SOME STATISTICS OF GUSTY WINDS IN LITHUANIA AND ANALYSIS OF TWO CATASTROPHIC CASES ON JANUARY 2022

Izolda Marcinonienė

Climate and Research Department

Lithuanian Hydrometeorological Service

Criteria of winds:

- Strong – ≥**15 … <28 m/s**
- Very strong – **28 … <33 m/s**
- Catastrophic – ≥**33 m/s**

WINDS IN LITHUANIA DURING THE PERIOD 1961–2021 IN RETROSPECT

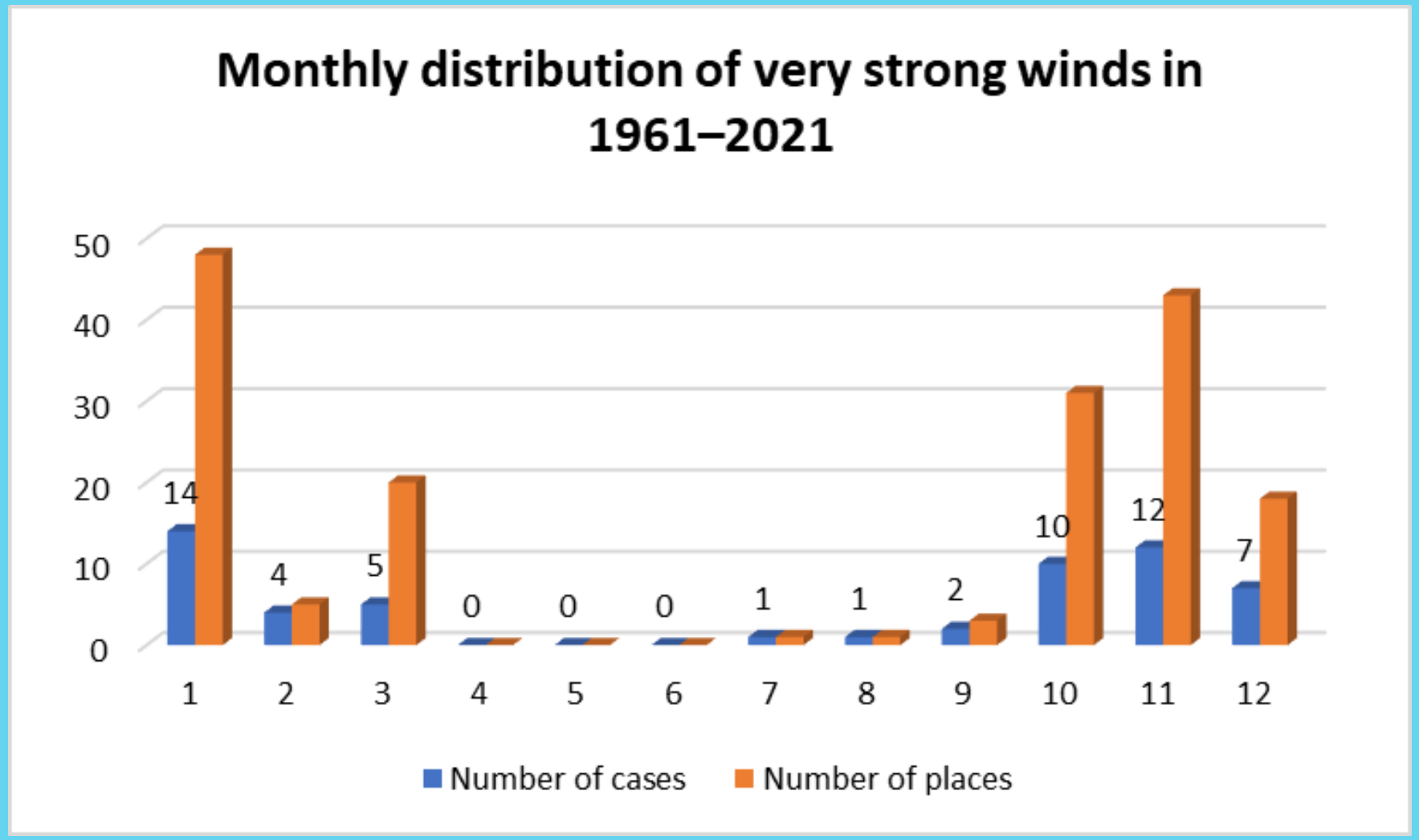
Statistics

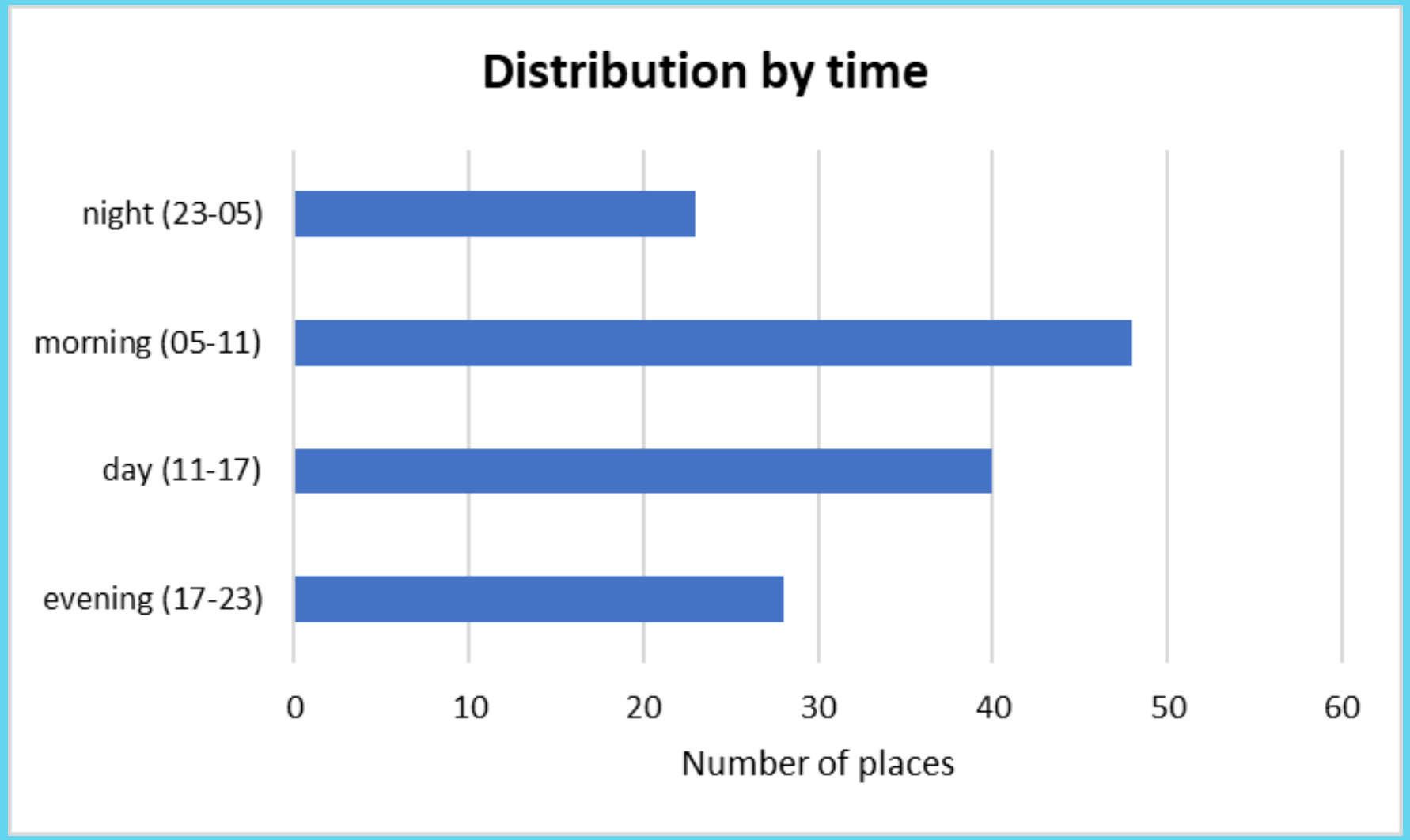
56 cases in 173 observation sites:

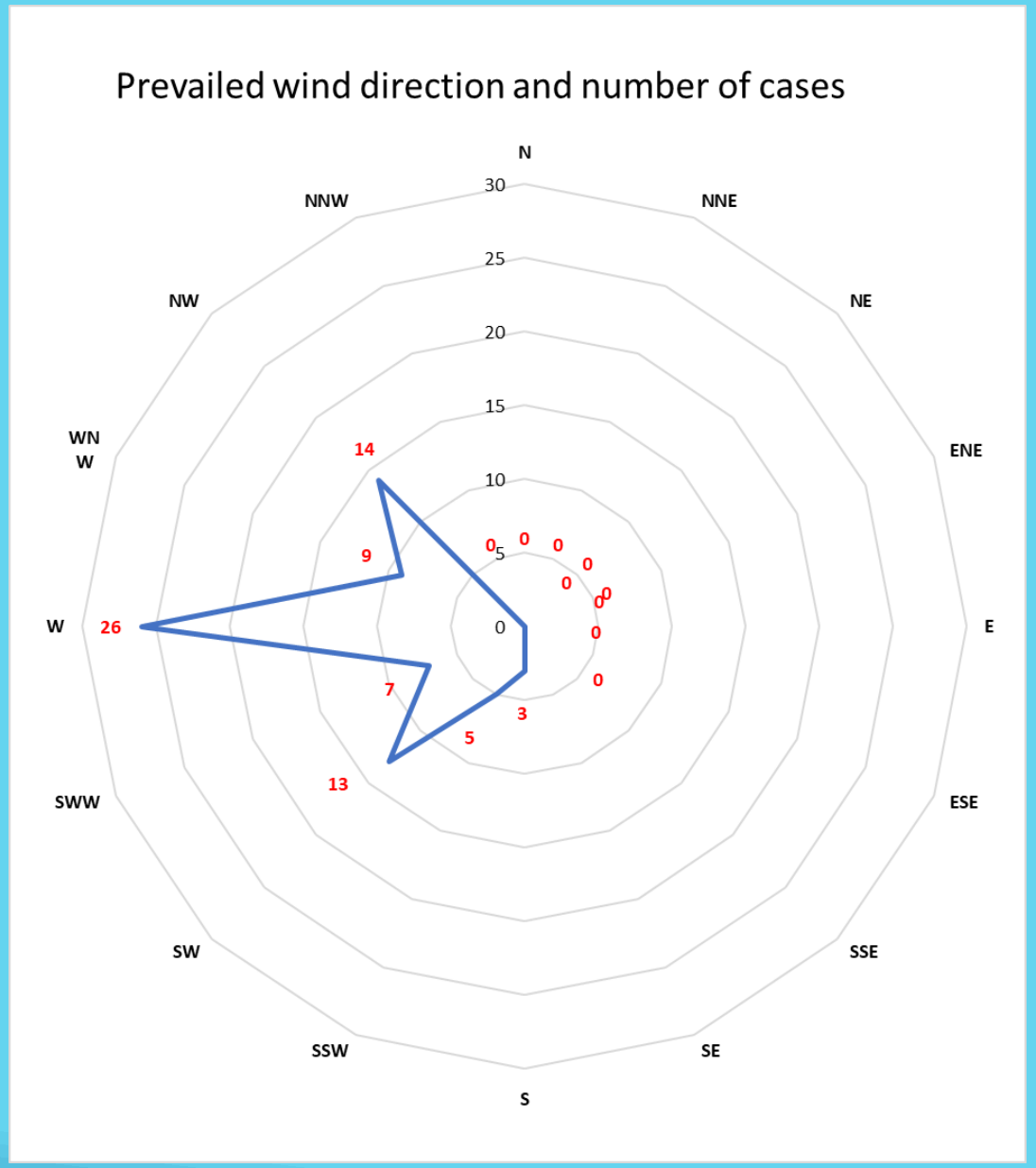
≥ 28…<33 m/s …… in 126 sites (73 %)

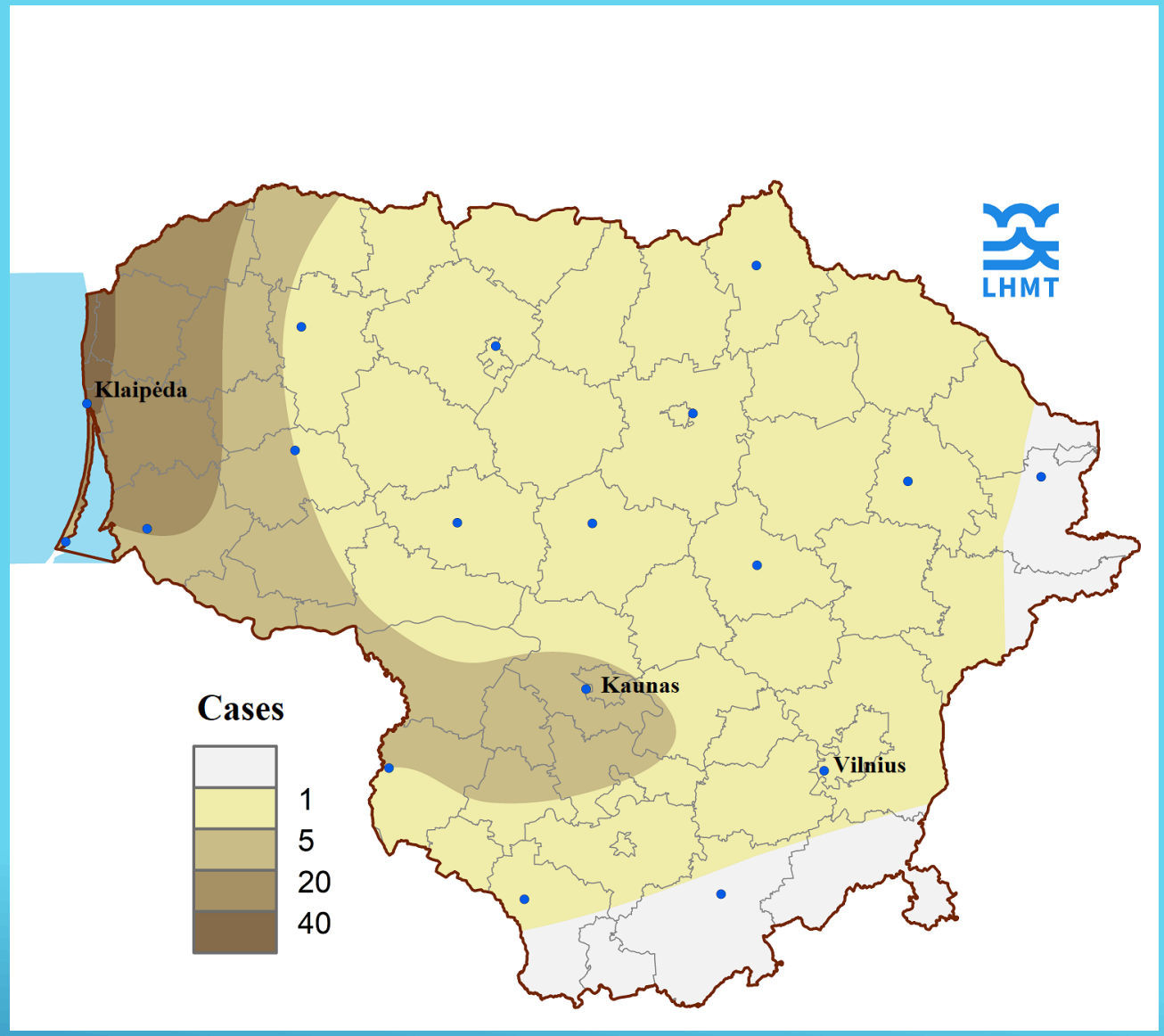
≥33…<37 m/s …… in 35 sites (20 %)

≥37 m/s …… in 12 sites (7 %)


Monthly distribution of very strong winds in 1961–2021
50
40
30
20
10
0
14
4
5
0
0
0
1
1
2
10
12
7
1
2
3
4
5
6
7
8
9
10
11
12
Number of cases
Number of places

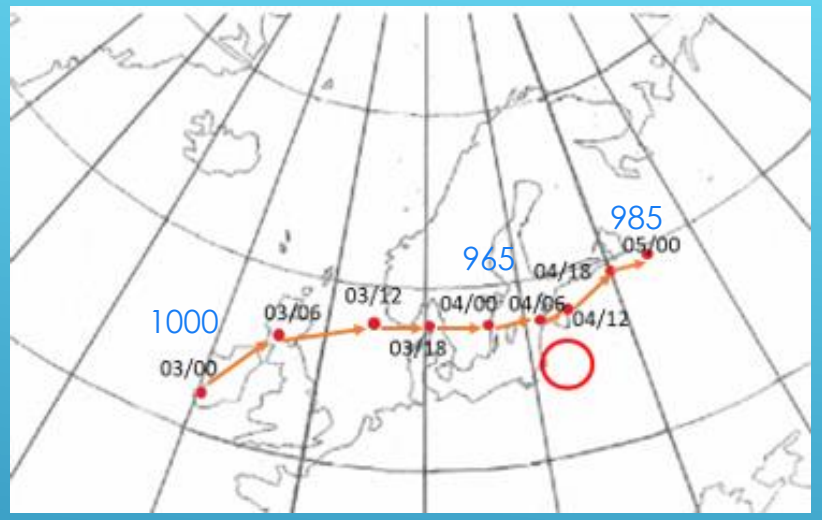

Distribution by time
night (23-05)
morning (05-11)
day (11-17)
evening (17-23)
0
10
20
30
40
50
60
Number of places


Prevailed wind direction and number of cases
N
NNE
NE
ENE
E
ESE
SSE
SE
S
SSW
SW
SWW
W
WNW
NW
NNW
30
25
20
15
10
5
0
14
9
26
7
13
5
3
0
0
0
0
0
0
0
0

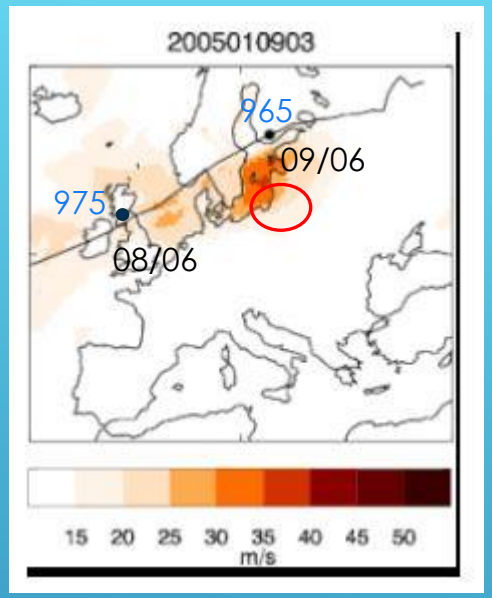


DISTRIBUTION OF WIND CASES

TRACKS OF THE MOST POWERFUL CYCLONES

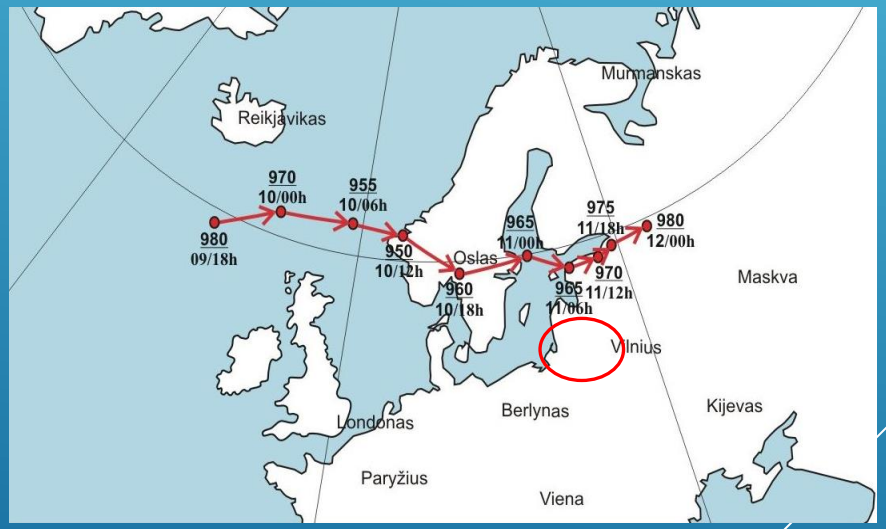


"Anatolij", 04/05-12-1999, 40 m/s

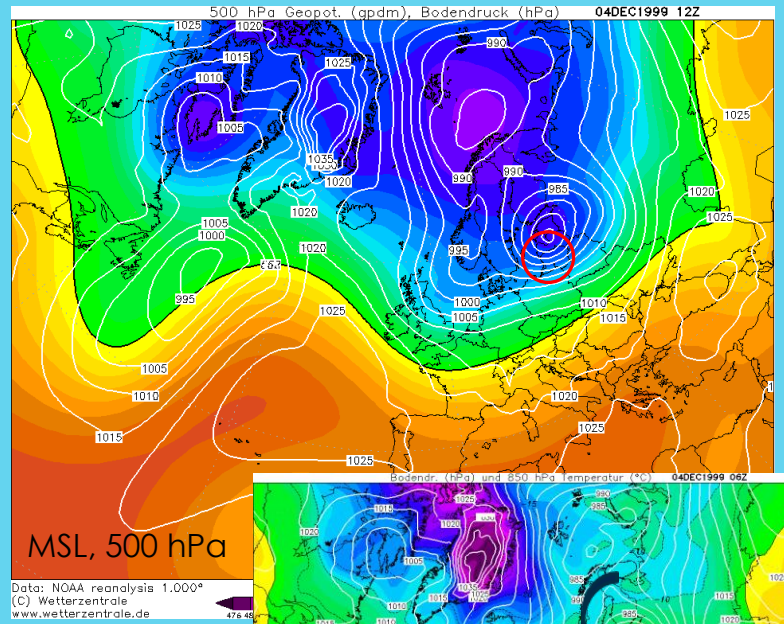


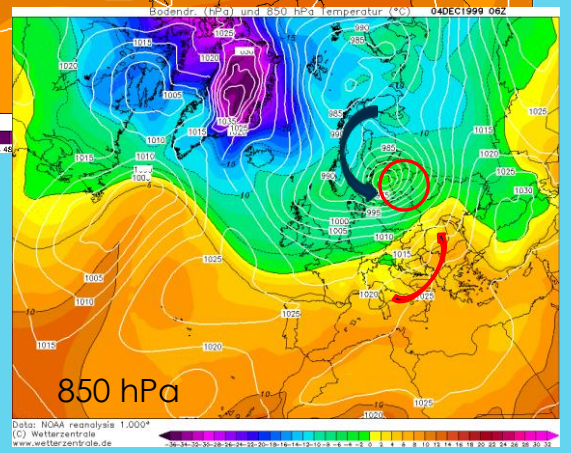
"Erwin",09-01-2005, 32–37 m/s

"Per", 14/15-01-2007, 32 m/s

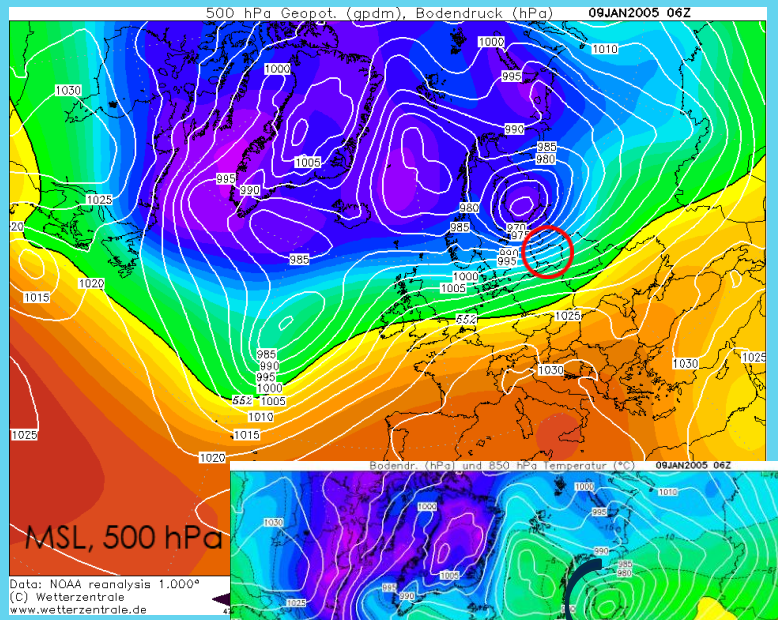


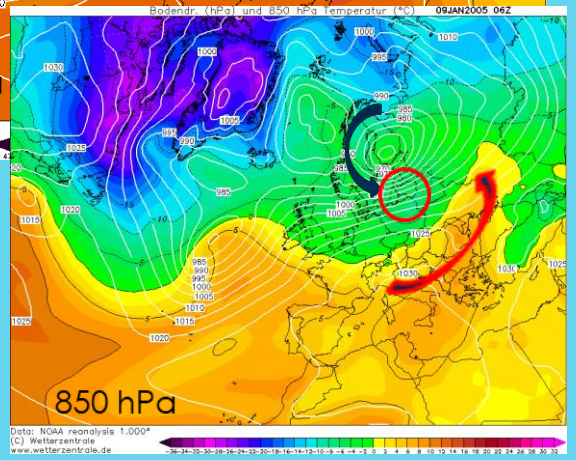
"Felix", 11-01-2015, 31 m/s



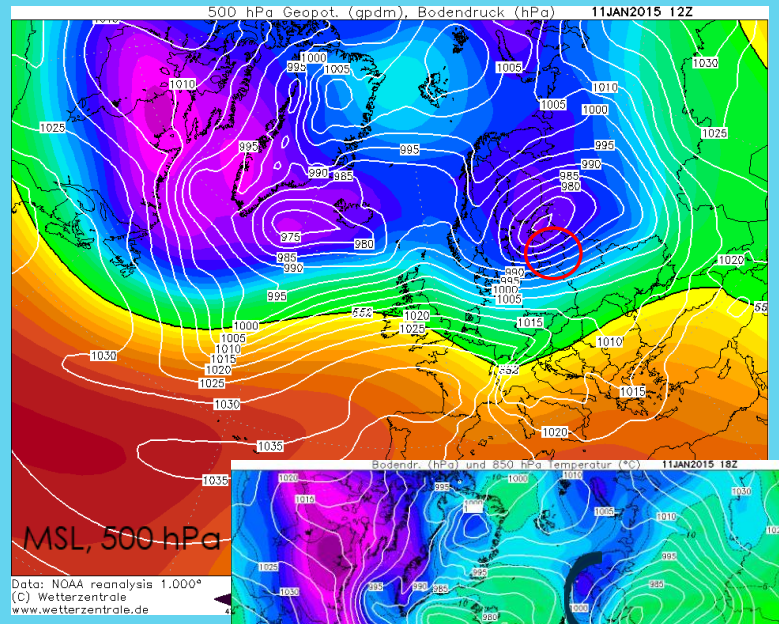


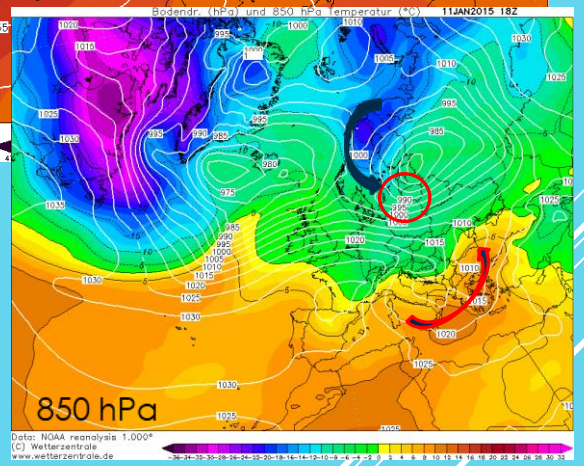
Anatolij, 04-12-1999





Erwin 09-01-2005



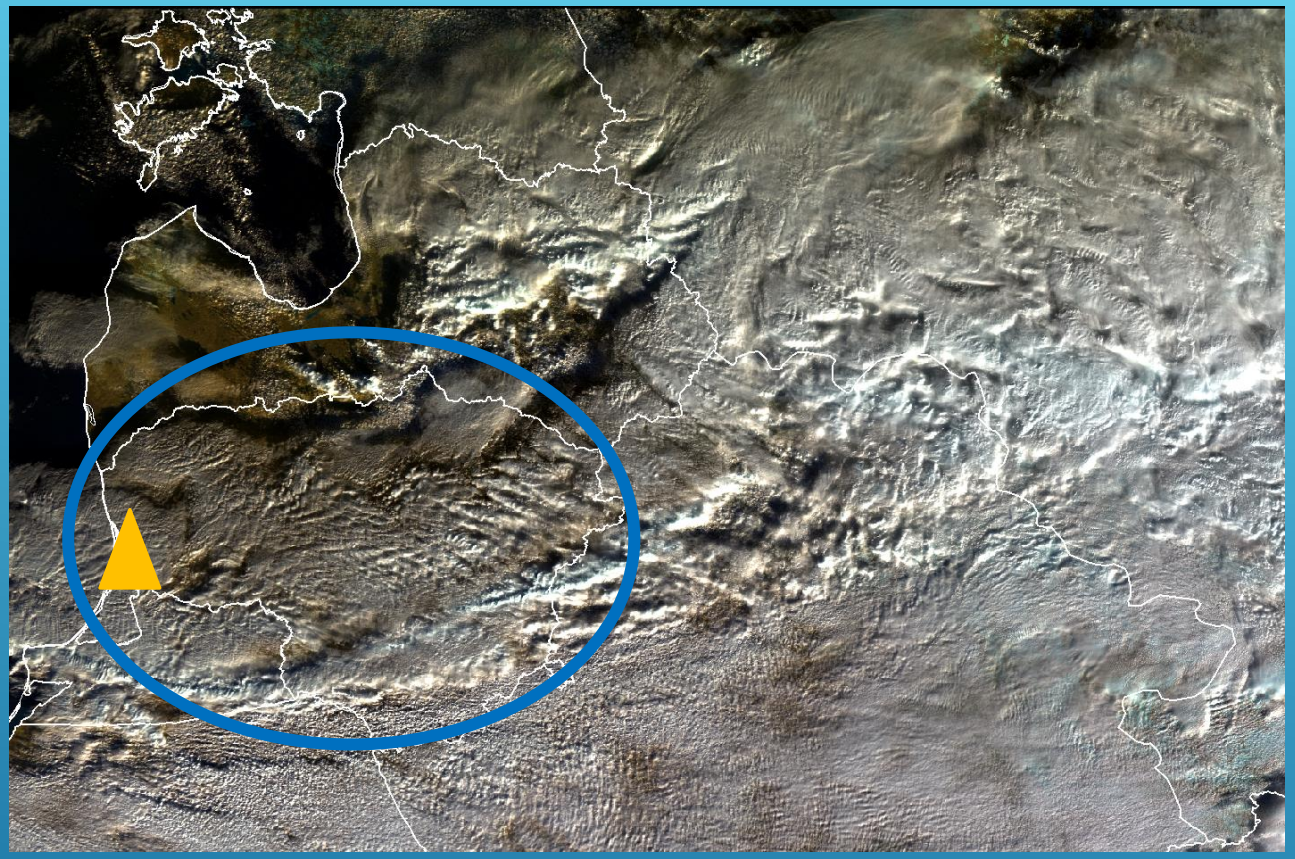


Felix, 11-01-2015

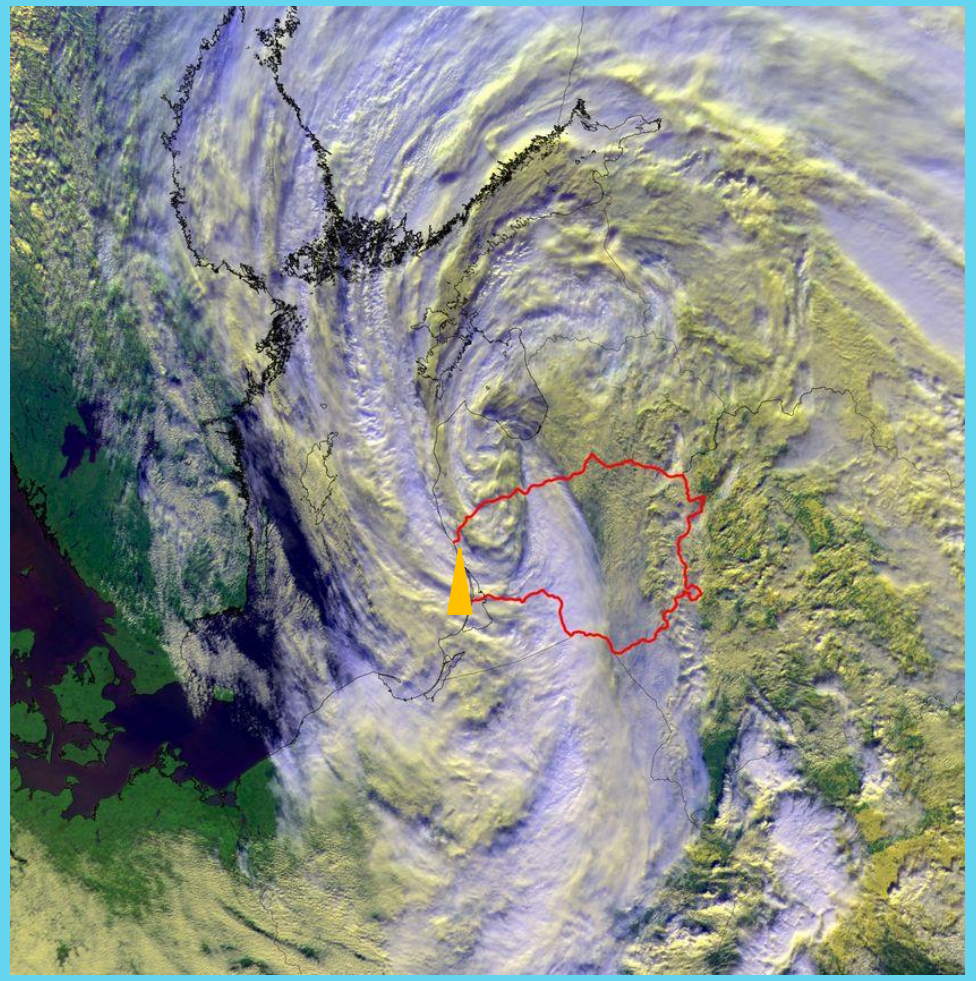
TYPICAL SYNOPTIC SITUATIONS (AT MSL, 850 HPA AND 500 HPA)

VERY POWERFULL WINDS IN JANUARY, 2022

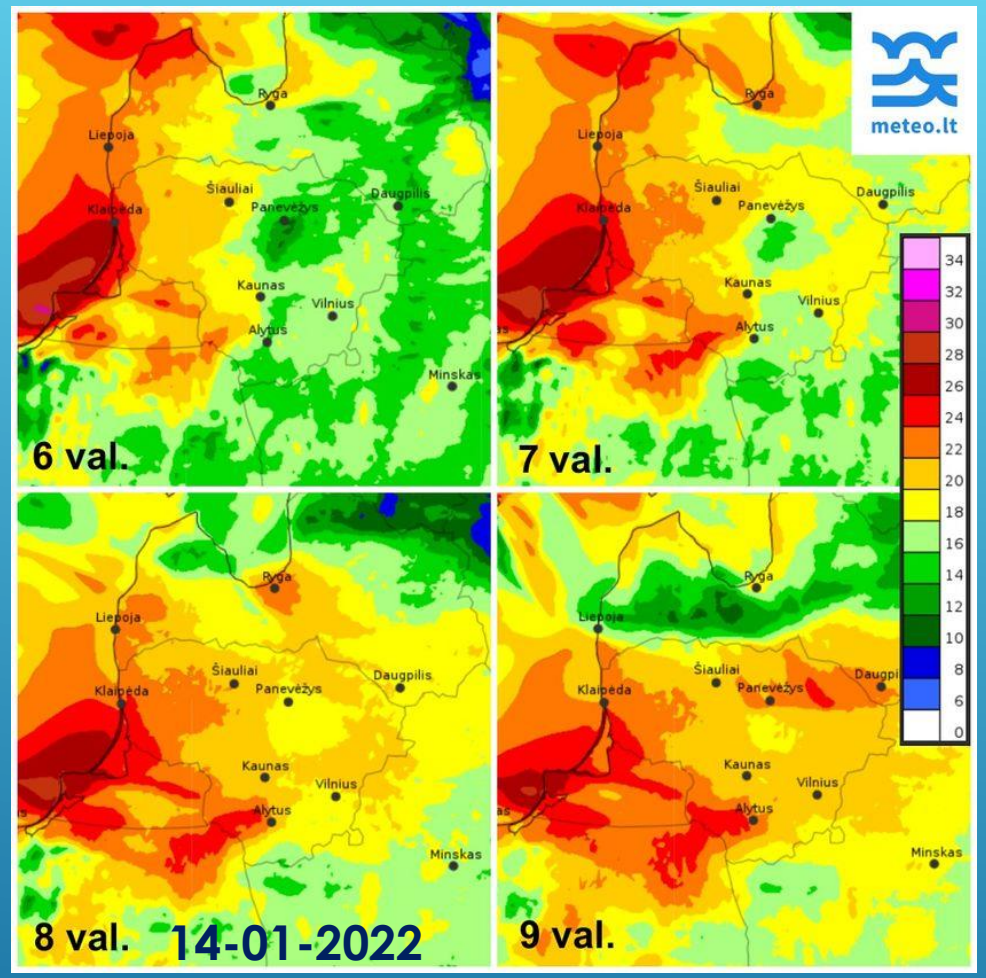
- **14 January** (28–36 m/s)
- 17 January (28–29 m/s)
- 20 January (28–31 m/s)
- **30 January** (29–35 m/s) (storm “Malik”)

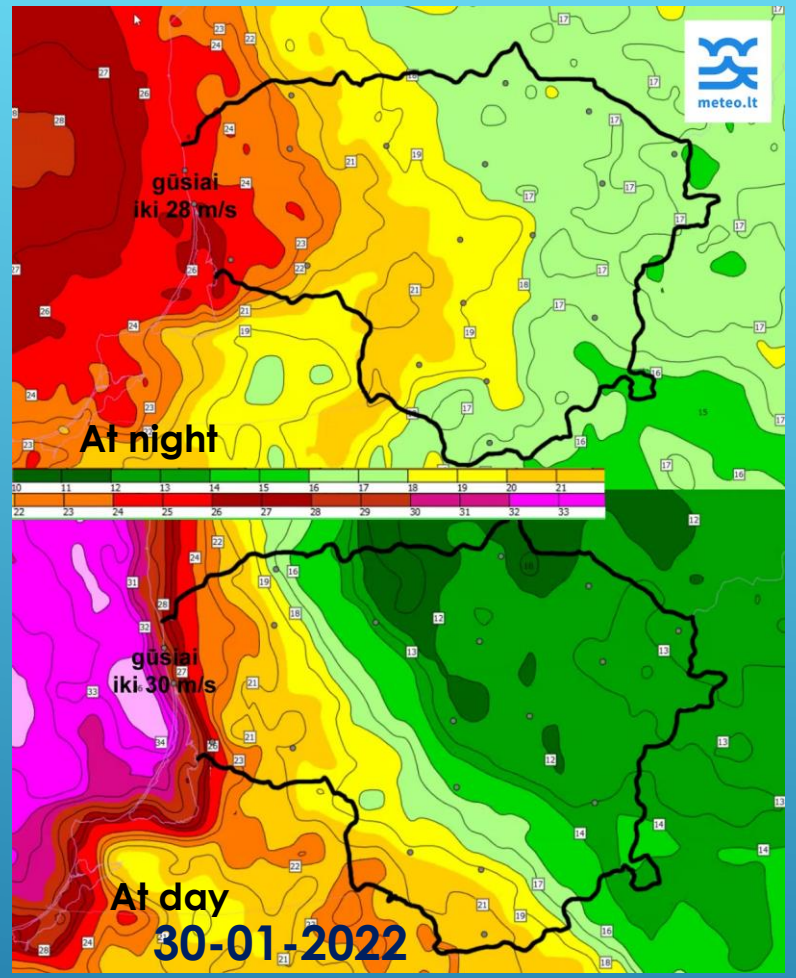


WHAT HAS HAPPENED… ON 14 OF JAN

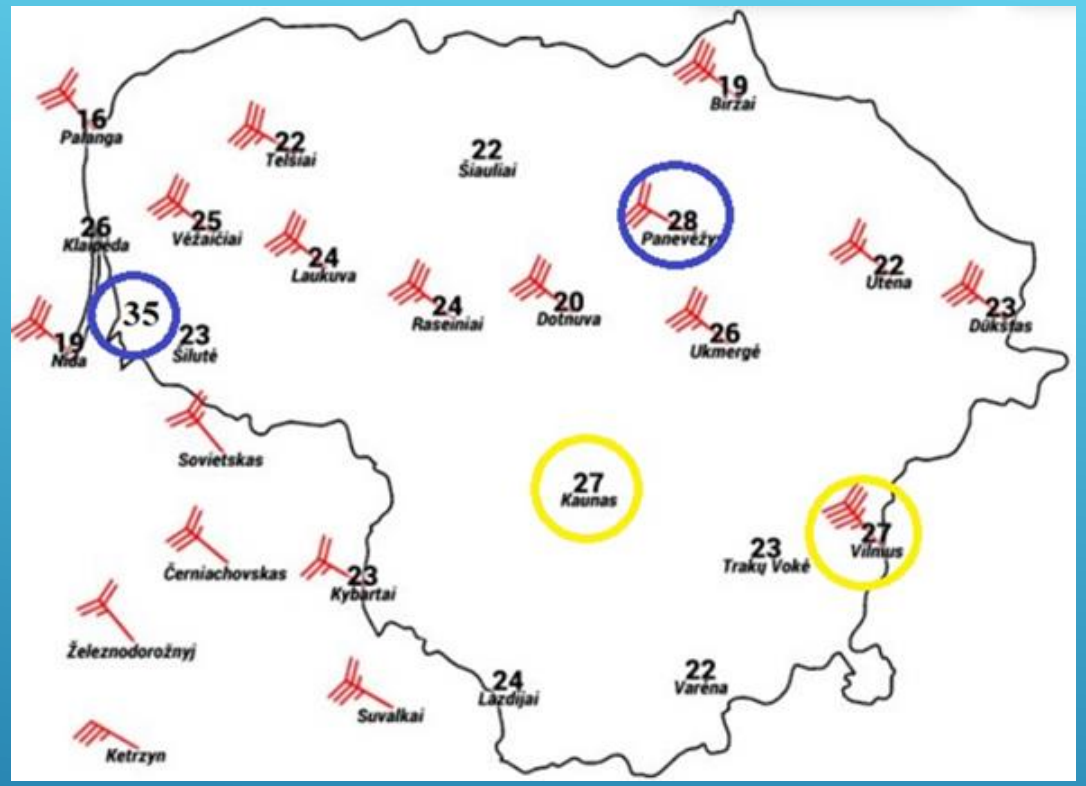


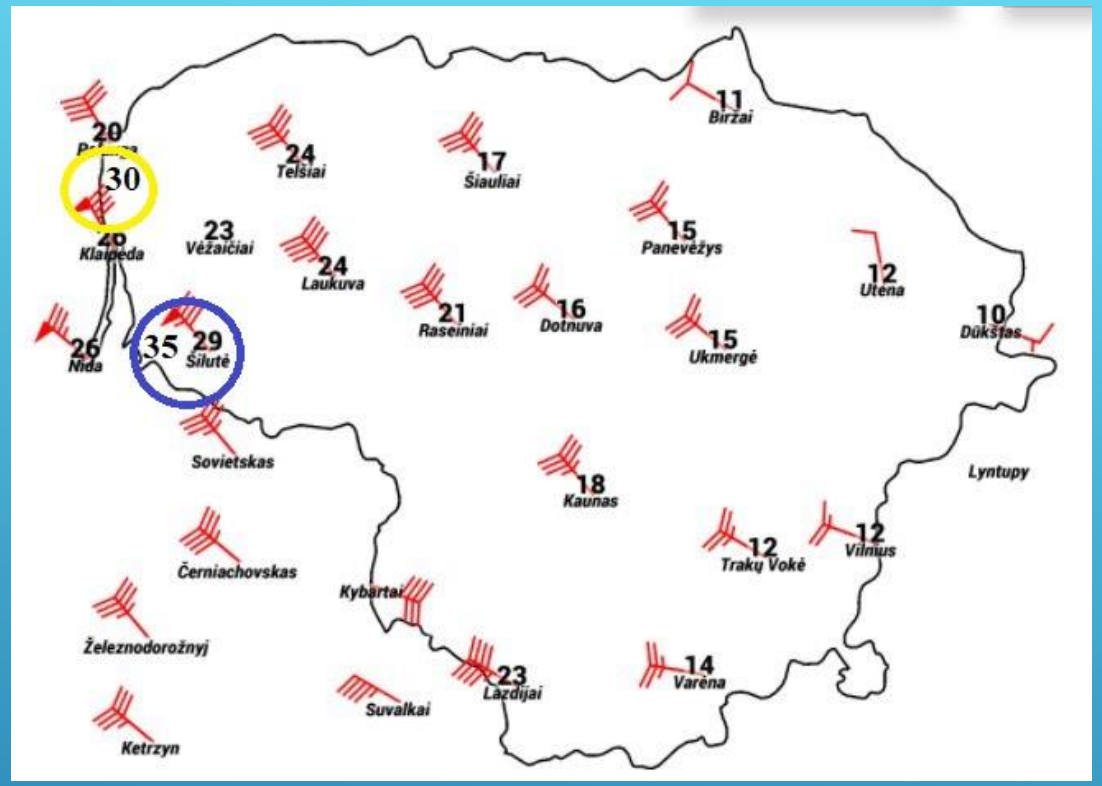
…ON 30 OF JANUARY



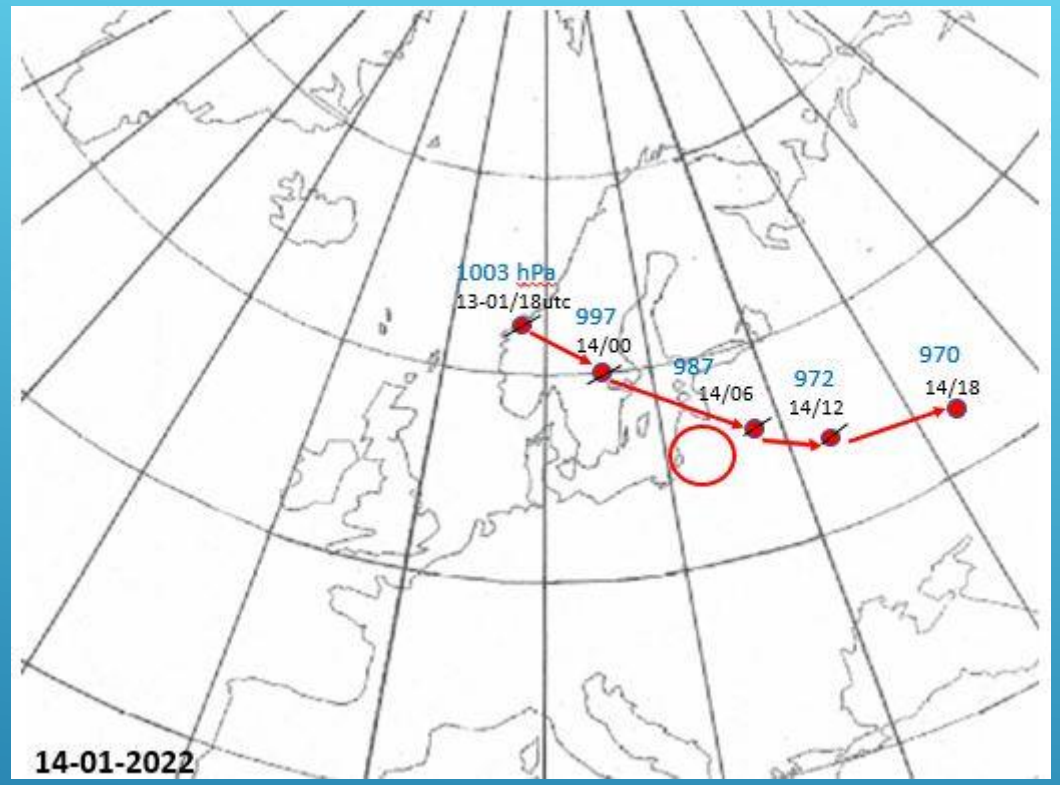


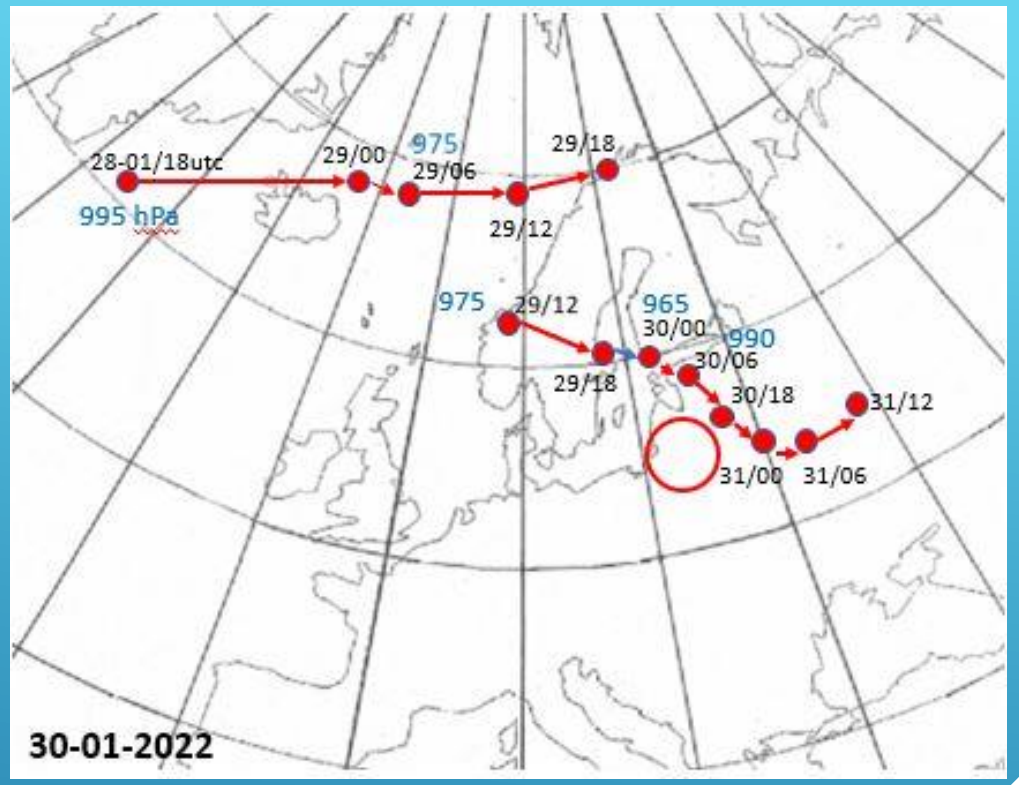
FORECAST (HARMONY 00UTC RUN)



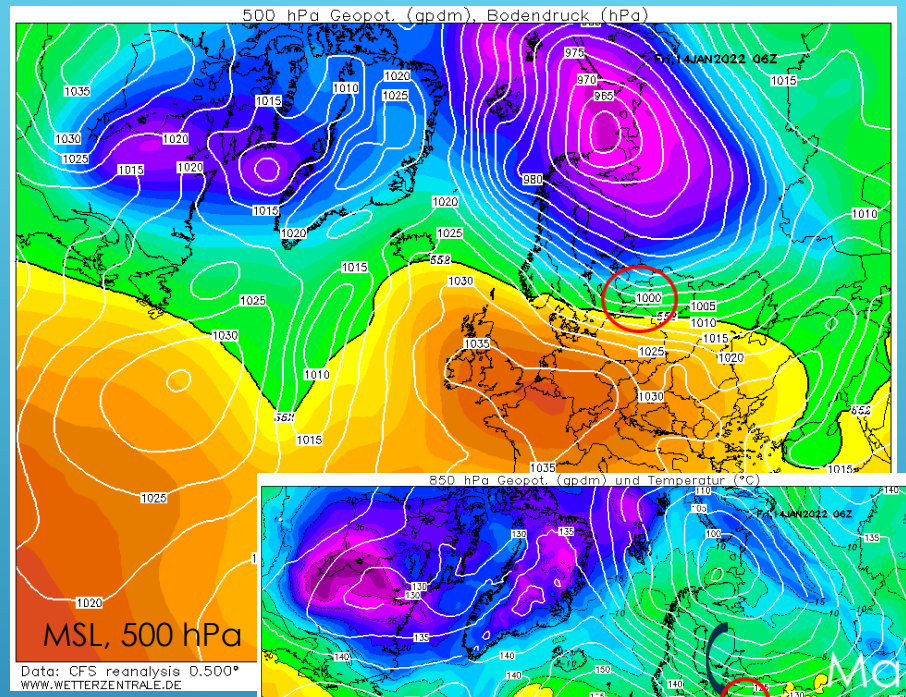


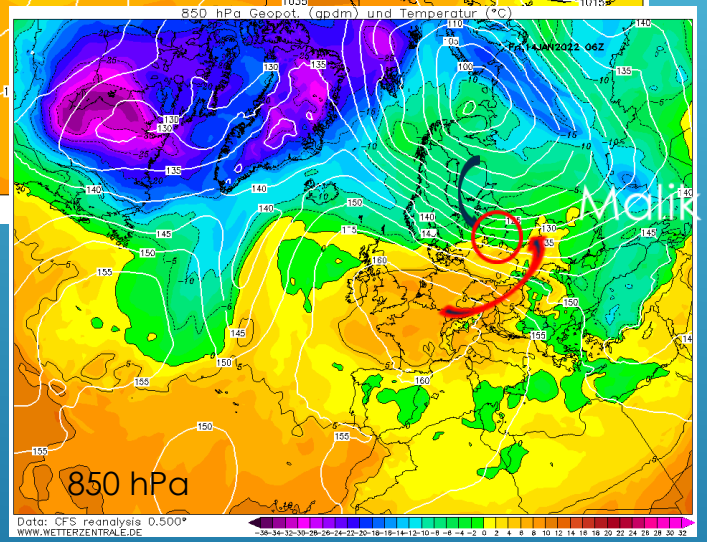
MAX WIND GUSTS (M/S) ON 14 AND 30 JAN



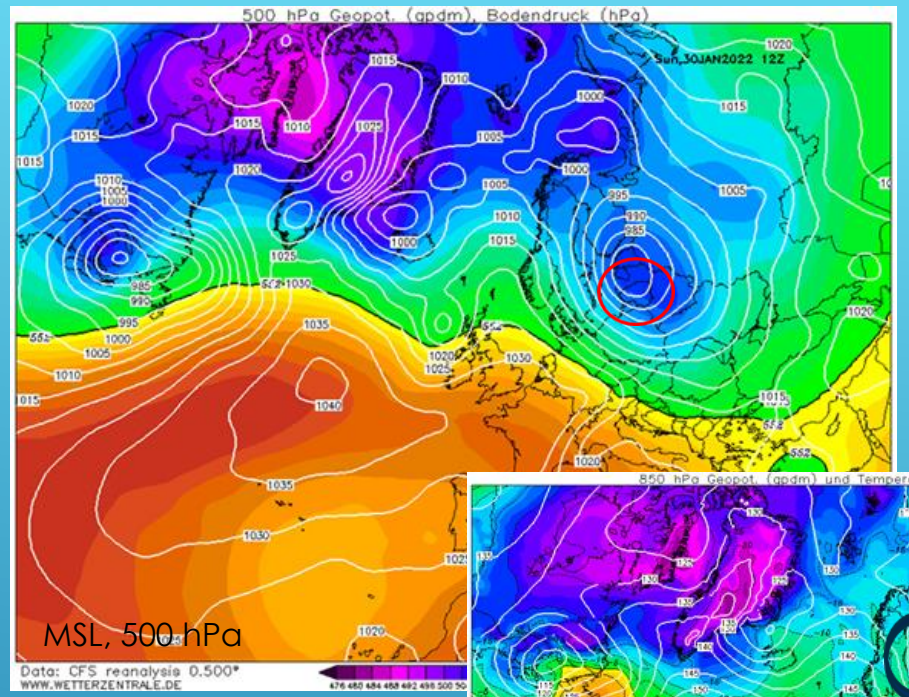


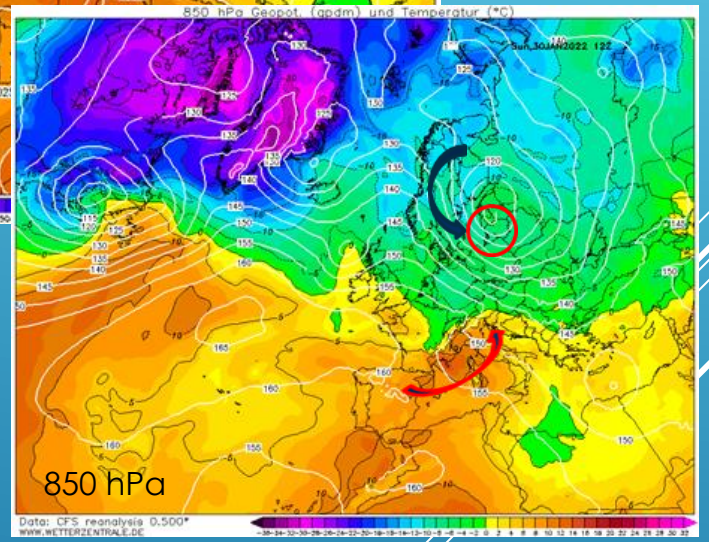
CYCLONE TRACKS ON 14 AND 30 OF JAN





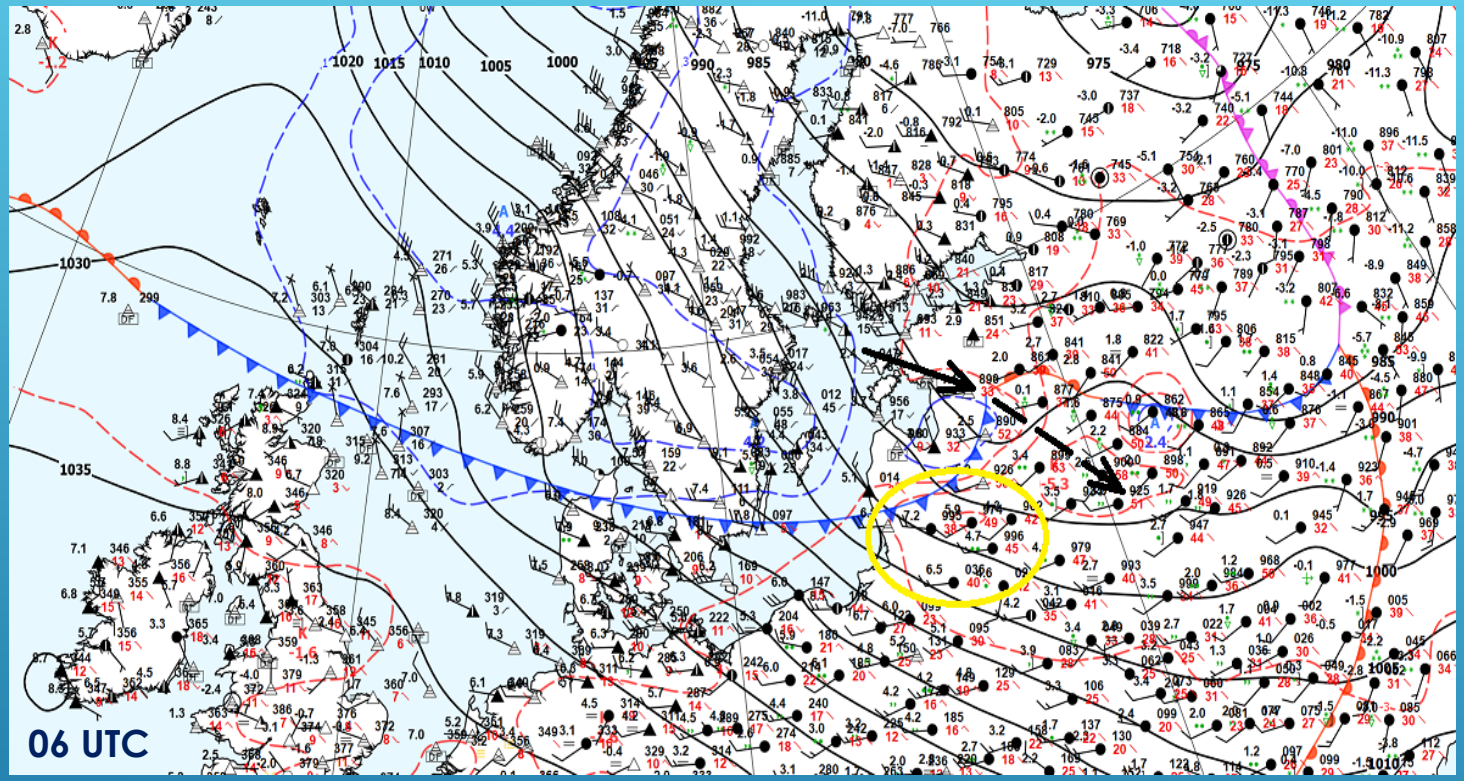
14-01-2022

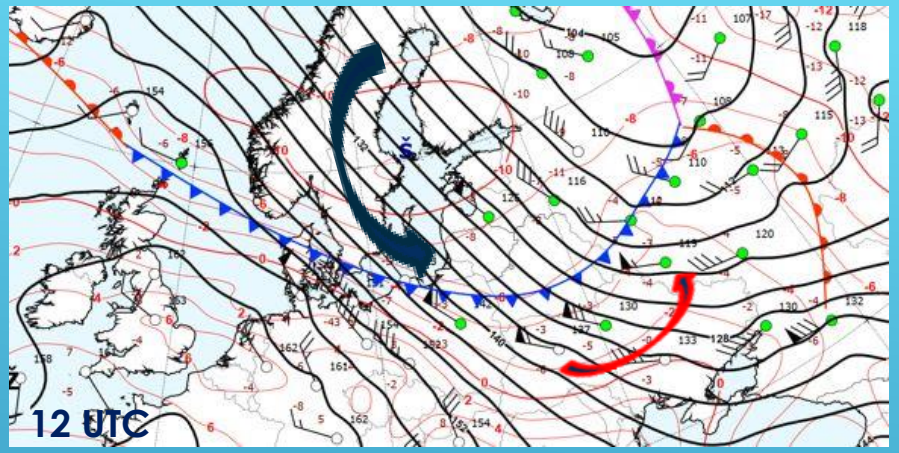


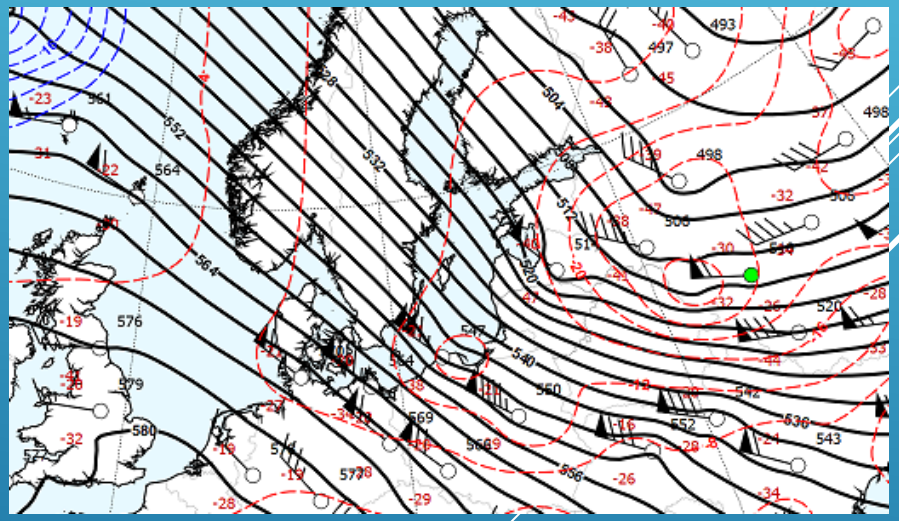


"Malik", 30-01-2022

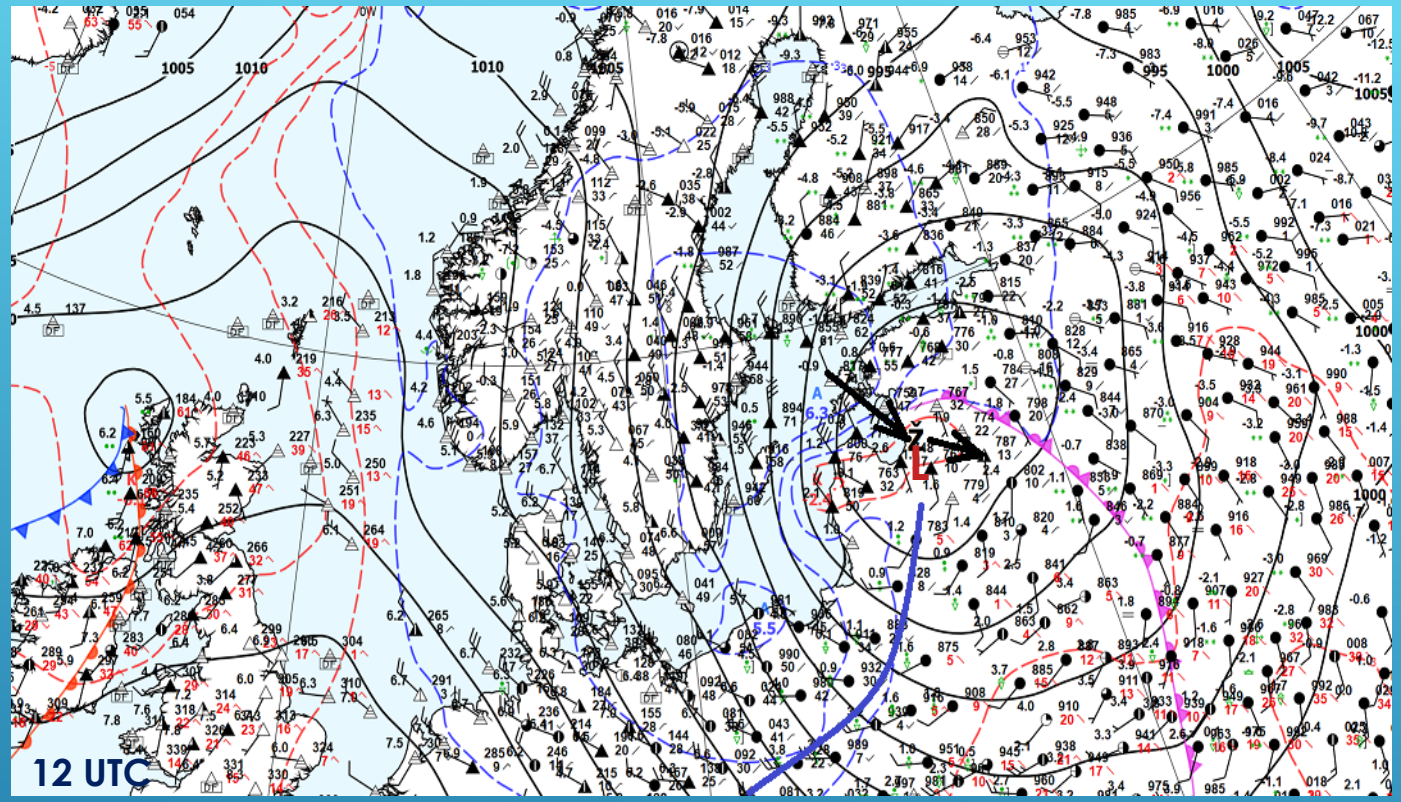
SITUATION AT MSL, 850 HPA, 500 HPA

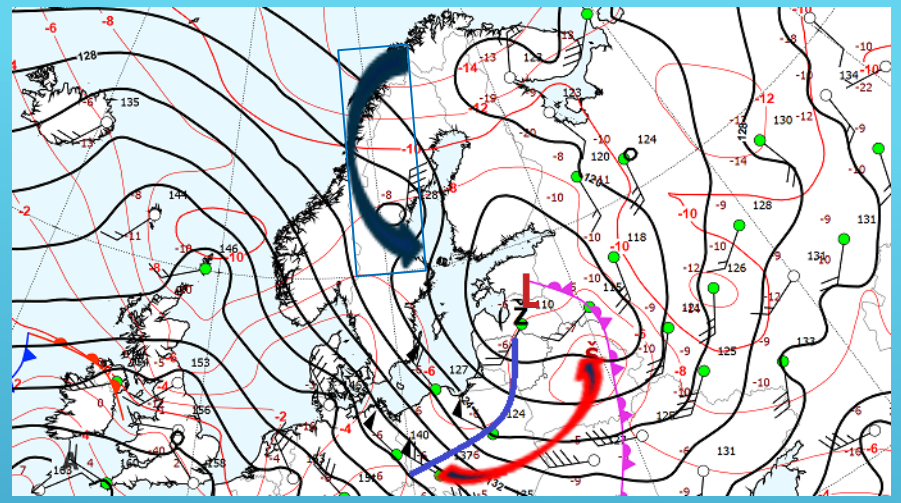


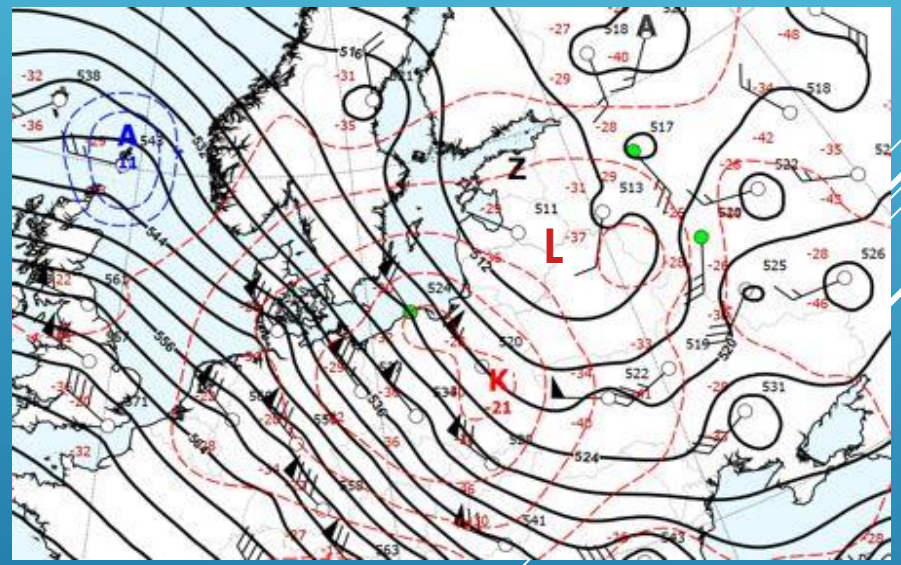




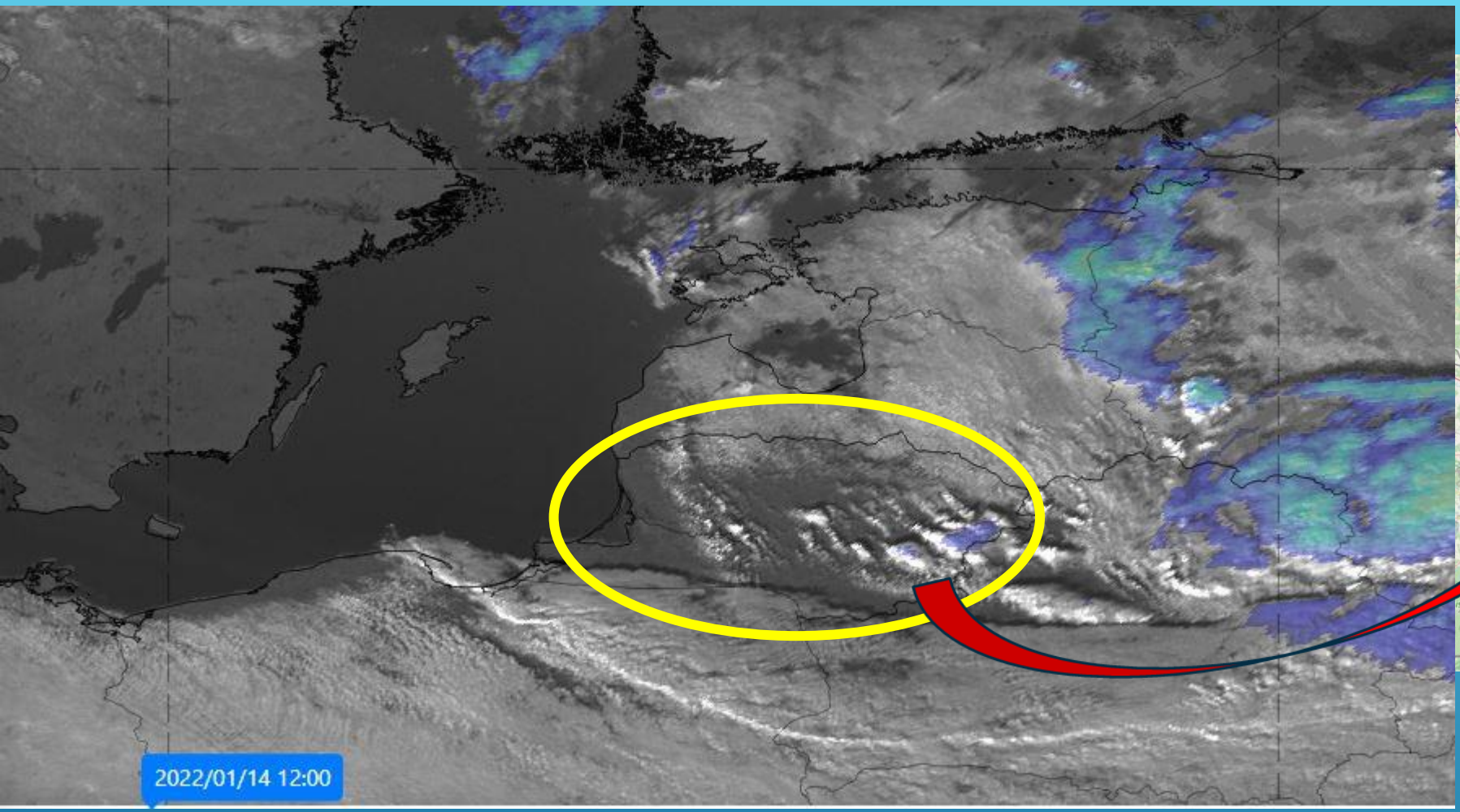
SITUATION AT MSL, 850 HPA, 500 HPA ON 14 JAN

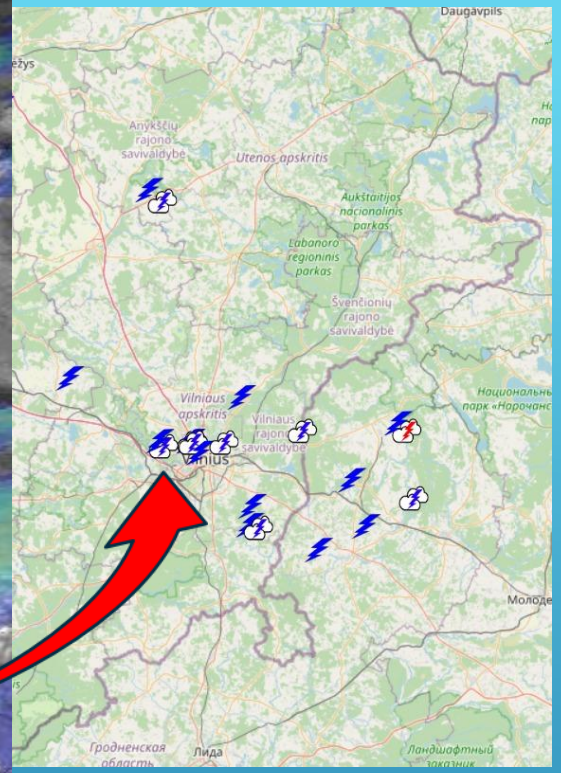




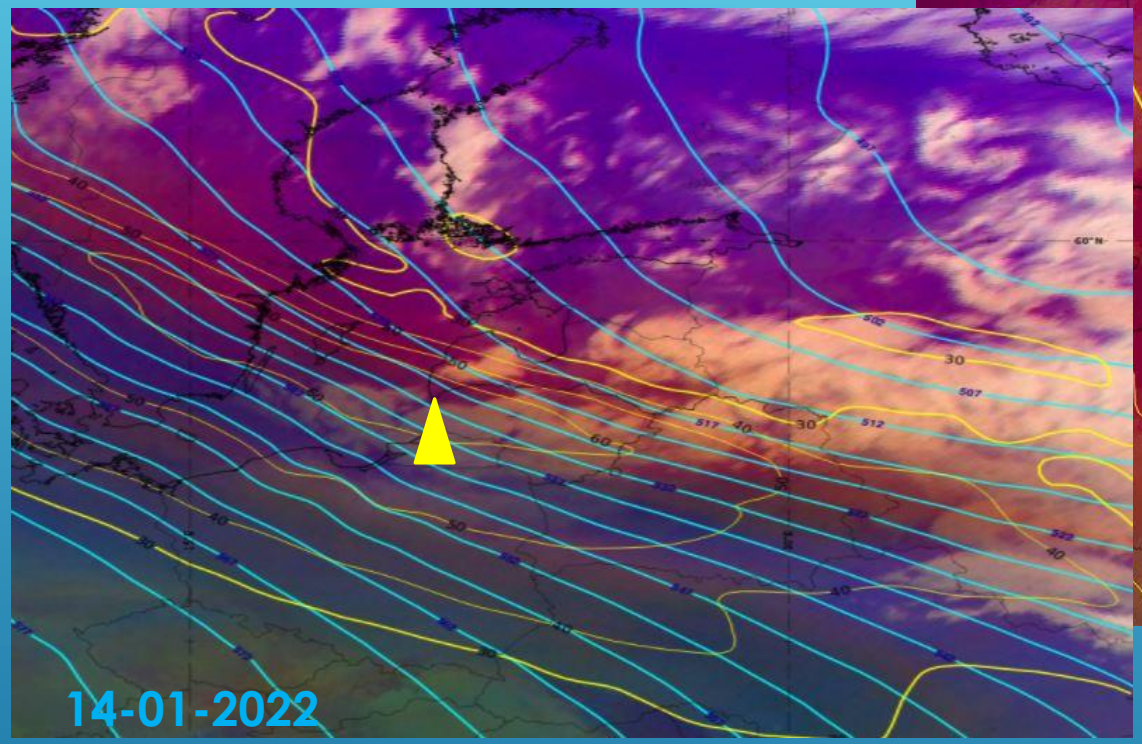


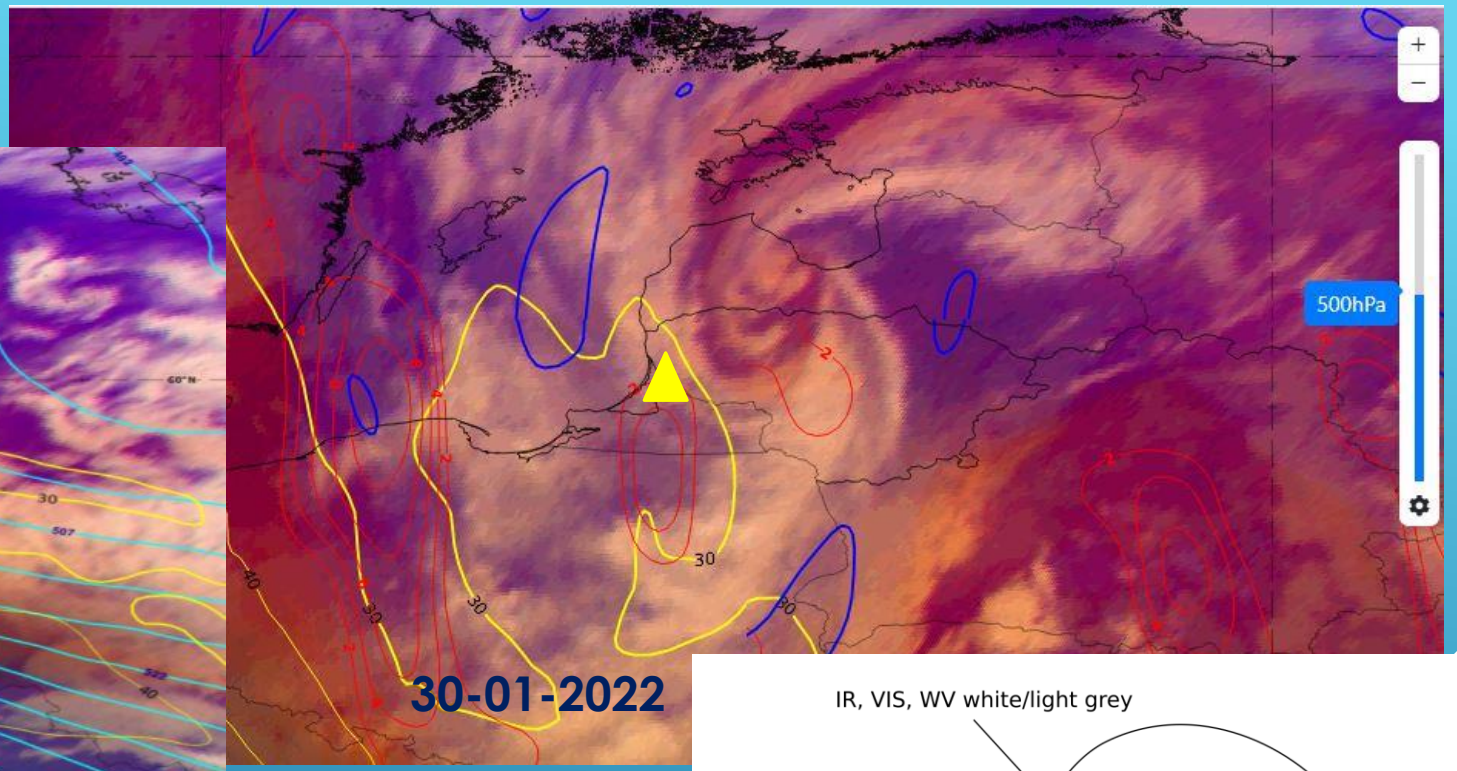
SITUATION AT MSL, 850 HPA, 500 HPA ON 30 JAN

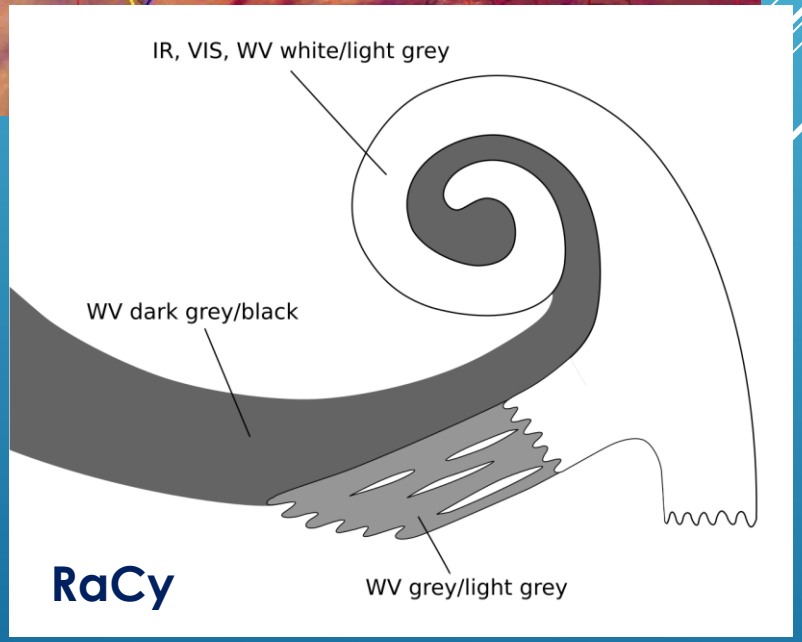




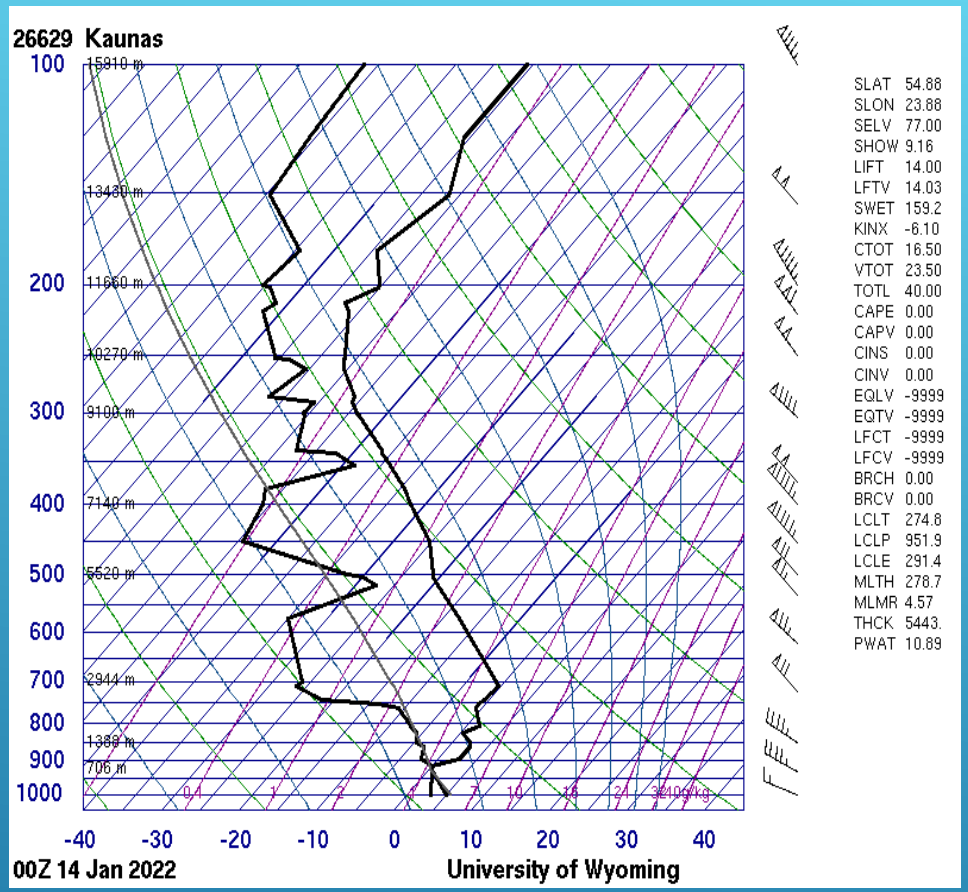
THUNDERSTORMS ON 14 J AN

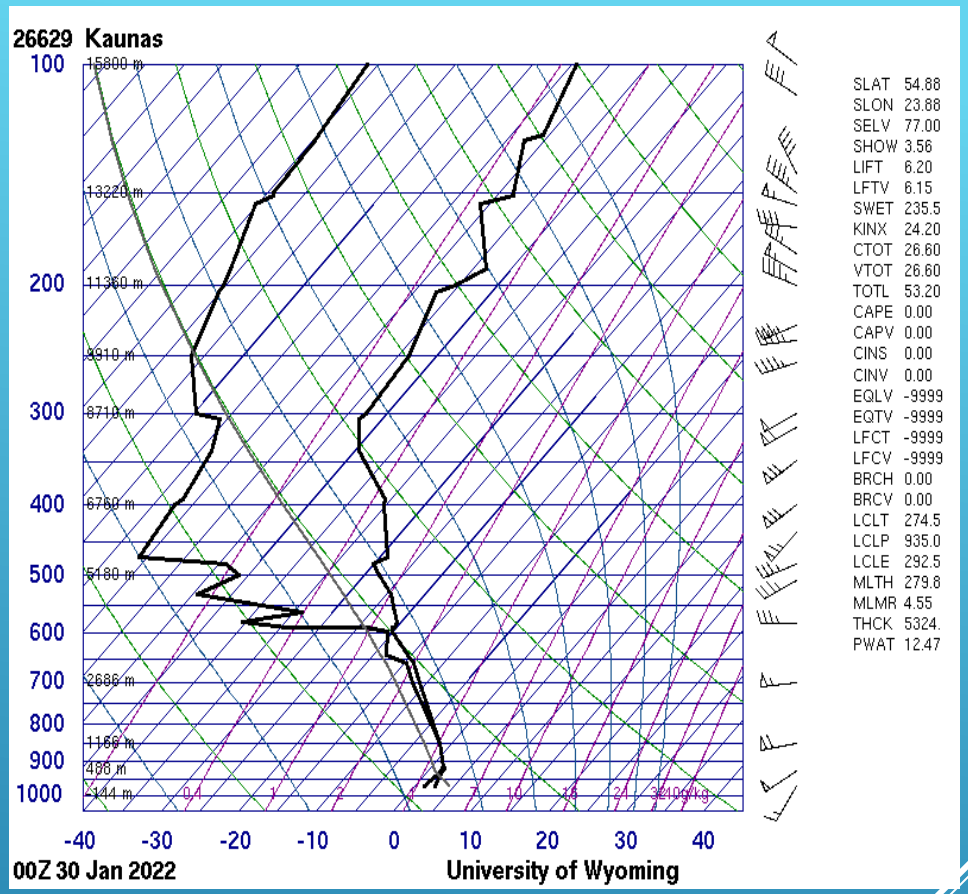




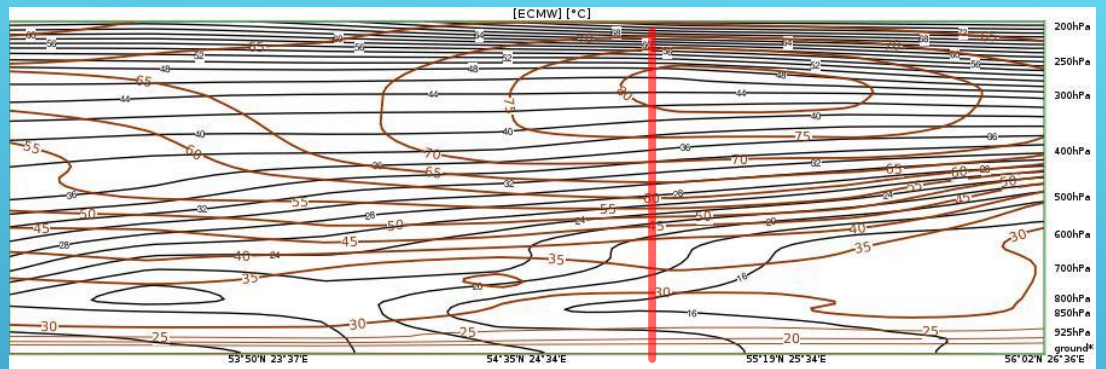


SATELLITE DATA AND PHYSICAL PARAMETERS (ECMWF)

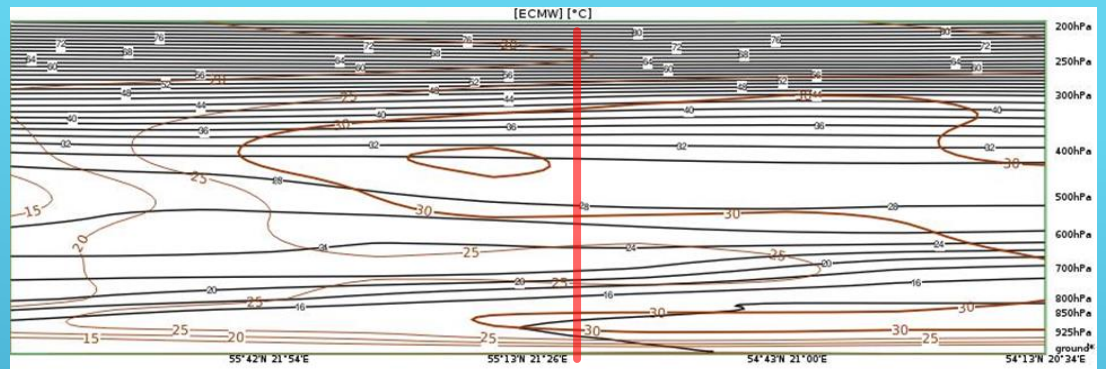




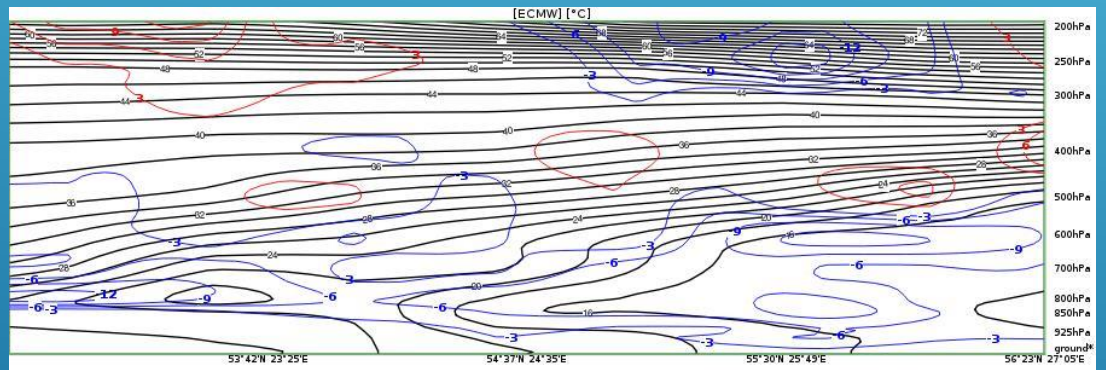
SOUNDING DATA (KAUNAS AS)



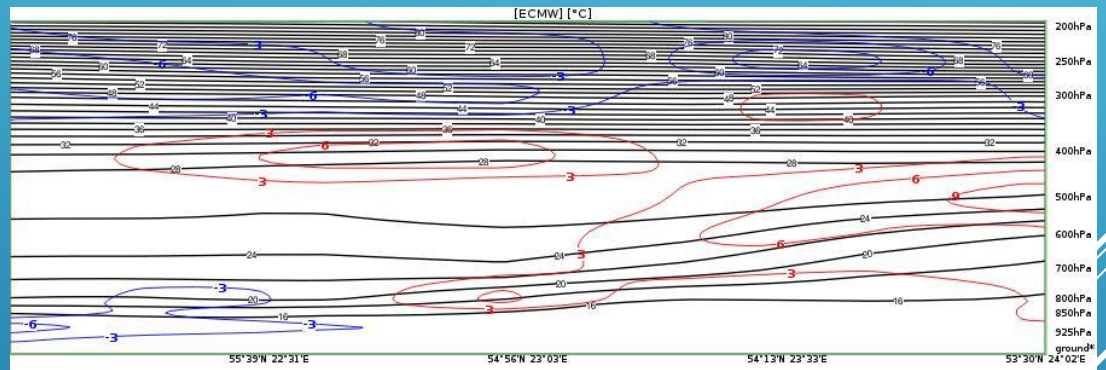
Cross-Section from map **Equivalent Potential Temperature** and **Isotachs**
for 53°05'N 22°41'E - 56°02'N 26°36'E, valid 14.01.2022 09:00



Cross-Section from map **Equivalent Potential Temperature** and **Isotachs**
for 56°12'N 22°22'E - 54°13'N 20°34'E, valid 30.01.2022 12:00



Cross-Section from map **Equivalent Potential Temperature** and **Temperature Advection**
for 52°47'N 22°18'E - 56°23'N 27°05'E, valid 14.01.2022 09:00



Cross-Section from map **Equivalent Potential Temperature** and **Temperature Advection**
for 56°22'N 21°59'E - 53°30'N 24°02'E, valid 30.01.2022 12:00

VERTICAL PROFILES (ECMWF)

- ECMWF forecast (MSL, 850, 500 hPa) was accurate 8 days (14 Jan) and 10 days (30 Jan) before the event;
- Forecast/warning at LHMS issued 2 days in advance

MAIN RECOMMENDATIONS

Look at:

- **Cyclone track – fact/forecast**
- **Monitor the cyclogenesis (RaCy)**
- **Cold air intrusion**
- **Jet stream: direction and speed**

THANK YOU!