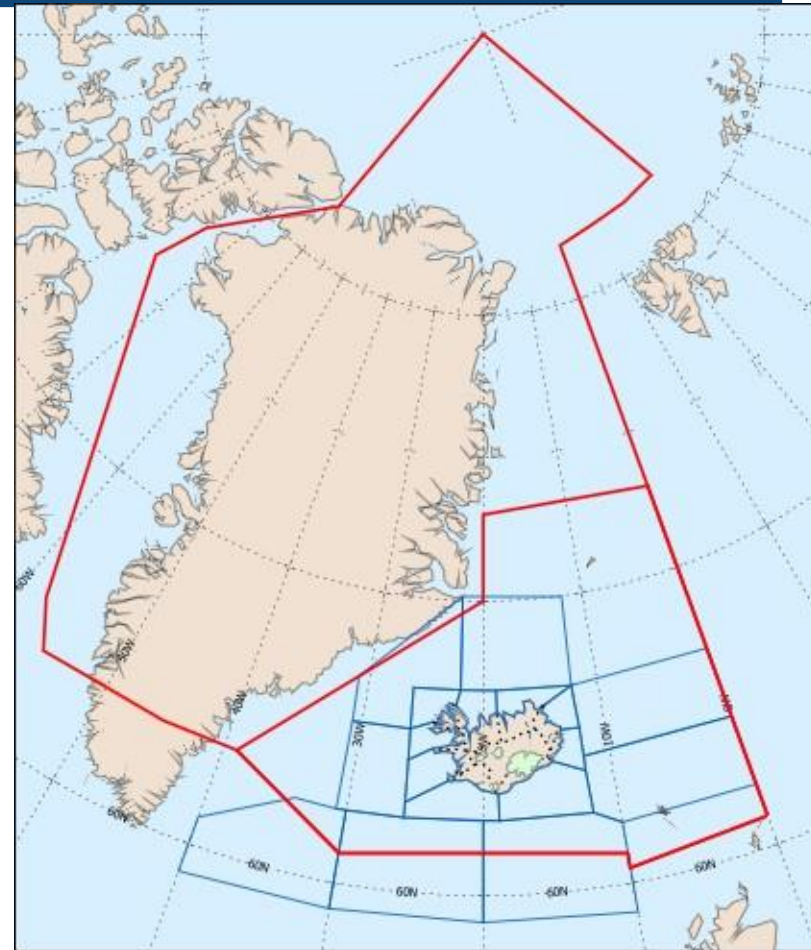

Using EMCWF's forecast to successfully predict and issue warnings for severe storms in Iceland.

The forecasters view

Helga Ívarsdóttir, Bolli Pálmason and others from the Icelandic Meteorological Office

Responsibility of the meteorologist on duty

- ▶ Monitoring and issuing forecasts and warnings for
 - ▲ land and sea
 - ▲ a large flight control area
- ▶ Consulting and communication with
 - ▲ avalanche/flood specialists
 - ▲ civil protection and rescue teams
 - ▲ media
 - ▲ Aristotle project



Possibility of storms

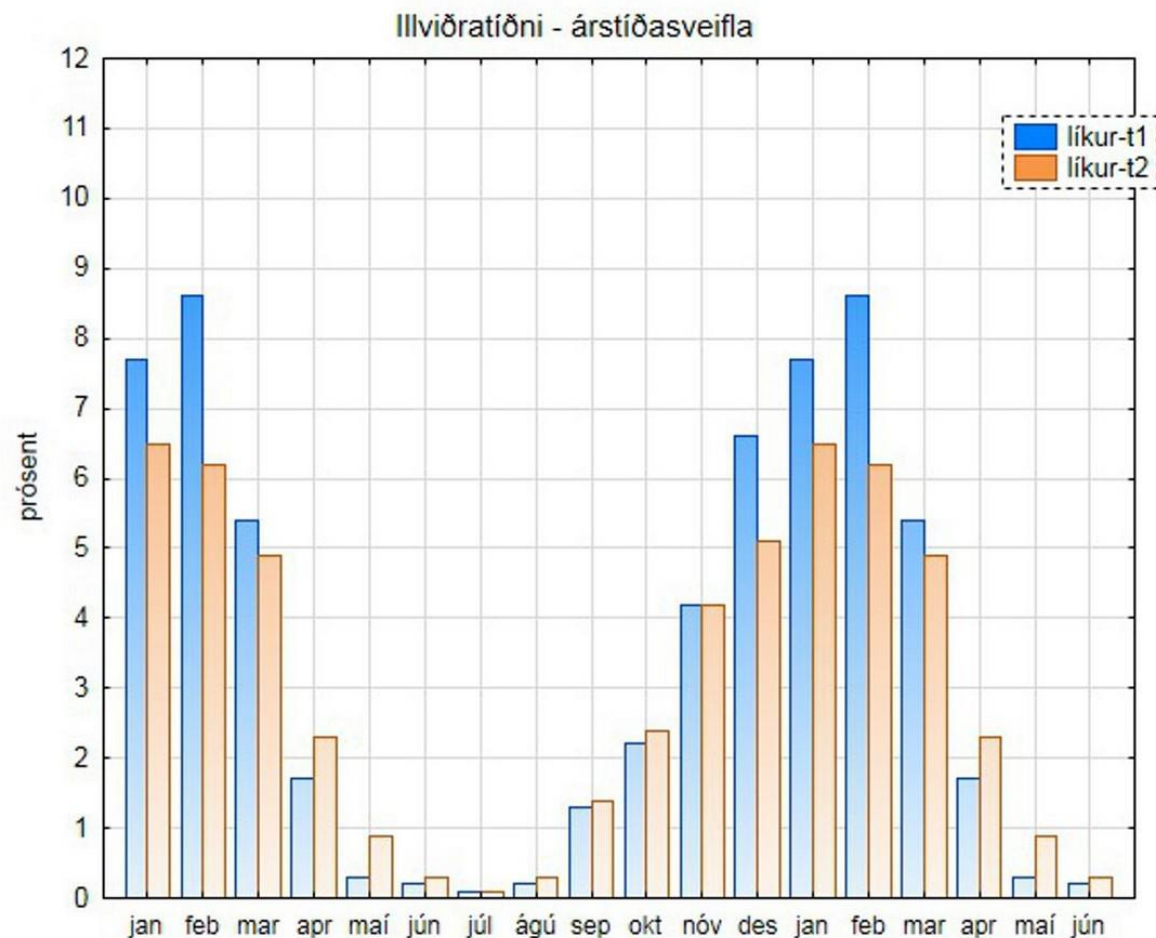
Sample: 1949-2016

t1: $W > 20$ m/s in $\frac{1}{4}$ of selected weather stations

t2: 24h mean wind in selected station in populated areas $> 10,5$ m/s

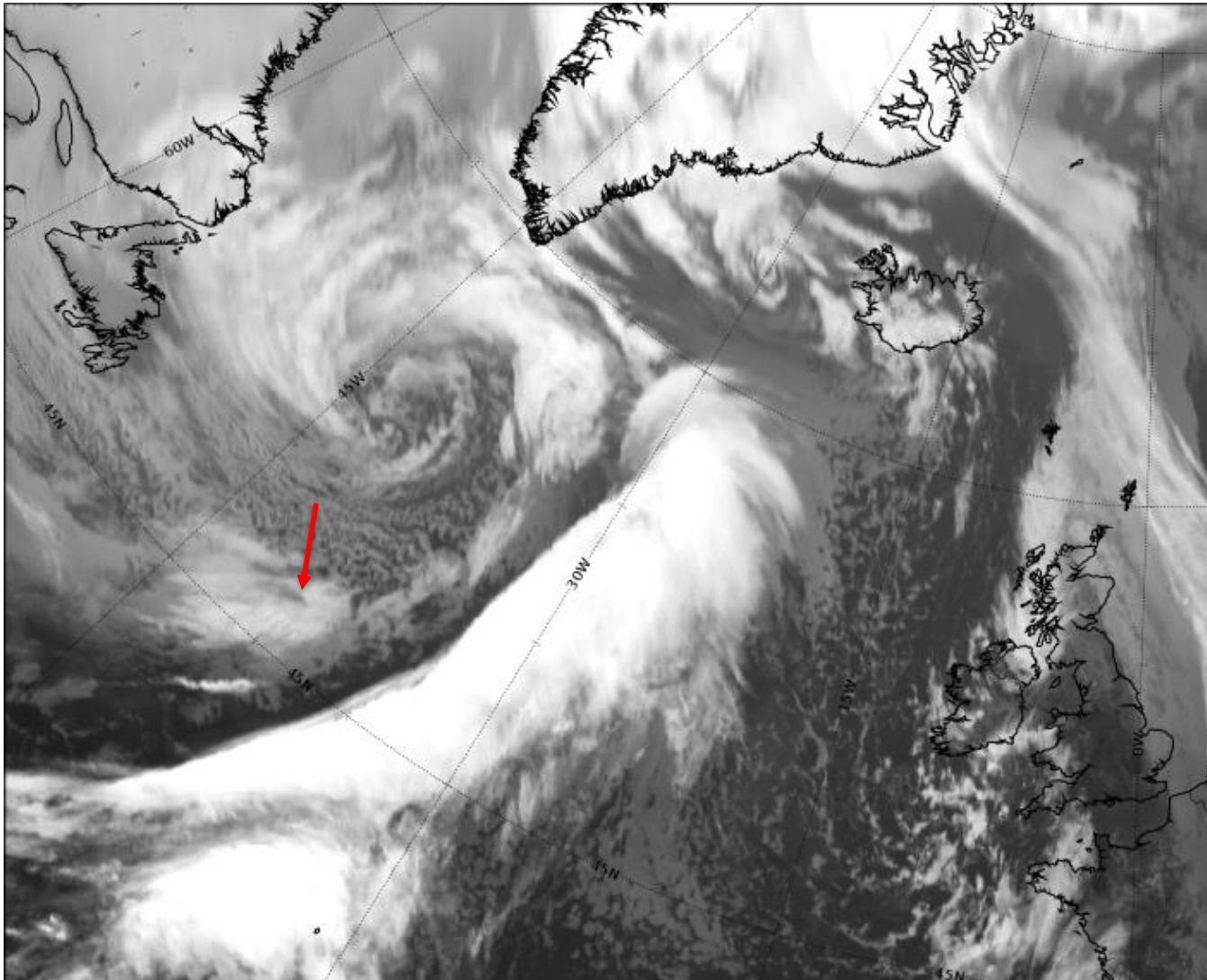
Winter 2016-2017

- t2 = 7 days (2 in may)



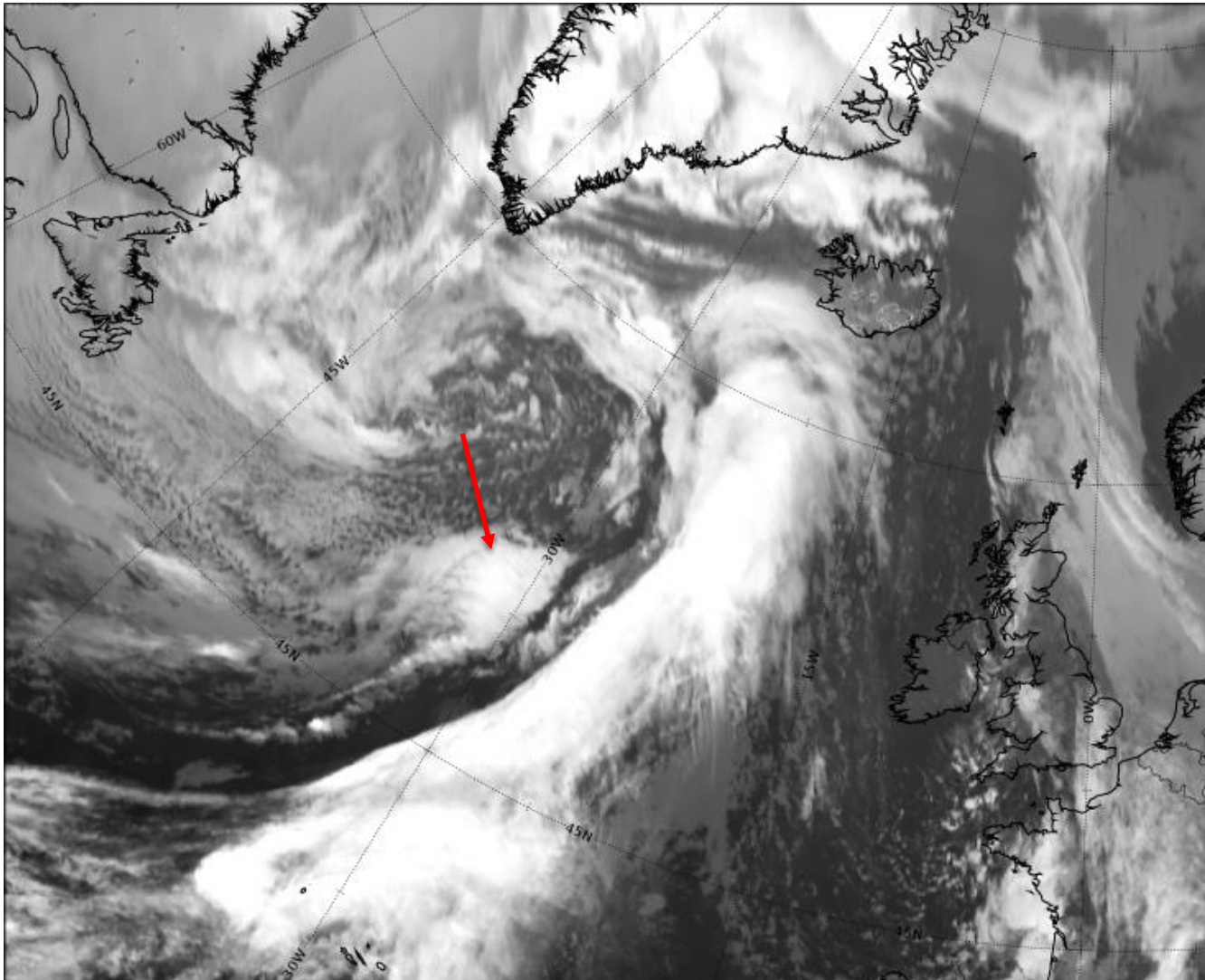
SEVIRI IR10.8

07.02 12Z



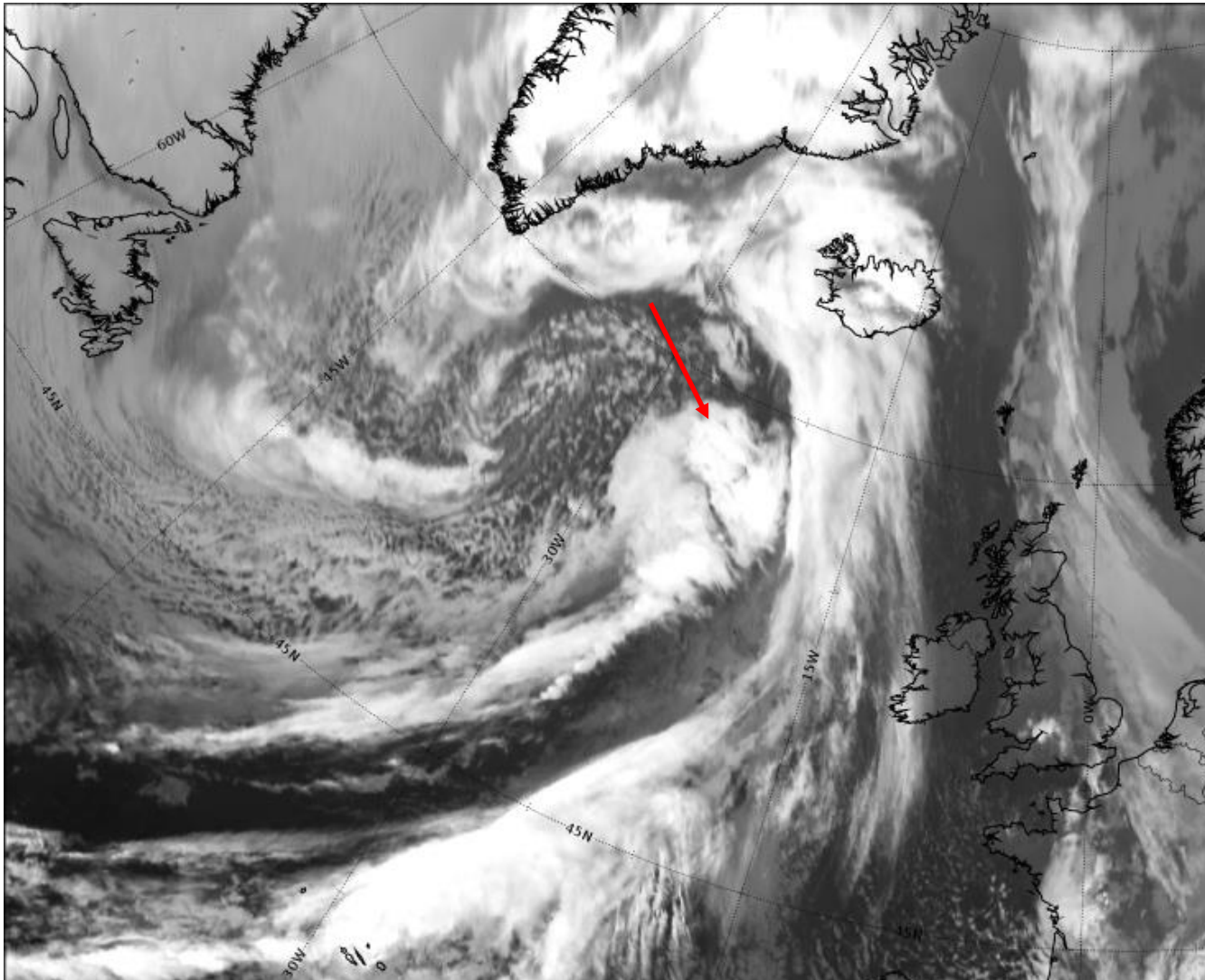
SEVIRI IR10.8

07.02 18Z



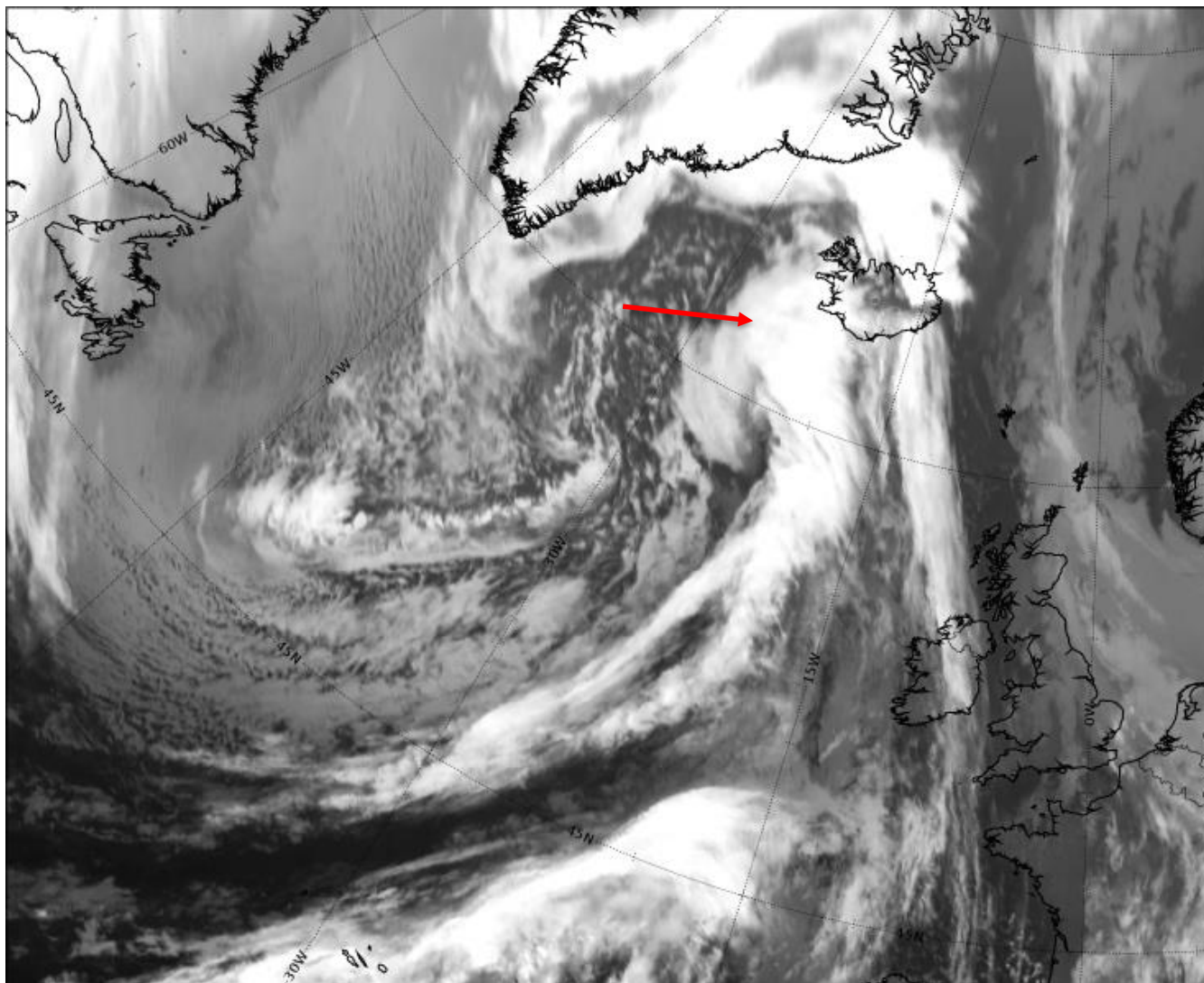
SEVIRI IR10.8

08.02 00Z

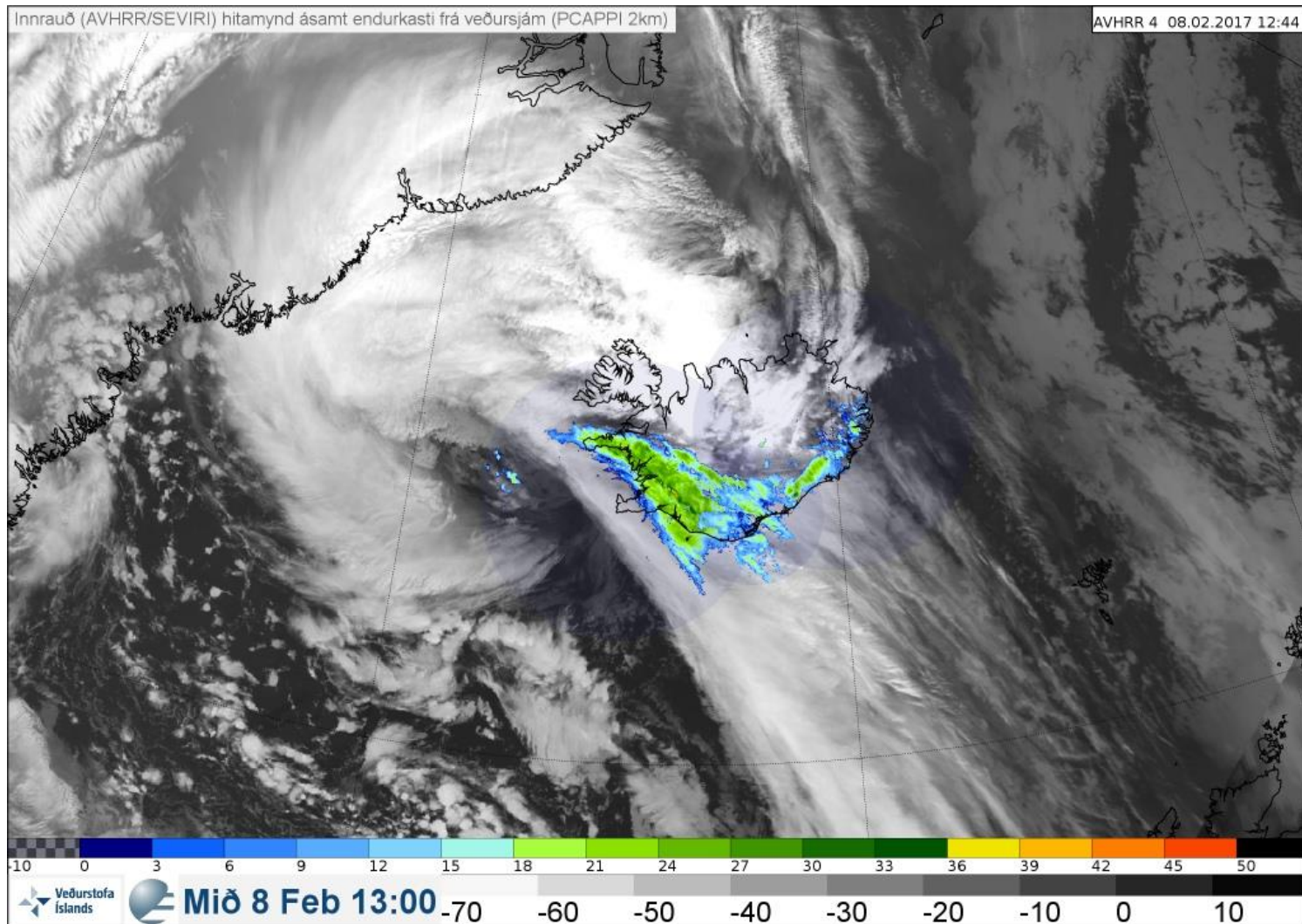


SEVIRI IR10.8

08.02 06Z



AVHRR 12:44Z and PCAPPI 13Z



Forecast for Wednesday 08. February 2017

Severe weather forecast

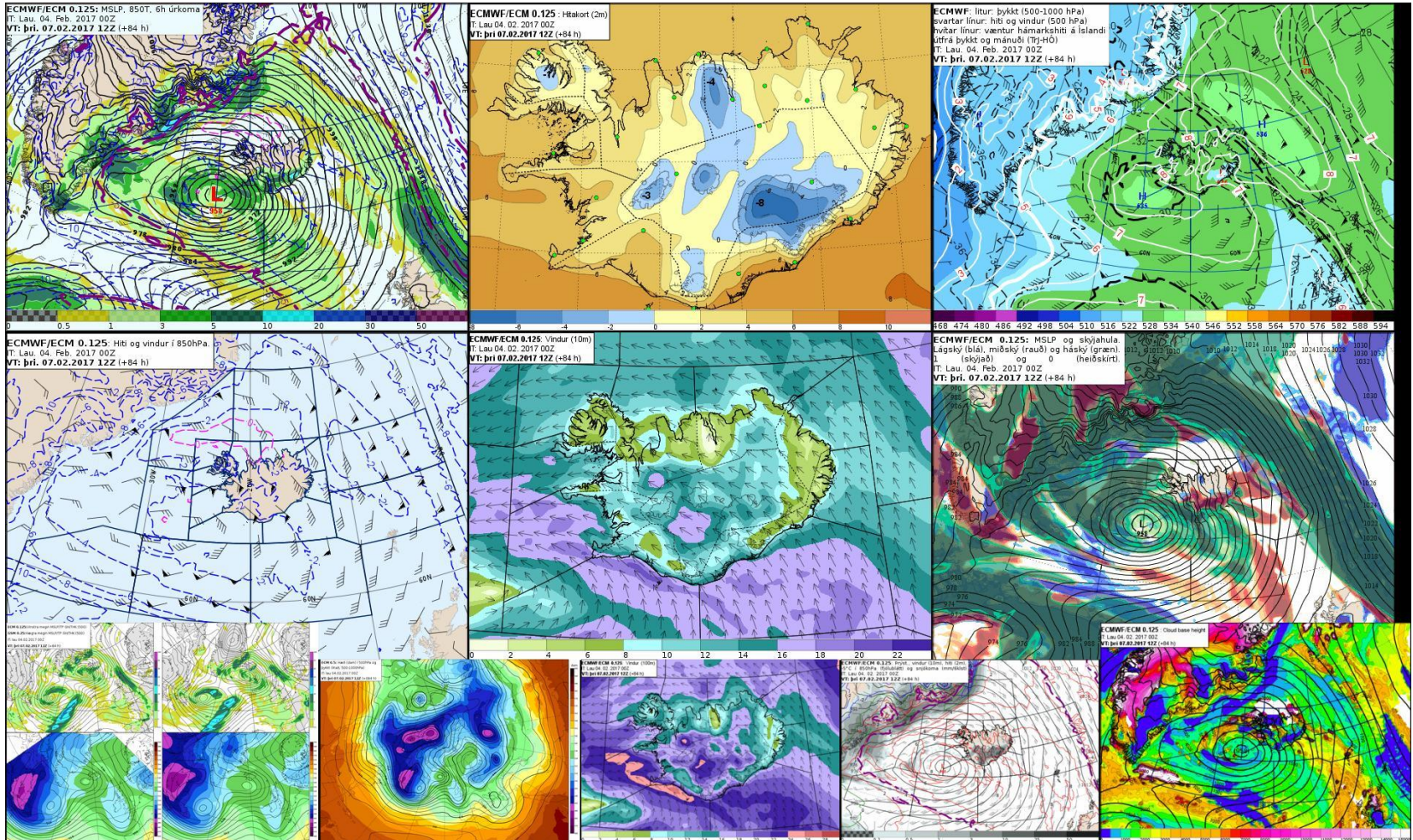
- ▶ Gale warnings are issued from IMO if windspeed exceeds 20 m/s

Date	Lead time	Forecast	
03.02.2017	120 h	Gale	15-20 m/s
04.02.2017	96 h	Strong gale	18-23 m/s
05.02.2017	72 h	Strong gale	18-23 m/s
06.02.2017	48 h	Storm	20-25 m/s
07.02.2017	24 h	Violent storm	23-30 m/s

ECMWF – HRES

IT 05.02 00Z

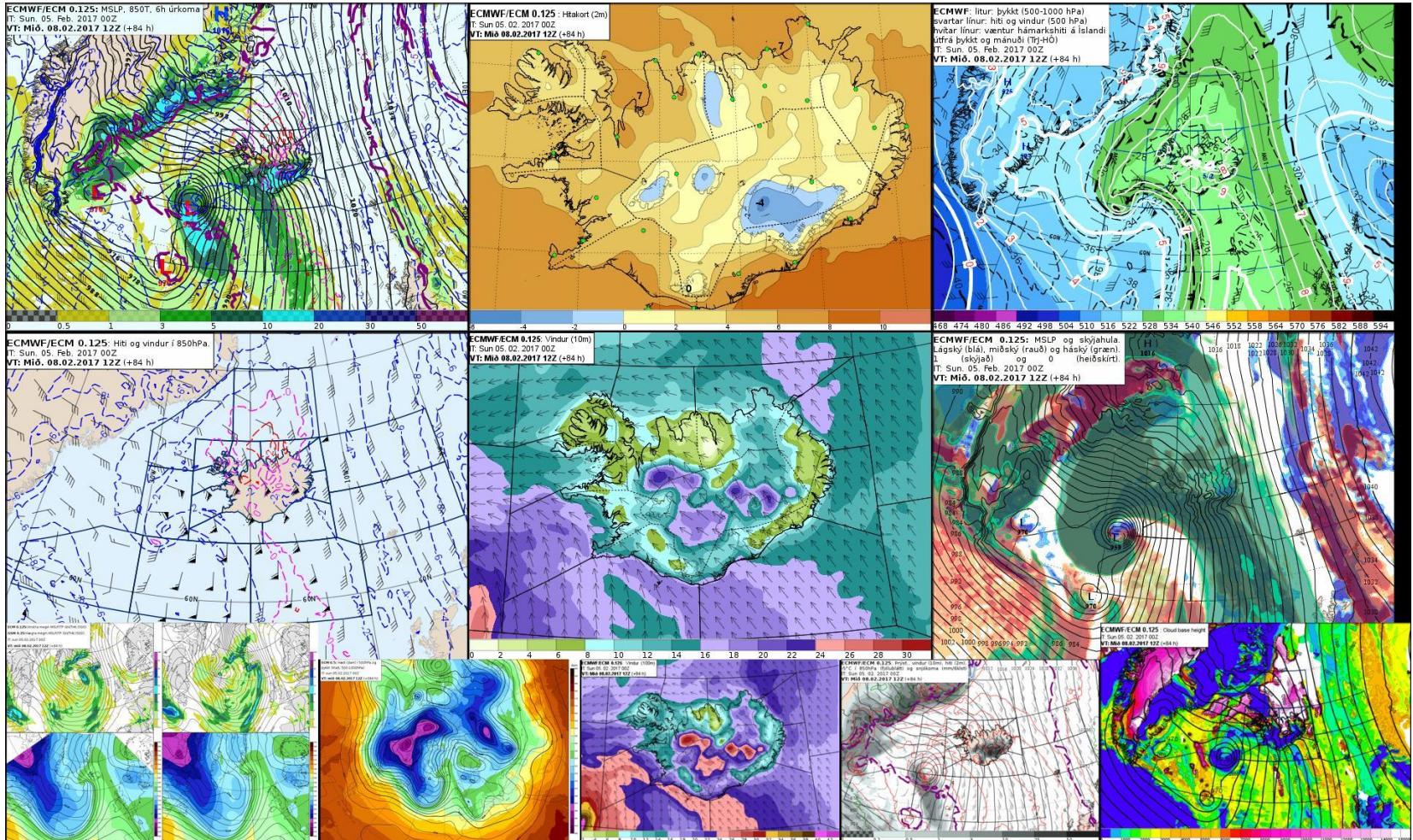
VT 08.02 12Z



ECMWF – HRES

IT 06.02 00Z

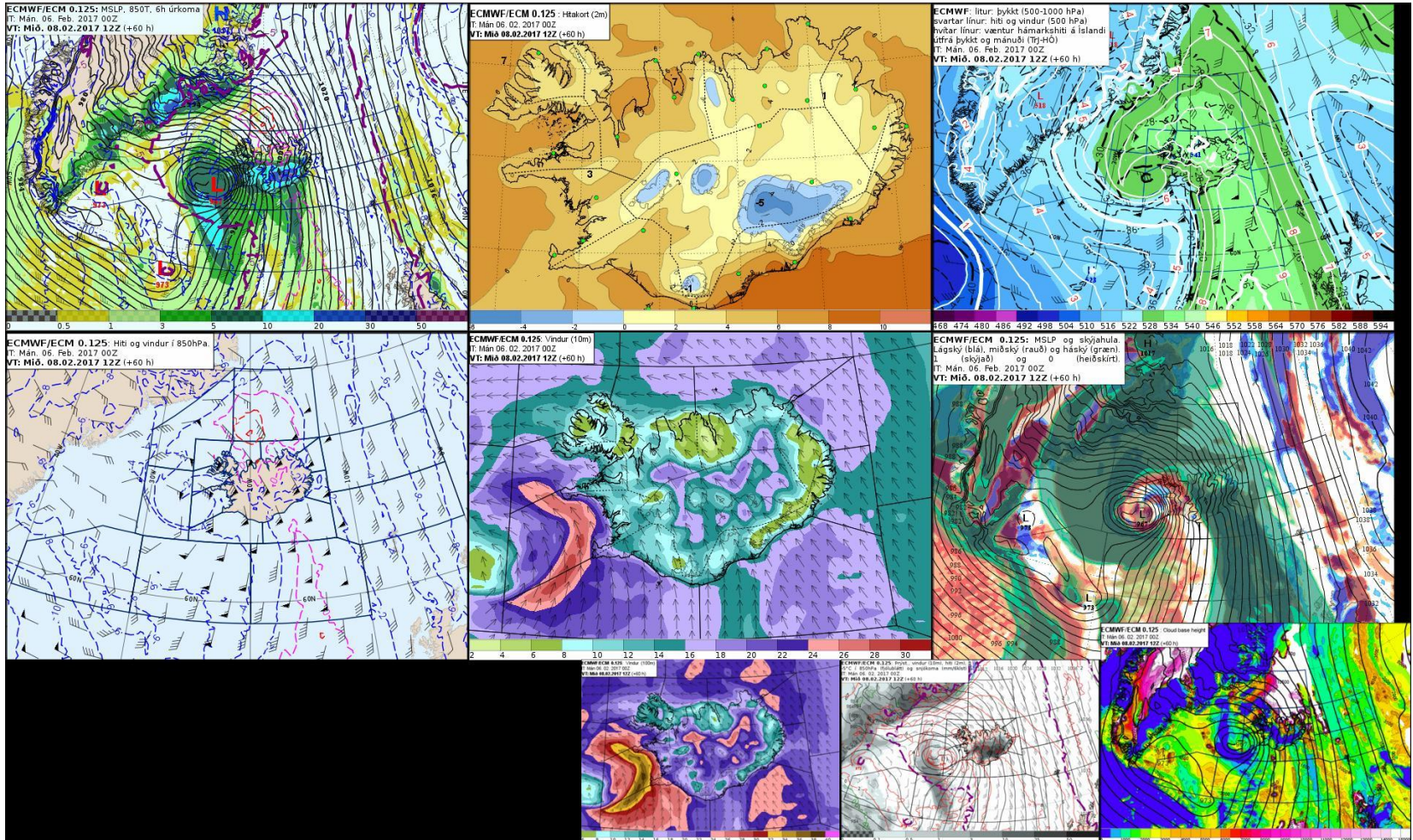
VT 08.02 12Z



ECMWF – HRES

IT 07.02 00Z

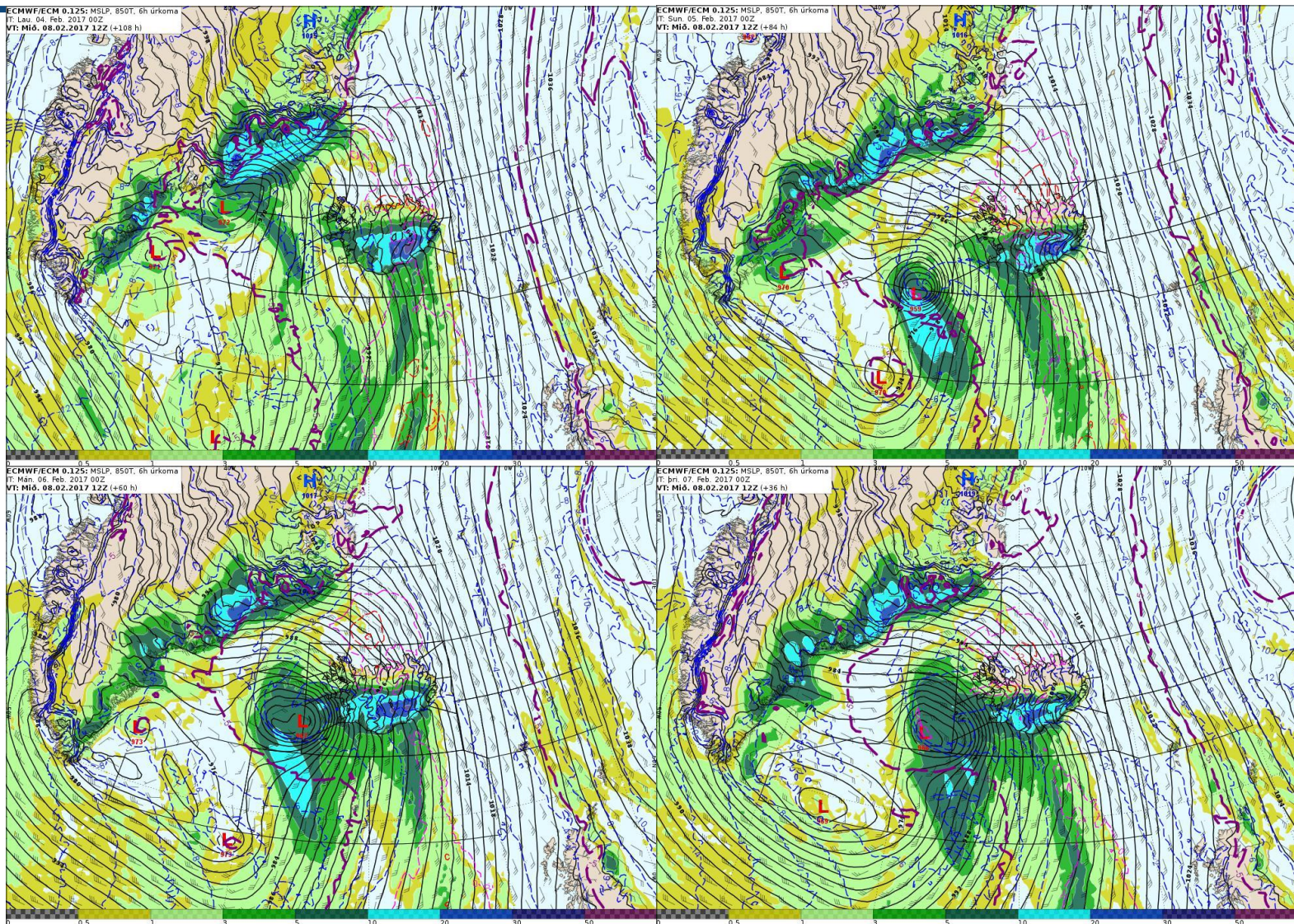
VT 08.02 12Z



ECMWF – HRES

IT 04.02 00Z – 07.02 00Z

VT 08.02 12Z



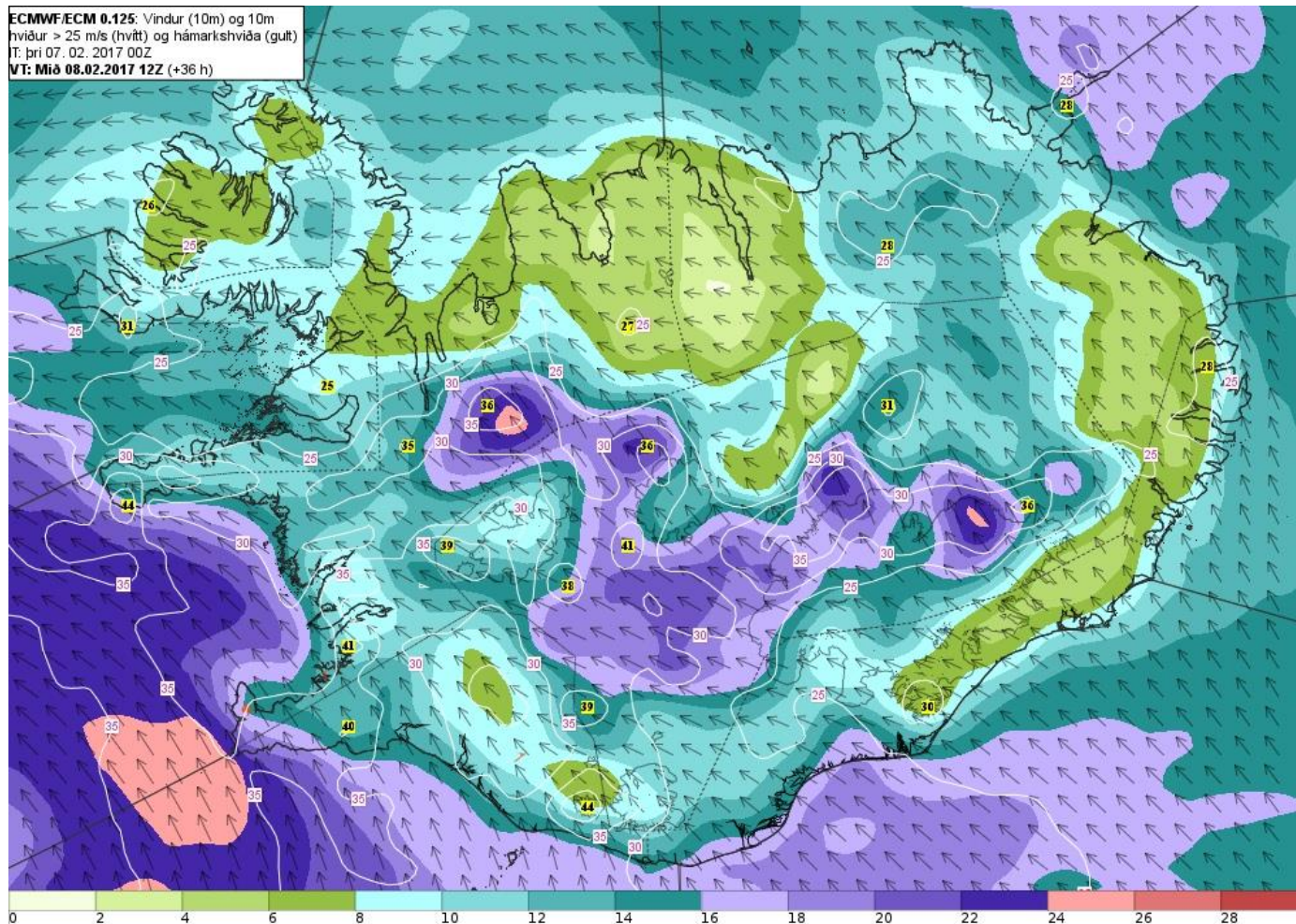
MSLP difference between westernmost and easternmost part of Iceland at 12Z in ECMWF - HRES forecast compared to observations.

Lead time	Gufuskálar	Dalatangi	Difference
+108	992 hPa	1014 hPa	22 hPa
+85	988 hPa	1013 hPa	25 hPa
+60	980 hPa	1011 hPa	31 hPa
+36	986 hPa	1013 hPa	27 hPa
+00	986,5 hPa	1012,6 hPa	26,1 hPa

ECMWF – HRES wind (10m) wg (10m)

IT 07.02 00Z

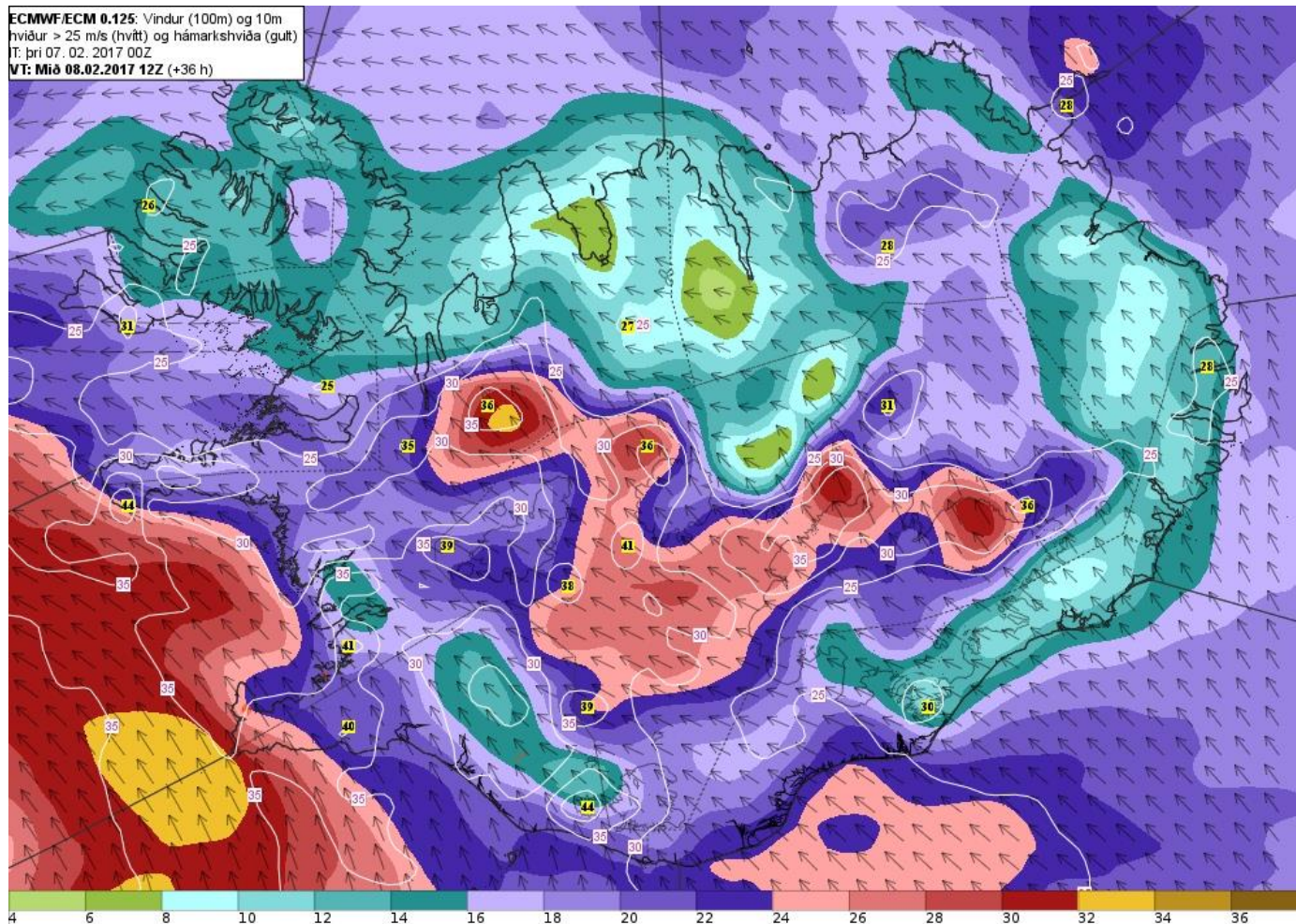
VT 08.02 12Z



ECMWF – HRES wind (100m) wg (10m)

IT 07.02 00Z

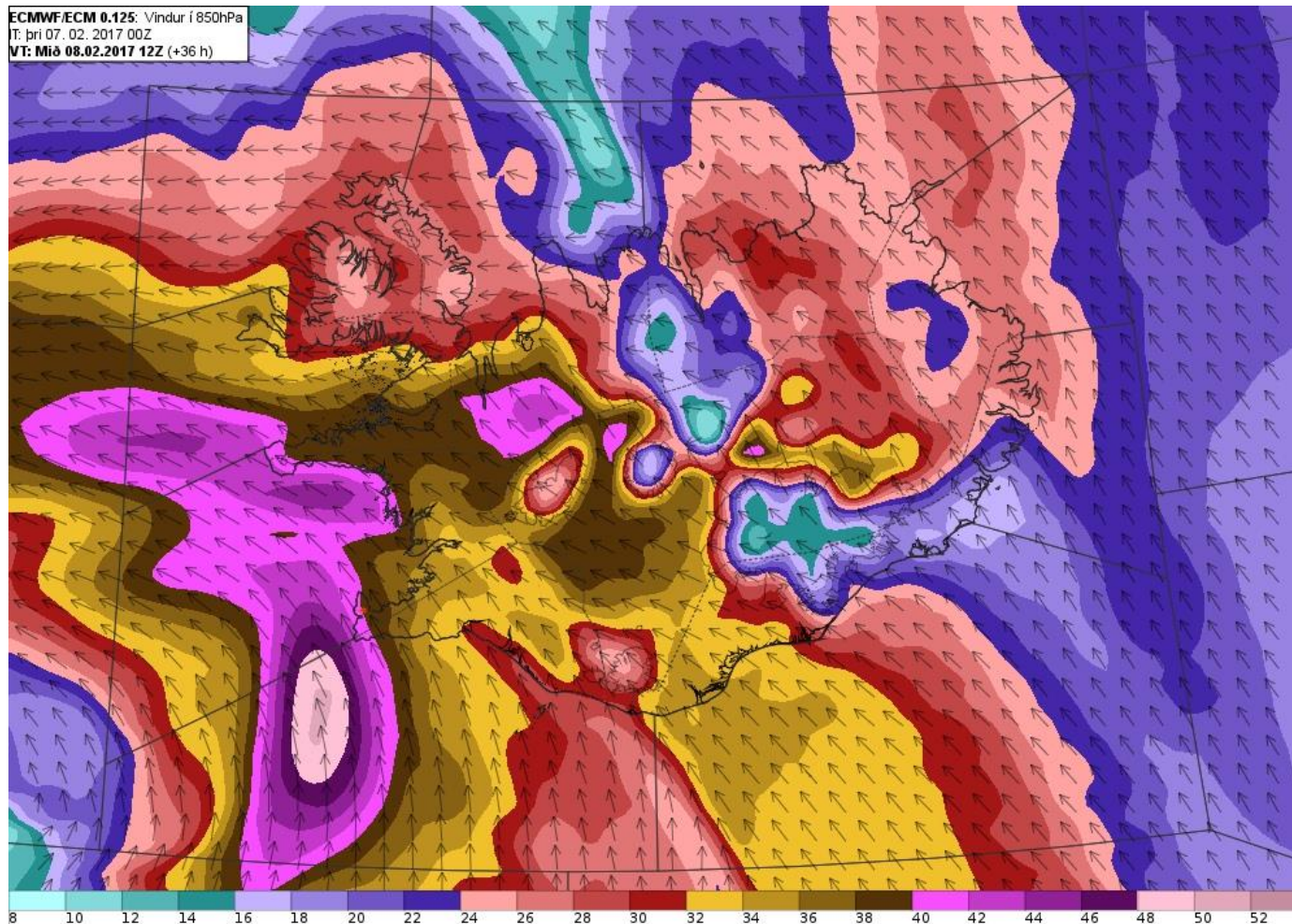
VT 08.02 12Z



ECMWF – HRES wind (850hPa)

IT 07.02 00Z

VT 08.02 12Z

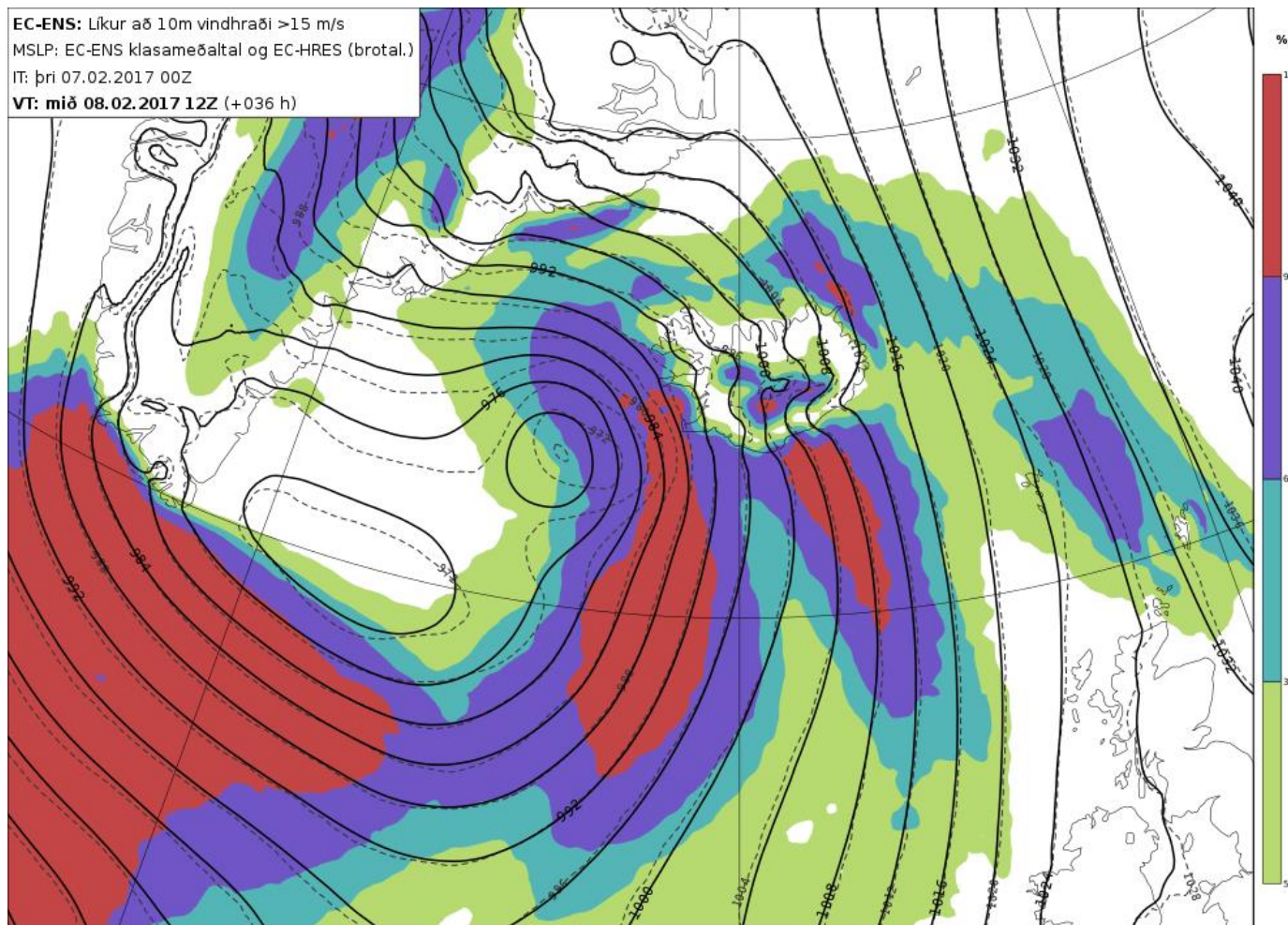


ECMWF – ENS (Prob W > 15 m/s)

IT 07.02 00Z

VT 08.02 12Z

EC-ENS: Líkur að 10m vindhraði >15 m/s
MSLP: EC-ENS klasameðaltal og EC-HRES (brotal.)
IT: þri 07.02.2017 00Z
VT: mið 08.02.2017 12Z (+036 h)

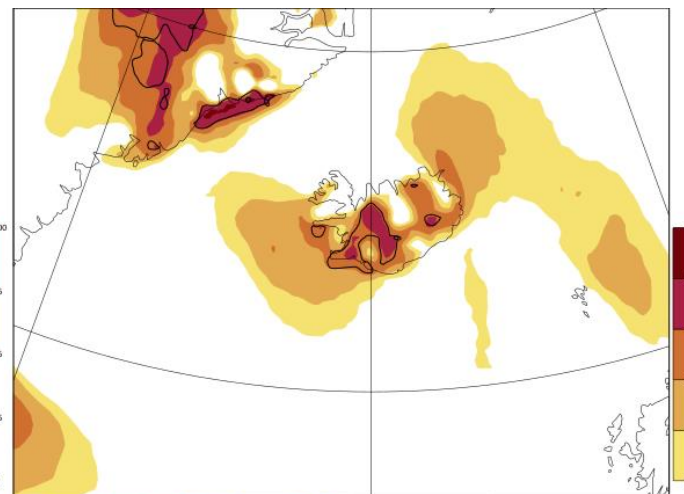
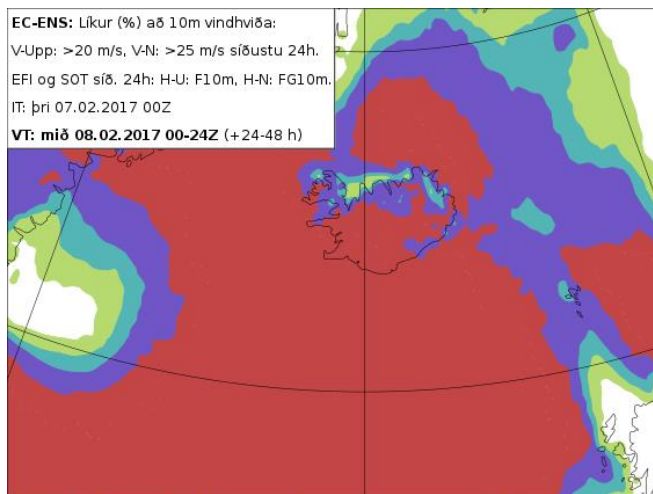


ECMWF – ENS (EFI and SOT)

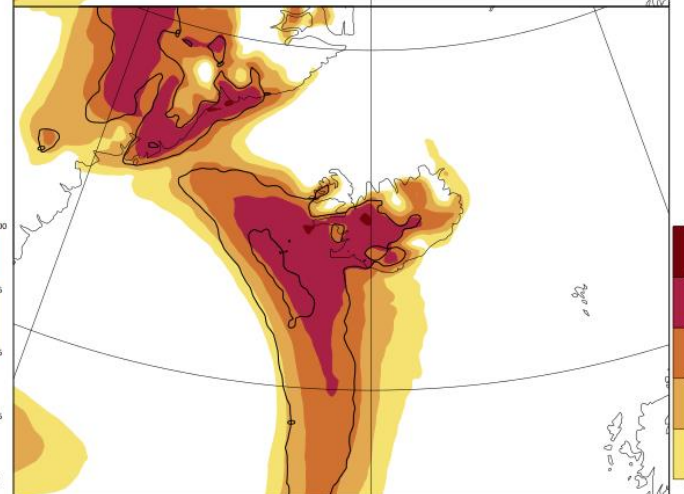
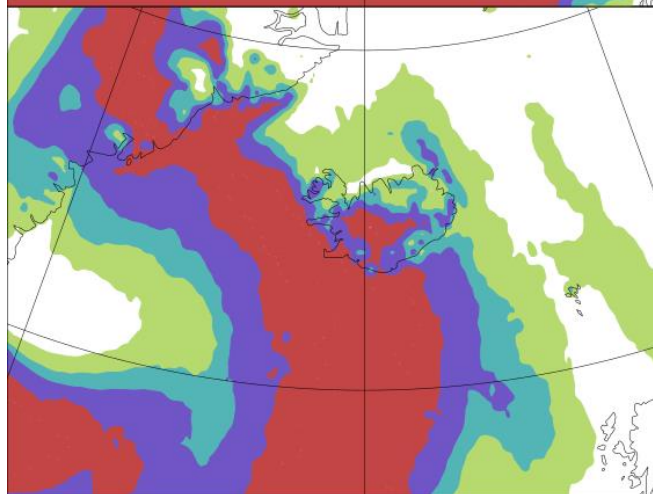
IT 07.02 00Z

VT 08.02 12Z

Wg > 20 m/s



Wg > 25 m/s



ECMWF – ENS (MSLP and STd)

IT 07.02 00Z

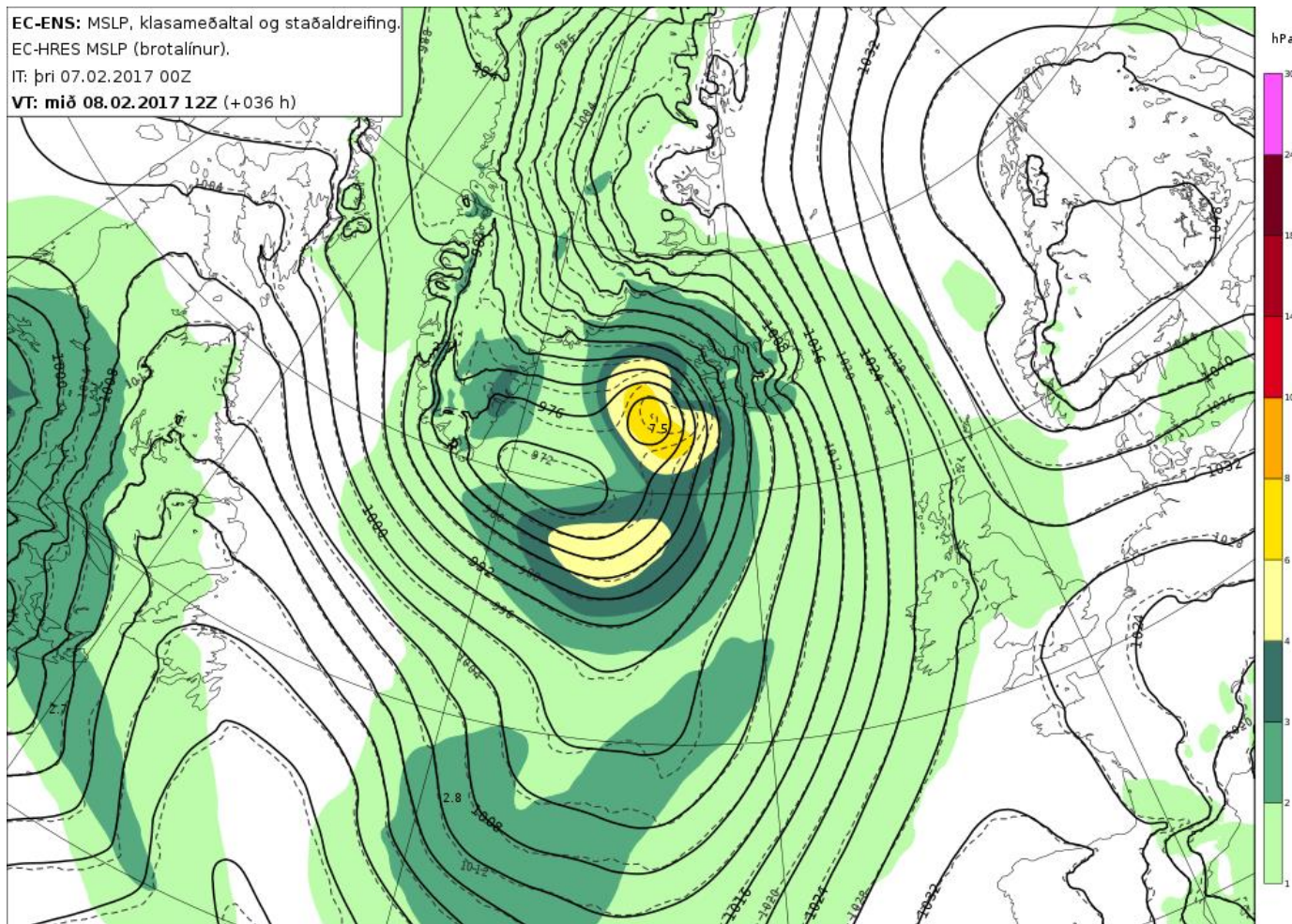
VT 08.02 12Z

EC-ENS: MSLP, klasameðaltal og staðaldreifing.

EC-HRES MSLP (brotalínur).

IT: þri 07.02.2017 00Z

VT: mið 08.02.2017 12Z (+036 h)

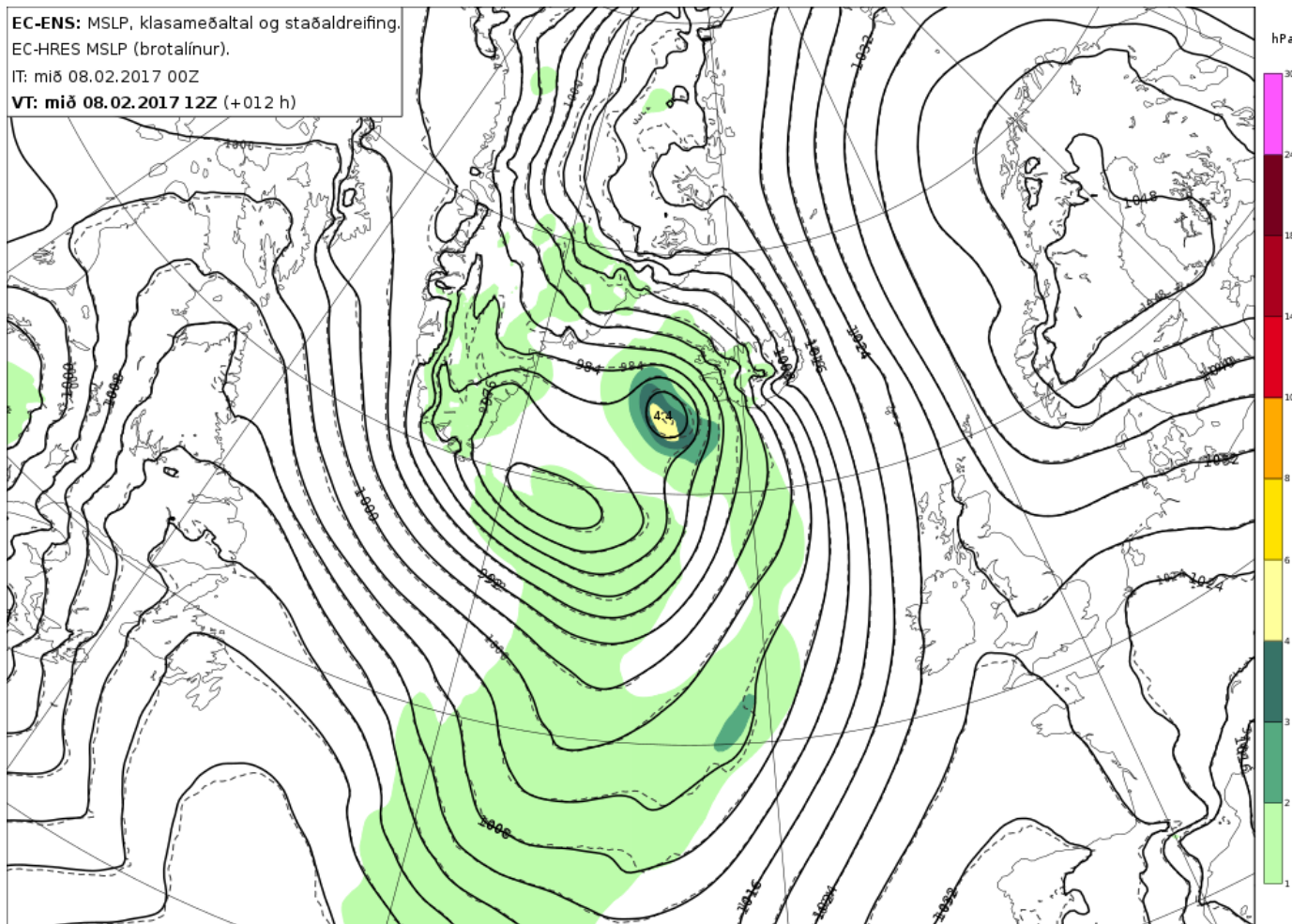


ECMWF – ENS (MSLP and STd)

IT 08.02 00Z

VT 08.02 12Z

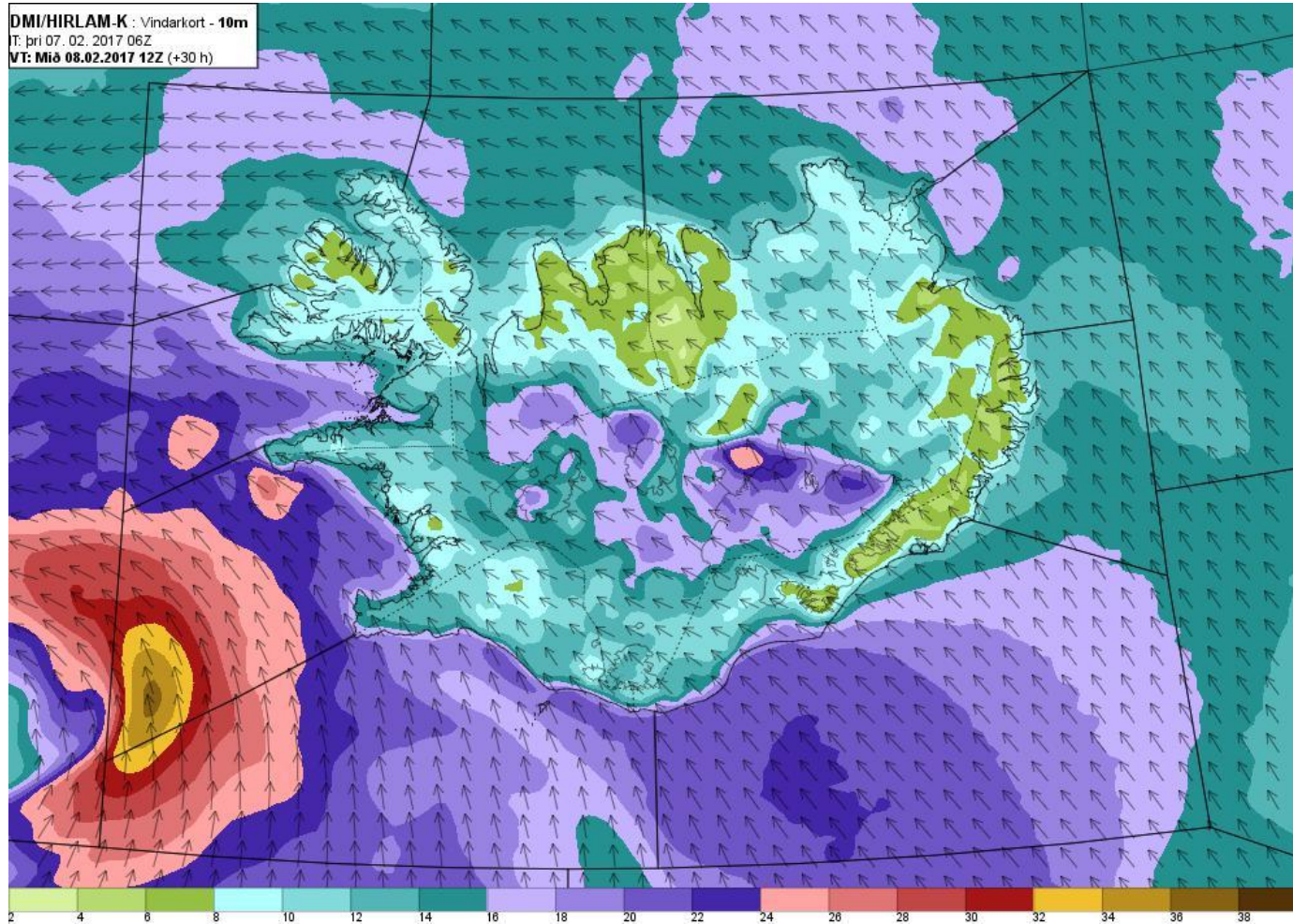
EC-ENS: MSLP, klasameðaltal og staðaldreifing.
EC-HRES MSLP (brotalínur).
IT: mið 08.02.2017 00Z
VT: mið 08.02.2017 12Z (+012 h)



HIRLAM – K Wind (10m)

IT 07.02 06Z

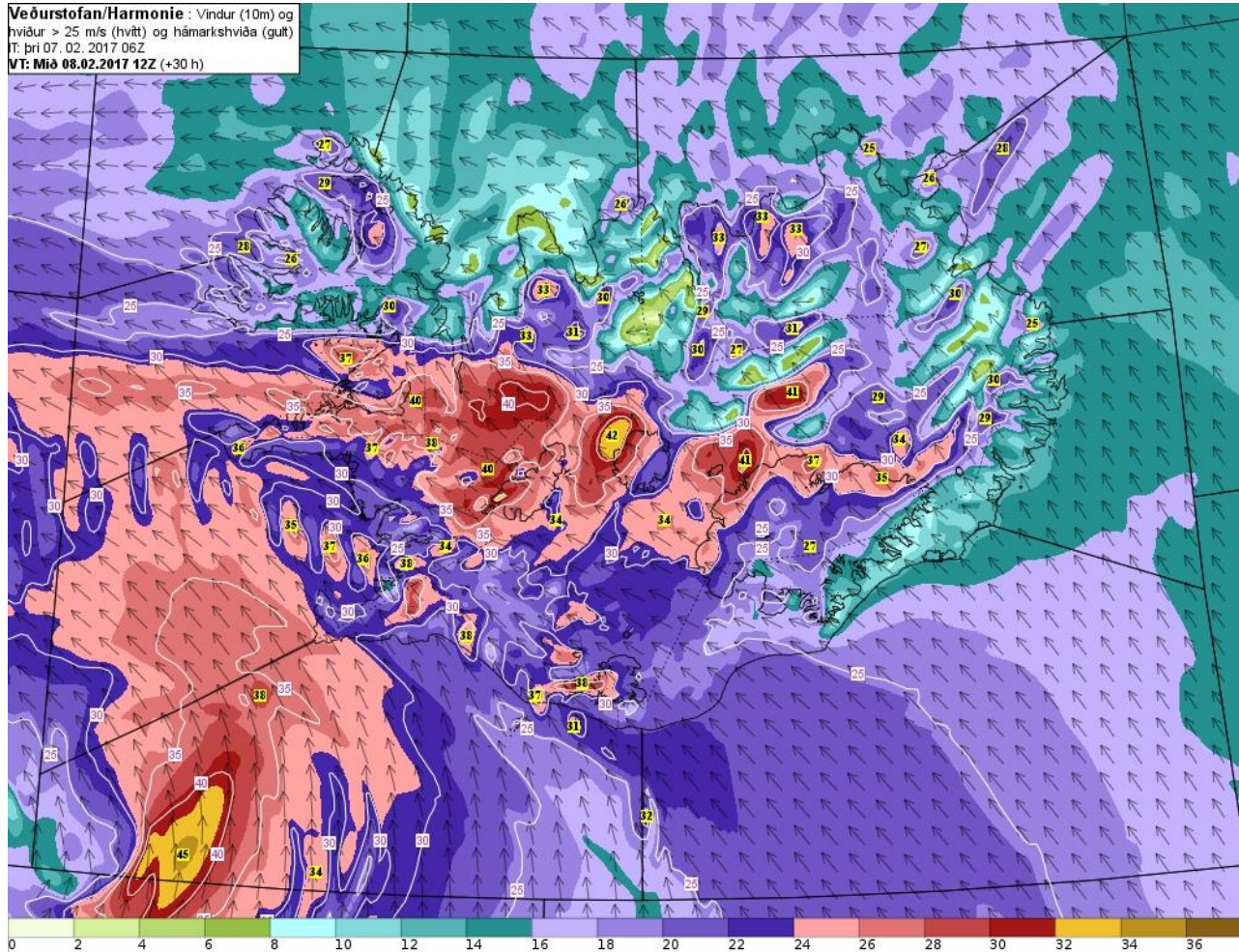
VT 08.02 12Z



Harmonie Wind (10m)

IT 07.02 06Z

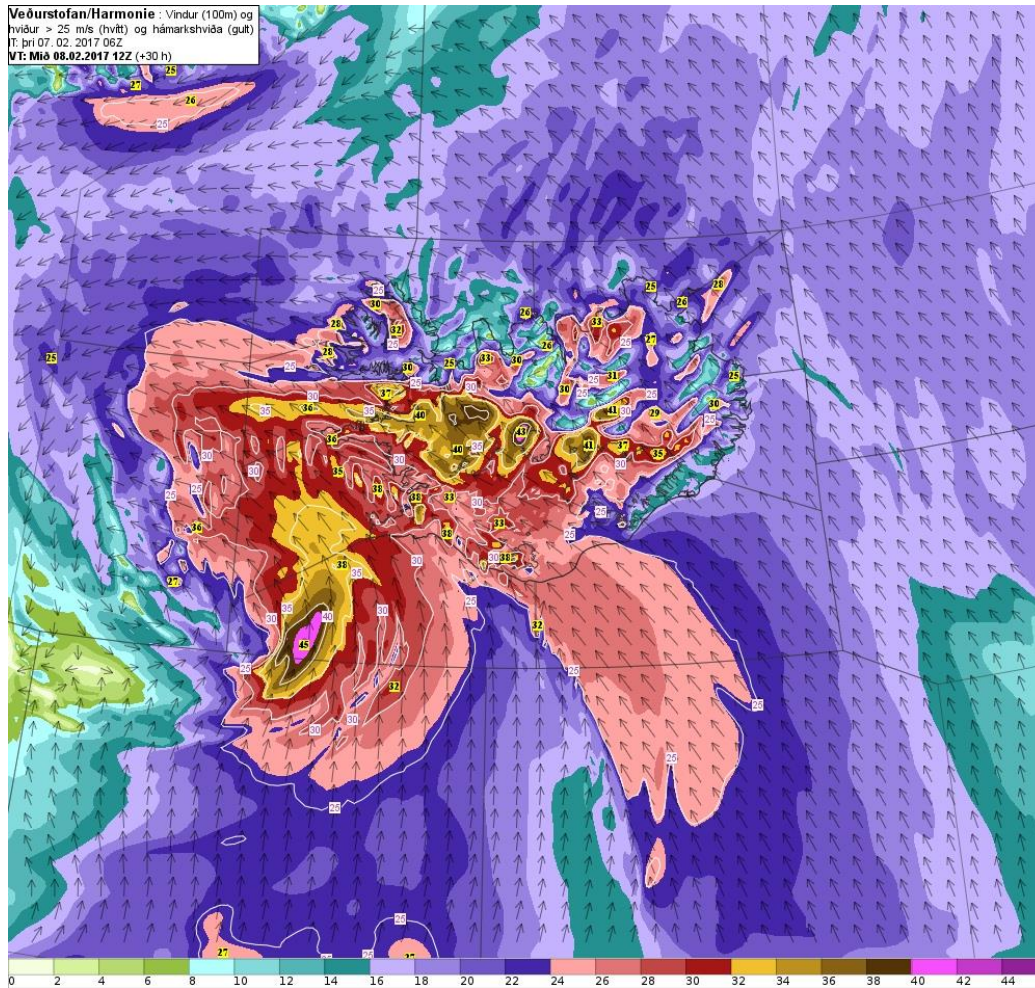
VT 08.02 12Z



Harmonie Wind (100m)

IT 07.02 06Z

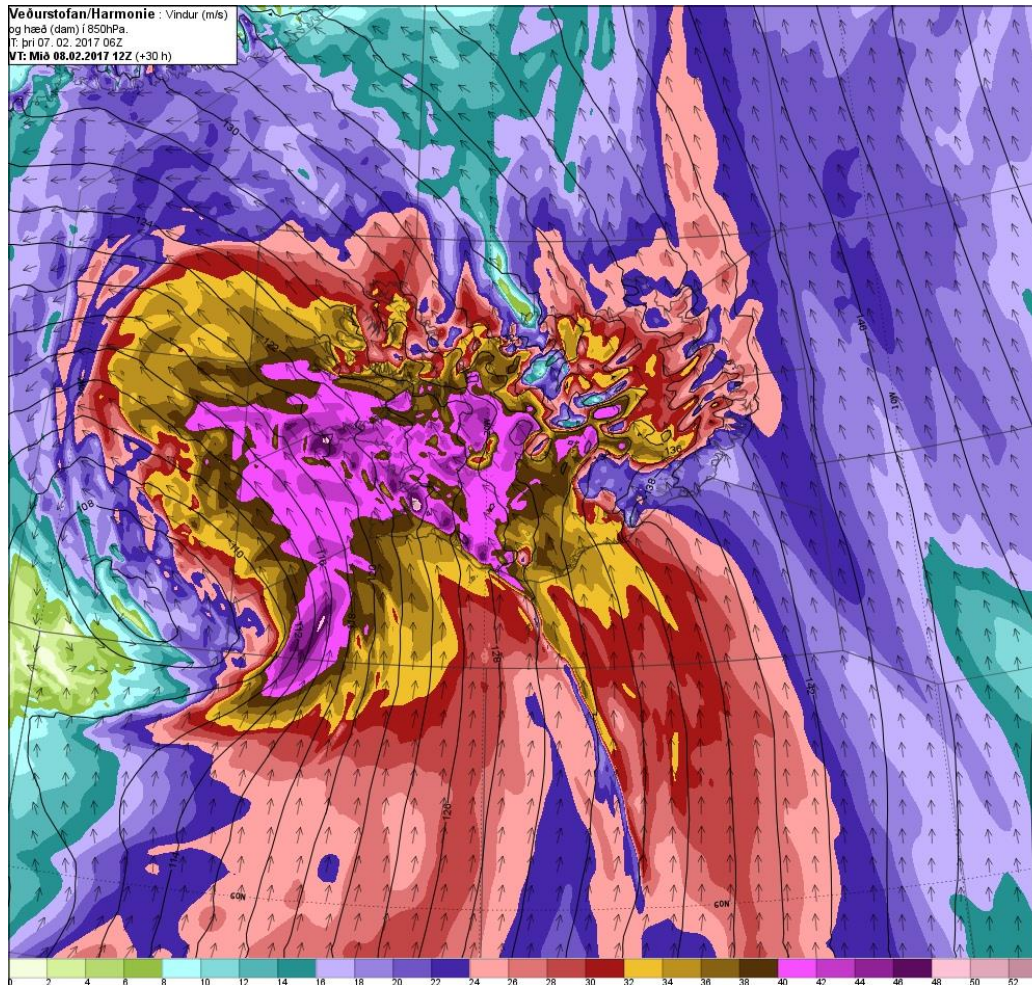
VT 08.02 12Z



Harmonie Wind (850 hPa)

IT 07.02 06Z

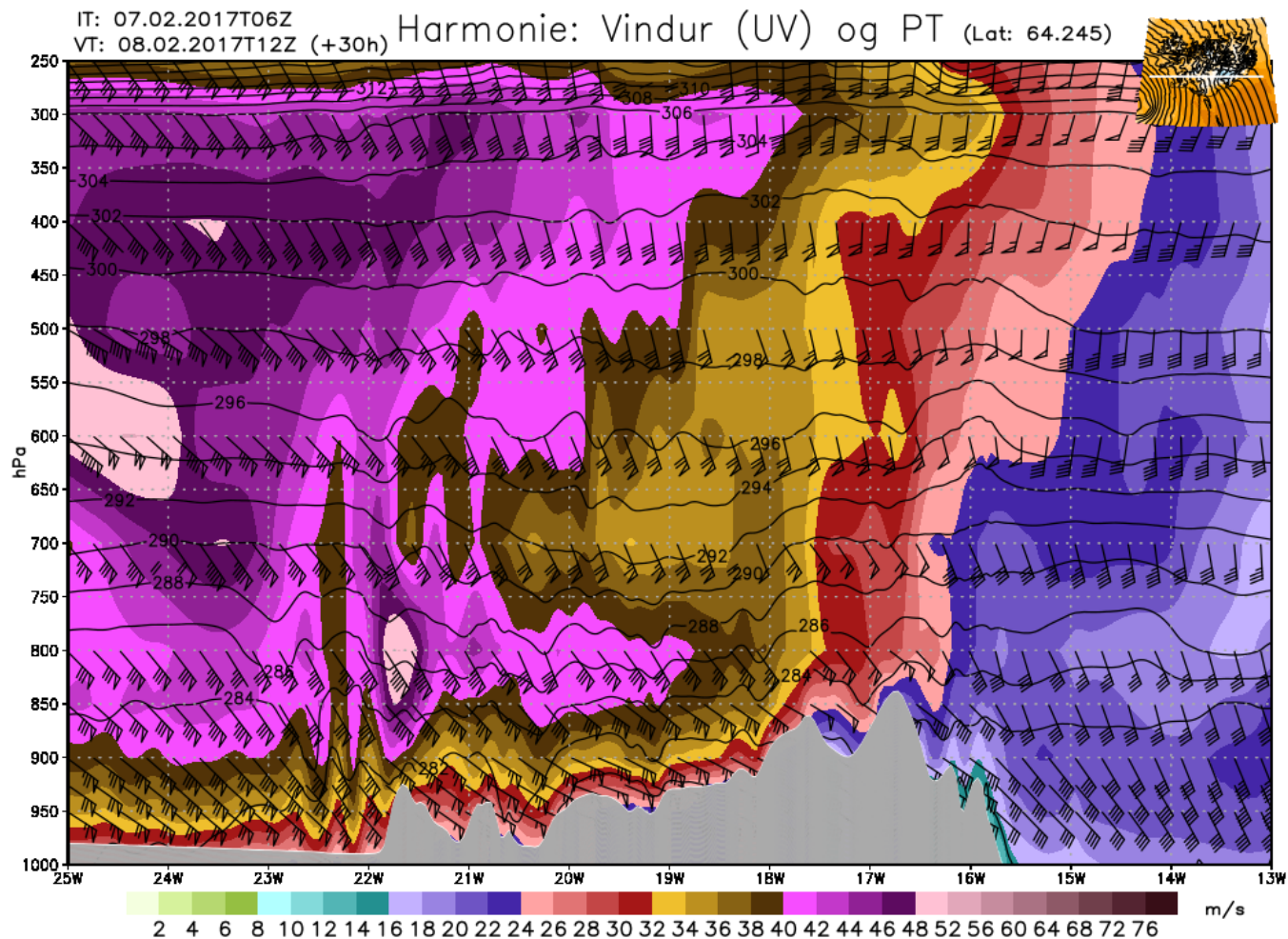
VT 08.02 12Z



Harmonie (Wind cross section)

IT 08.02 00Z

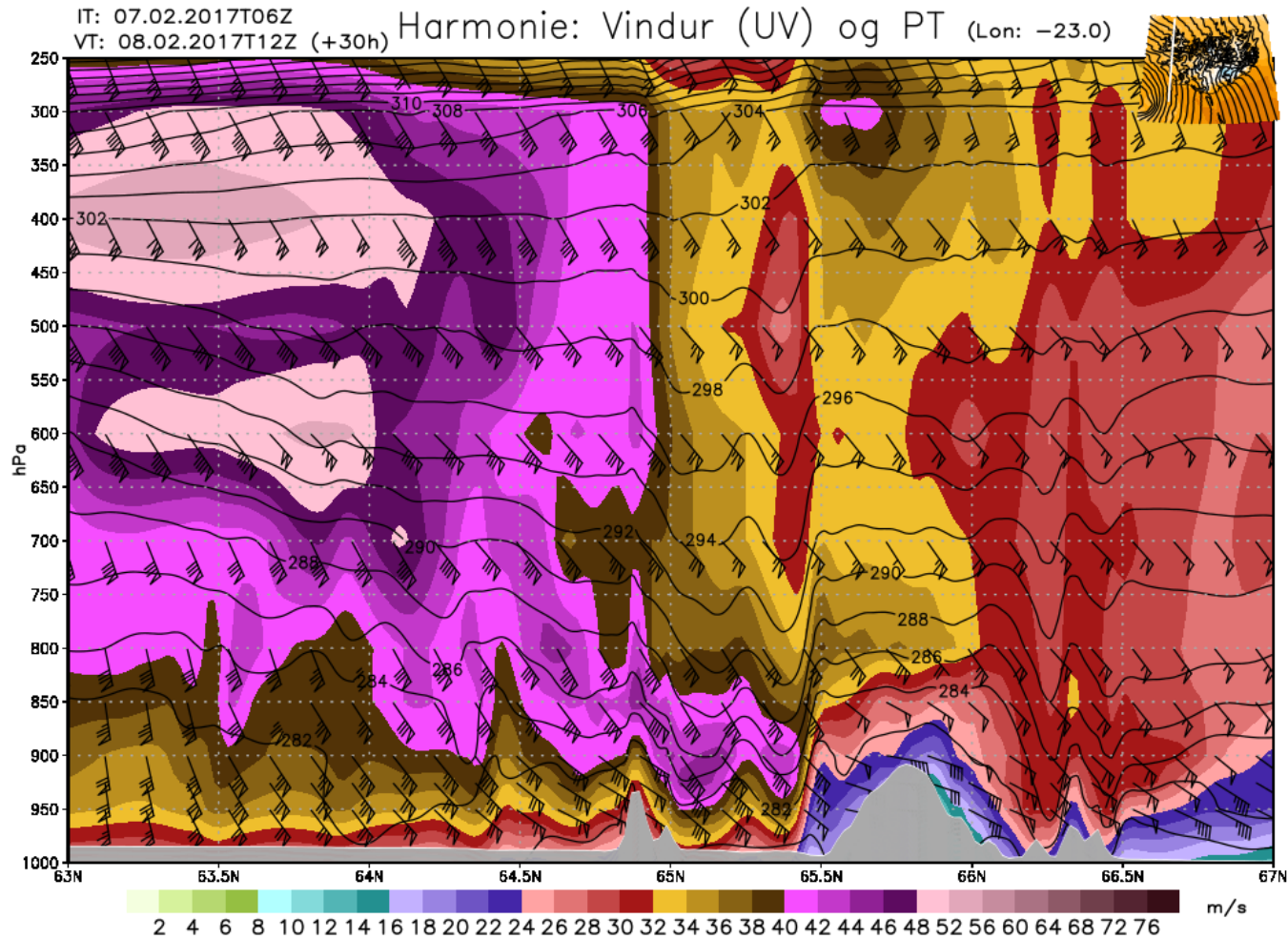
VT 08.02 12Z



Harmonie (Wind cross section)

IT 08.02 00Z

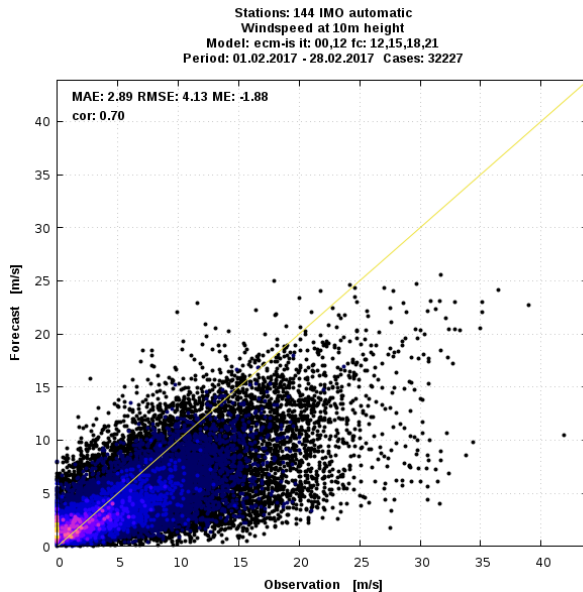
VT 08.02 12Z



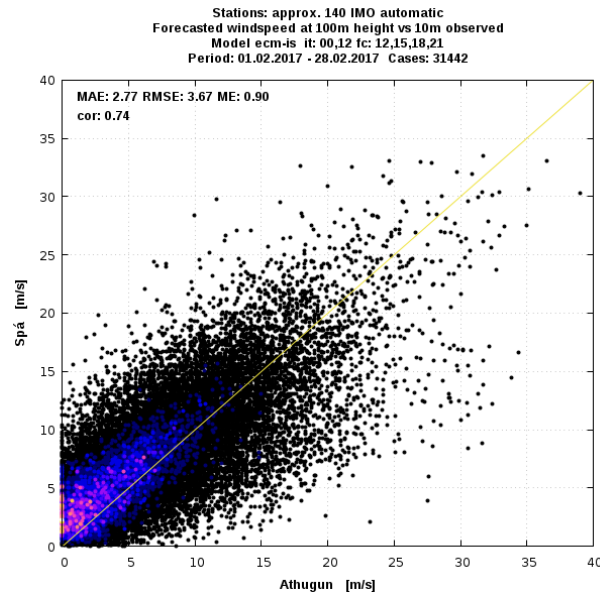
Scatter plot

Observation/Forecast
Over 140 automatic stations

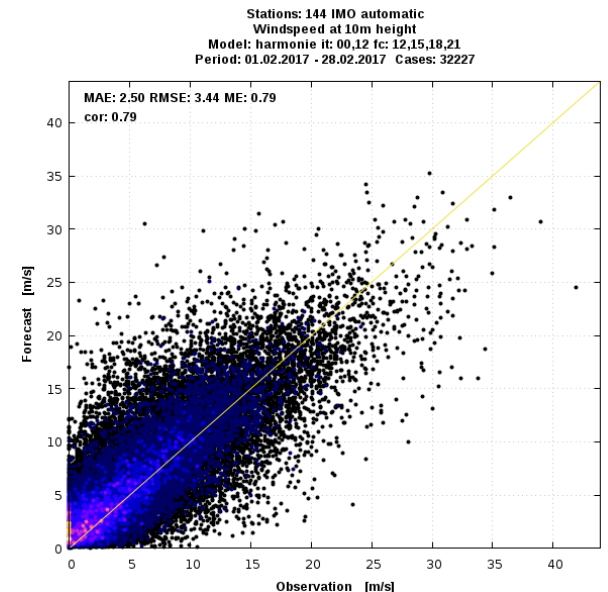
ECMWF 10m wind



ECMWF 100m wind



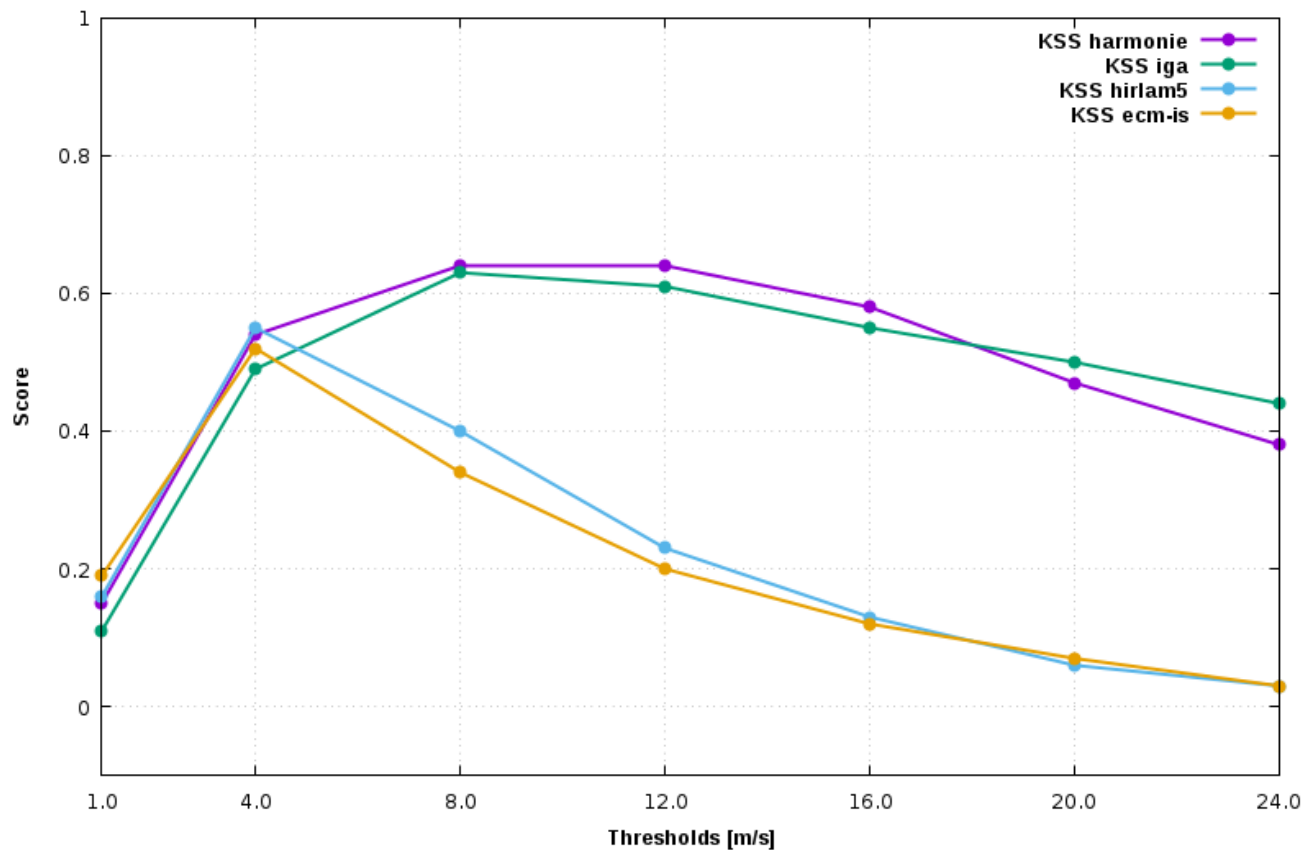
Harmonie 10m wind



Skill score

February 2017

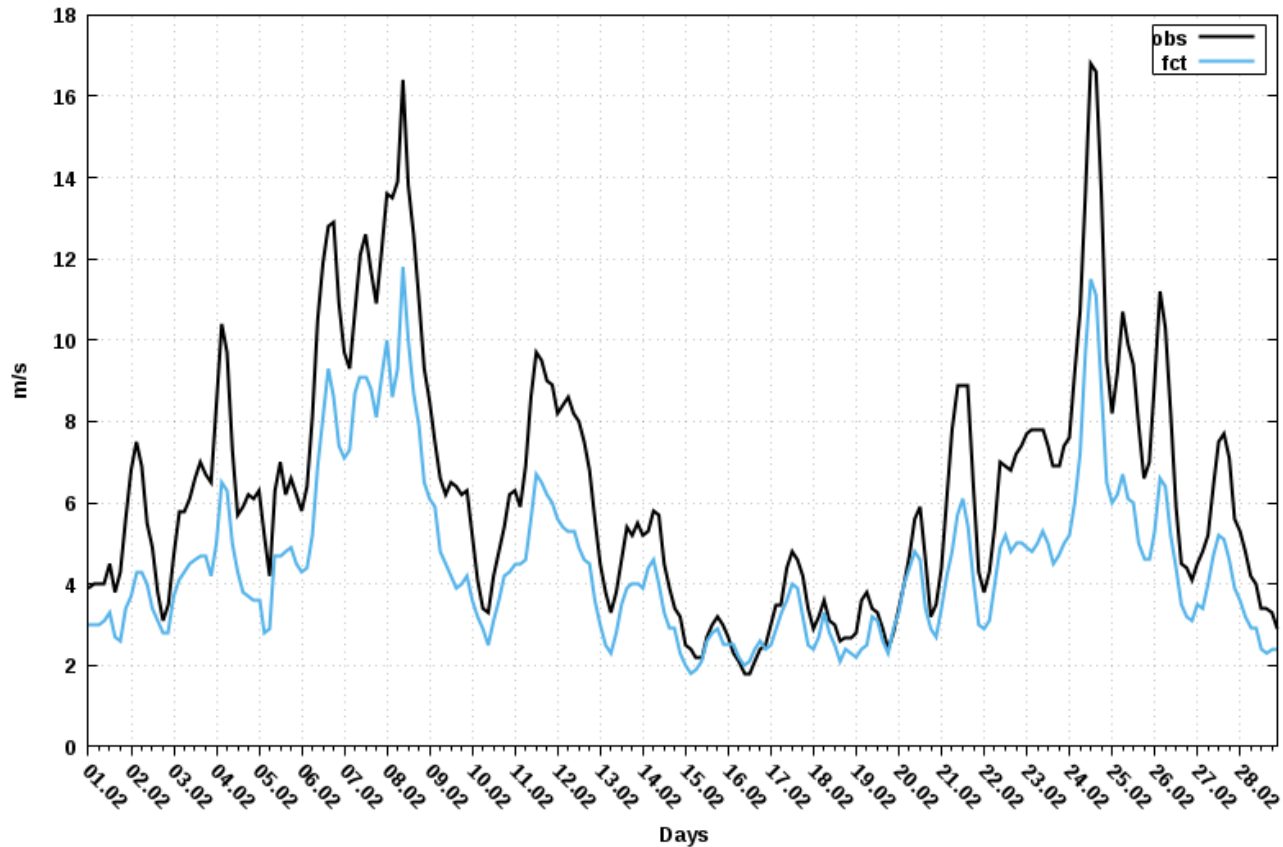
Stations: 144 IMO automatic
Windspeed at 10m height
it: 00,12 fc: 12,15,18,21
Period: 01.02.2017 - 28.02.2017



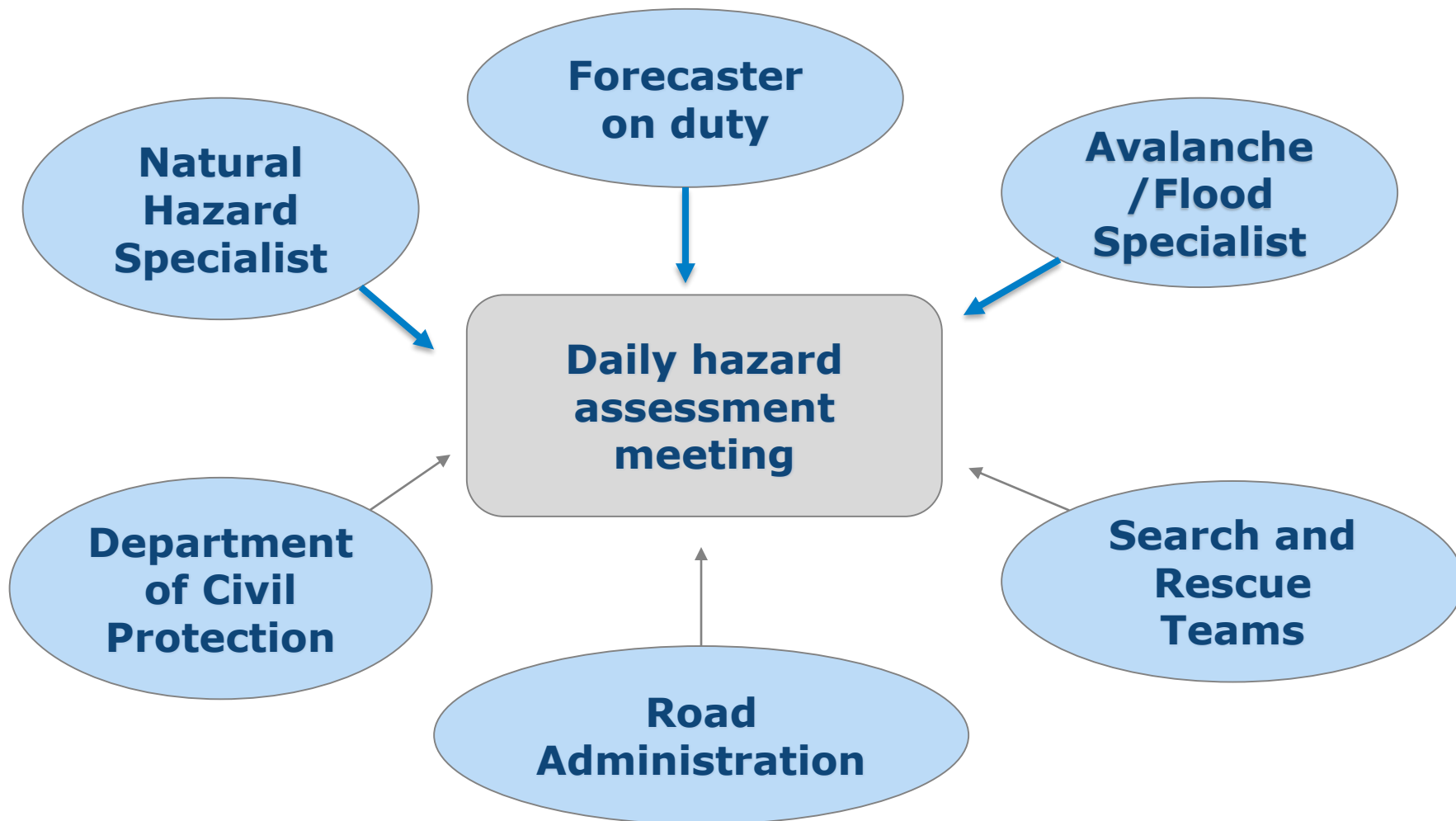
ECMWF (10m wind) / Observations

Average windspeed for 144 automatic stations

Stations: 144 IMO automatic
Avg. windspeed at 10m height
Model: ecm-is it: 00,12 fc: 12,15,18,21
Period: 01.02.2017 - 28.02.2017

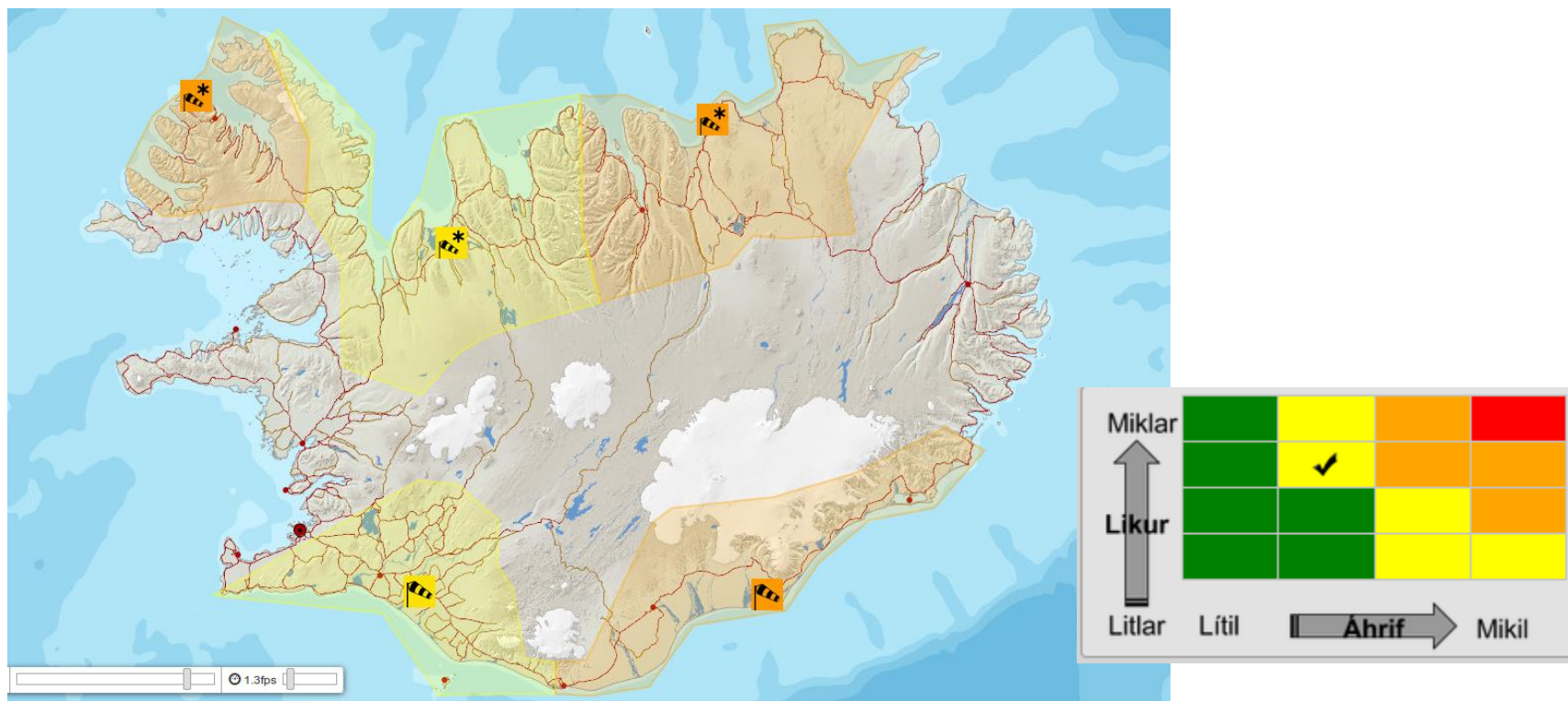


Daily hazard assessment meeting



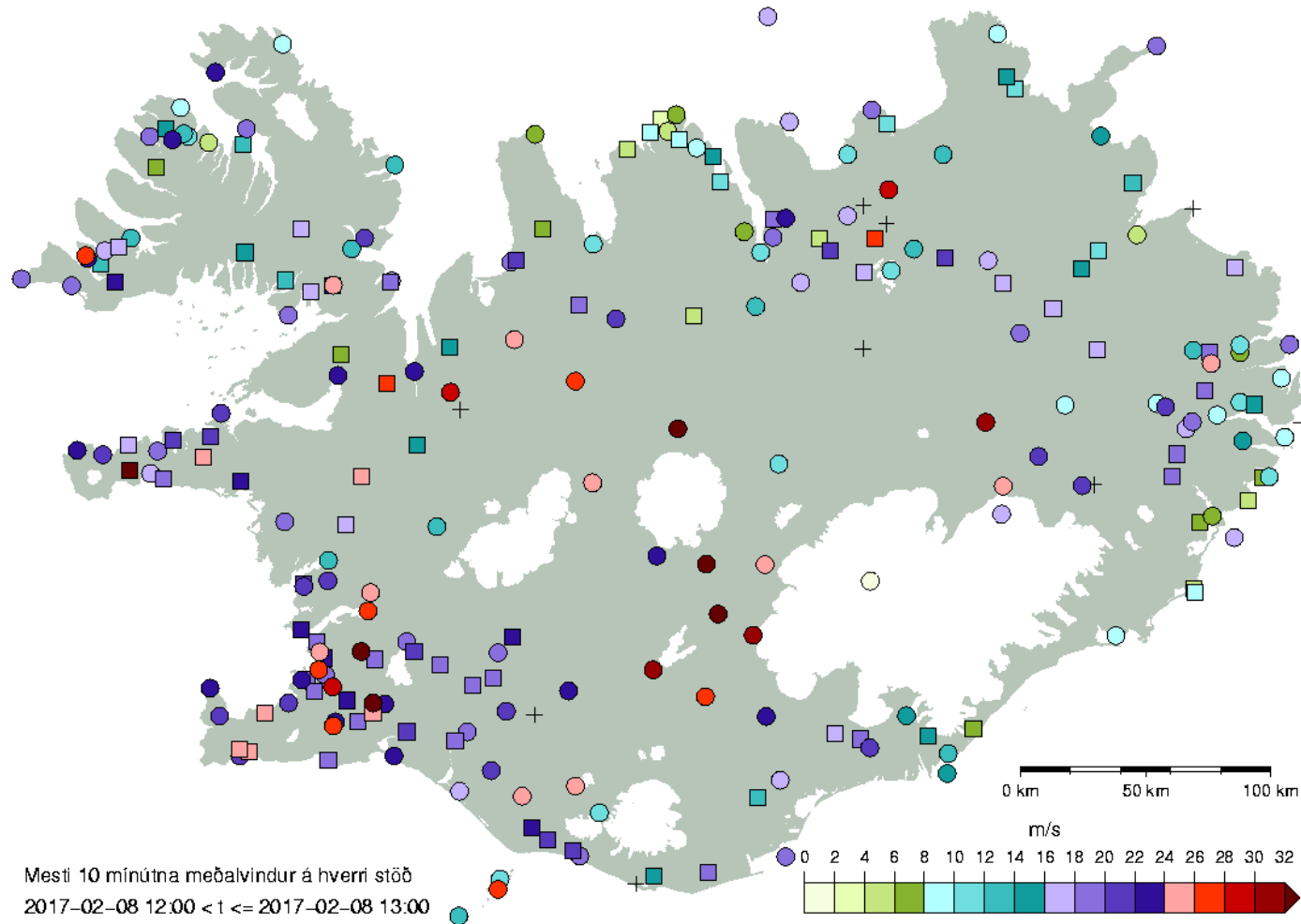
Impact Matrix

Impact based warnings will be implemented in 2017



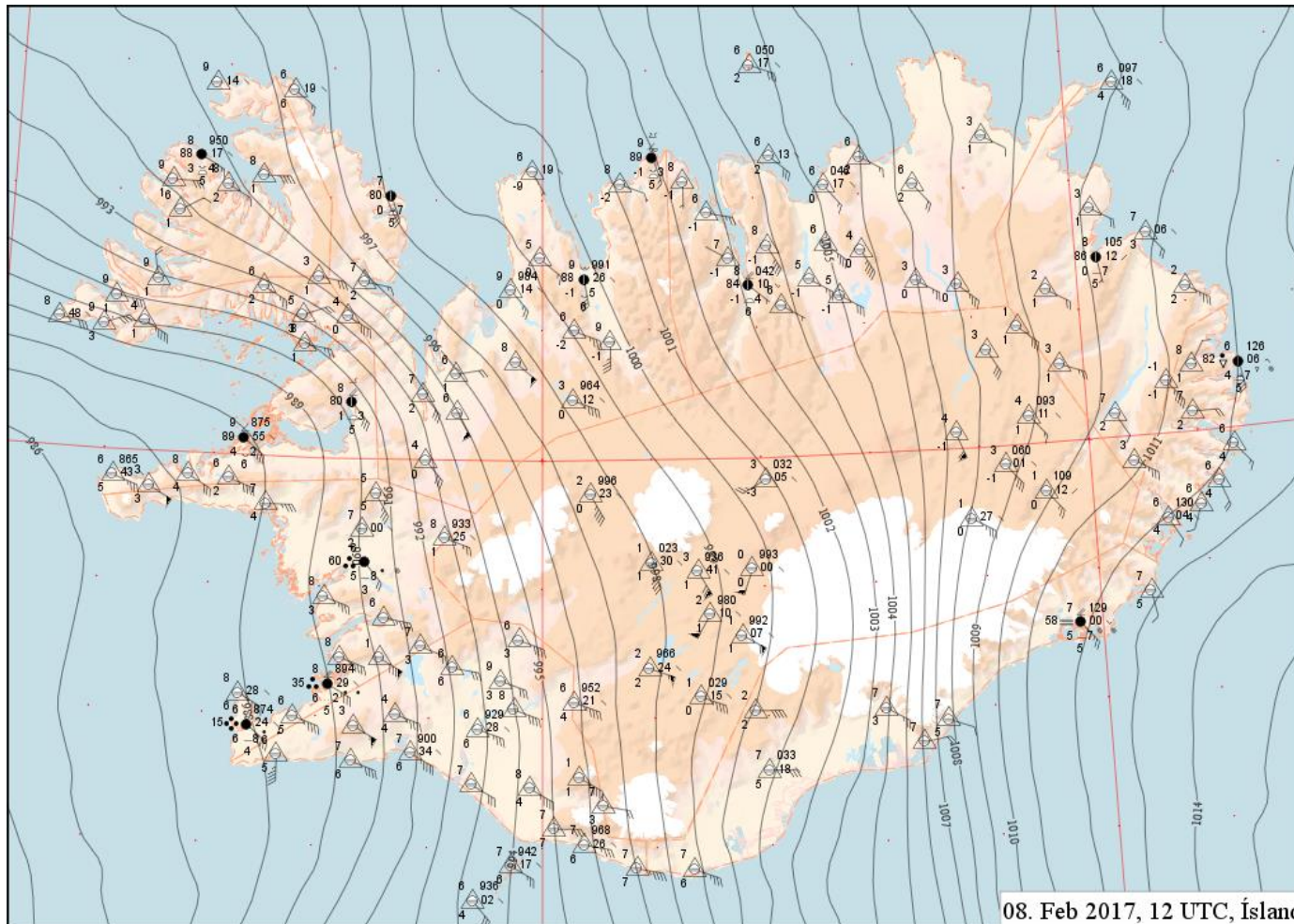
Max 10 min mean wind Observations

08. February 12Z-13Z

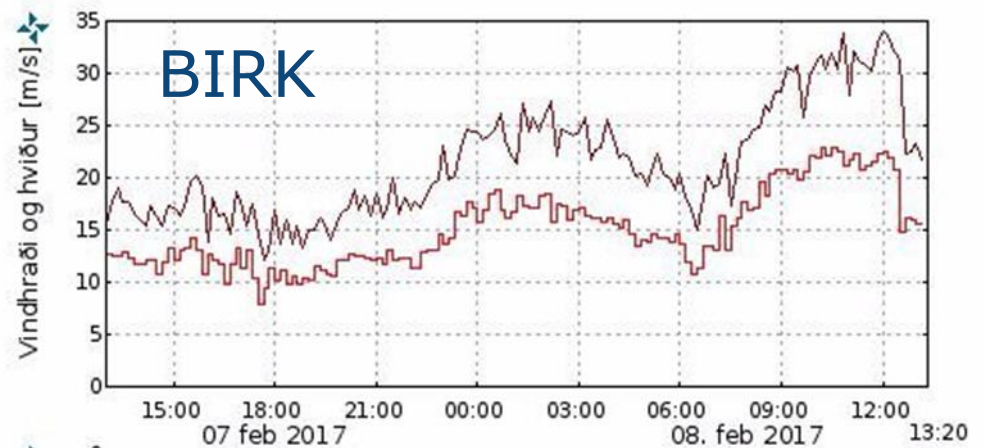
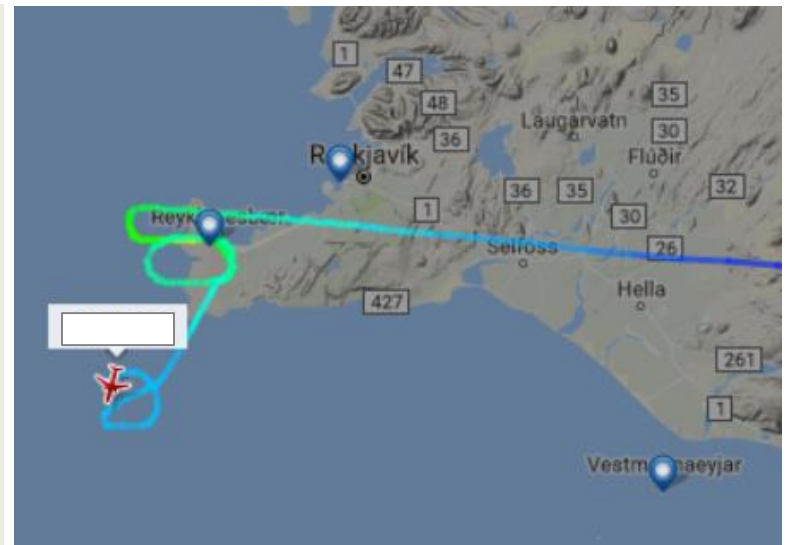
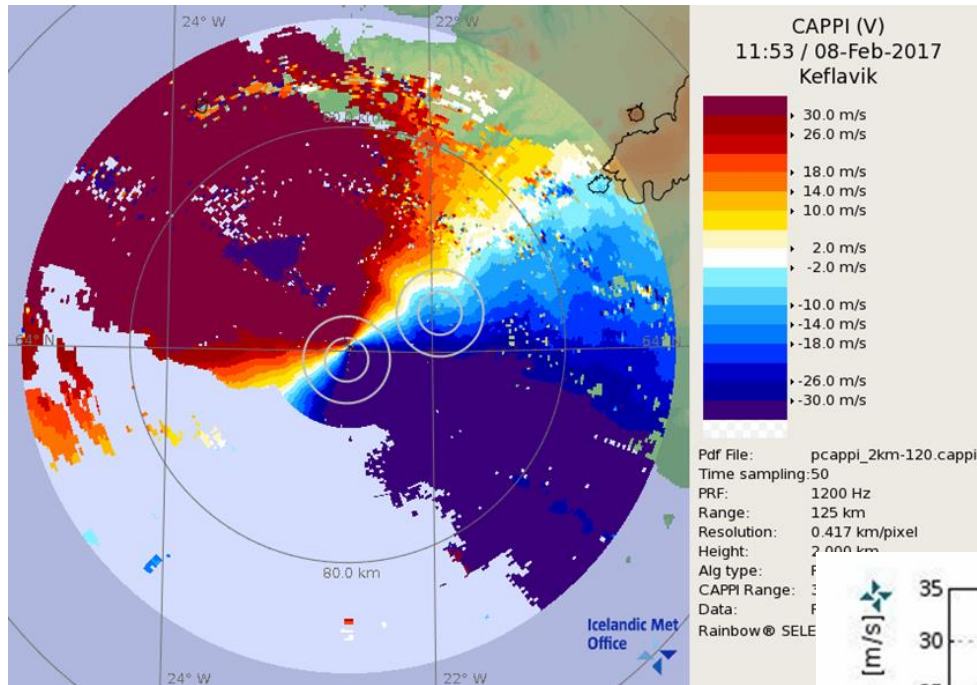


Synoptic chart

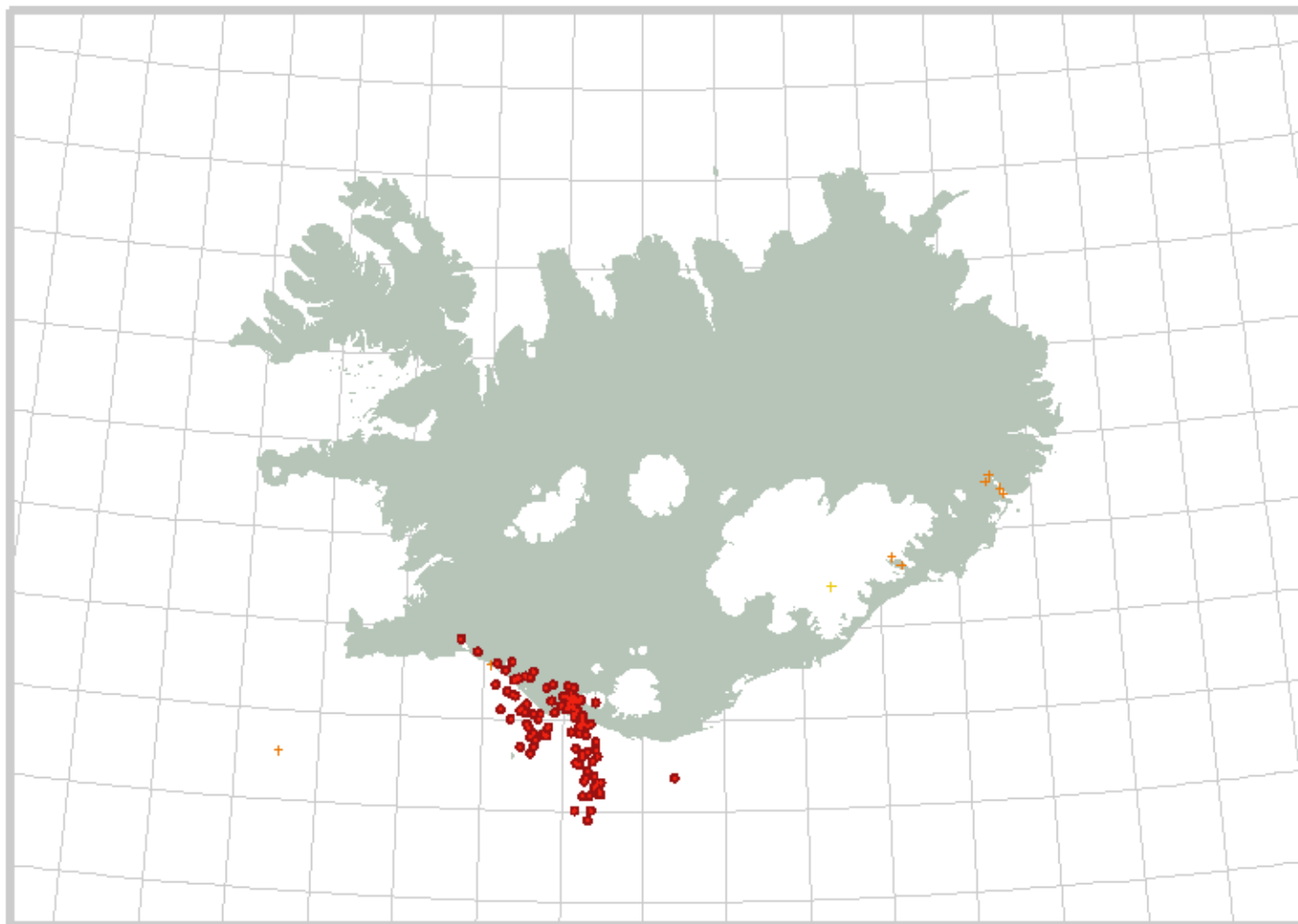
08. February 12Z



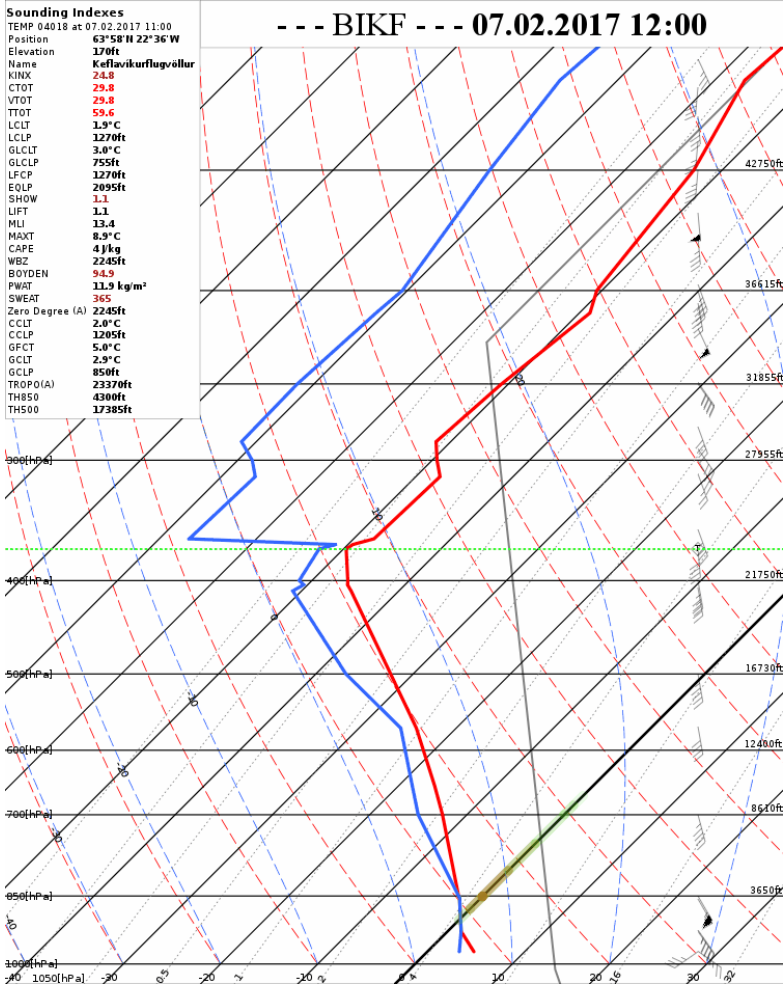
CAPPI and Flightradar



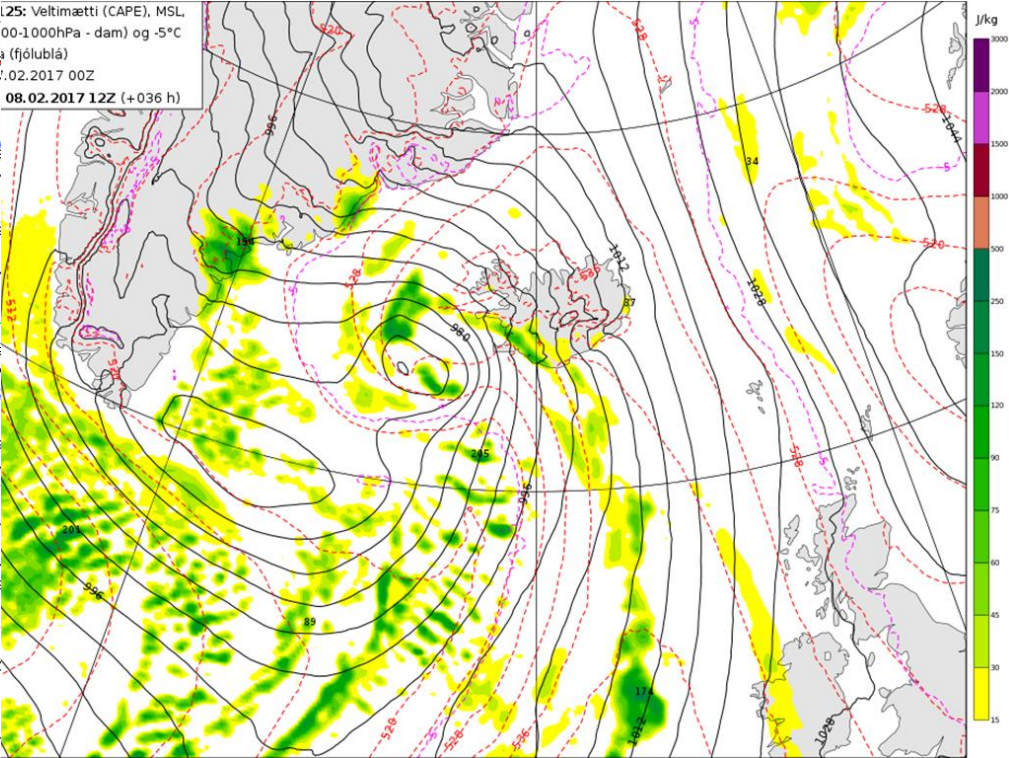
Over 100 lightnings detected between 12Z - 13Z



Radiosonde BIKF / Cape



ECMWF – HRES
IT 07.02 00Z
VT 08.02 12Z



Thank you!

Summary

- A good professional collaboration
- The weather forecast reached the public
- Minimal damage

