NCCC

NORTHERN CALIFORNIA CONTEST CLUB

October 15, 2007 Meeting

Propagation for SS 2007

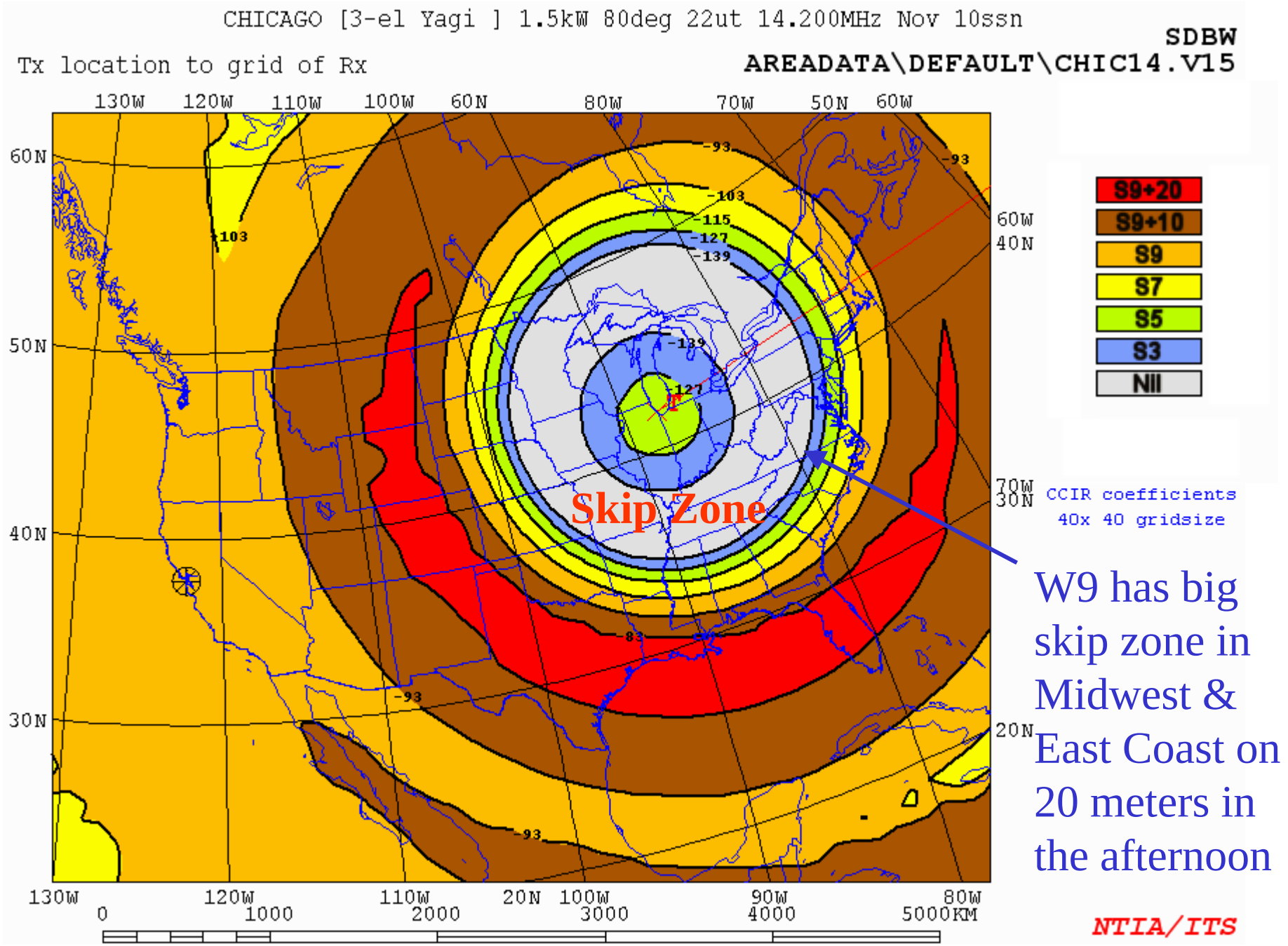
by Dean Straw, N6BV

November Sweepstakes

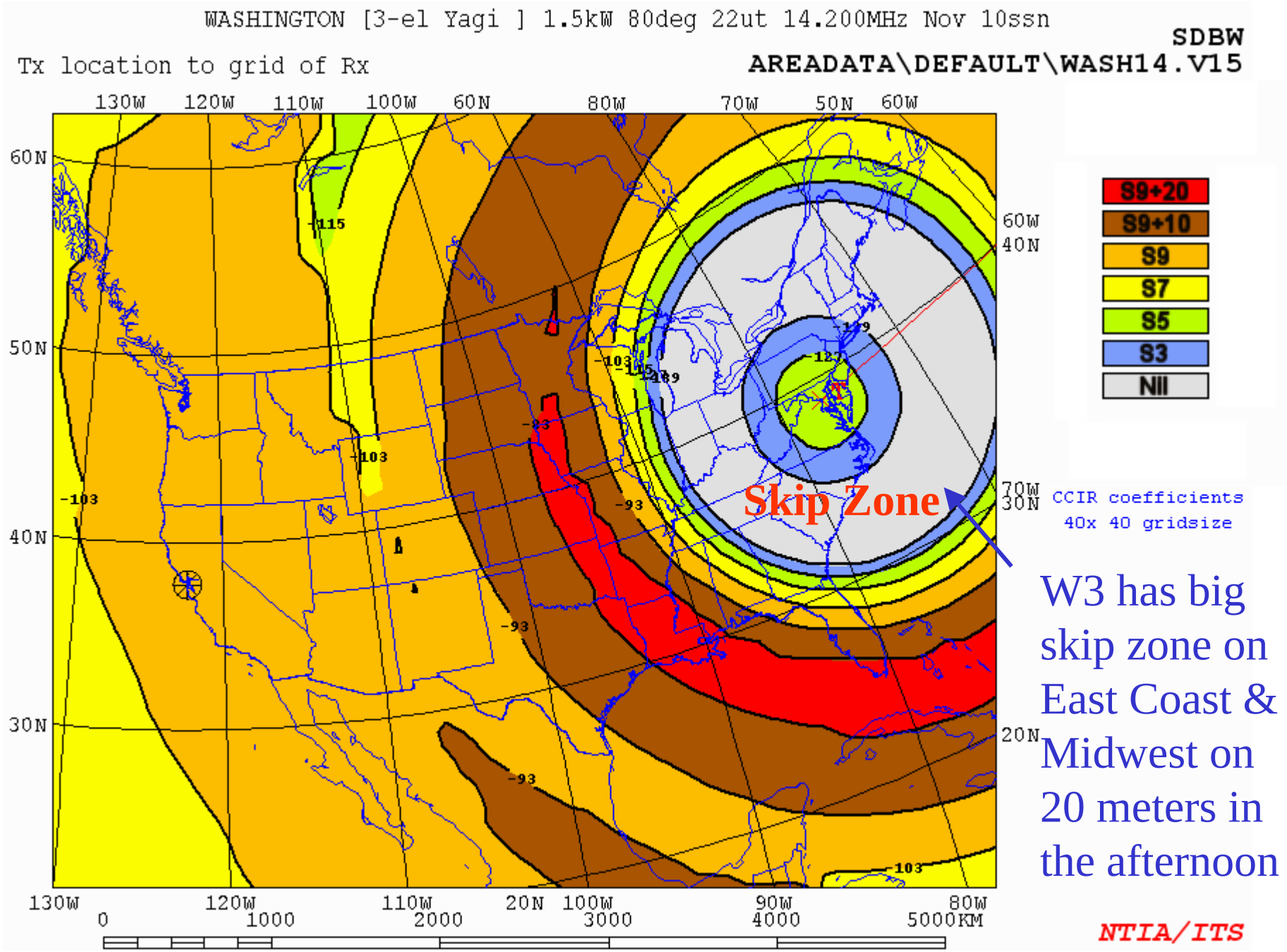
- Predictions for propagation coverage in 2007 Sweepstakes contests.
- Area-coverage plots for the bands expected to be open for SS. (SSN still Very Low)
- Strategies for maximizing NCCC scores.

Crucial Understanding: Skip Zones

- “Skip” means – a zone around the transmitter is literally “skipped.”
- Skip zones are bigger at higher frequencies.

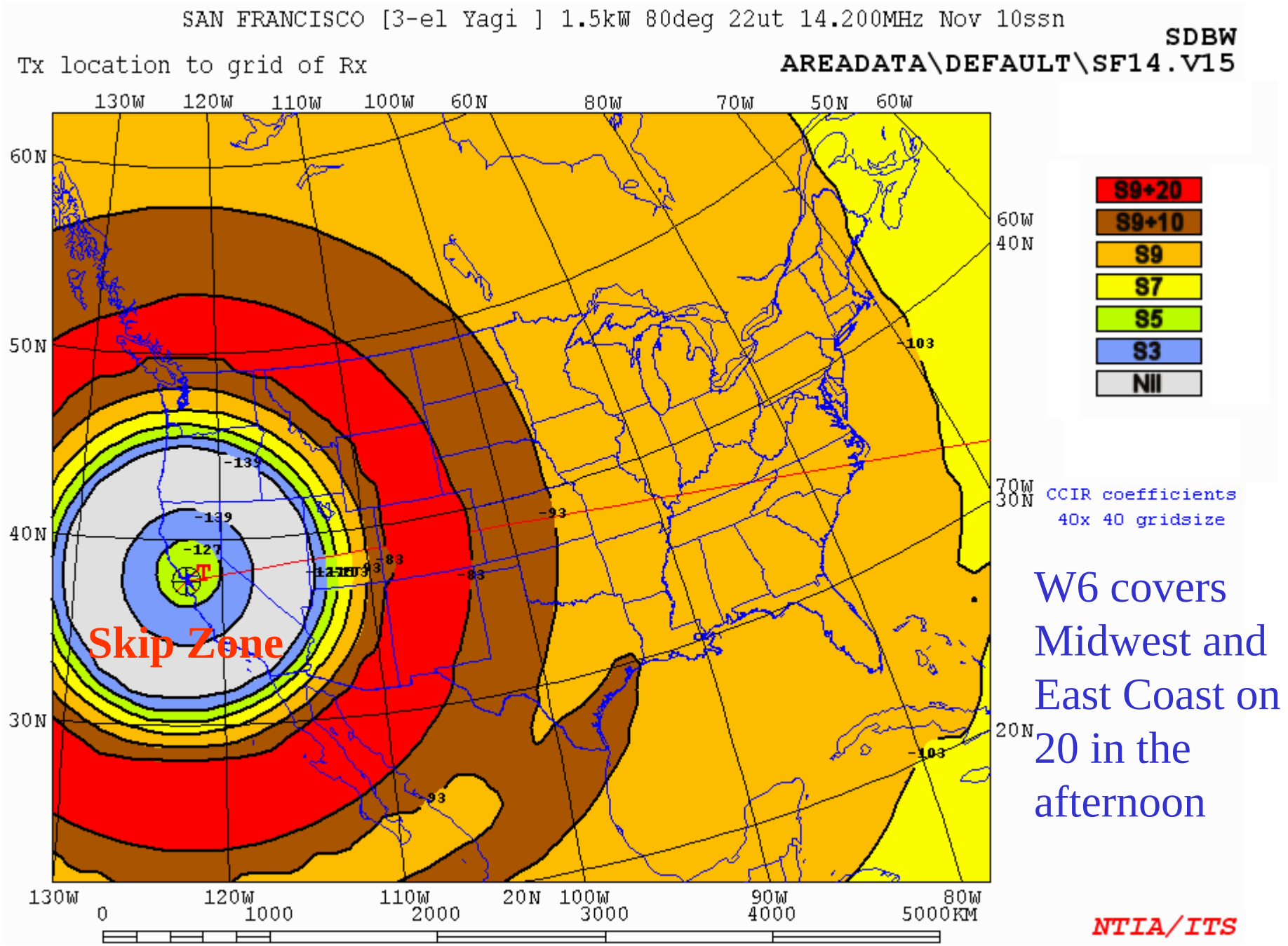


W9 has big skip zone in Midwest & East Coast on 20 meters in the afternoon

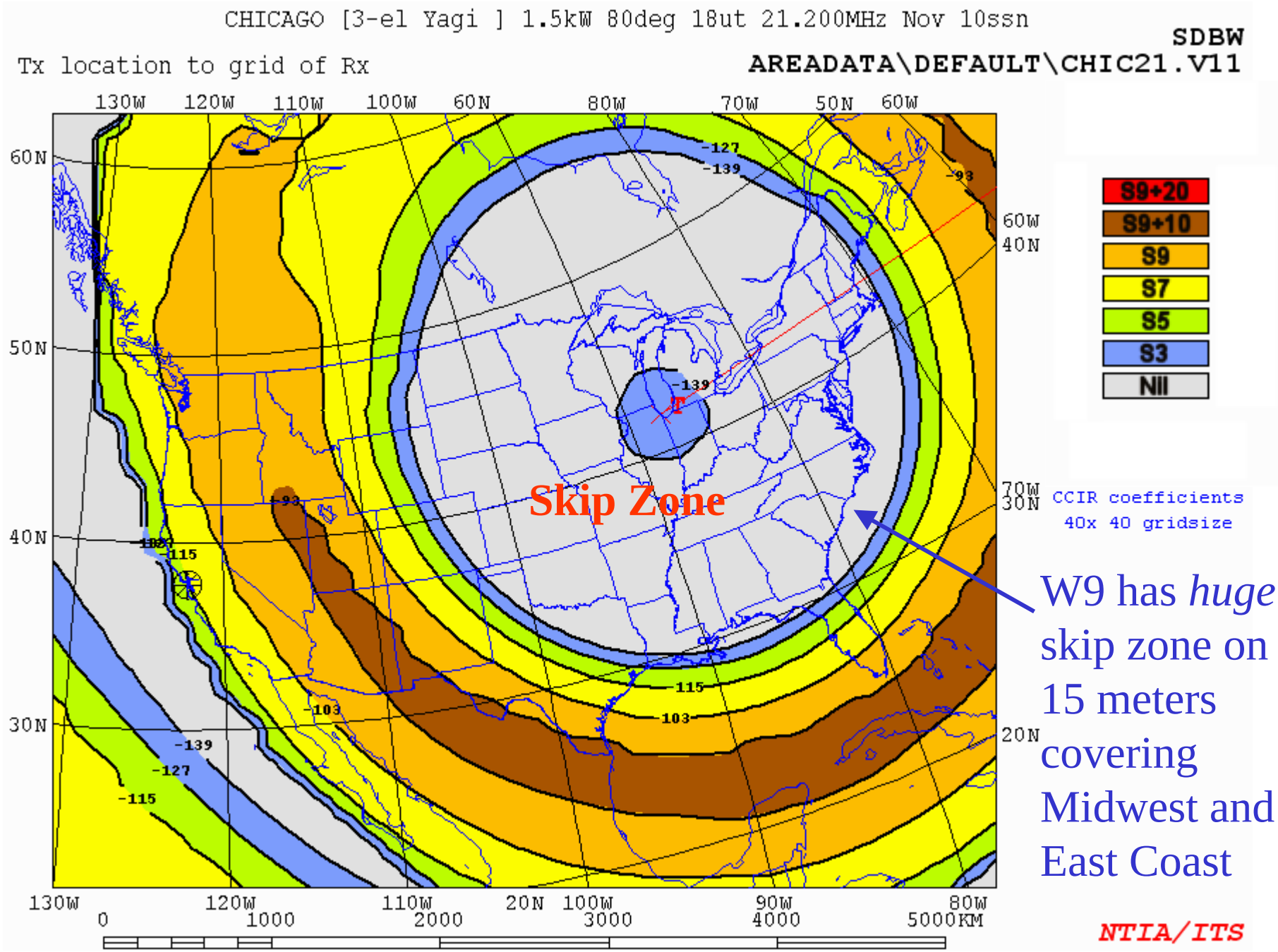


W3 has big skip zone on East Coast & Midwest on 20 meters in the afternoon

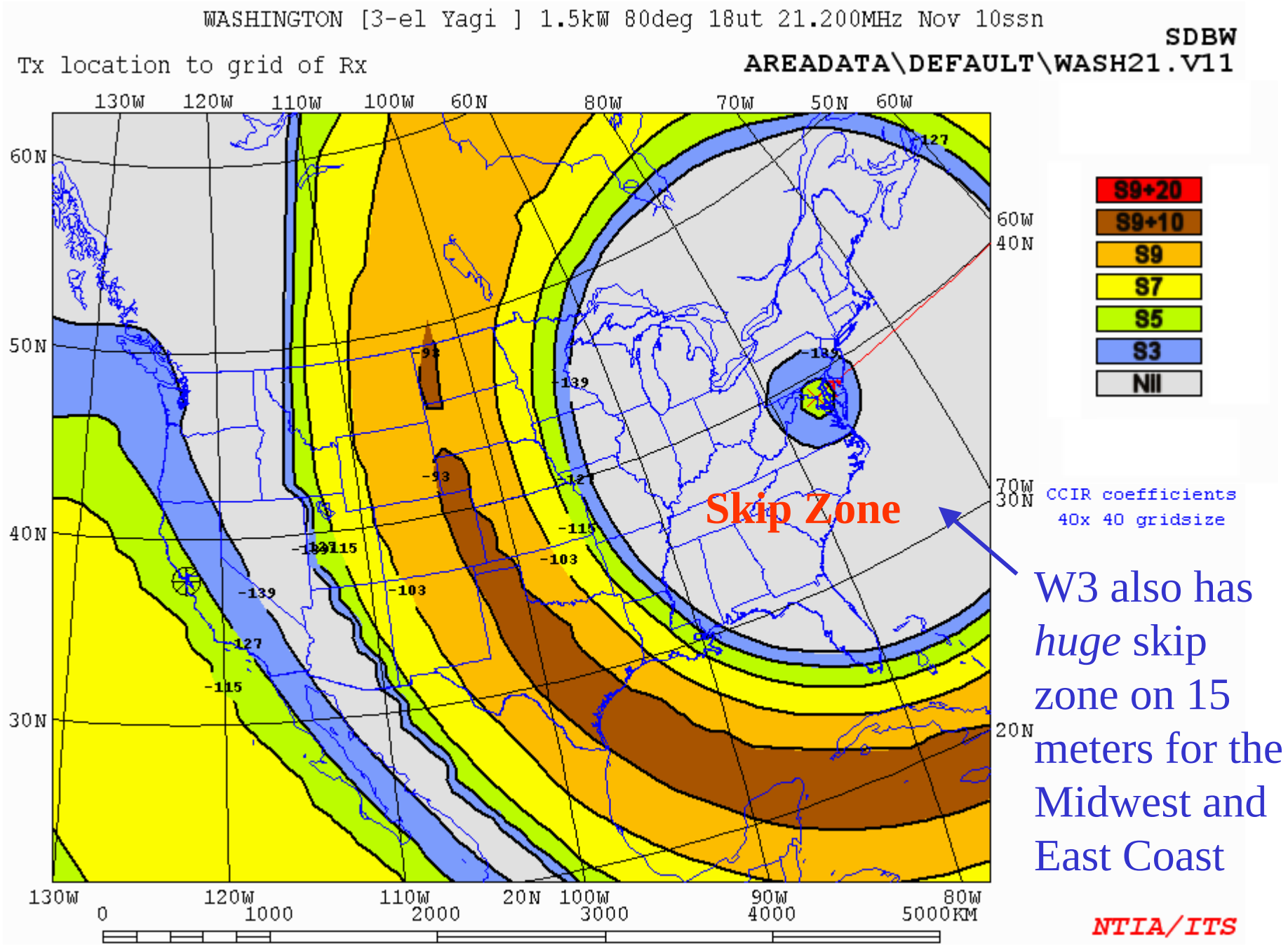
NTIA/ITS

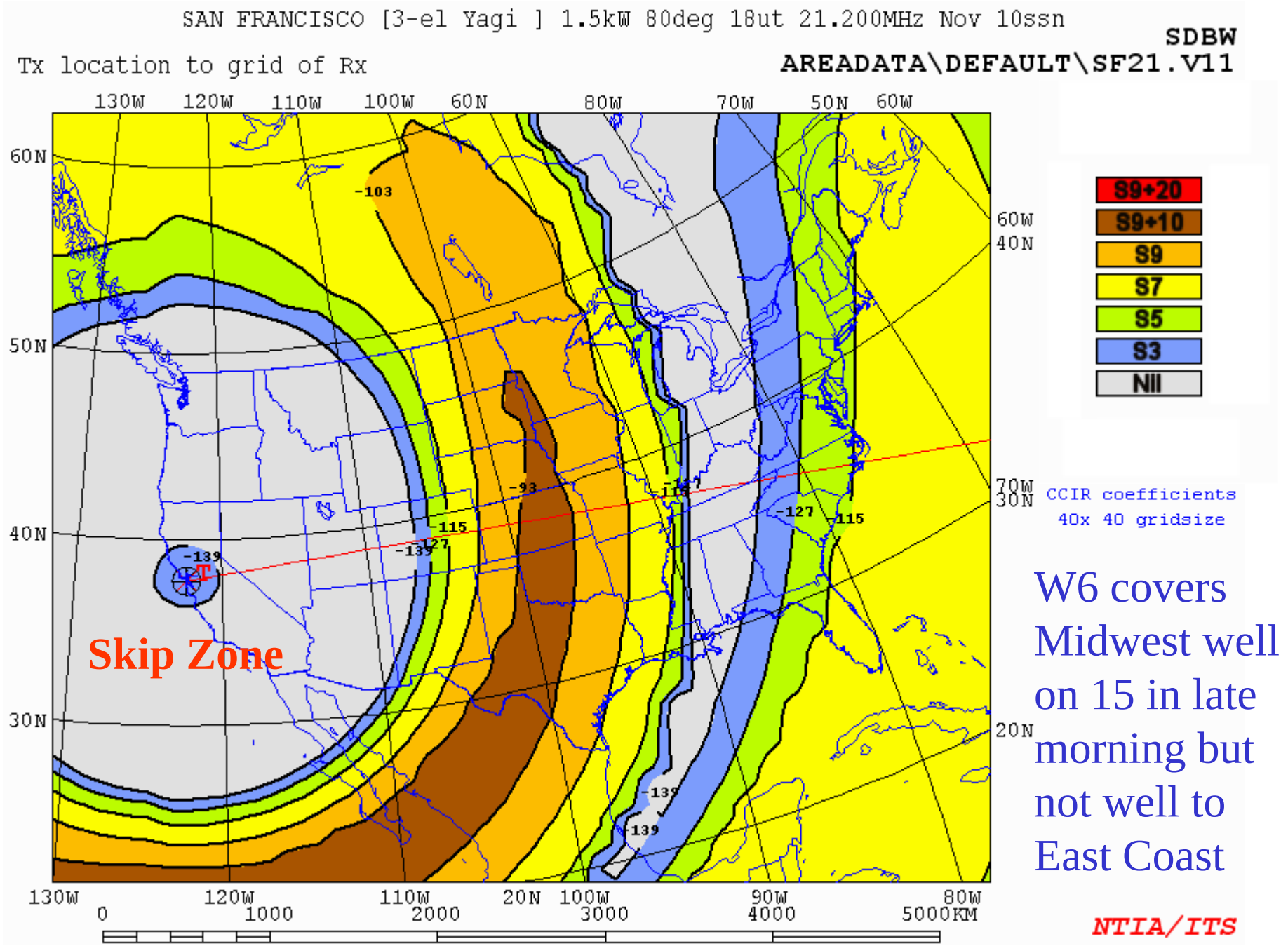


W6 covers Midwest and East Coast on 20 in the afternoon



W9 has *huge* skip zone on 15 meters covering Midwest and East Coast


WASHINGTON [3-el Yagi] 1.5kW 80deg 18ut 21.200MHz Nov 10ssn
SDBW
Tx location to grid of Rx
AREADATA\DEFAULT\WASH21.V11
130W 120W 110W 100W 60N 80W 70W 50N 60W
60N
50N
40N
30N
60W
40N
70W
30N
20N
S9+20
S9+10
S9
S7
S5
S3
Nil
CCIR coefficients
40x 40 gridsize
Skip Zone
W3 also has *huge* skip zone on 15 meters for the Midwest and East Coast
130W 120W 110W 20N 100W 90W 80W
0 1000 2000 3000 4000 5000KM
NTIA/ITS


SAN FRANCISCO [3-el Yagi] 1.5kW 80deg 18ut 21.200MHz Nov 10ssn
SDBW
Tx location to grid of Rx
AREADATA\DEFAULT\SF21.V11
130W 120W 110W 100W 60N 80W 70W 50N 60W
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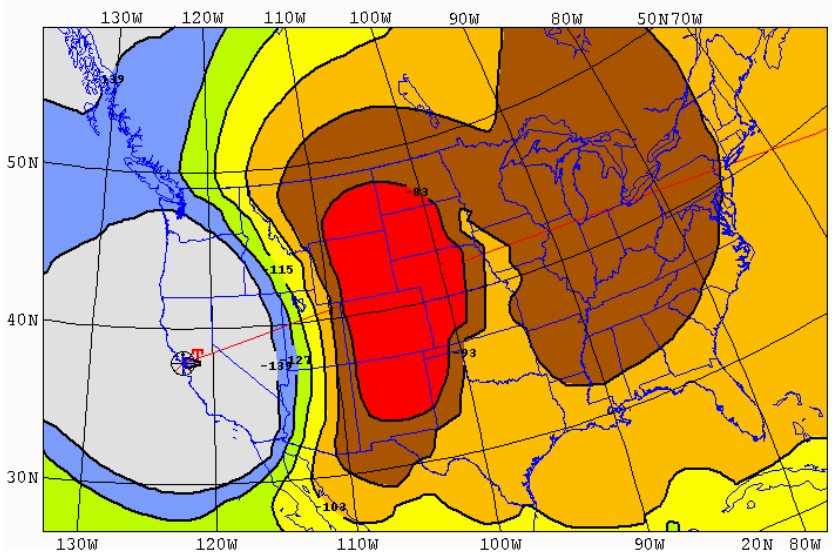
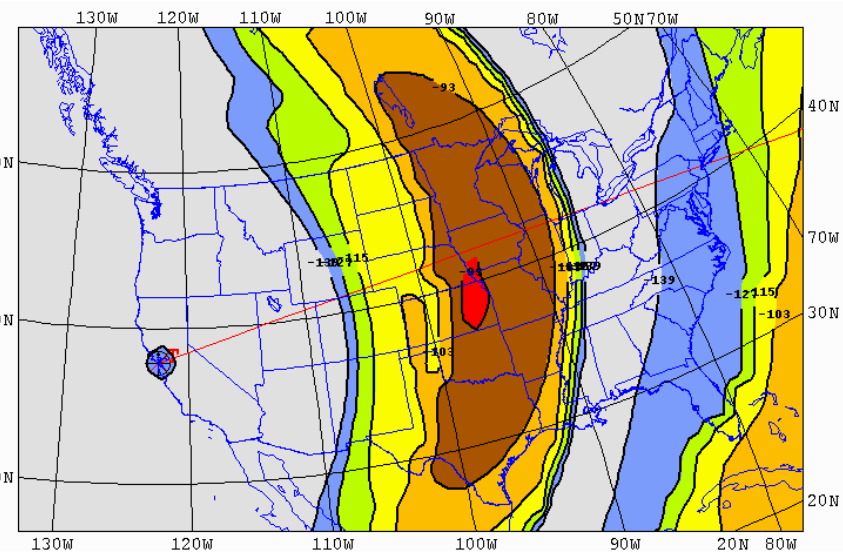
40N
70W
30N
20N
S9+20
S9+10
S9
S7
S5
S3
Nil
CCIR coefficients
40x 40 gridsize
-103
-93
-115
-127
-139
Skip Zone
130W 120W 110W 20N 100W 90W 80W
0 1000 2000 3000 4000 5000KM
W6 covers Midwest well on 15 in late morning but not well to East Coast
NTIA/ITS

Propagation Slideshow for 2006/2007 for N6BV SS Operation at N6RO

- Ed, W0YK, has put this slideshow on the Members-only Web site. **www.nccc.org**, Members, Sweepstakes, 2007, scroll down to Propagation, Propagation Graphics (2006).
- I run a laptop near the operating position with this slideshow on it, manually advanced every hour.
- This simulation uses N6RO antennas – YMMV!

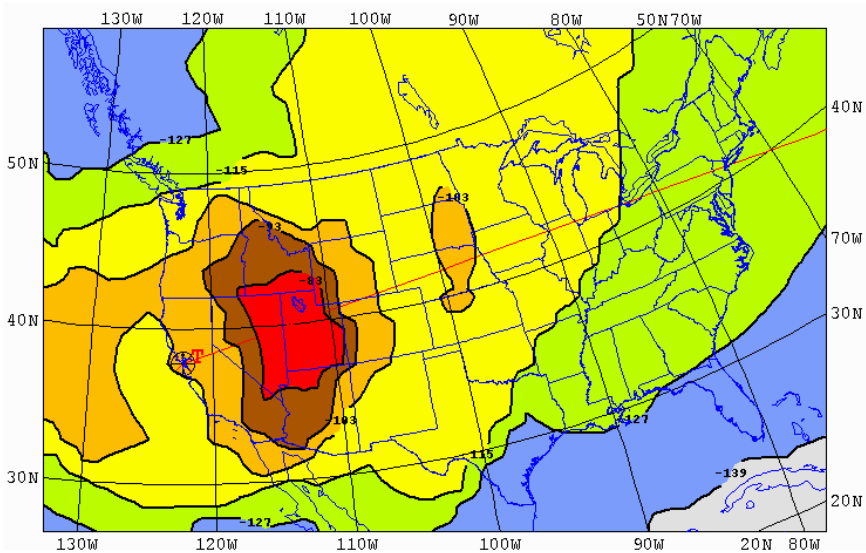


20 m



15 m

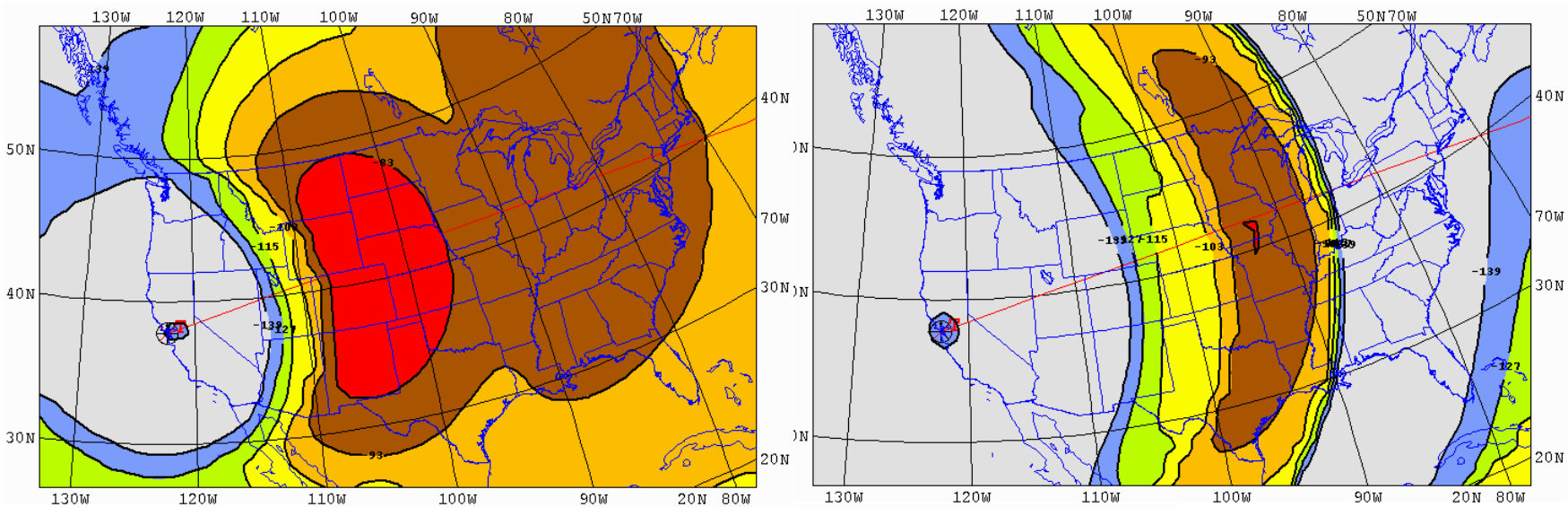
Red = S9+20,
Brown = S9+10,
Orange = S9,
Yellow = S7,
Green = S5,
Blue = Nil



40 m

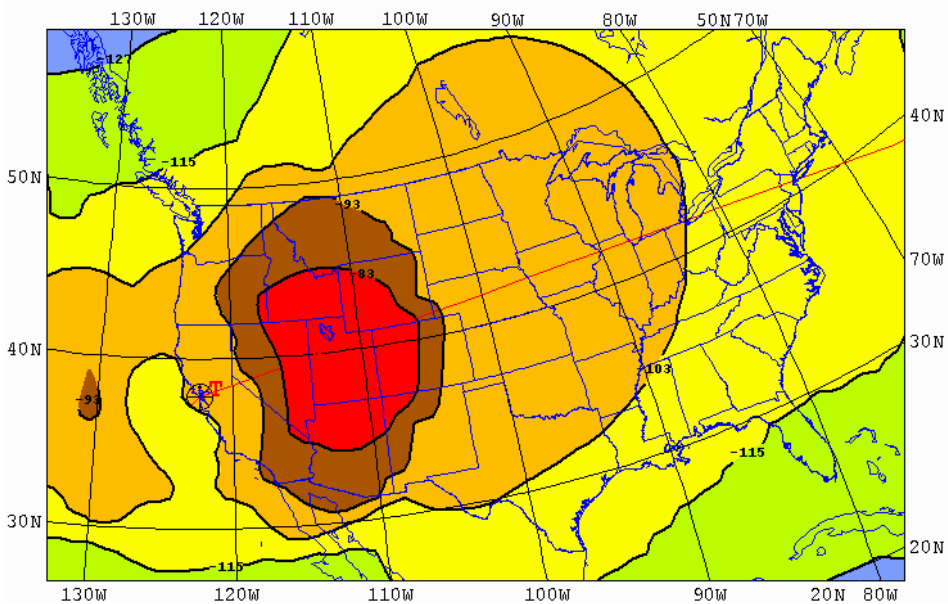
21 UTC

Customized for N6RO Antennas, Nov. 2007



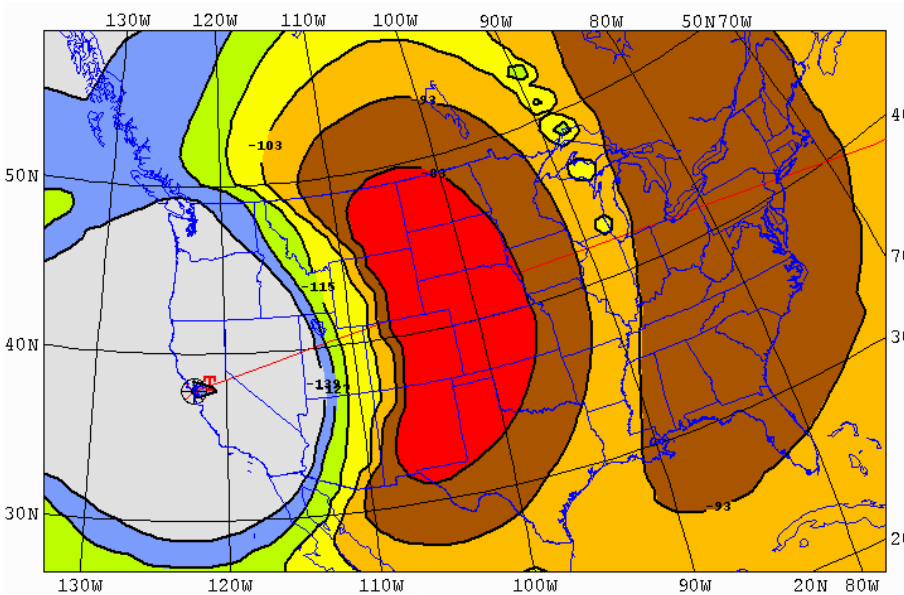
20 m

15 m



22 UTC

40 m



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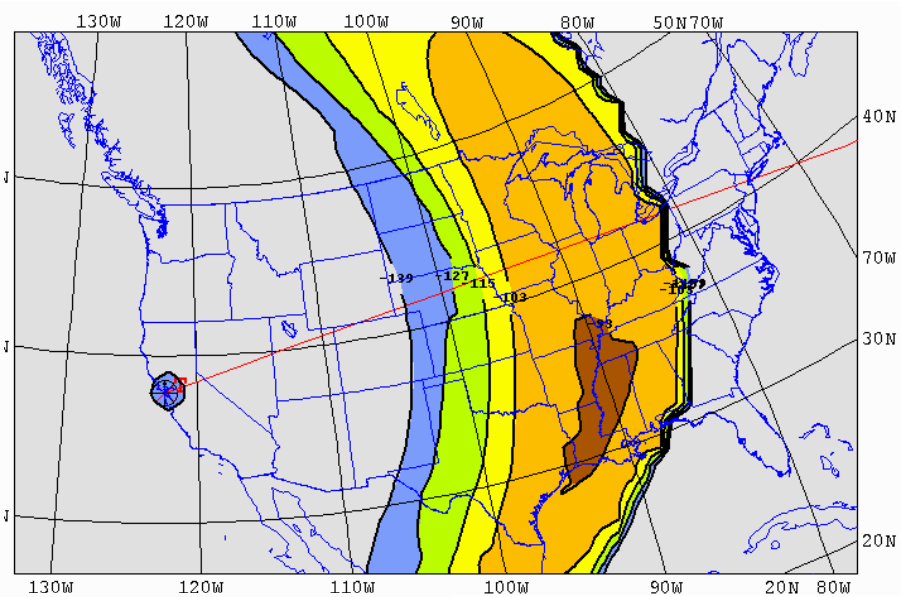

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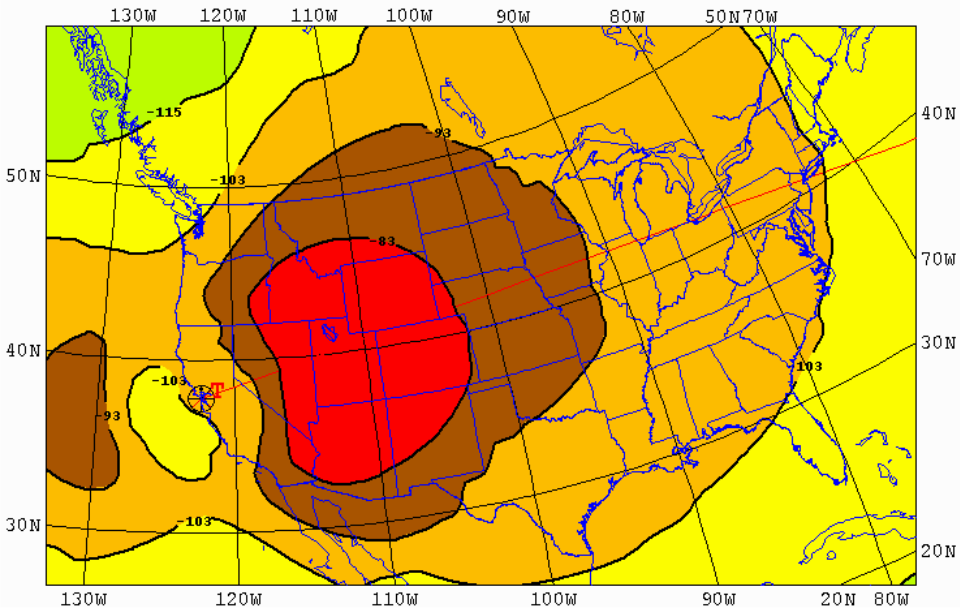

23 UTC

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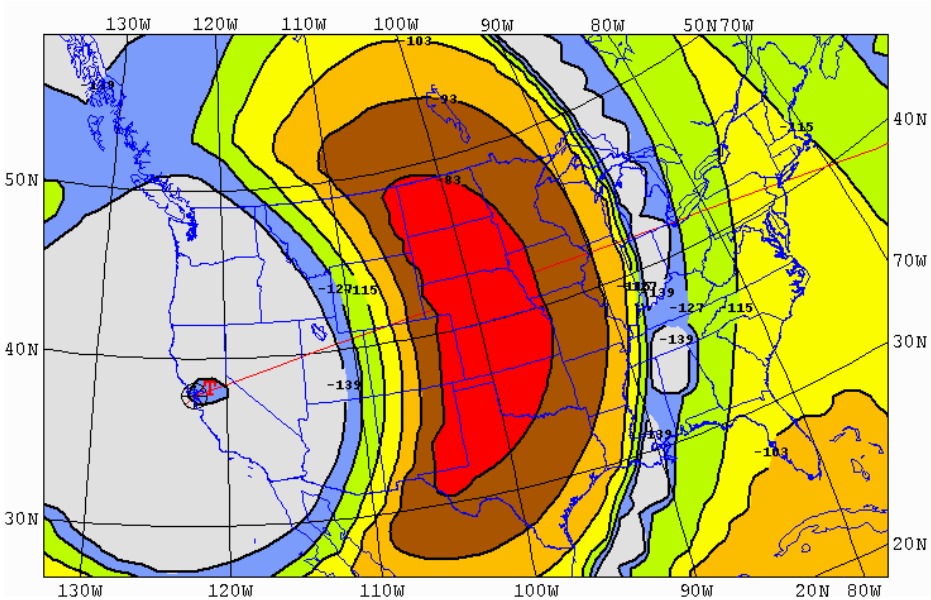

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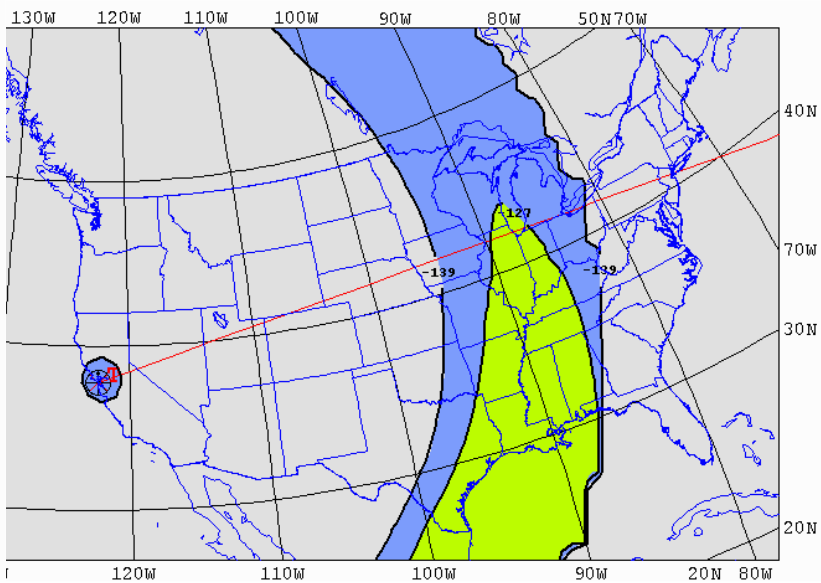

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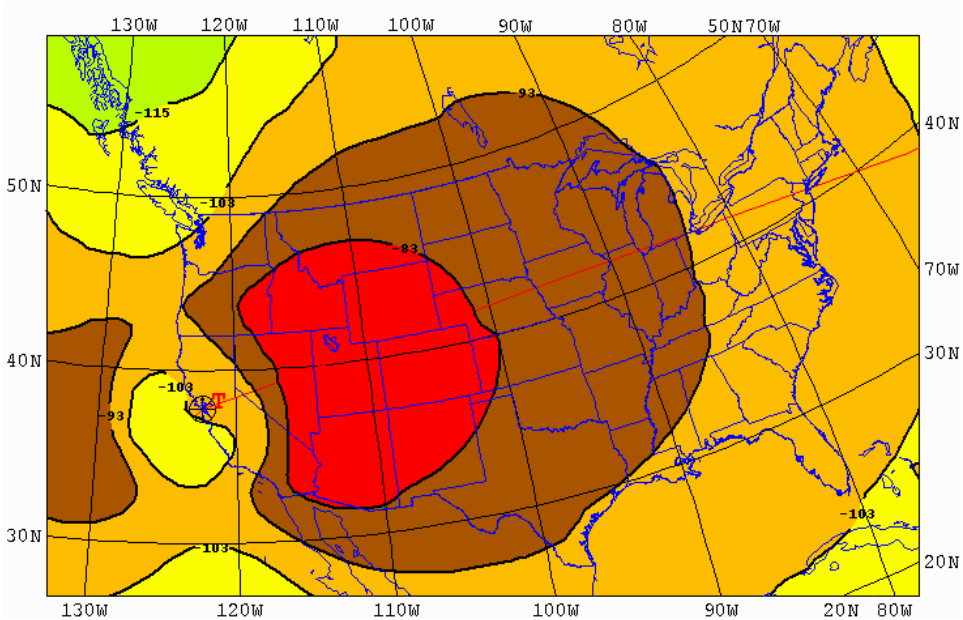
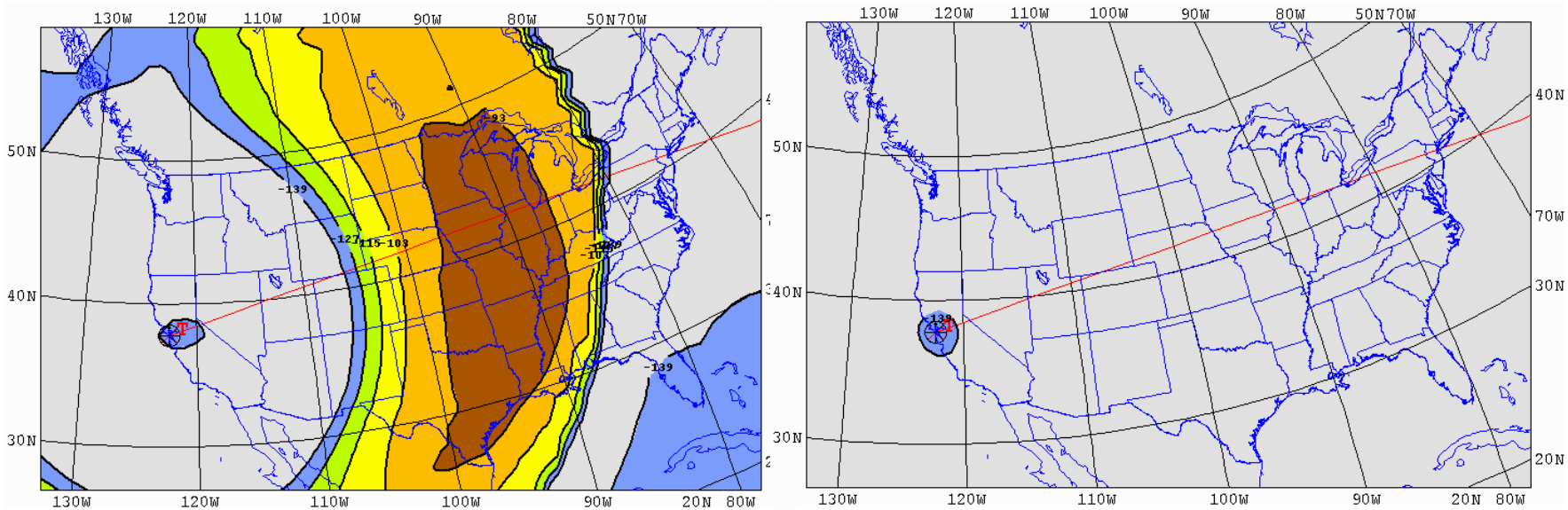


40 m

00 UTC

N6BV 2005: 0 Qs,
1986: 22 Qs

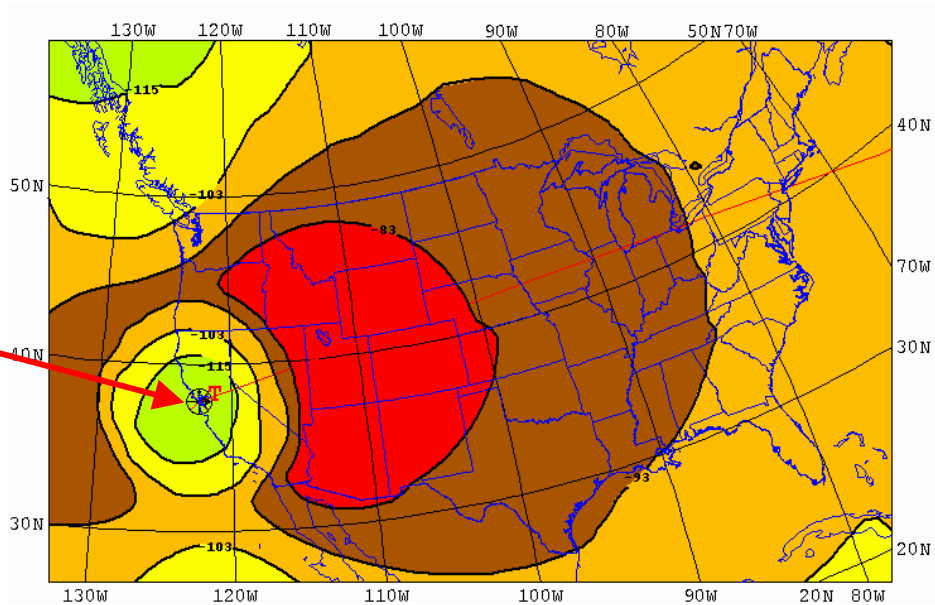


20 m

15 m

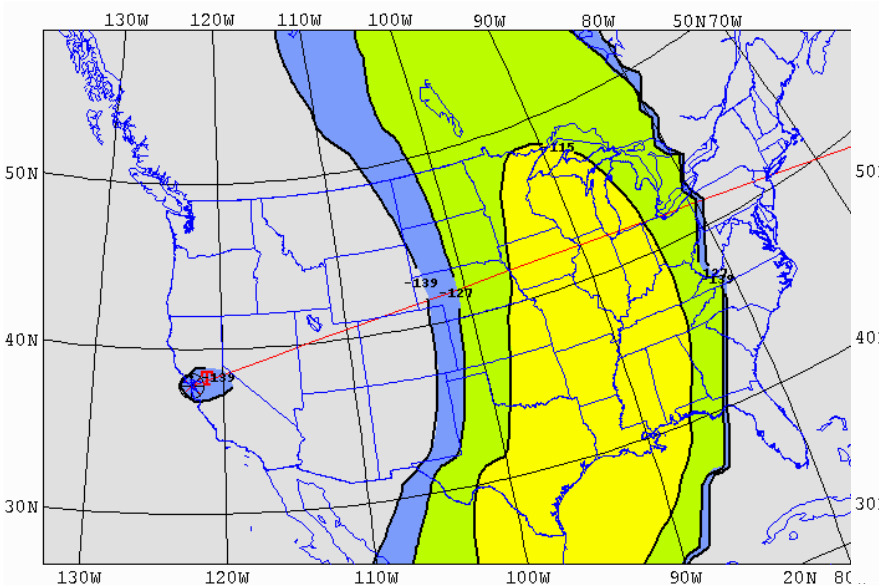
Skip zone
to SoCal

01 UTC

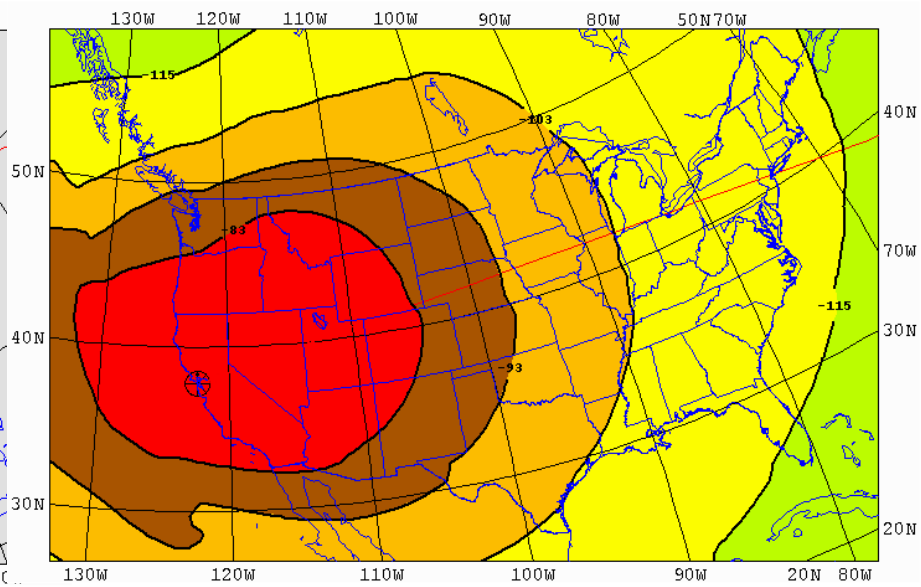


40 m

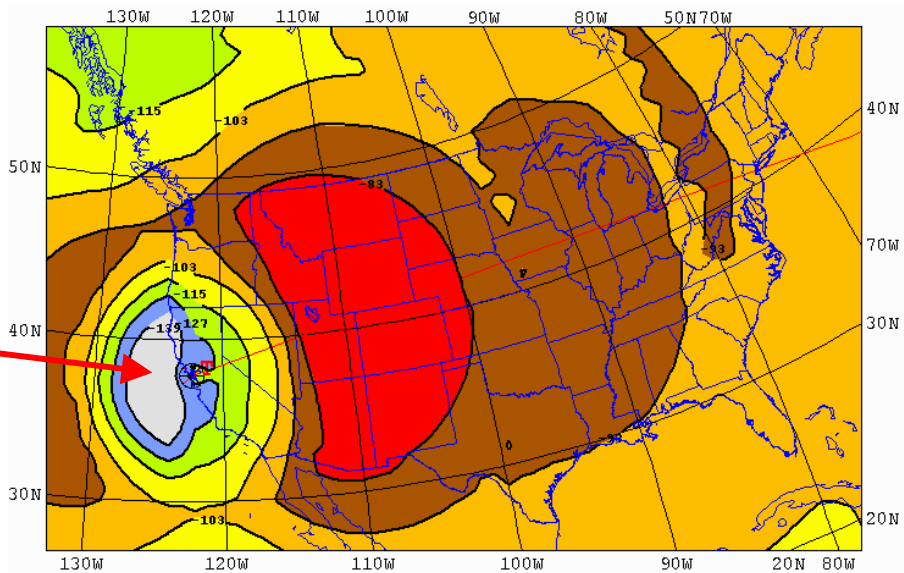
N6BV 2005: 59 Qs,
1986: 116 Qs



20 m



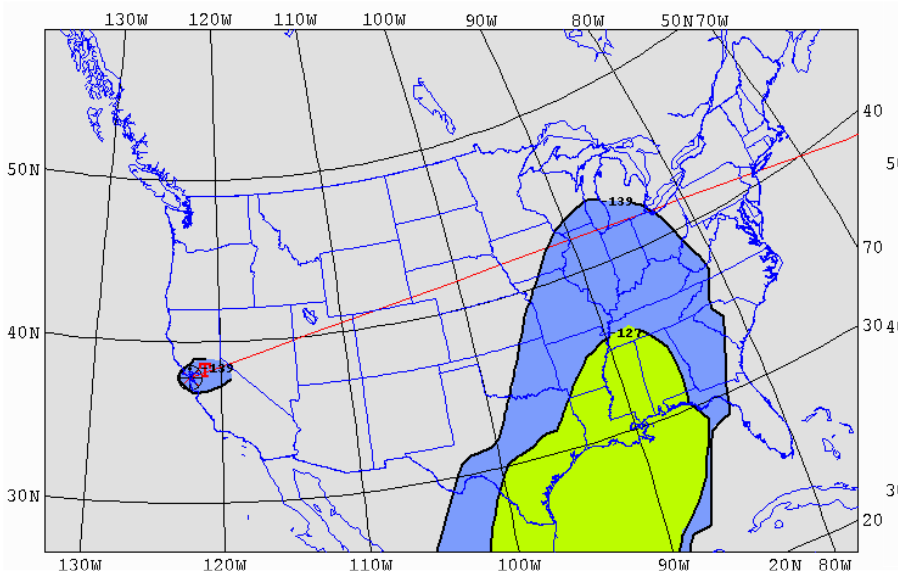
80 m



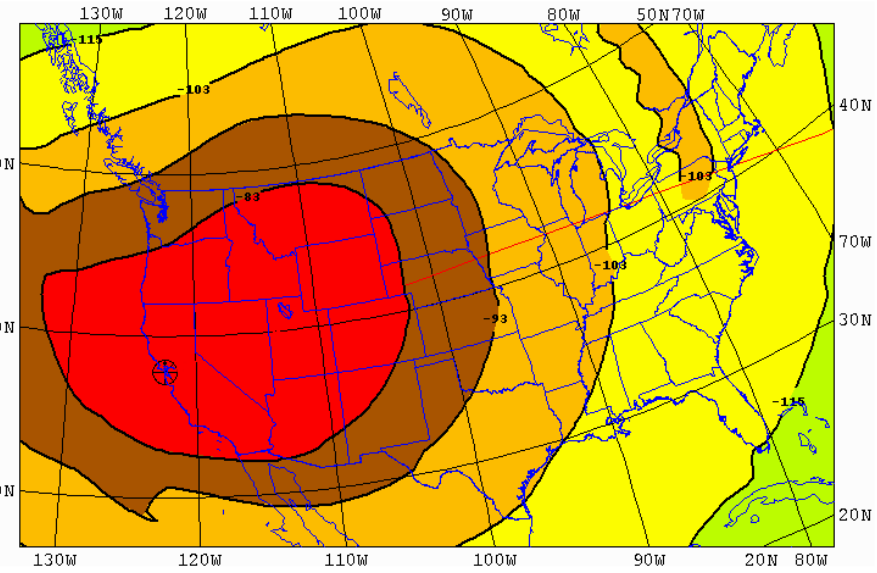
02 UTC

40 m

N6BV 2005: 87 Qs,
1986: 111 Qs



20 m



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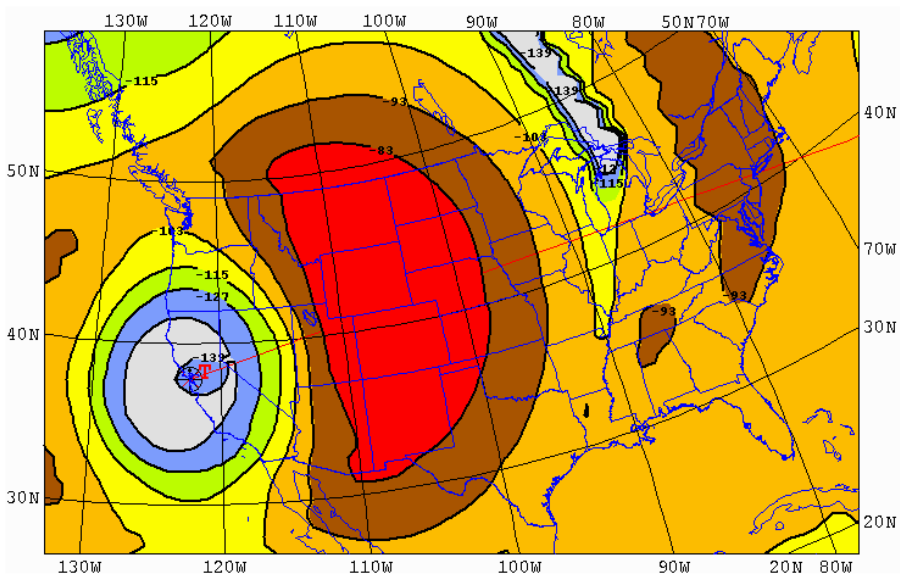
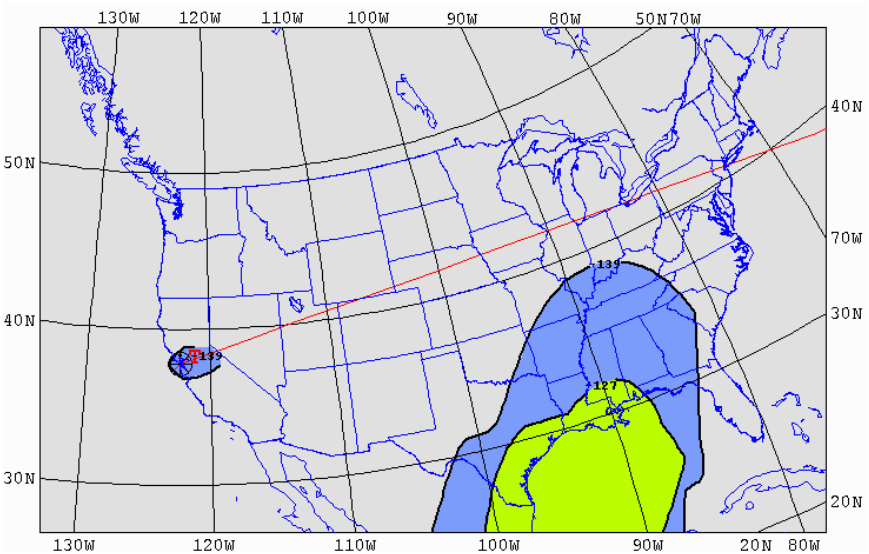


03 UTC

40 m

N6BV 2005: 68 Qs,



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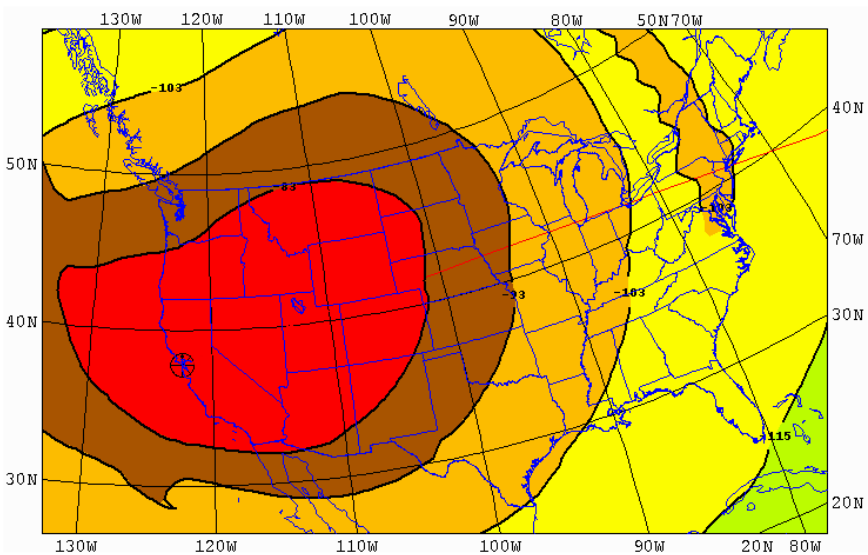

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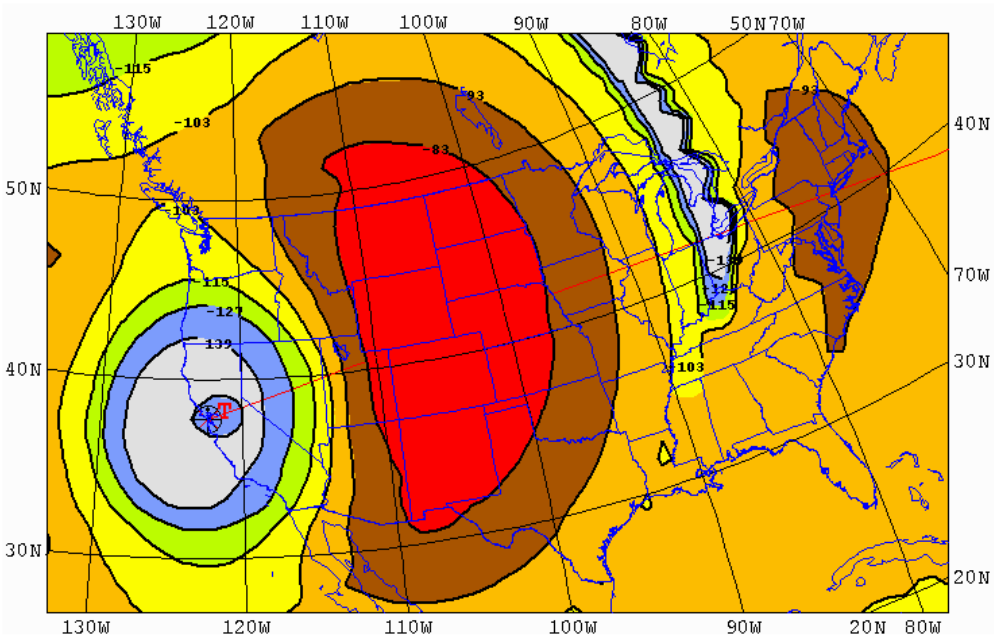
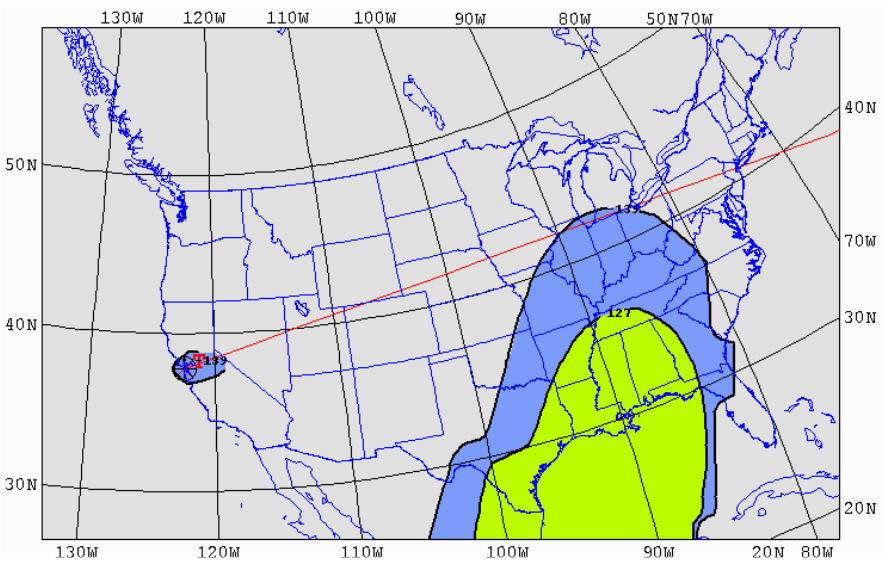


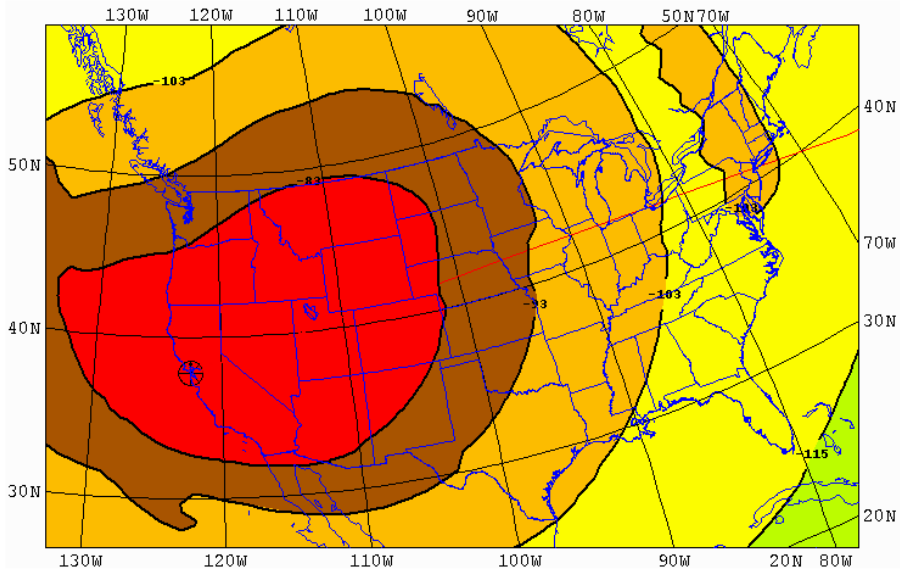
40 m

04 UTC

N6BV 2005: 47 Qs

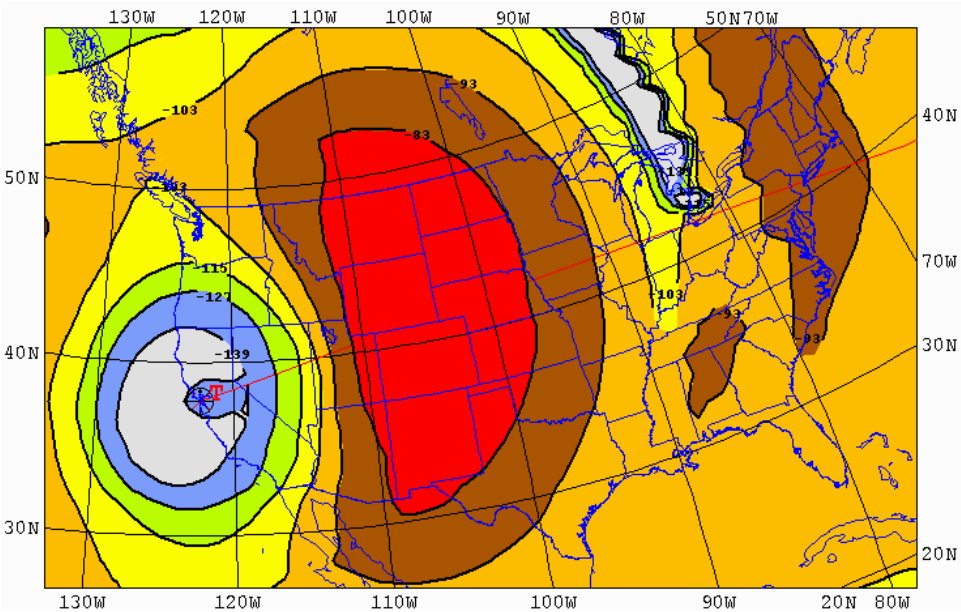


20 m



80 m

05 UTC



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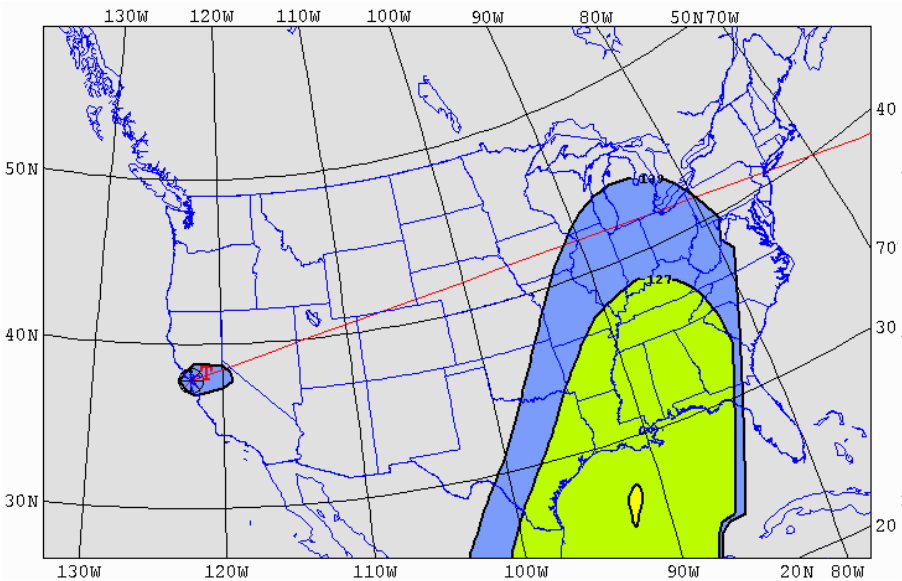

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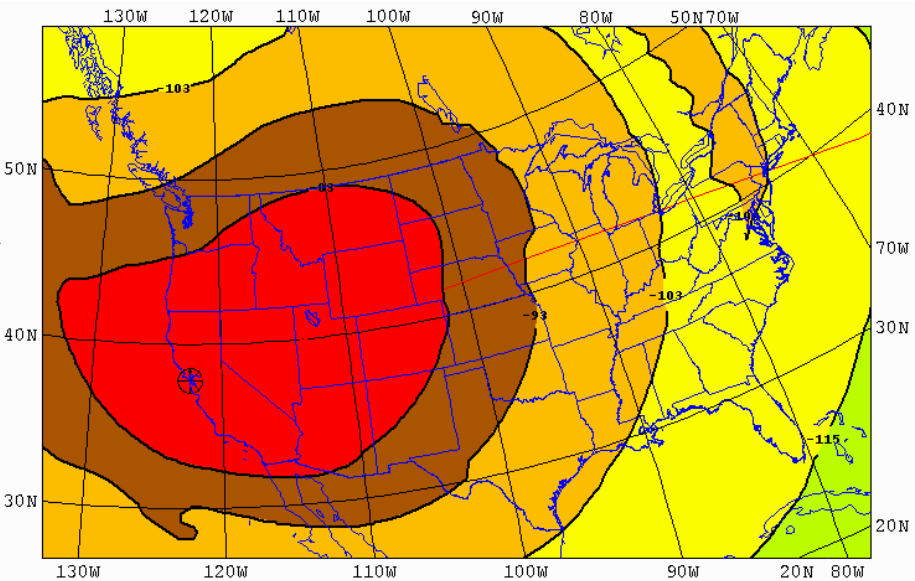
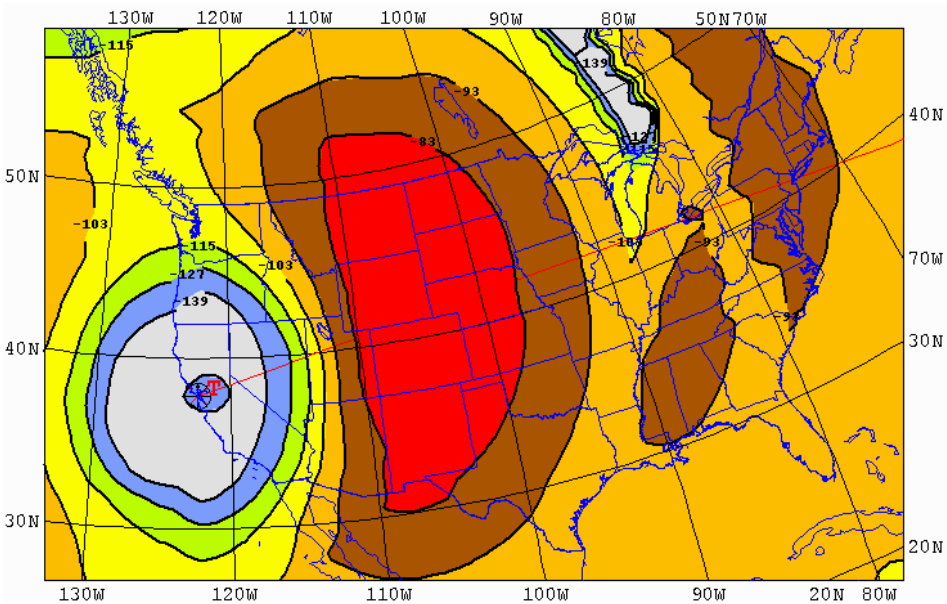


80 m

06 UTC



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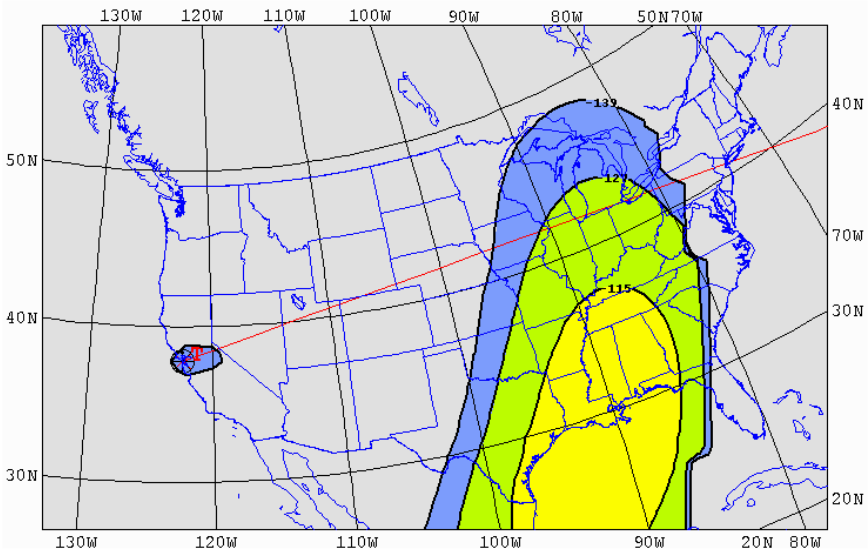

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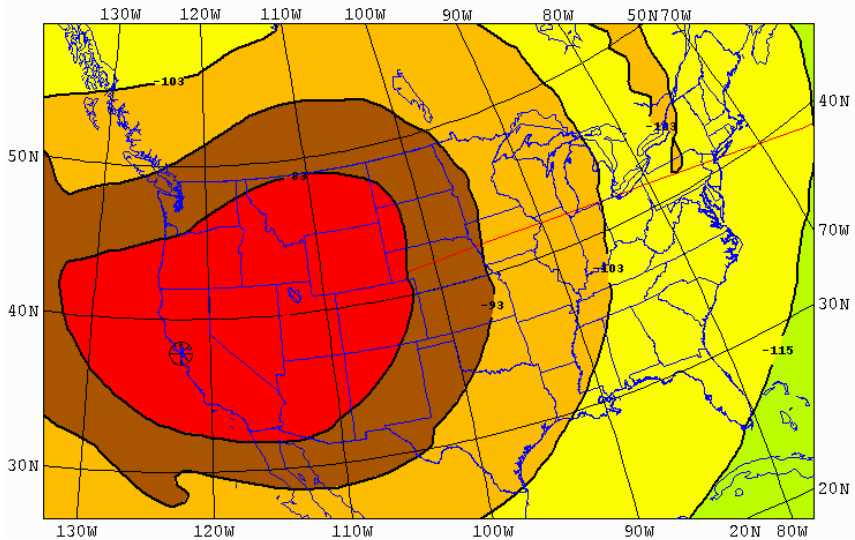

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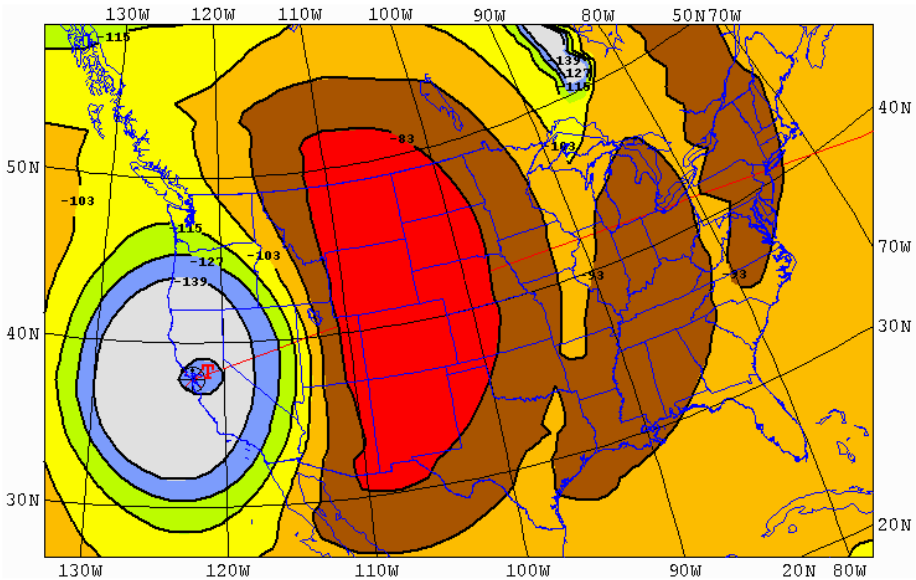
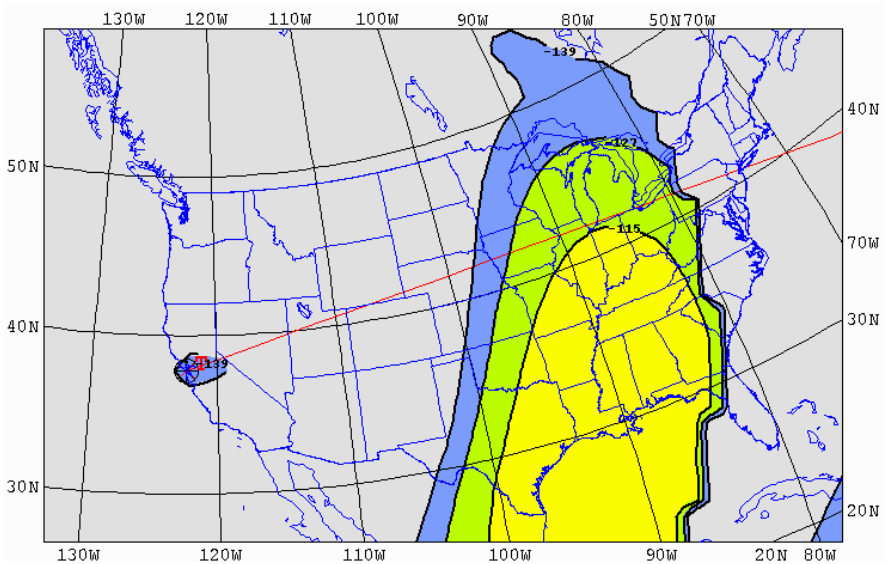


07 UTC

40 m



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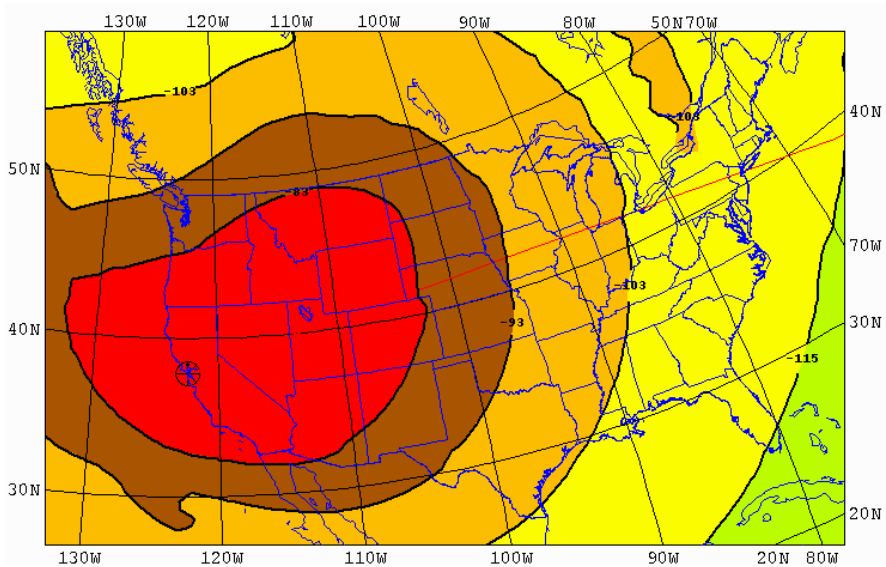

80 m

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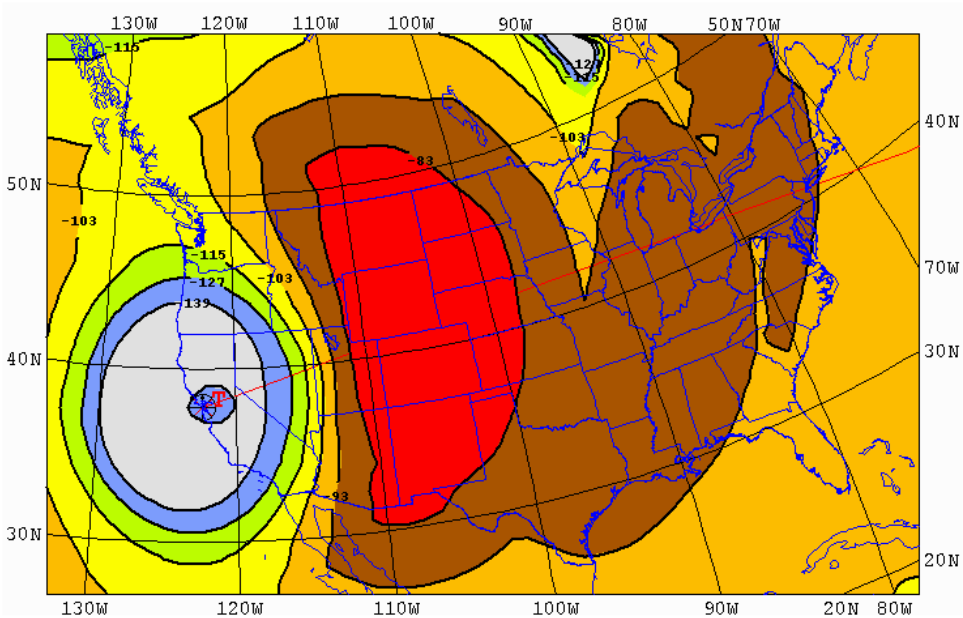
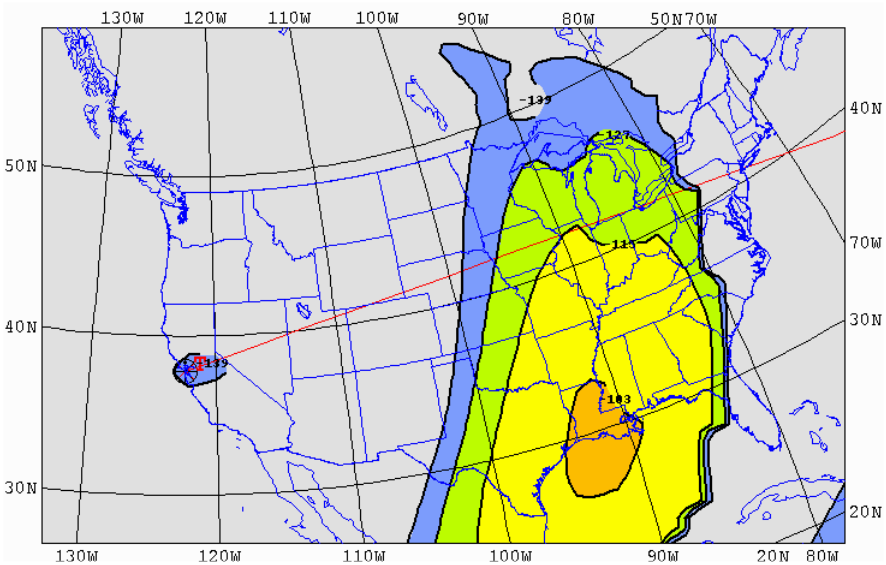
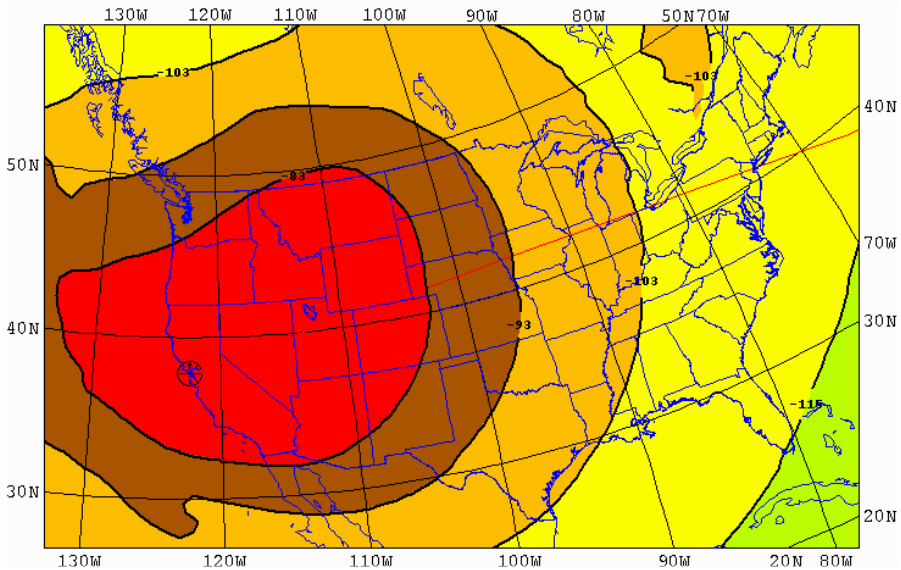


40 m



20 m



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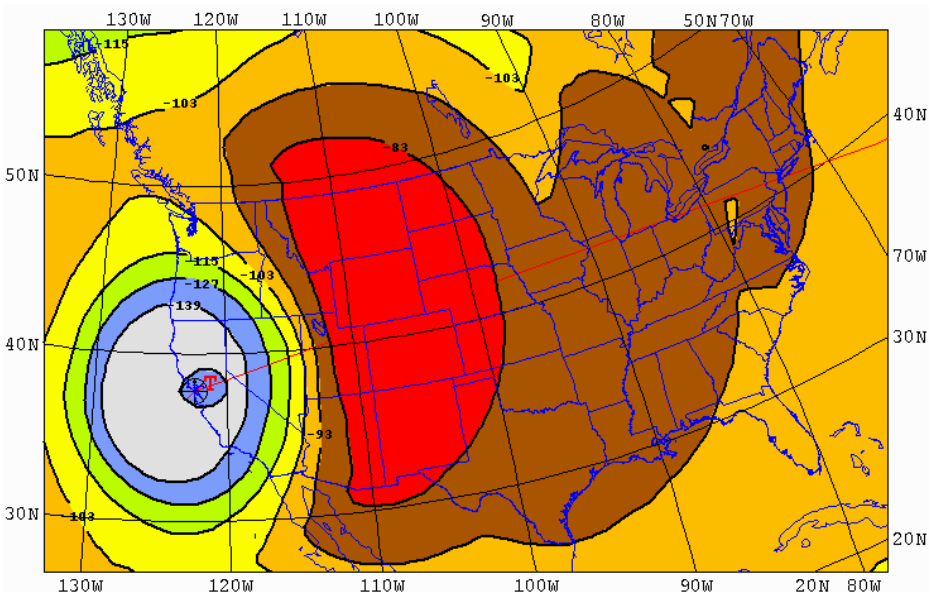

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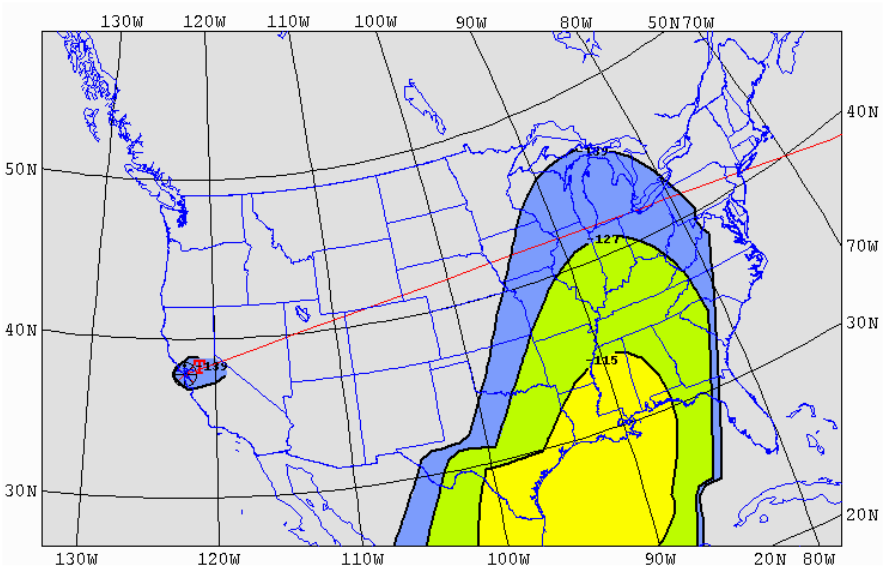

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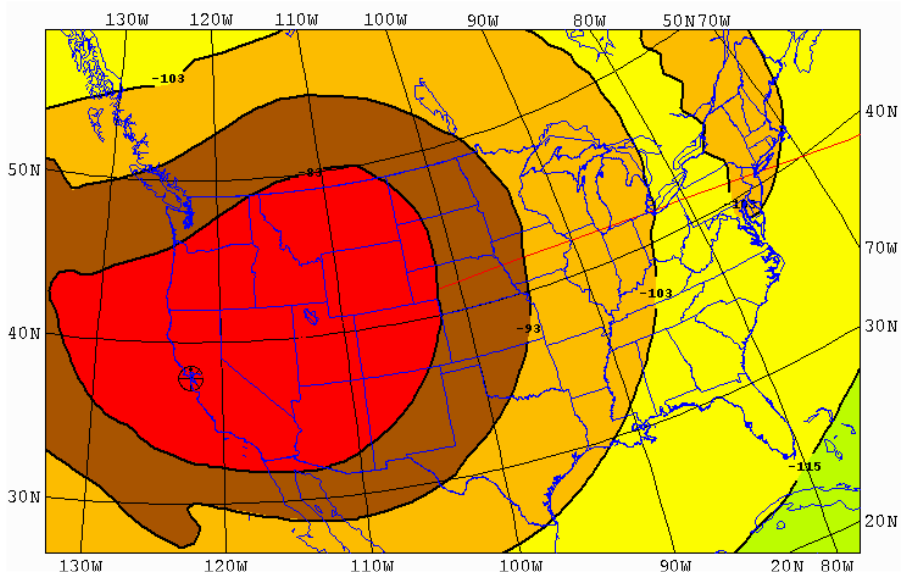

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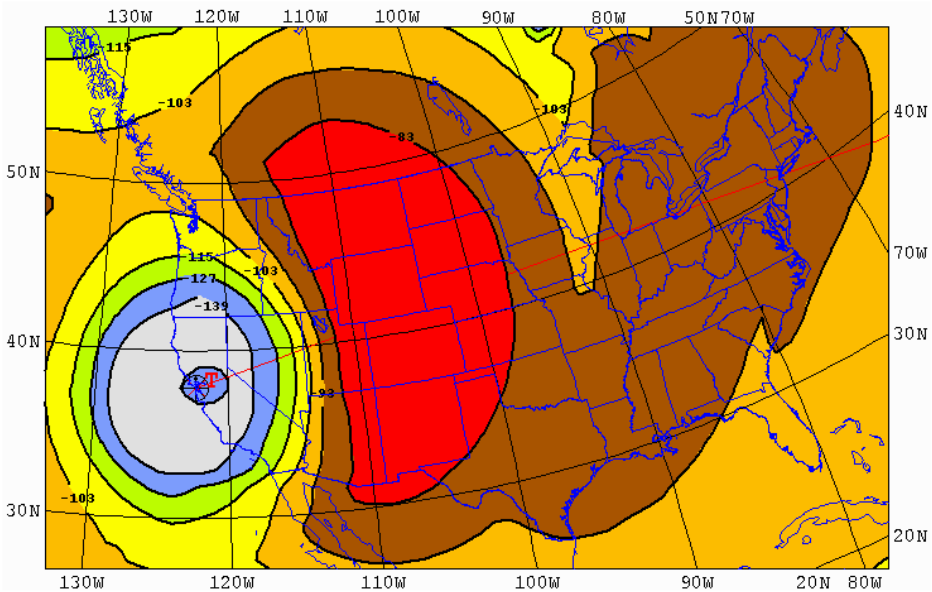
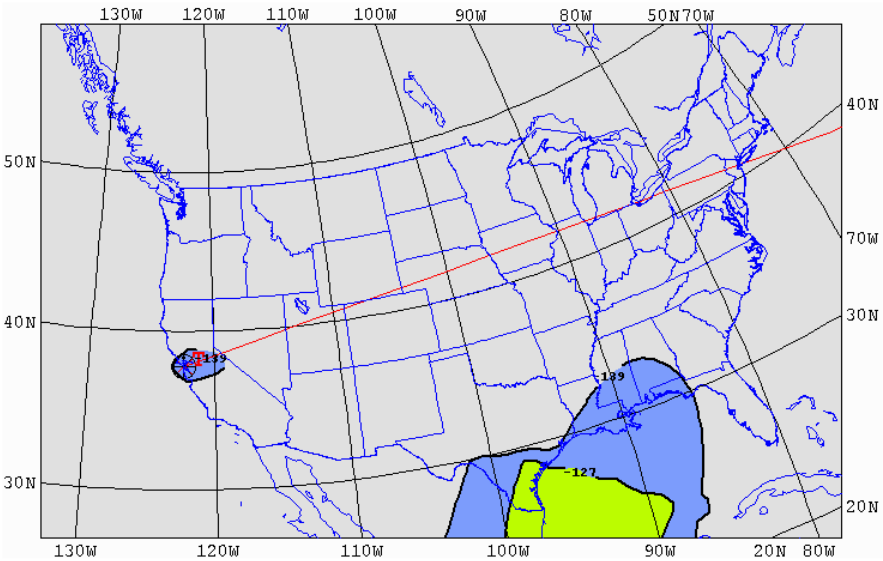


10 UTC

40 m



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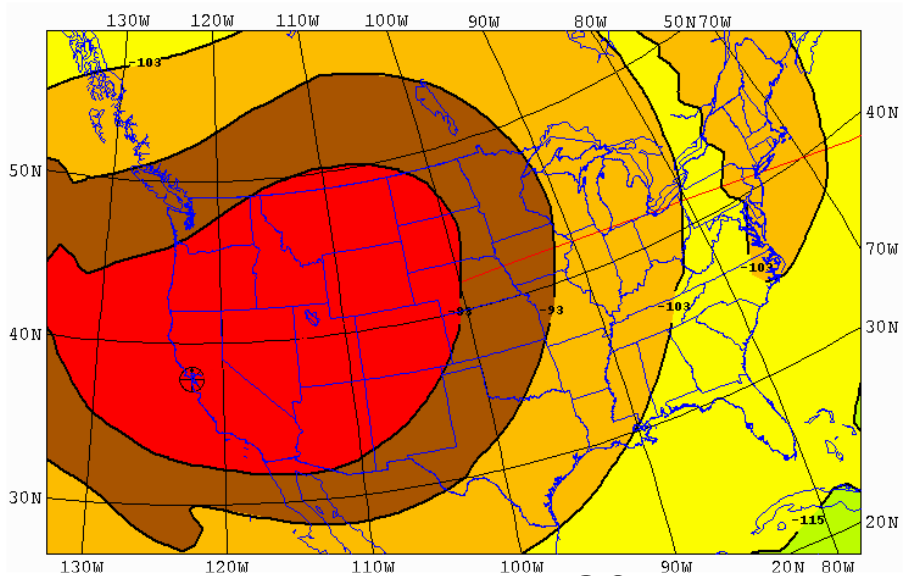
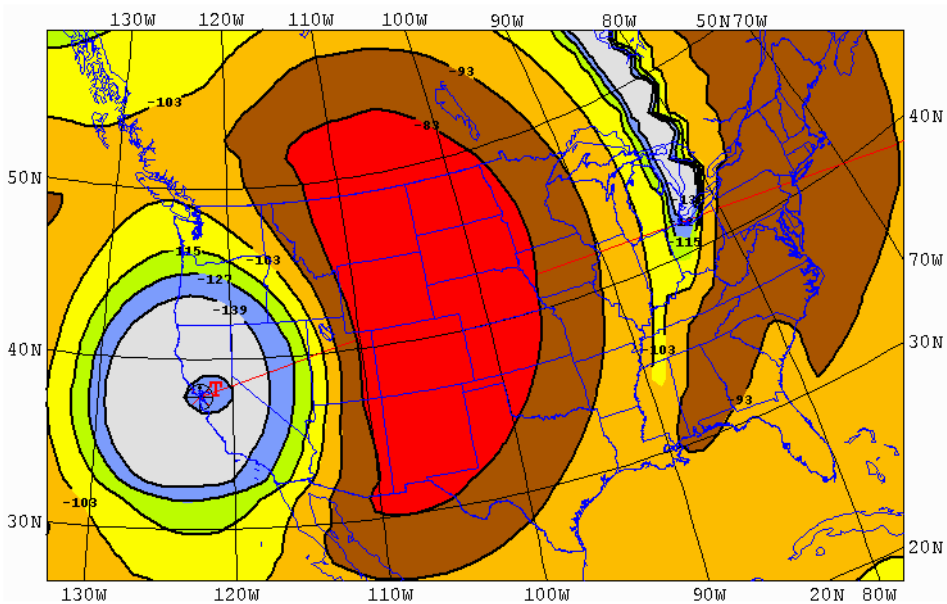
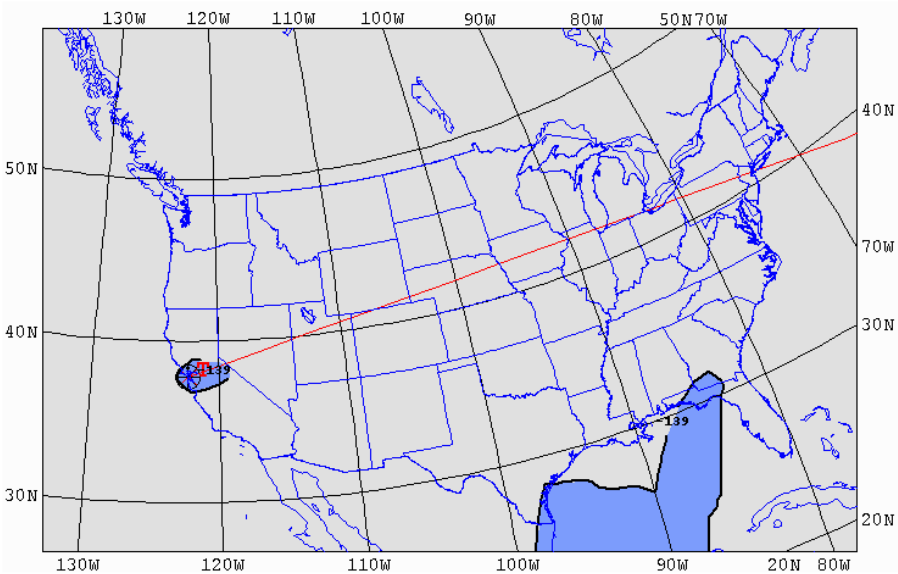


80 m

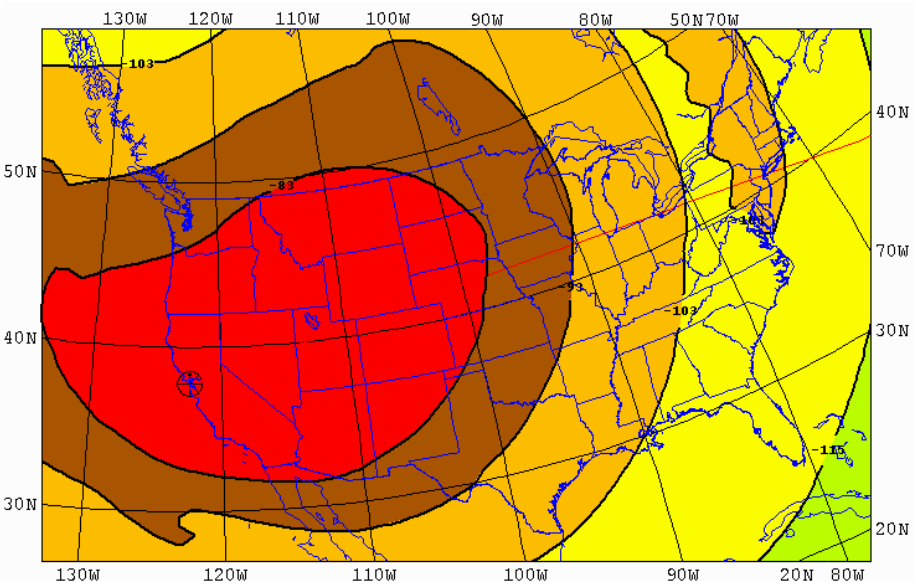
11 UTC



40 m



20 m



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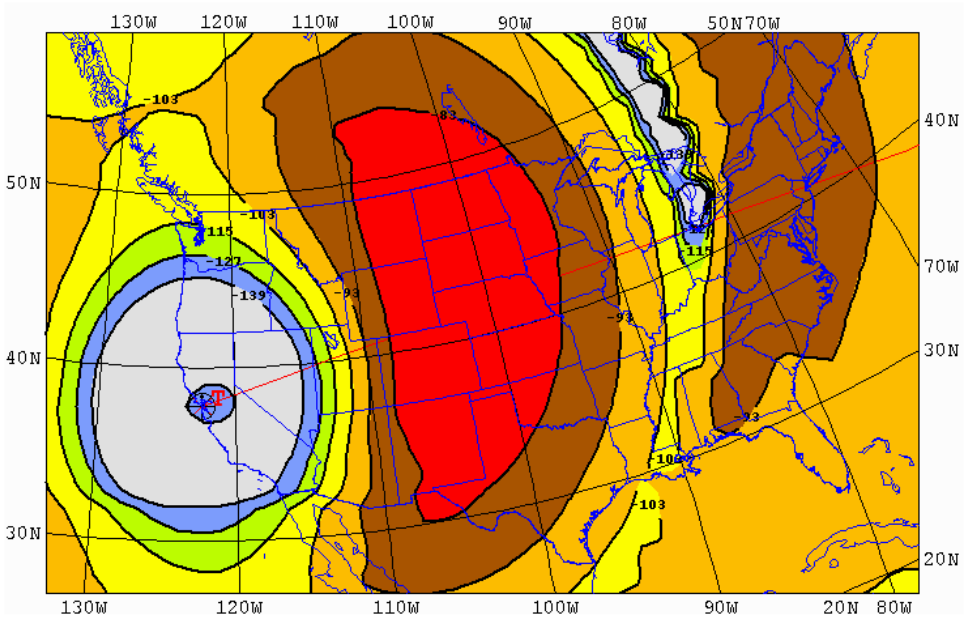

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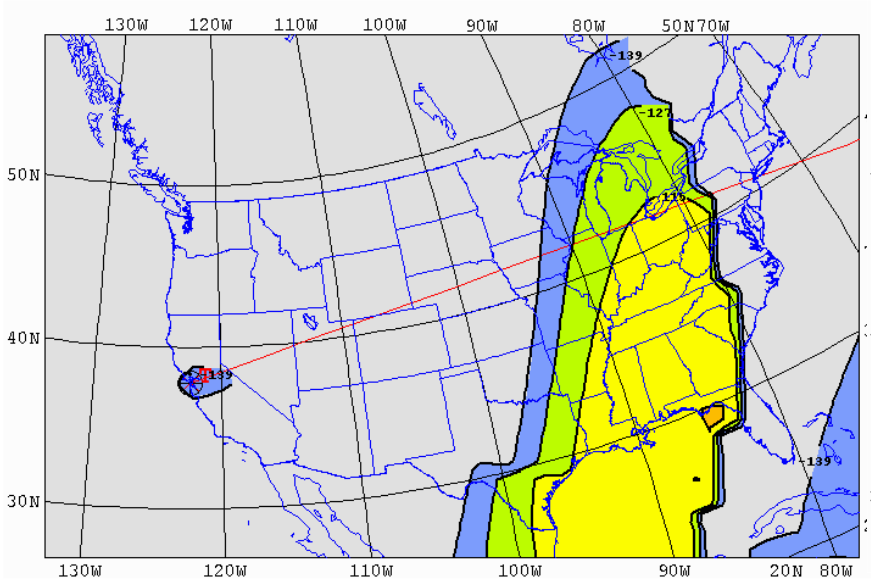
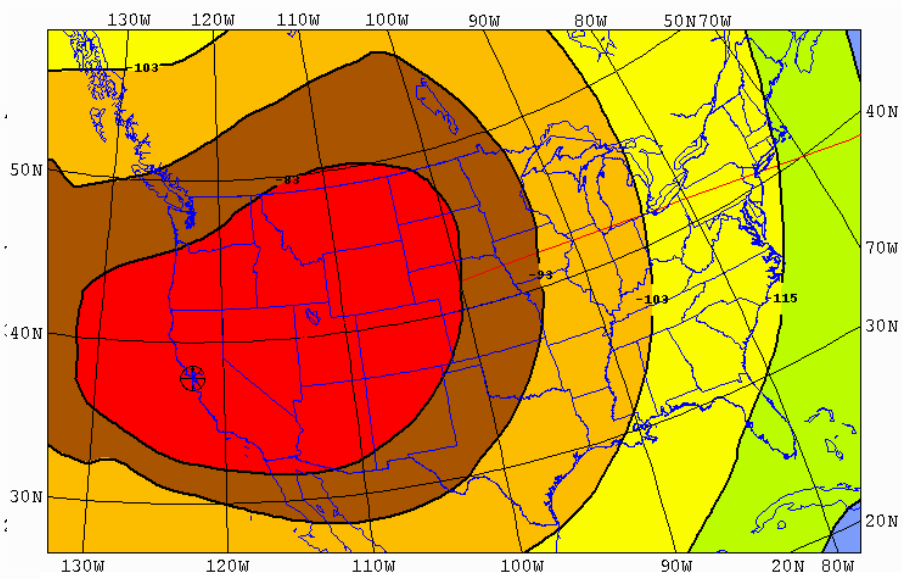
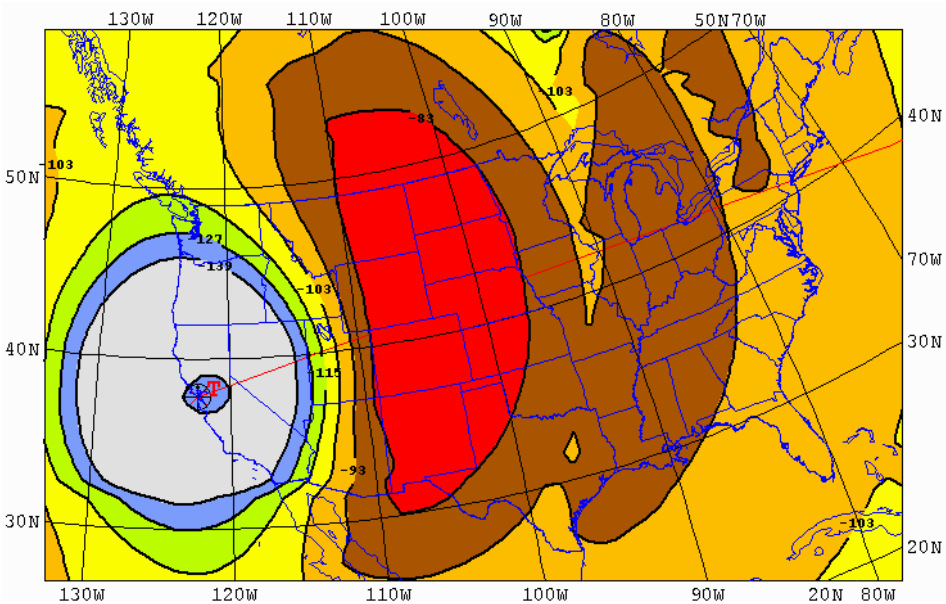


20 m



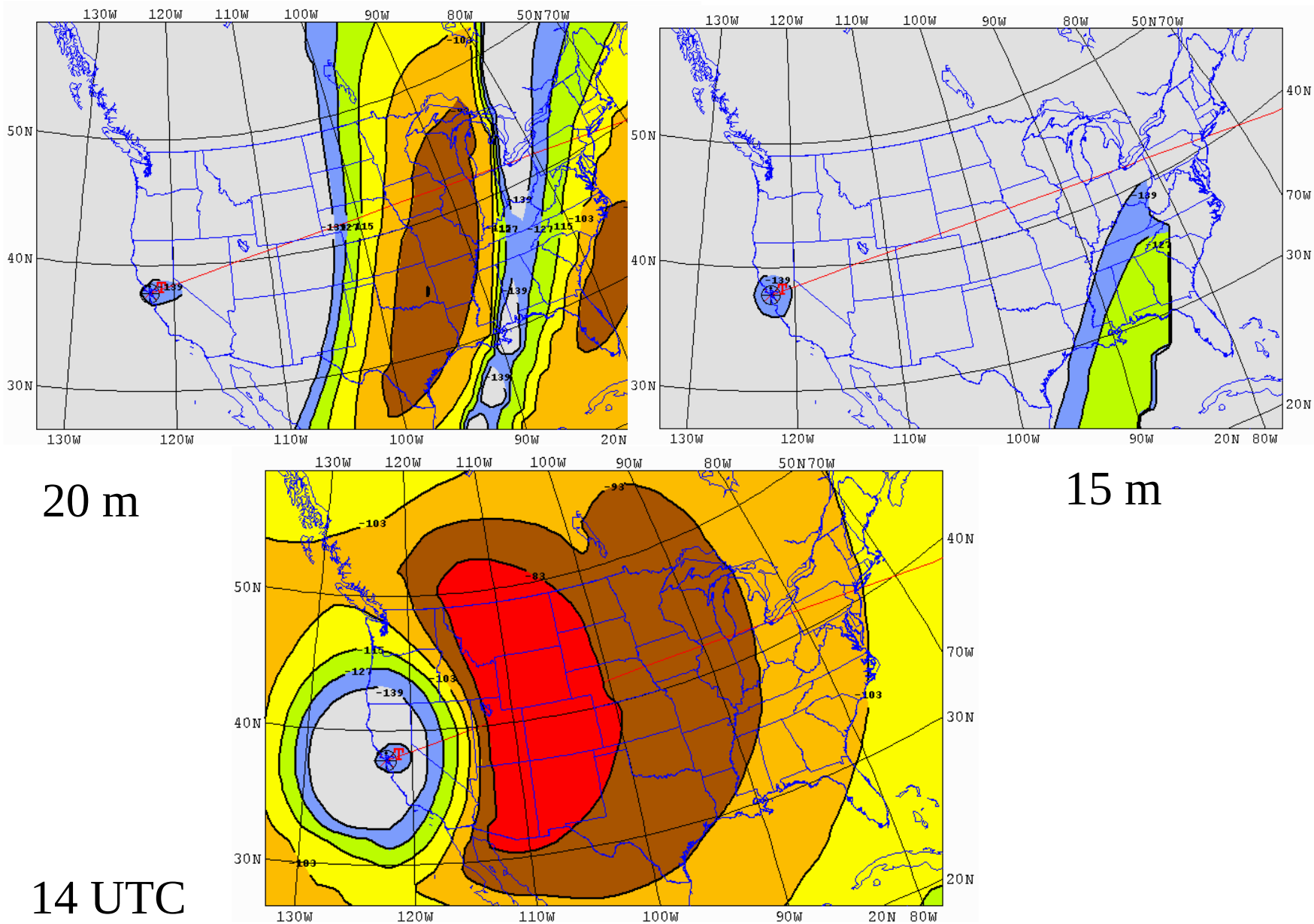
80 m

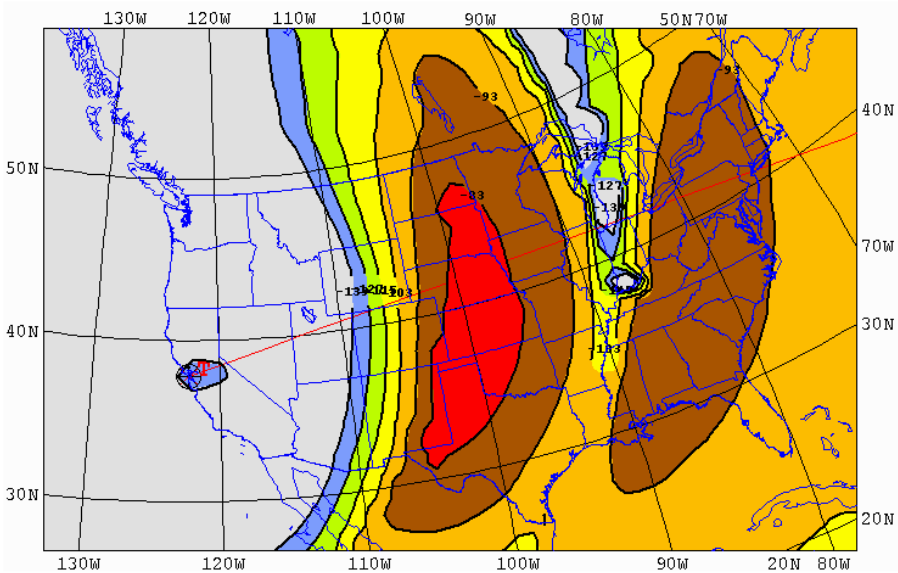


40 m

13 UTC

East Coast sunrise


20 m
15 m
40 m
14 UTC
130W
120W
110W
100W
90W
80W
50N70W
50N
40N
30N
20N
70W



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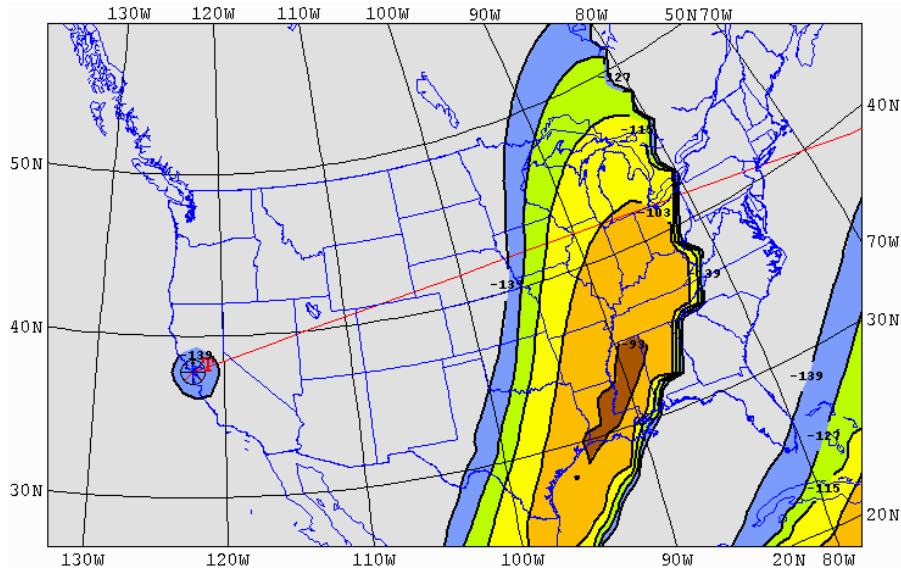

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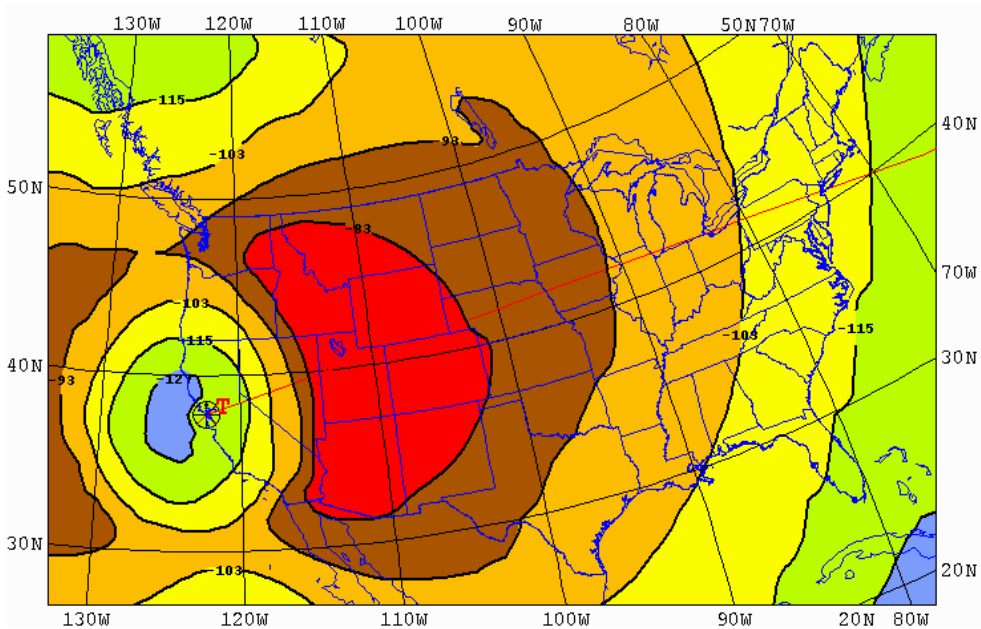
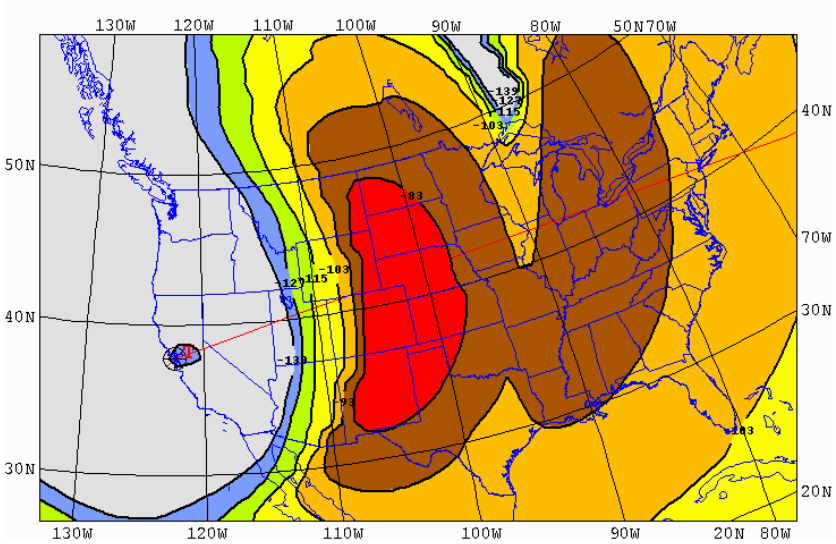


15 UTC

40 m



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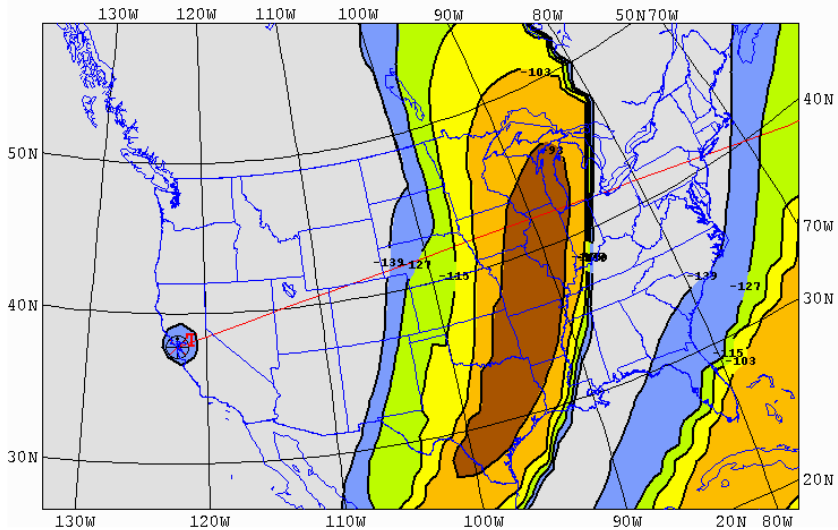
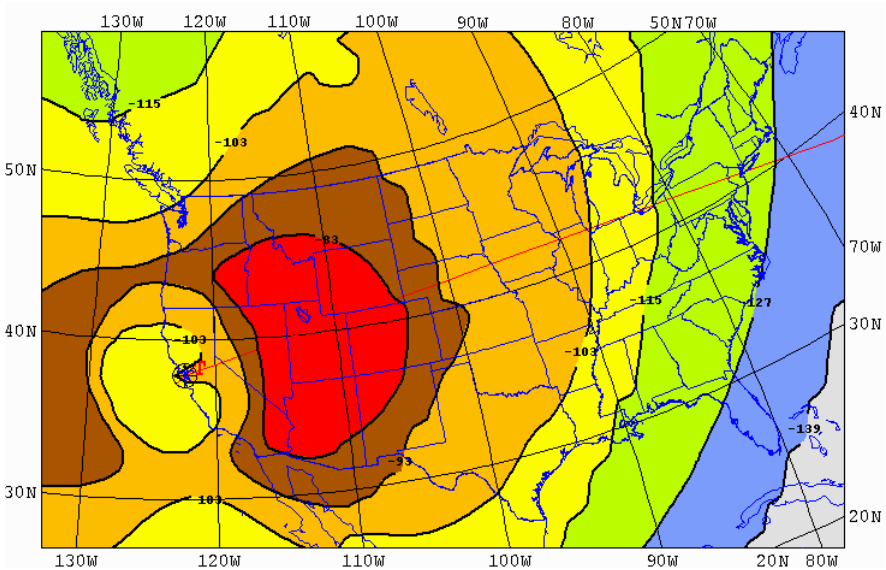
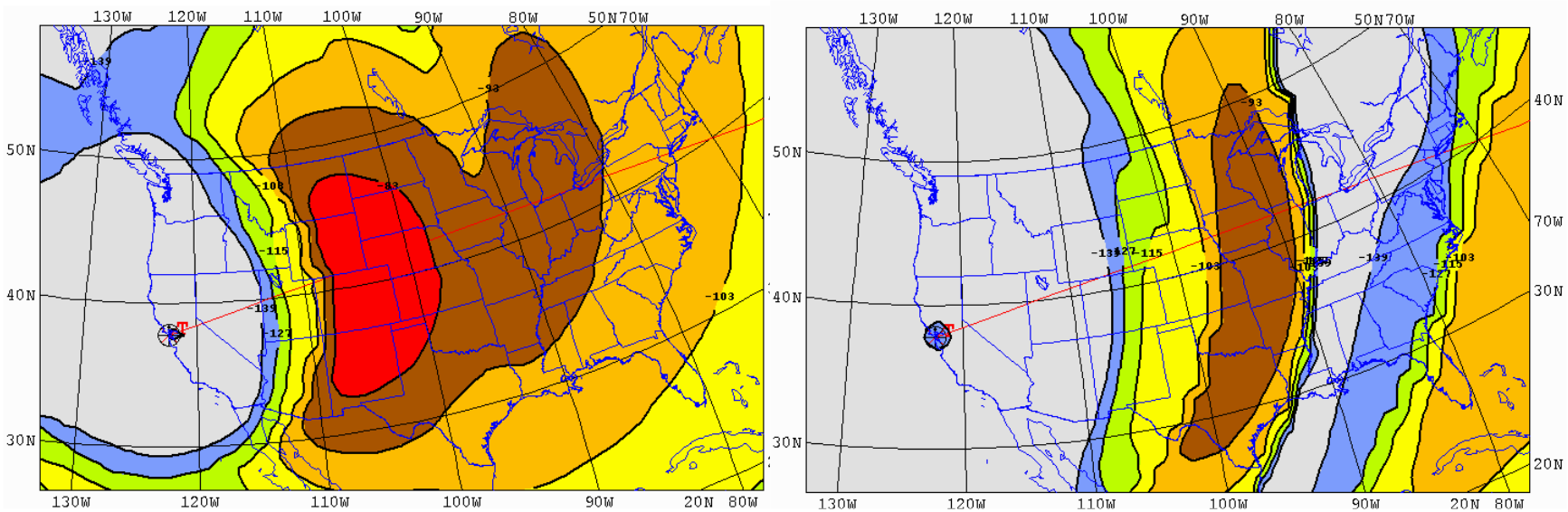


15 m



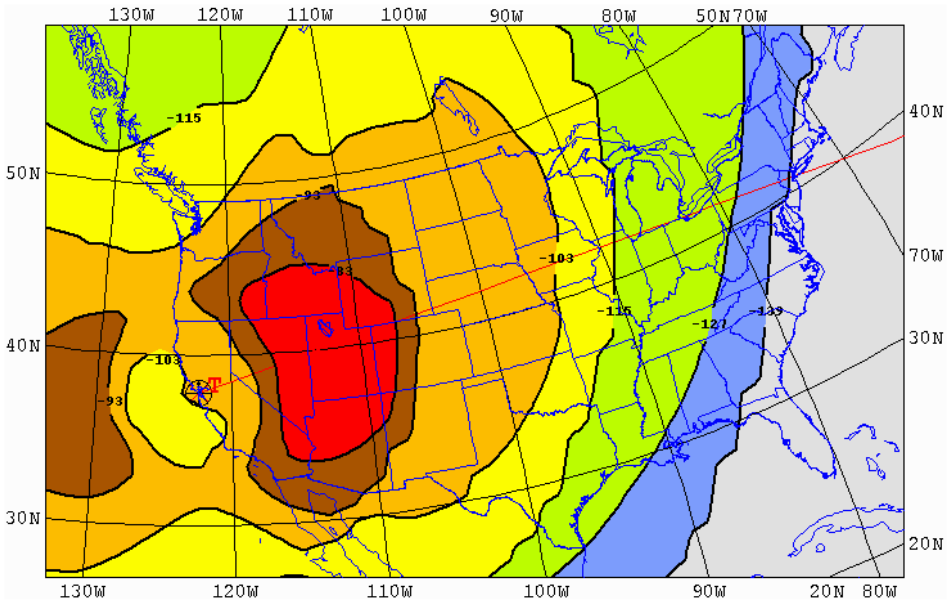
16 UTC

40 m



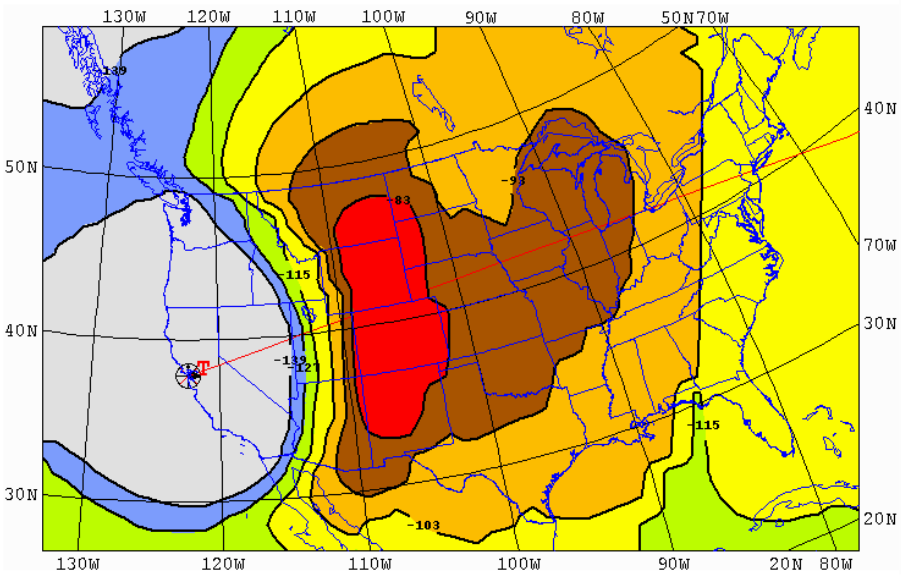
20 m

15 m

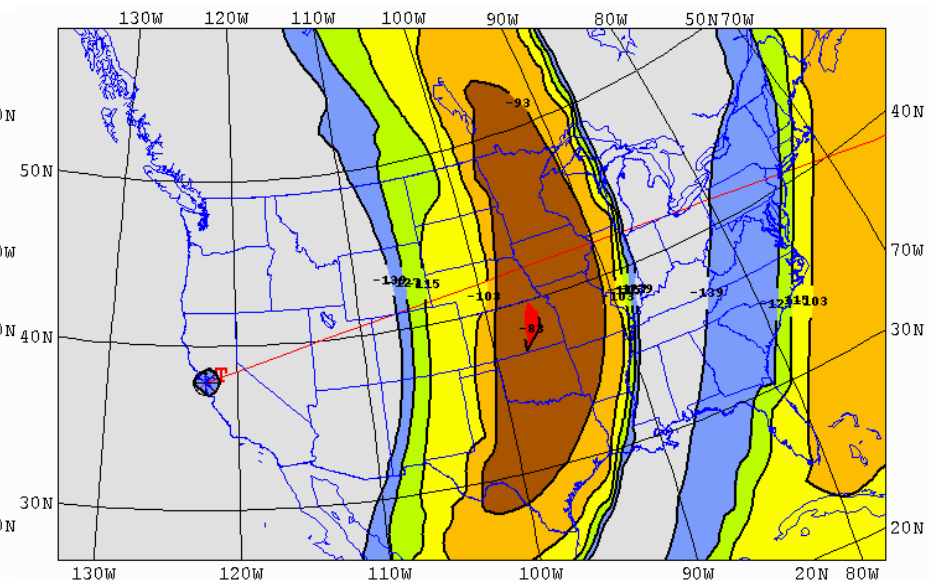


17 UTC

40 m

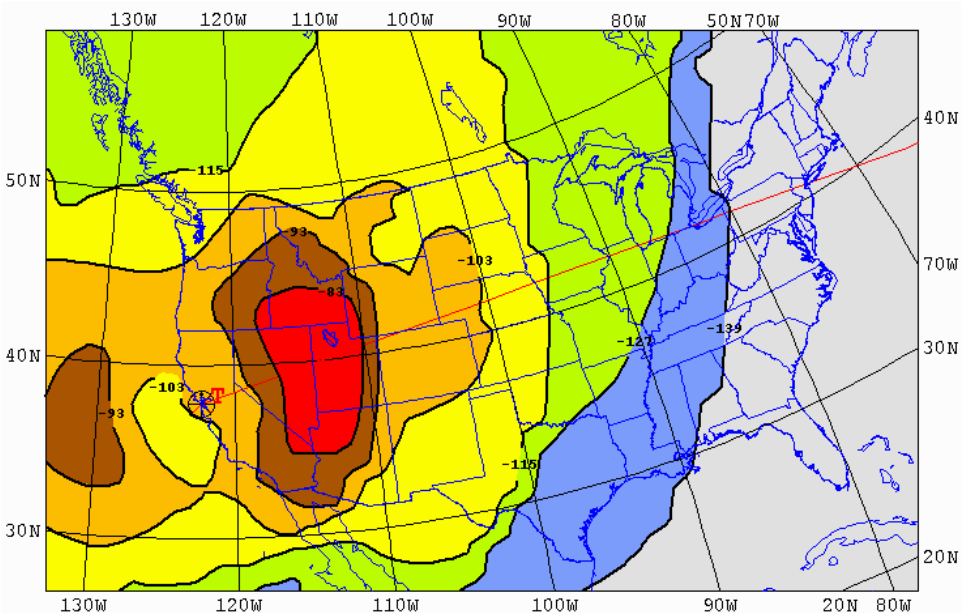


20 m

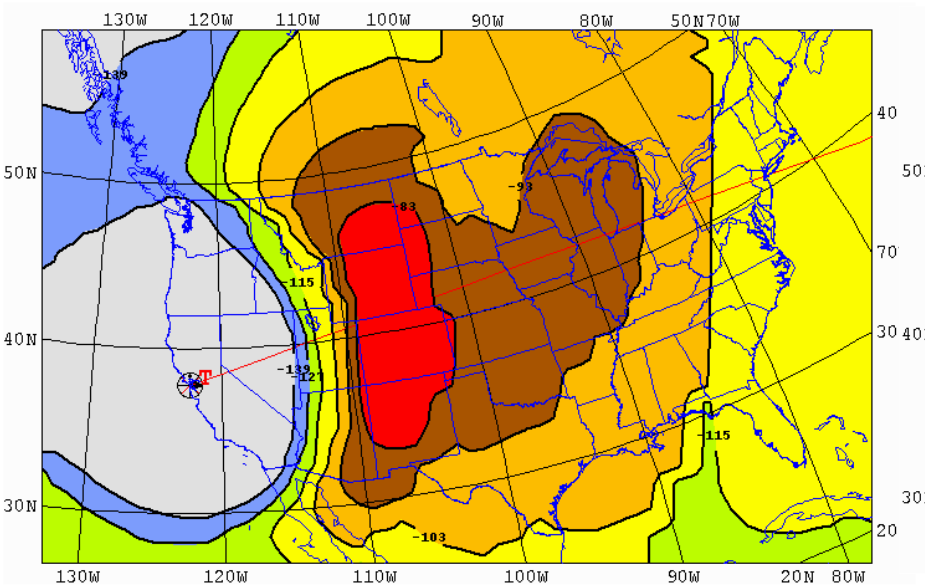


15 m

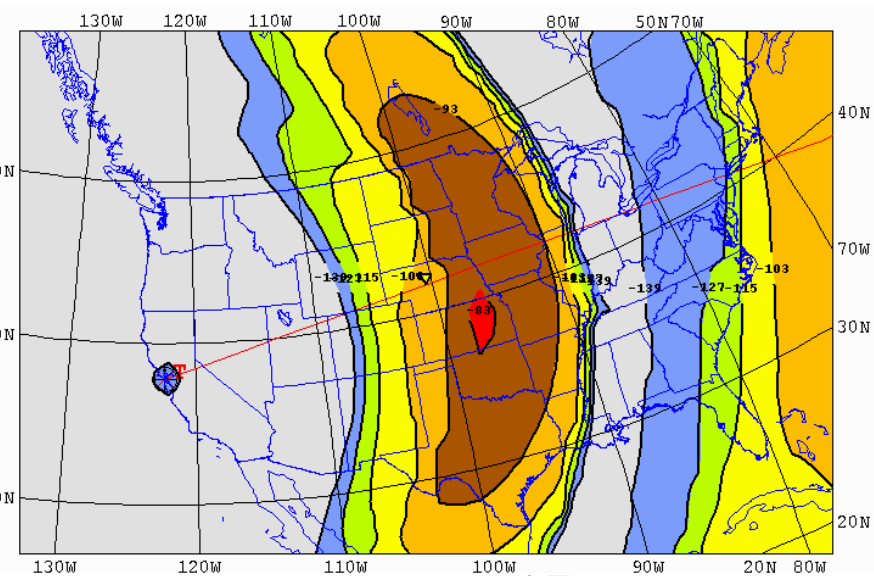
18 UTC



40 m

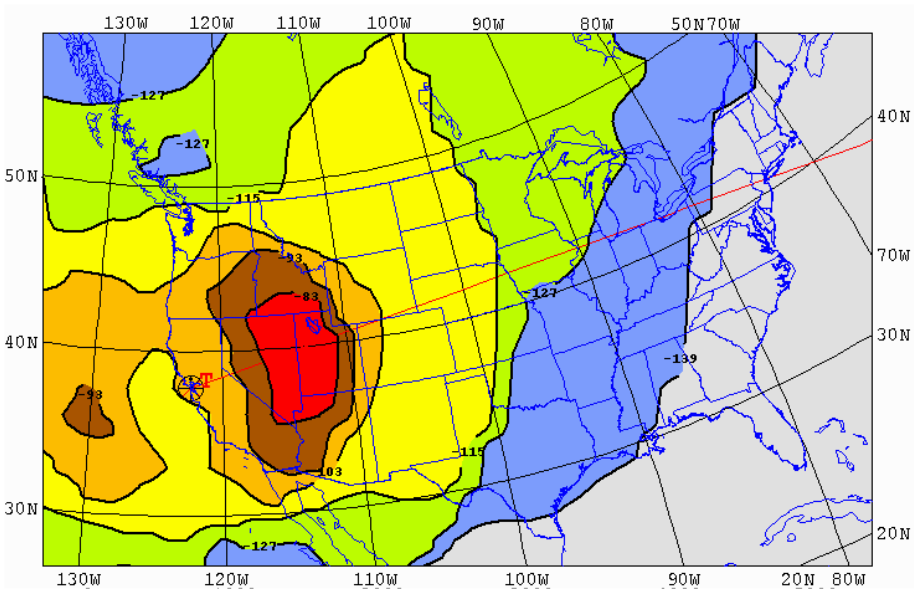


20 m

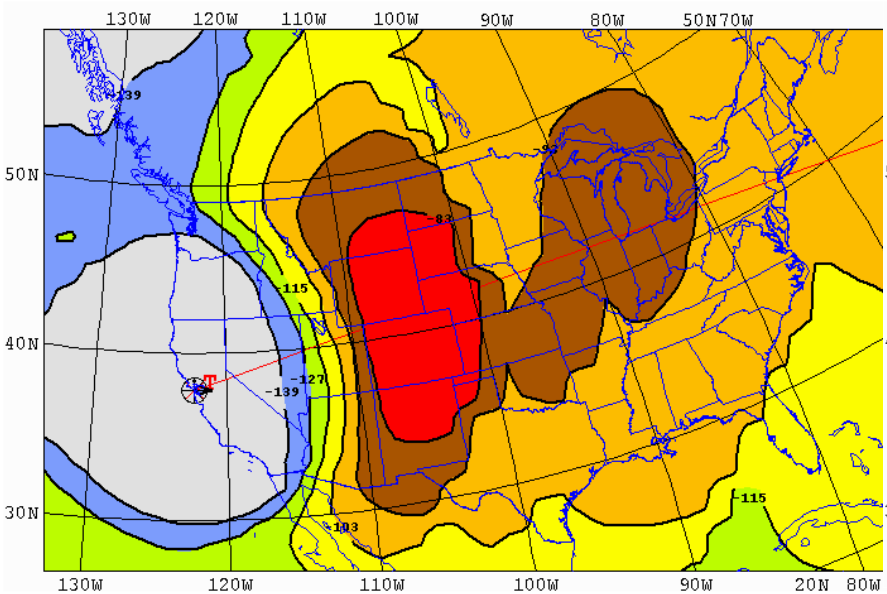


15 m

19 UTC



40 m



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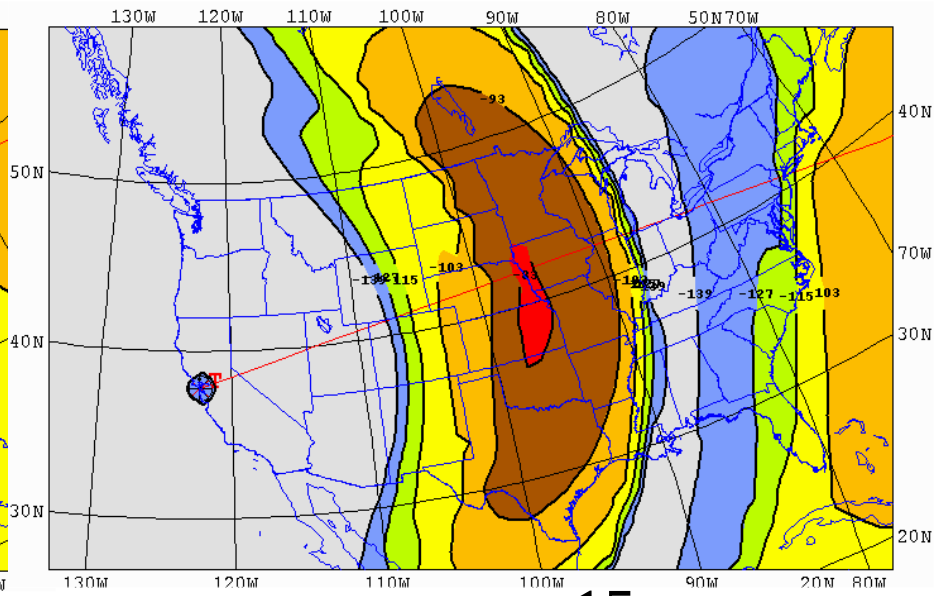

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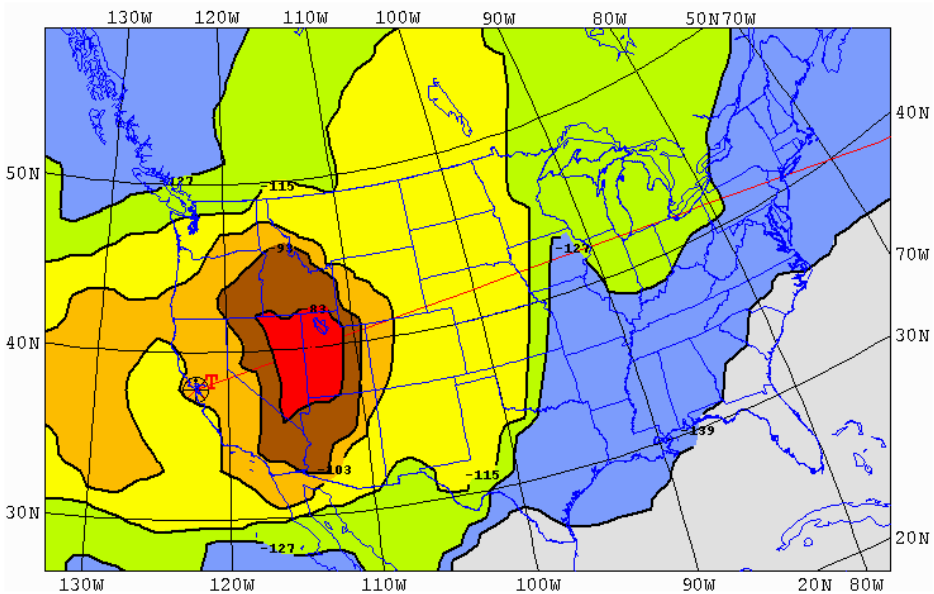
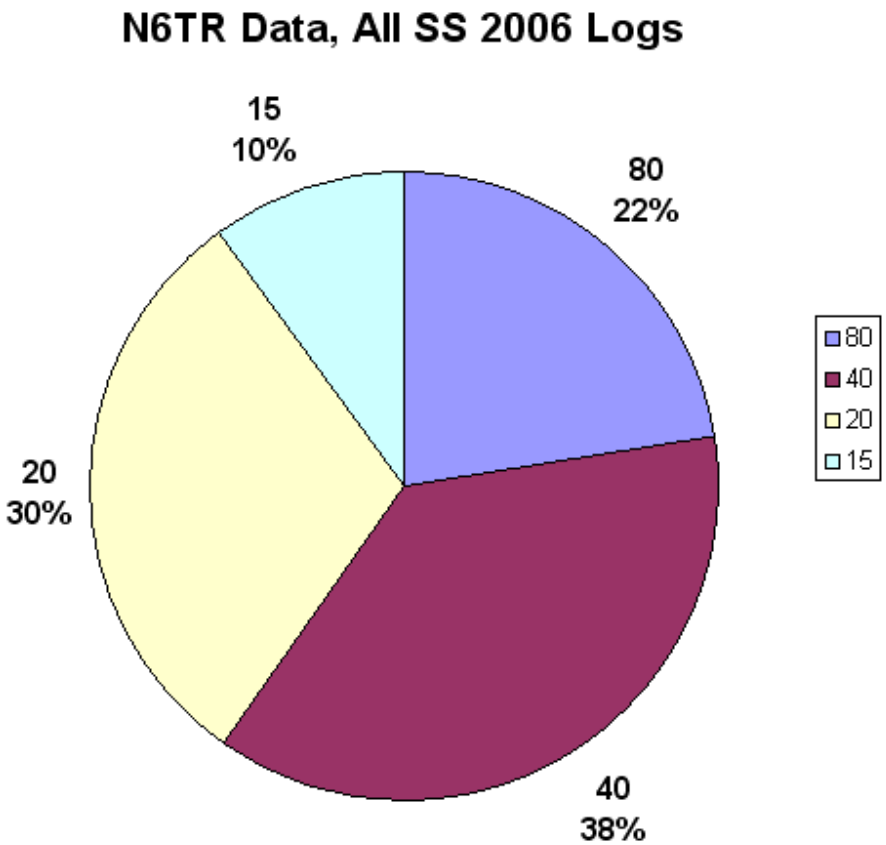
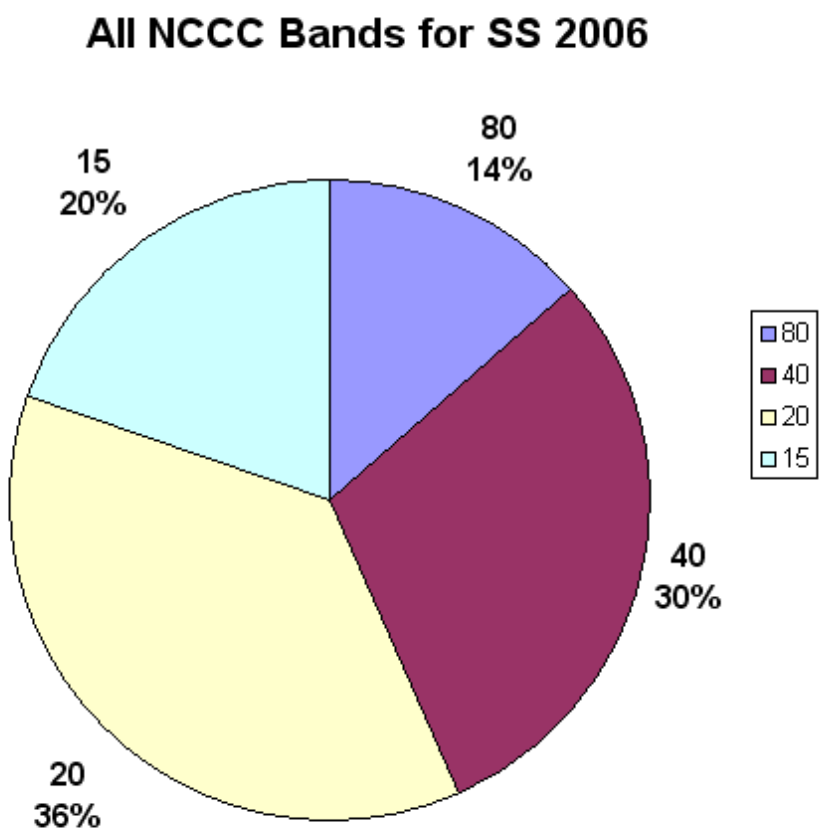


40 m

20 UTC

QSOs on Open Bands, SS 2006





We W6s make more QSOs on upper bands

N6TR Totals for all logs							
HOUR	**160**	**80**	**40**	**20**	**15**	**10**	**TOTAL**
2100	0	61	4,457	14,316	13,064	7	31,905
2200	0	36	5,784	18,275	7,222	0	31,317
2300	0	1,074	9,146	15,918	1,214	0	27,352
0	0	4,570	14,311	8,312	13	0	27,206
100	18	7,788	18,980	1,030	0	0	27,816
200	138	10,293	15,476	59	0	0	25,966
300	38	13,066	11,374	36	0	0	24,514
400	28	14,383	9,356	31	0	0	23,798
500	7	13,862	8,242	51	0	0	22,162
600	2	12,029	6,370	36	19	1	18,457
700	0	10,339	3,229	5	0	0	13,573
800	4	4,928	2,488	0	0	0	7,420
900	0	1,154	960	0	0	0	2,114
1000	2	1,116	795	1	0	0	1,914
1100	2	2,346	1,860	18	0	0	4,226
1200	0	3,705	5,061	338	0	0	9,104
1300	0	2,304	8,975	2,169	0	0	13,448
1400	0	310	10,966	6,998	68	0	18,342
1500	0	1	7,859	11,736	716	1	20,313
1600	0	0	4,314	11,785	4,042	0	20,141
1700	0	0	2,887	10,184	6,220	3	19,294
1800	0	0	2,306	10,154	6,142	2	18,604
1900	0	0	2,959	9,888	6,080	21	18,948
2000	0	0	4,077	10,583	4,428	0	19,088
2100	0	1	5,402	11,356	3,472	0	20,231
2200	0	297	6,124	11,520	1,084	0	19,025
2300	3	1,769	6,664	8,777	160	0	17,373
0	2	4,428	8,973	2,097	3	0	15,503
100	63	6,332	8,248	66	0	0	14,709
200	430	6,388	5,030	7	0	0	11,855
HOUR	**160**	**80**	**40**	**20**	**15**	**10**	**TOTAL**
Sum	737	122,580	202,673	165,746	53,947	35	

What bands the operators all around USA were on in 2006 SS contests

Best band

Next best band

BREAKDOWN QSO/mults N6BV ARRL SWEEPSTAKES 2006 Phone Single Operator

HOUR	160	80	40	20	15	10	HR TOT	CUM TOT
21	.....	.....	.....	.....	122/31	.....	122/31	122/31
22	.	.	.	18/6	90/11	.	108/17	230/48
23	.	.	.	134/16	.	.	134/16	364/64
0	.	.	.	110/4	.	.	110/4	474/68
1	.	.	64/5	5/0	.	.	69/5	543/73
2	.	.	77/0	.	.	.	77/0	620/73
3	.	12/2	37/0	.	.	.	49/2	669/75
4	.	46/2	25/0	.	.	.	71/2	740/77
5	.....	40/1	21/0	.....	.....	.....	61/1	801/78
6	.	27/0	32/0	.	.	.	59/0	860/78
7	.	13/0	10/0	.	.	.	23/0	883/78
8	.	7/0	26/0	.	.	.	33/0	916/78
9	.	.	.	.	.	.	.	916/78
10	.	.	.	.	.	.	.	916/78
11	.	.	.	.	.	.	.	916/78
12	.	.	.	.	.	.	.	916/78
13	.....	.....	.....	.....	.....	.....	.....	916/78
14	.	.	.	79/1	1/1	.	80/2	996/80
15	.	.	.	96/0	.	.	96/0	1092/80
16	.	.	.	97/0	4/0	.	101/0	1193/80
17	.	.	.	67/0	7/0	.	74/0	1267/80
18	.	.	.	56/0	7/0	.	63/0	1330/80
19	.	.	.	71/0	4/0	.	75/0	1405/80
20	.	.	.	66/0	3/0	.	69/0	1474/80
21	.....	.....	.....	59/0	2/0	.....	61/0	1535/80
22	.	.	.	46/0	1/0	.	47/0	1582/80
23	.	.	.	58/0	.	.	58/0	1640/80
0	.	.	27/0	32/0	.	.	59/0	1699/80
1	.	1/0	54/0	.	.	.	55/0	1754/80
2	.	.	35/0	.	.	.	35/0	1789/80
DAY1	.	145/5	292/5	799/27	238/43	.	.	1474/80
DAY2	.	1/0	116/0	195/0	3/0	.	.	315/0
TOT	.....	146/5	408/5	994/27	241/43	.....	.....	1789/80

What Happened During CQP 2007?

Propagation Modes on 80 Meters

- **NVIS (Near Vertical Incidence Skywave) – a low horizontal dipoles work best < 500 miles**
- **Ground-wave propagation – verticals works best within about 50 miles on 80 meters**
- **Oblique-angle propagation – higher antennas are usually better > 500 miles**

Vertical-Incidence Ionospheric Plots

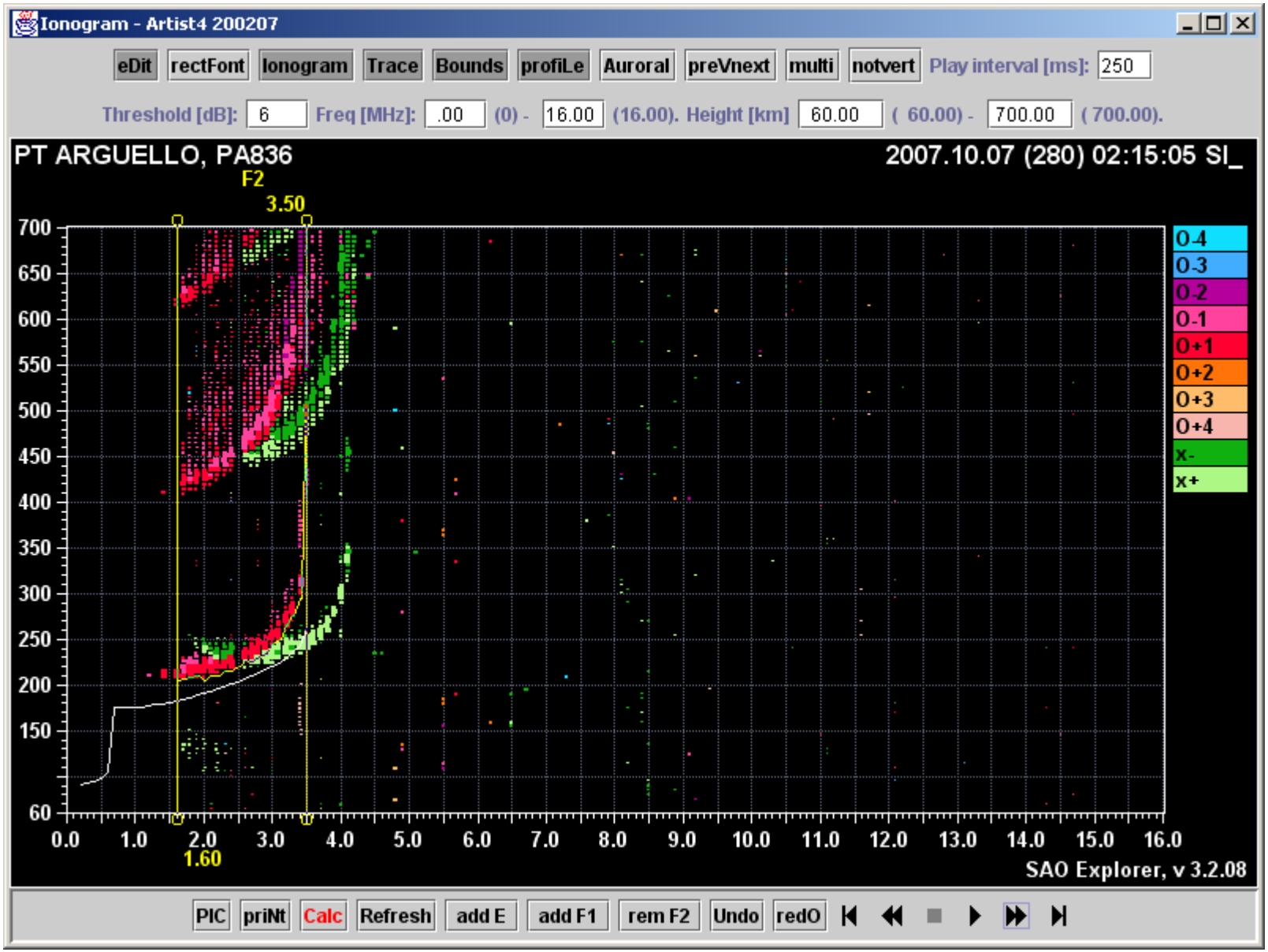
- **Pt Arguello (Southern California) – nearest ionospheric sounder to us.**
- **For evening of Saturday, October 7, 2007 (CQP).**
- **f_oF_2 is highest frequency for ordinary wave at F_2 layer at vertical incidence angle.**
- **f_oF_2 is worst-case NVIS situation – straight up.**

Vertical Incidence Sounder

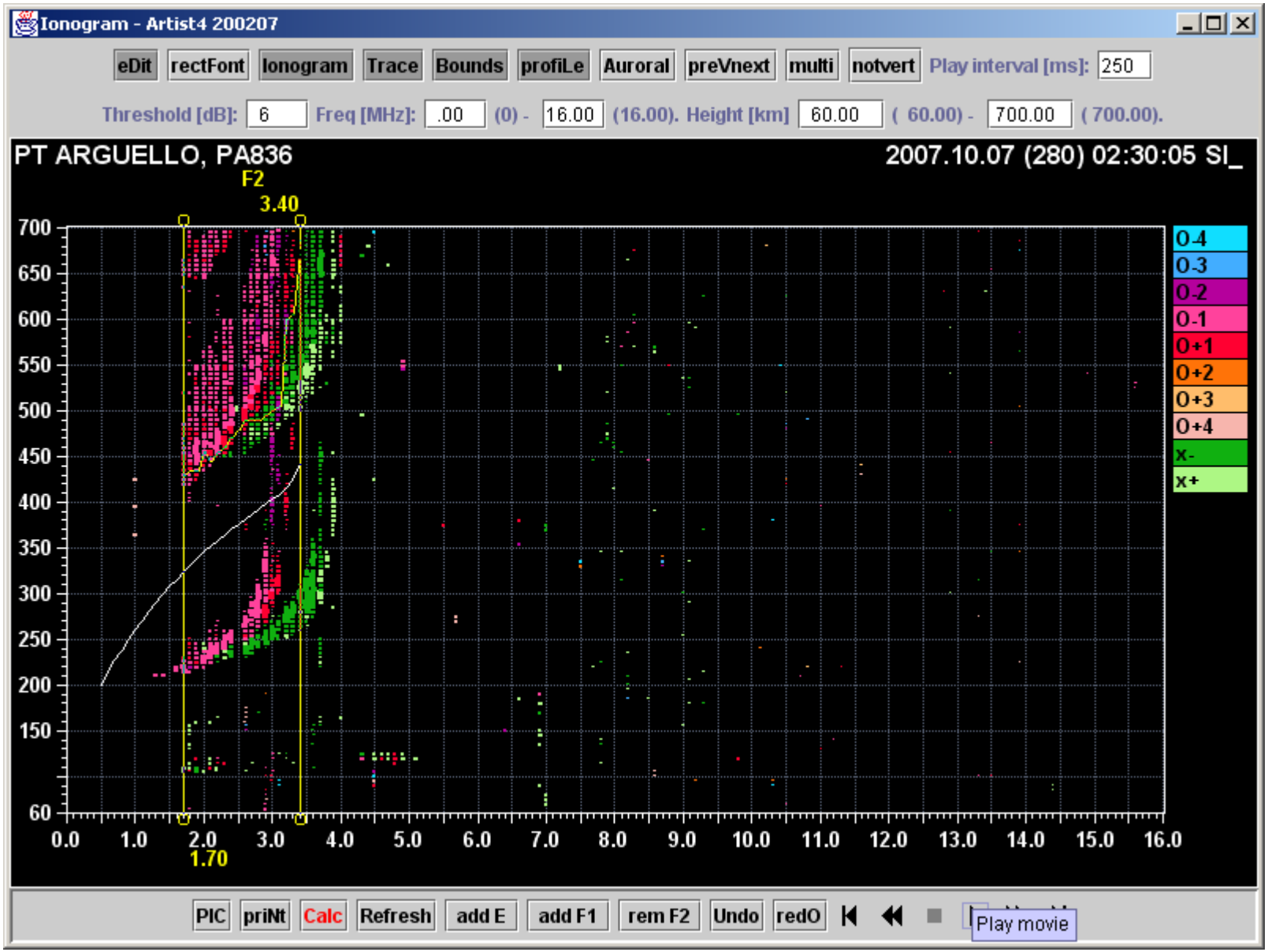
f_oF_2 = 4.5 MHz

0200 UTC

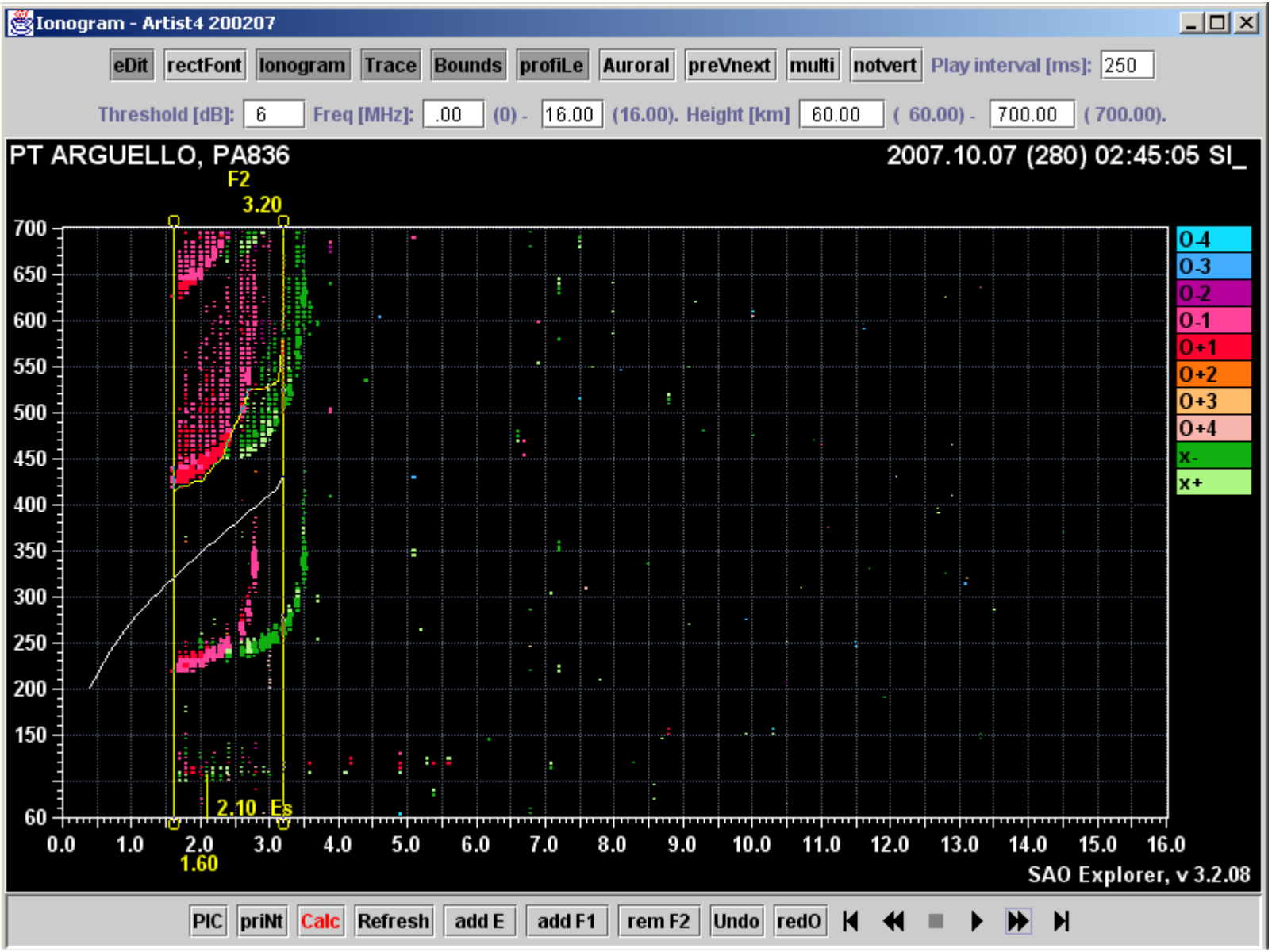
SSB goes “long” f_oF_2 = 3.5 MHz 0215 UTC



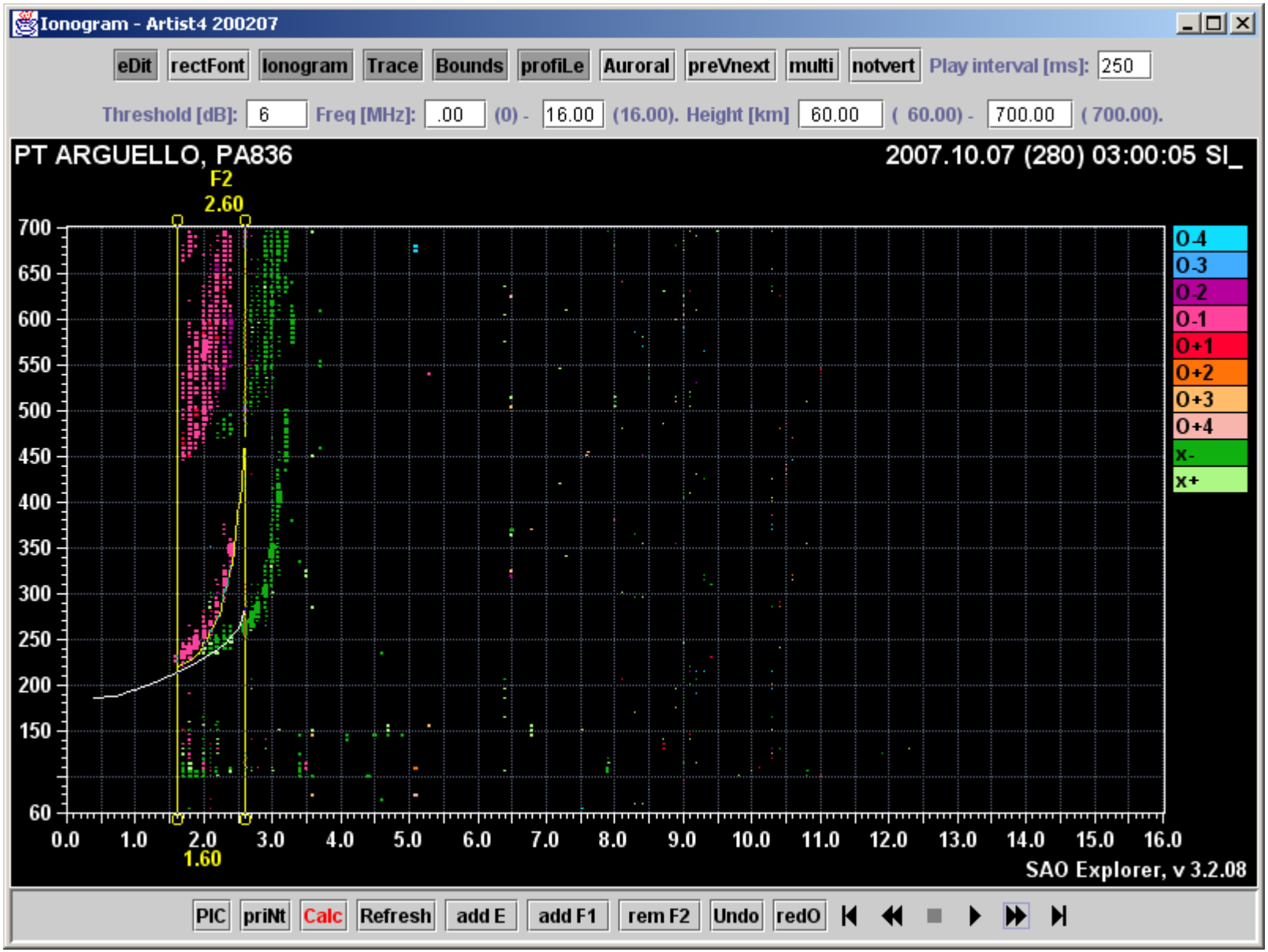
CW goes “long” f_oF_2 = 3.4 MHz 0230 UTC



Very marginal f_oF_2 = 3.2 MHz 0245 UTC



80/75 gone “long” f_oF_2 = 2.6 MHz 0300 UTC



Daybreak finally f_oF_2 = 3.7 MHz 1400 UTC