CANSAC WORKSHOP

May 1, 2008 ***McClellan CA***

The following are several different sections of CANSAC that I use in North Ops Predictive Services work related to Smoke dispersion forecasting, primarily in site-specific (Spot) forecasts for prescribed burning

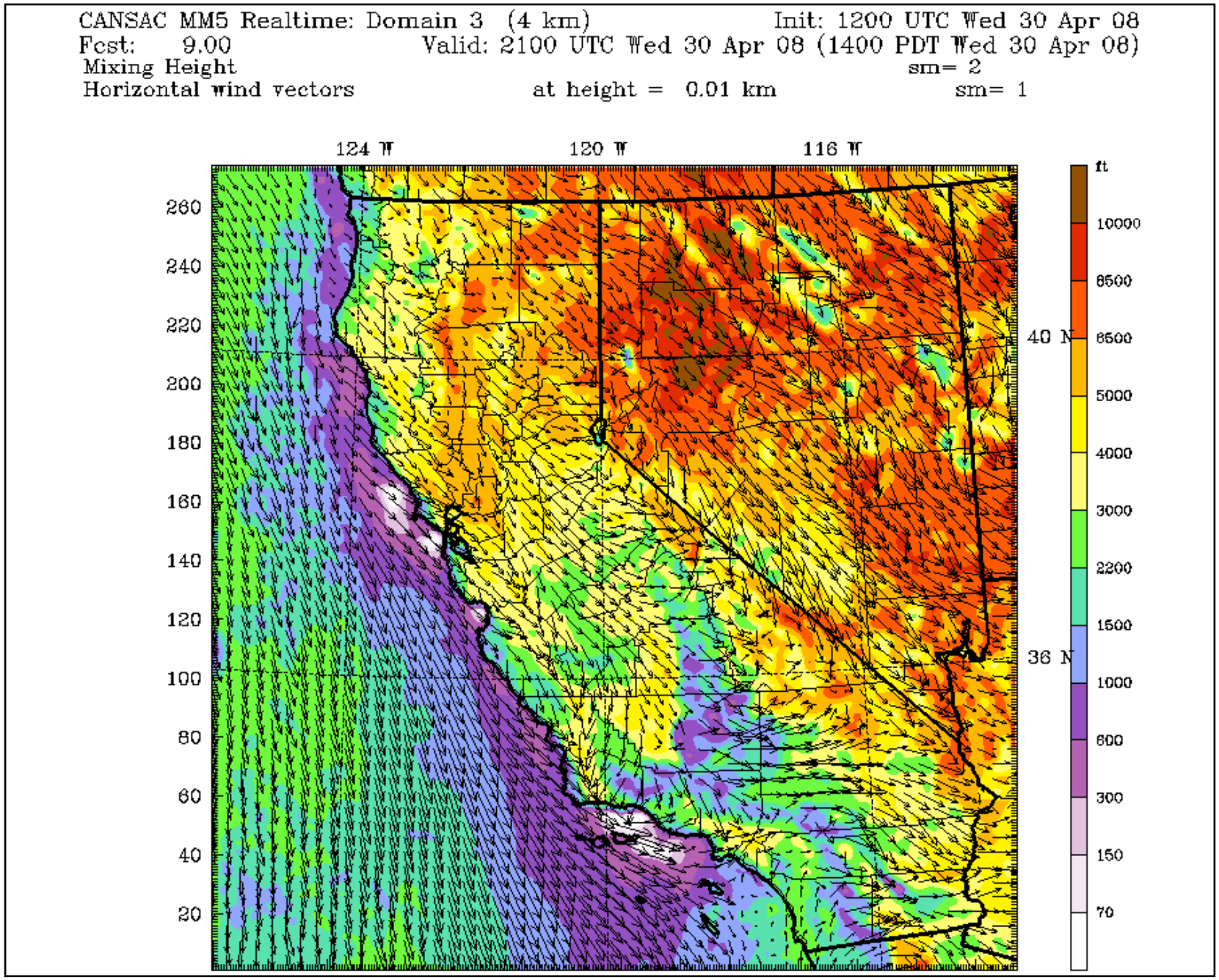
AIR QUALITY PRODUCTS PAGE, 4KM DOMAIN:

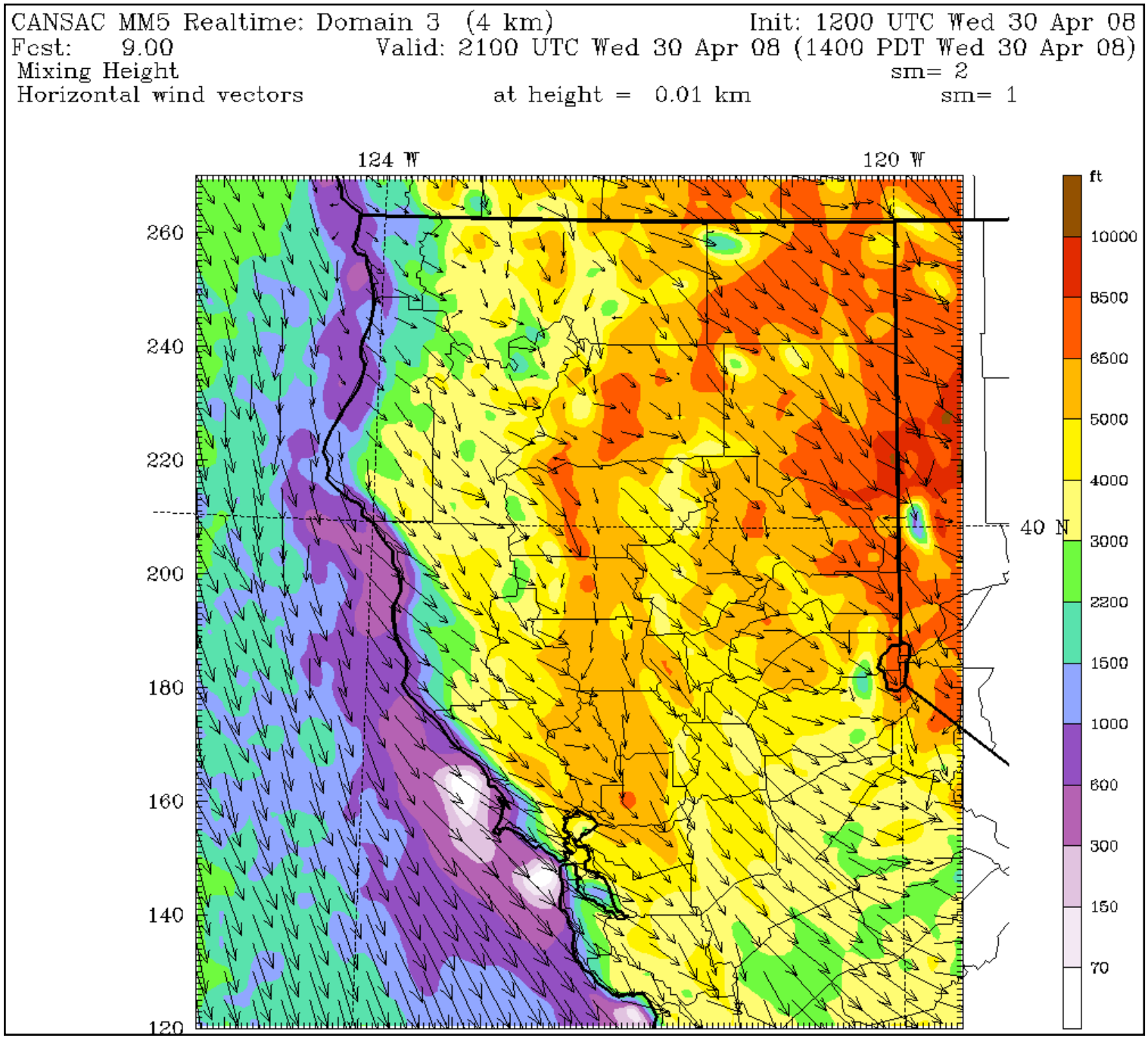
- **Mixing Heights for all of 4km domain (CA and NV)**
- **Mixing Heights in NW Quadrant**
- **Transport Winds for all of 4km domain (CA and NV)**
- **Transport Winds in NW Quadrant**

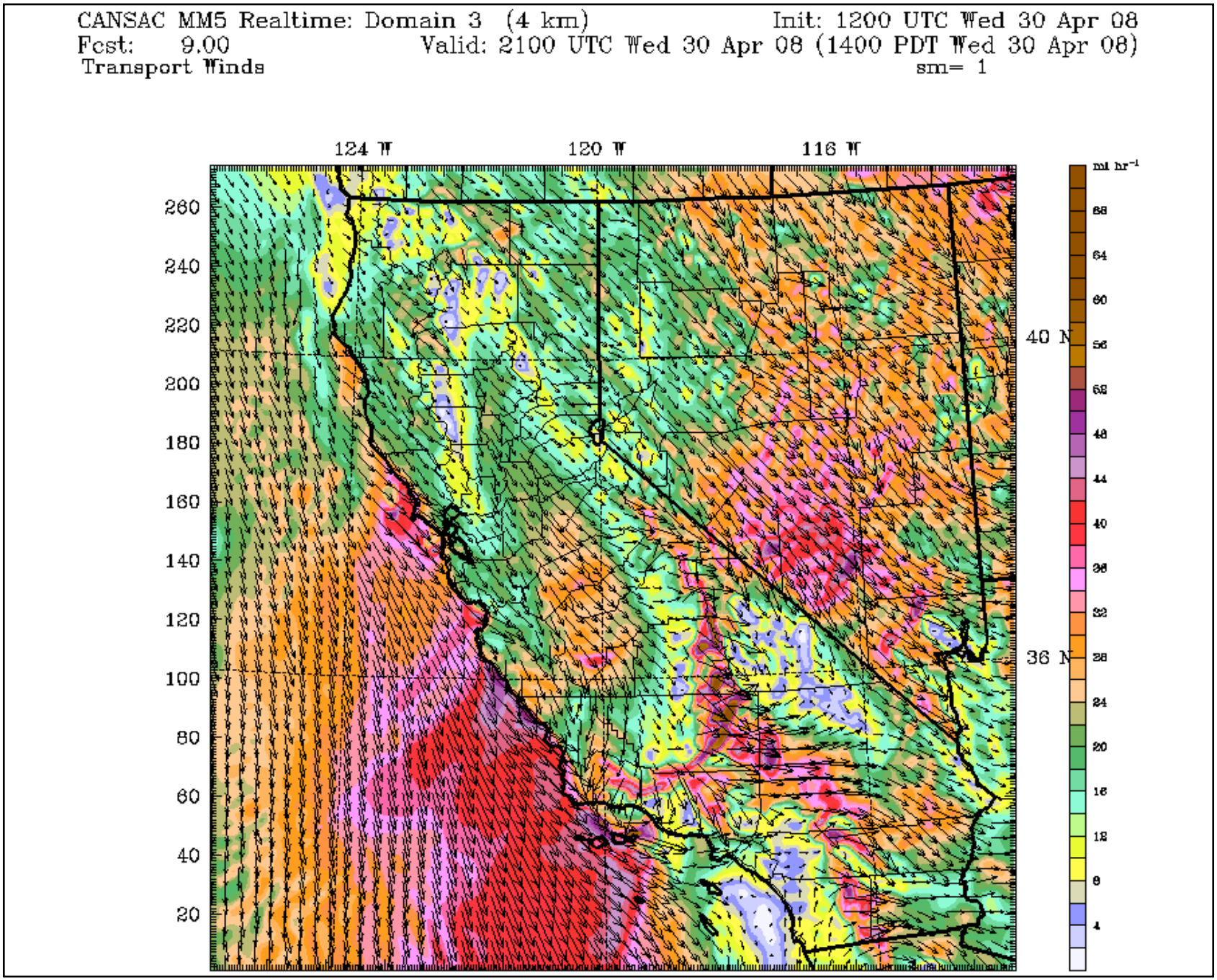
•**The next 4 frames show examples of the above**, all valid at 21Z (1300 PDT) yesterday

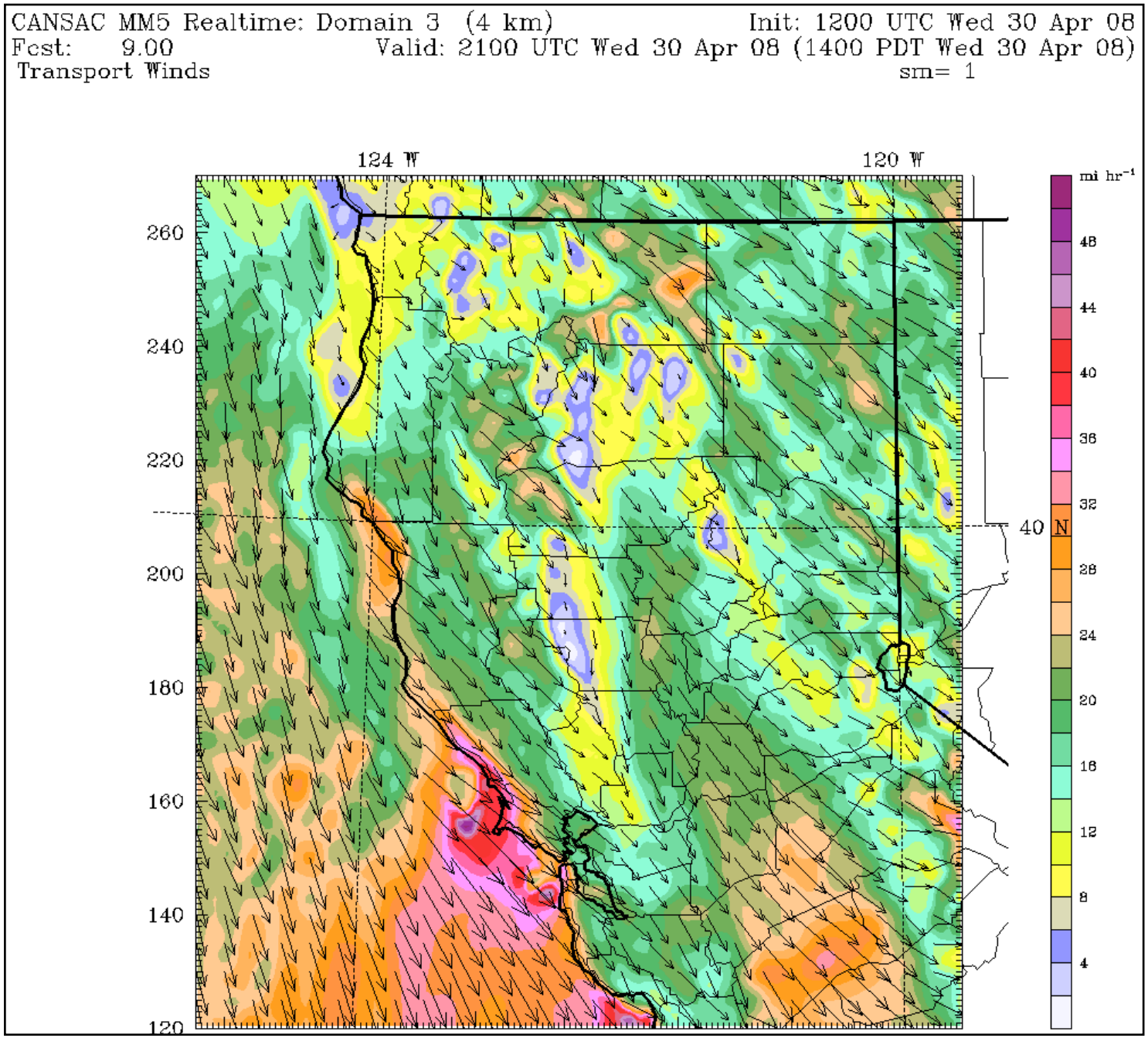
•The next 3 frames show **Mixing Heights in the other 3 quadrants**, i.e. SW, SE, and NE, all valid at 1300 PDT today

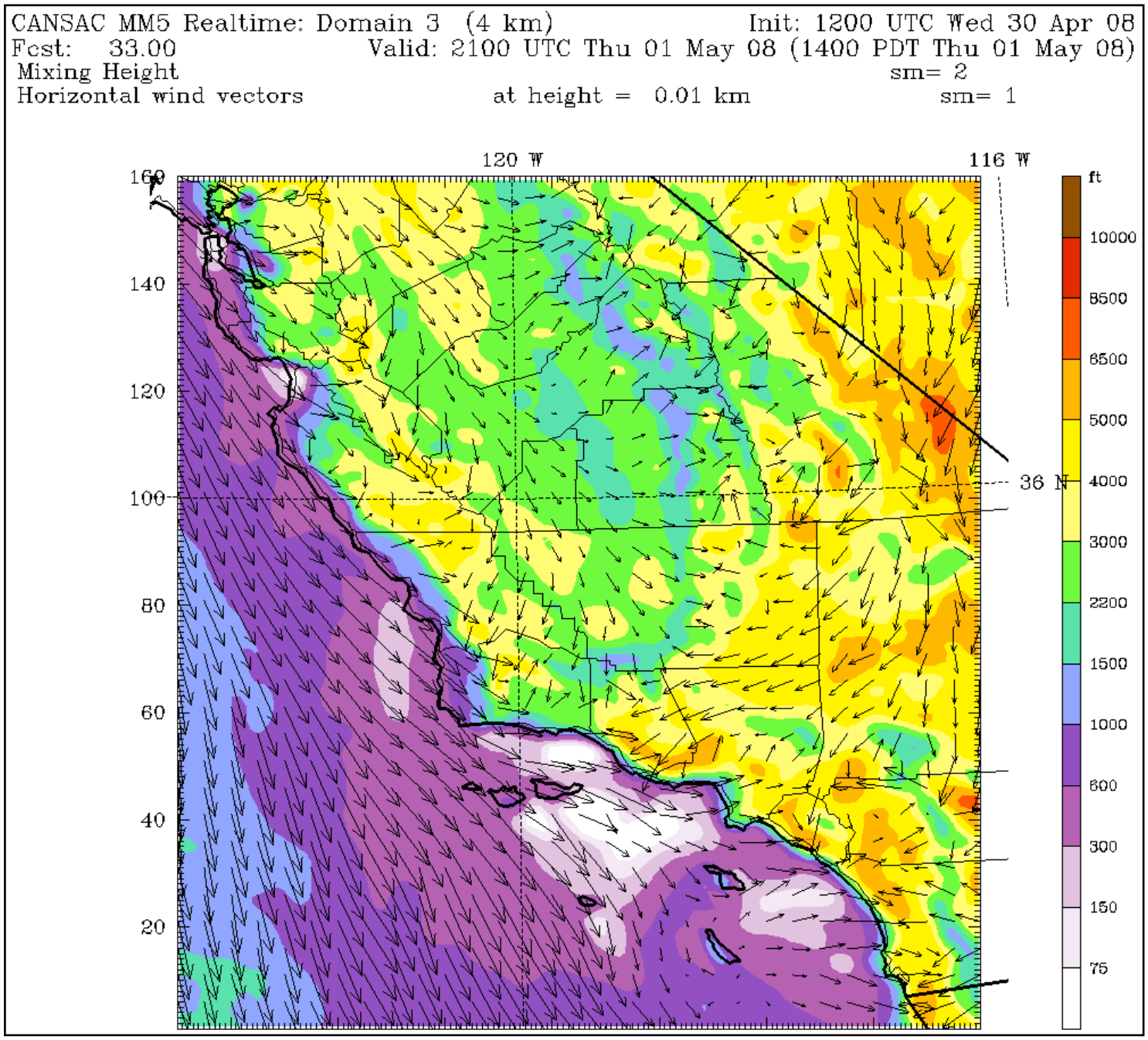
•The next 3 frames show **Transport Winds in those three quadrants**

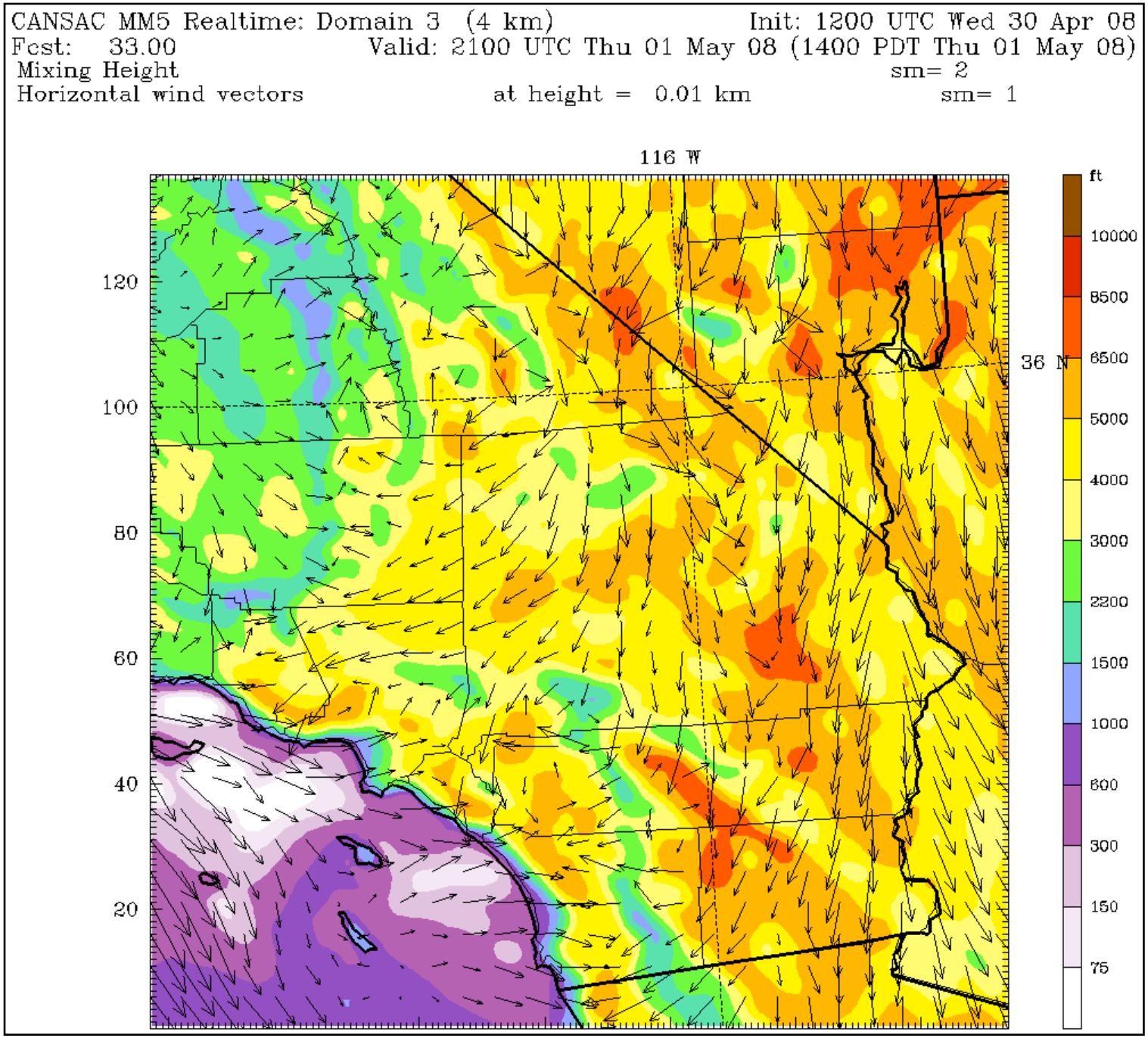

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 9.00
Valid: 2100 UTC Wed 30 Apr 08 (1400 PDT Wed 30 Apr 08)
Mixing Height
sm= 2
Horizontal wind vectors
at height = 0.01 km
sm= 1
124 W
120 W
116 W
260
240
220
200
180
160
140
120
100
80
60
40
20
40 N
36 N
ft
10000
6500
6500
5000
4000
3000
2200
1500
1000
600
300
150
70

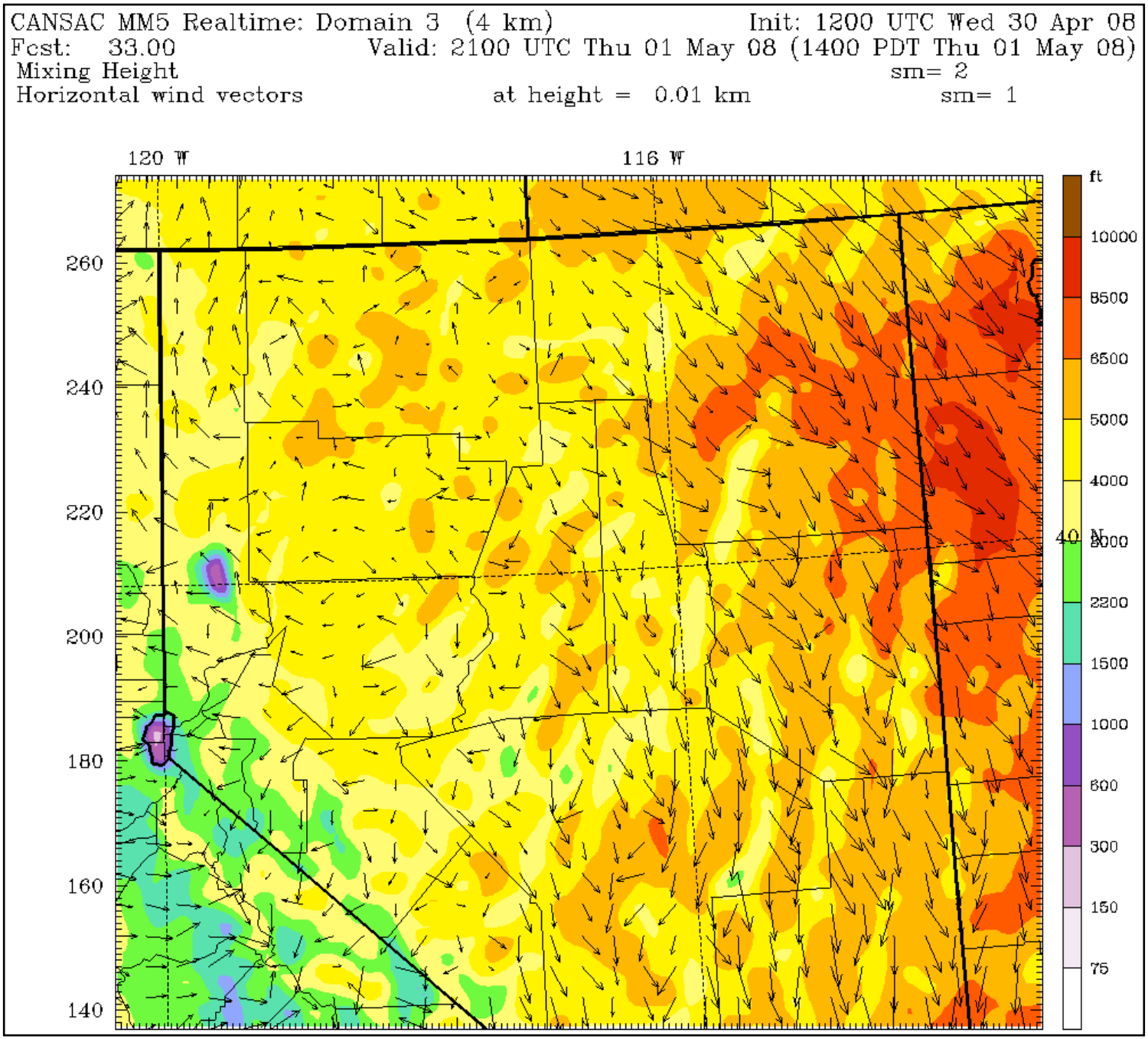

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 9.00
Valid: 2100 UTC Wed 30 Apr 08 (1400 PDT Wed 30 Apr 08)
Mixing Height
sm= 2
Horizontal wind vectors
at height = 0.01 km
sm= 1
124 W
120 W
260
240
220
200
180
160
140
120
40 N
ft
10000
8500
6500
5000
4000
3000
2200
1500
1000
600
300
150
70

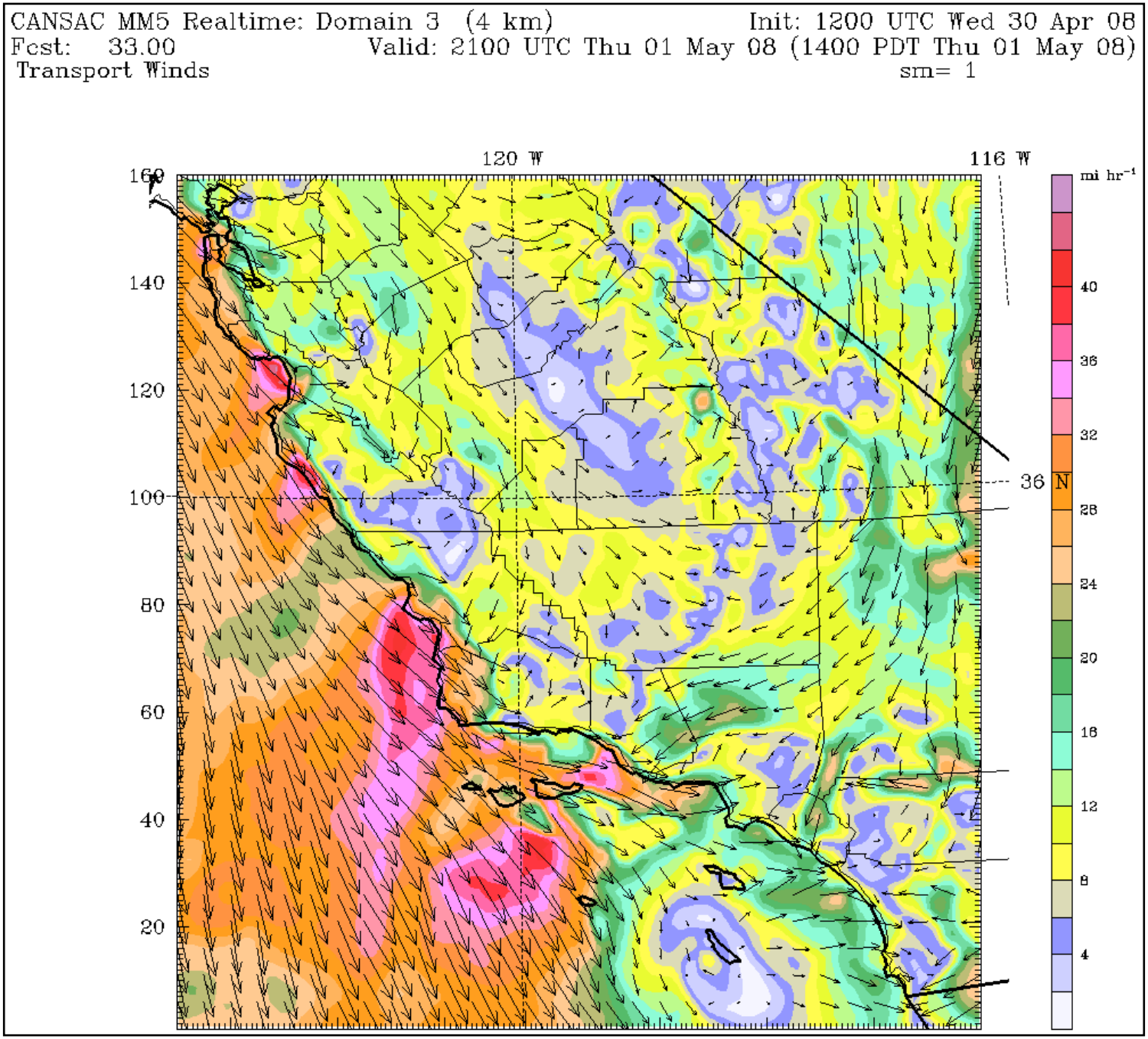

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 9.00
Valid: 2100 UTC Wed 30 Apr 08 (1400 PDT Wed 30 Apr 08)
Transport Winds
sm= 1
124 W
120 W
116 W
260
240
220
200
180
160
140
120
100
80
60
40
20
40 N
36 N
mi hr-1
68
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4

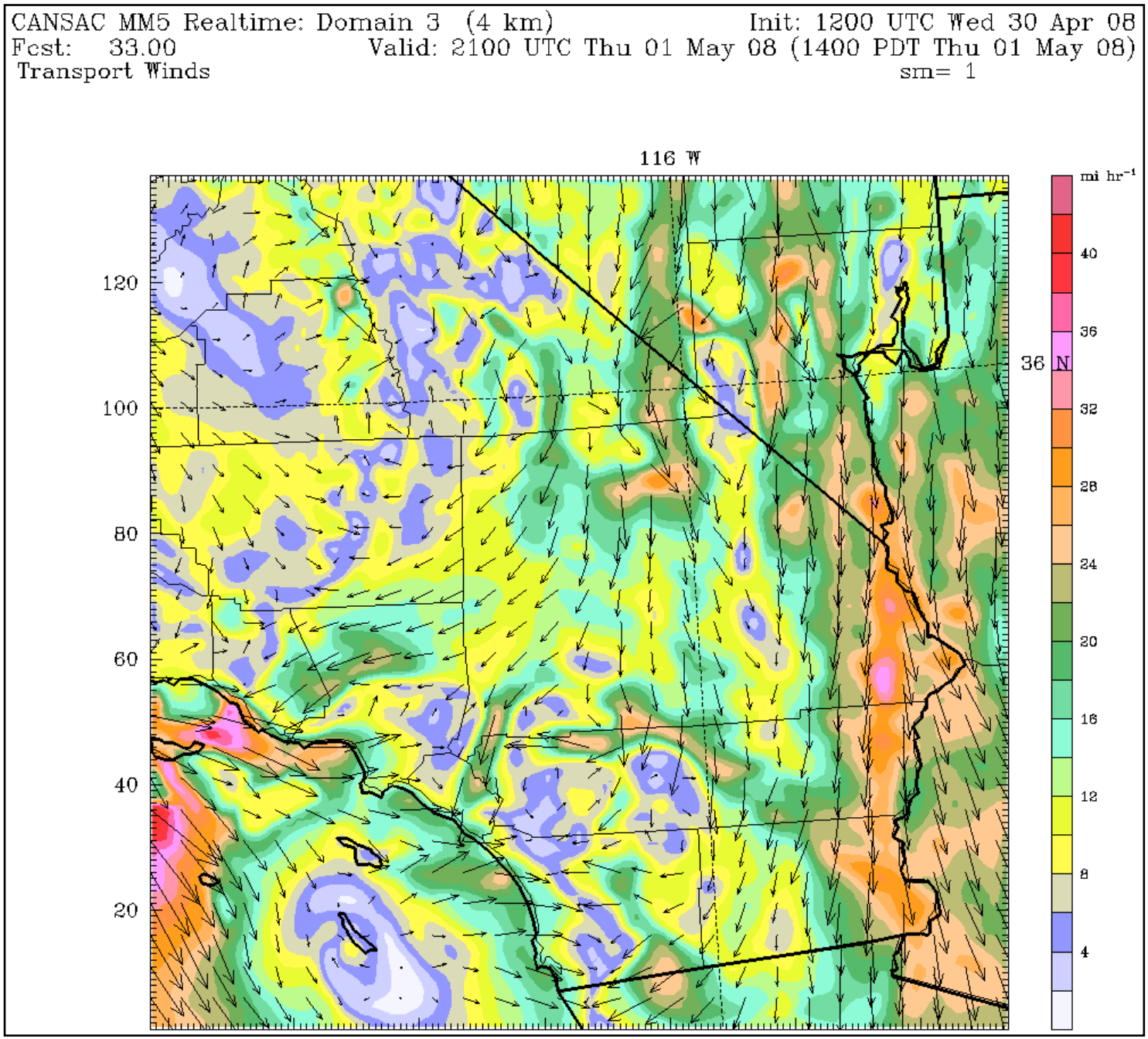

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 9.00
Valid: 2100 UTC Wed 30 Apr 08 (1400 PDT Wed 30 Apr 08)
Transport Winds
sm= 1
124 W
120 W
260
240
220
200
180
160
140
120
40 N
mi hr-1
48
44
40
36
32
28
24
20
16
12
8
4

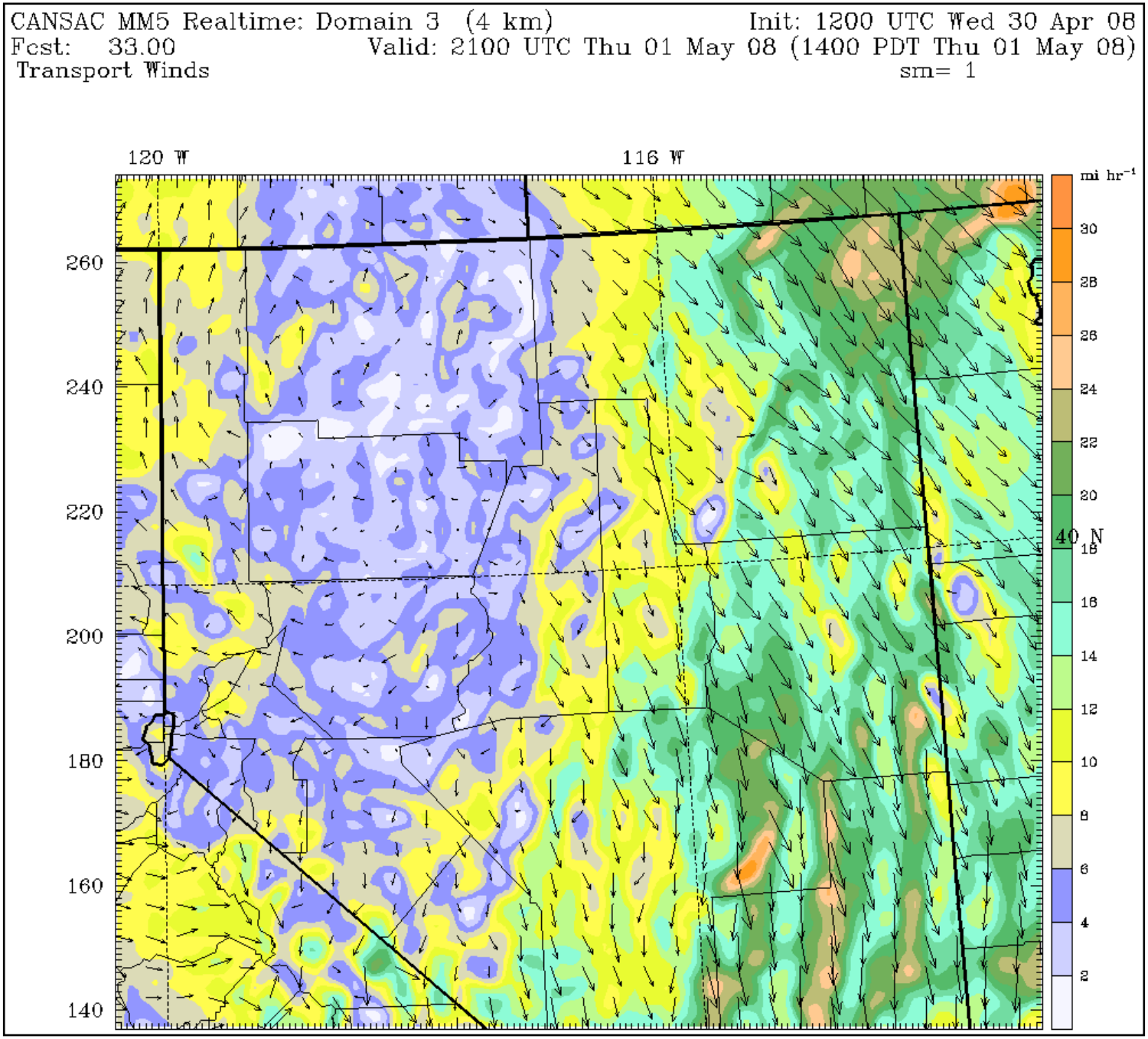

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 33.00
Valid: 2100 UTC Thu 01 May 08 (1400 PDT Thu 01 May 08)
Mixing Height
sm= 2
Horizontal wind vectors
at height = 0.01 km
sm= 1
120 W
116 W
160
140
120
100
80
60
40
20
36 N
ft
10000
8500
6500
5000
4000
3000
2200
1500
1000
600
300
150
75


CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 33.00
Valid: 2100 UTC Thu 01 May 08 (1400 PDT Thu 01 May 08)
Mixing Height
sm= 2
Horizontal wind vectors
at height = 0.01 km
sm= 1
116 W
120
100
80
60
40
20
36 N
ft
10000
8500
6500
5000
4000
3000
2200
1500
1000
600
300
150
75

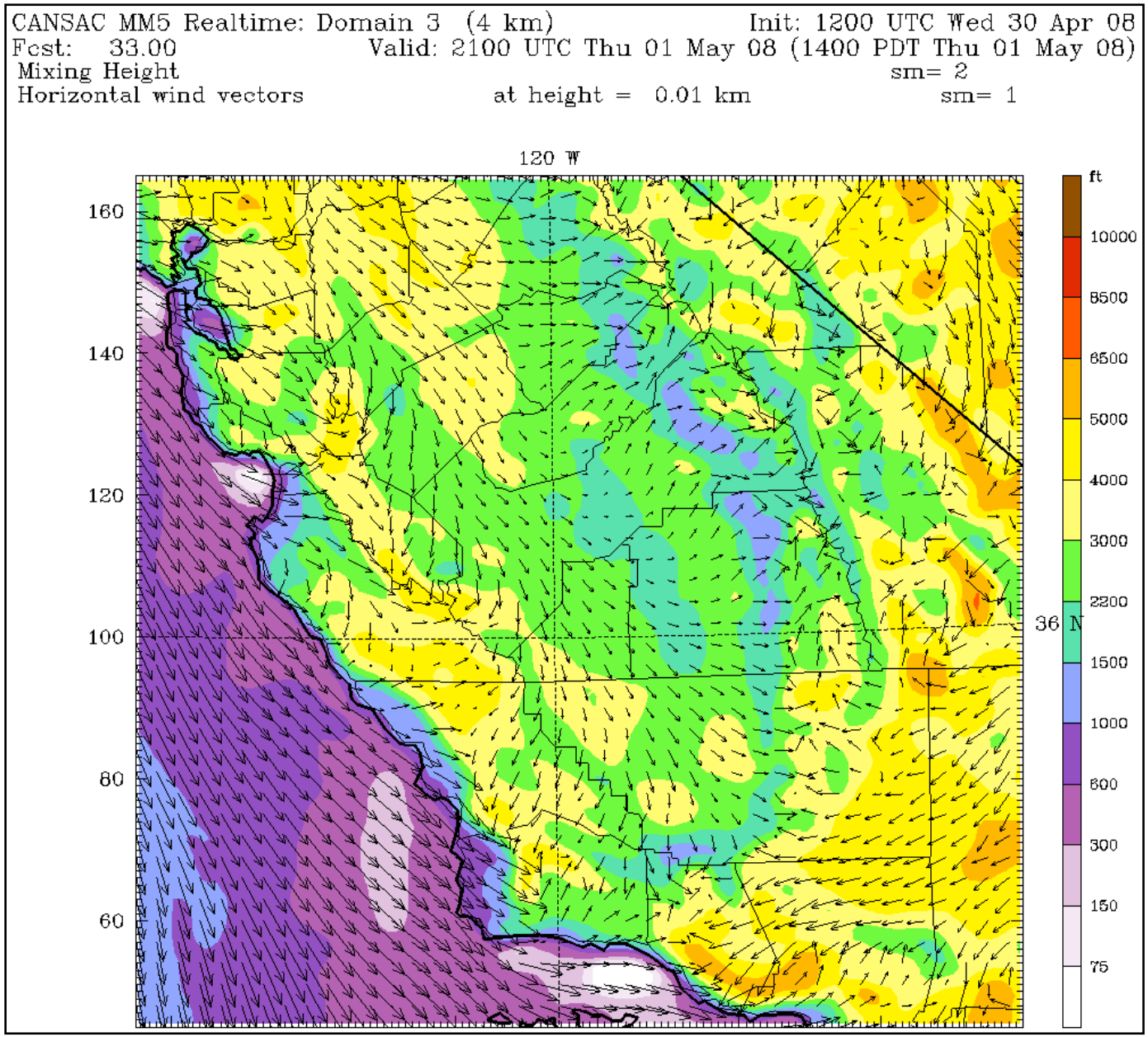

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 33.00
Valid: 2100 UTC Thu 01 May 08 (1400 PDT Thu 01 May 08)
Mixing Height
sm= 2
Horizontal wind vectors
at height = 0.01 km
sm= 1
120 W
116 W
260
240
220
200
180
160
140
40 N
ft
10000
8500
6500
5000
4000
3000
2200
1500
1000
600
300
150
75


CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 33.00
Valid: 2100 UTC Thu 01 May 08 (1400 PDT Thu 01 May 08)
Transport Winds
sm= 1
120 W
116 W
160
140
120
100
80
60
40
20
36 N
mi hr-1
40
36
32
28
24
20
16
12
8
4

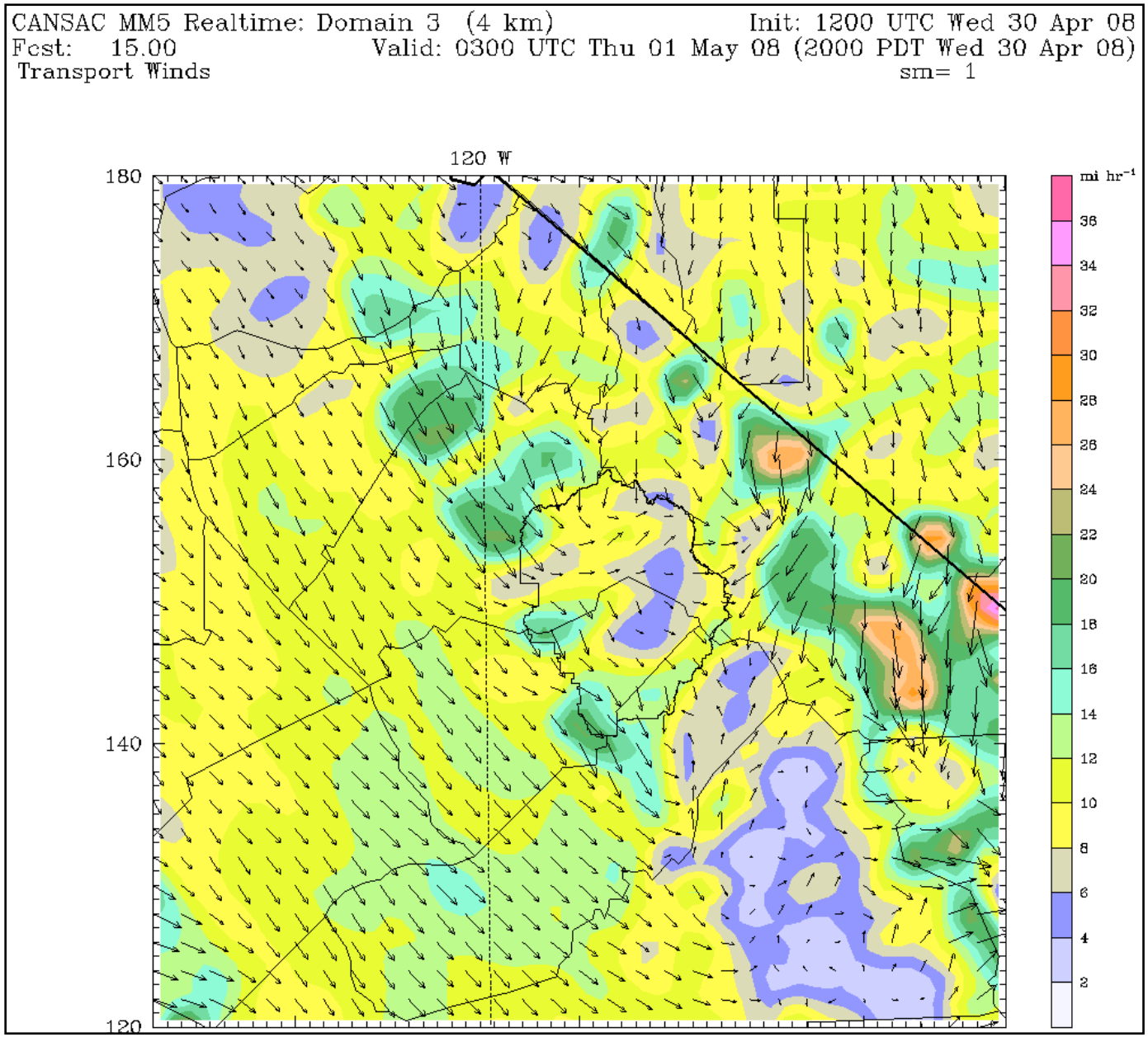

CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 33.00
Valid: 2100 UTC Thu 01 May 08 (1400 PDT Thu 01 May 08)
Transport Winds
sm= 1
116 W
120
100
80
60
40
20
36 N
mi hr-1
40
36
32
28
24
20
16
12
8
4


CANSAC MM5 Realtime: Domain 3 (4 km)
Init: 1200 UTC Wed 30 Apr 08
Fcst: 33.00
Valid: 2100 UTC Thu 01 May 08 (1400 PDT Thu 01 May 08)
Transport Winds
sm= 1
120 W
116 W
260
240
220
200
180
160
140
40 N
mi hr-1
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2

This is a 'specialty domain', centered on the San Joaquin Vly UAPCD. You are looking at the 33 hour Mixing height forecast from Wednesday morning's 0500 PDT CANSAC run.



This is the 'specialty domain' centered on Yosemite NP. You are looking at 15 hour Transport wind forecast from yesterday's 0500 run, VT 8pm PDT Wed. evening.

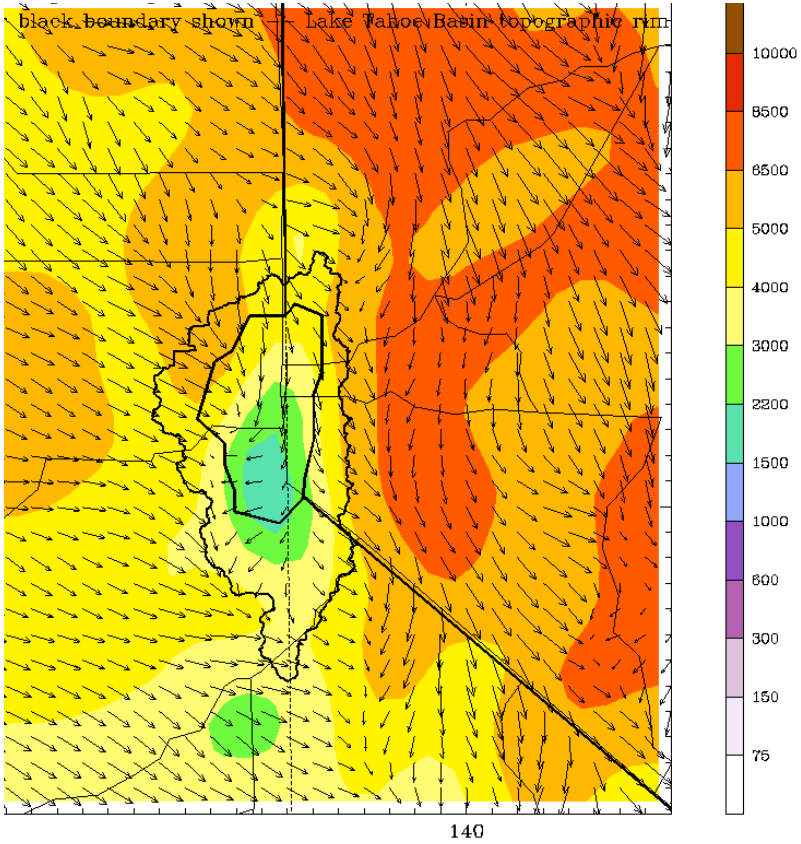


Special domain made recently for the Lake Tahoe Basin. Questions may arise in your mind… Why are there lower mixing heights over the lake? Why are they centered on the south end of the lake? Why are transport winds lower in a very similar area? Is this just a coincidence?

[Why did the Giants sign Barry Zito?]

Domain 3 (4 km) Init: 1200 UTC Wed 30 Apr 08
Valid: 2100 UTC Wed 30 Apr 08 (1400 PDT Wed 30 Apr 08)
sm= 2
at height = 0.01 km sm= 1

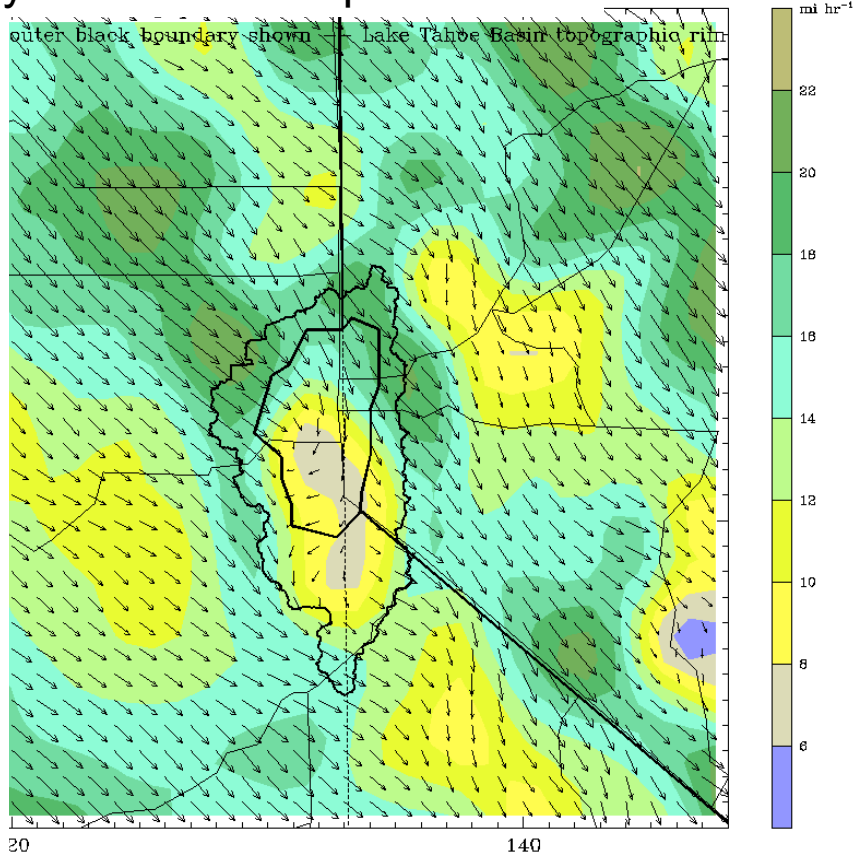
Mixing Heights 2pm yesterday



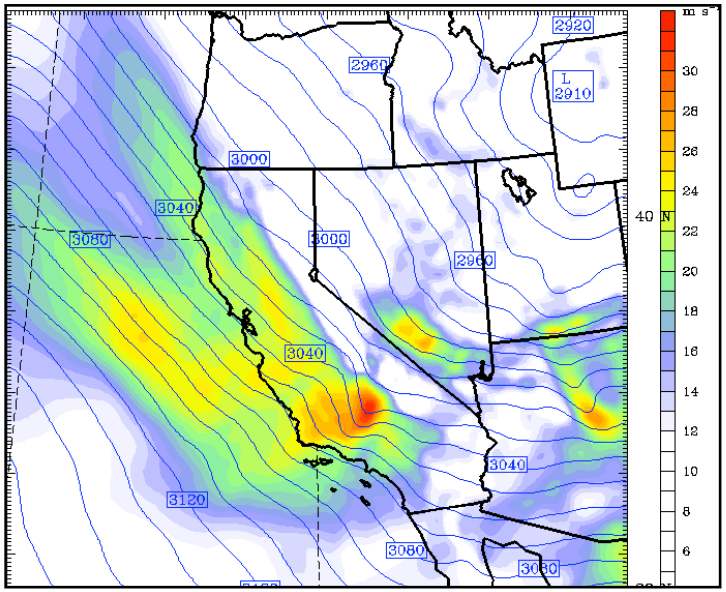
MAXIMUM VECTOR: 17.4 mi hr^{-1} ⟶
No Cumulus Eta PBL Simple ice 4 km, 31 levels, 12 sec

me: Domain 3 (4 km) Init: 1200 UTC Wed 30 Apr 08
Valid: 2100 UTC Wed 30 Apr 08 (1400 PDT Wed 30 Apr 08)
sm= 1

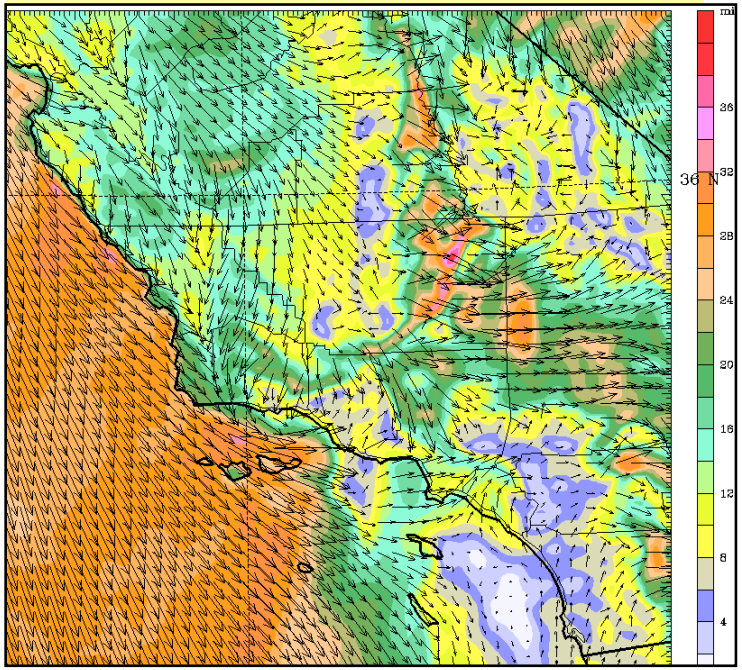
Transport Winds

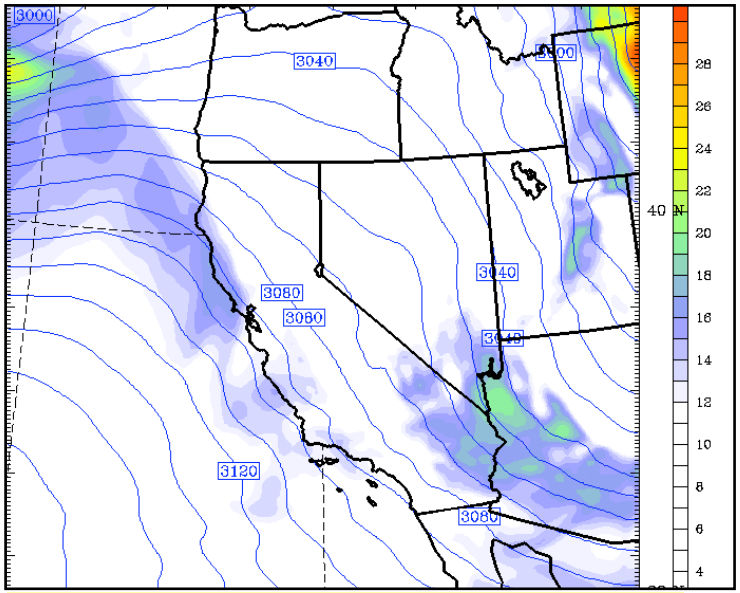


MAXIMUM VECTOR: 25.2 mi hr^{-1} ⟶
17.3 No Cumulus Eta PBL Simple ice 4 km, 31 levels, 12 sec

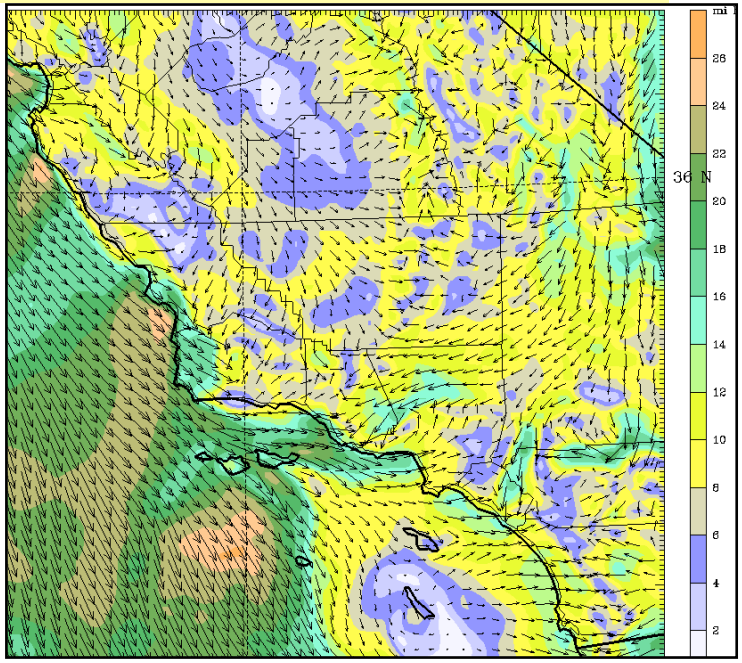


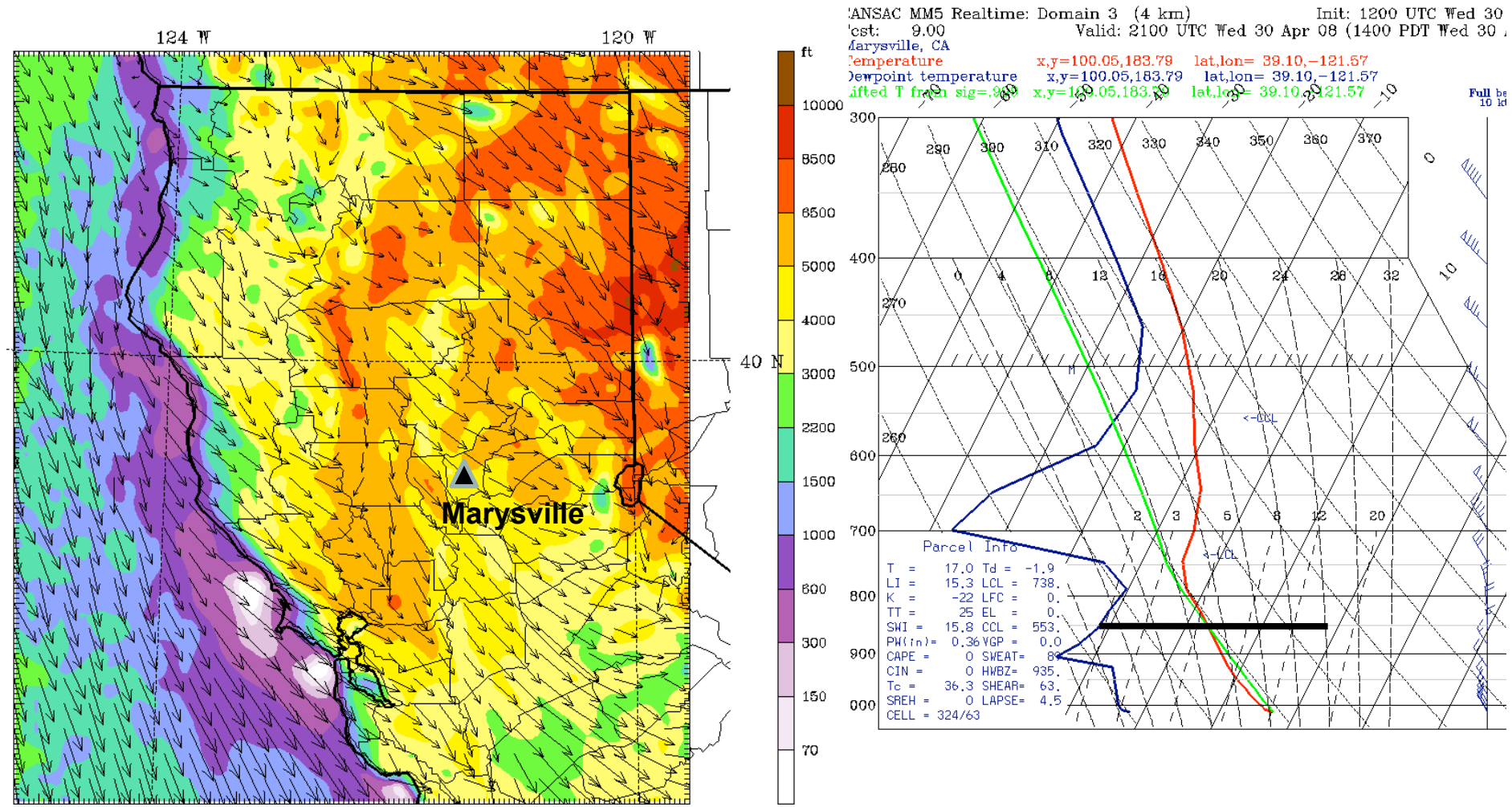
Above, 10,000 ft winds VT 2pm 4/30/8
Below 10-m Sfc Winds, VT 2pm 4/30/8





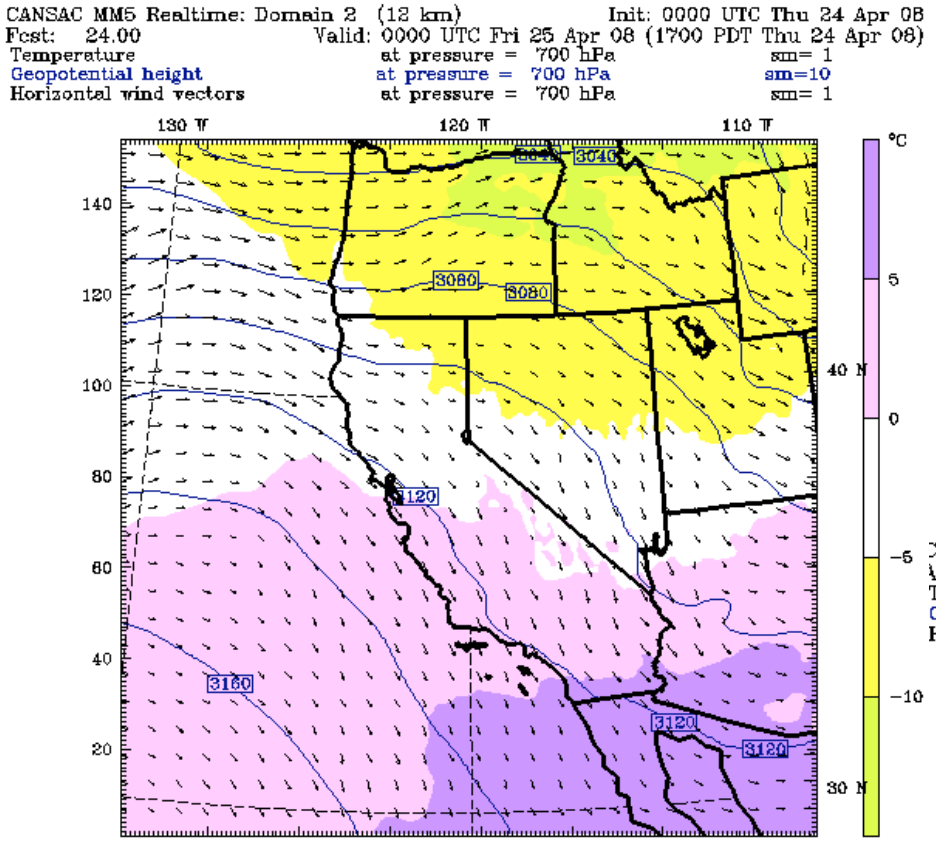
Above, 10,000 ft winds VT 2pm 5/1/8
Below 10-m Sfc Winds, VT 2pm 5/1/8





On the left, we have a CANSAC mixing height map valid 2pm yesterday (21Z). On the right is the corresponding CANSAC sounding. Using the 'old school technique' to find a mixing height from a sounding leads to the level of the horizontal black bar, just below 850 mb, 4500-5000'

Verification products



Above, CANSAC 24 hr forecast of 700 mb heights, temps, winds

Below, actual analysis at 700 mb 24 hours later, at fcst VT