36		
Pembroke (St. Ann's)	29.72	46	SSW	7	0	29.36	-22	47	44	+4	WSW	8	0	49	43	5.8	0.42		
BRITISH ISLANDS.																			
Scilly (St. Mary's) ...	29.73	49	S	8	0	29.54	-16	49	47	+3	SW	4	0	51	42	6.3	0.28		
Jersey (St. Aubins) ...	30.04	48	SSW	4	0	29.69	-20	50	49	+8	SW	4	0	51	42	7.7	0.04		
Portland Bill ...	29.93	46	SW	5	0	29.55	-14	49	47	+4	WSW	6	0	50	43	*	0.09		
Dungeness ...	29.98	46	WSW	6	0	29.59	-09	49	48	+4	SW	9	0	49	?	*	0.06		
Wick ...	29.31	38	W	4	0	28.46	-54	42	42	+6	S	6	+	44	34	*	0.15		
Nairn ...	29.36	35	SW	1	0	28.39	-67	40	39	+4	E	1	0	42	32	*	0.06		
Aberdeen ...	29.47	38	SW	3	0	28.37	-77	43	41	+5	SE	5	0	45	35	3.6	0.23		
Leith ...	29.50	42	WSW	3	0	28.30	-90	45	44	+5	WSW	3	+	46	36	*	0.25		
North Shields ...	29.61	41	SW	3	0	28.55	-79	44	41	+4	SW	8	0	46	38	*	0.20		
Spurn Head ...	29.76	42	WSW	5	0	29.01	-45	48	46	+7	SW	9	0	50	41	*	0.04		
Yarmouth ...	29.84	45	WSW	5	0	29.33	-21	51	47	+5	SW	7	0	51	39	*	0.04		
Loughborough ...																			
Oxford ...	29.84	42	SW	2	0	29.45	-19	48	43	+8	SW	4	0	46	38	*	0.04		





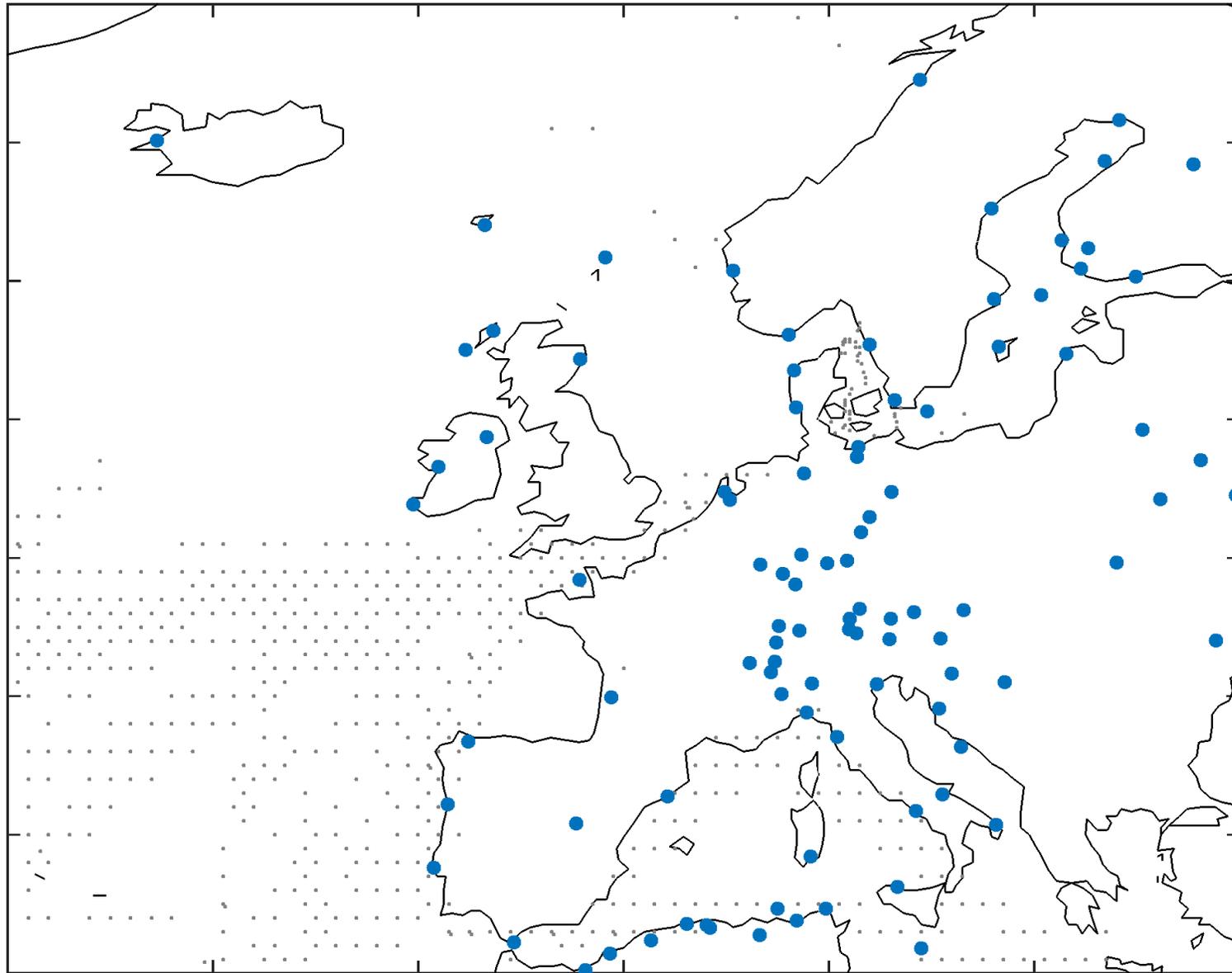
GREAT STORM, FEBRUARY 27TH, 1903.

Phœnix Park—2,948 Trees blown down (1,242 Forest Trees, 1,706 Thorns).

“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.”

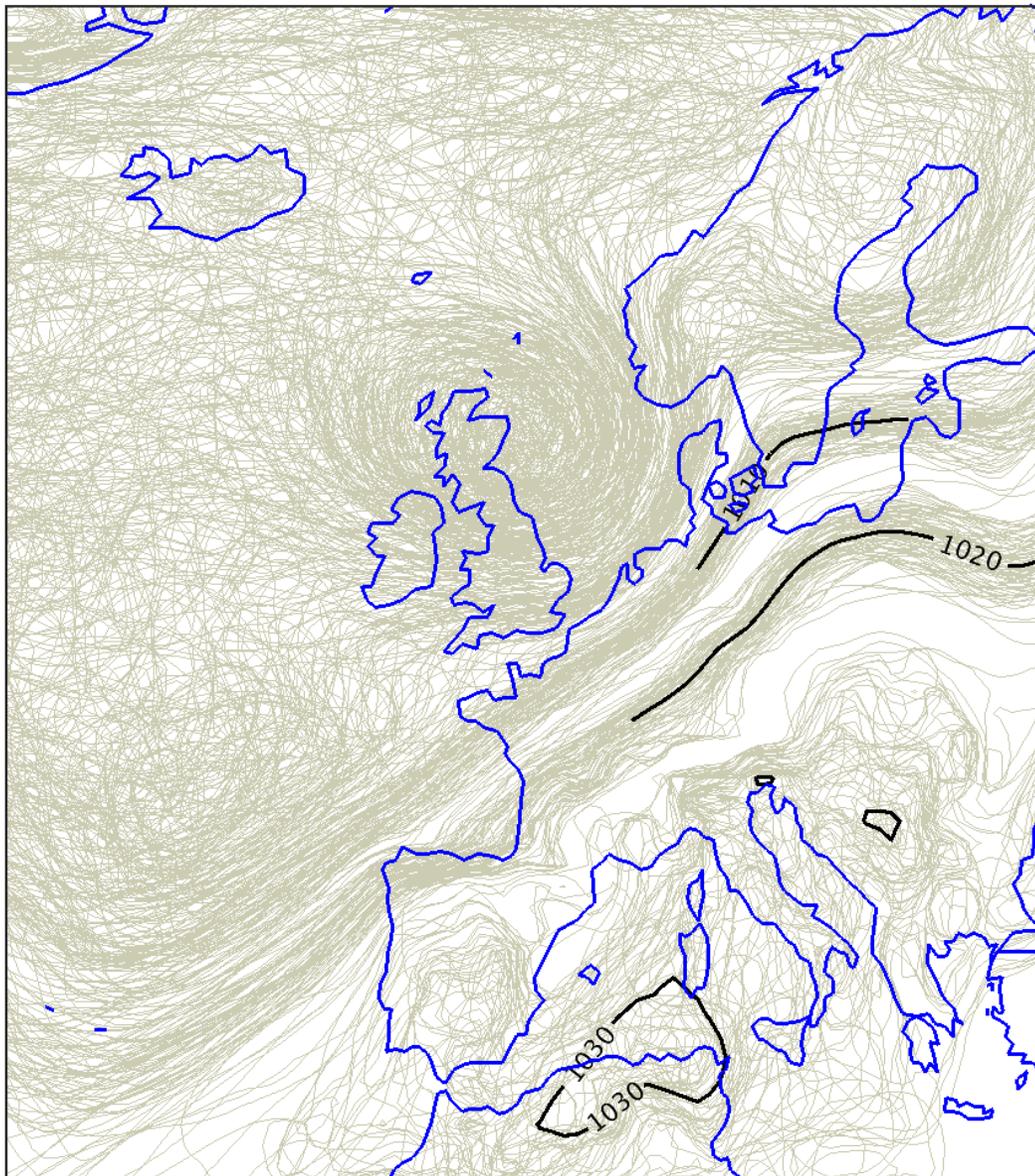
- from *Ulysses* by James Joyce, set in 1904

Pressure observations currently available for 1903



27 February 1903 at 0900

Without new observations

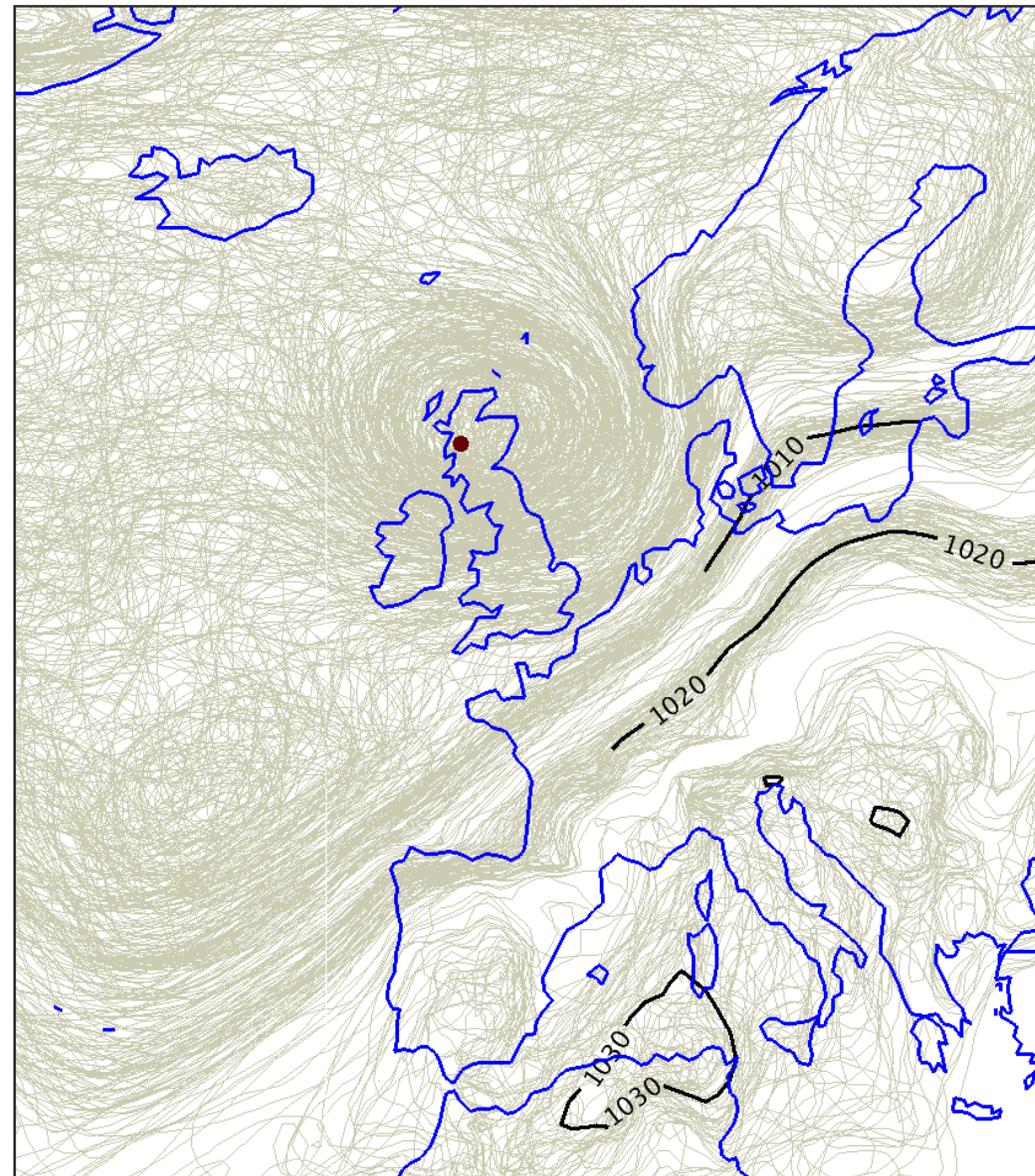
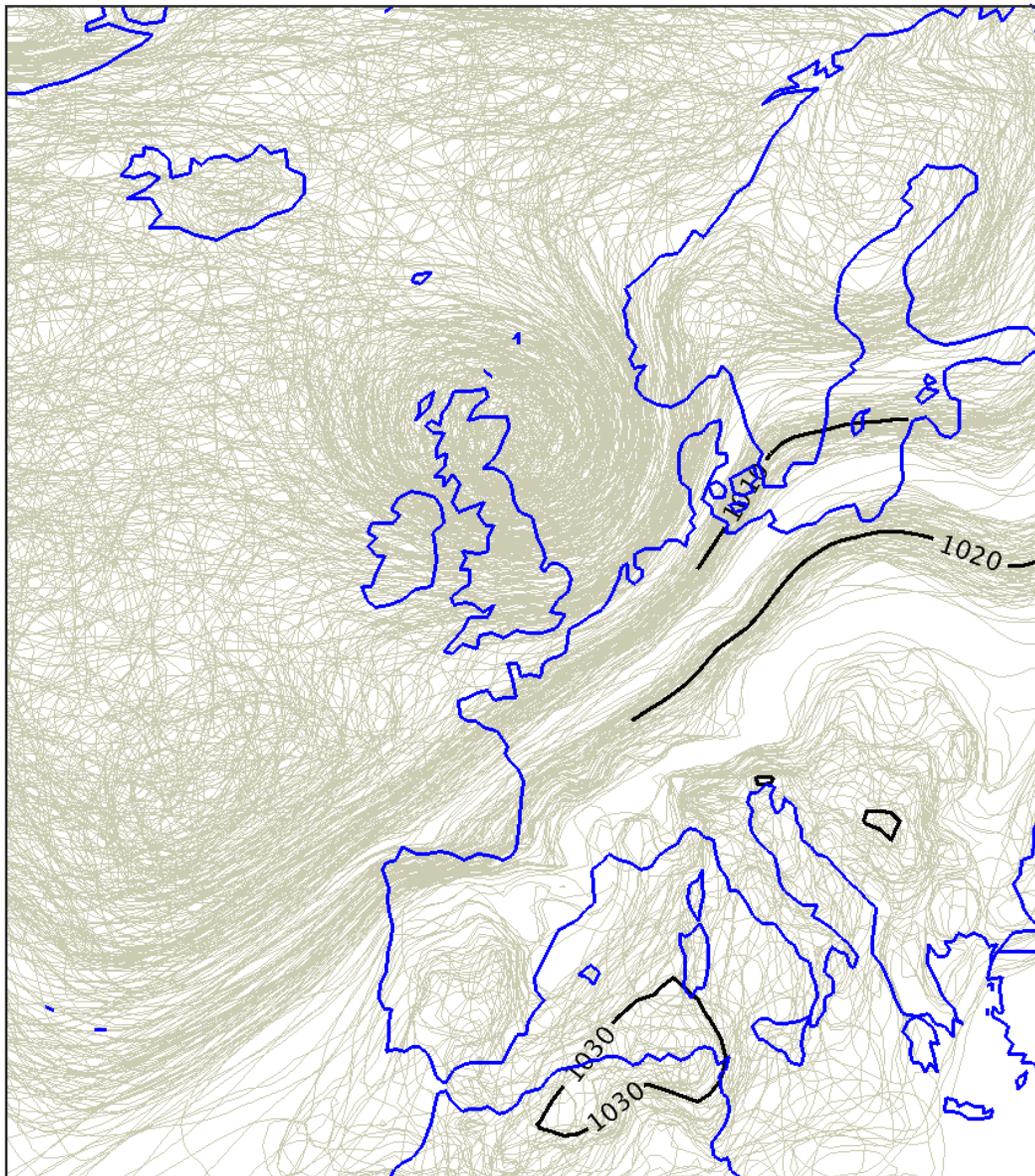


20th Century Reanalysis v3

27 February 1903 at 0900

Without new observations

Adding observations



20th Century Reanalysis v3

Offline assimilation of new observations

- ❖ **Volunteer citizen scientists have rescued 3.2million lost observations (so far), allowing us to better reconstruct past UK weather, including extreme events, to provide long-term context for modern changes**
- ❖ **Billions more observations still await rescue...**







Hourly wind speed on Ben Nevis summit

