Forecasting for Gliding using

National Oceanic and Atmospheric Administration

Jenny Thompson Jan 07, rev 2

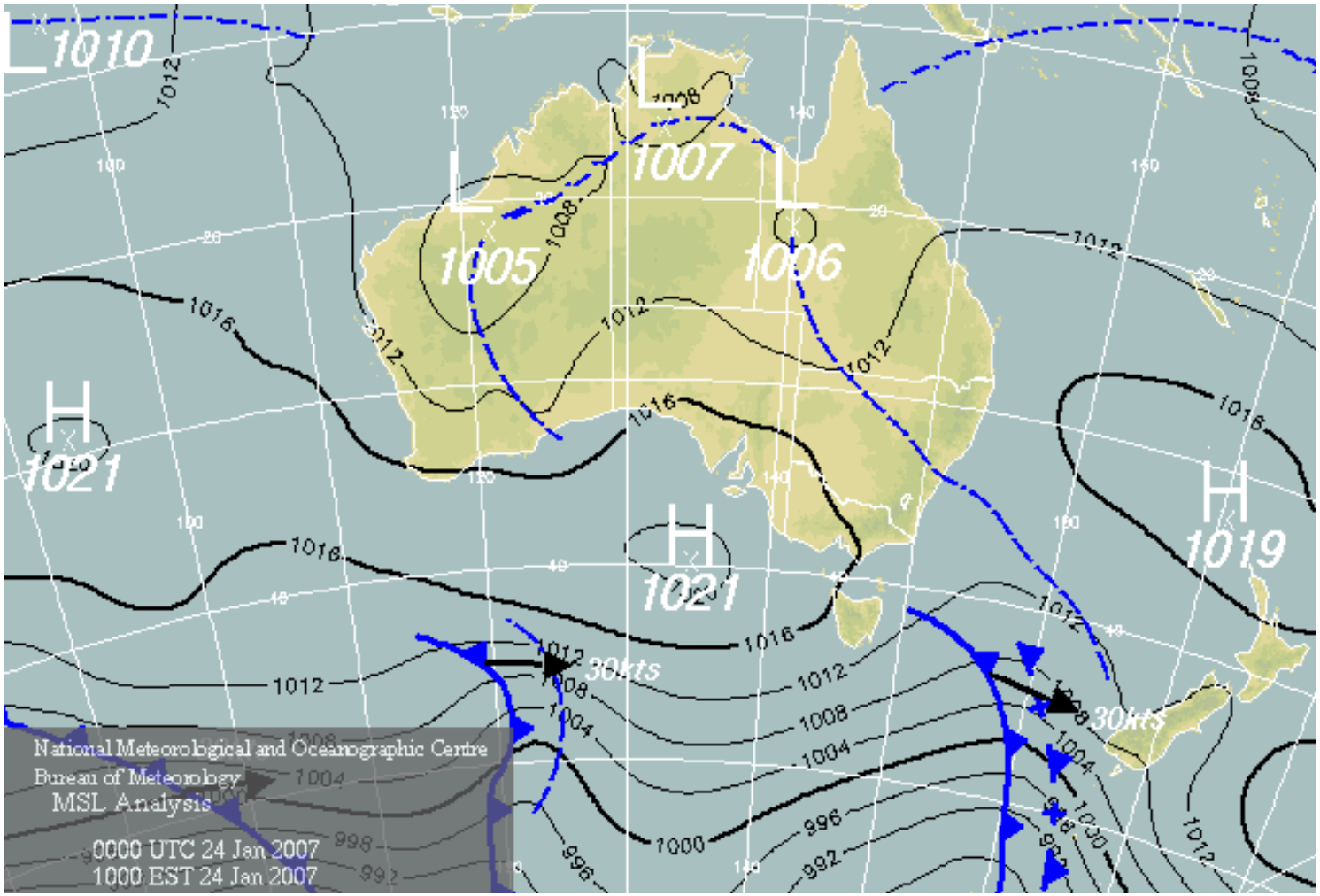
Information Sources

http://www.arl.noaa.gov/ready/cmet.html

www.bom.gov.au

NAIPS

http://www.ddsc.org.au/links/links.asp - weather



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Air Resources Laboratory READY

HOME | HYSPLIT | DISPERSION MODELING | METEOROLOGY | EMERGENCY RESPONSE | STATUS | CONTACTS

CURRENT METEOROLOGY (WORLD)

Forecast Model Graphics

Choose a forecast location by entering an 4-character ICAO station identifier or a 6-d
or a latitude/longitude pair and then click the Continue button, or by clicking on the lo
will be taken to the model products section.

ICAO or WMO ID: Search for Code

Or choose a city –>

OR

Latitude (degrees)

Longitude (West < 0)

Convert Deg/Min/Sec into Decimal Degrees

Continue Reset

OR click a location on the map below.

North American Map United States Global Map

Latitude using Minus sign (South)

Longitude

CURRENT METEOROLOGY (WORLD)

Forecast Model Graphics

ast location by entering an 4-character ICAO station identifier or a 6-digit WMO index num
ngitude pair and then click the Continue button, or by clicking on the location in the map.
the model products section.

O ID: Search for Code

y –>

OR

-32.2 Latitude (degrees)

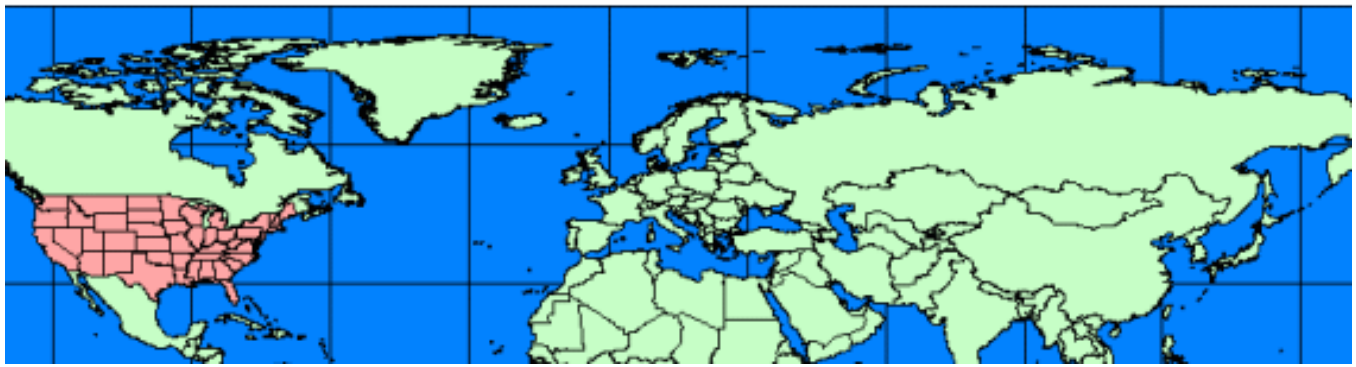
148.2 Longitude (West < 0)

Convert Deg/Min/Sec into Decimal Deg

Continue Reset

OR click a location on the map below.

can Map United States Global



HOME | HYSPLIT | DISPERSION MODELING | METEOROLOGY | EMERGENCY RESPONSE | STATUS | CONTACTS

Return to: CURRENT METEOROLOGY | STATE WEATHER

READY PRODUCTS FOR LOCATION: -32.20 148.20

DISPLAY PROGRAM What is UTC, GMT, Z time?	METEOROLOGICAL DATA Model Data Status Information on forecast datasets	
AUTOGRAM	-----Plot up to 6 meteorograms at a time----	
METEOROGRAM	————Choose A Forecast Dataset————	Go
WINDGRAM	————Choose A Forecast Dataset————	Go
WINDROSE	————Choose A Forecast Dataset————	Go
SOUNDING	————Choose A Forecast Dataset————	Go
STABILITY TIME-SERIES	————Choose A Forecast Dataset————	Go
INTERACTIVE MAP	————Choose A Forecast Dataset————	Go
INTERACTIVE MAP (JAVA-BASED)	————Choose A Forecast Dataset————	Go
DATASET HELP	————Choose A Forecast Dataset————	Go
FORECAST MODEL ANIMATIONS		

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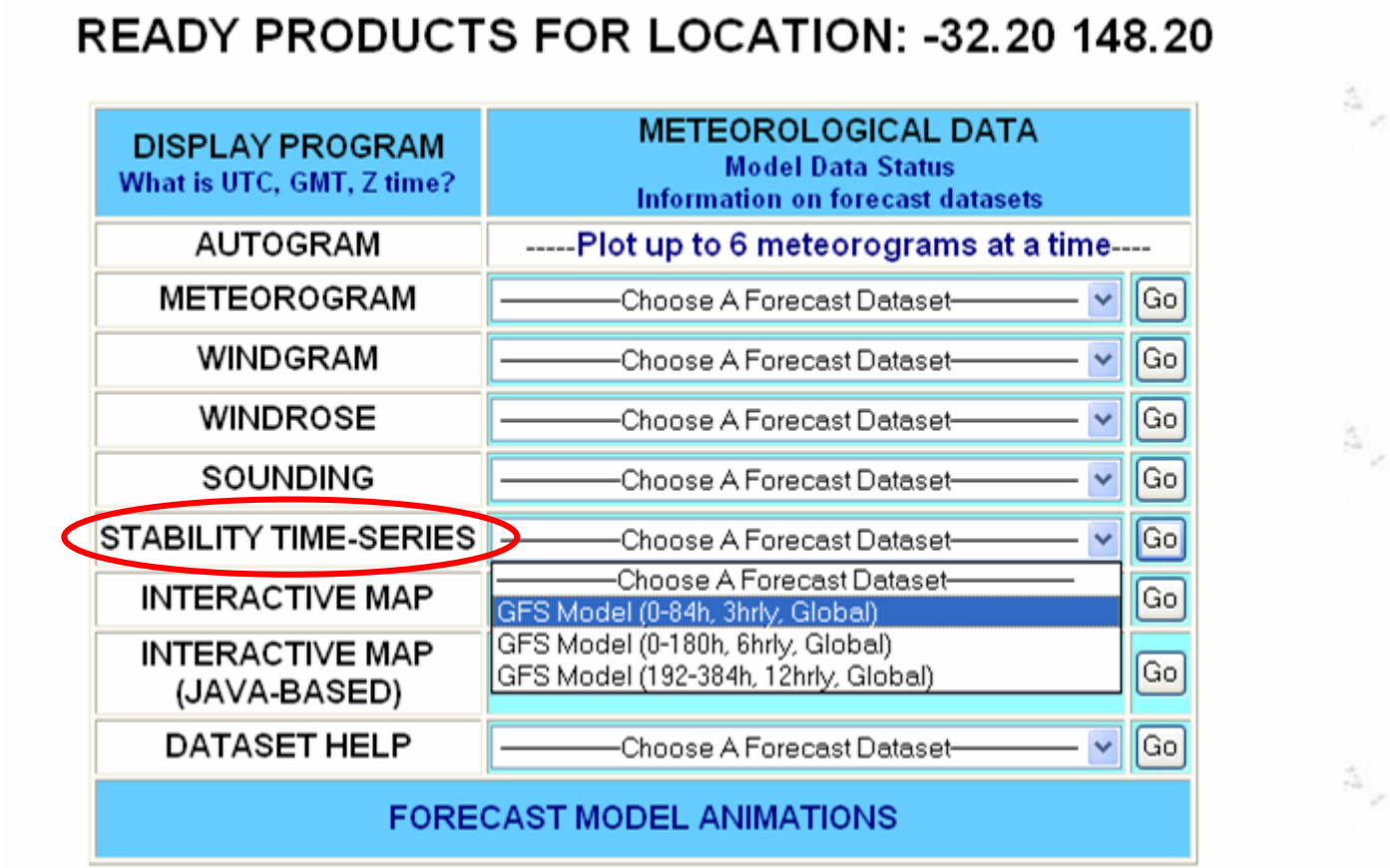
1. Stability Time Series
    - 3-6 day lookahead for lat long specified
    - Generally reliable for lookahead 3 days
    - not used for cloud base, convection only.
    - Handy for length of day
2. Meteorogram
    - Handy lookahead for a number of parameters
        - Cloud cover
        - Storms
        - Cloudbase, dew point etc
3. Sounding
    - Determination of cloudbase, rough time of convection and length of day
4. Windgram
    - Handy for front changes, shear prediction etc

Stability Time Series



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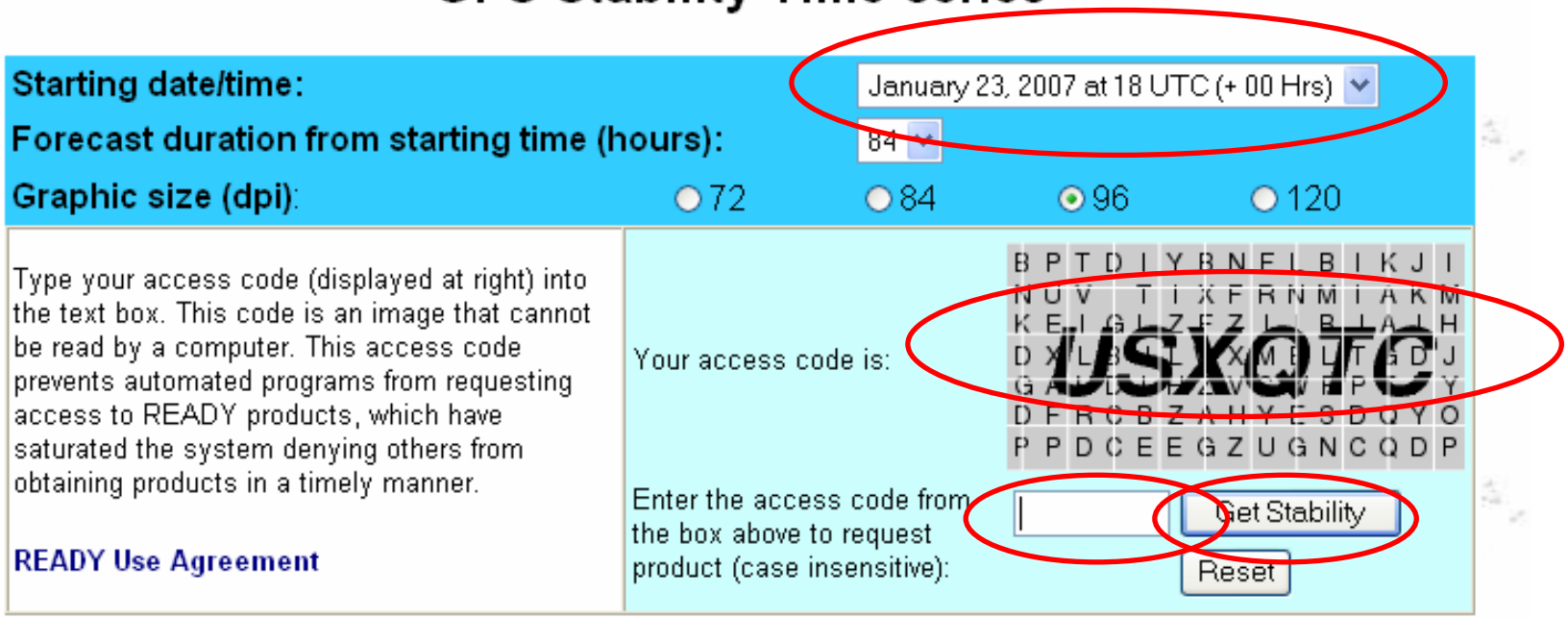
GFS Stability Time-series



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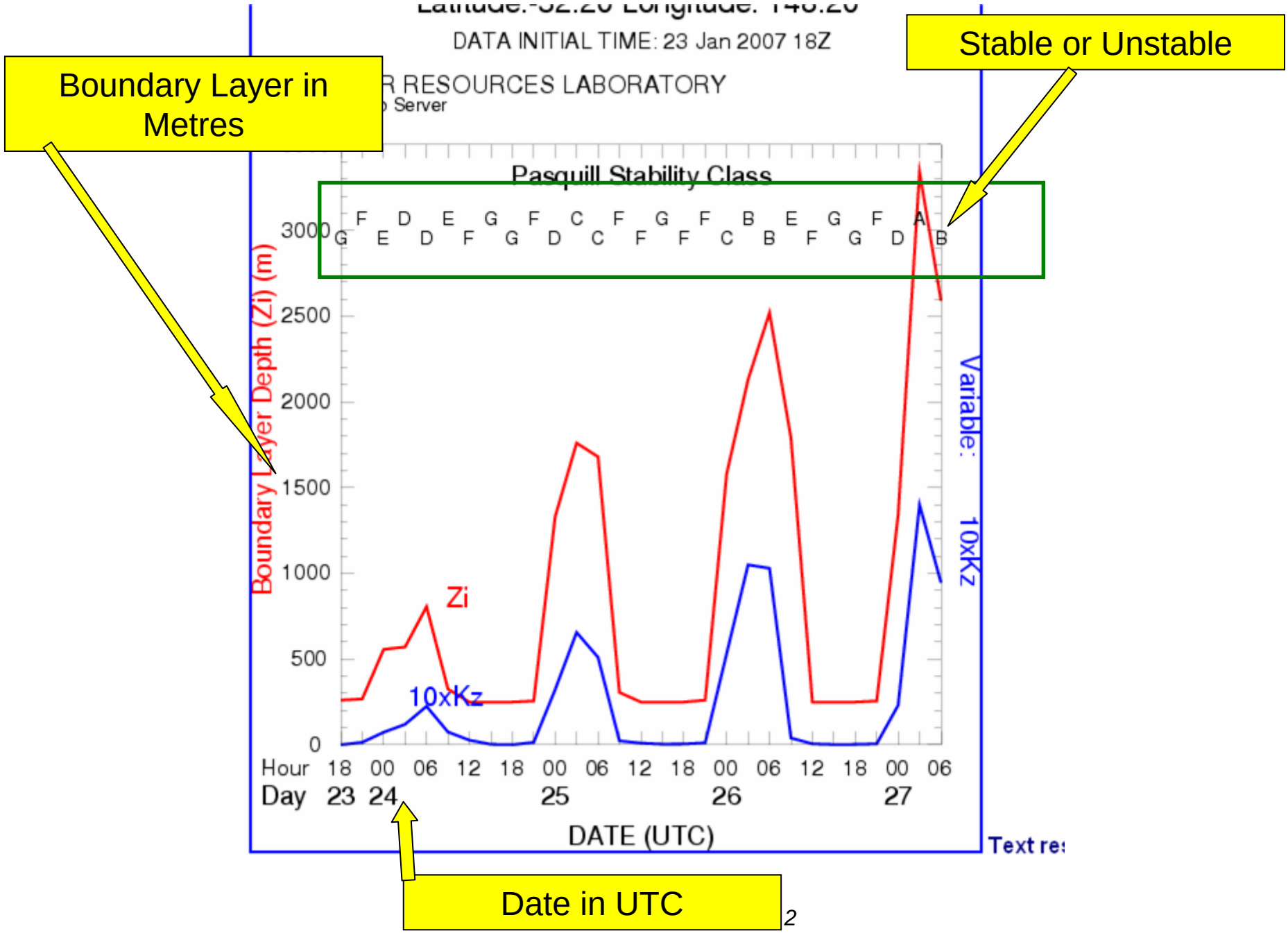

Boundary Layer in Metres
Stable or Unstable
DATA INITIAL TIME: 23 Jan 2007 18Z
RESOURCES LABORATORY
Server
Pasquill Stability Class
F D E G F C F G F B E G F A
G E D F G D C F F C B F G D B
Boundary Layer Depth (Zi) (m)
3000
2500
2000
1500
1000
500
0
Zi
10xKz
Variable: 10xKz
Hour 18 00 06 12 18 00 06 12 18 00 06 12 18 00 06
Day 23 24 25 26 27
DATE (UTC)
Text re
Date in UTC

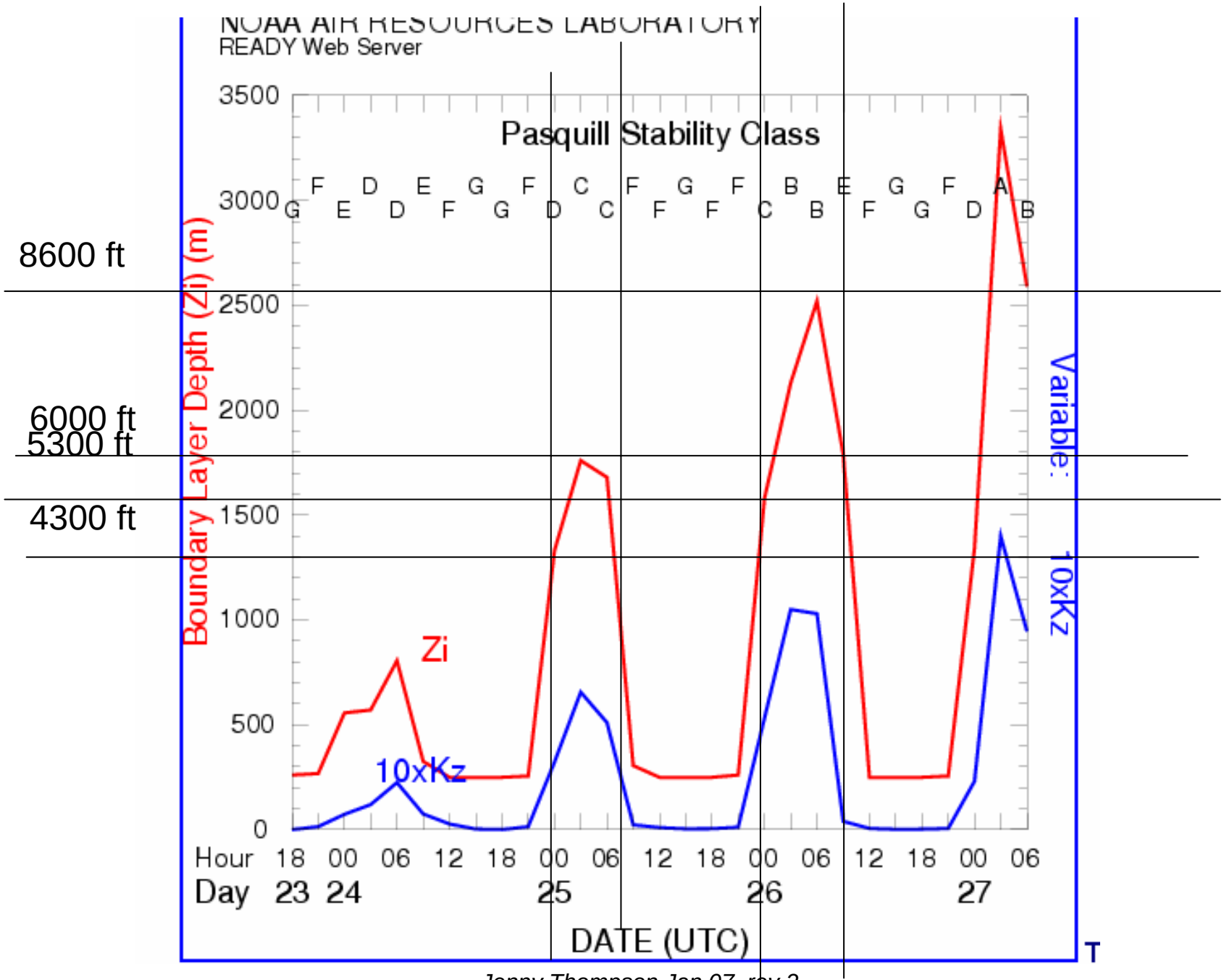
Pasquill Stability Classes

A: Extremely unstable conditions	D: Neutral conditions
B: Moderately unstable conditions	E: Slightly stable conditions
C: Slightly unstable conditions	F: Moderately stable conditions
G: Extremely Stable	

Meteorological conditions defining Pasquill stability classes.

	Daytime insolation			Night-time conditions	
Surface wind speed (m/s)	**Strong**	**Moderate**	**Slight**	**Thin overcast or > 4/8 low cloud**	**<= 4/8 cloudiness**
< 2	A	A - B	B		
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	C	D	E
5 - 6	C	C - D	D	D	D
> 6	C	D	D	D	D

Source: Pasquill, 1961.



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GFS Meteorogram

Starting date/time:	January 23, 2007 at 18 UTC (+ 00 Hrs)		
Forecast duration from starting time:	84 hours		
Fields to plot:	◉ Default	○ Default with winds	○ Choose from below
Plot text below wind flags:	○ None	◉ Speed only	○ Speed and Direction

(SFC = surface field, 3D = multi-level field)

Mean Sea Level Pressure (SFC)	SFC
Field 2 not selected	SFC
Field 3 not selected	SFC
Field 4 not selected	SFC
Field 5 not selected	SFC
Field 6 not selected	SFC
Field 7 not selected	SFC
Field 8 not selected	SFC
Field 9 not selected	SFC
Field 10 not selected	SFC

Output Options:	◉ Graphic and text		○ Text only	
Meteorogram size (dpi):	○ 72	○ 84	◉ 96	○ 120

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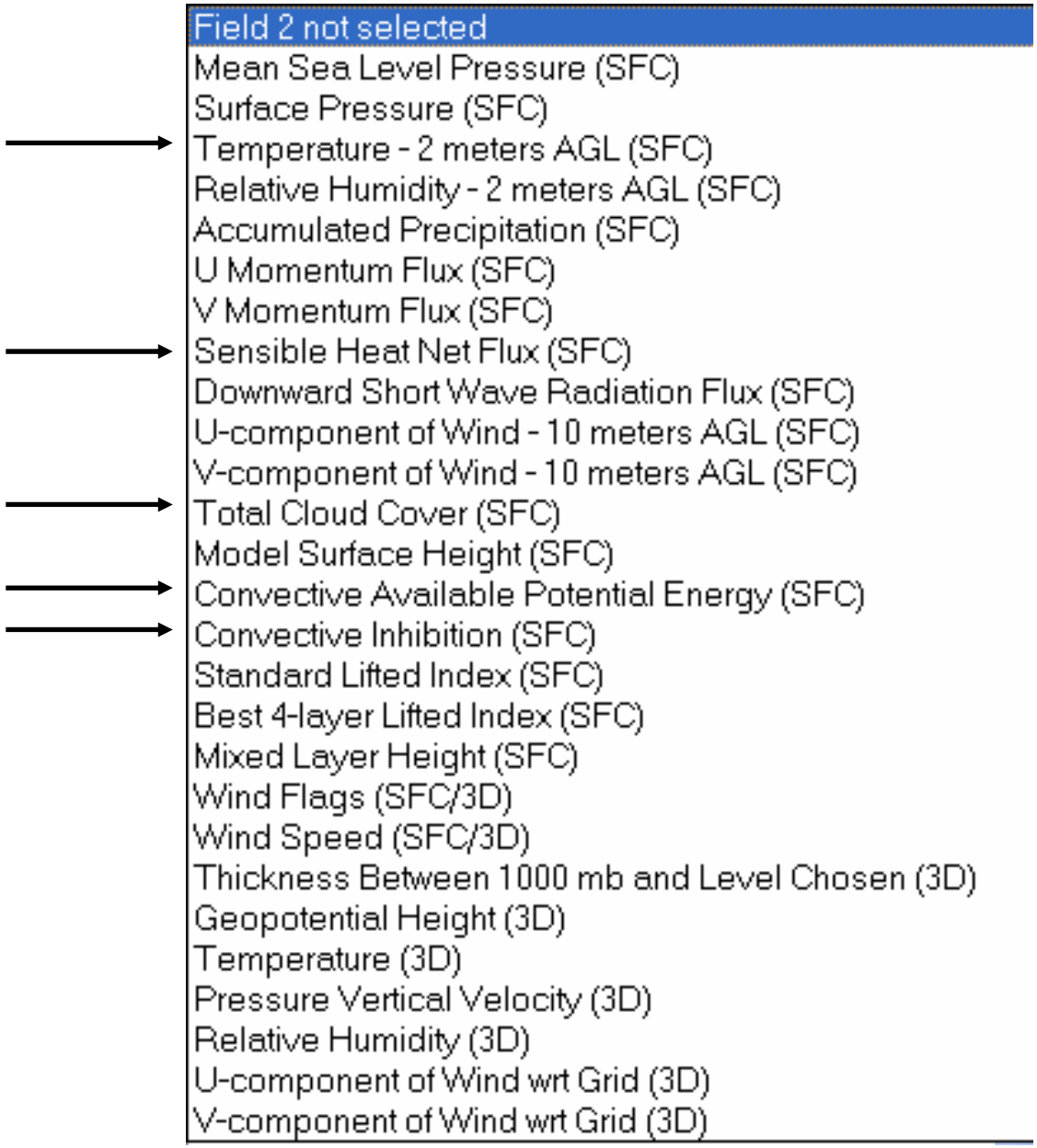

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GFS Meteorogram

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Fields to plot:	○ Default	○ Default with winds	◉ Choose from below
Plot text below wind flags:	○ None	◉ Speed only	○ Speed and Direction

(SFC = surface field, 3D = multi-level field)

Mean Sea Level Pressure (SFC)	SFC
Temperature - 2 meters AGL (SFC)	SFC
Sensible Heat Net Flux (SFC)	SFC
Total Cloud Cover (SFC)	SFC
Convective Available Potential Energy (SFC)	SFC
Convective Inhibition (SFC)	SFC
Field 7 not selected	SFC
Field 8 not selected	SFC
Field 9 not selected	SFC
Field 10 not selected	SFC

Output Options:	◉ Graphic and text		○ Text only	
Meteorogram size (dpi):	○ 72	○ 84	◉ 96	○ 120

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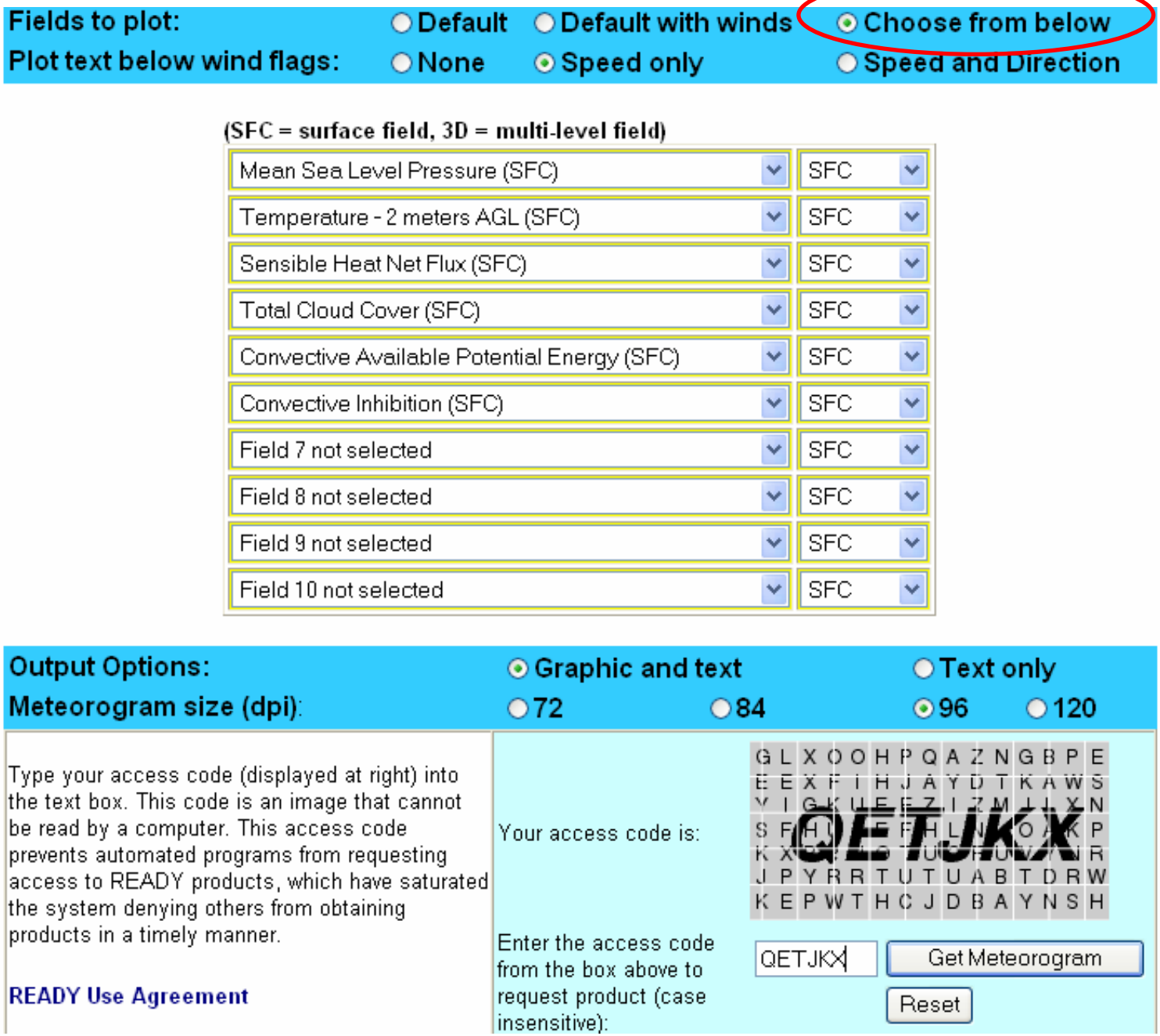

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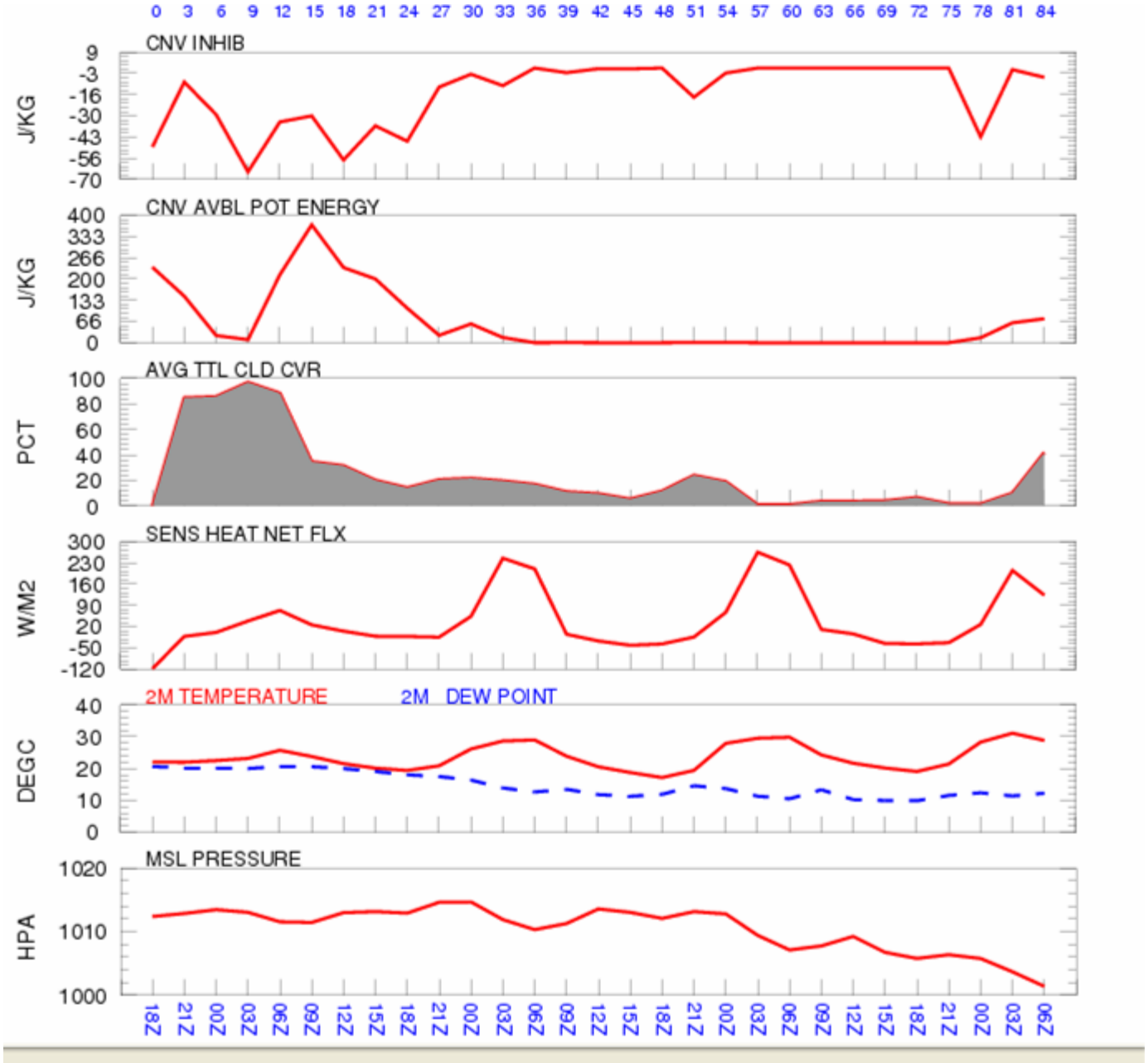
Energy suppression

Energy above the Boundary Layer

Heat flux density/ radiance

Temp and Dew Point



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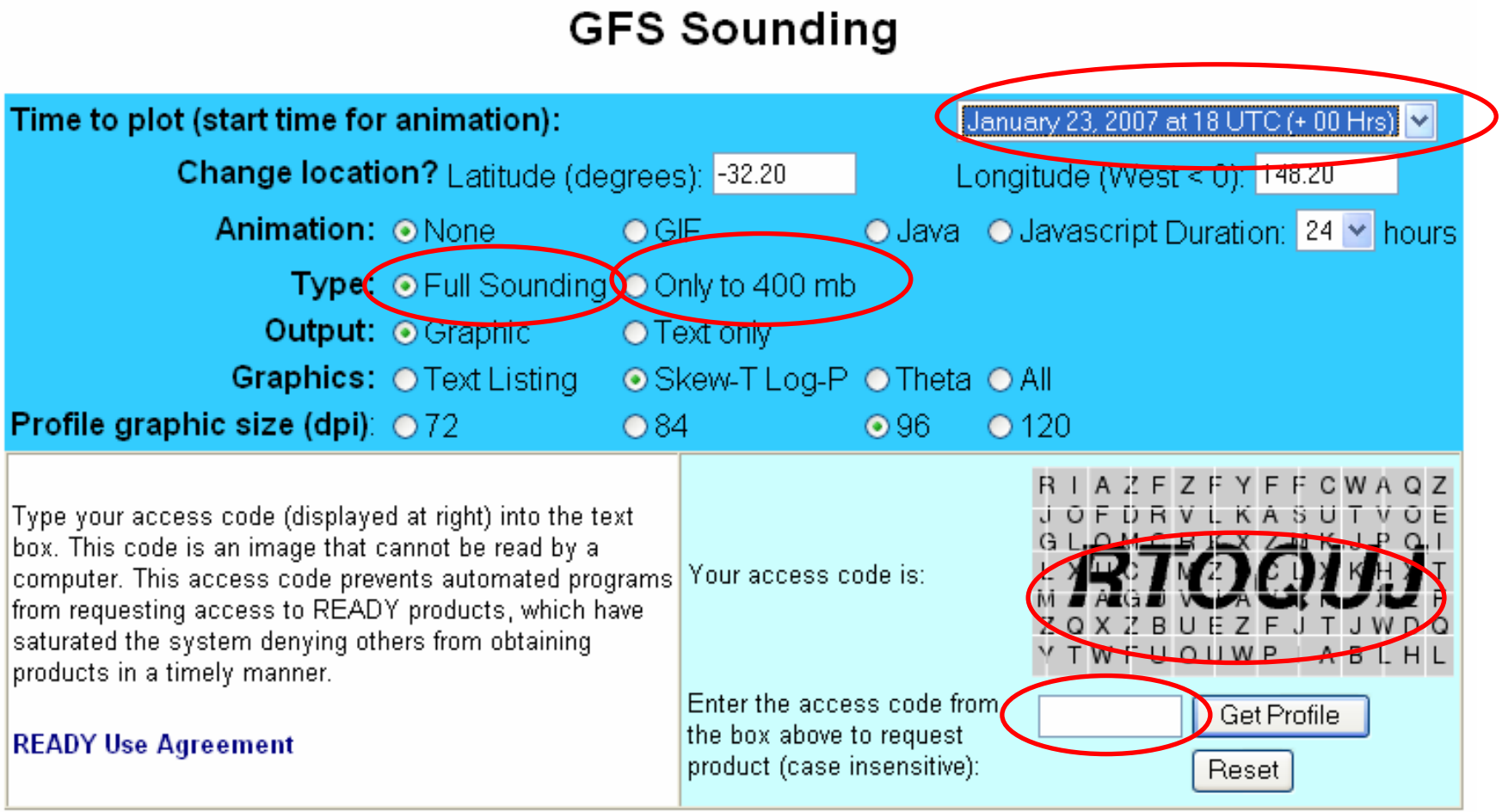
GFS Sounding – Skew T



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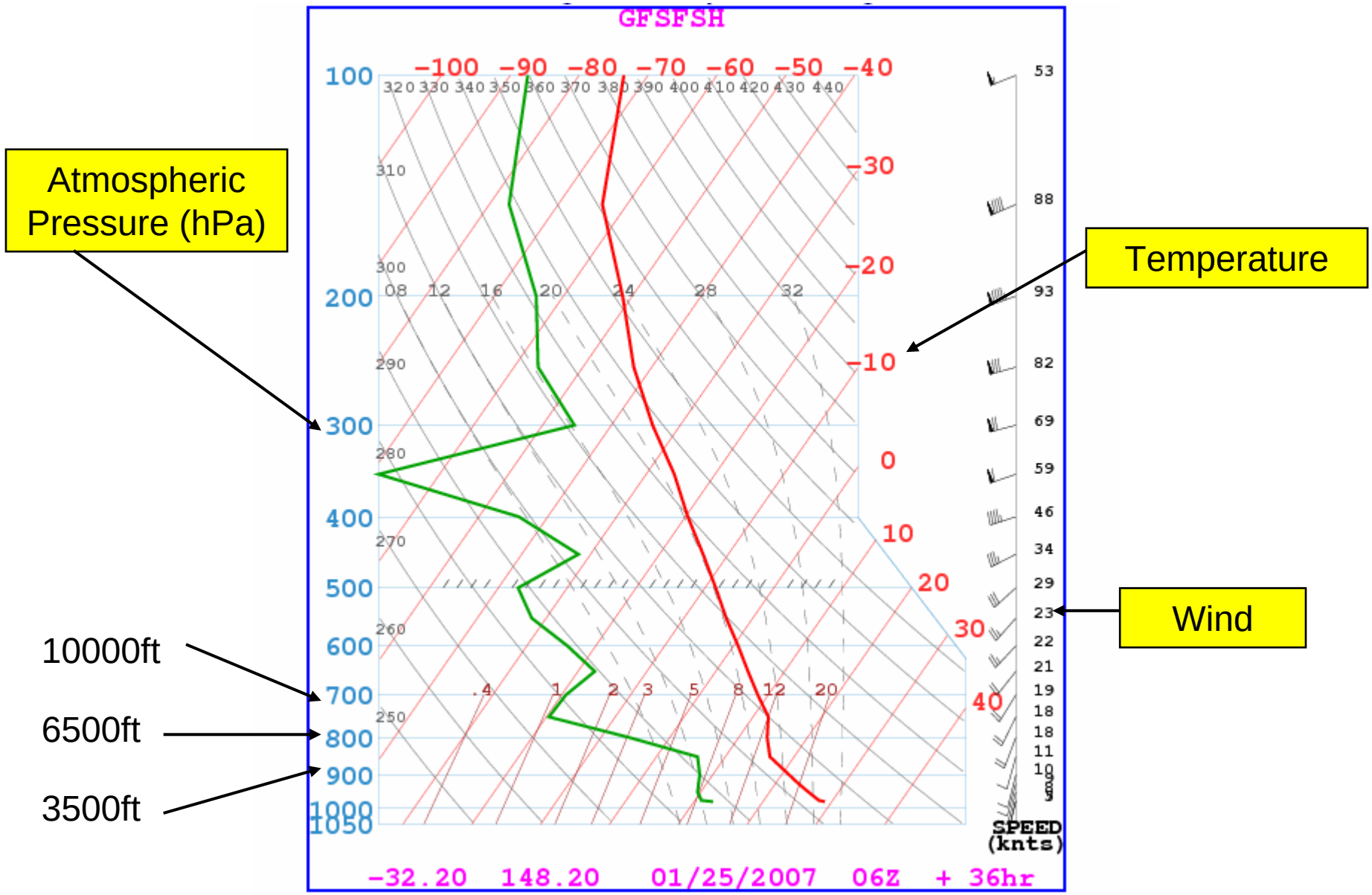

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Pressure vs Altitude Conversion

Press (hPa)	Alt (ft)
1013	0
995	500
977	1,000
960	1,500
943	2,000
926	2,500
909	3,000
893	3,500
877	4,000
861	4,500
846	5,000
830	5,500
816	6,000
801	6,500
787	7,000
772	7,500
759	8,000
745	8,500
732	9,000
719	9,500

Press (hPa)	Alt (ft)
706	10,000
693	10,500
681	11,000
668	11,500
656	12,000
645	12,500
633	13,000
622	13,500
611	14,000
600	14,500
589	15,000
578	15,500
568	16,000
558	16,500
548	17,000
538	17,500
528	18,000
519	18,500
510	19,000
500	19,500
491	20,000

Back to 24th Jan

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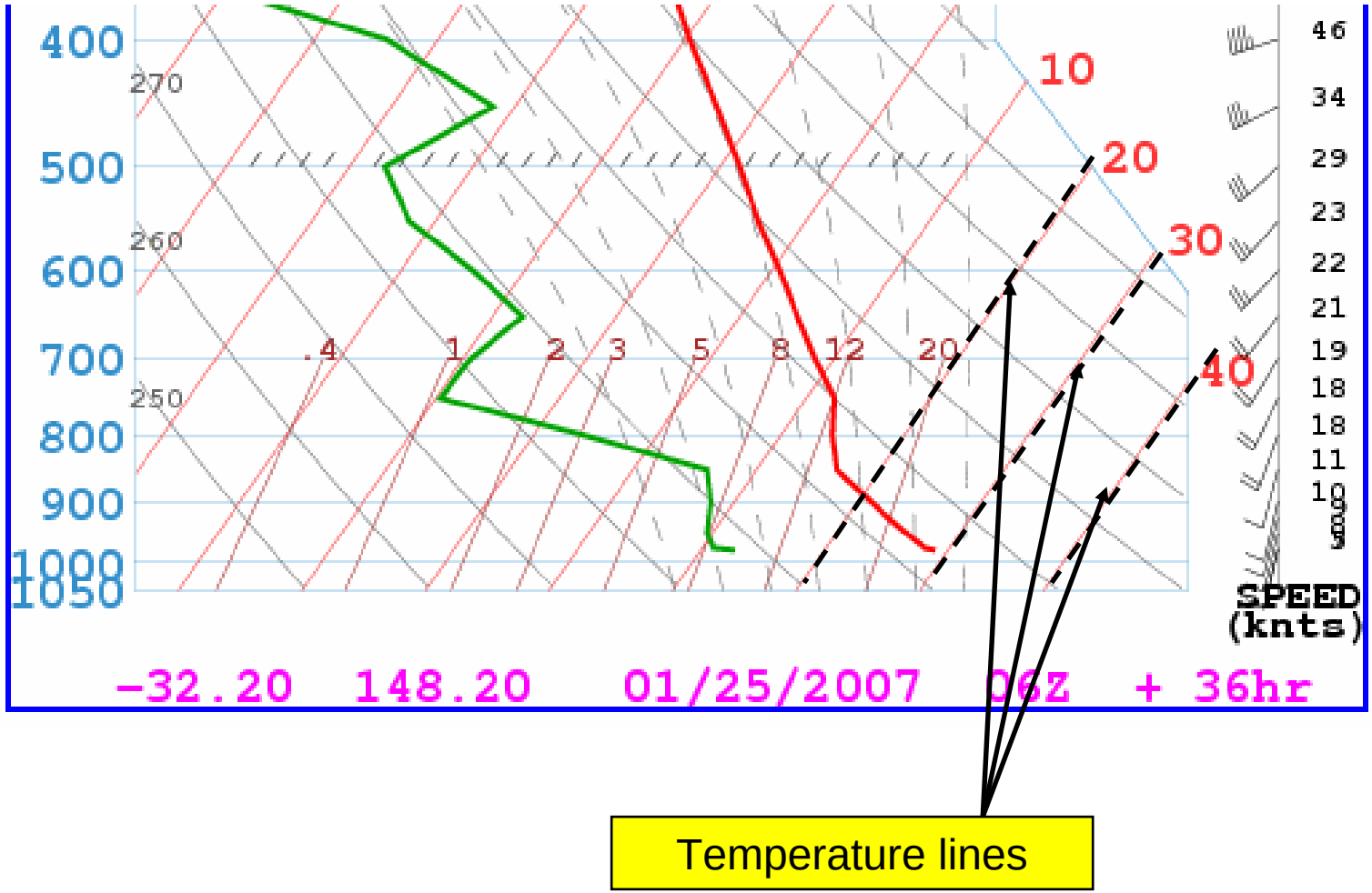
400
500
600
700
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1050
270
260
250
.4
1
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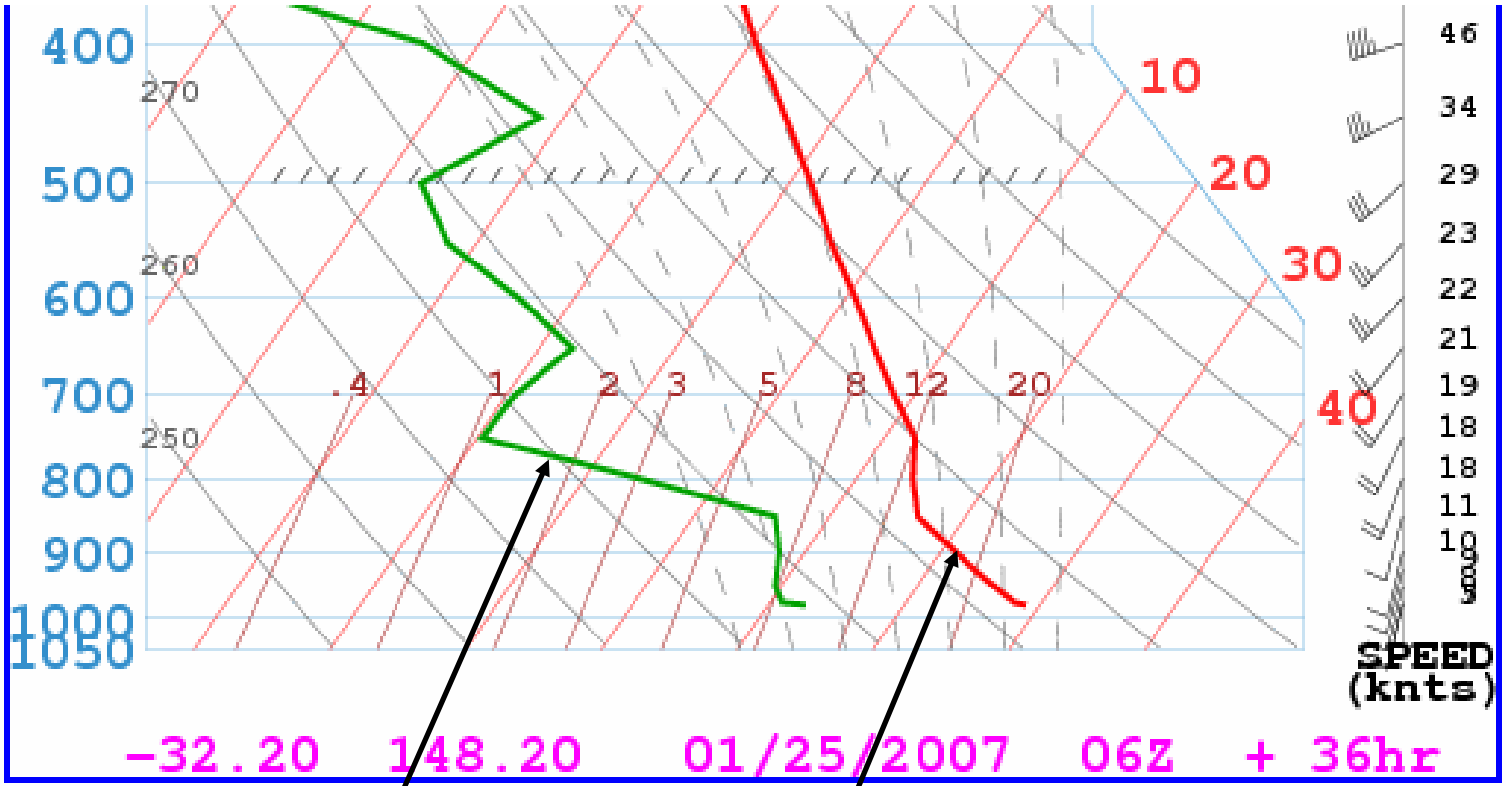
20
10
20
30
40
46
34
29
23
22
21
19
18
18
11
10
SPEED
(knts)
-32.20 148.20 01/25/2007 06Z + 36hr
Temperature lines



Dew Point LIne

Environmental Lapse Rate

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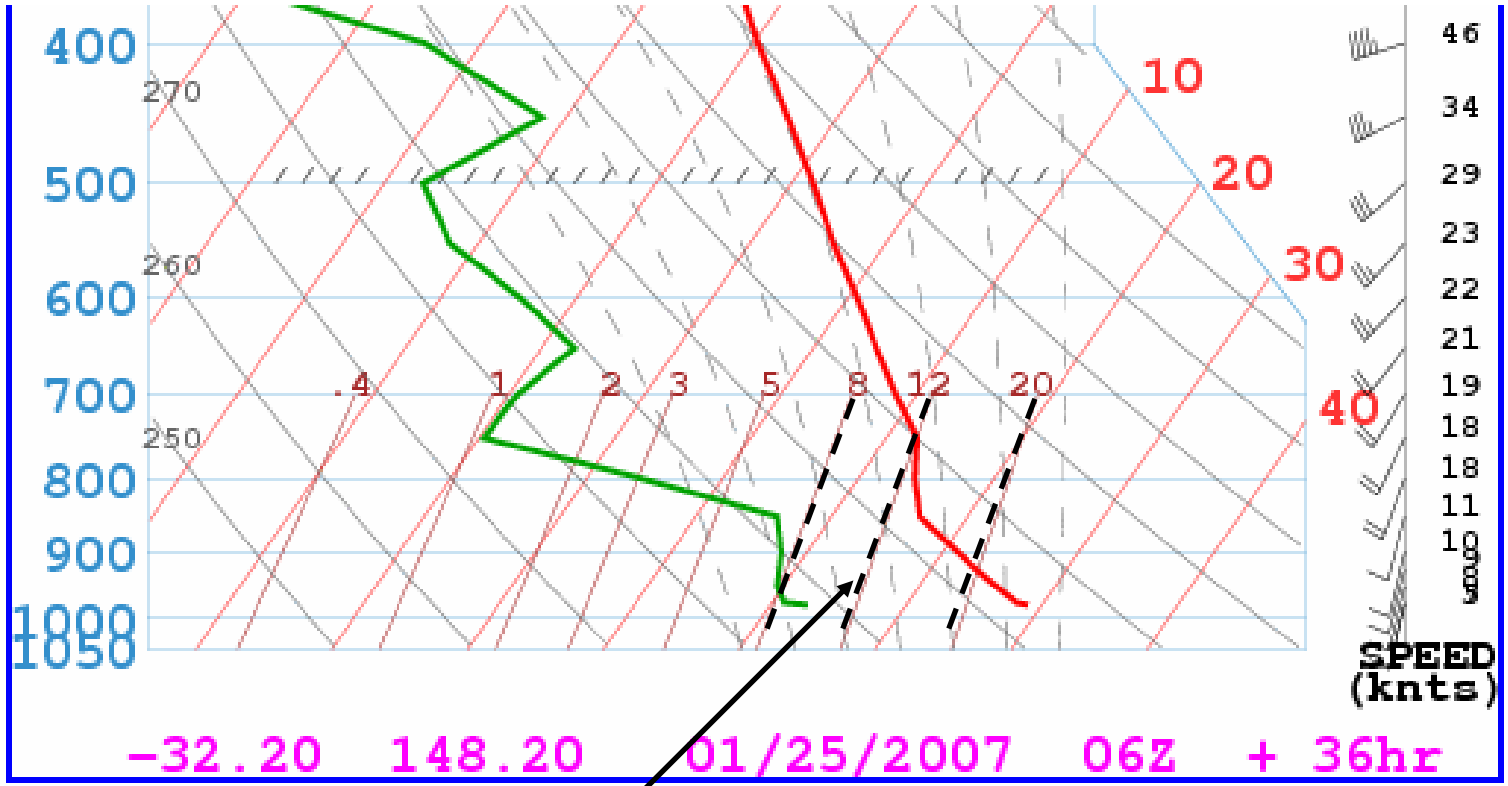
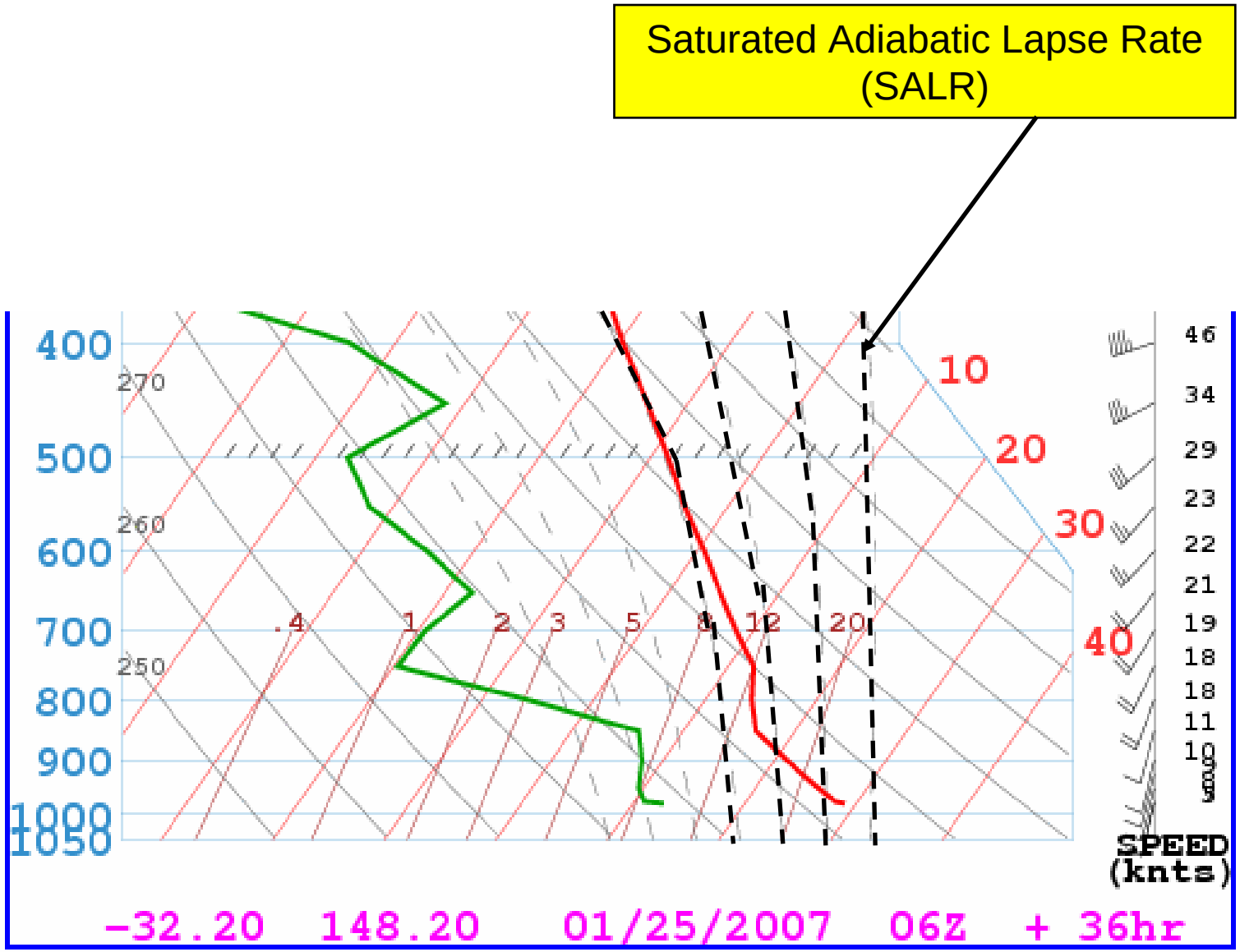


Mixing Lines


Saturated Adiabatic Lapse Rate
(SALR)
400
500
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270
260
250
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46
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22
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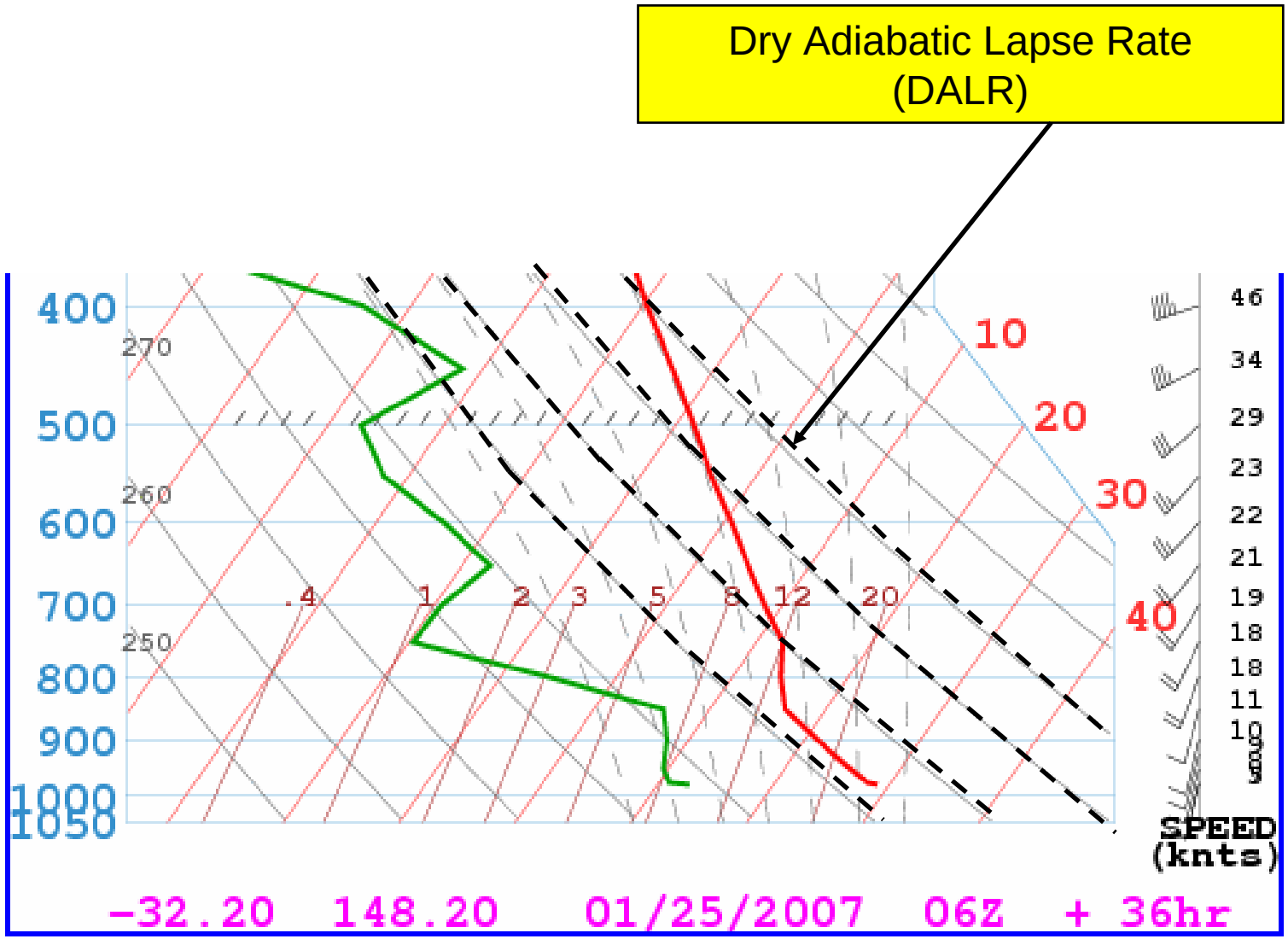
19
18
18
11
10
SPEED
(knts)
-32.20 148.20 01/25/2007 06Z + 36hr


Dry Adiabatic Lapse Rate
(DALR)
400
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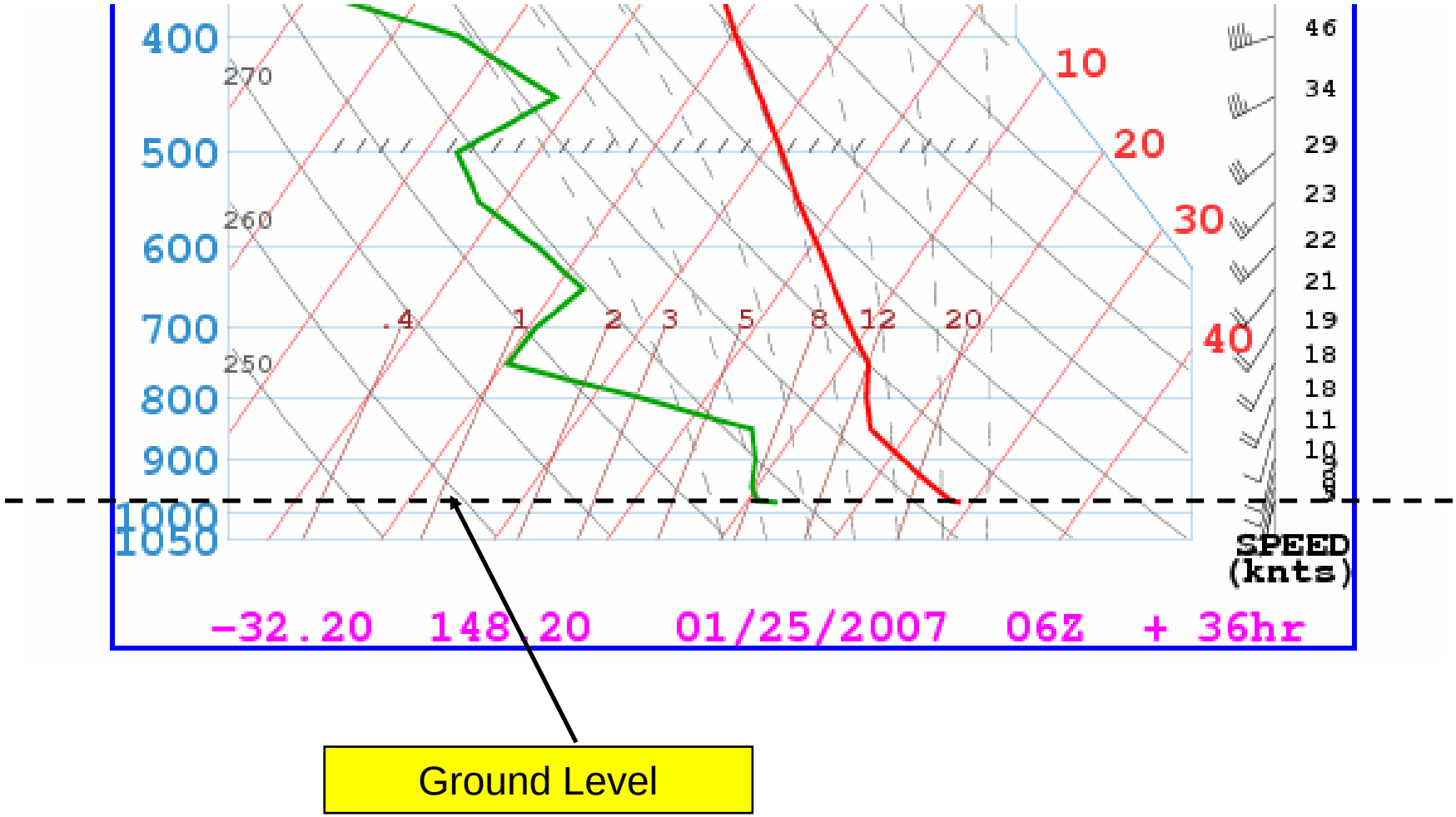
SPEED
(knts)
-32.20 148.20 01/25/2007 06Z + 36hr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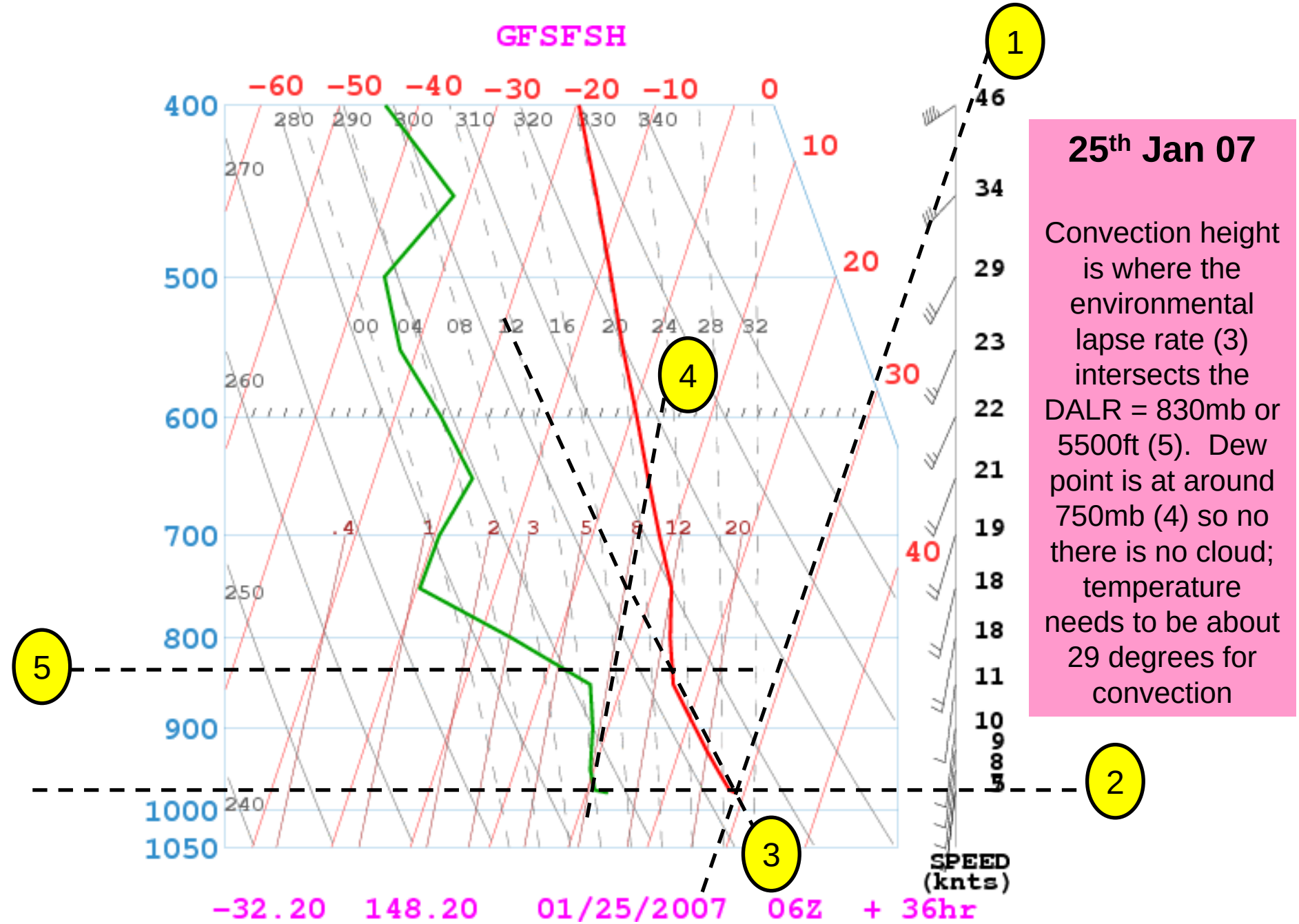
10
SPEED
(knts)
-32.20 148.20 01/25/2007 06Z + 36hr
Ground Level



25th Jan 07

Convection height is where the environmental lapse rate (3) intersects the DALR = 830mb or 5500ft (5). Dew point is at around 750mb (4) so no there is no cloud; temperature needs to be about 29 degrees for convection

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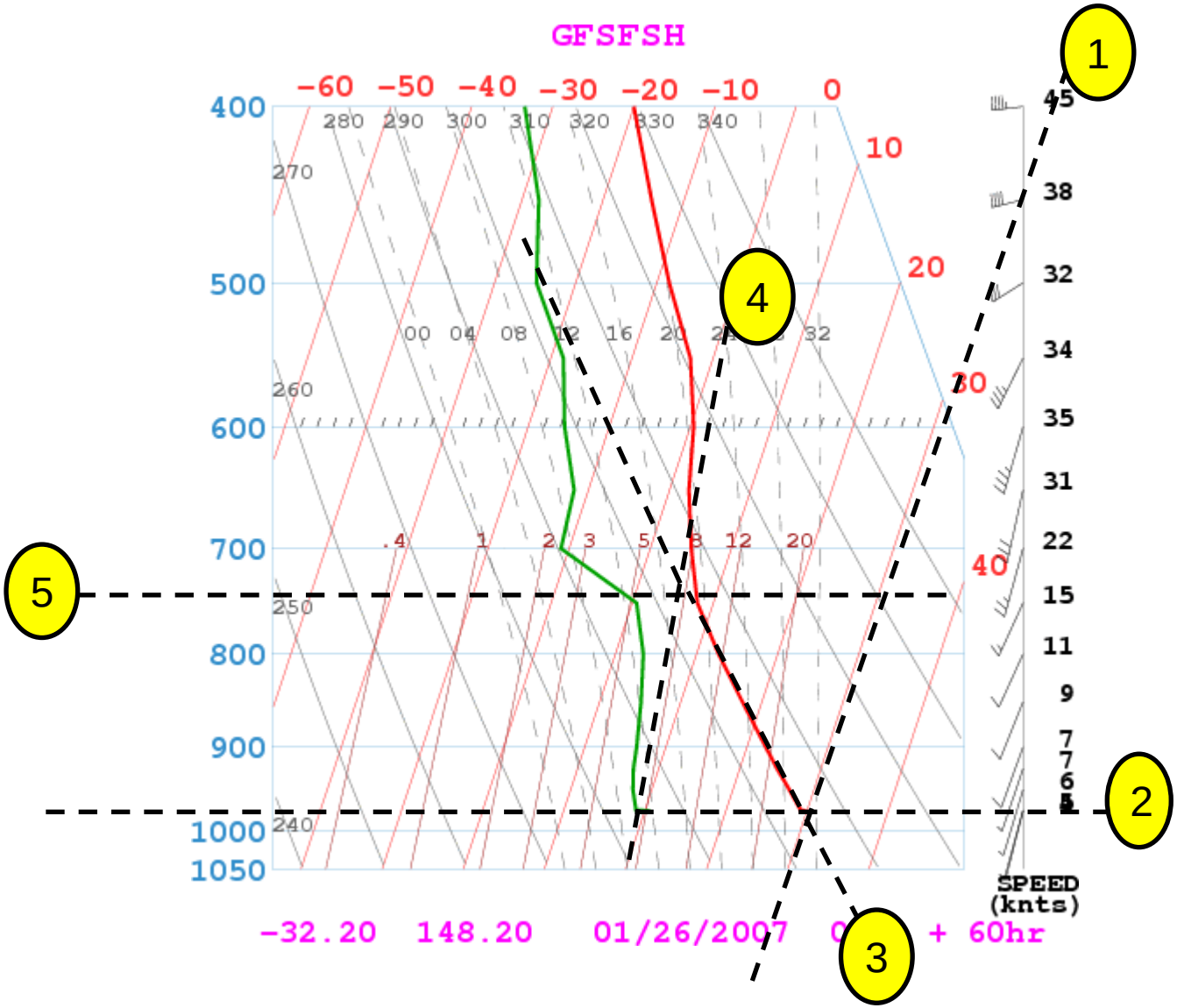
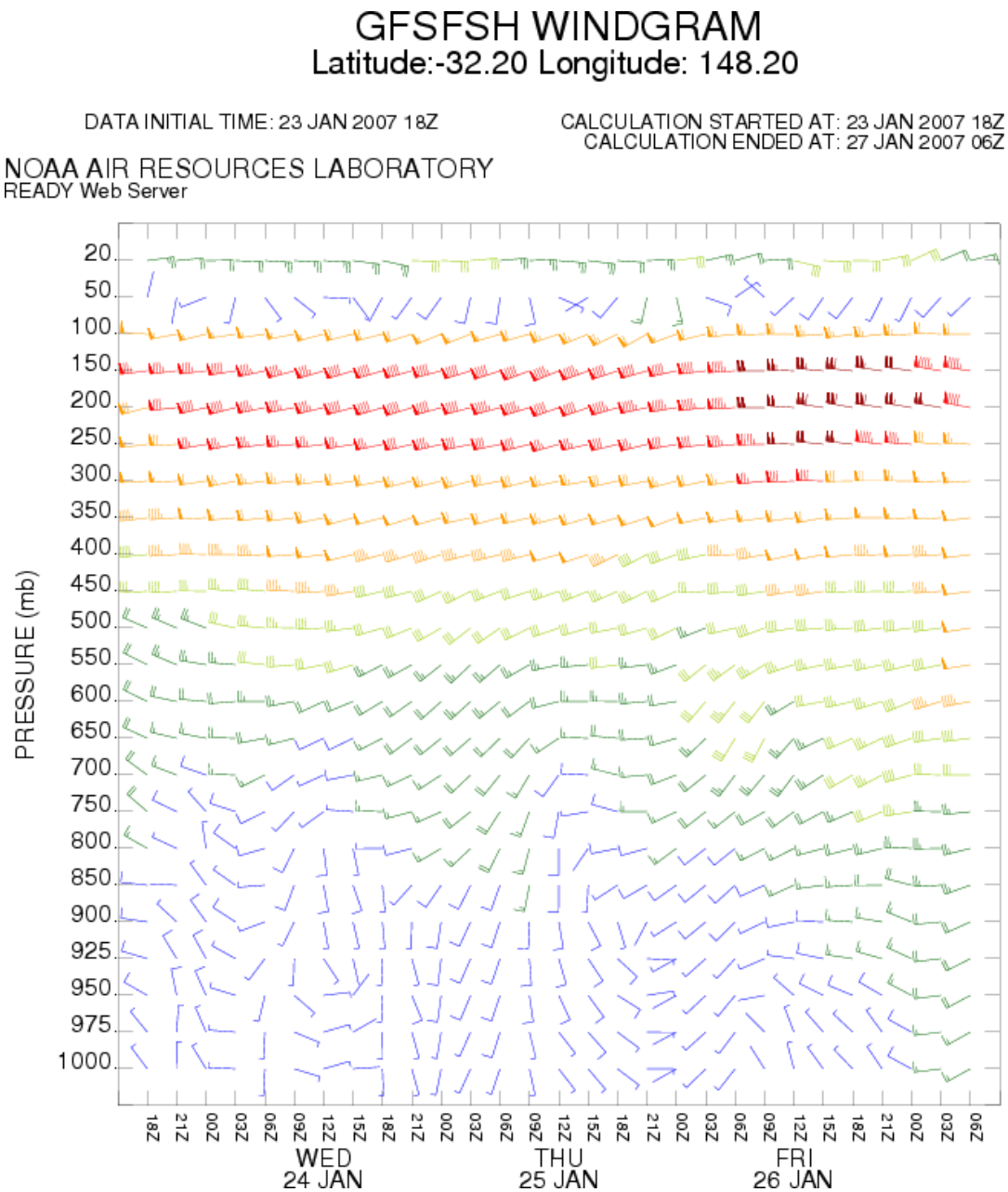


26th Jan 07

Convection height is where the environmental lapse rate (3) intersects/leaves the DALR = 730mb or about 9000ft (5). Dew point is at around 720mb (4) so there is possibly cloud; temperature needs to get to 31 degrees for convection.



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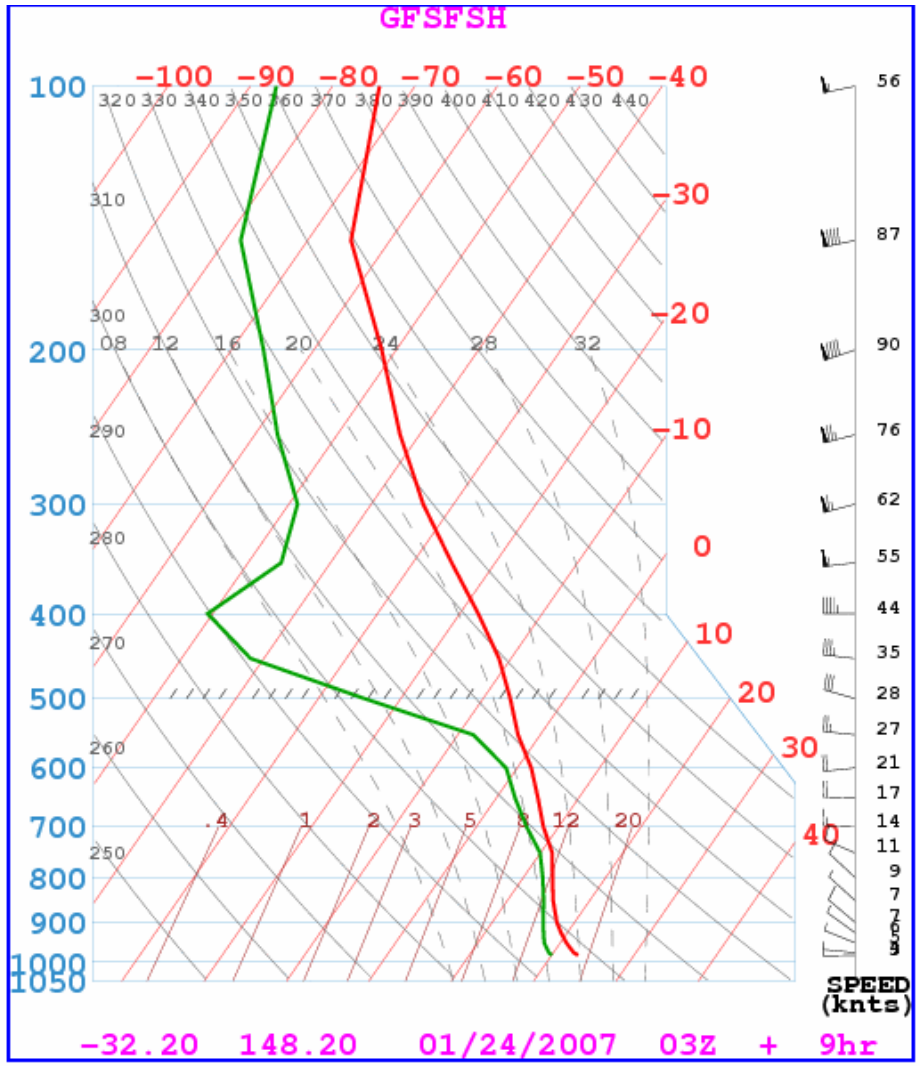
Windgram

The windgram can be useful in seeing what the middle levels are doing, wind trends over the next few days, and possibly for predicting possibility of windshear.

Limitations of the Model

- The further out the prediction time, the less accurate it will be for a specific day
- The model is susceptible to fast or slow moving weather systems
- Check the upper system dew point and ELR for effects in upper and middle atmosphere.
- The predicted conditions from the model will be often be worse (actual) where there are strong winds
- The model is for the local area – use more locations to get a full “picture” of the day.
- Hot spots and localised lift may give better heights than the model predicts.

No Gliding Today!



END