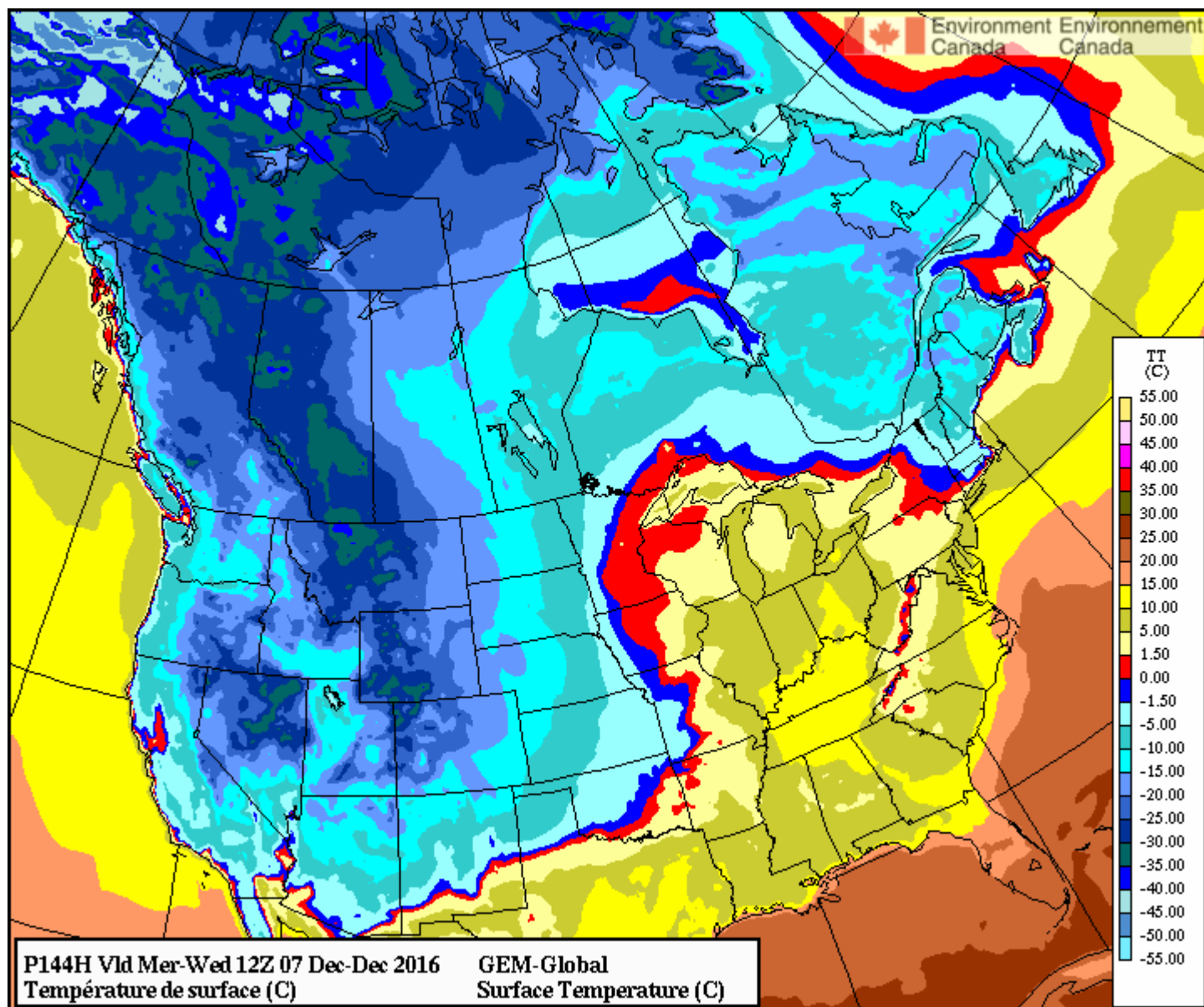


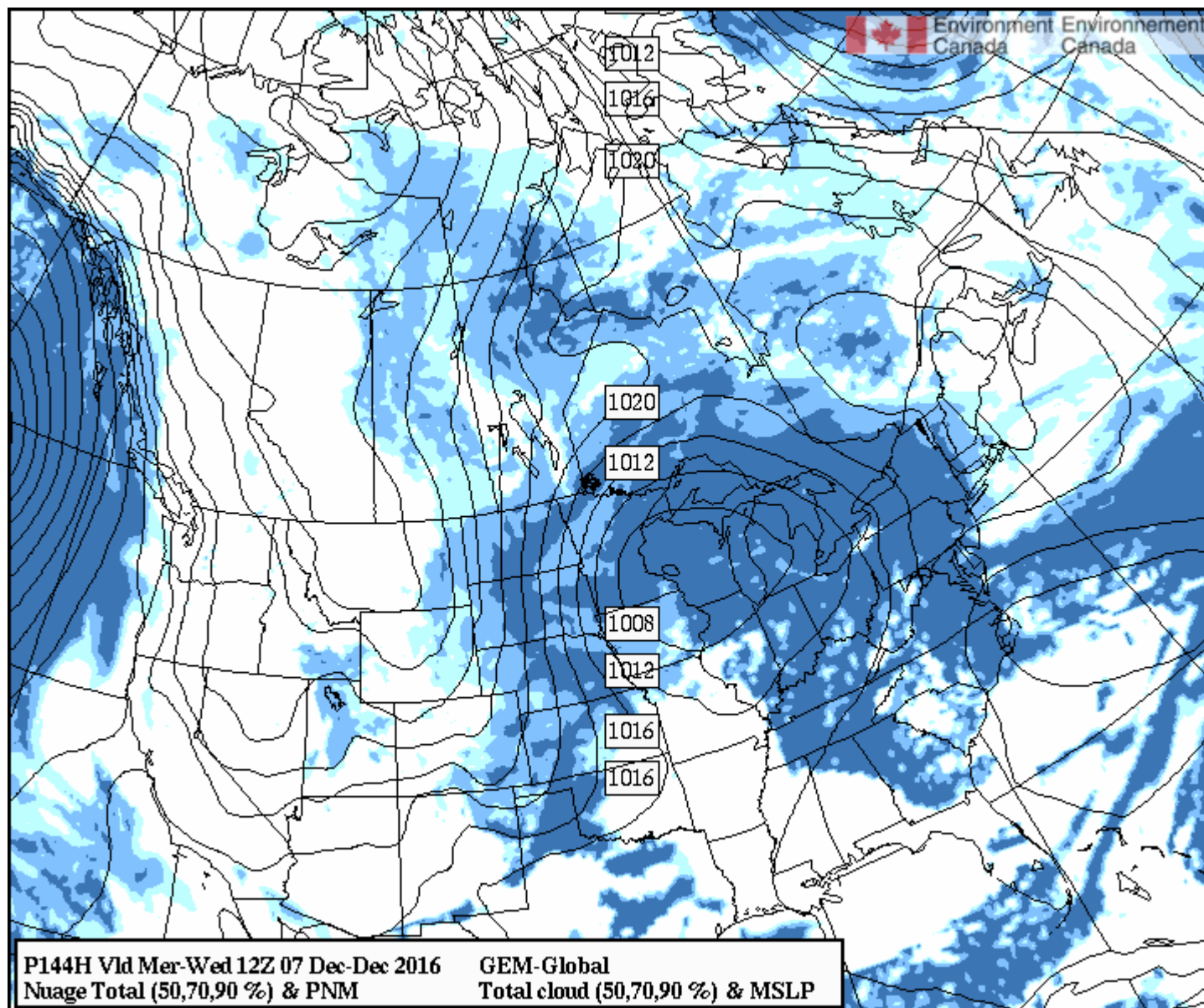
P144H Vld Mer-Wed 12Z 07 Dec-Dec 2016 **GEM-Global**
CONTINU PNM (hPa) & 1000-500 DZ **SOLID MSLP (hPa) & 1000-500 DZ**

Can you locate where strong cold thickness advection is occurring?



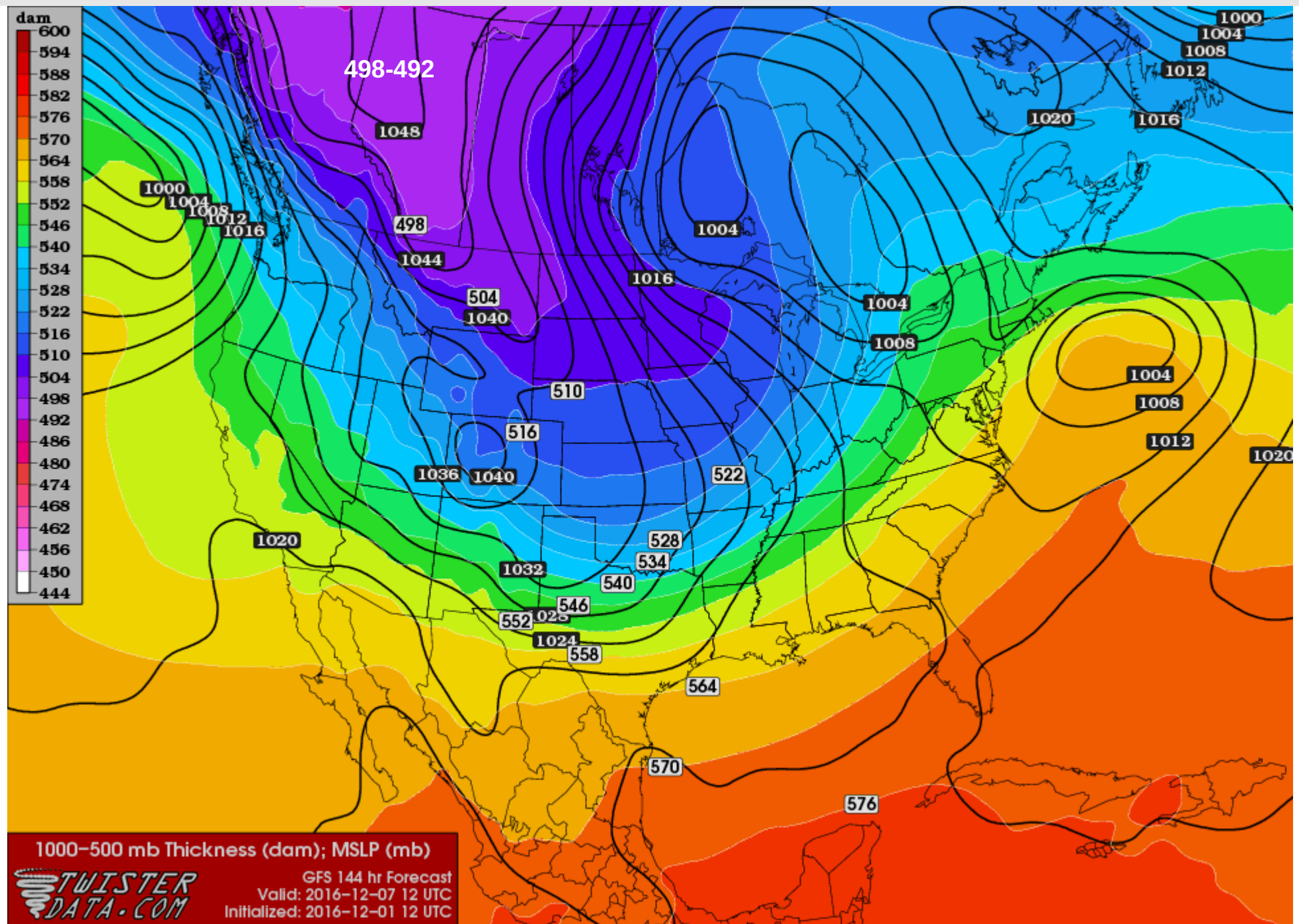
Rural areas near
Edmonton forecast to
see -30°C to -35°C

GDPS (Global Deterministic Prediction System) initialized 12Z Thurs 1 Dec.



Cold and clear –
overnight radiative
cooling will have helped
produce the forecast
extreme cold

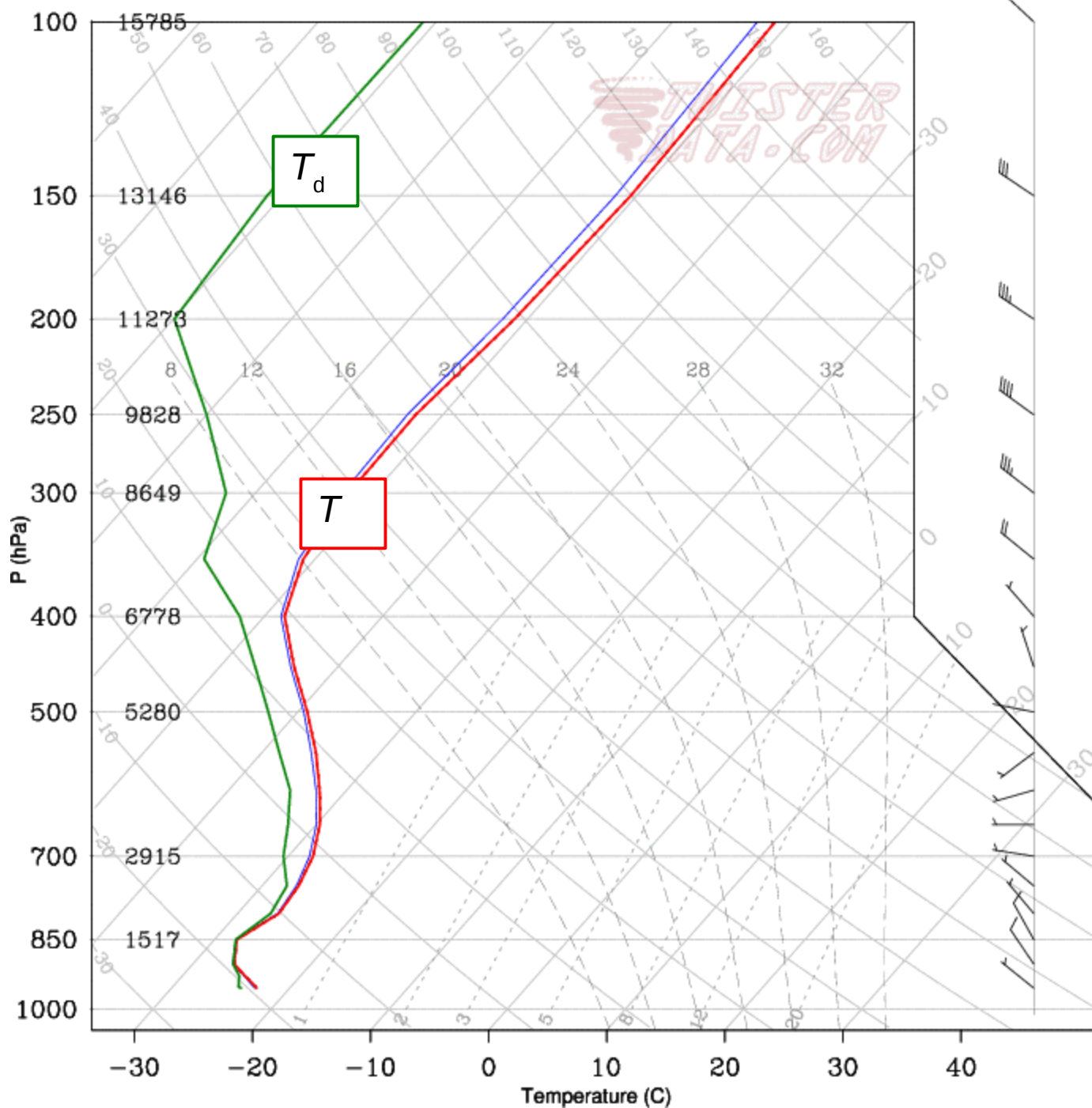
GDPS (Global Deterministic Prediction System) initialized 12Z Thurs 1 Dec.

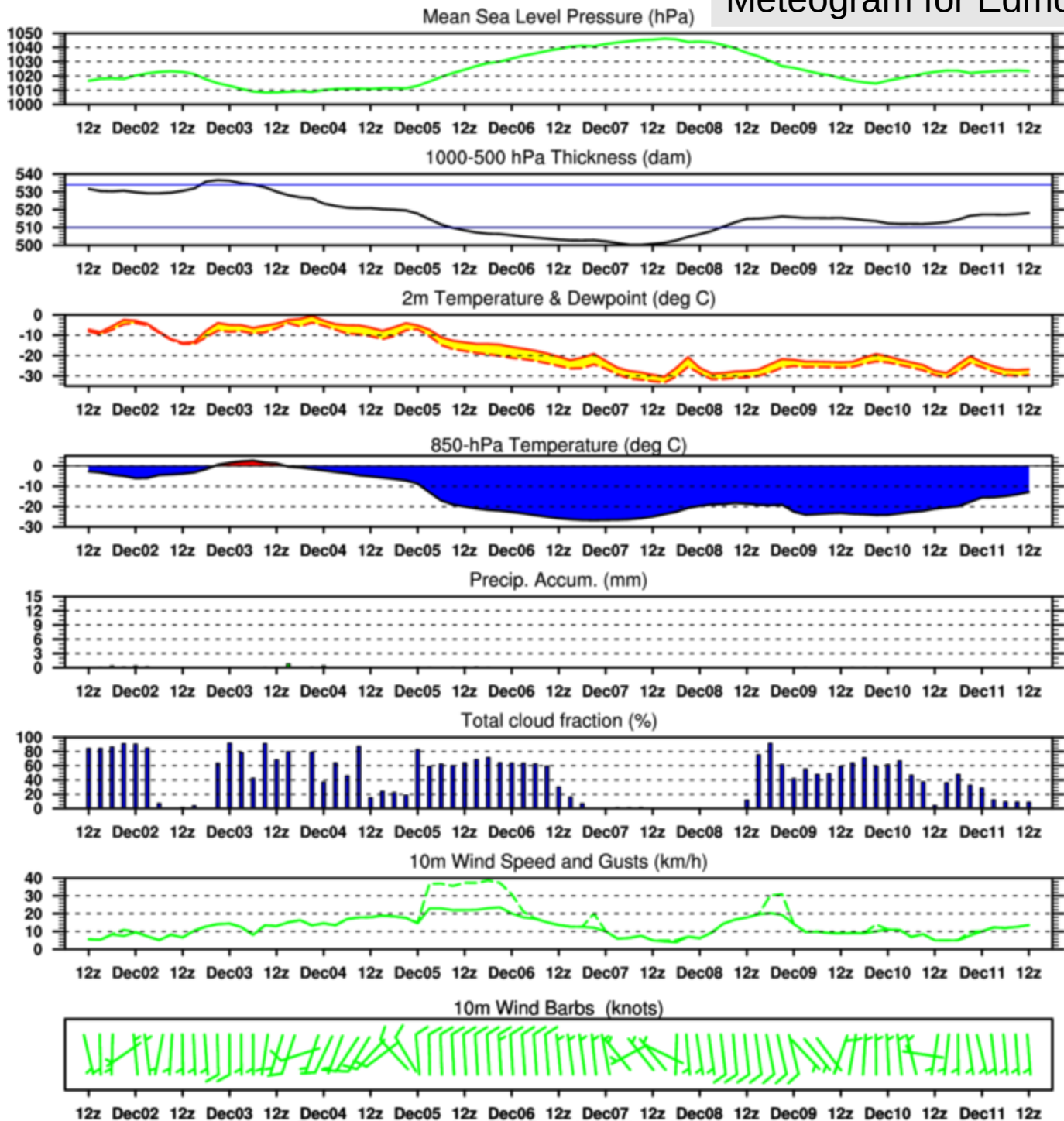


Global Forecast System, initialized 12Z Thurs 1 Dec.

United States Global Forecast System "GFS sounding near Edmonton: 12Z Wed 7 Dec. 5/33

GFS Sounding | 12 UTC Wed 07 Dec 2016 | Lat 54.0000 | Lon -114.0000

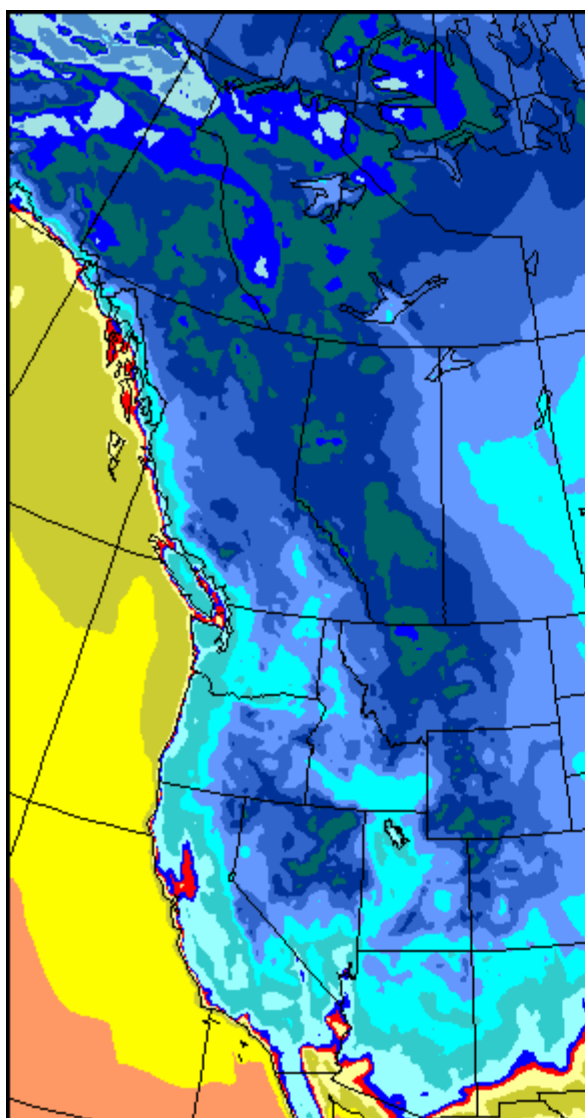




Forecast Initialized on Thu Dec 1 12:00:00 2016

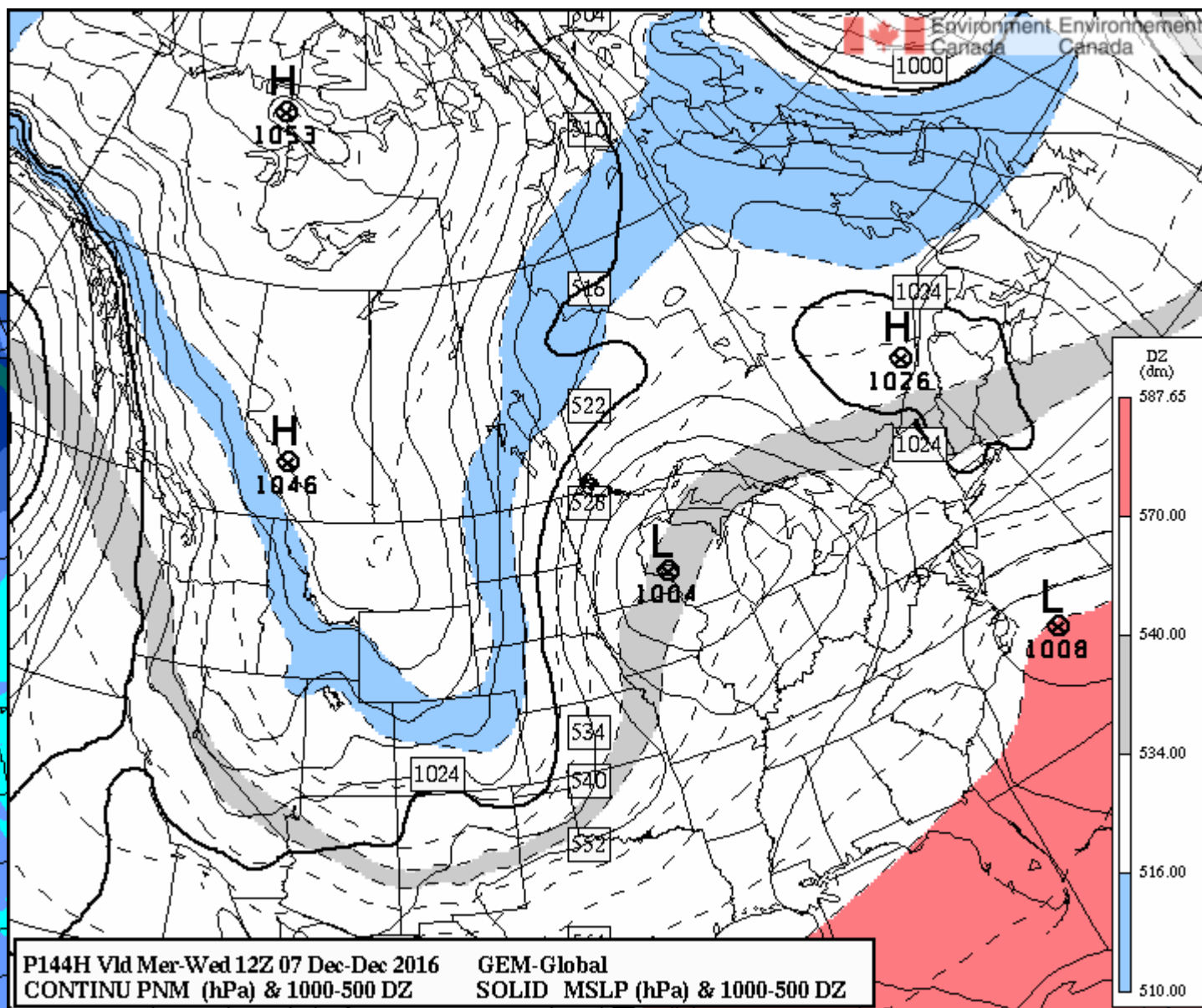
CMC-GDPS for the City of Edmonton - <http://meteocentre.com/>

Let's track the sequence of successively "younger" CMC forecasts, each valid at 12Z Wednesday 7 Dec...



P144H Vld Mer-Wed 12Z 07 Dec-Dec 2016
Température de surface (C)

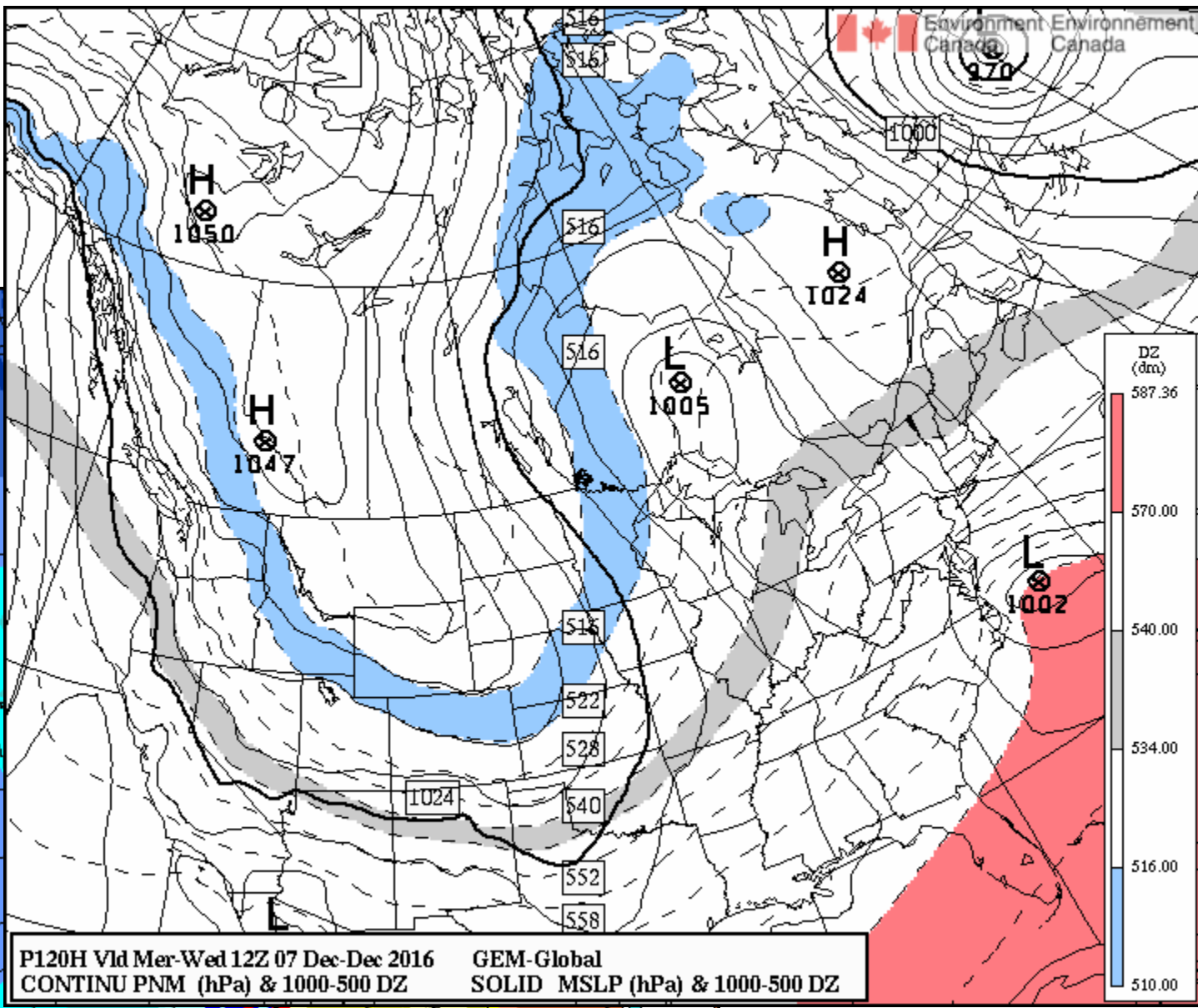
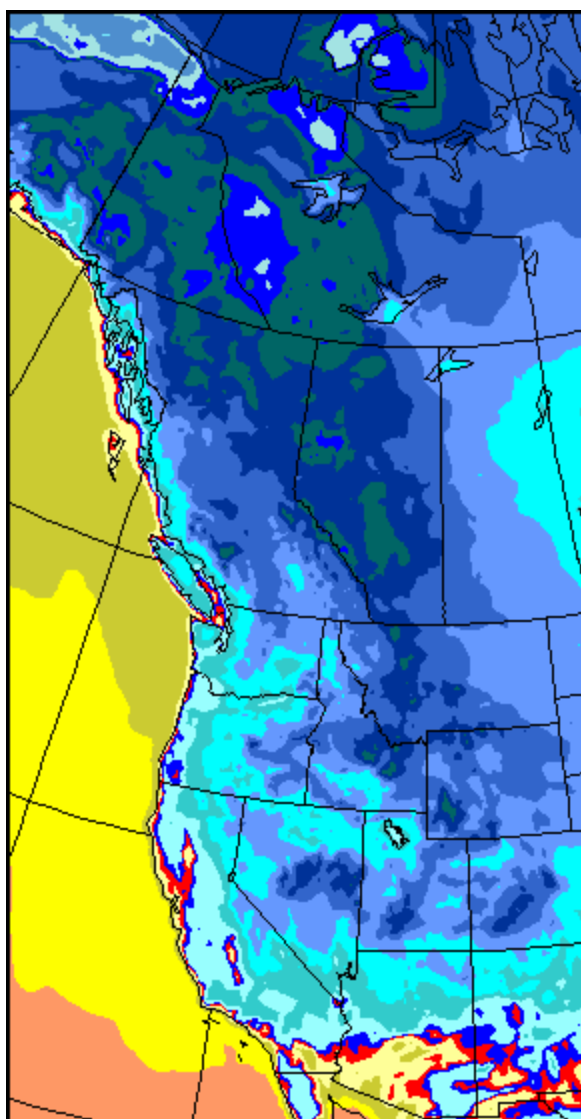
GEM-Global
Surface Temperature (C)



P144H Vld Mer-Wed 12Z 07 Dec-Dec 2016
CONTINU PNM (hPa) & 1000-500 DZ

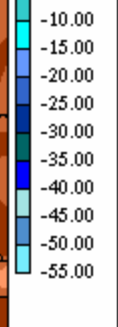
GEM-Global
SOLID MSLP (hPa) & 1000-500 DZ

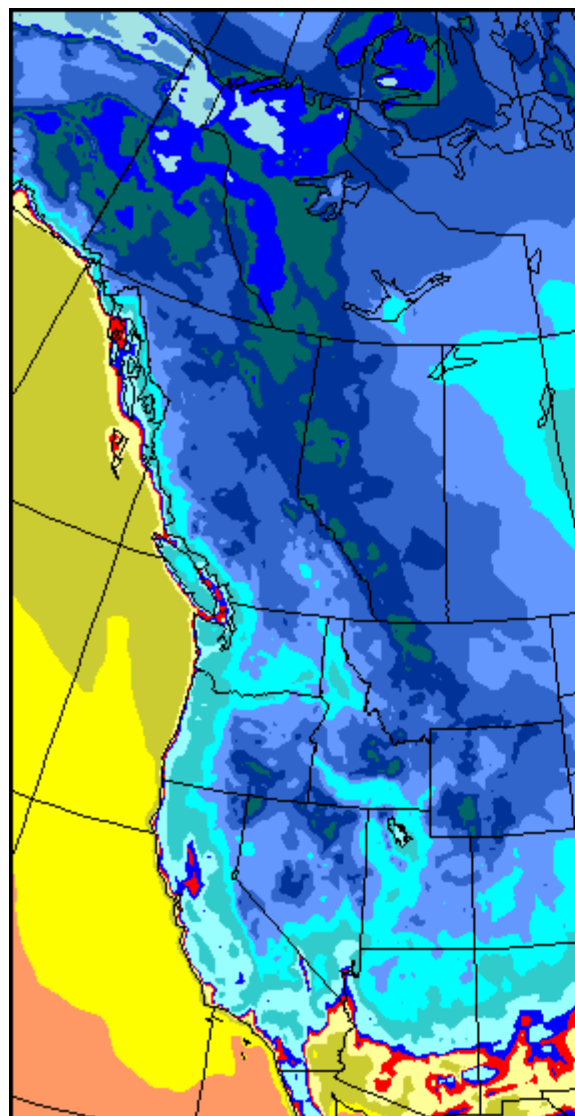
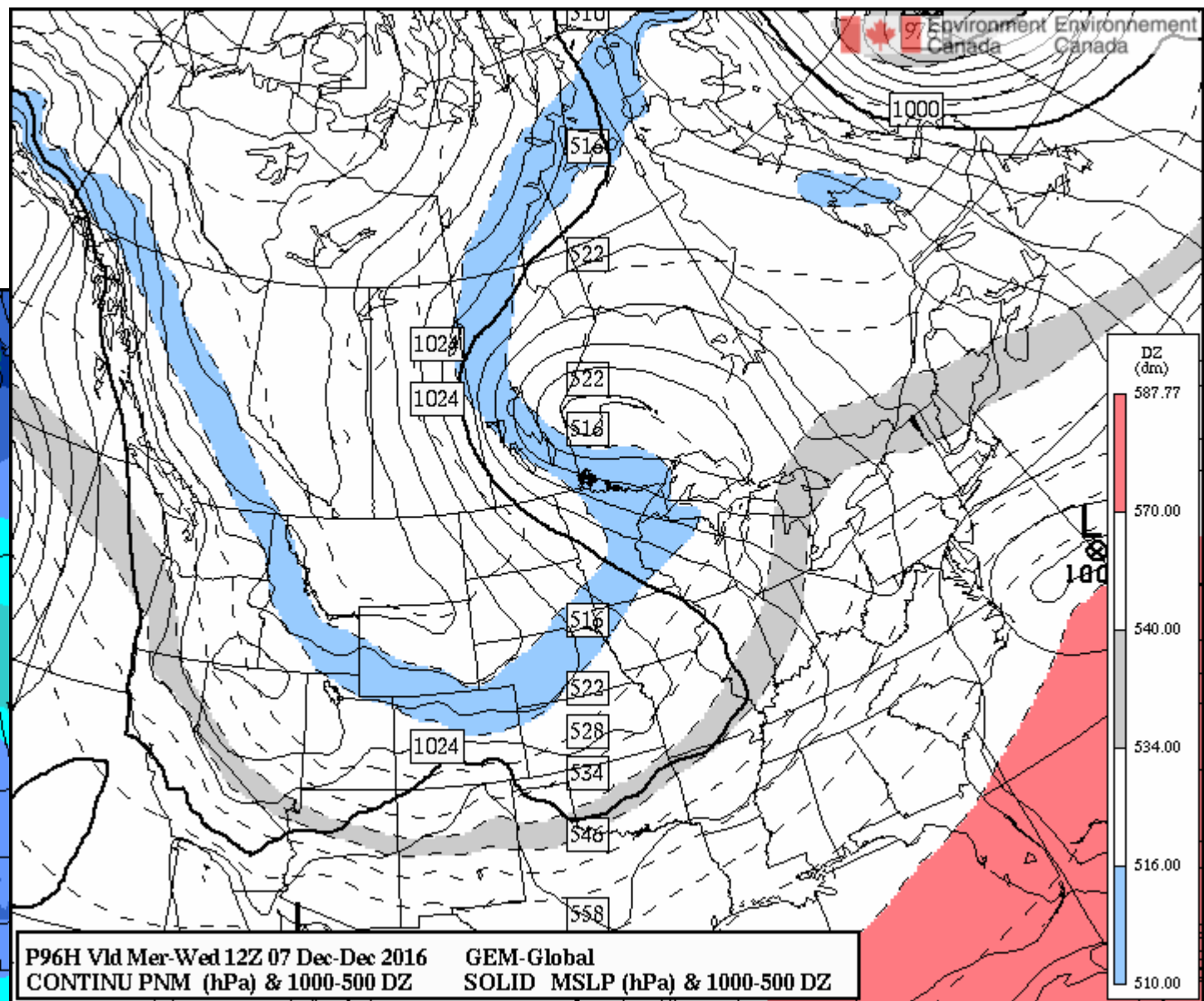




P120H Vld Mer-Wed 12Z 07 Dec-Dec 2016 GEM-Global
 CONTINU PNM (hPa) & 1000-500 DZ SOLID MSLP (hPa) & 1000-500 DZ

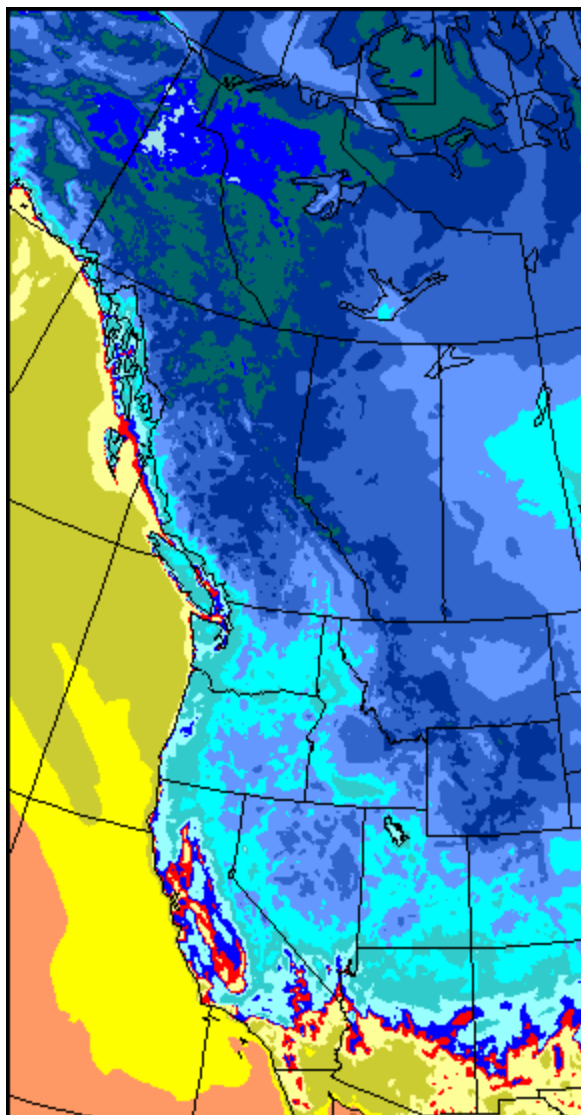
P120H Vld Mer-Wed 12Z 07 Dec-Dec 2016 GEM-Global
 Température de surface (C) Surface Temperature (C)





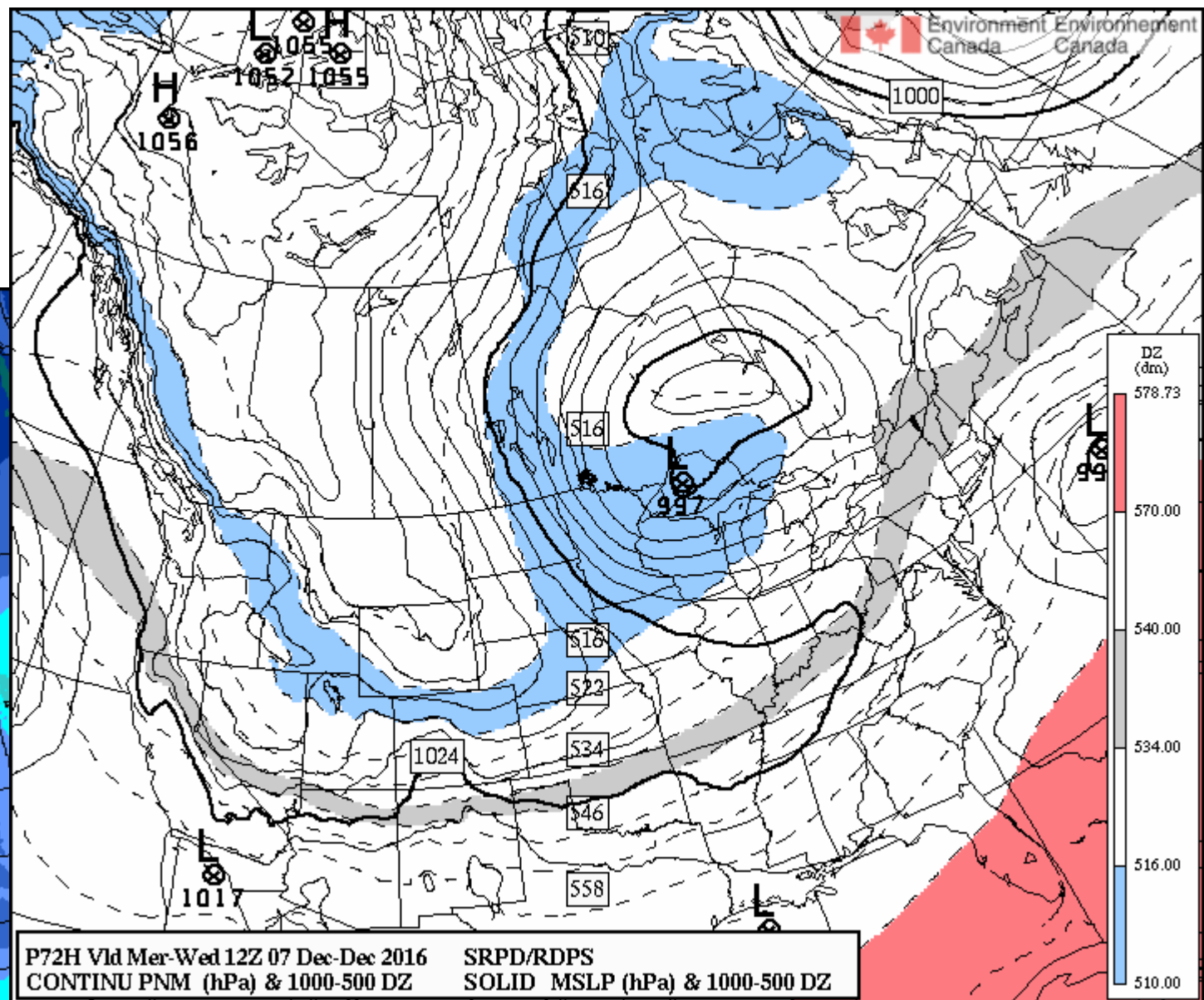
P96H Vld Mer-Wed 12Z 07 Dec-Dec 2016 GEM-Global
Température de surface (C) Surface Temperature (C)

At 72h lead time, RDPS foresees rural C. Alberta 2m temperature to be in the -20 to -25°C range at 5 MST (12Z) on Wed. 7th



P72H Vld Mer-Wed 12Z 07 Dec-Dec 2016
Température de surface (C)

SRPD/RDPS
Surface Temperature (C)

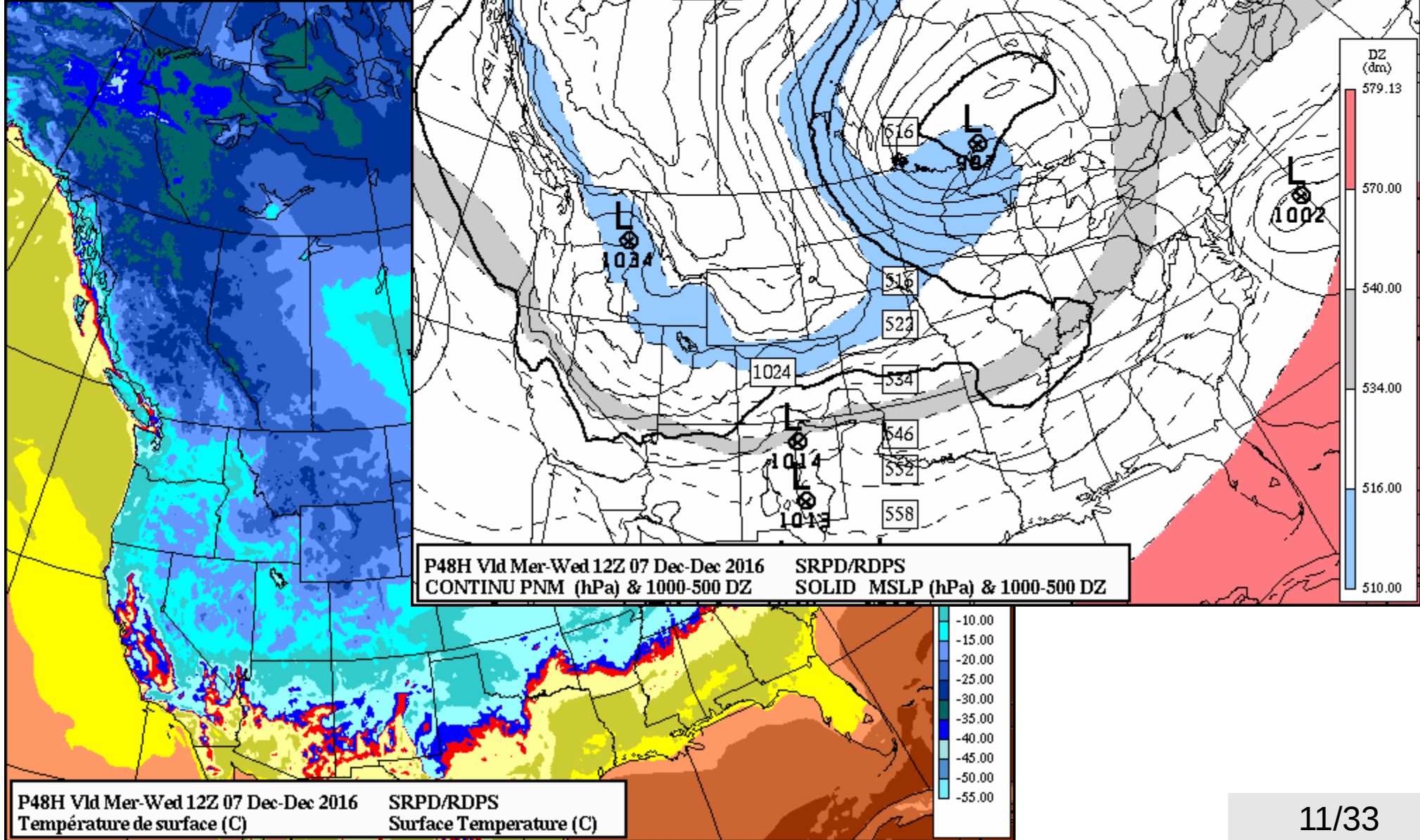


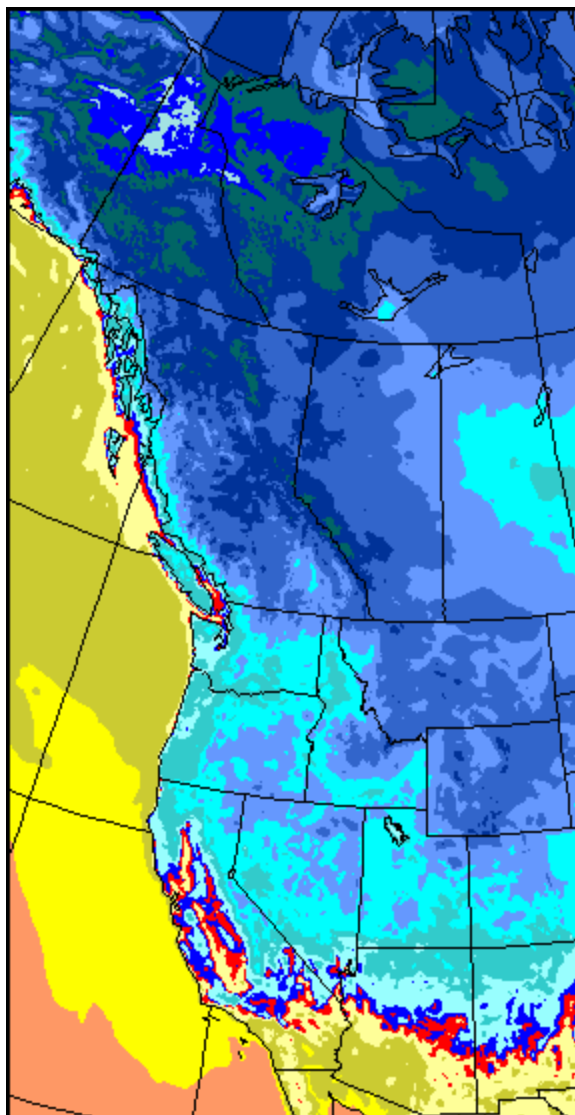
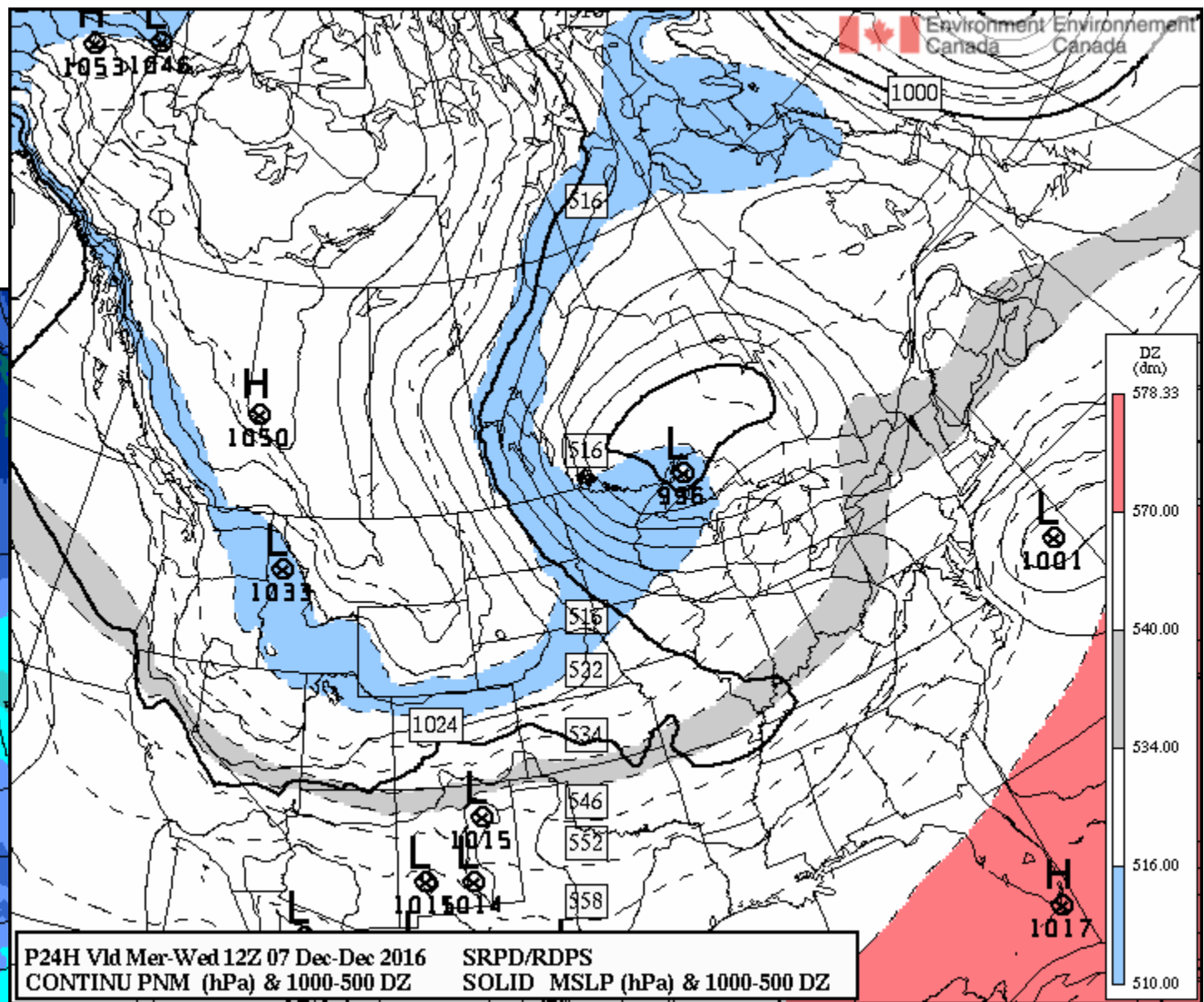
P72H Vld Mer-Wed 12Z 07 Dec-Dec 2016
CONTINU PNM (hPa) & 1000-500 DZ

SRPD/RDPS
SOLID MSLP (hPa) & 1000-500 DZ

12Z Wed is now within
the forecast range of
the higher resolution
RDPS – arctic high
1056 hPa!

At 48h lead time, RDPS foresees rural C. Alberta 2m temperature to be in the -20 to -25°C range at 5 MST (12Z) on Wednesday 7th



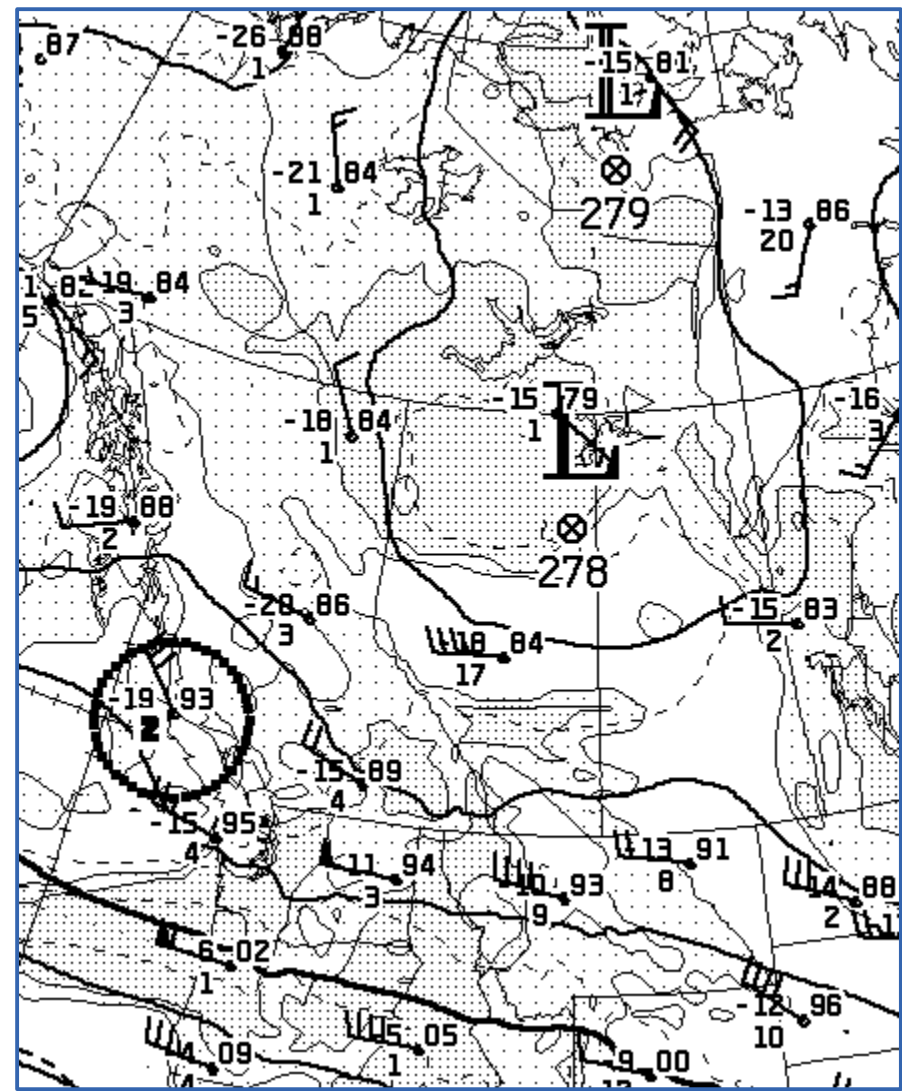
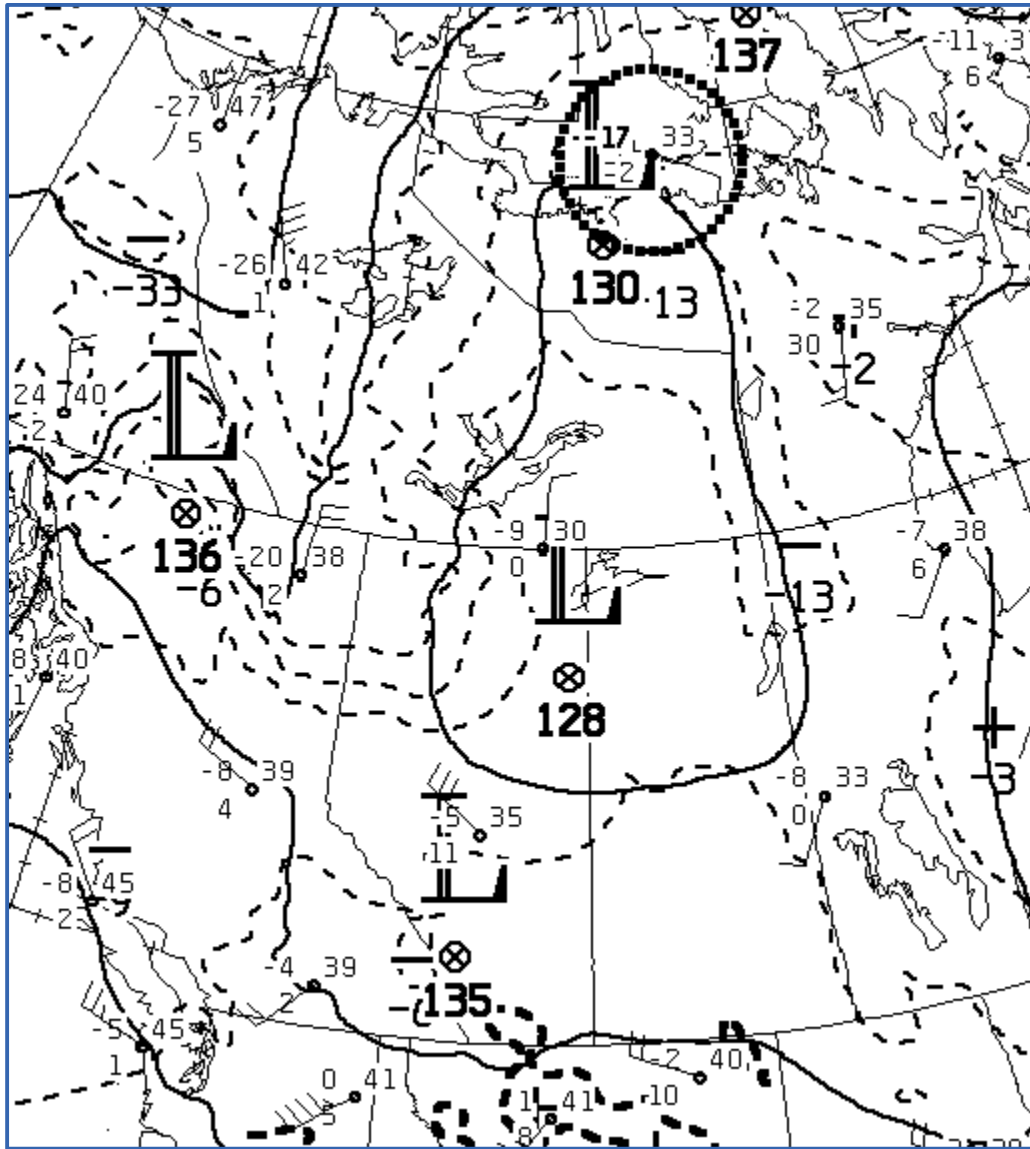


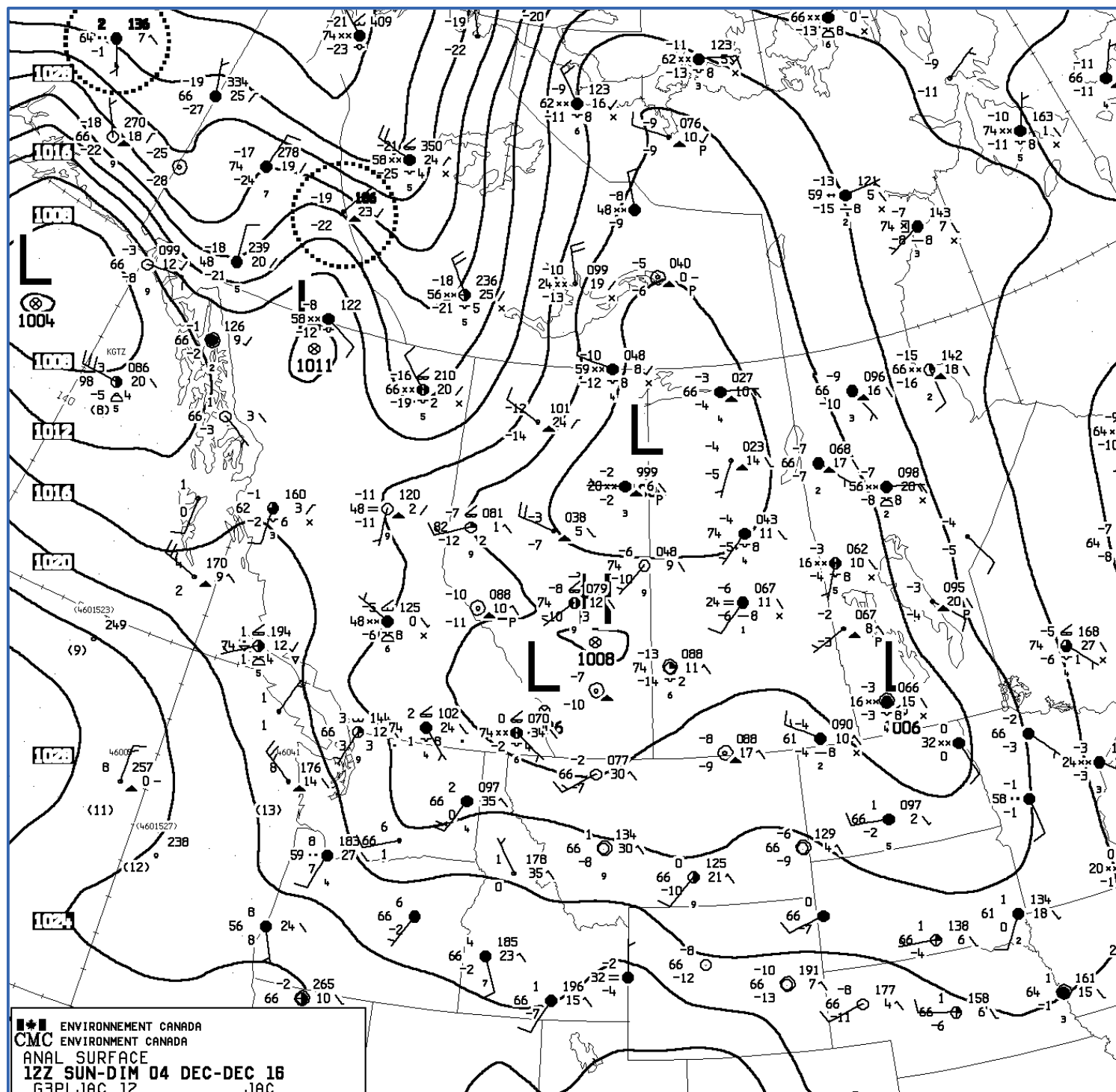
P24H Vld Mer-Wed 12Z 07 Dec-Dec 2016
Température de surface (C)
Surface Temperature (C)

-10.00
-15.00
-20.00
-25.00
-30.00
-35.00
-40.00
-45.00
-50.00
-55.00

Now let's look at some analyses, as the cold air arrives...

Here comes the cold air... CMC 850 & 700 hPa analyses 12Z Sunday 4 December 2016

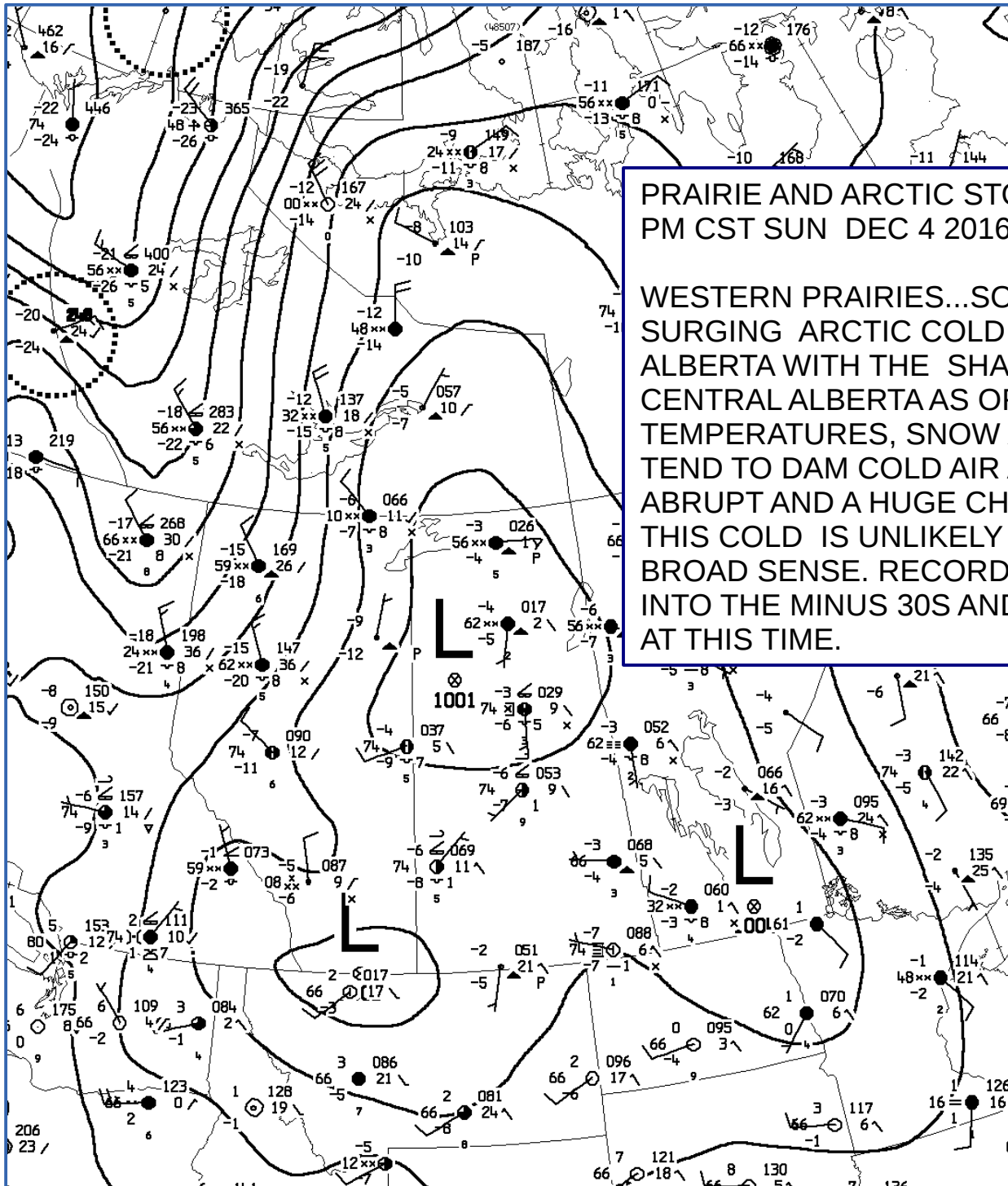


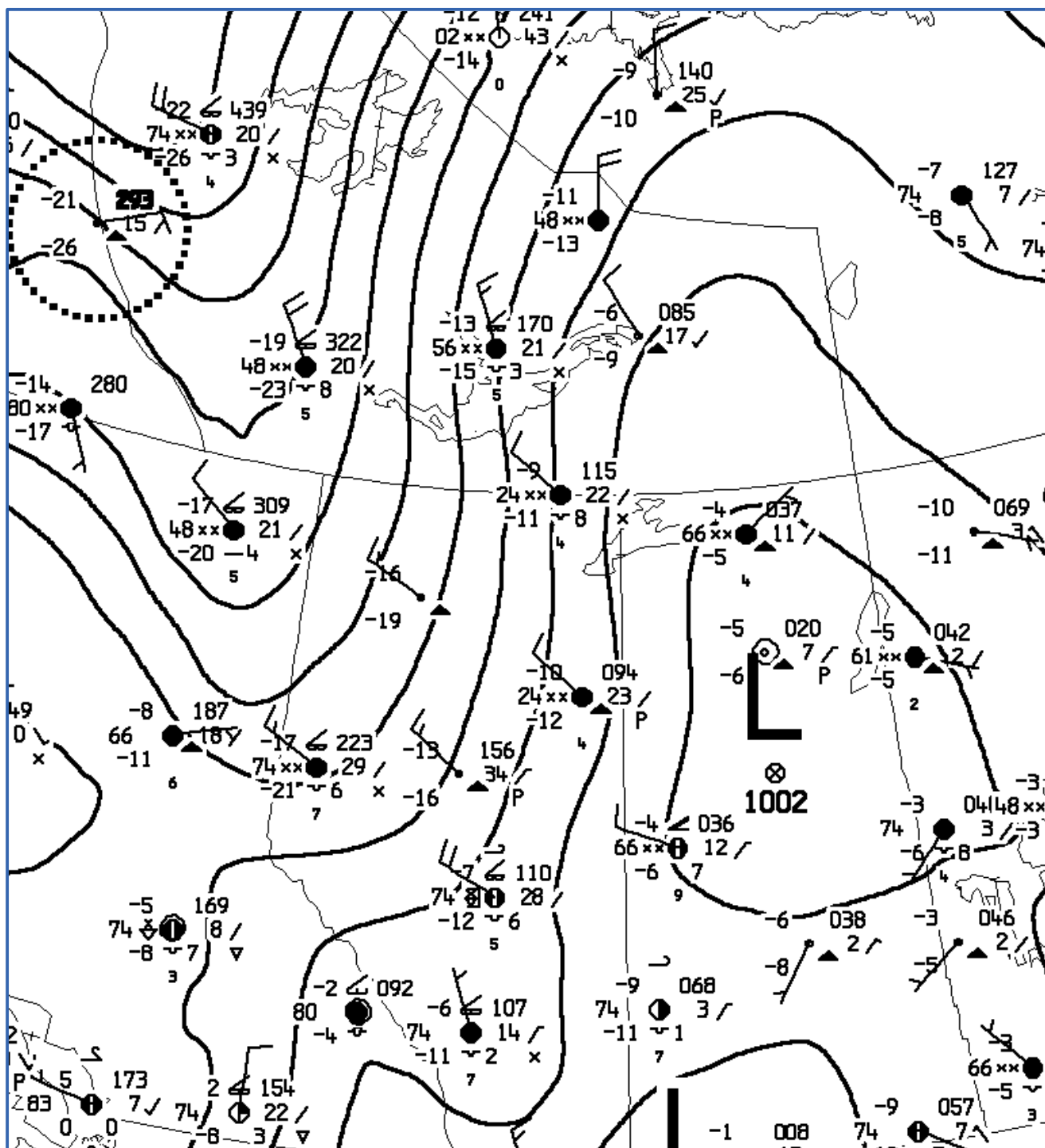


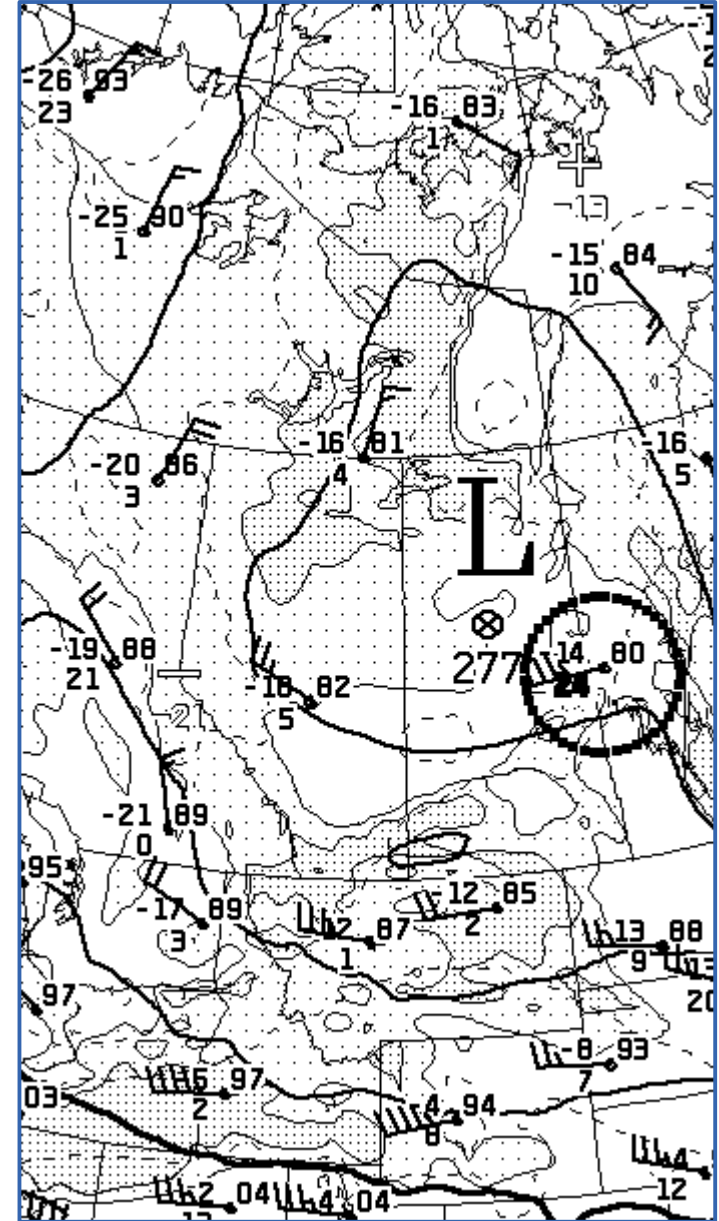
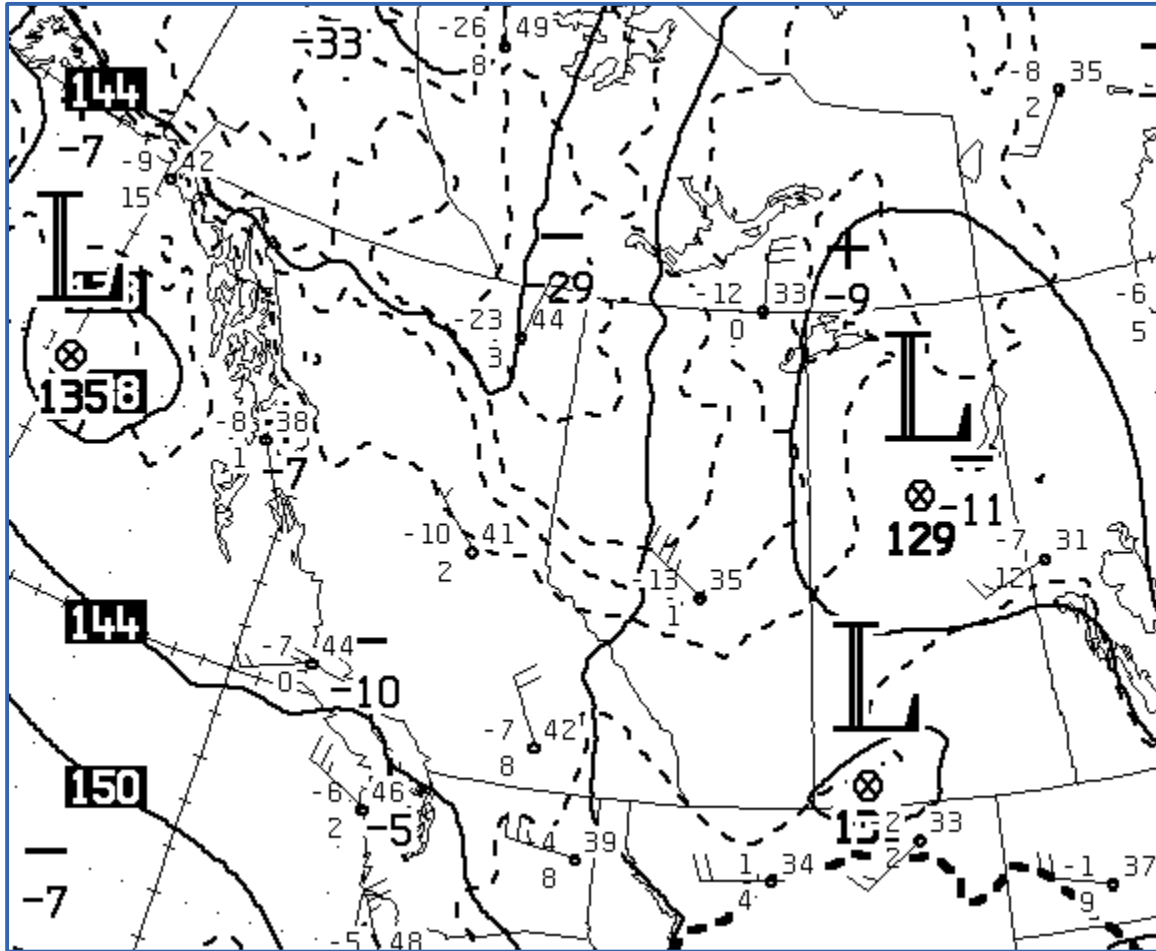
- snowing in the NW of AB

PRAIRIE AND ARCTIC STORM PREDICTION CENTRE OF EC, 2:00 PM CST SUN DEC 4 2016.

WESTERN PRAIRIES...SOUTH OF 60, THE FOCUS WILL BE THE SURGING ARCTIC COLD FRONT. VERY COLD AIR IS INFILTRATING ALBERTA WITH THE SHARP COLD FRONT MOVING THROUGH CENTRAL ALBERTA AS OF 19Z BRINGING WITH IT PLUNGING TEMPERATURES, SNOW AND GUSTY WINDS. THESE SETUPS TEND TO DAM COLD AIR AGAINST THE ROCKIES... ALTHOUGH ABRUPT AND A HUGE CHANGE FROM RECENT TEMPERATURES, THIS COLD IS UNLIKELY TO BE RECORD-BREAKING, AT LEAST IN A BROAD SENSE. RECORD LOWS THIS TIME OF YEAR ARE WELL INTO THE MINUS 30S AND 40S, AND THOSE ARE NOT FORECAST AT THIS TIME.



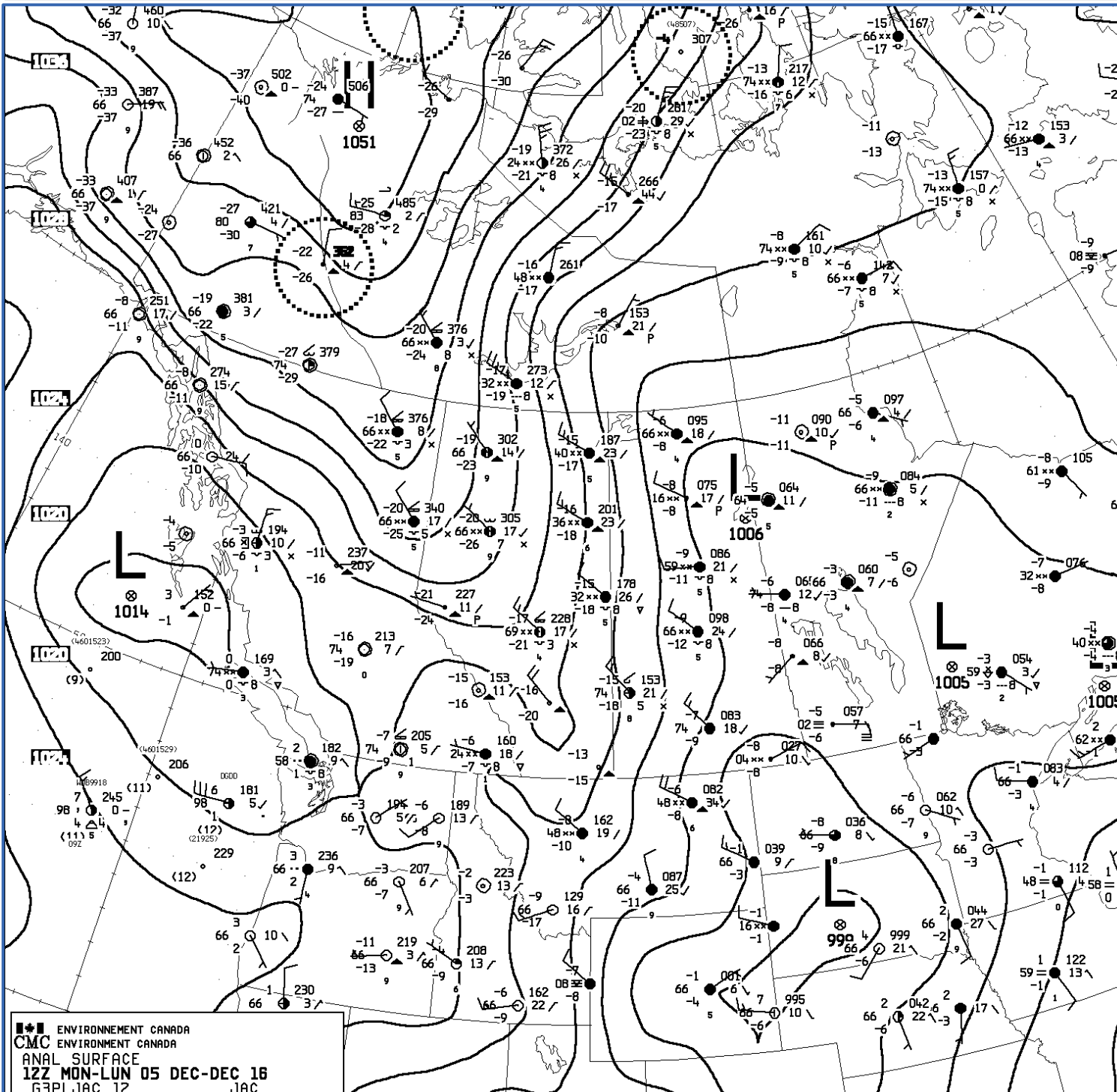


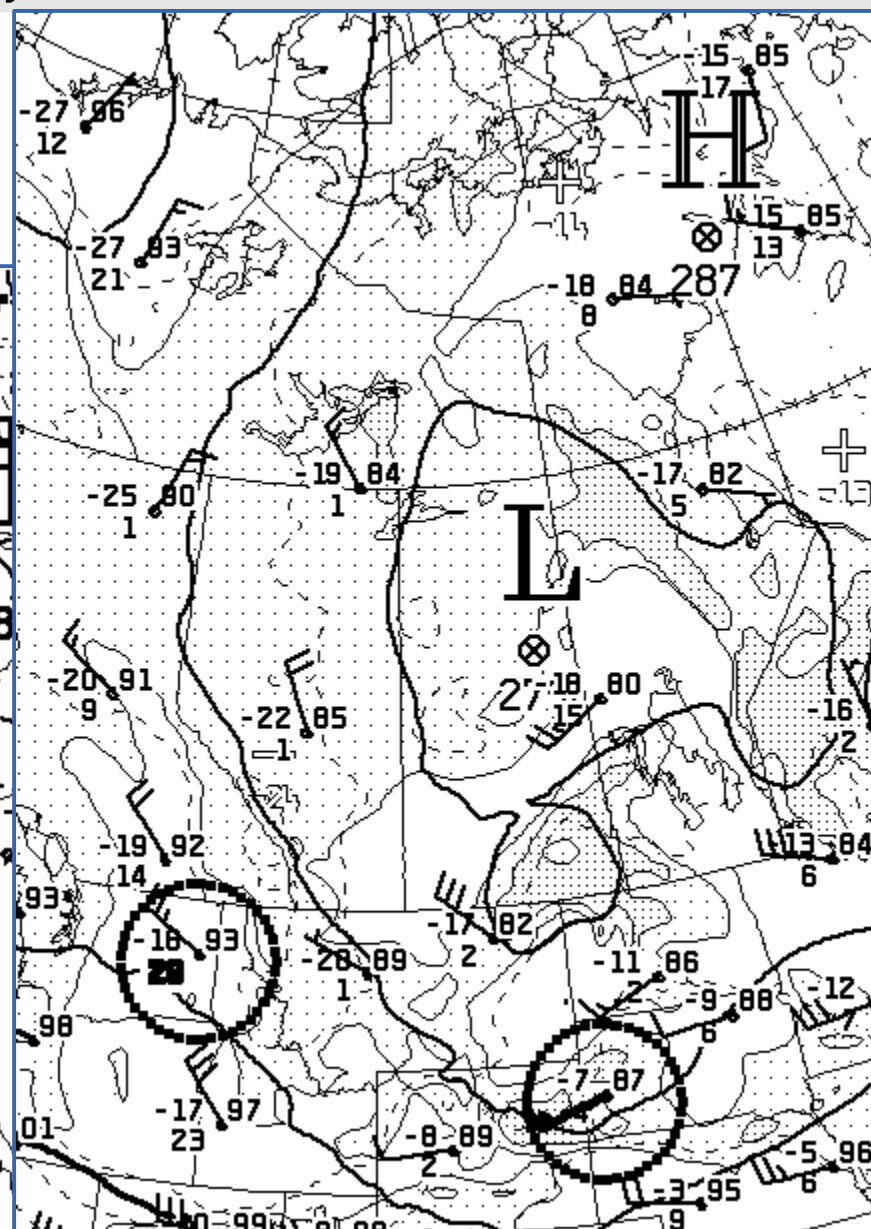
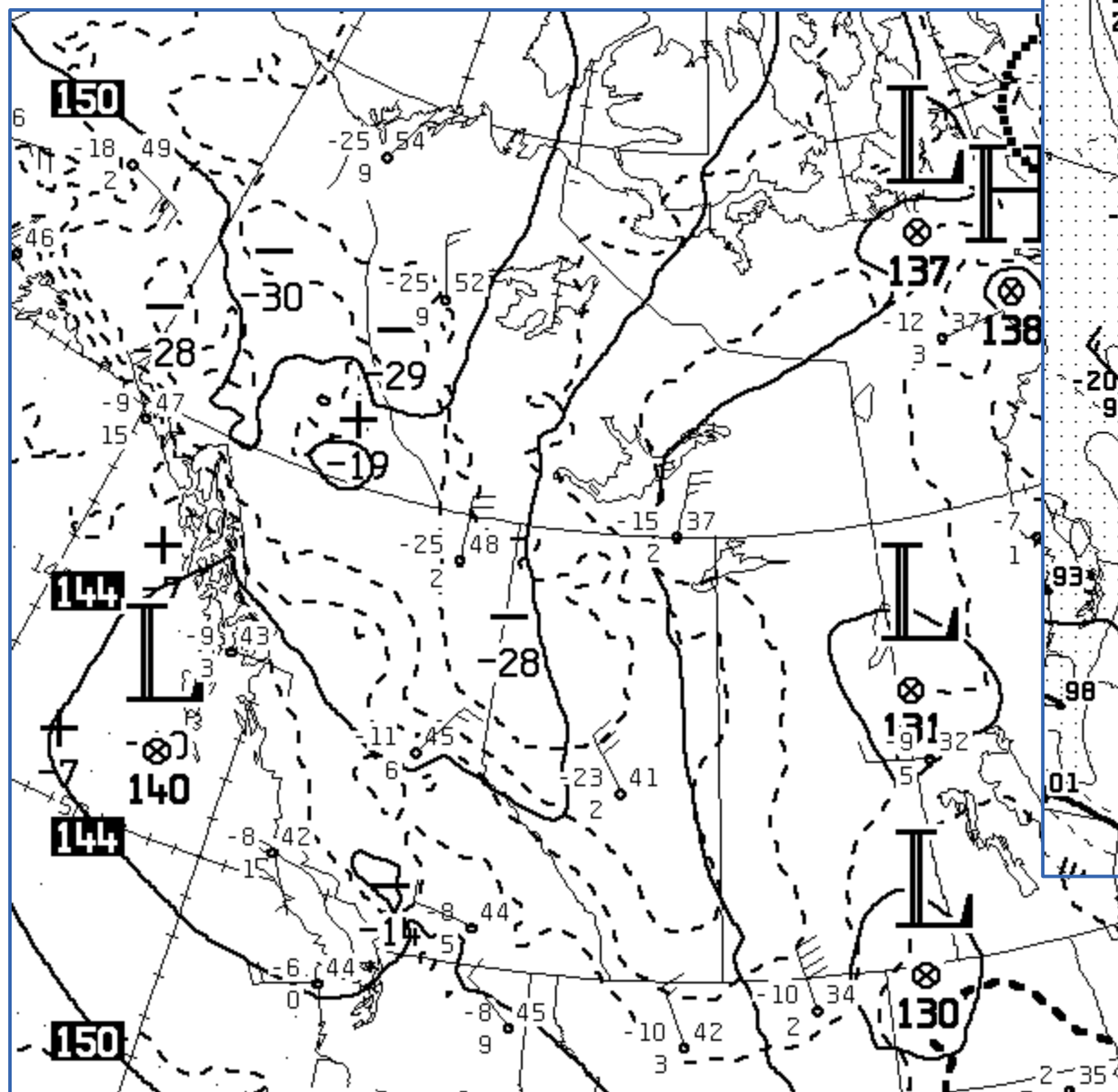


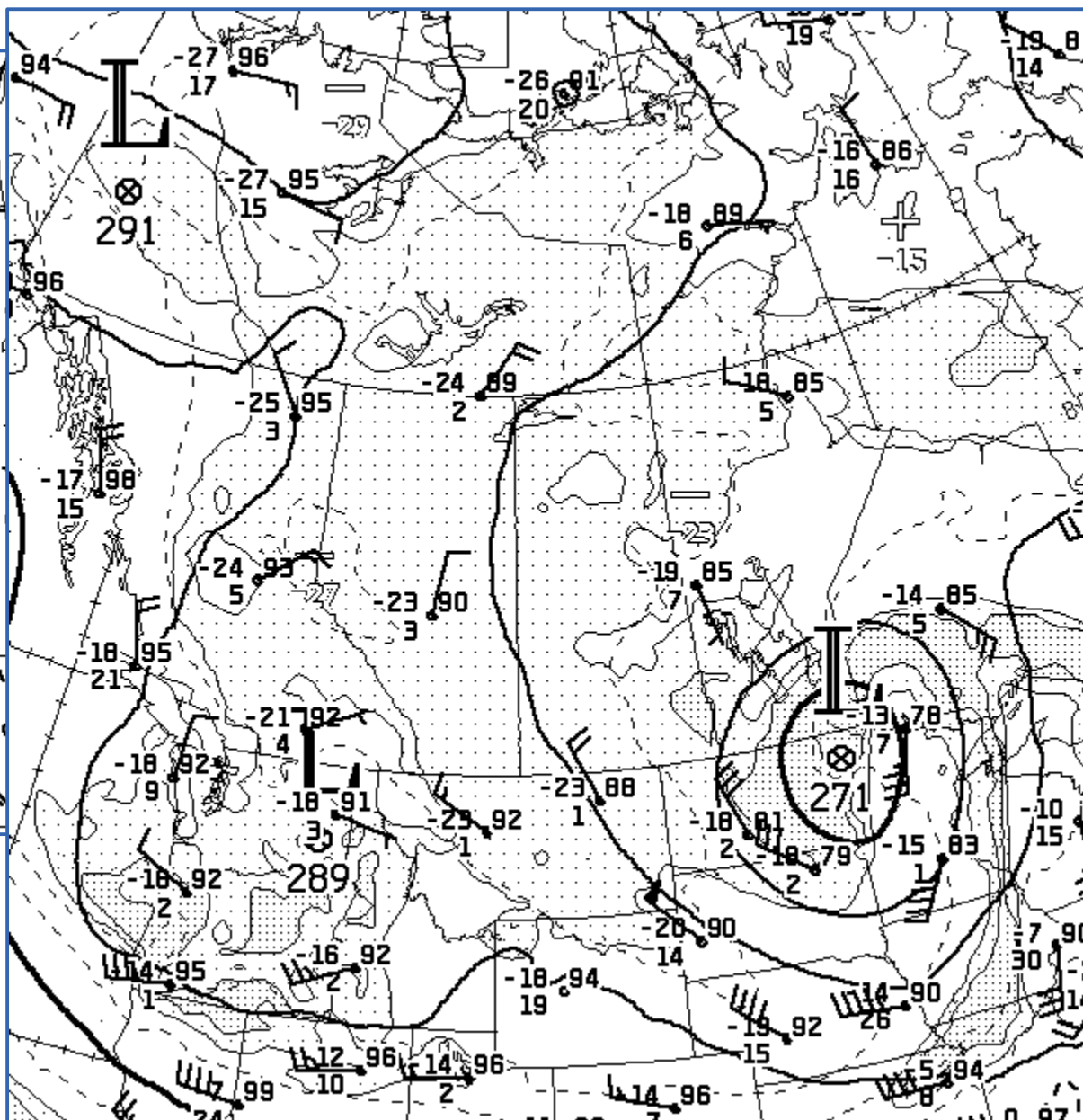
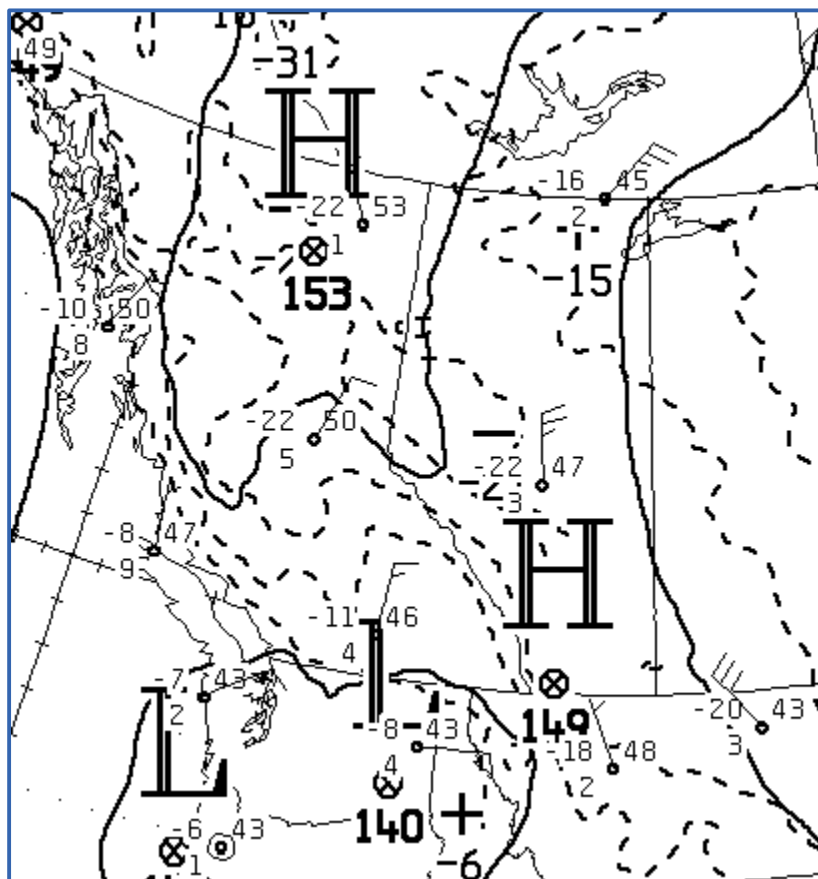
- 1051 hPa arctic high

EC 7:00 AM CST MON.
DEC. 5 2016.

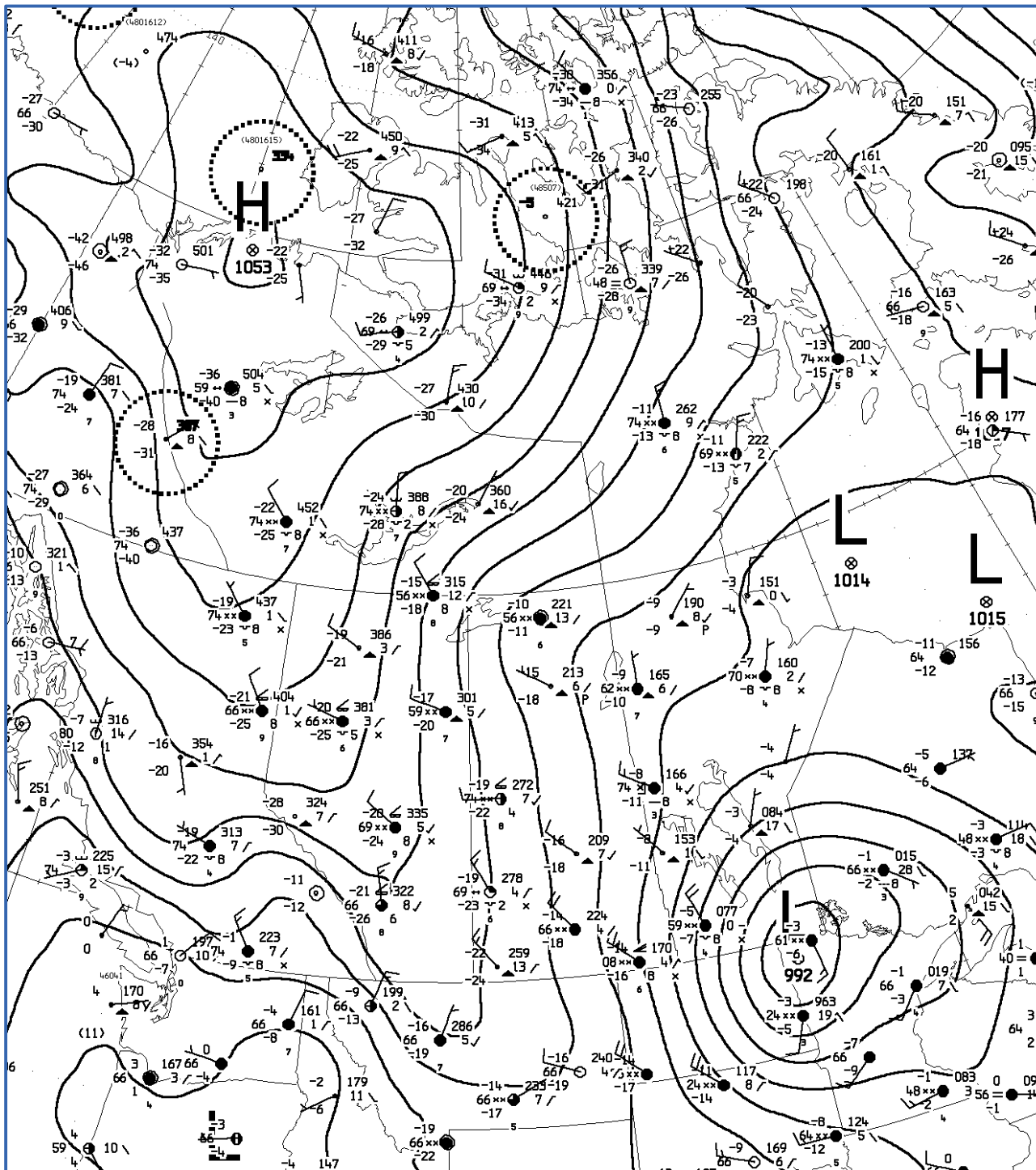
AB...GETTING COLDER.
THE LONG RANGE HINTS
THAT SOME EXTREME
COLD WARNINGS MAY
BE NEEDED LATE THIS
WEEK OR THIS
WEEKEND OVER PARTS
OF N. ALBERTA,
INCLUDING THE CAPITAL
REGION.







CMC surface analysis 12Z Tuesday 6 December 2016



Edmonton Int'l Airport, Alberta

Latitude 53.31° N | Longitude 113.58° W

Past 24 Hour Conditions

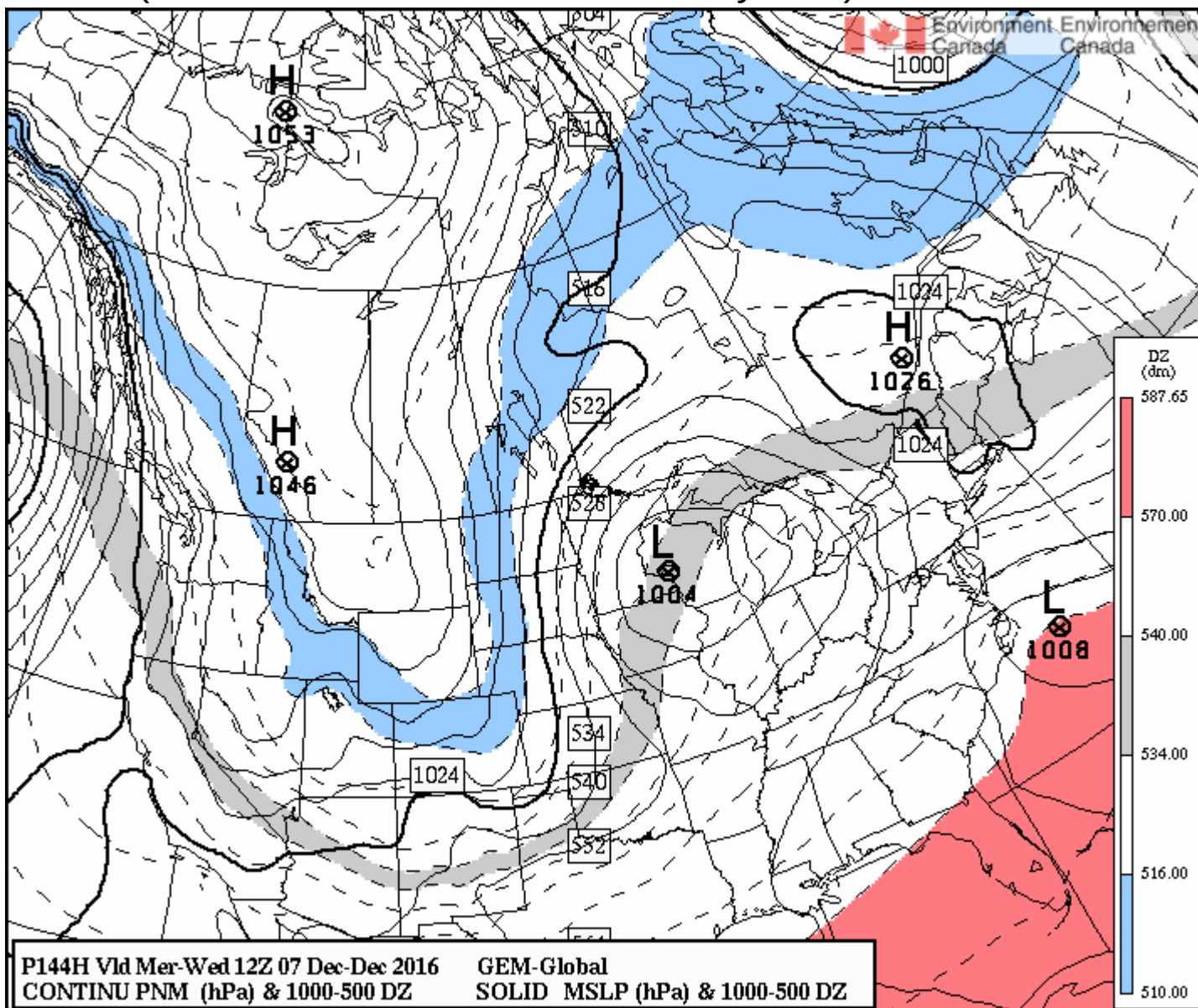
Date / Time (MST)	Conditions	Temperature (°C)	Wind (km/h)
06 December 2016			
08:00	Light Snow	-20 (-20.0)	NW 21 gust 32
07:00	Light Snow	-20 (-19.9)	NW 20 gust 32
06:00	Light Snow	-20 (-19.8)	WNW 23 gust 32
05:00	Light Snow	-20 (-19.8)	WNW 21 gust 32
04:00	Light Snow	-20 (-19.7)	WNW 28
03:00	Light Snow	-20 (-19.8)	WNW 25
02:00	Light Snow	-20 (-19.8)	WNW 24 gust 34
01:00	Light Snow	-20 (-19.9)	WNW 23
00:00	Light Snow	-20 (-20.1) ↓	WNW 22
05 December 2016			
23:00	Light Snow	-20 (-19.9)	NW 19 gust 29
22:00	Light Snow	-20 (-19.5)	NW 21 gust 31
21:00	Ice Crystals	-19 (-18.7)	NW 19 gust 36
20:00	Ice Crystals	-19 (-18.6)	NW 26
19:00	Ice Crystals	-19 (-18.5)	NW 22 gust 35
18:00	Ice Crystals	-18 (-18.4)	NW 23 gust 39
17:00	Drifting Snow	-18 (-18.1)	NW 26 gust 39
16:00	Drifting Snow	-18 (-17.7)	NW 30 gust 41
15:00	Light Snow	-17 (-17.1)	NW 26 gust 39
14:00	Light Snow	-17 (-17.4)	NW 31 gust 44
13:00	Light Snow	-17 (-17.0) ↑	NW 27 gust 37
12:00	Light Snow	-17 (-17.1)	WNW 27
11:00	Light Snow	-17 (-17.0) ↑	NW 27
10:00	Light Snow	-17 (-17.1)	NW 30 gust 48
09:00	Light Snow	-17 (-17.0)	NW 22 gust 30
08:00	Light Snow	-17 (-17.0)	NW 22 gust 30

Now let's compare the NWP forecasts with the observed situation at their valid time, 12Z Wednesday 7 Dec....

PRAIRIE AND ARCTIC STORM PREDICTION CENTRE 7:00 AM CST WEDNESDAY
DECEMBER 7 2016.

ALBERTA... PATCHY CLOUD A FEW FLURRIES AND FRIGID ARCTIC TEMPERATURES
WILL CONTINUE TODAY.

GDPS (Global Deterministic Prediction System) **initialized 12Z Thurs 1 Dec.**



Arctic high in wake of storm

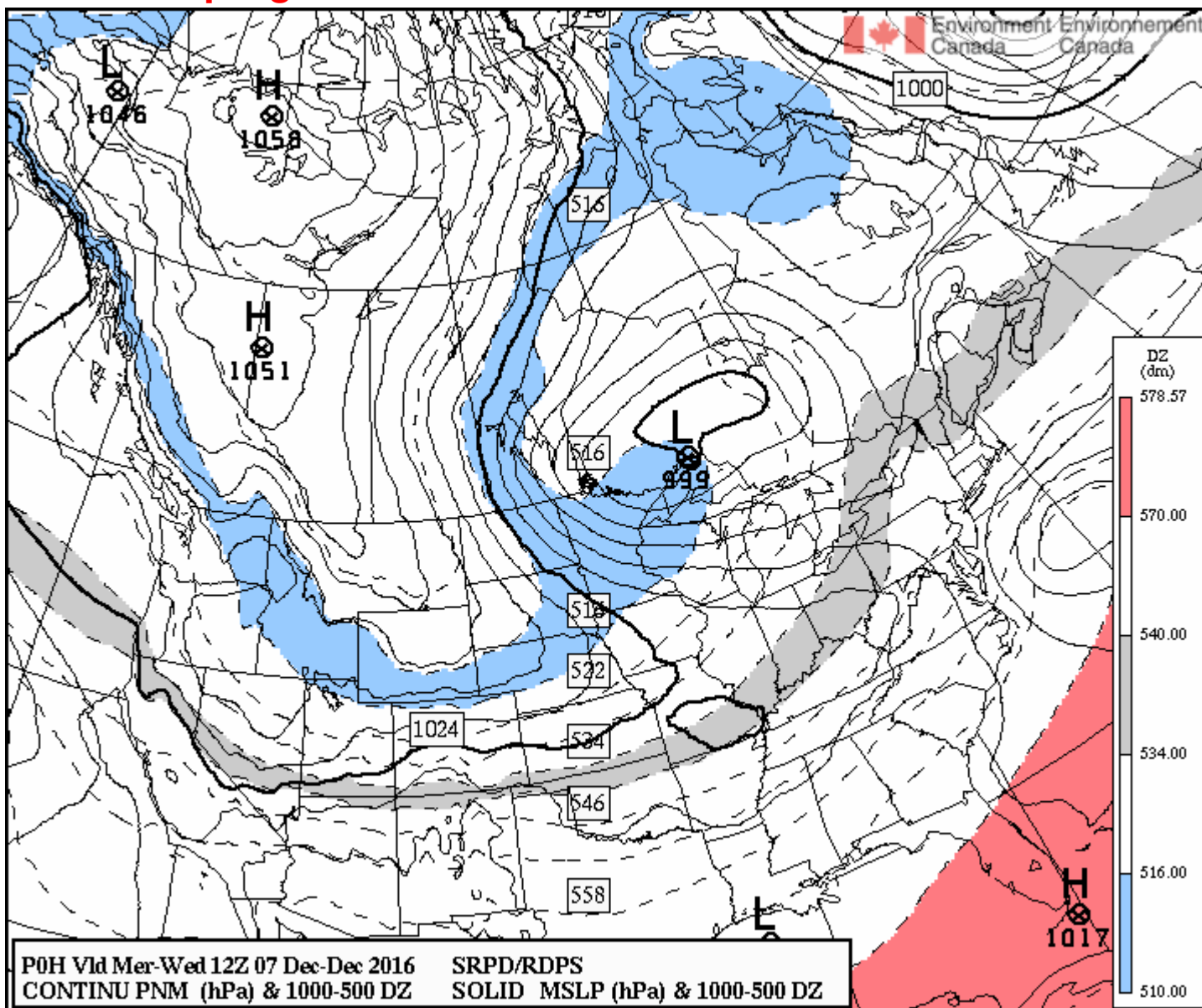
Thickness at Stony Plain as of 12Z on Thurs 1 Dec. was 532 dam

144 hr fcst predicts cooling to below 504 dam

(i.e. 14°C of cooling)

Verification of 144h NWP forecast... the observed situation as per the 0h prog of 12Z Wed 7

RDPS 0h prog valid 12Z Wed 7 Dec.



144 hr forecast thkns was below 504 dam

Observed thkns from Stony Plain radiosonde is 500 dam (next page)

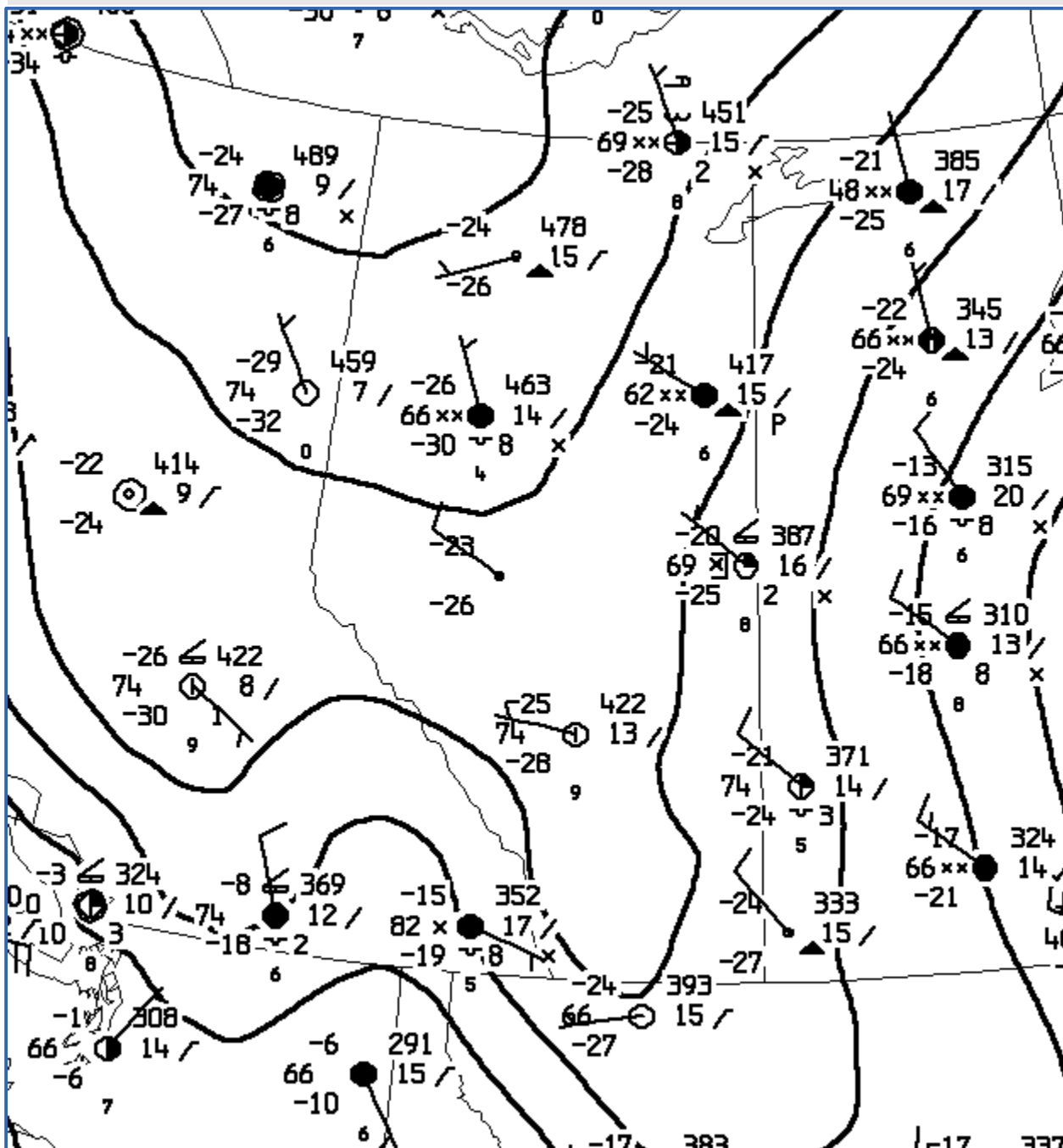
144 hr forecast is spot on, qualitatively – there are minor quantitative differences – which is entirely to be expected at 144 hr lead time.

71119 WSE Edmonton Stony Plain Observations at 12Z 07 Dec 2016

$$\Delta Z_{1000-500} = 5330 - 330 = 500 \text{ dam}$$

PRES hPa	HGHT m	TEMP C	DWPT C	RELH %	MIXR g/kg	DRCT deg	SKNT knot	THTA K	THTE K	THTV K
1000.0	330									
943.0	766	-22.5	-25.8	74	0.50	290	7	254.9	256.3	255.0
925.0	910	-22.5	-26.1	72	0.50	320	17	256.3	257.7	256.4
924.5	914	-22.5	-26.1	73	0.50	320	17	256.3	257.8	256.4
886.8	1219	-23.1	-25.9	78	0.53	355	17	258.8	260.3	258.9
850.0	1529	-23.7	-25.6	84	0.56	320	13	261.3	262.9	261.4
847.0	1555	-23.9	-25.6	86	0.57	322	14	261.4	263.0	261.4
815.8	1829	-23.9	-25.1	90	0.61	345	19	264.2	266.0	264.3
797.0	1999	-23.9	-24.8	92	0.65	7	14	265.9	267.9	266.1
788.0	2082	-22.1	-22.9	93	0.77	18	12	268.7	271.0	268.9
782.5	2134	-22.2	-23.2	92	0.76	25	10	269.1	271.4	269.3
750.7	2438	-23.0	-25.2	82	0.66	15	11	271.5	273.5	271.6
732.0	2623	-23.5	-26.4	77	0.61	18	10	272.9	274.8	273.0
720.0	2743	-24.3	-27.4	75	0.56	20	9	273.4	275.1	273.5
710.0	2845	-24.9	-28.3	73	0.53	15	8	273.8	275.4	273.9
700.0	2948	-25.9	-28.6	78	0.52	10	7	273.8	275.4	273.9
658.0	3393	-29.1	-29.7	95	0.50	354	10	275.1	276.6	275.1
637.0	3624	-28.5	-31.5	75	0.43	346	12	278.3	279.7	278.4
634.0	3658	-28.7	-31.5	76	0.43	345	12	278.5	279.9	278.6
619.0	3829	-29.5	-31.7	81	0.44	351	12	279.4	280.8	279.5
589.0	4183	-29.9	-34.4	65	0.35	2	11	283.0	284.1	283.0
582.0	4267	-30.4	-35.2	63	0.33	5	11	283.3	284.4	283.4
550.0	4667	-32.9	-38.9	55	0.24	358	16	285.0	285.8	285.0
533.6	4877	-34.4	-39.9	57	0.22	355	19	285.7	286.5	285.8
500.0	5330	-37.5	-42.1	62	0.19	350	19	287.3	287.9	287.3

CMC surface analysis 12Z Wed. 7 Dec.



Edmonton Int'l Airport, Alberta

Latitude 53.31° N | Longitude 113.58° W

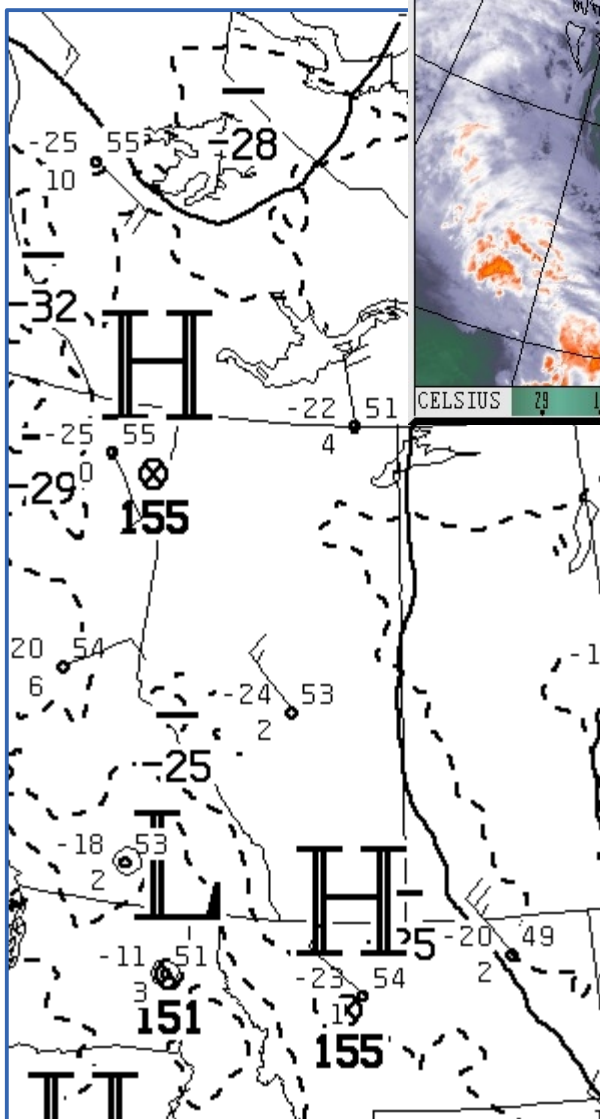
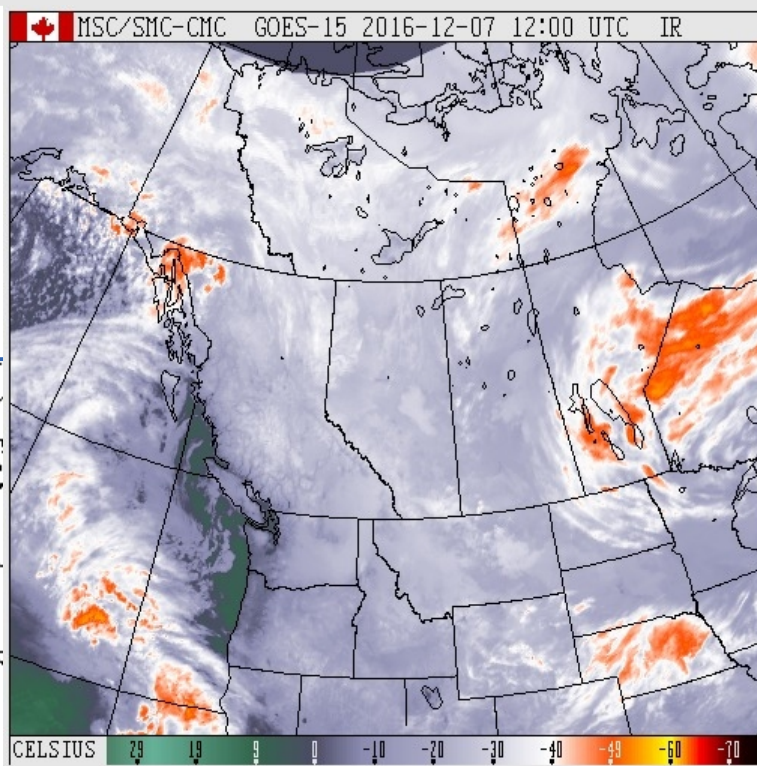
Past 24 Hour Conditions

Date / Time (MST)	Conditions	Temperature (°C)	Wind (km/h)
07 December 2016			
08:00	Light Snow	-21 (-21.2)	WNW 16
07:00	Light Snow	-22 (-21.5)	NW 15
06:00	Light Snow	-22 (-21.5)	WNW 17
05:00	Light Snow	-22 (-22.2)	WNW 13
04:00	Mainly Clear	-23 (-22.9) ↓	WNW 12
03:00	Light Snow	-22 (-21.5)	NW 13
02:00	Light Snow	-22 (-21.5)	NW 12
01:00	Light Snow	-22 (-21.6)	WNW 13
00:00	Light Snow	-21 (-20.6)	WNW 16

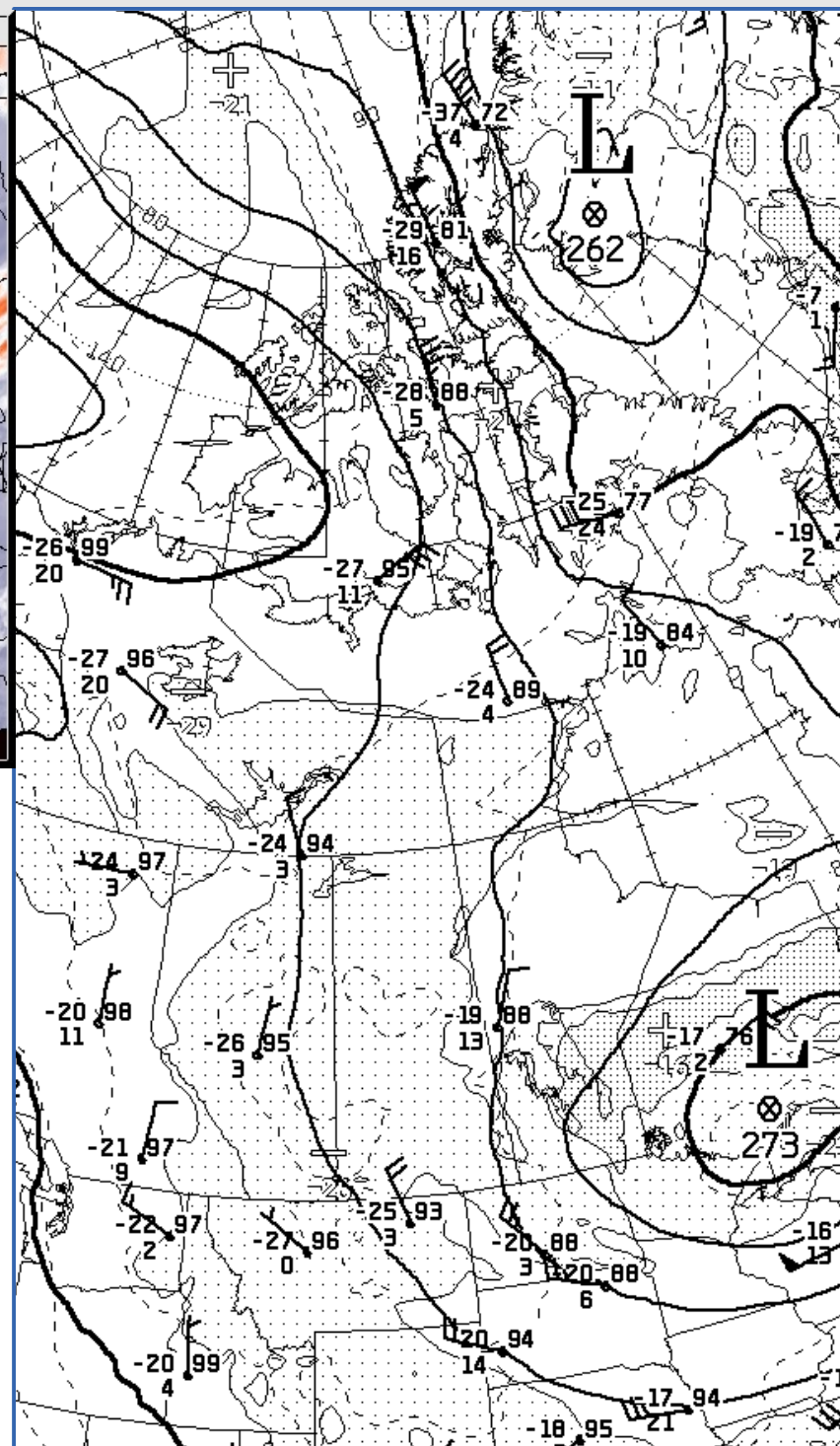
06 December 2016

23:00	Light Snow	-20 (-20.3)	WNW 19
22:00	Light Snow	-20 (-20.2)	WNW 18
21:00	Light Snow	-20 (-20.0)	WNW 21
20:00	Light Snow	-20 (-19.7)	WNW 23
19:00	Light Snow	-19 (-19.4)	WNW 17
18:00	Light Snow	-19 (-19.2)	NW 21
17:00	Light Snow	-19 (-19.4)	NW 18
16:00	Light Snow	-19 (-19.0)	NW 22
15:00	Light Snow	-19 (-18.8) ↑	WNW 20
14:00	Light Snow	-19 (-19.1)	WNW 23
13:00	Light Snow	-19 (-19.1)	WNW 22 gust 32
12:00	Light Snow	-19 (-19.2)	NW 26 gust 35
11:00	Light Snow	-20 (-19.5)	WNW 29
10:00	Light Snow	-20 (-19.2)	WNW 22 gust 32
09:00	Light Snow	-20 (-19.2)	WNW 22 gust 32

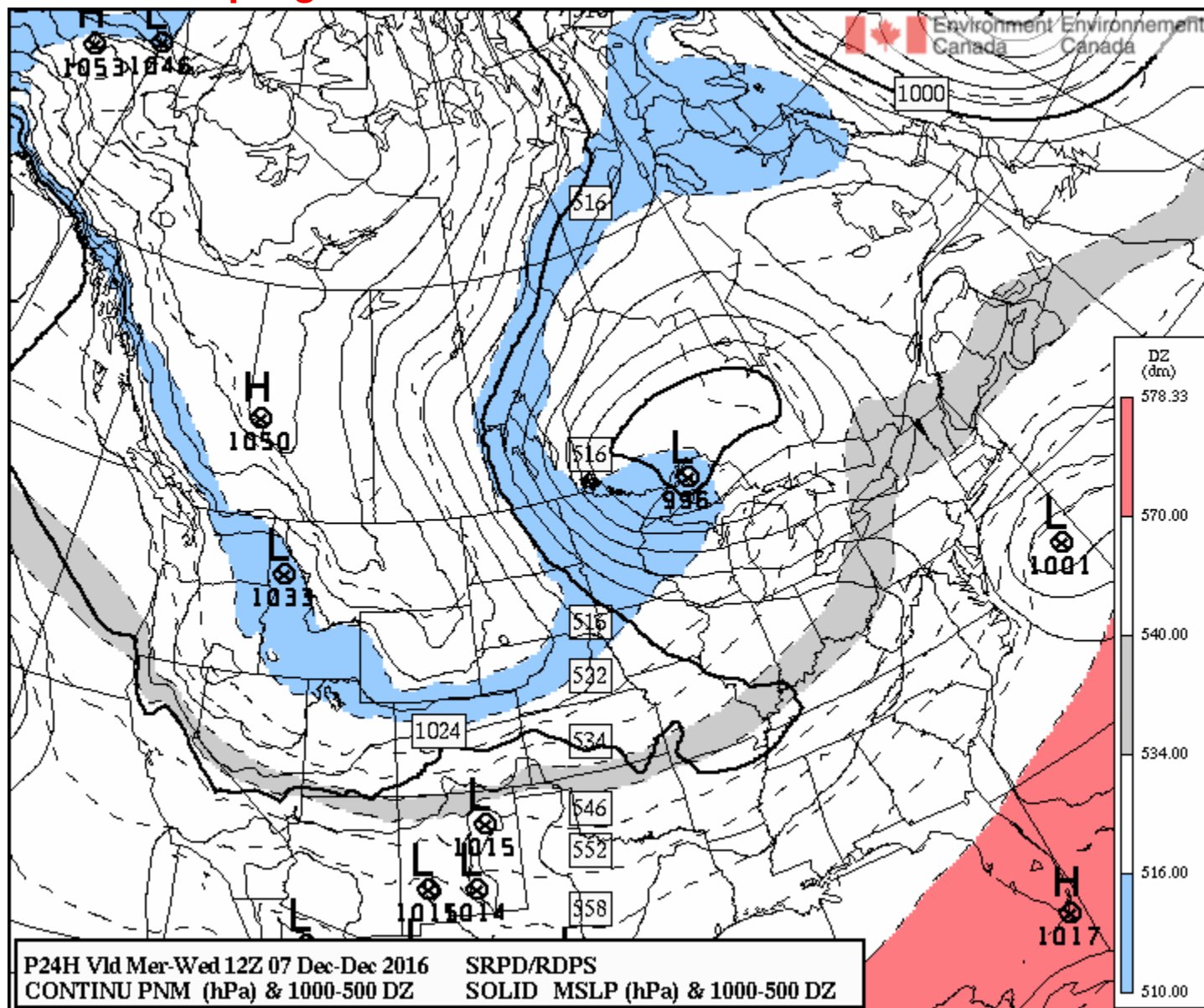
Contrary to 144 h fcst (p3), we had low cloud overnight



- thin low cloud kept overnight temp from plunging lower
- flow aloft indicates no short term prospect of advective temperature change, as of 12Z Wed 7th Dec.

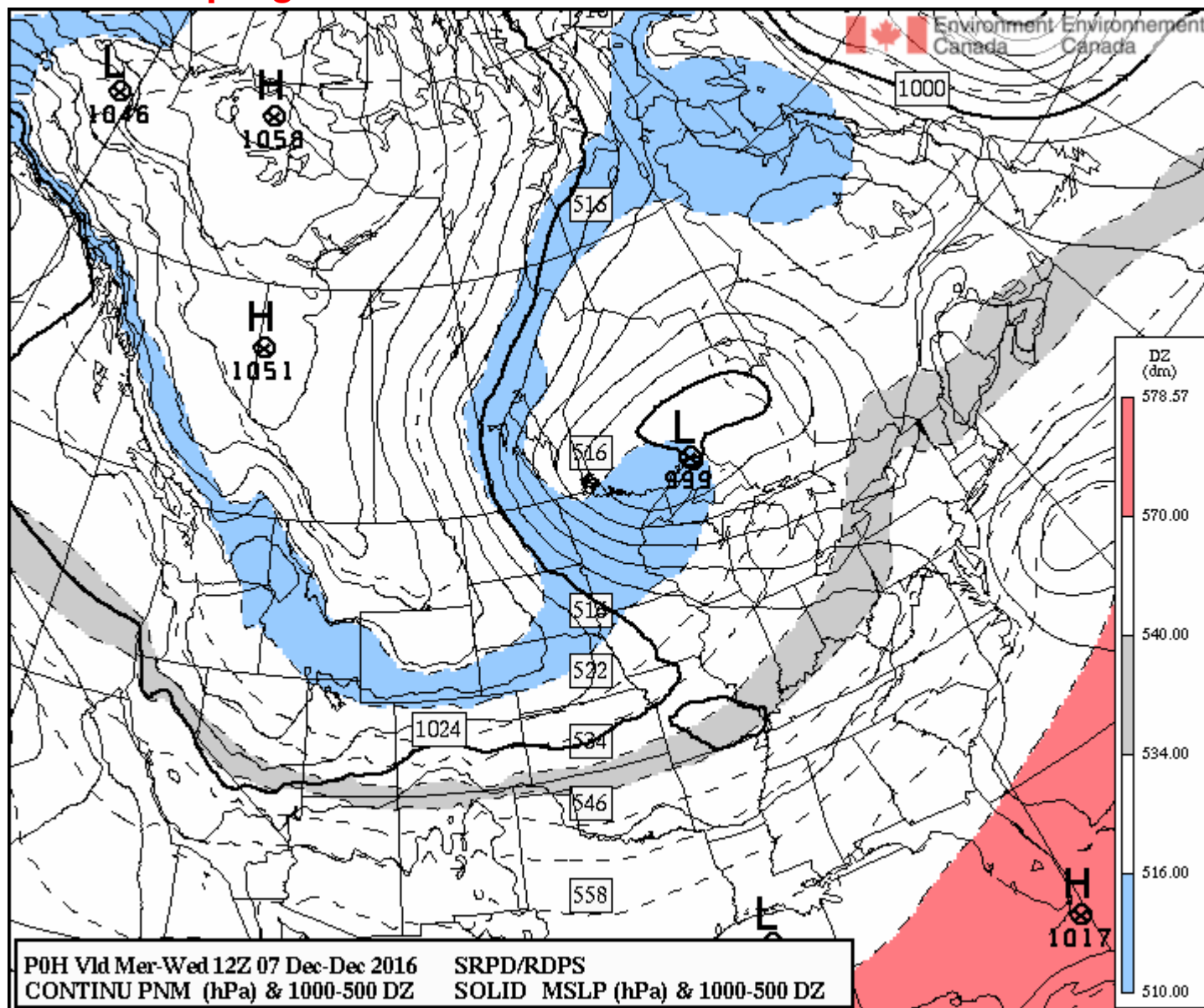


RDPS 24h prog valid 12Z Wed 7 Dec.



Verification of 24h NWP forecast... the observed situation as per the 0h prog of 12Z Wed 7

RDPS 0h prog valid 12Z Wed 7 Dec.



161201/1200 71119

WSE

SHOW:

10

LIFT:

16

SWET:

CAPE:

0

EQLV:

-9999

SELV:

LCLT:

265

LCLP:

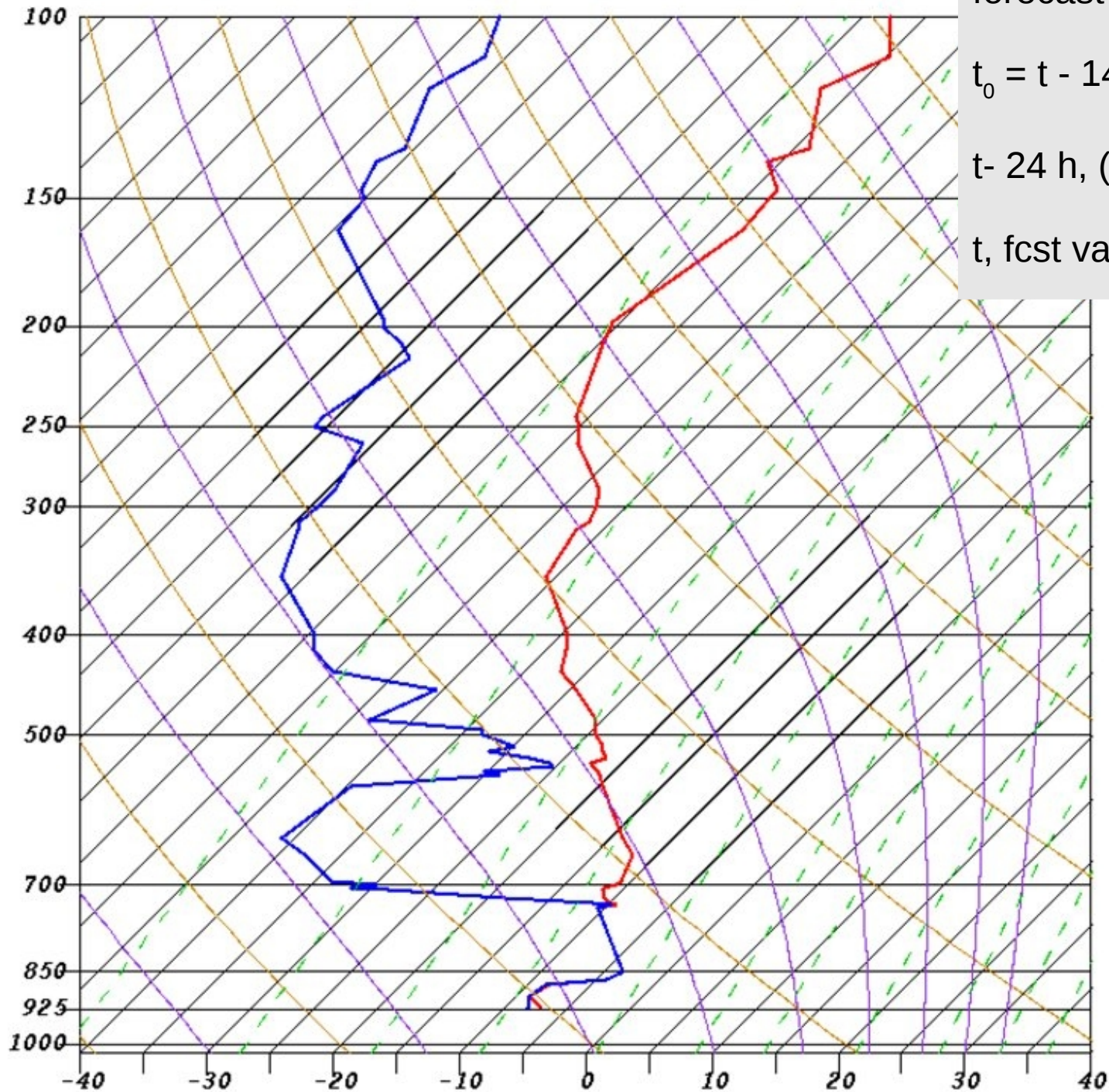
908

Sequence of soundings over the forecast interval:

$t_0 = t - 144$ h, the initial state

$t - 24$ h, (12Z Tues 6 Dec)

t , fcst valid time (12Z Wed 7)



161206/1200 71119

WSE

SHOW:

17 LIFT:

21

SWET:

55

VTOT:

17 TC

CAPE:

0

EQLV:

-9999

SELV:

766

CINS:

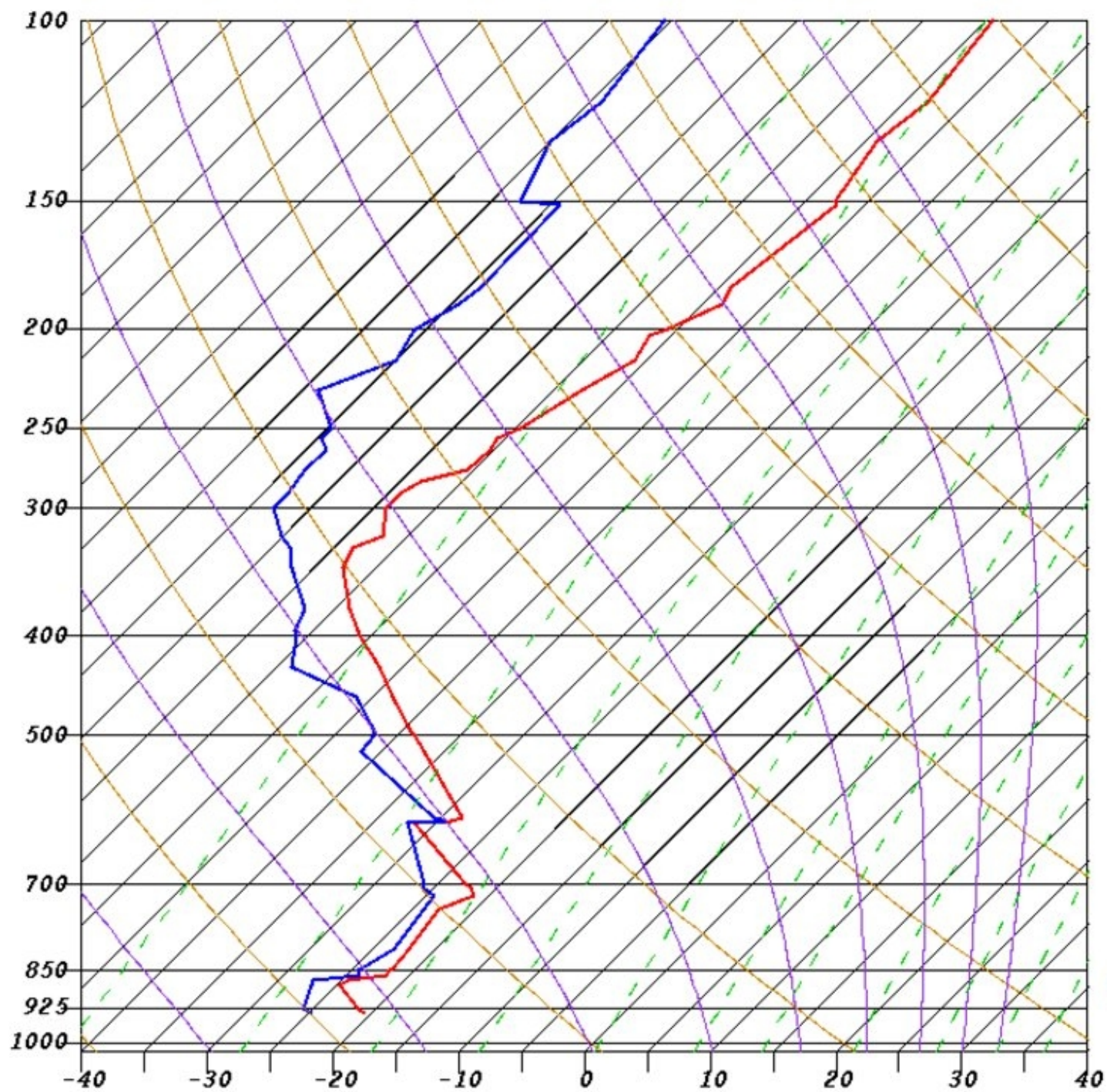
0 LI

LCLT:

248

LCLP:

872



161207/1200 71119 HSE SHOW: 20 LIFT: 23 SWET: 45 VTOT: 14
CAPE: 0 EQLV: -9999 SELV: 766 CINS: 0
LCLT: 247 LCLP: 893

