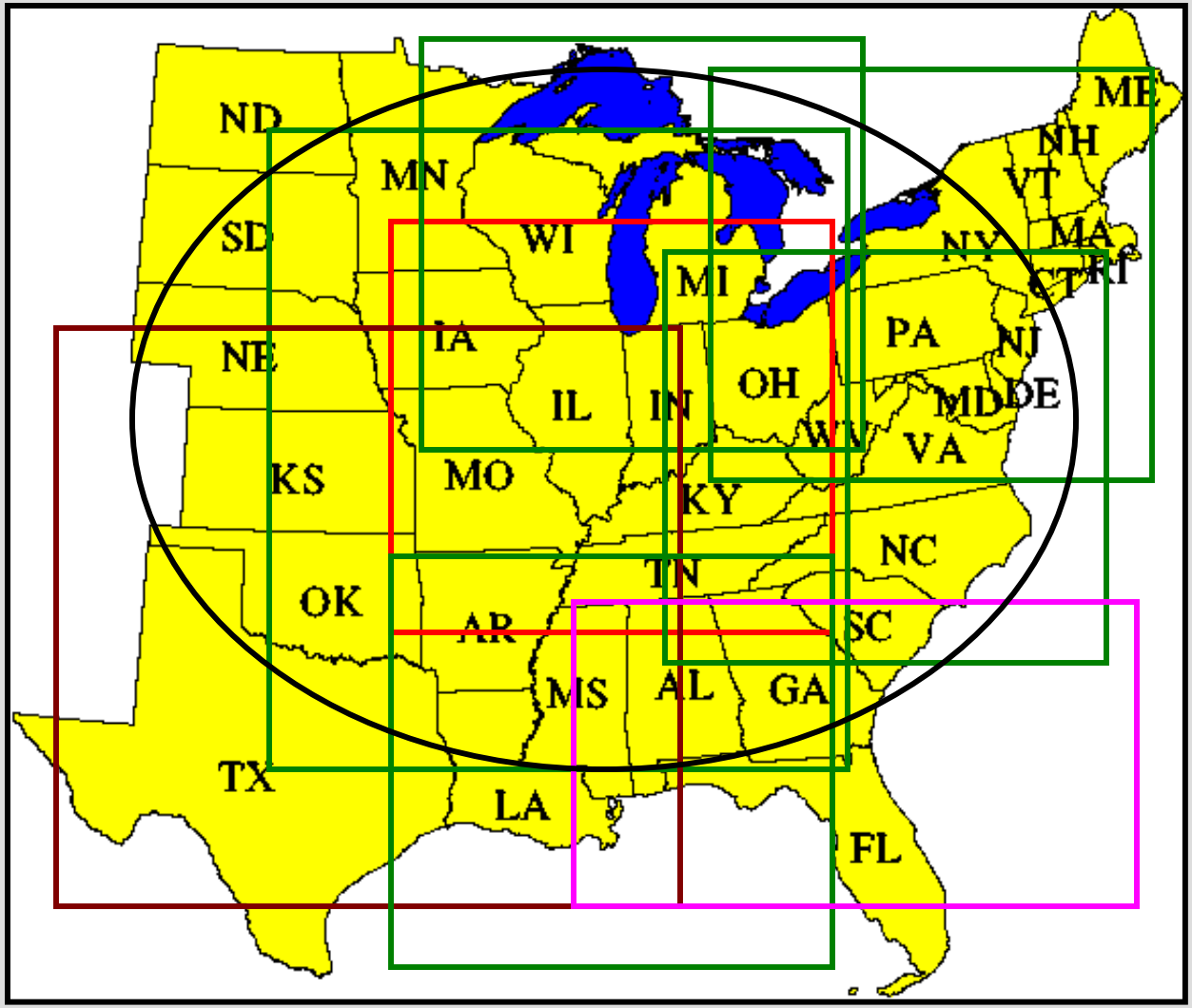
Status of MM5/Photochemical

Domain Configuration/Episode Selection for St. Louis Area



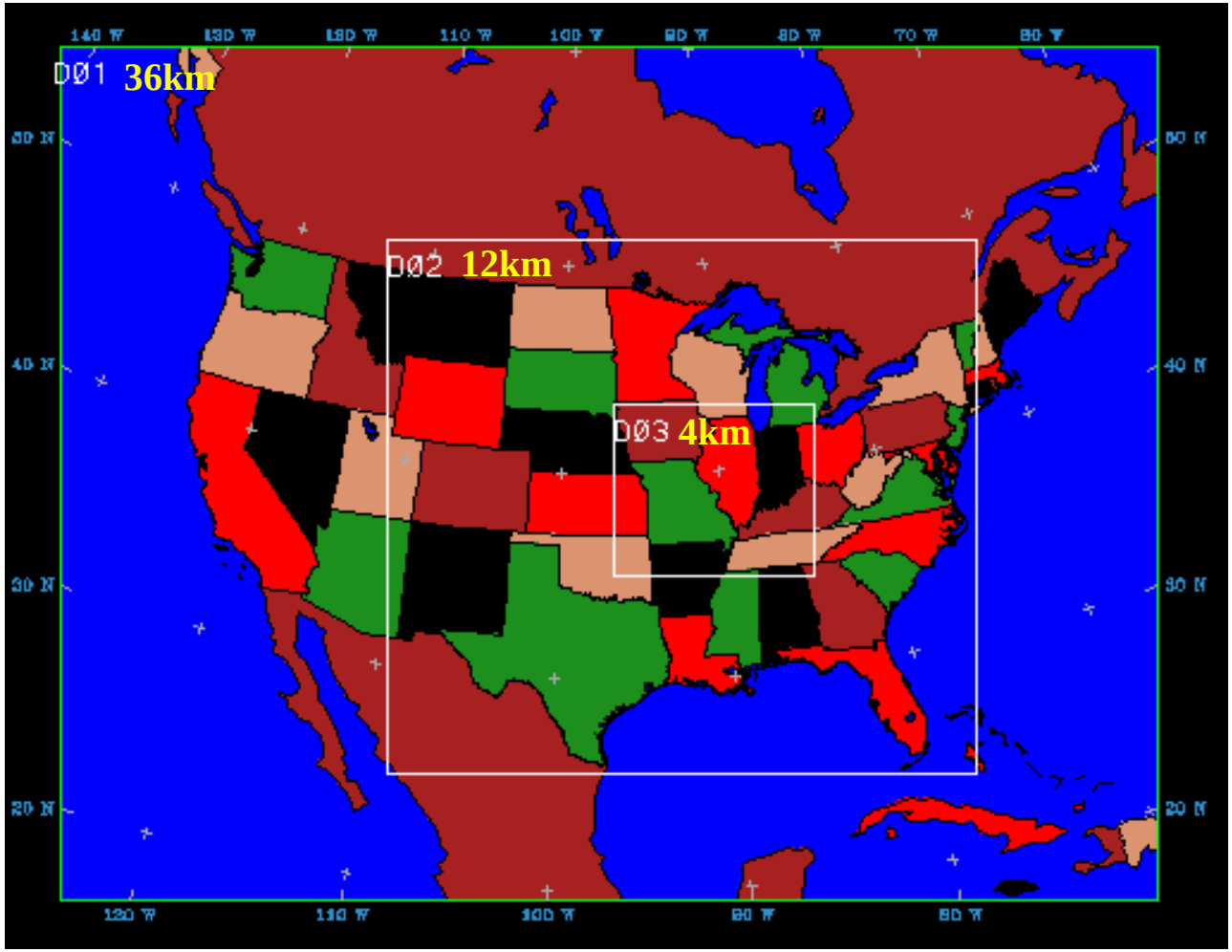
St. Louis Technical Meeting

January 25th, 2005

MM5 36-12-4 km Grid Domain Scenario (Base 1)

Technical Group Consensus Grid Dimension

36km: 129x165
12km: 241x265
4km: 235x271
Total Cells= 5.0 mil



Episode Days Modeled for MM5 Base1

Model 'Ramp up' days ⇩ ⇩ ⇩ ⇩

Exceedances days in St. Louis ⇩ ⇩ ⇩ ⇩ ⇩ ⇩

Modeler																
MDNR (Dawn) →	June	15	16	17	18	19	20	21	22	23	24, 2002					
AMEREN (Ken) →	Jul/Aug	28	29	30	31	1	2	3	4	5	6, 2002					
RegionVII (Bret) →	July	9	10	11	12	13	14	15	16	17	18, 2002					
IEPA (Steve) →	Jan/Feb	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7
		8	9	10	11	12	13	14, 2002								

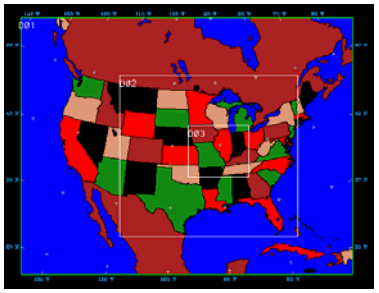
Status of the MM5 Runs

Modeler	Days to Run, Run Time, Completion %
MDNR (Dawn) →	June 15-24, 2002 – 84 hours per day, **60% complete**
AMEREN (Ken) →	July 28 - Aug 6, 2002 – 57 hours per day, **Done**
Region VII (Bret) →	July 9-18, 2002 – 82 hours per day, 20% **complete**
IEPA (Steve) →	Jan 24 -Feb 14 – 55 hours per day, 58% **complete**

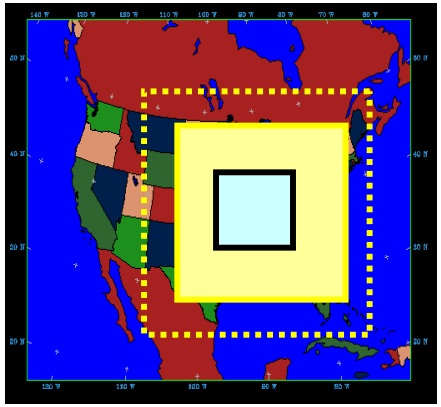
Grid Conversion: MM5 to CAM-X

*Proposed collapsing of MM5 vertical layers to Photochemical Model layers.

MM5 Vertical Layers = 34
MM5 Horizontal Structure: (Nx, Ny)
36 km = 165 x 129
12 km = 265 x 241
04 km = 271 x 235
Total Grid Cells = 5.0 mil



CAM-X Vertical Layers = 16
CAM-X Horizontal Structure: (Nx,Ny)
36 km = 97 x 90
12 km = 200 x 195
04 km = 235 x 271
Total Grid Cells = 1.8 mil



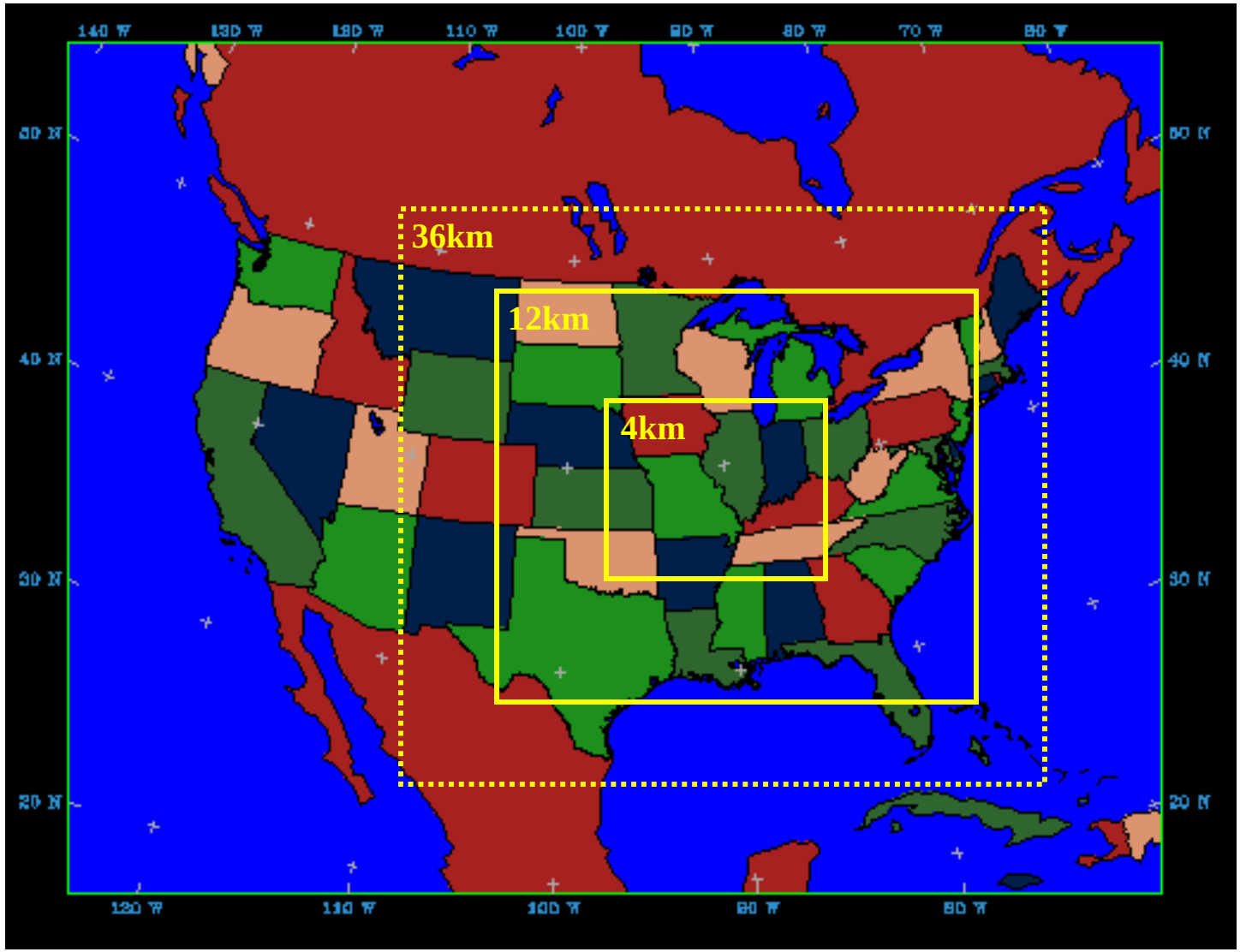
Height(m)	k(MM5)	Depth(m)	CAM-X	Depth(m)	Bottom of Layer (m)
14662	34	1841	16	4535	14661
12822	33	1466			
11356	32	1228			
10127	31	1062	15	3611	10126
9066	30	939			
8127	29	843			
7284	28	767			
6517	27	704	14	2533	6515
5812	26	652			
5160	25	607			
4553	24	569			
3984	23	536	13	1522	3982
3448	22	506			
2942	21	480			
2462	20	367	12	634	2460
2095	19	266			
1828	18	259	11	428	1826
1569	17	169			
1400	16	166	10	329	1398
1235	15	163			
1071	14	160	9	318	1069
911	13	158			
753	12	78	8	155	751
675	11	77			
598	10	77	7	153	596
521	9	76			
445	8	76	6	151	445
369	7	75			
294	6	74	5	148	294
220	5	74			
146	4	37	4	37	146
109	3	37	3	37	109
73	2	36	2	36	72
36	1	36	1	36	36
--Surface----	Surface----	Surface----	Surface----	Surface--	--Surface--

Straw Man Proposal

Photochemical Modeling Domain
St. Louis 8-hour Ozone/PM2.5
Horizontal = 36-12-4 km Grid
Vertical = 16 levels

Photochemical Grid Dimensions

36km: 97 x 90
12km: 200 x 195
4km: 271x 235
Total Cells=1.8 mil

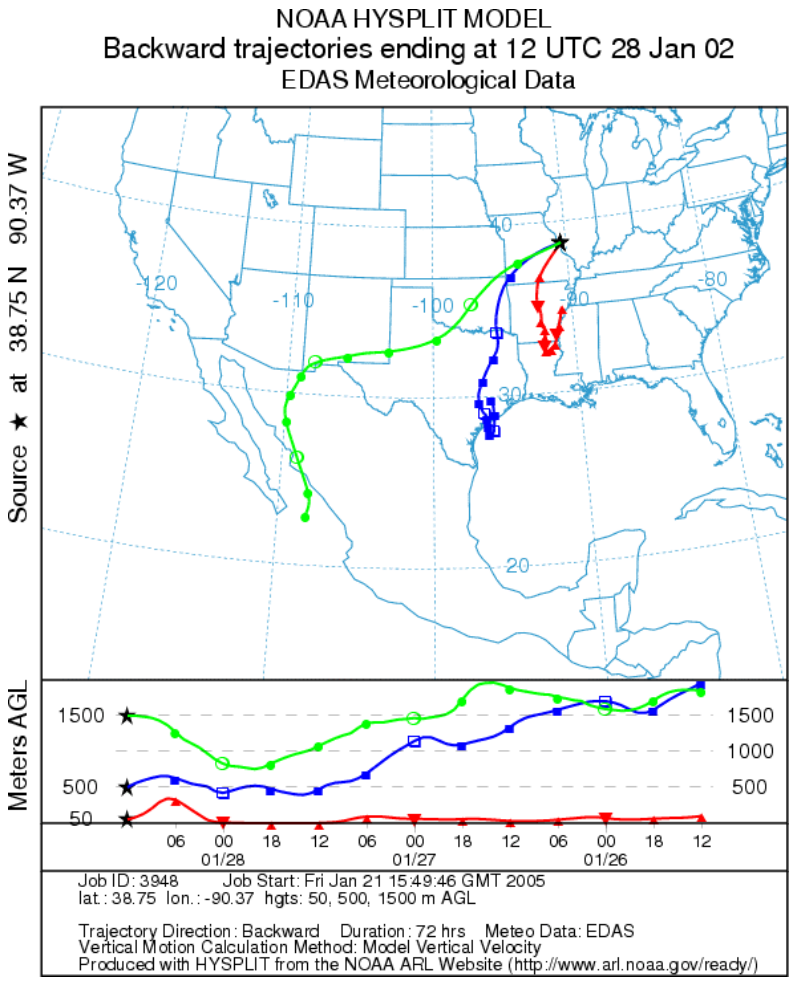


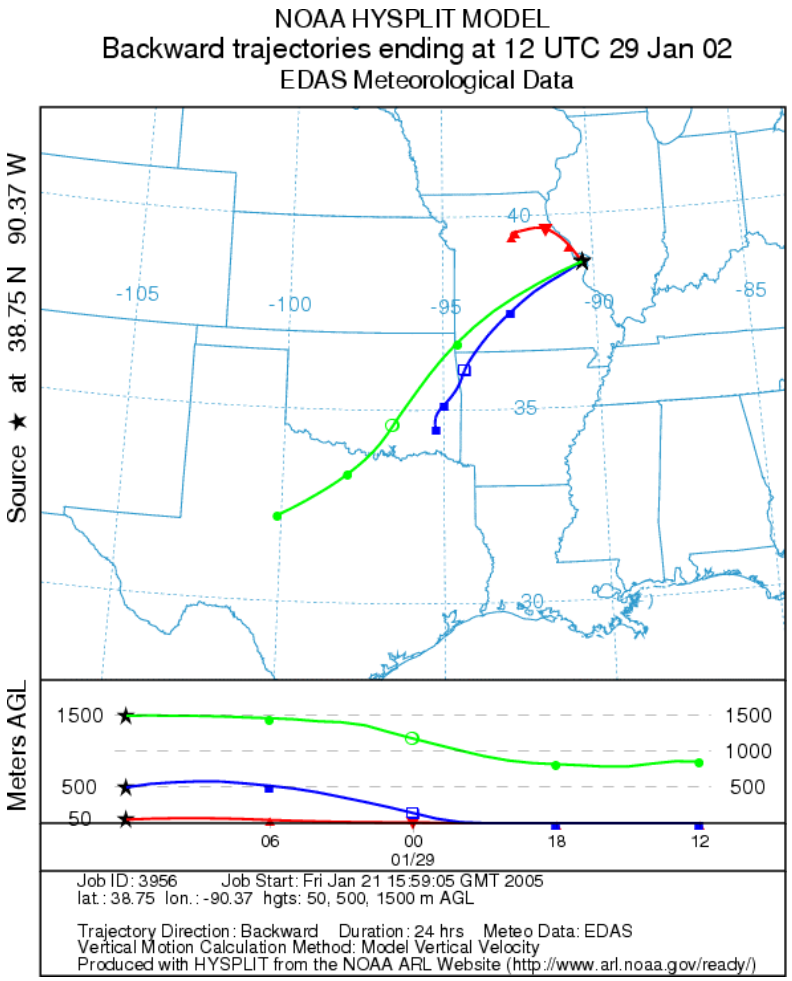
"Proposed"
Days to simulate in Photochemical Model

Model 'Ramp up' days **Exceedances days in St. Louis**

June	16	17	18	19	20	21	22	23,	2002
July	10	11	12	13	14	15	16,	2002	
Jul/Aug	29	30	31	1	2	3	4,	2002	
Jan/Feb	25	26	27	28	29	30	31	1	2
	3	4	5	6	7	8	9	10	11, 2002

Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)



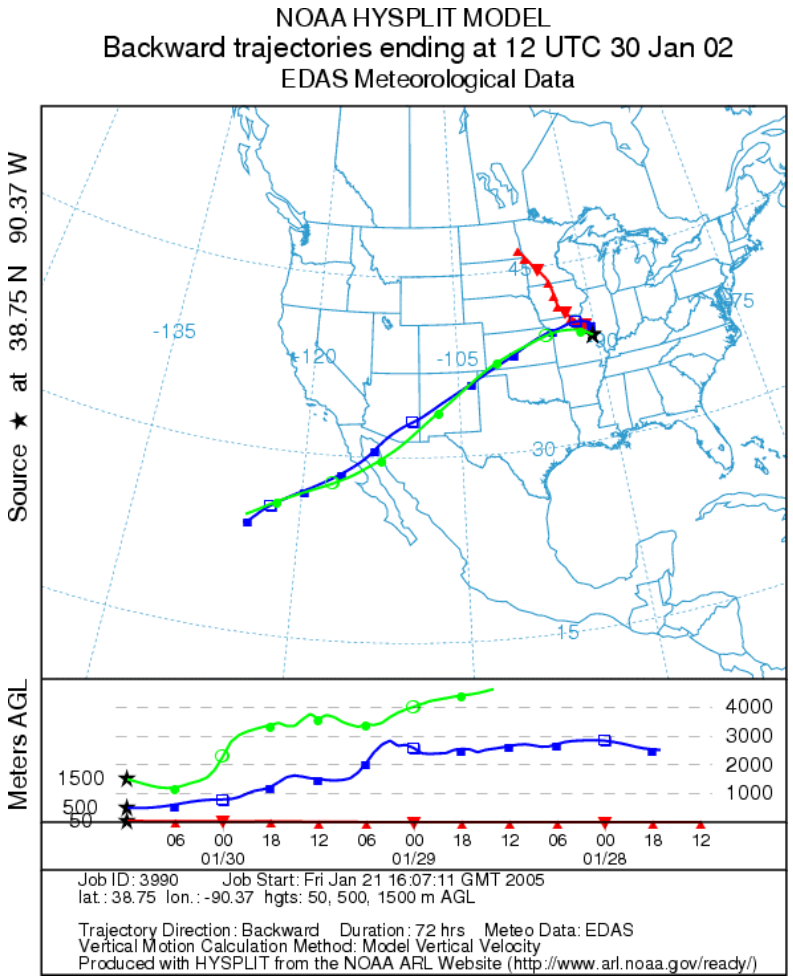


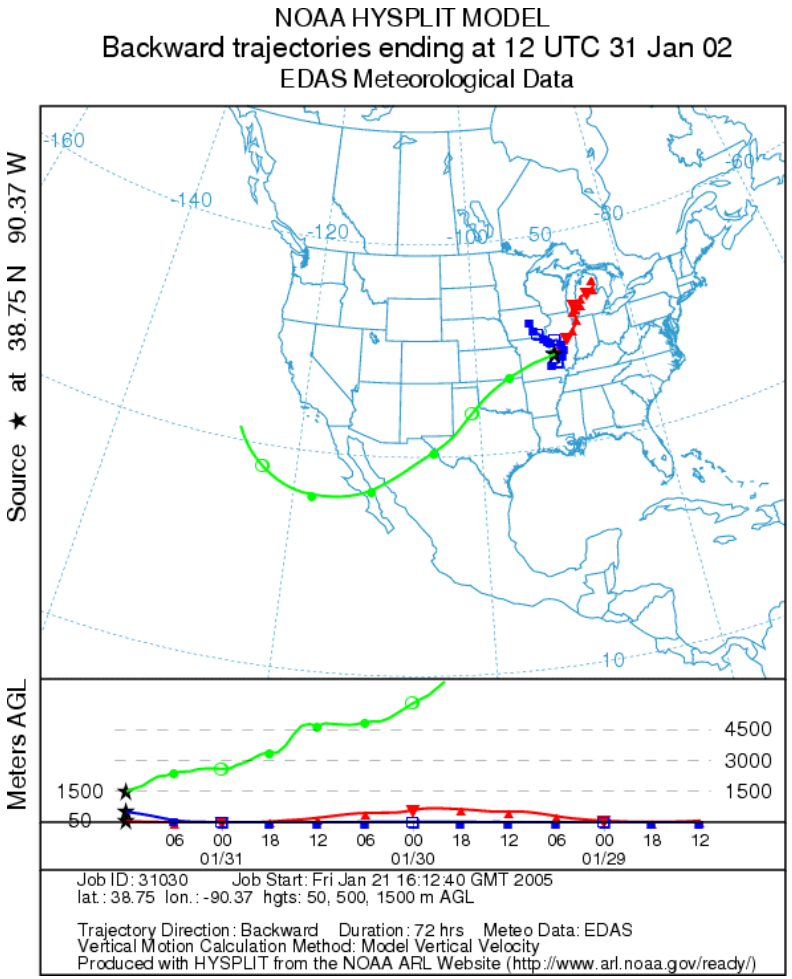
Max PM2.5 Concentration in STL

31.5 ug/m3 (Wood River)

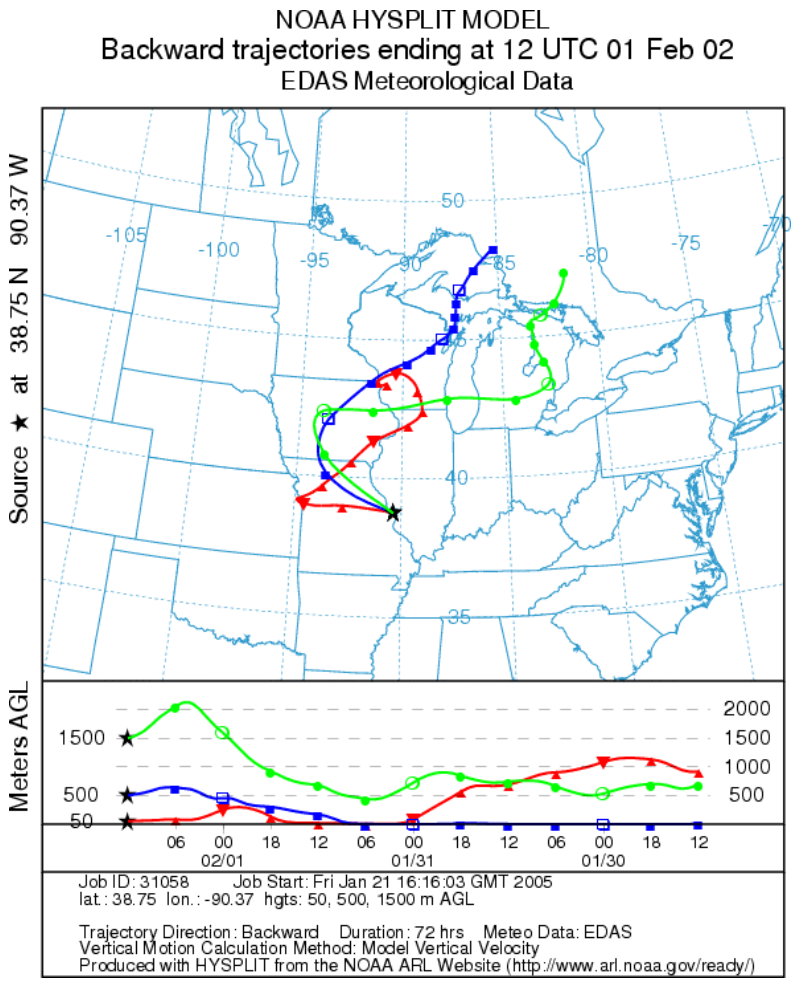
31.2 ug/m3 (South Broadway)

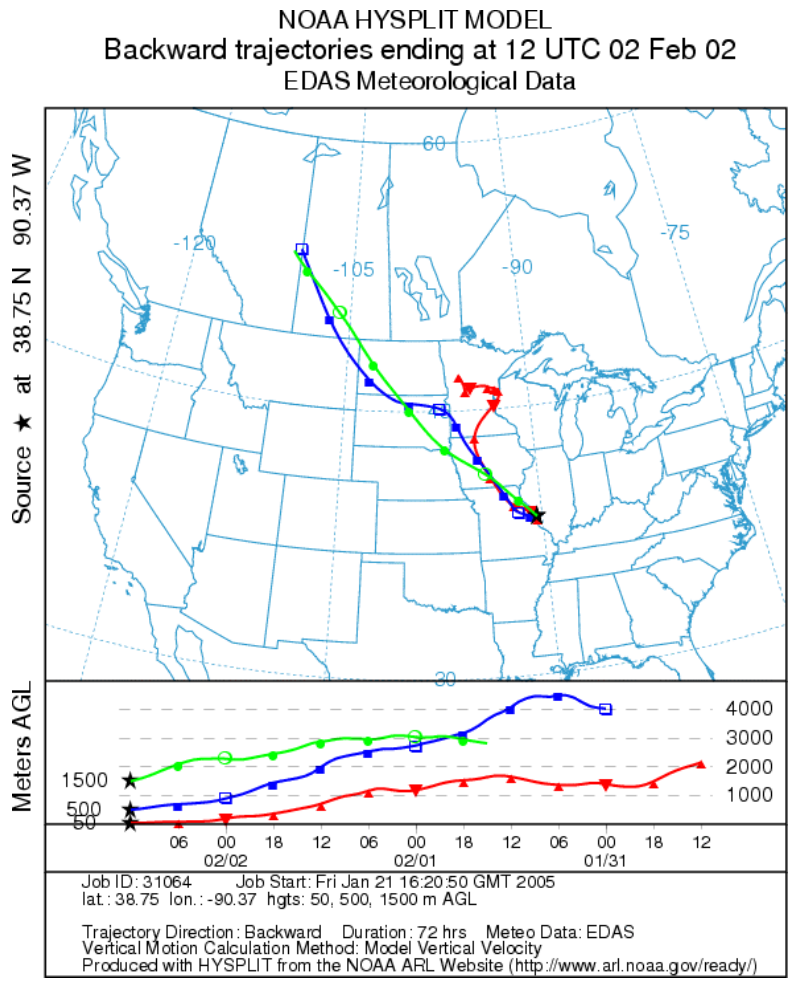
Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)





Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)

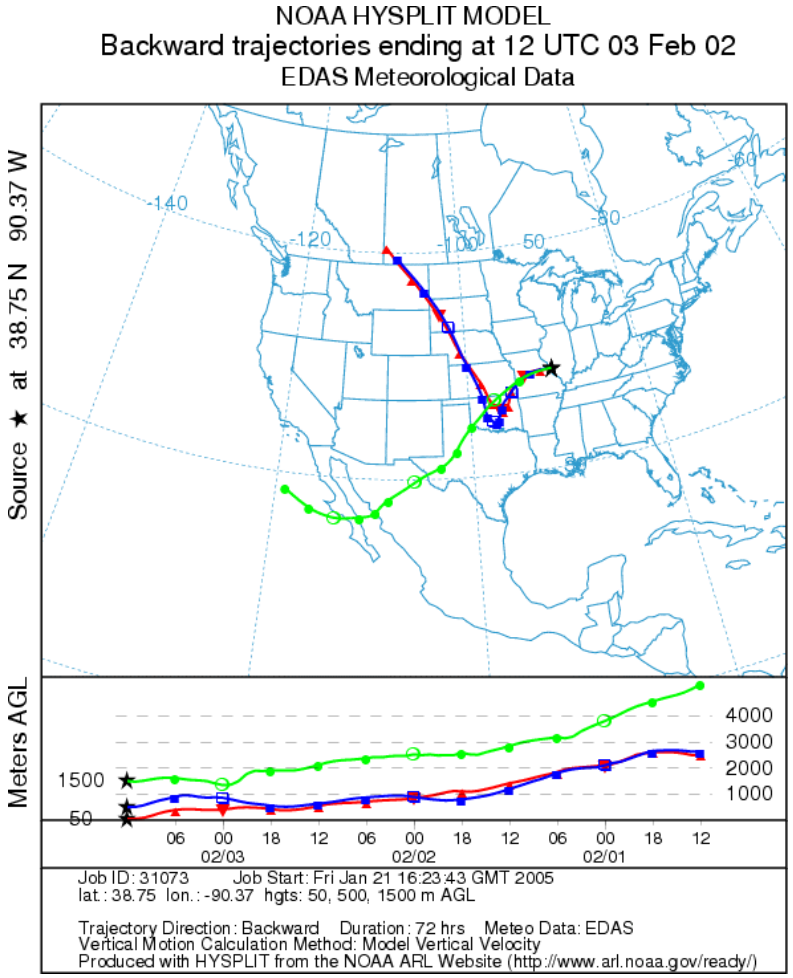


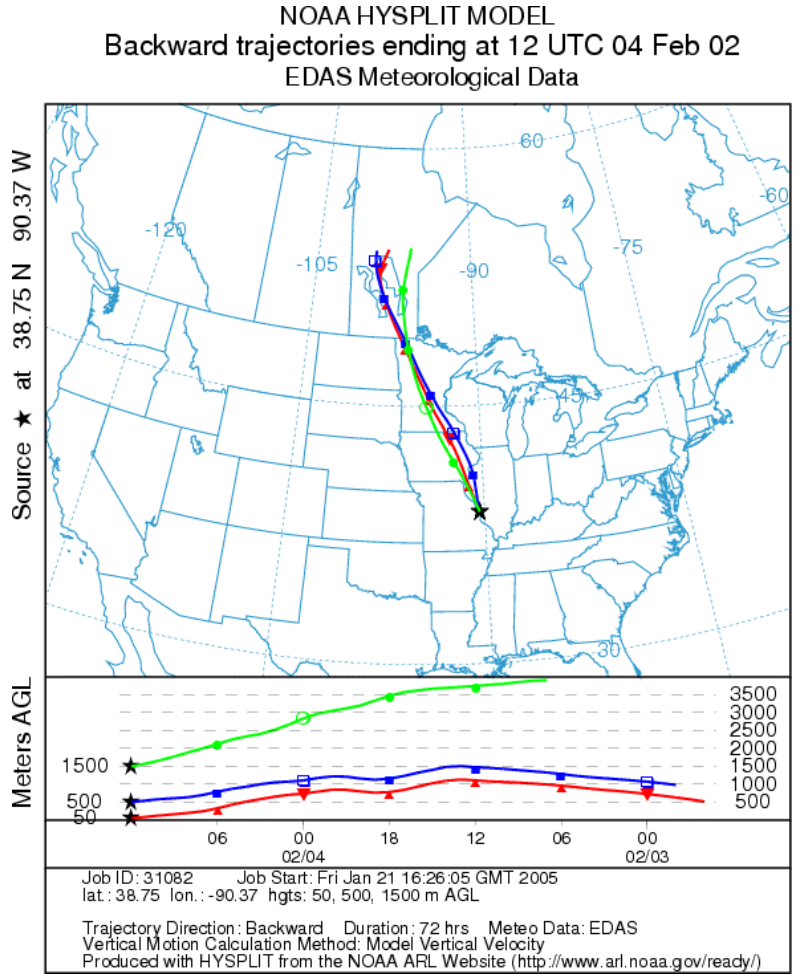


Max PM2.5 Concentration in STL

9.1 ug/m3 (Arnold, Ladue "Clayton")

Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)



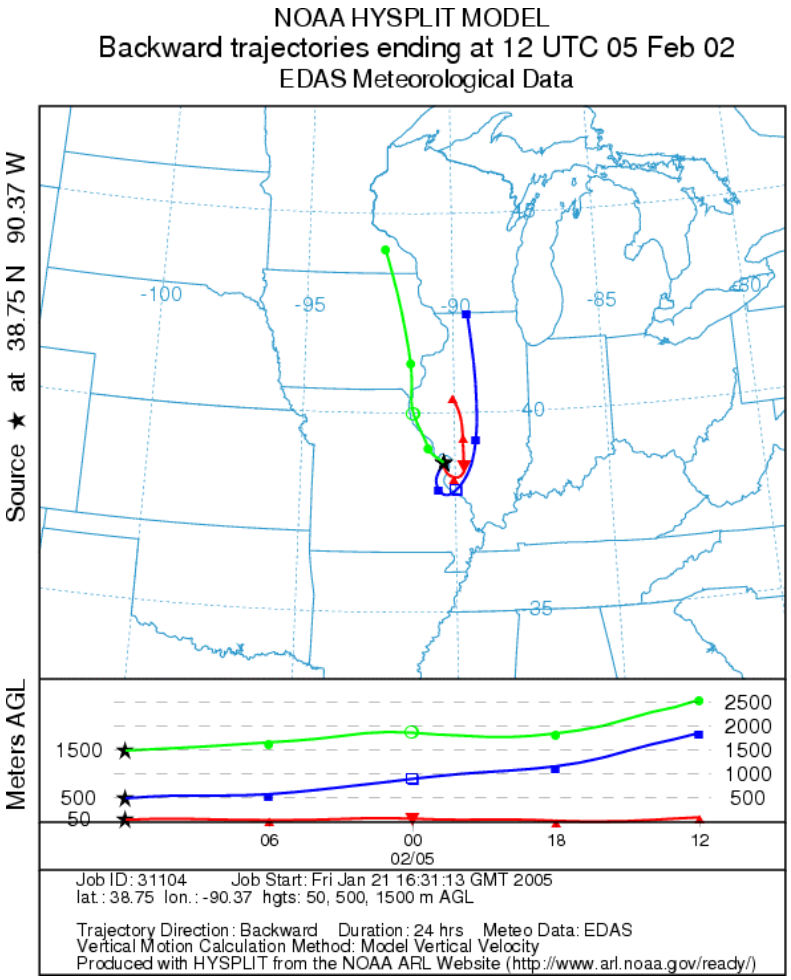


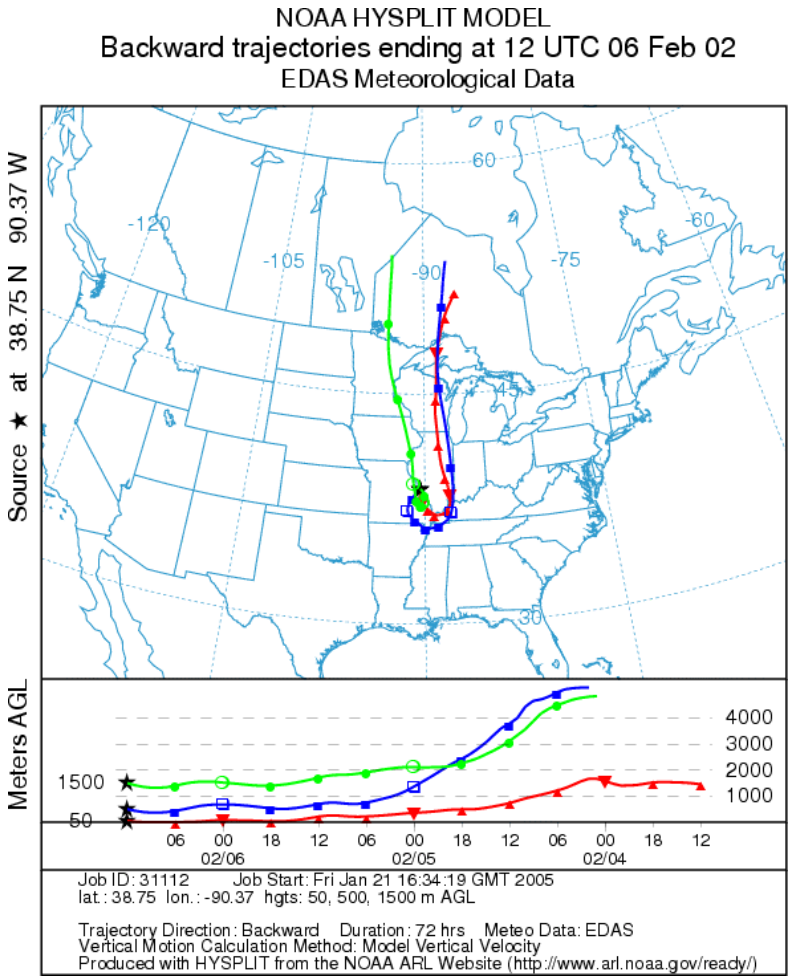
Max PM2.5 Concentration in STL

13.7 ug/m3 (Arnold)

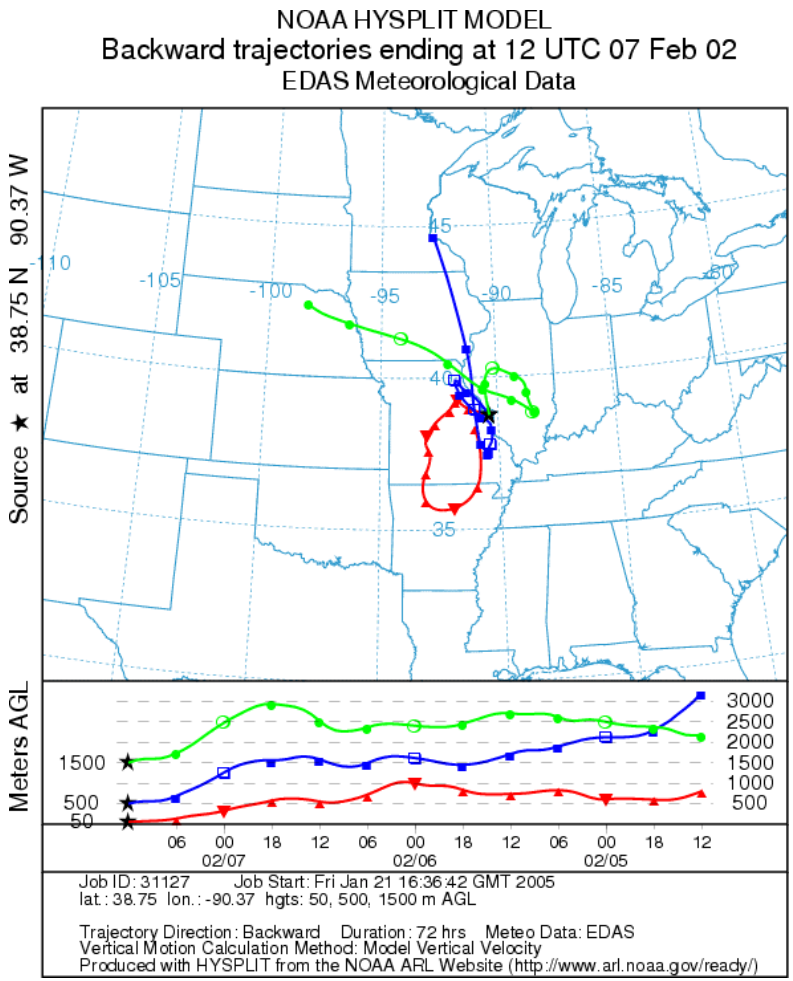
12.5 ug/m3 (Broadway)

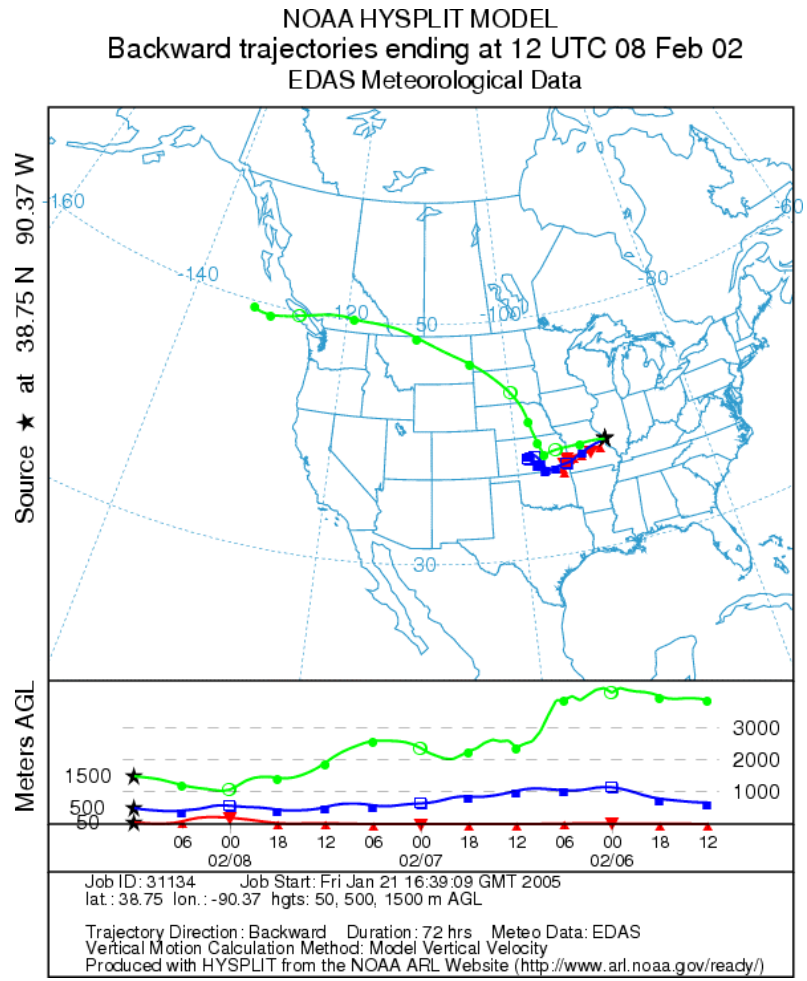
Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)





Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)



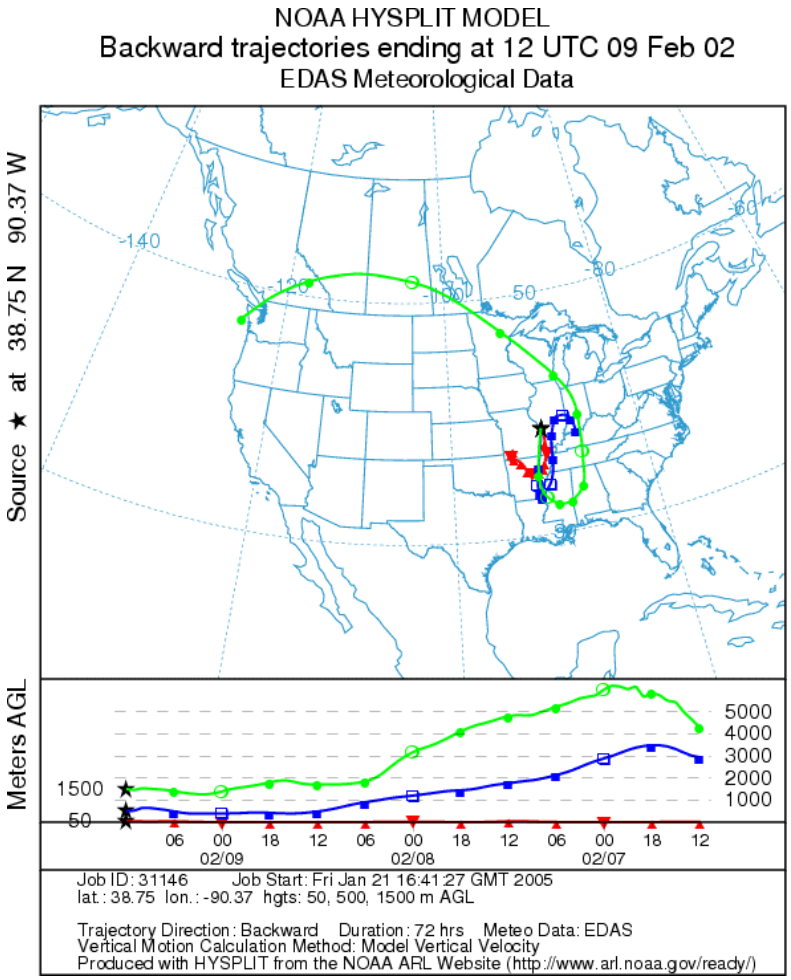


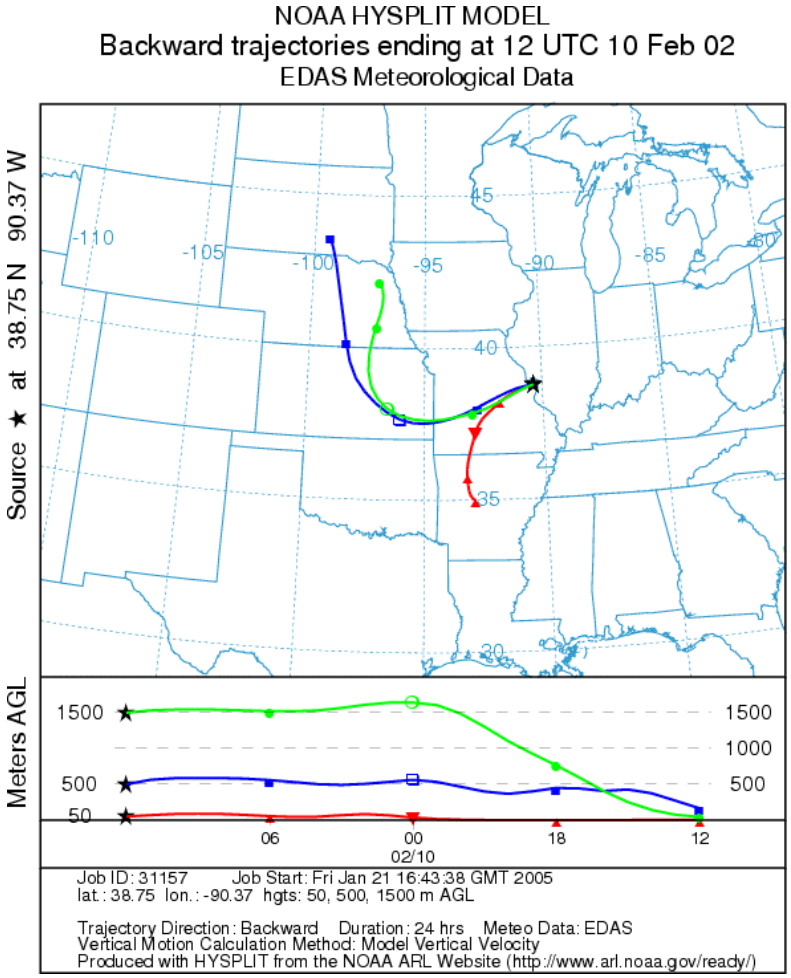
Max PM2.5 Concentration in STL

23.2 ug/m3 (Granite City)

21.7 ug/m3 (Blair St.)

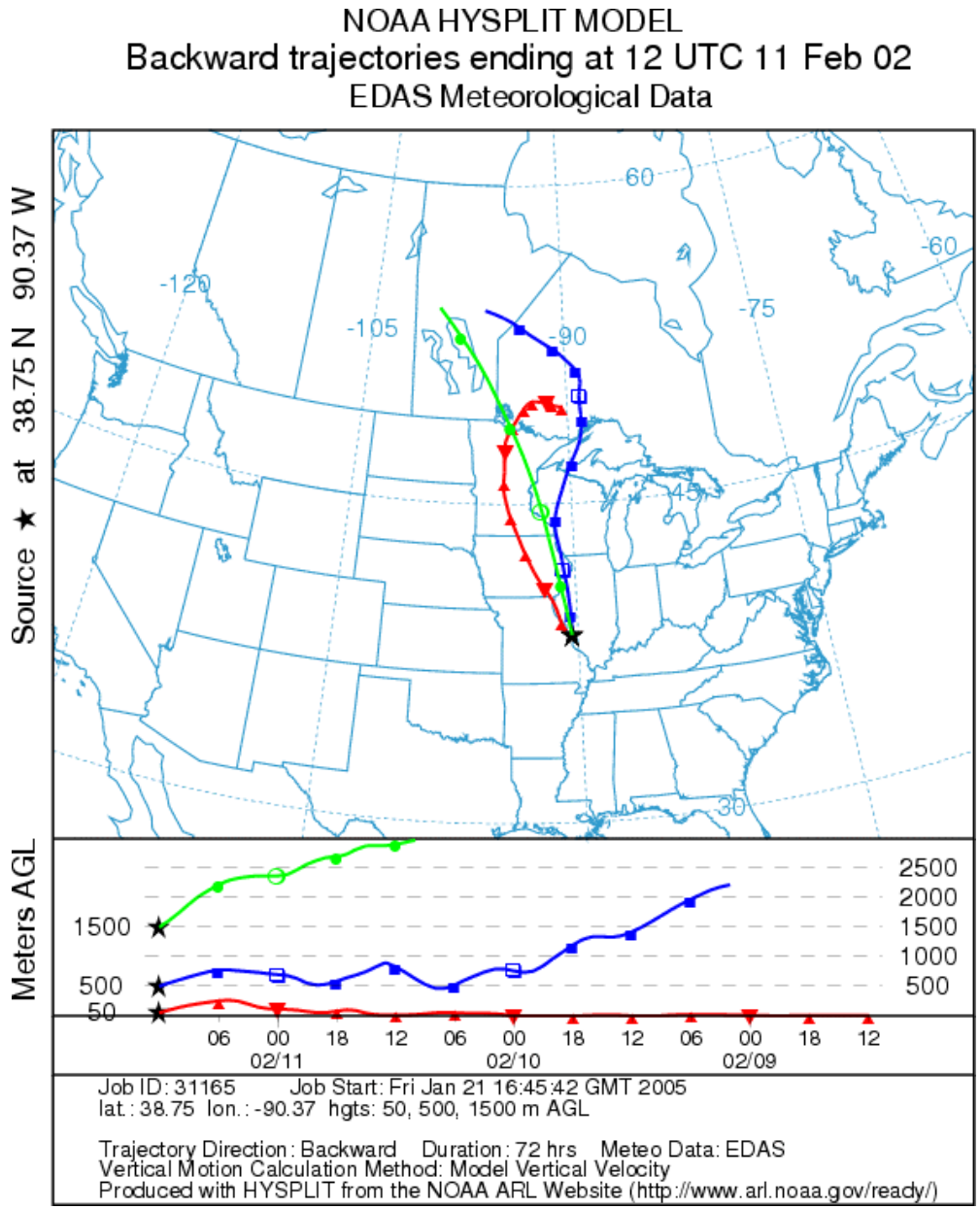
Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)





Max PM2.5 Concentration in STL

12.0 ug/m3 (Granite City)

10.3 ug/m3 (Alton)

Back Trajectories for Winter Episode (Jan 28-Feb 11, 2002)