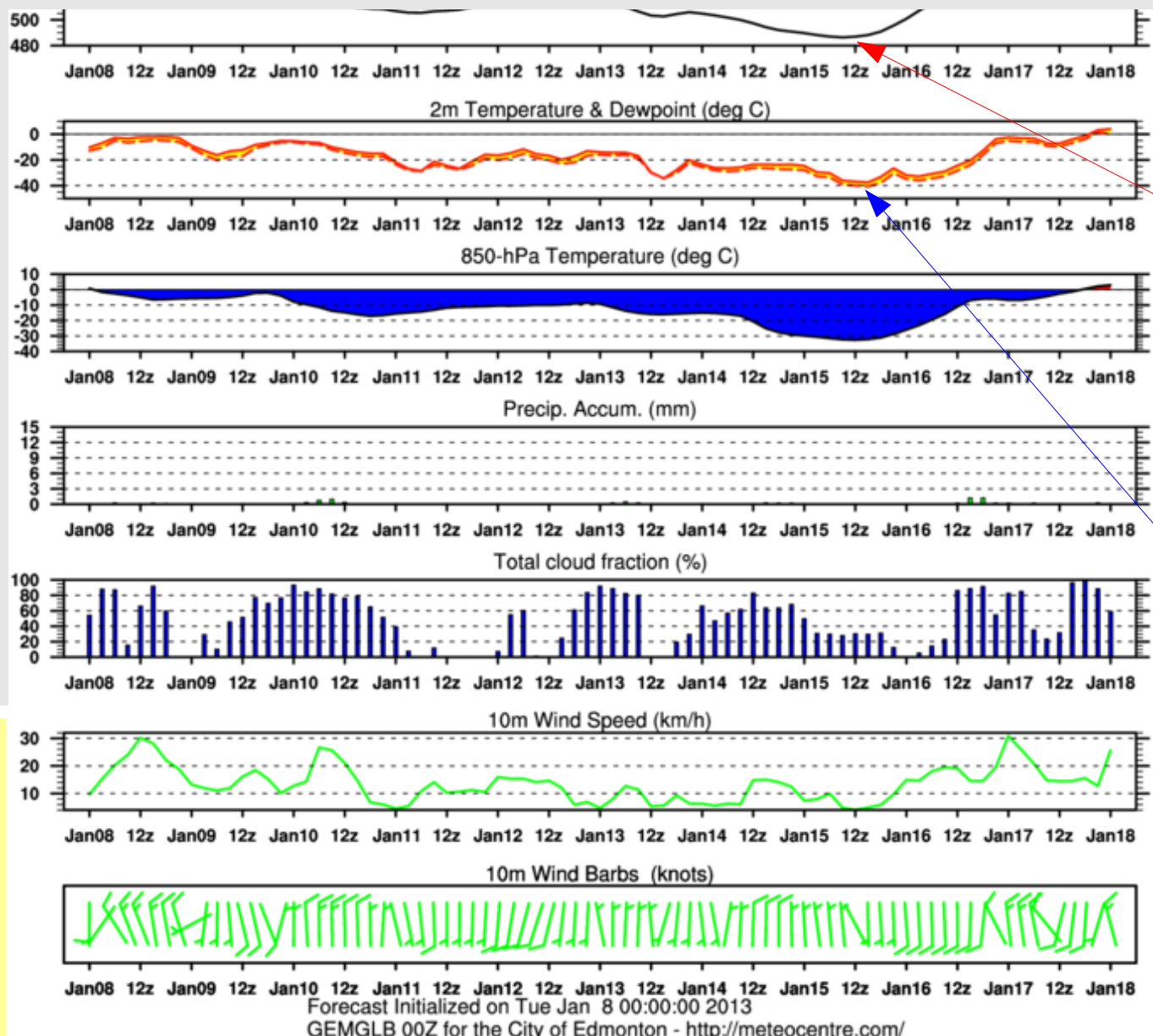


- follow-up on a forecast from one week ago
- completing the exercises of 10 Jan
- using Eq. (1.39), compute the geostrophic wind speed at Edmonton and at The Pass based on the 500 hPa analysis for 12Z Mon 14 Jan. (over)

# Tale of the instructor's bust forecast – extreme cold for today

Instructor could have been more careful – scale is very fine, and the T was more like -35 (and one could expect several degrees of urban heat island effect). The Pass (west-central Manitoba) did hit -34°C

But the main story is one of timing. The cold ridge moved east more quickly than foreseen by this 180 hr prog; the next day's prog forecast the incursion of mild air over Alberta

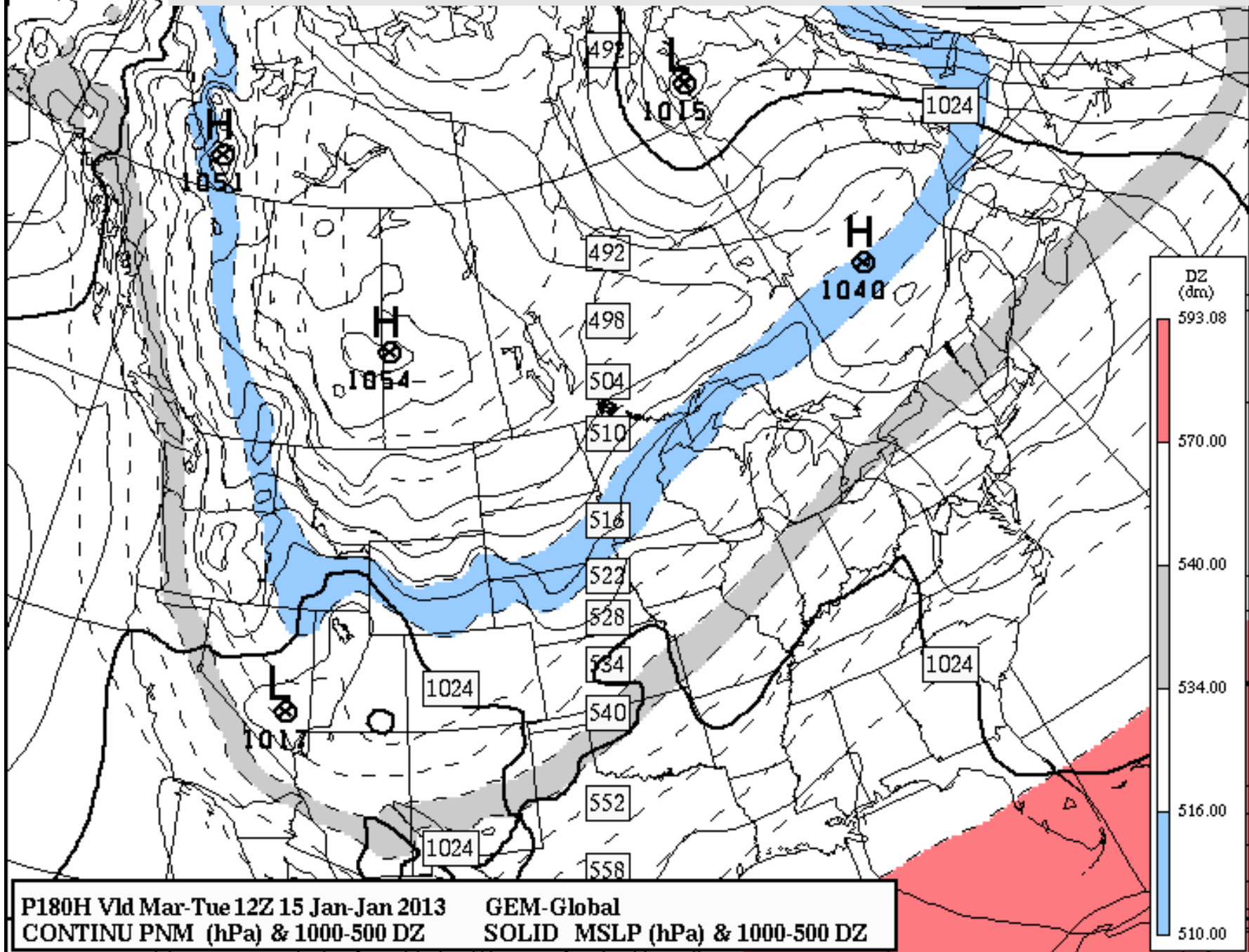


thickness about 490 dam

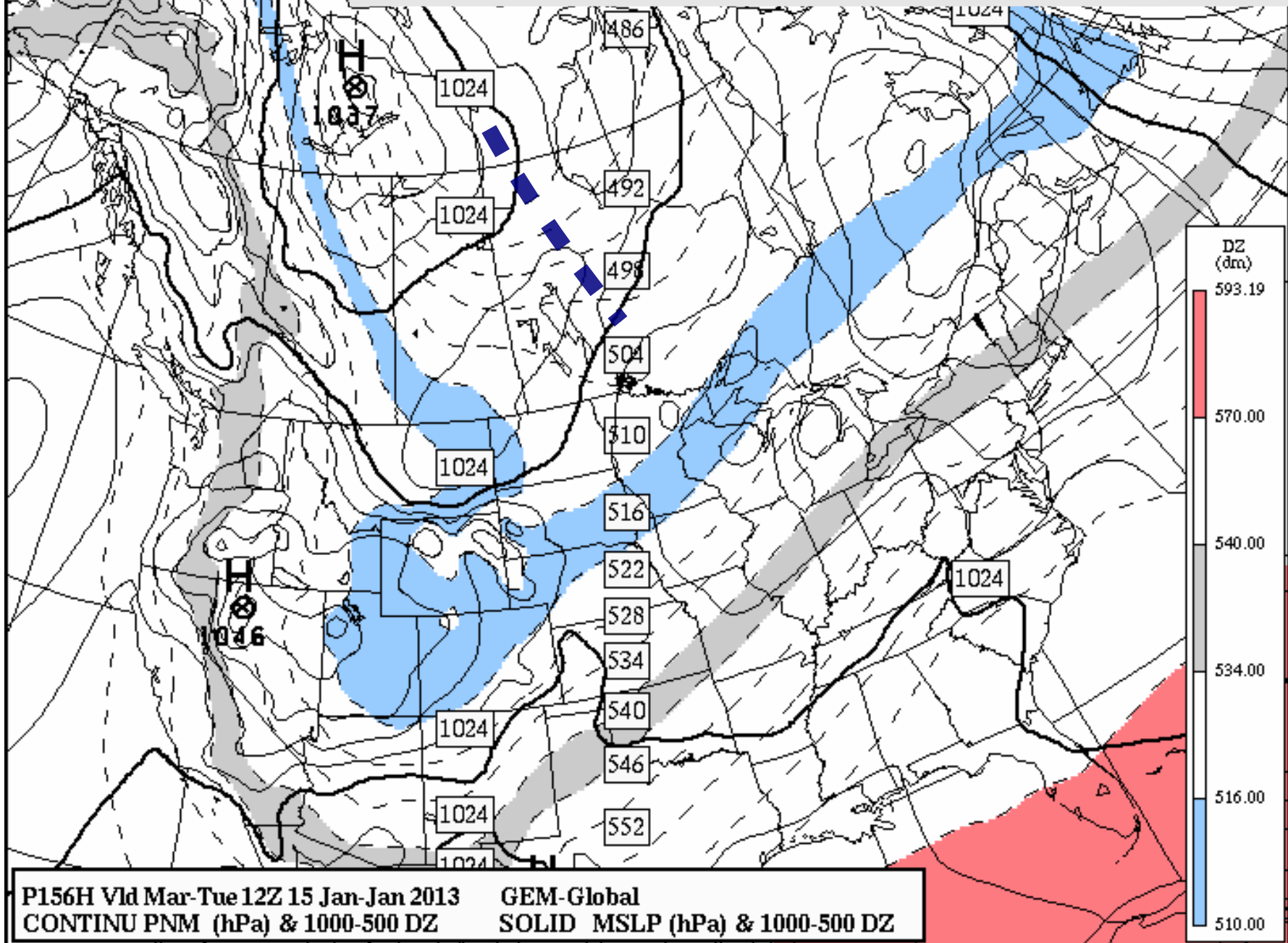
sfc temp about -40

Let's review the bad forecast, the better forecast, and what happened

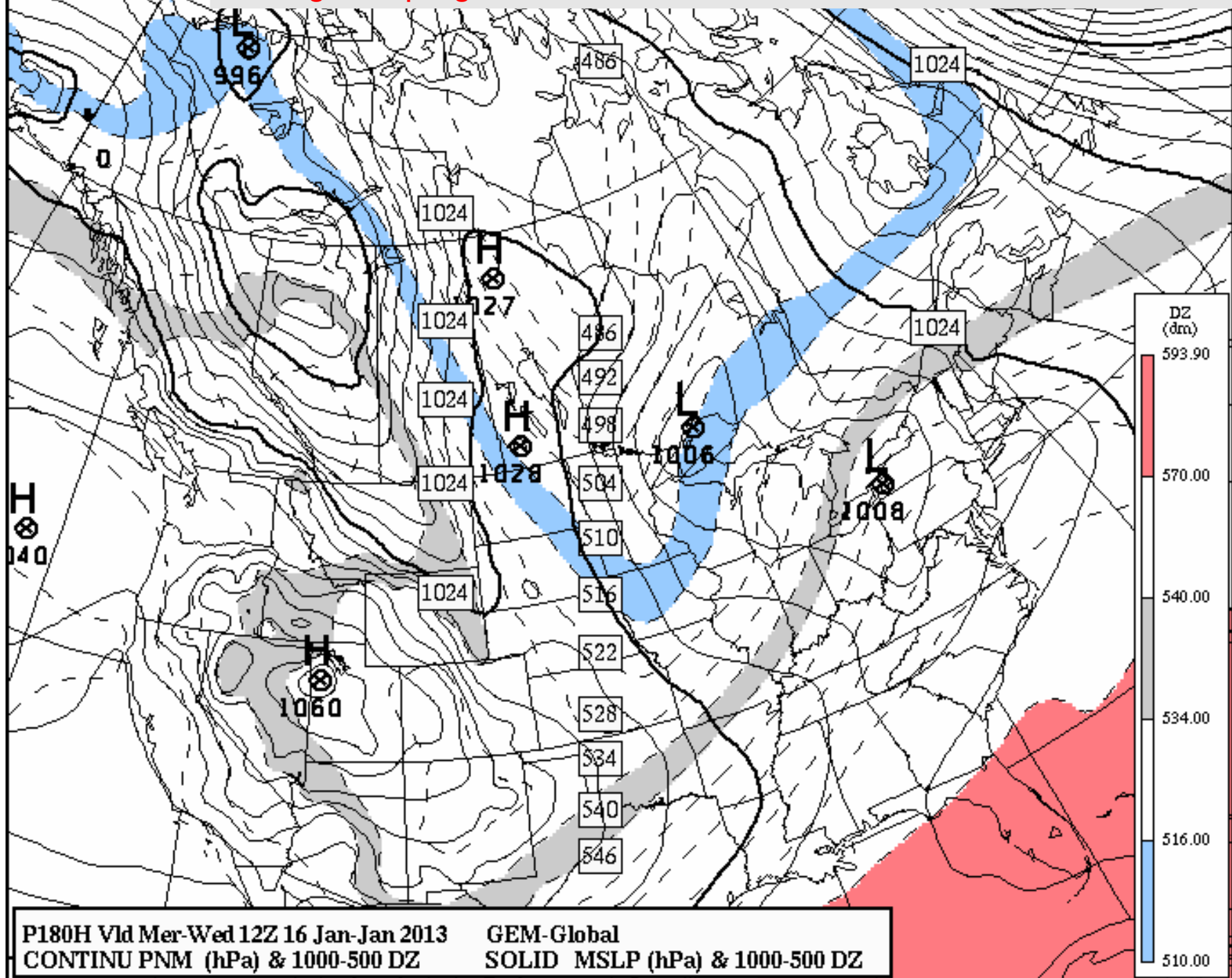
GEM global 180 hr prog initialized 00Z Tues 8 Jan predicted extreme cold for today (Tues 15 Jan) – thickness over Edmonton between 492 and 486 dam



However 156 hr GEM global prog initialized one day later, at 00Z Wed 9 Jan, had the thermal trough displaced further east by today (Tues 15 Jan) – with a surface trough pushing into Alberta



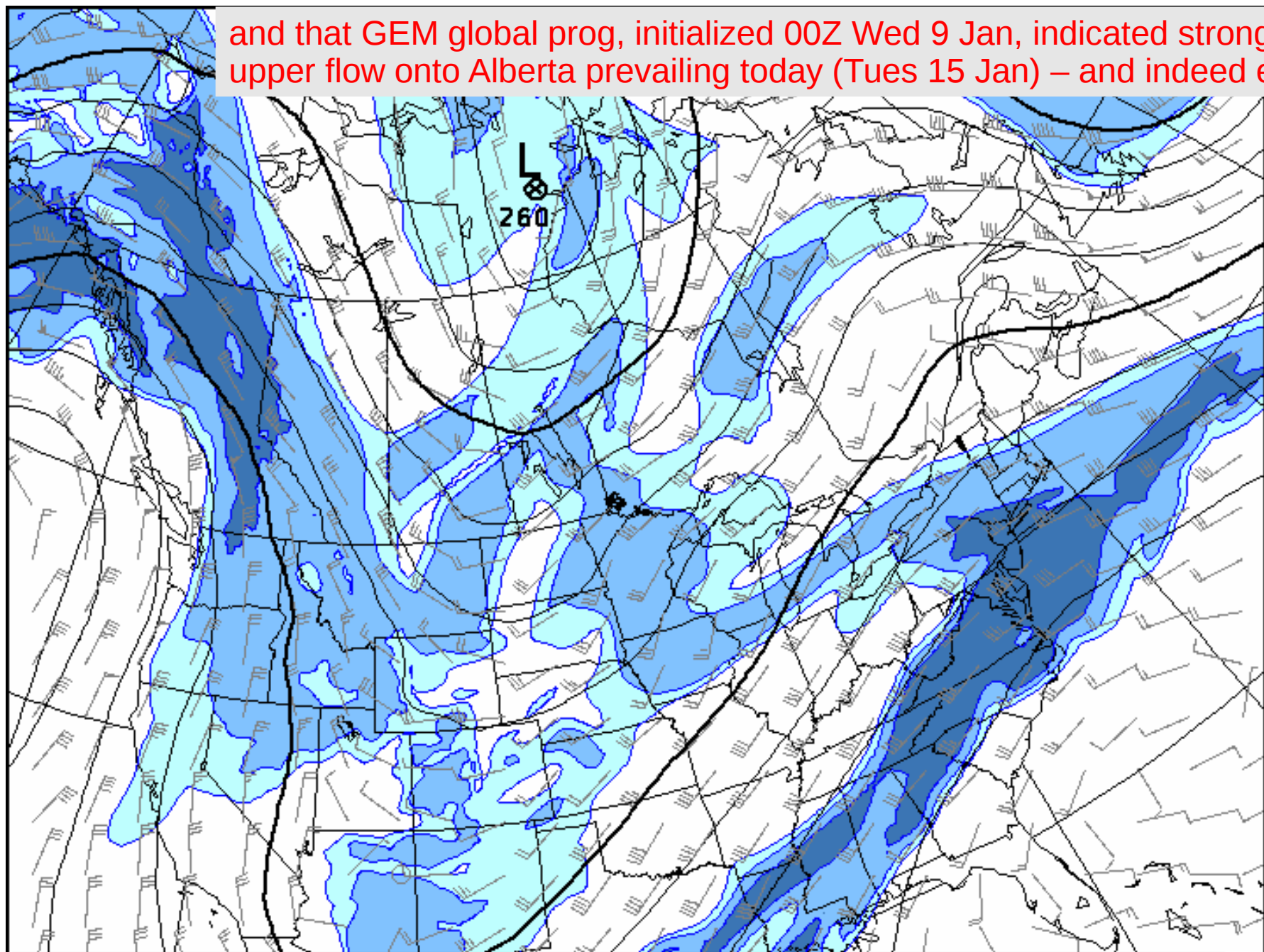
GEM global prog initialized 00Z Wed 9 Jan – valid 12Z Wed 16 Jan



P180H Vld Mer-Wed 12Z 16 Jan-Jan 2013  
CONTINU PNM (hPa) & 1000-500 DZ

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

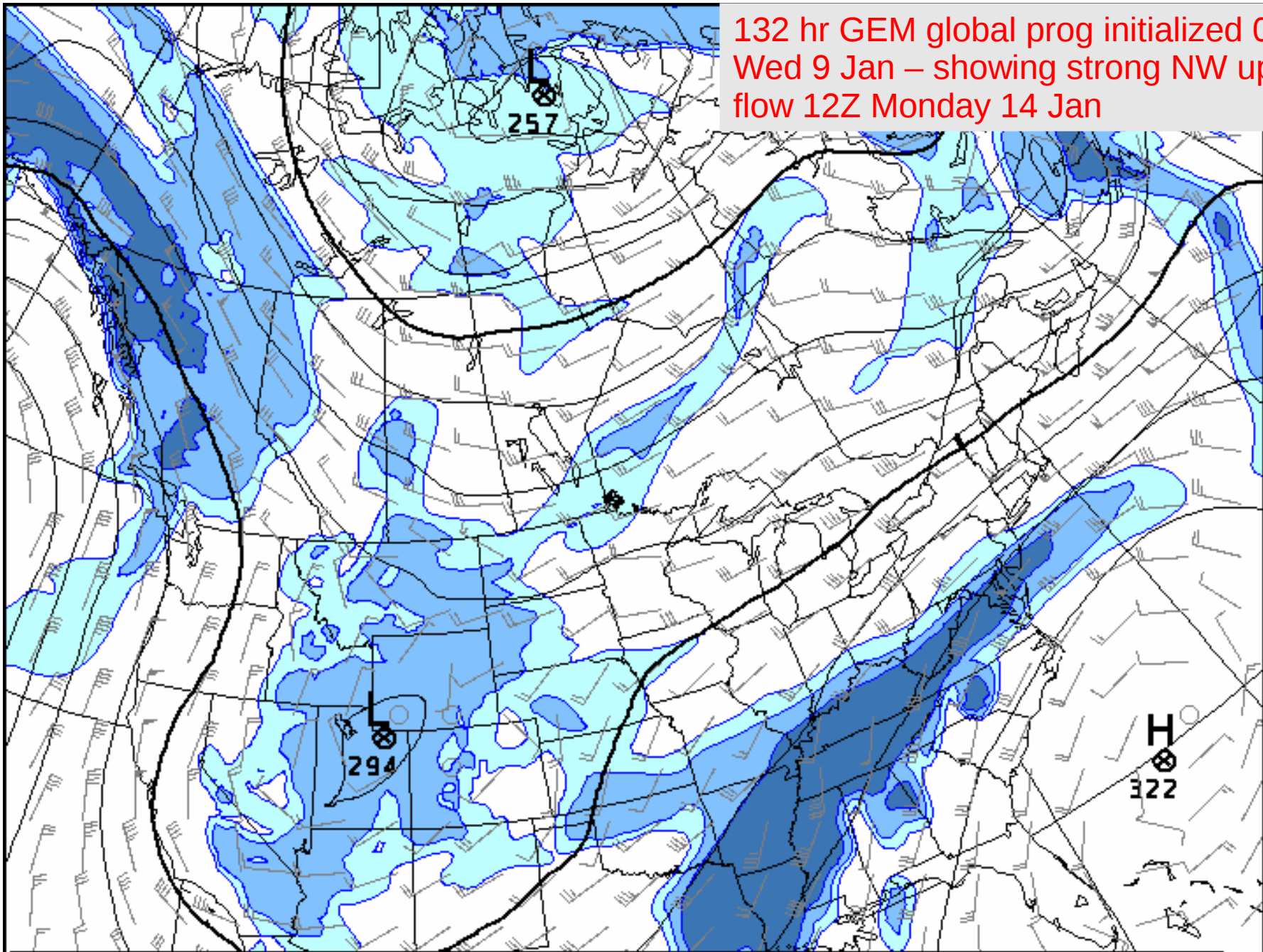
and that GEM global prog, initialized 00Z Wed 9 Jan, indicated strong NW upper flow onto Alberta prevailing today (Tues 15 Jan) – and indeed earlier –



P156H Vld Mar-Tue 12Z 15 Jan-Jan 2013  
Arrière plan: Humidité relative à 700 hPa (50,70,90%)  
Hauteur géopotentielle à 700 hPa (dam)

GEM-Global  
Background: Relative humidity at 700 hPa (50,70,90%)  
Geopotential height at 700 hPa (dam)

132 hr GEM global prog initialized 00Z  
Wed 9 Jan – showing strong NW upper  
flow 12Z Monday 14 Jan



P132H Vld Lun-Mon 12Z 14 Jan-Jan 2013  
Arrière plan: Humidité relative à 700 hPa (50,70,90%)  
Hauteur géopotentielle à 700 hPa (dam)

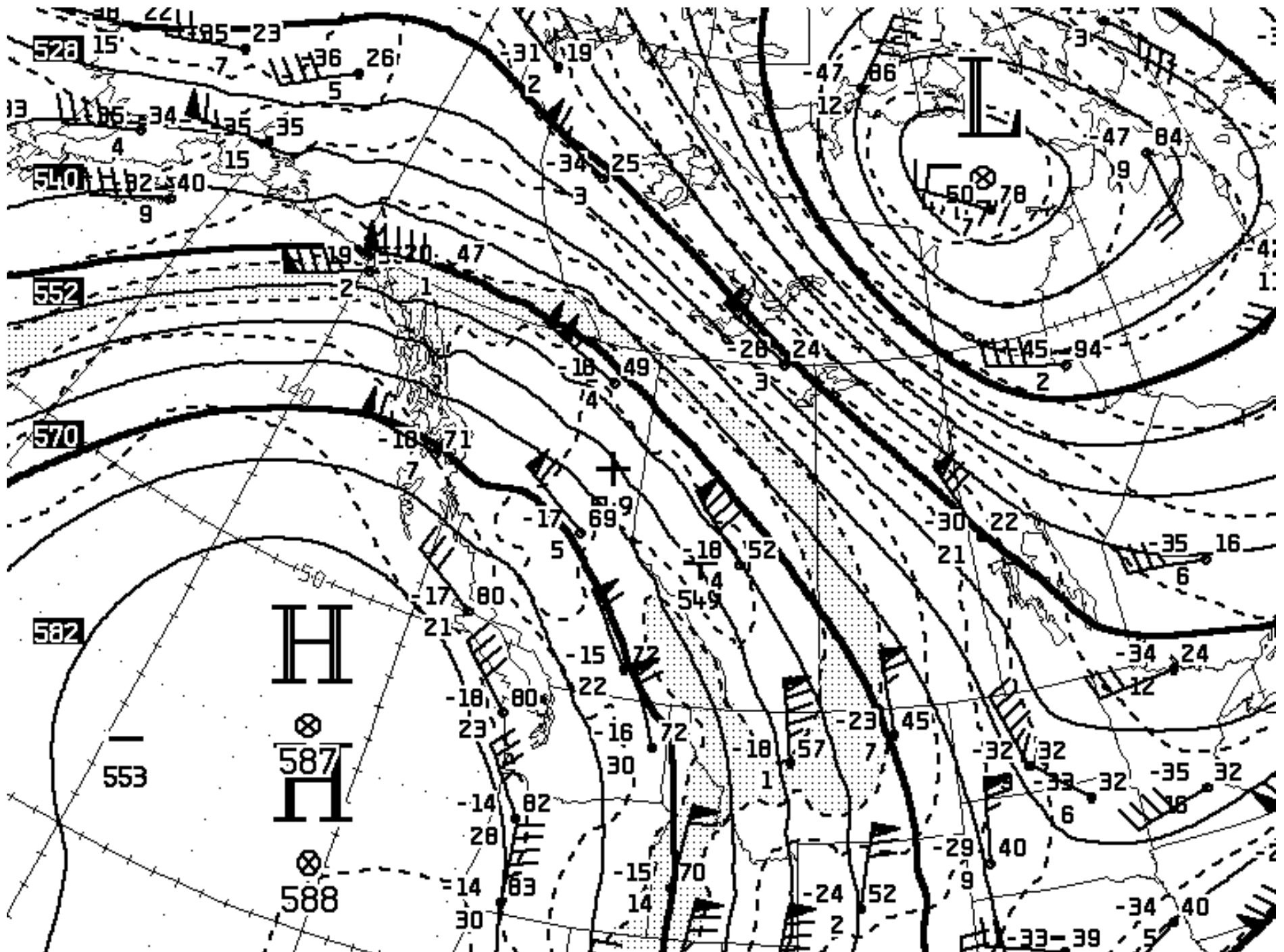
GEM-Global  
Background: Relative humidity at 700 hPa (50,70,90%)  
Geopotential height at 700 hPa (dam)

Thus had we looked at a prog initialized one day later, at 00Z Wed 9 Jan, we'd have had a different view – illustrating that one should always strive to base expectations on the most recent available forecast

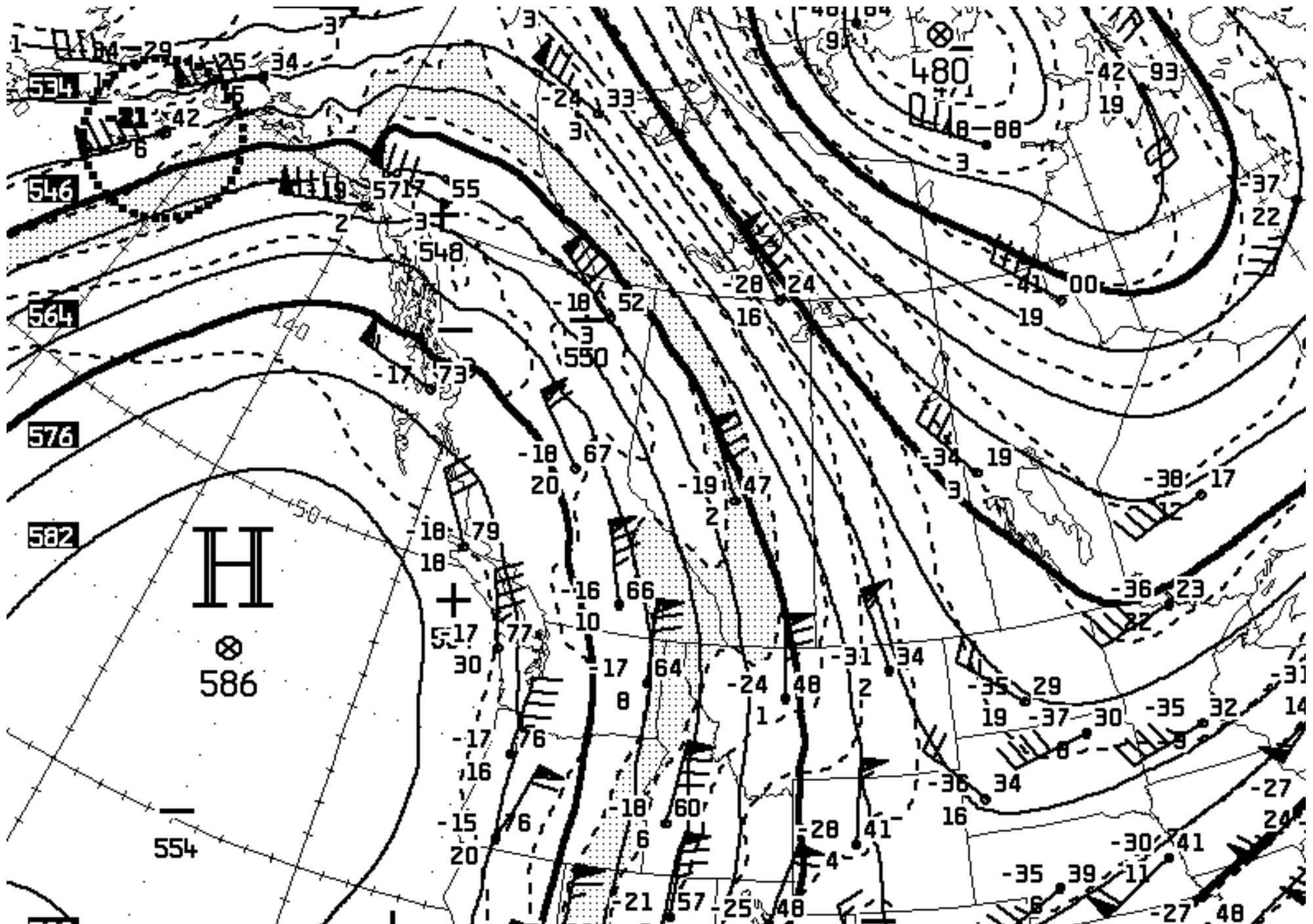
Now let's look at what has actually transpired, starting with today's situation and working back a day or so..

- strong NW flow onto western Canada around a slow-moving upper ridge
- that flow (warmer day by day) supplying moist air overhead (see 700 hPa charts)
- strong west-east temperature gradient (best seen at 850 hPa level) with exceedingly mild air over Alberta today

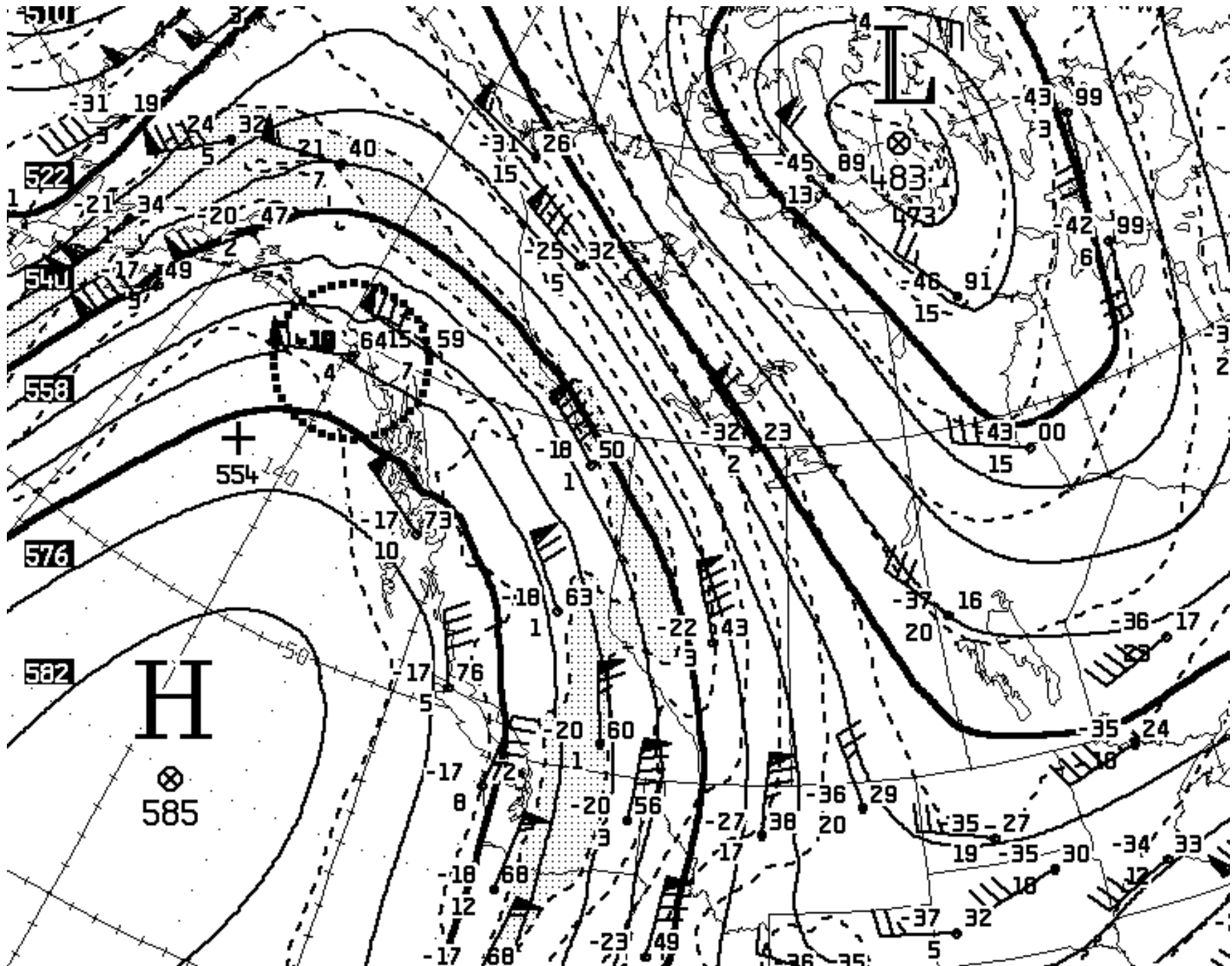




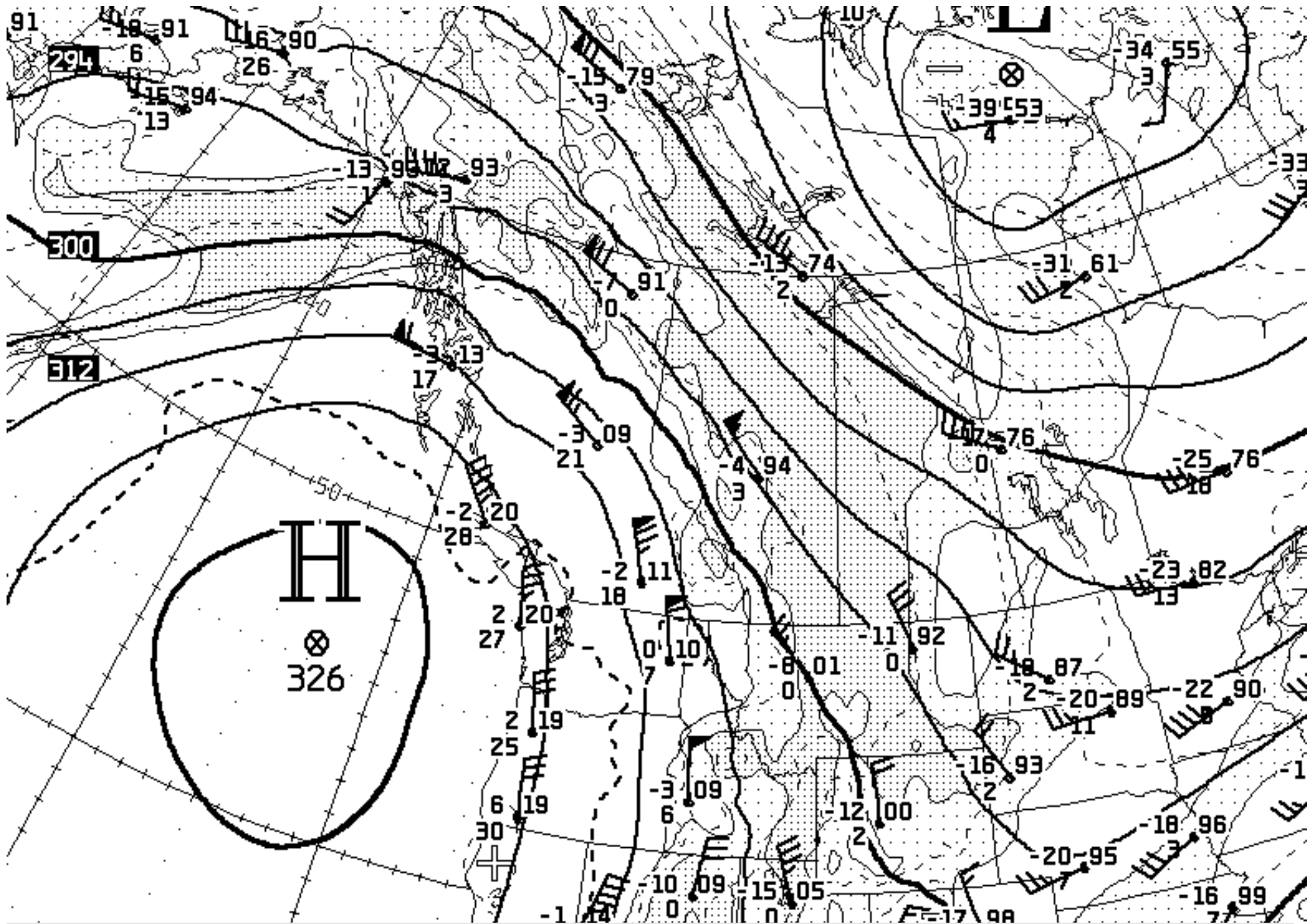
CMC 500 hPa analysis valid 12Z Tues 15 Jan. 2013 (today)



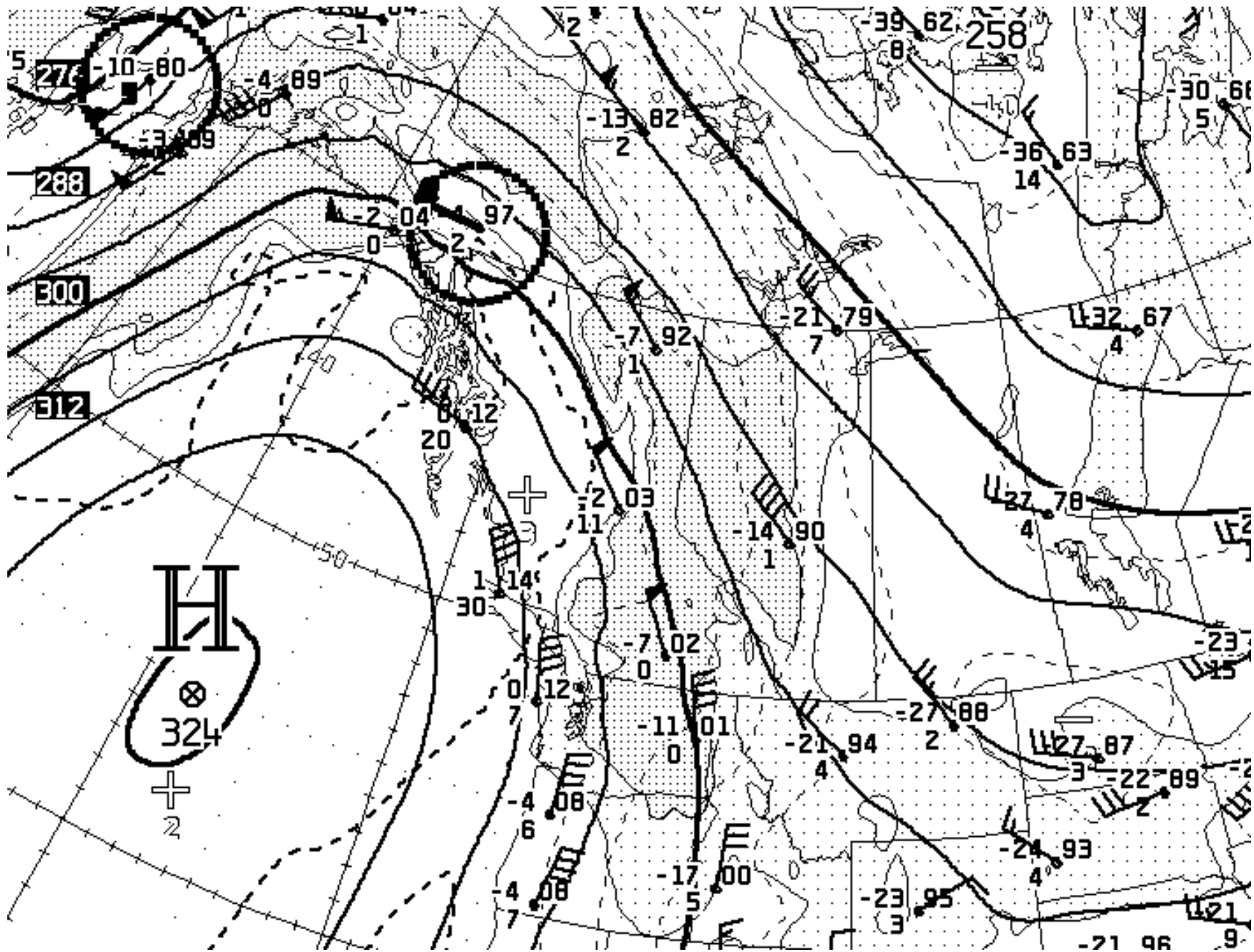
CMC 500 hPa analysis valid 00Z Tues 15 Jan. 2013



CMC 500 hPa analysis valid 12Z Mon 14 Jan. 2013

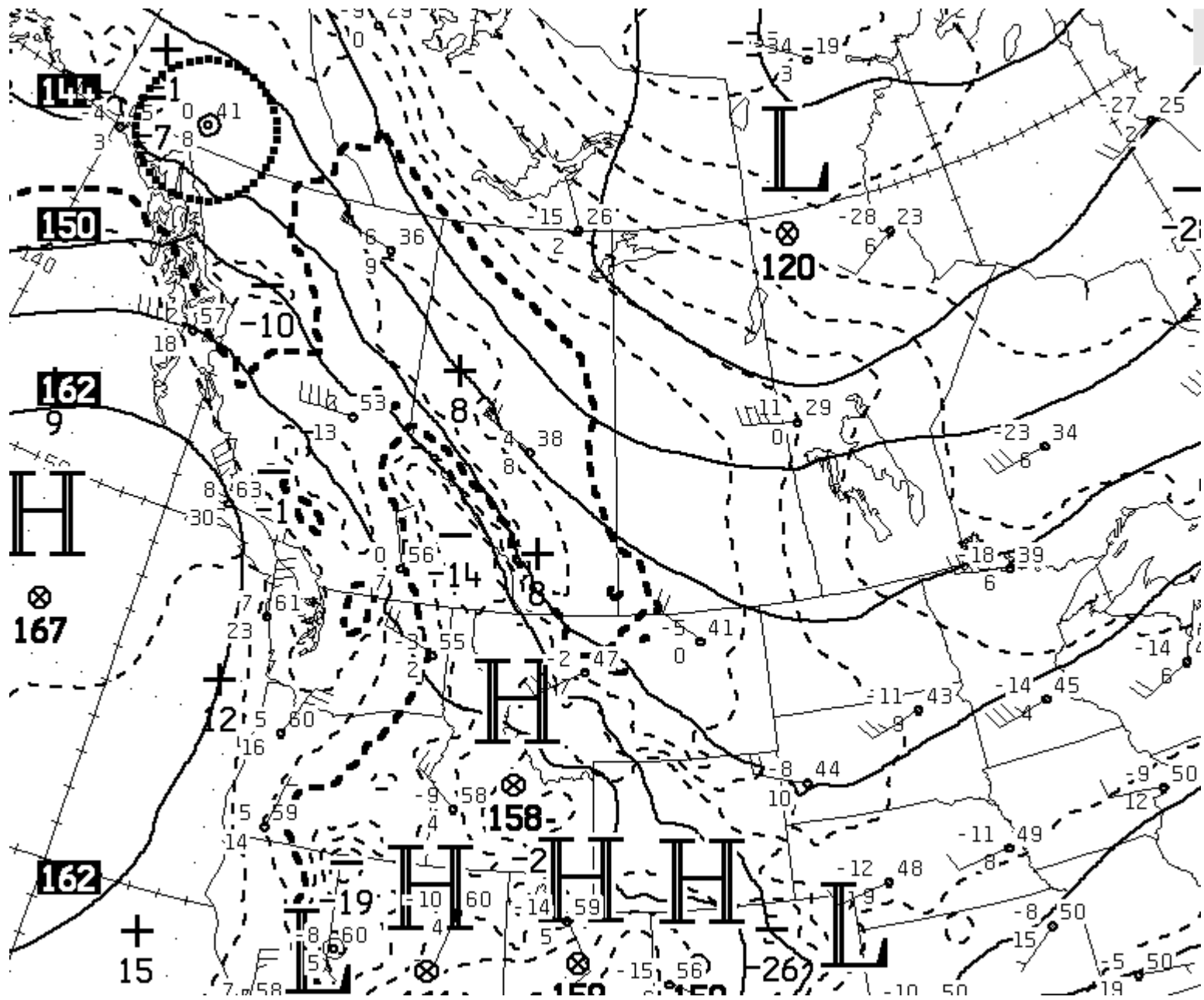


CMC 700 hPa analysis valid 12Z Tues 15 Jan. 2013 (today)

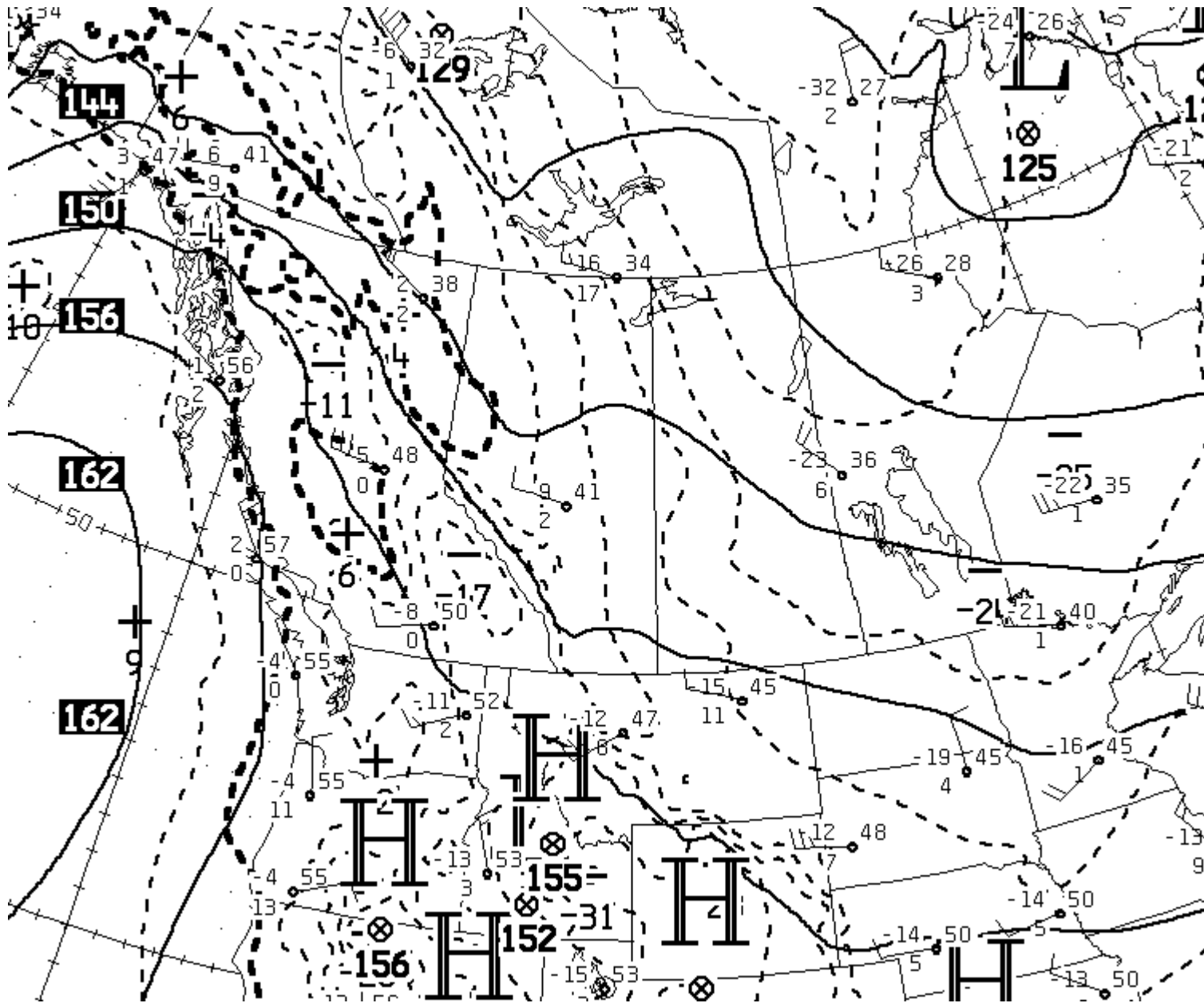


CMC 700 hPa analysis valid 12Z Mon 14 Jan. 2013

warm air aloft



CMC 850 hPa analysis valid 12Z Tues 15 Jan. 2013 (today)



still sub-zero aloft

CMC 850 hPa analysis valid 12Z Mon 14 Jan. 2013

# Edmonton City Centre Airport

## Past 24 Hour Conditions

### Imperial Units

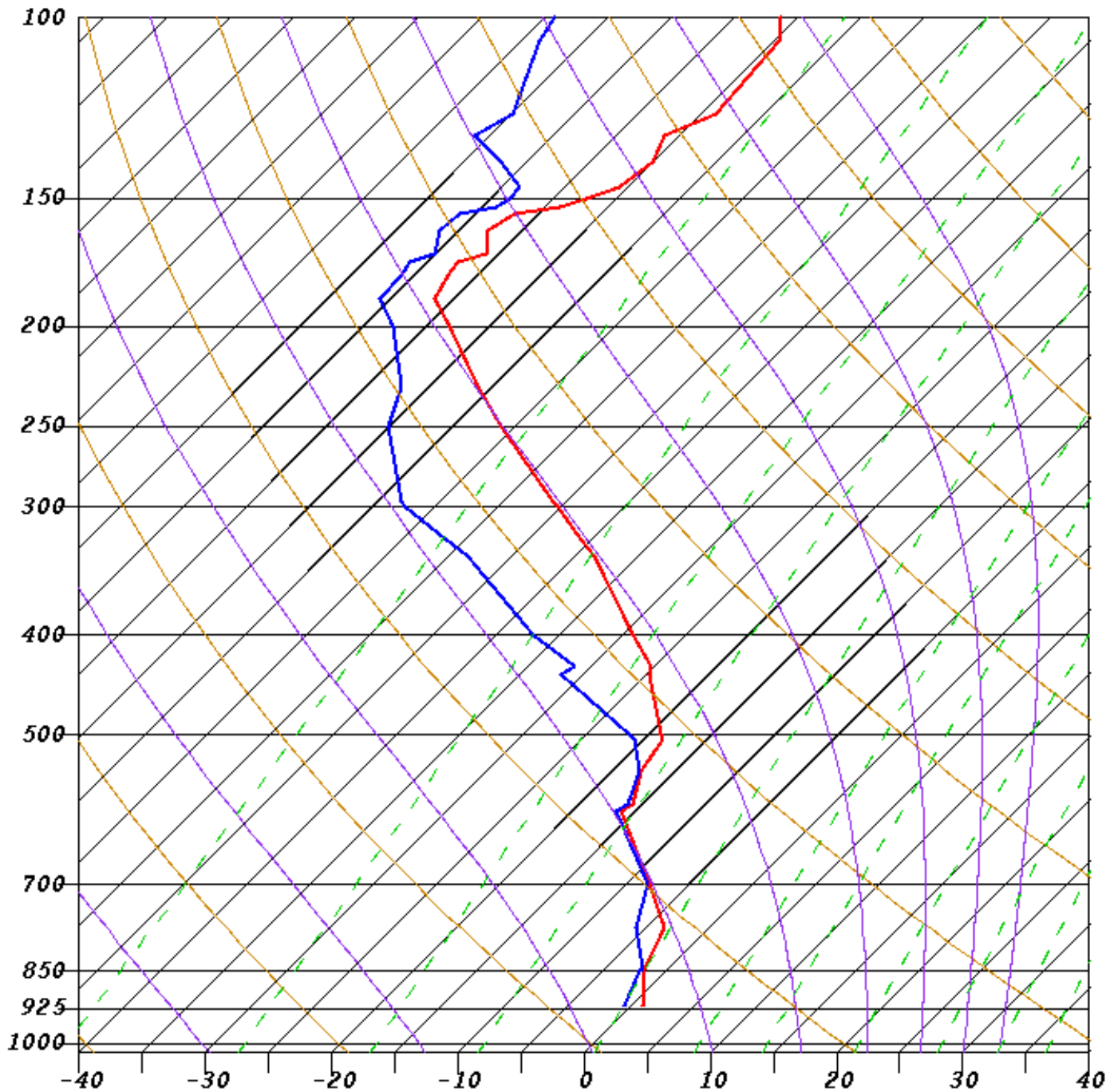
Date / Time (MST)	Conditions	Temp (°C)	Humidity (%)	Dew Point (°C)	Wind (km/h)	Pressure (kPa)	Vis (km)	Wind Chill
15 January 2013								
8:00	Mostly Cloudy	7	58	-1	WNW 30	100.6	15	*
7:00	Mostly Cloudy	5	66	-1	W 20	100.5	15	*
6:00	Mostly Cloudy	5	66	-1	W 20	100.5	15	*
5:00	Cloudy	5	68	-1	W 17	100.6	15	*
4:00	Mostly Cloudy	4	70	-1	WSW 17	100.7	15	*
3:00	Mostly Cloudy	4	70	-1	WSW 13	100.7	15	*
2:00	Mostly Cloudy	3	73	-1	SW 15	100.8	15	*
1:00	Cloudy	4	69	-1	W 20 gust 30	100.8	15	*
00:00	Cloudy	4	70	-1	W 20	100.9	15	*
14 January 2013								
23:00	Light Rain	3	75	-1	W 22	100.9	15	*
22:00	Cloudy	3	79	0	WSW 11	100.9	15	*
21:00	Cloudy	3	80	0	W 15	101.0	15	*
20:00	Cloudy	3	79	0	W 15	101.0	15	*
19:00	Light Rain	2	88	1	W 15	101.0	15	*
18:00	Light Rain	2	94	1	W 17	101.0	15	*
17:00	Light Precipitation	1	97	0	W 9	101.1	11	*
16:00	Light Precipitation	0	100	0	SW 7	101.1	3	-3
15:00	Light Snow	-1	98	-2	WSW 7	101.1	4	-4
14:00	Light Snow	-2	98	-3	WSW 17	101.1	6	-8
13:00	Light Snow	-3	97	-3	WSW 17	101.1	3	-9
12:00	Light Snow	-3	96	-4	W 13	101.2	15	-8
11:00	Light Snow	-4	96	-5	WSW 13	101.2	2	-9
10:00	Light Snow	-6	96	-6	SSW 11	101.3	3	-10
9:00	Light Snow	-6	94	-7	SSW 13	101.4	2	-12
8:00	Light Snow	-7	94	-8	SSW 11	101.5	2	-12





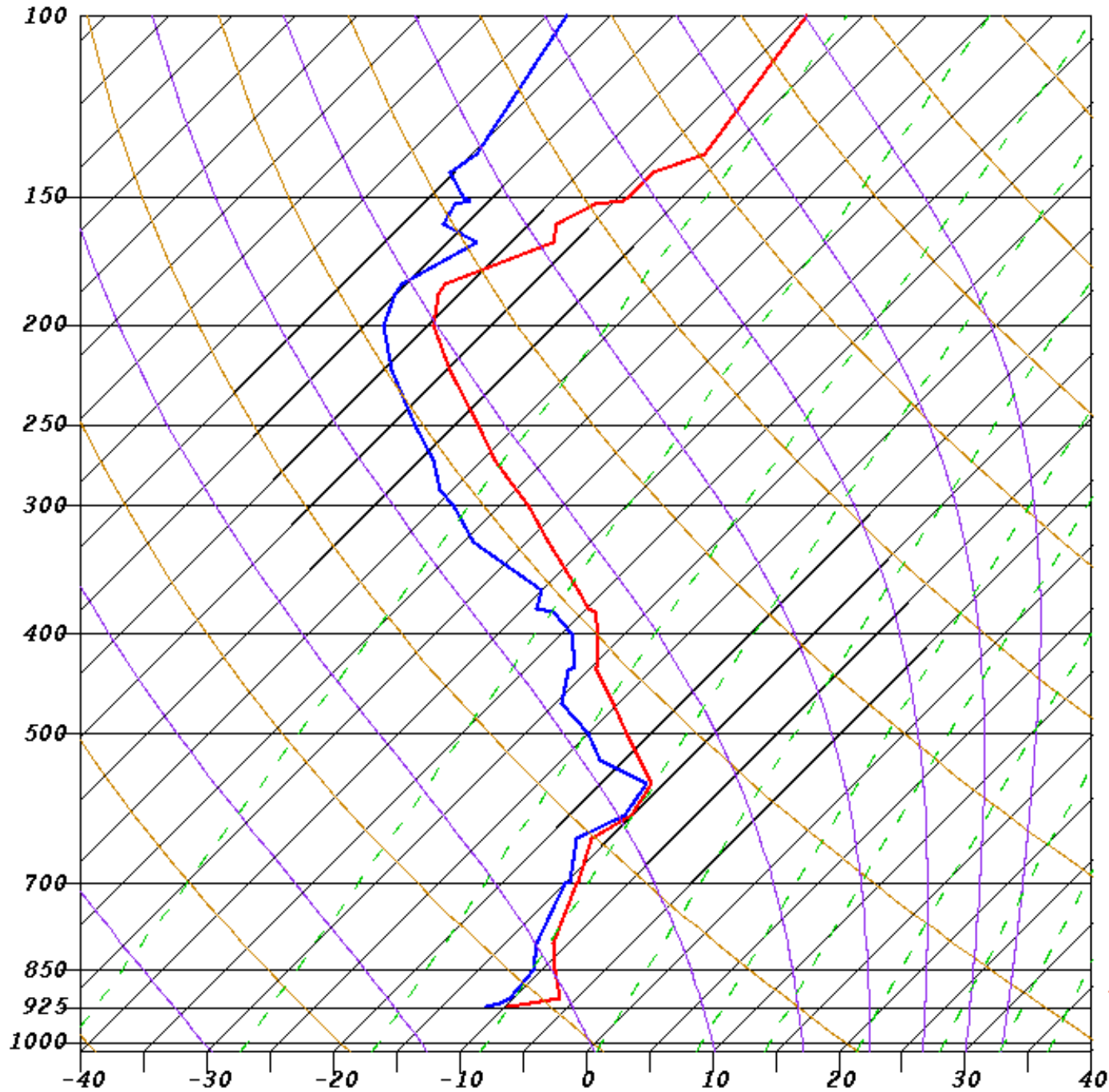
130115/0000 71119 WSE SHOW: 13 LIFT: 14 SWET: 181 VTOT: 17  
 CAPE: 0 EQLV: -9999 SELV: 766 CINS: 0  
 LCLT: 272 LCLP: 898

00Z Tues 15



- shallow layer near ground just above freezing
- danger of freezing rain

130114/1200 71119 WSE SHOW: 20 LIFT: 21 SWET: 111 VTOT:  
 CAPE: 0 EQLV: -9999 SELV: 766 CINS:  
 LCLT: 261 LCLP: 898



- deep layer of stable, nearly saturated air
- whole column sub-zero as of Monday 12Z

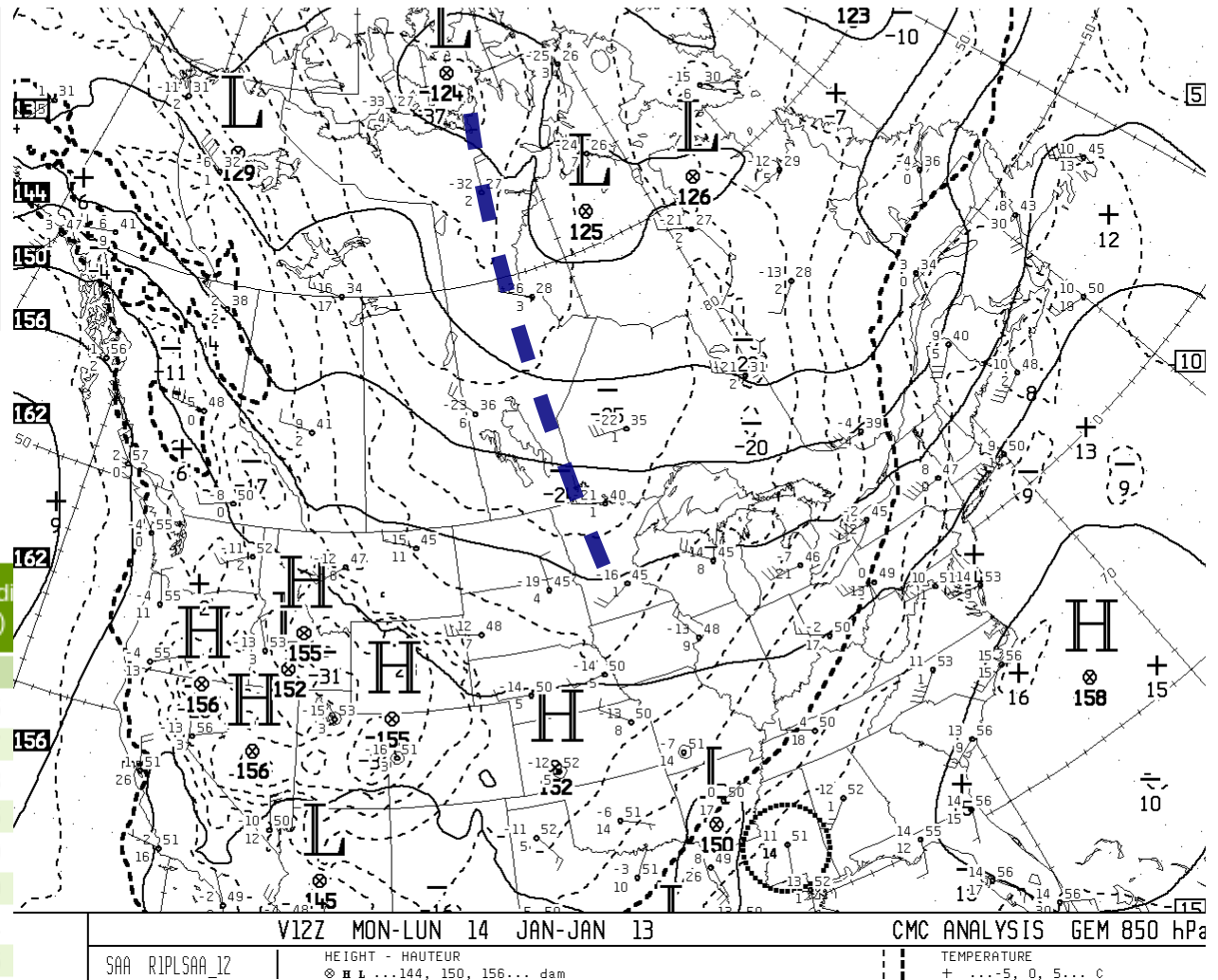


The **thickness trough** that *had* been predicted to lie over us early this week has slid eastward (more recent forecasts than the one from 00Z 8 Jan anticipated this)

## The Pas Airport Past 24 Hour Conditions

### Imperial Units

Date / Time (CST)	Conditions	Temp (°C)	Humid (%)
<b>14 January 2013</b>			
19:00	Mainly Clear	-28	65
18:00	Mainly Clear	-27	67
17:00	Mainly Clear	-27	68
16:00	Mainly Sunny	-26	65
15:00	Sunny	-26	69
14:00	Sunny	-26	70
13:00	Sunny	-26	71
12:00	Mainly Sunny	-29	65
11:00	Sunny	-31	73
10:00	Sunny	-33	67
9:00	Sunny	-33	63
8:00	Clear	-34	64
7:00	Clear	-32	66
6:00	Clear	-32	68
5:00	Clear	-32	66
4:00	Clear	-31	67
3:00	Clear	-30	69
2:00	Clear	-29	66
1:00	Clear	-29	66
00:00	Clear	-28	70



- warm, moist advection aloft over Edmonton has resulted in the thaw