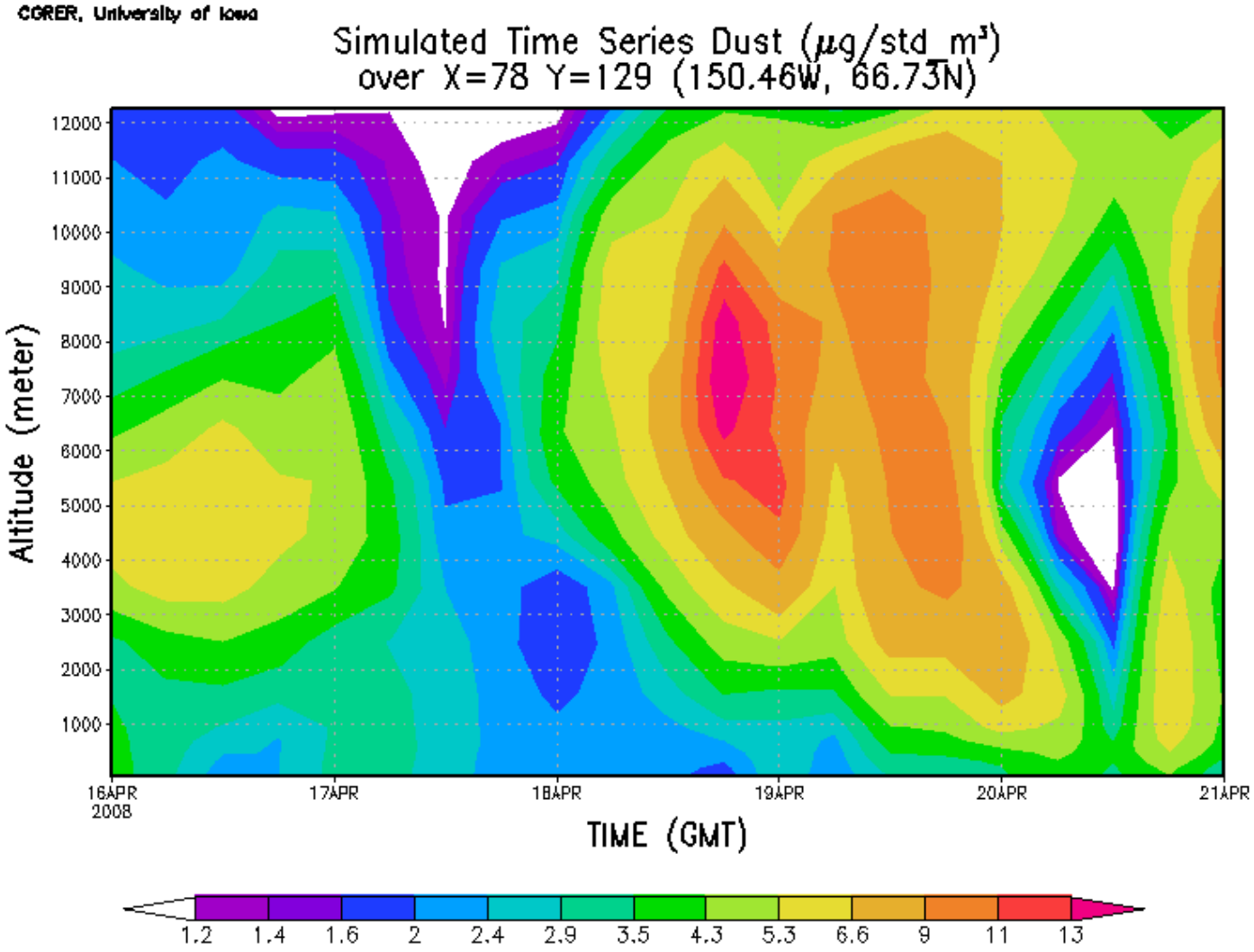
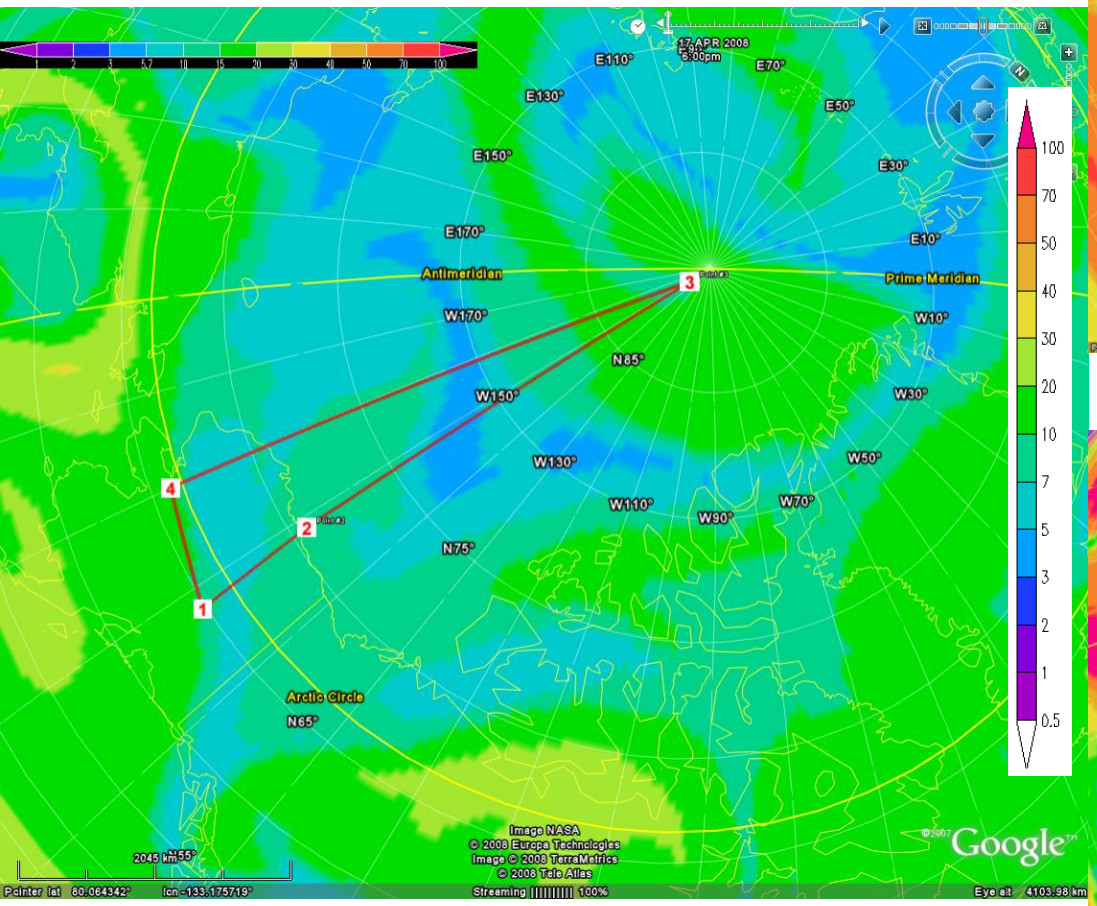

CGRER, University of Iowa
Simulated Time Series Dust (μg/std m³)
over X=78 Y=129 (150.46W, 66.73N)
Altitude (meter)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
16APR
2008
17APR
18APR
19APR
20APR
21APR
TIME (GMT)
1.2
1.4
1.6
2
2.4
2.9
3.5
4.3
5.3
6.6
9
11
13

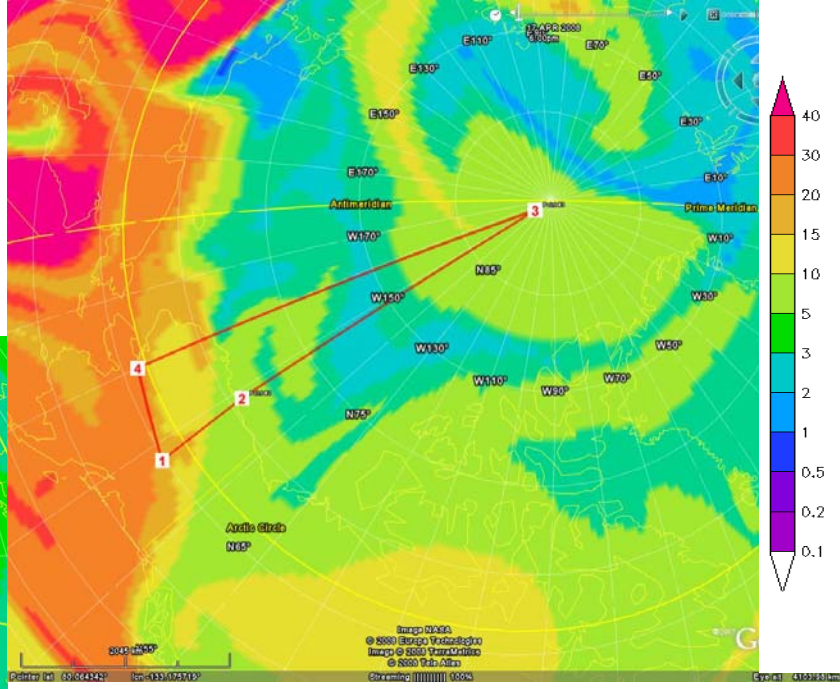
Biomass CO

Europe Flight

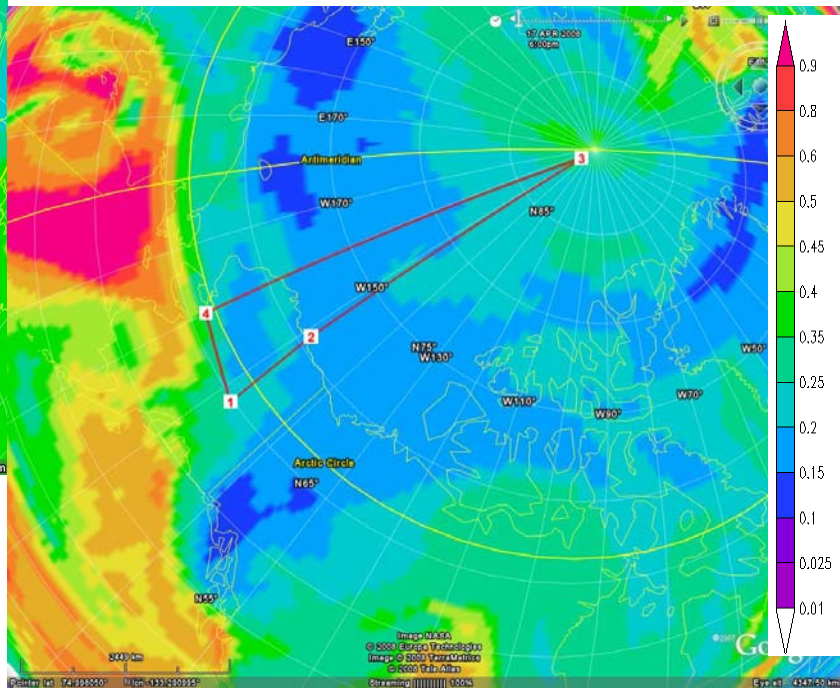
April 17th, 18Z, 5.4 km (42hr)

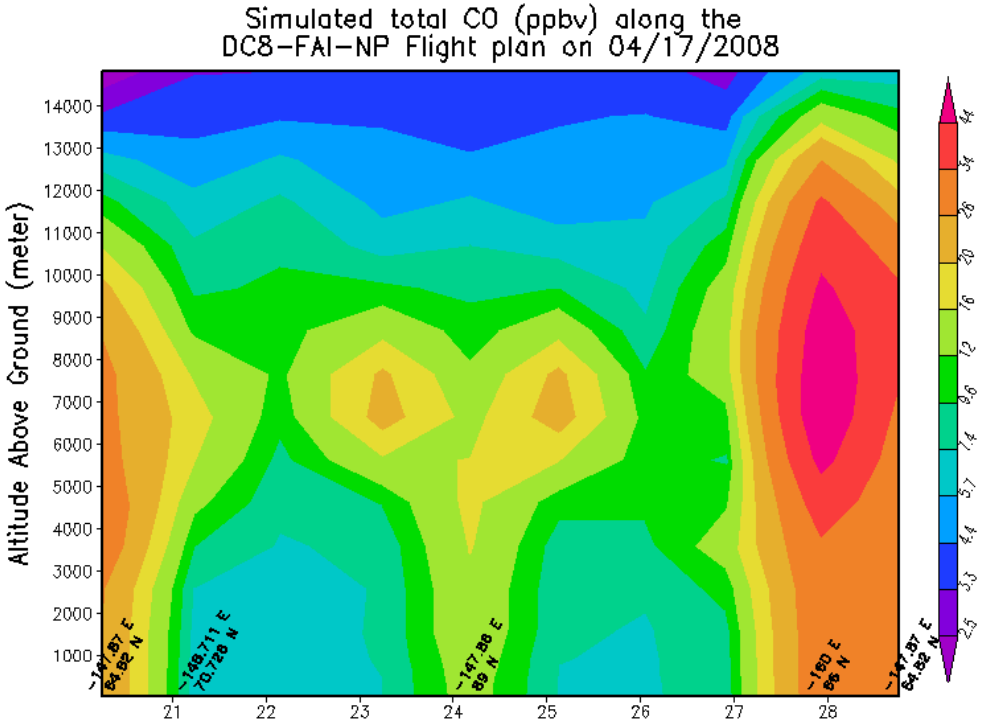


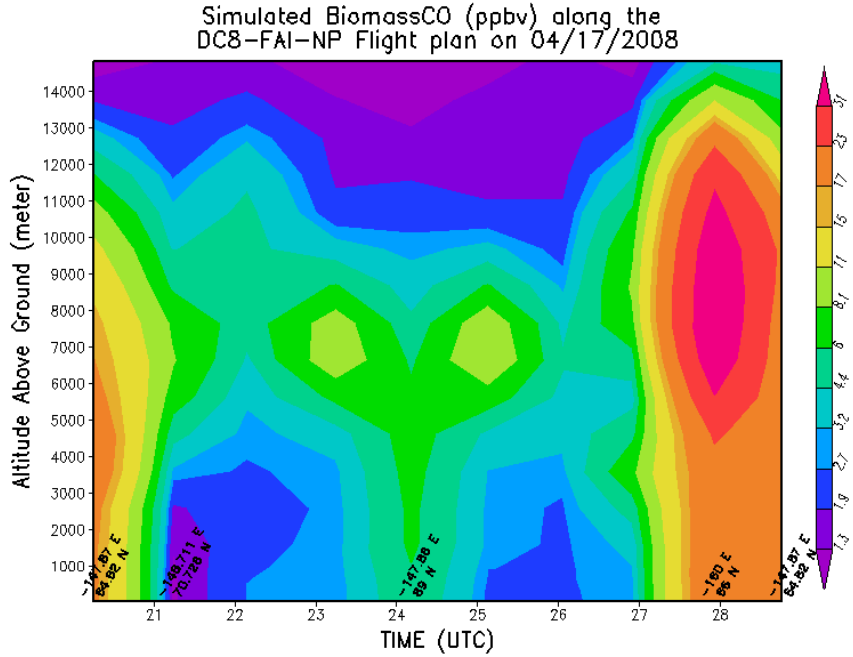
Anthropogenic CO

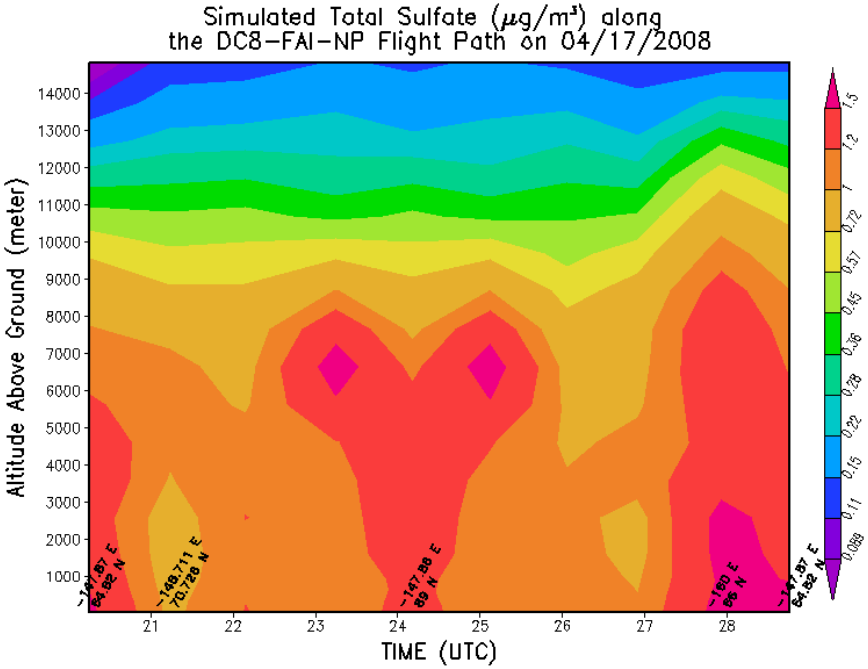


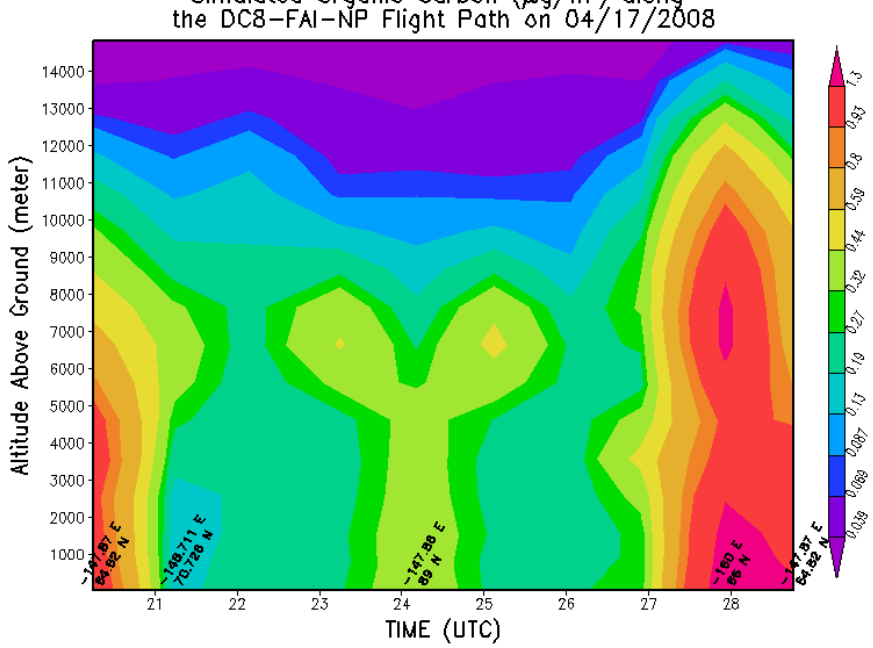
AOD

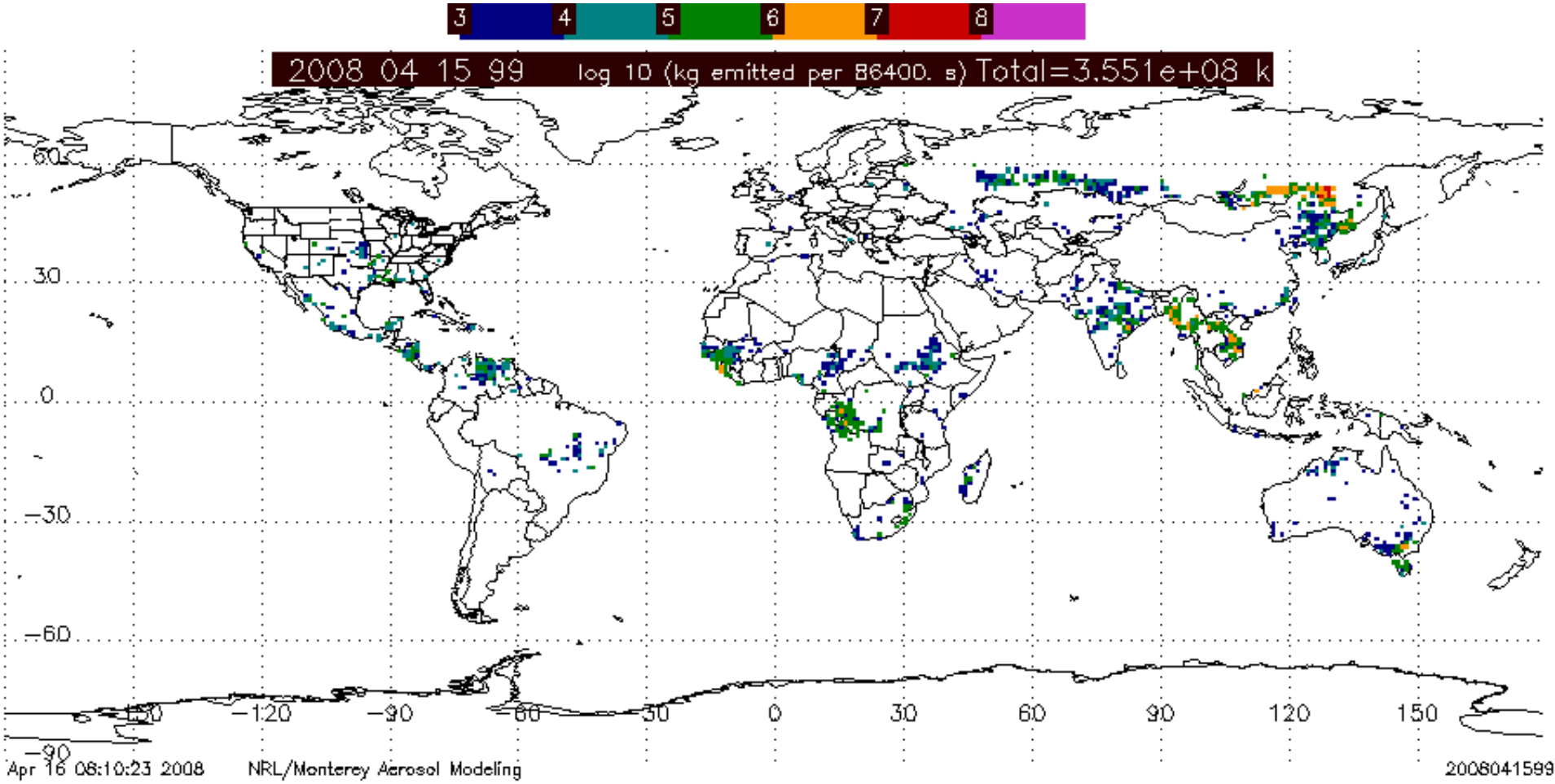



Simulated total CO (ppbv) along the
DC8-FAI-NP Flight plan on 04/17/2008
Altitude Above Ground (meter)
-147.87 E
64.82 N
-149.711 E
70.728 N
-147.88 E
89 N
-160 E
86 N
-147.87 E
64.82 N


Simulated BiomassCO (ppbv) along the
DC8-FAI-NP Flight plan on 04/17/2008
Altitude Above Ground (meter)
TIME (UTC)


Simulated Total Sulfate (μg/m³) along
the DC8-FAI-NP Flight Path on 04/17/2008
Altitude Above Ground (meter)
TIME (UTC)

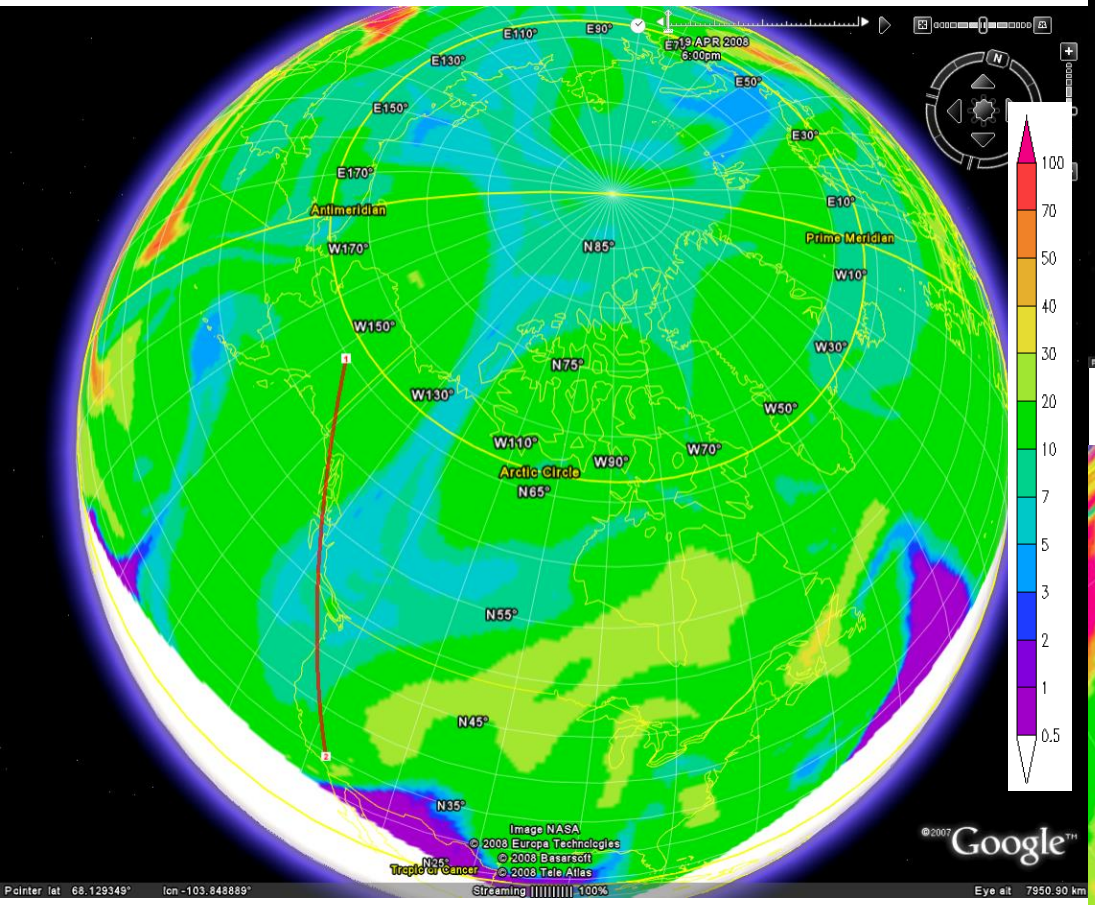

Simulated Organic Carbon (μg/m³) along
the DC8-FAI-NP Flight Path on 04/17/2008
Altitude Above Ground (meter)
TIME (UTC)


3
4
5
6
7
8
2008 04 15 99 log 10 (kg emitted per 86400. s) Total=3.551e+08 k
60
30
0
−30
−60
−90
−150
−120
−90
−60
−30
0
30
60
90
120
150
Apr 16 08:10:23 2008
NRL/Monterey Aerosol Modeling
2008041599

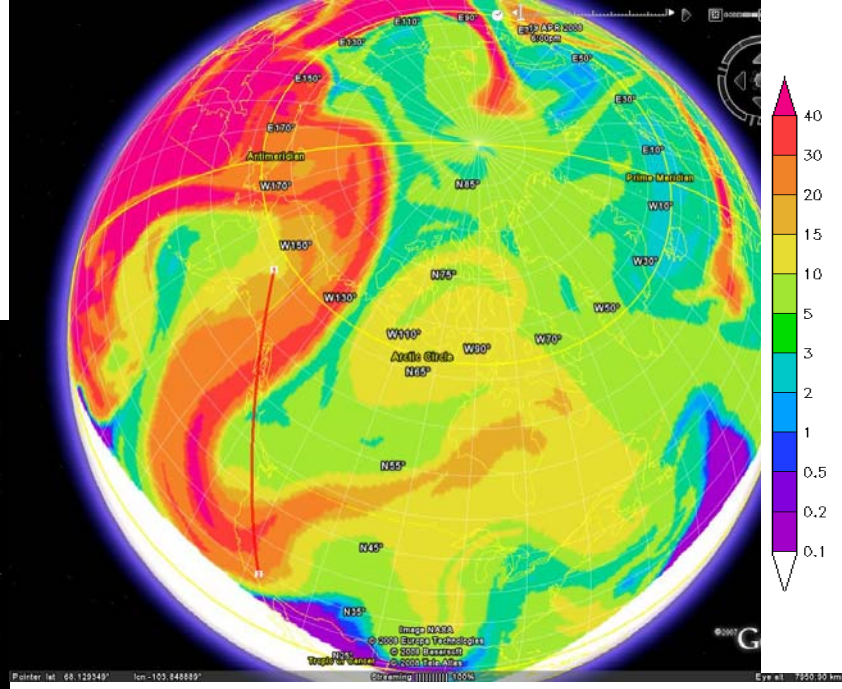
Biomass CO

Transit Flight

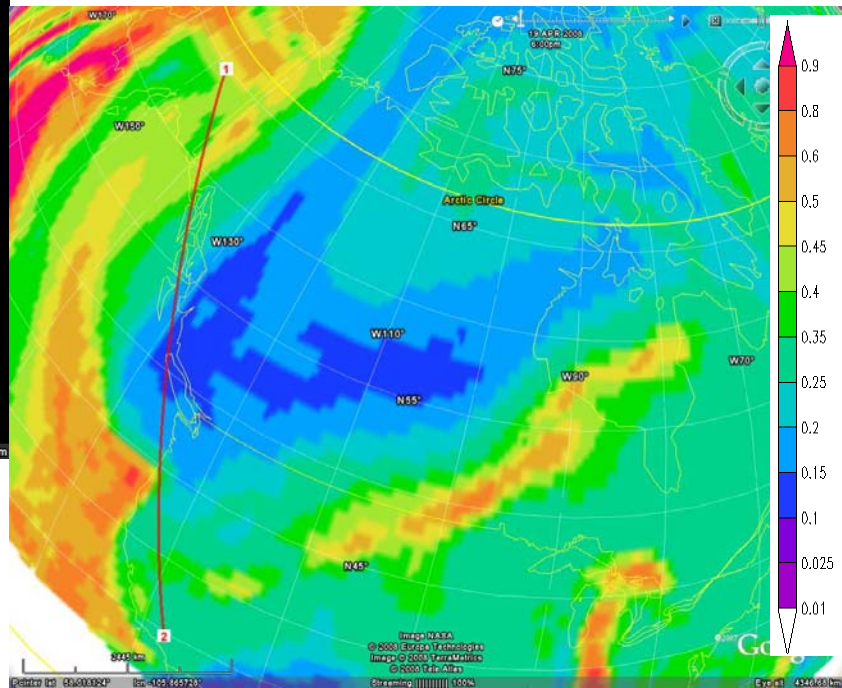
April 19th, 18Z, 5.4 km (90hr)

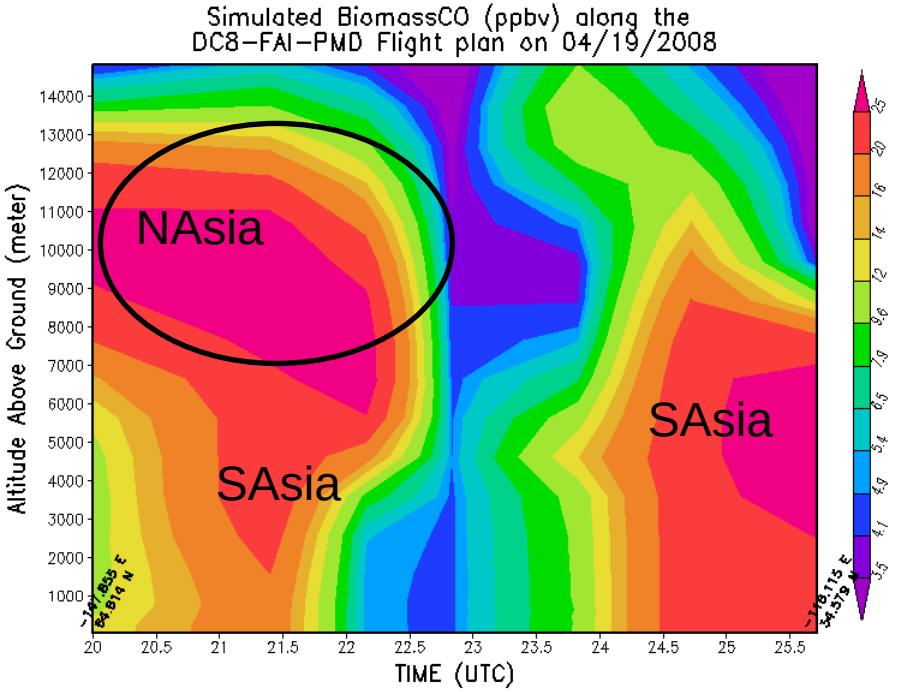


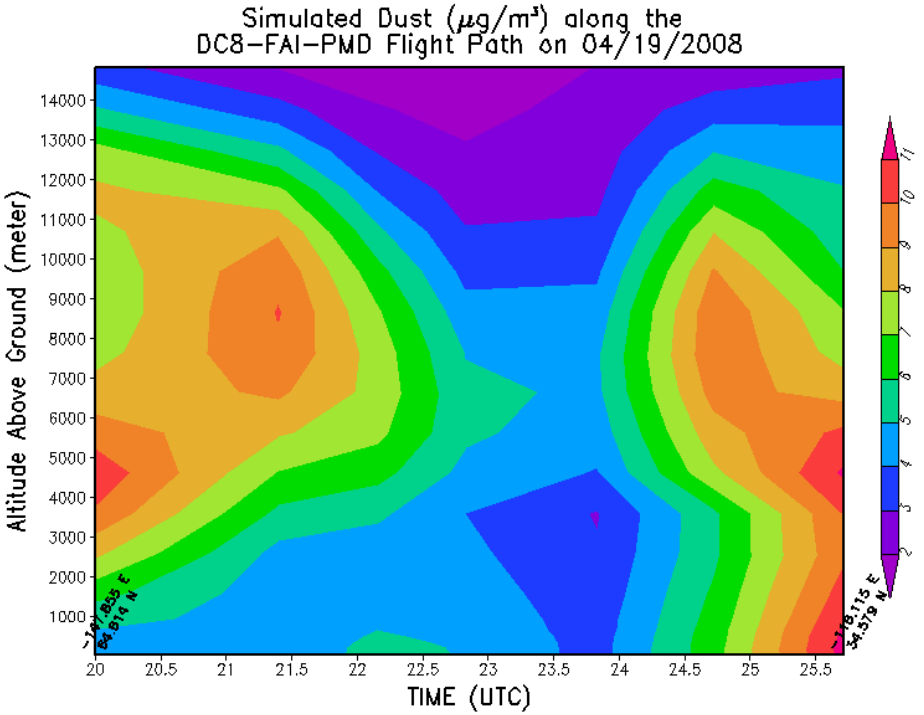
Biomass CO

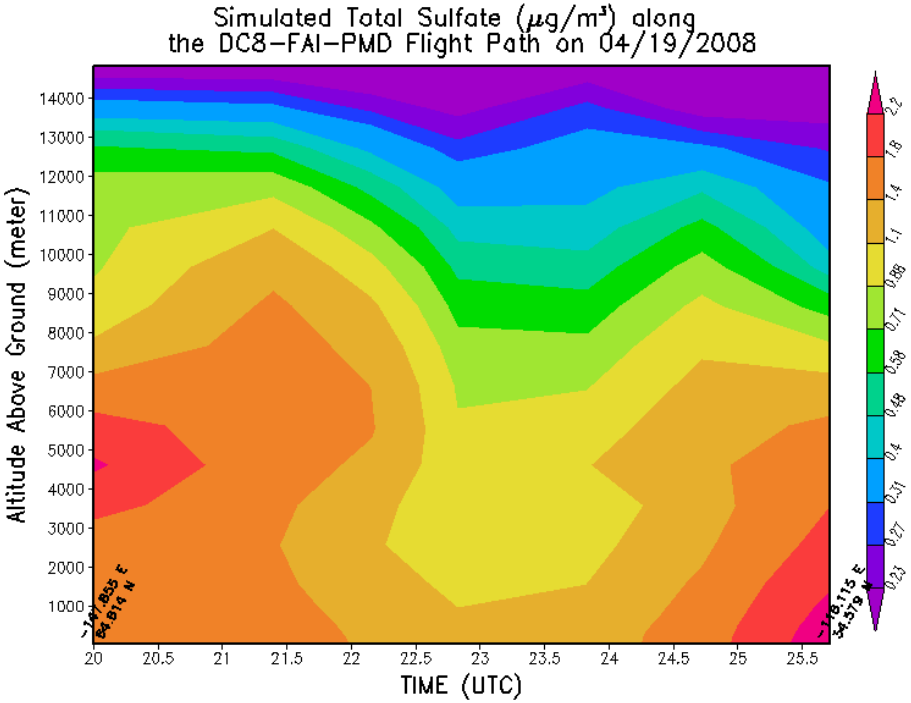


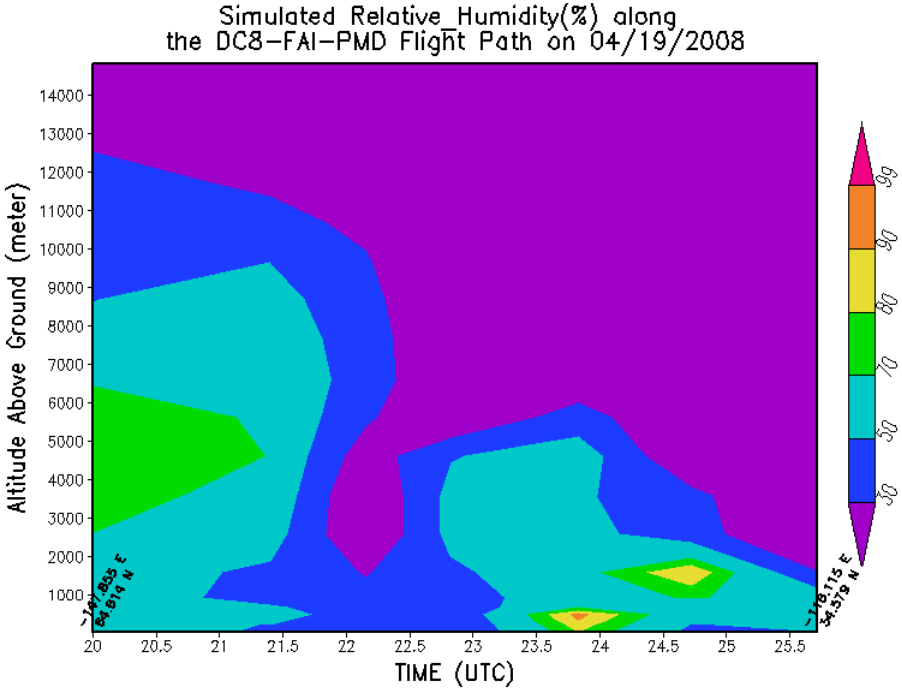
AOD




Simulated BiomassCO (ppbv) along the
DC8-FAI-PMD Flight plan on 04/19/2008
NAsia
SAsia
SAsia
Altitude Above Ground (meter)
TIME (UTC)
~147.855 E
64.814 N
~118.115 E
34.379 N


Simulated Dust (μg/m³) along the
DC8-FAI-PMD Flight Path on 04/19/2008
Altitude Above Ground (meter)
TIME (UTC)
~147.855 E
64.814 N
~118.115 E
34.379 N

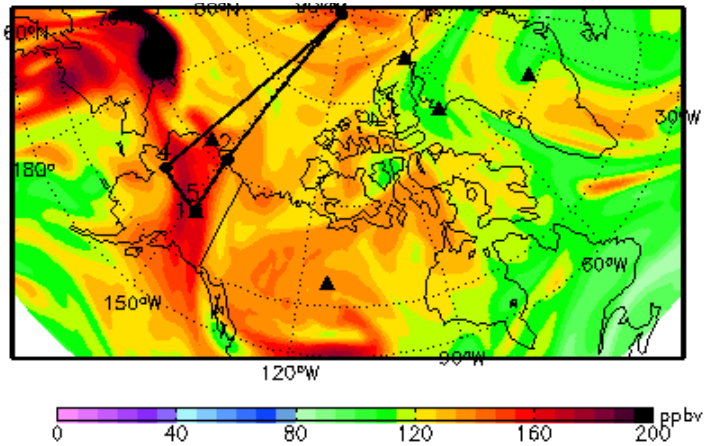

Simulated Total Sulfate (μg/m³) along
the DC8-FAI-PMD Flight Path on 04/19/2008
Altitude Above Ground (meter)
TIME (UTC)
~147.855 E
64.814 N
~118.115 E
34.379 N


Simulated Relative_Humidity(%) along
the DC8-FAI-PMD Flight Path on 04/19/2008
Altitude Above Ground (meter)
TIME (UTC)
~147.855 E
64.814 N
~118.115 E
34.379 N

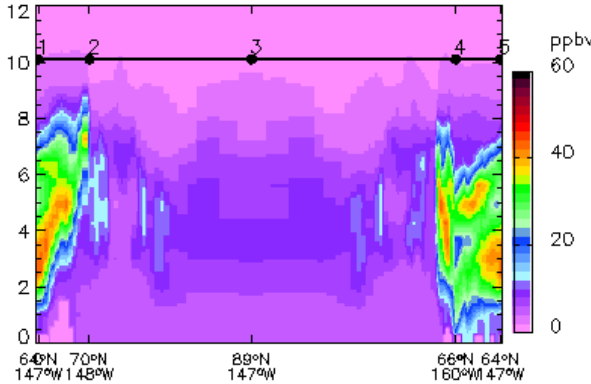
GEOS-5 forecasts for 4/17/2008 DC-8 Going to the North Pole!

Initialized at 20080416-06Z

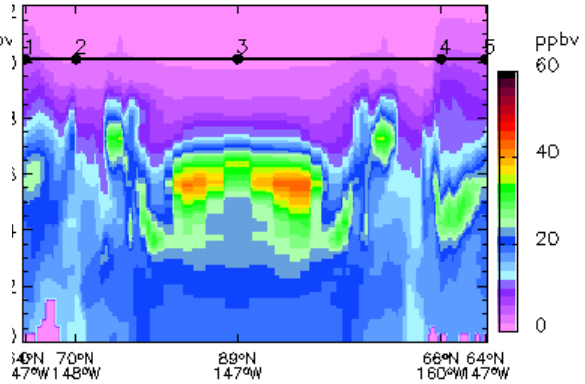
GEOS-5 forecast 4/17/2008 22:30Z – CO



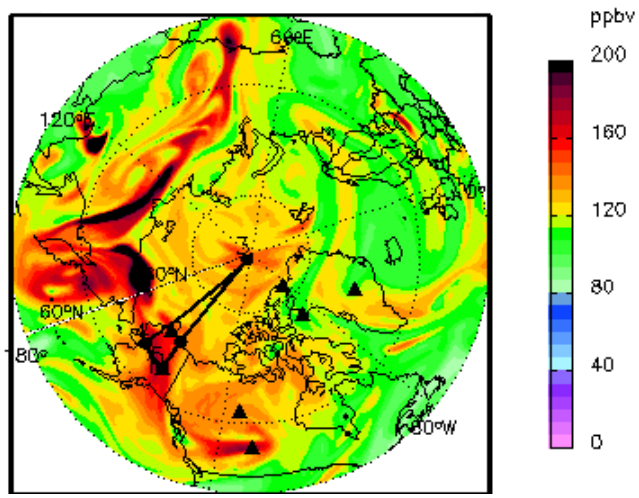
Boreal CO



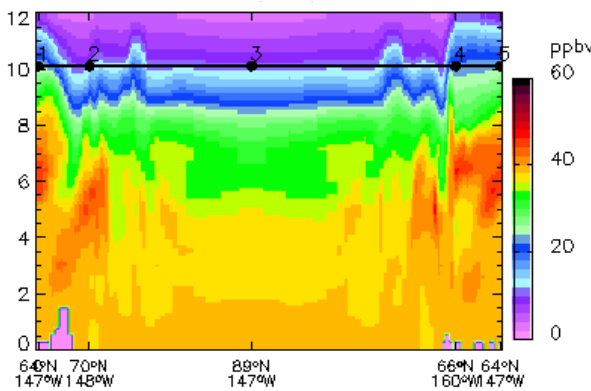
European CO



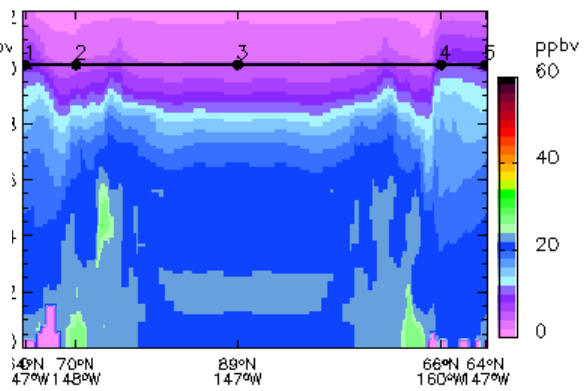
Total CO 500 hPa



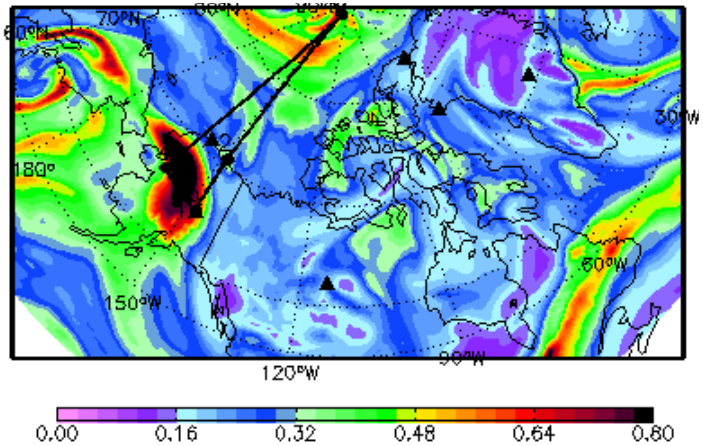
Asian CO



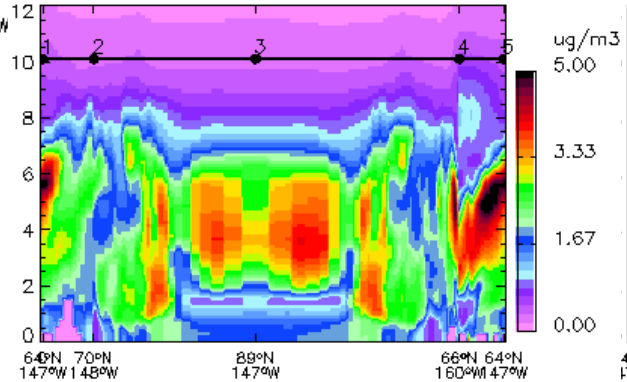
North American CO



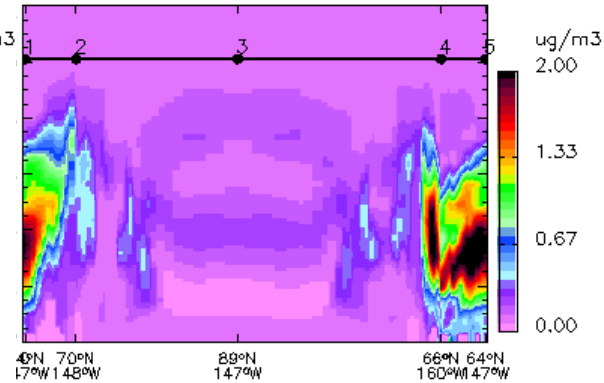
GEOS-5 forecast 4/16/2008 22:30Z – Aerosols



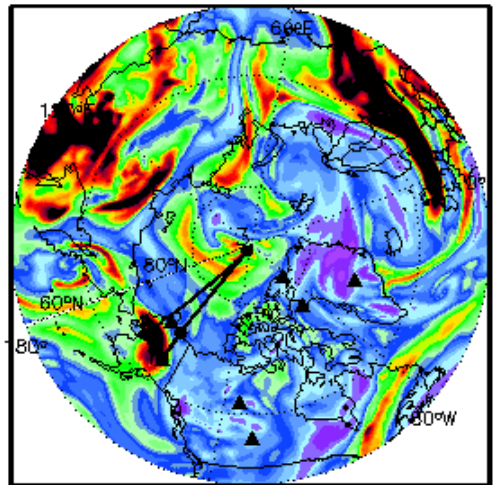
Sulfate



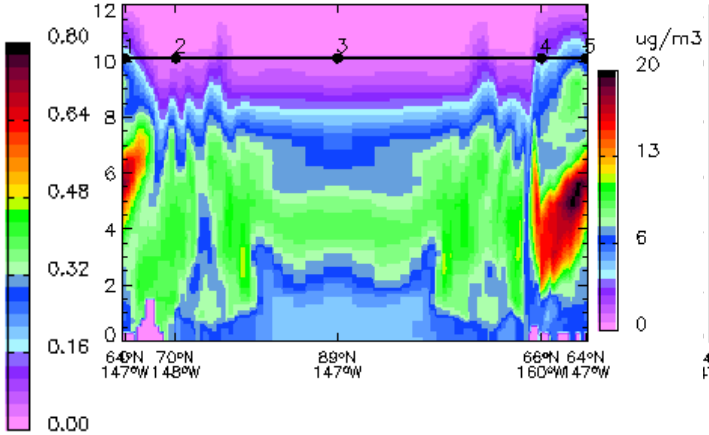
Organic carbon



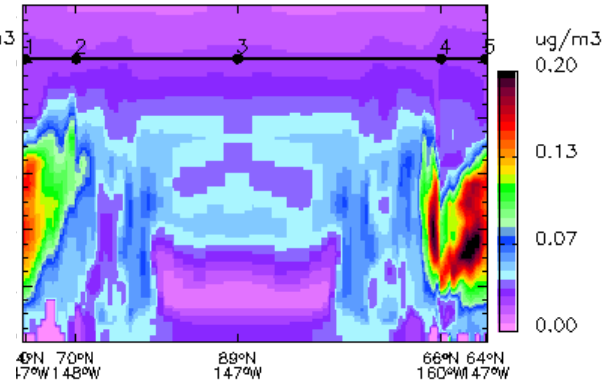
Total AOD 550 nm



Dust

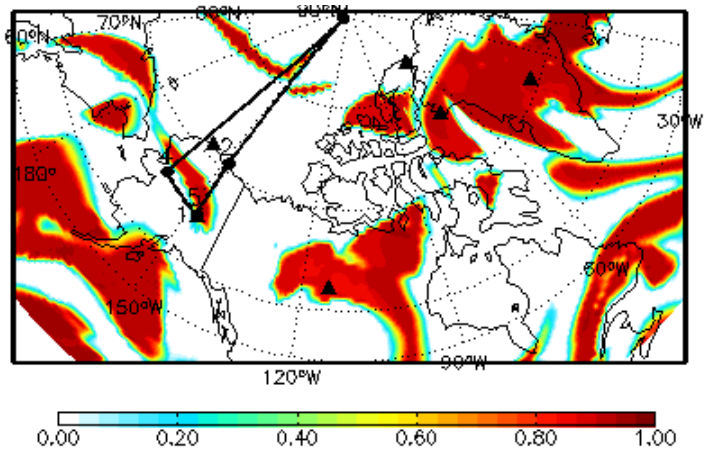


Black carbon

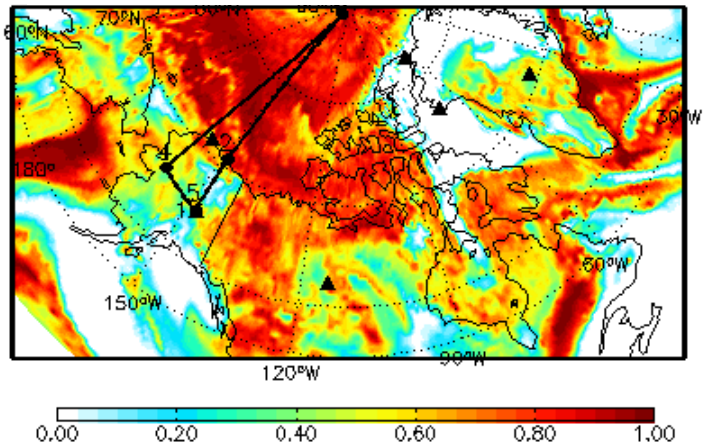


GEOS-5 forecast 4/16/2008 22:30Z – Clouds

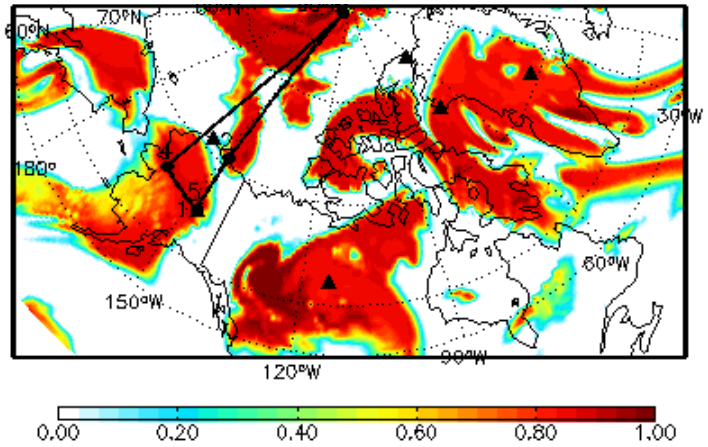
High cloud fraction (< 400 hPa)



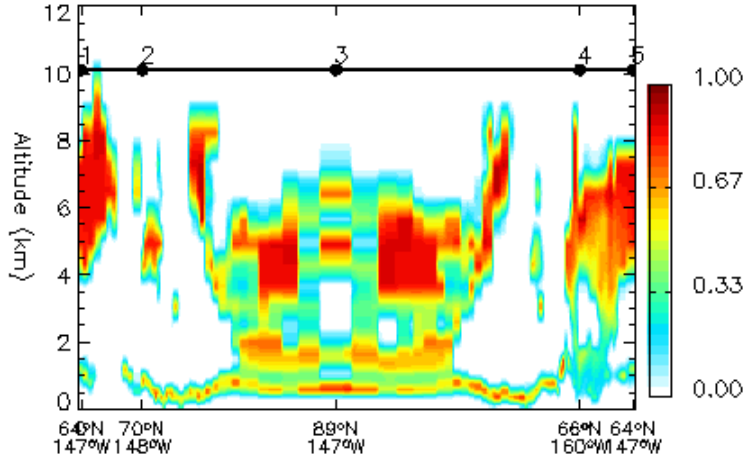
Low cloud fraction (1000-700 hPa)



Middle cloud fraction (700-400 hPa)

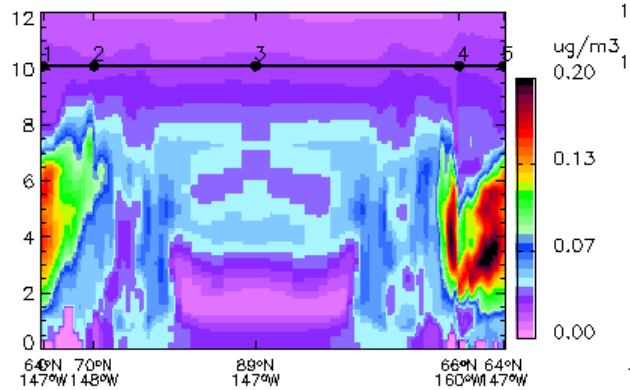


Cloud fraction along flight track

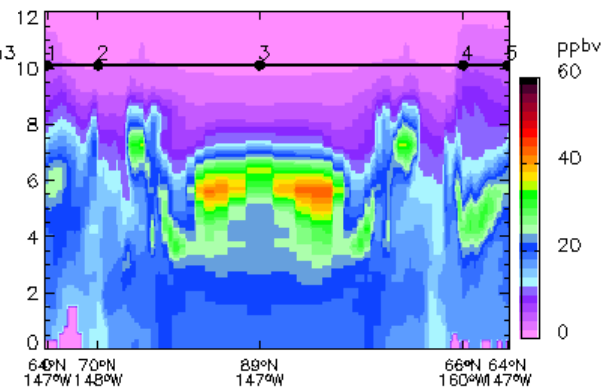


Put all the evil faces together

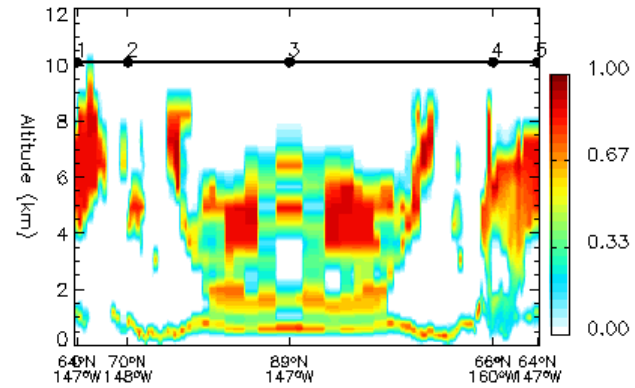
Black carbon



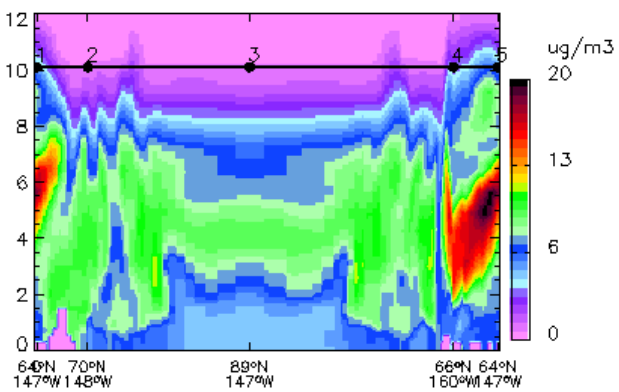
European CO



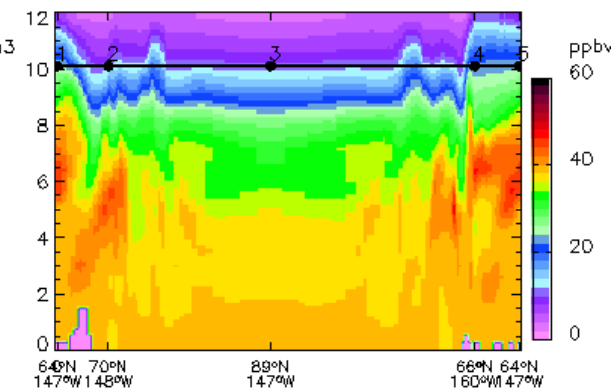
Cloud fraction



Dust



Asian CO



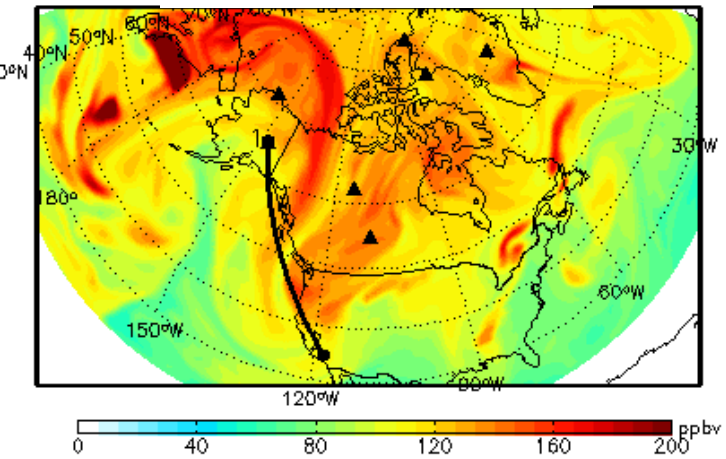
- Dust comes with clouds
- EUR pollution above Asian pollution
- Smoke lower than pollution and dust

GEOS-5 forecasts for 4/19/2008 DC-8 Going home!

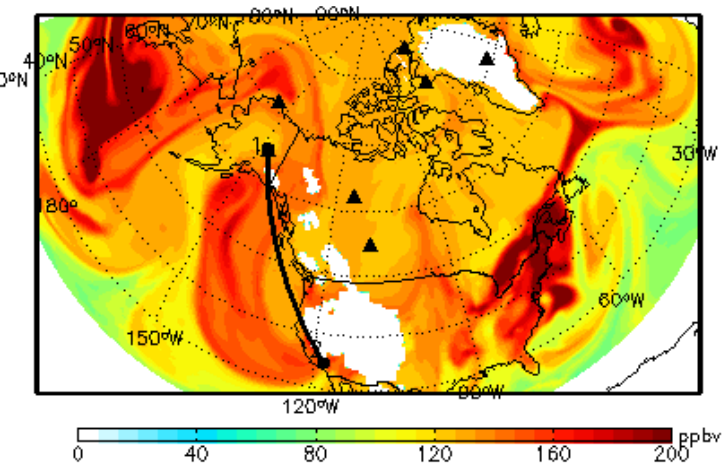
Initialized at 20080416-06Z

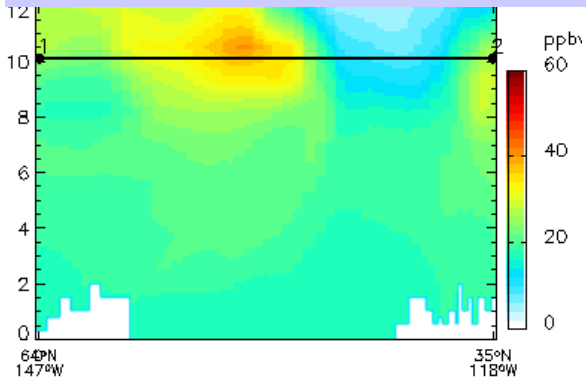
GEOS-5 forecast 4/19/2008 19:30Z – CO

Total CO 500 hPa

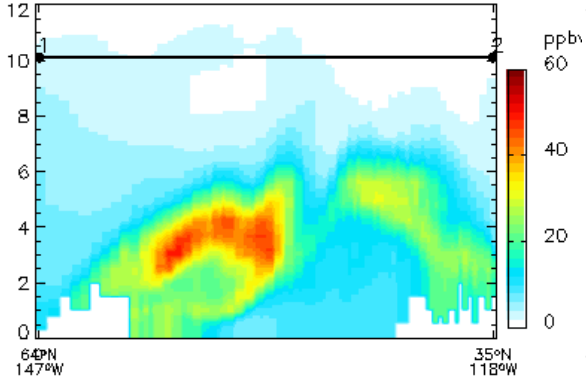


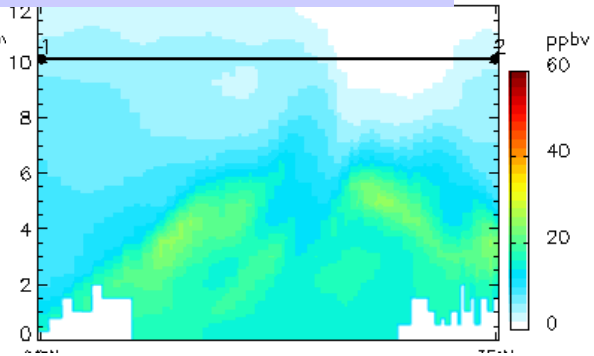
Total CO 850 hPa



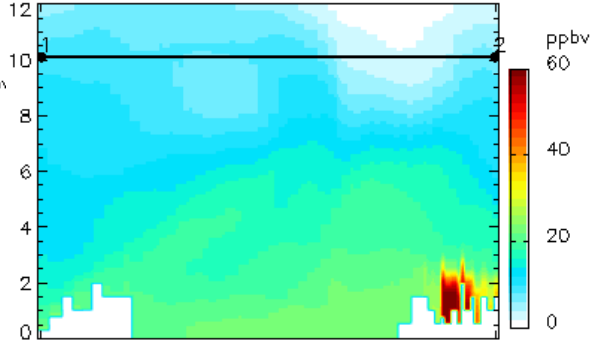


Boreal biomass CO

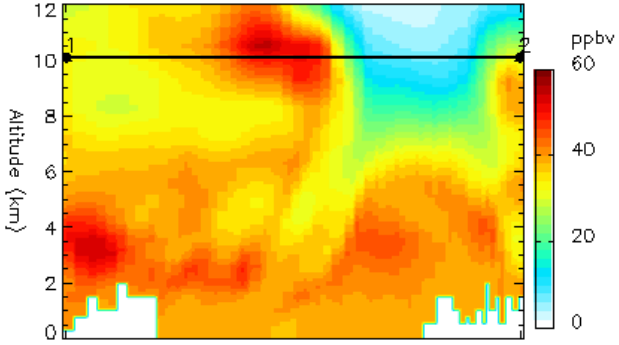




N American CO



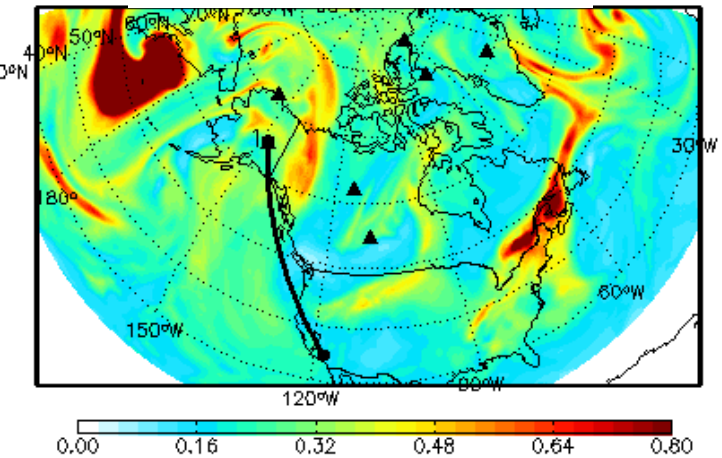
Asian



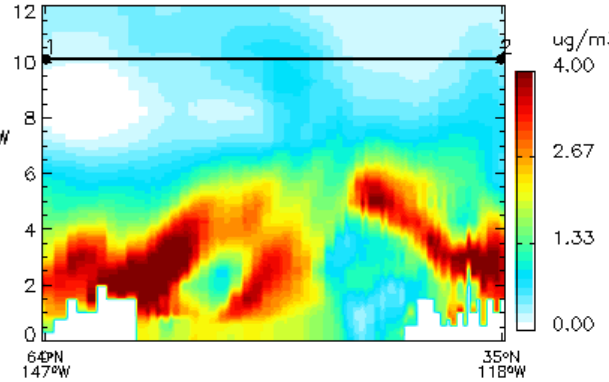
Distinguishable plumes!

- Non-boreal high up
- Boreal 2-4 km
- Asian up and down

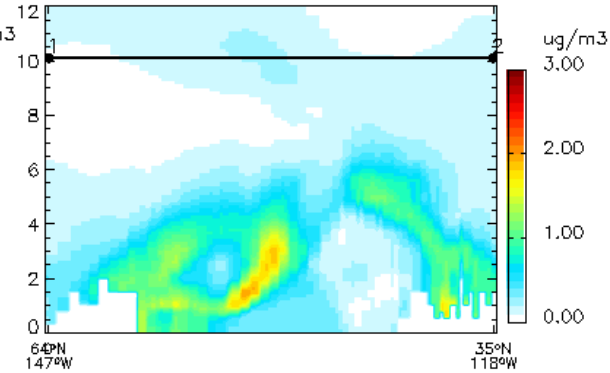
GEOS-5 forecast 4/19/2008 19:30Z – Aerosols



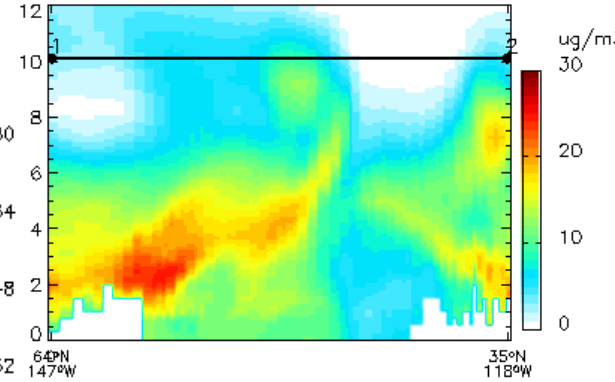
Sulfate



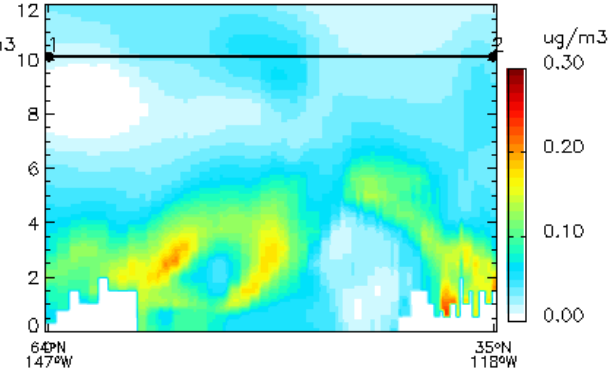
Organic carbon



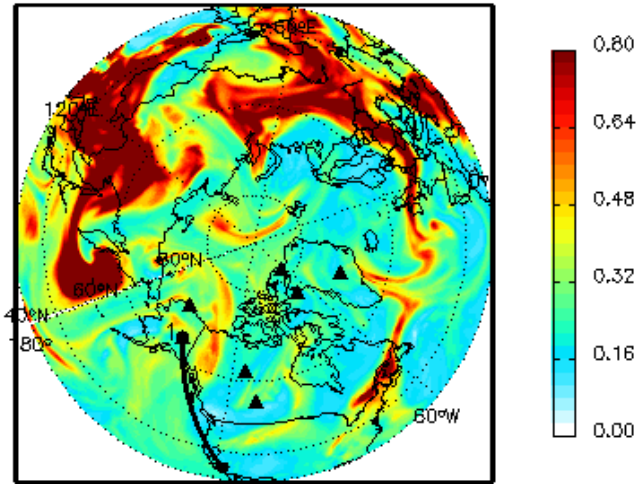
Dust



Black carbon



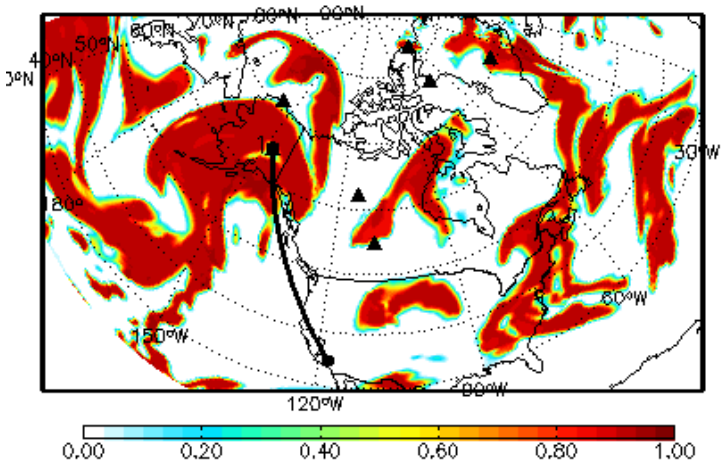
Total AOD 550 nm



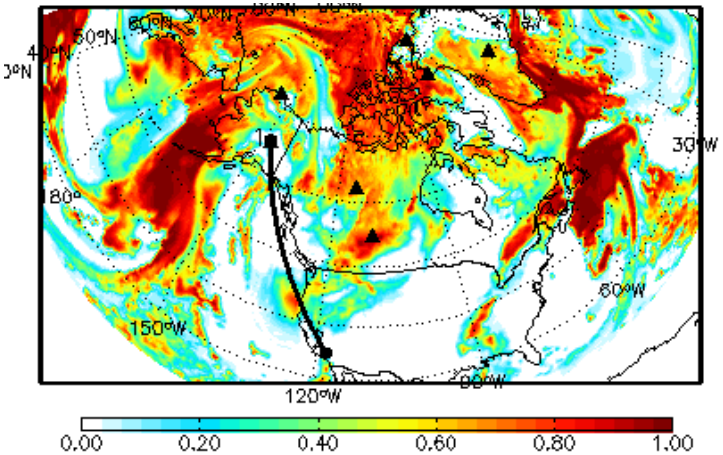
Aerosols are concentrated in mid to lower altitudes

GEOS-5 forecast 4/19/2008 19:30Z – Clouds

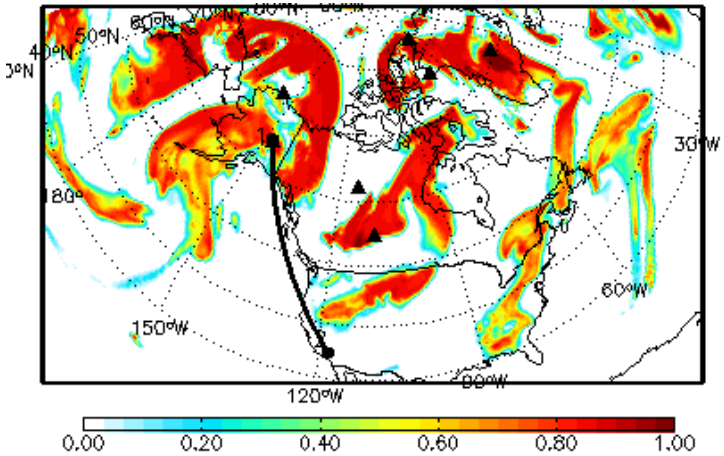
High cloud fraction (< 400 hPa)



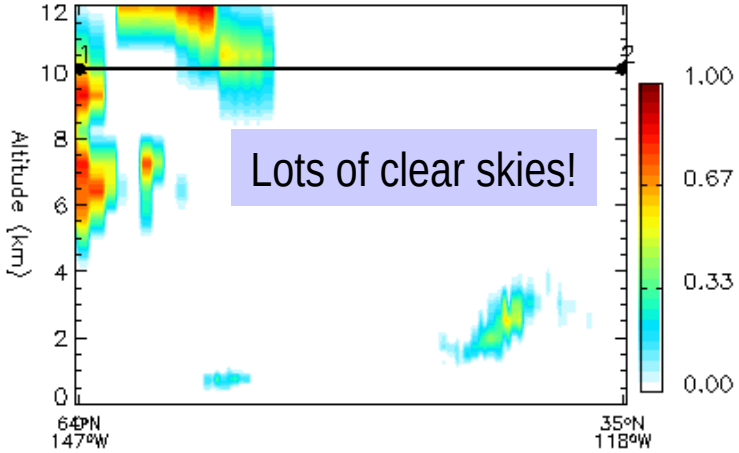
Low cloud fraction (1000-700 hPa)



Middle cloud fraction (700-400 hPa)



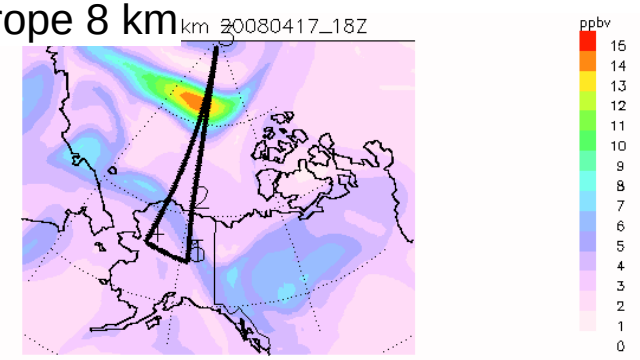
Cloud fraction along flight track



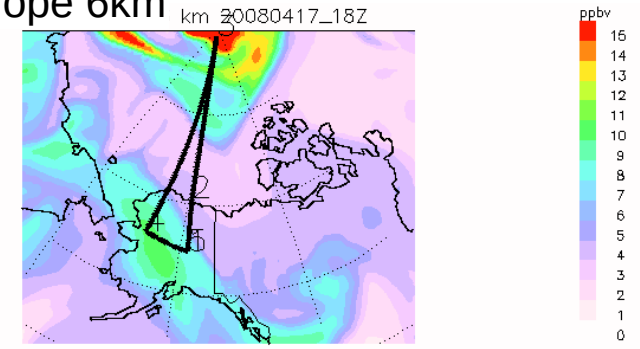
MZ4/GFS Apr 17

Apr 17 15Z

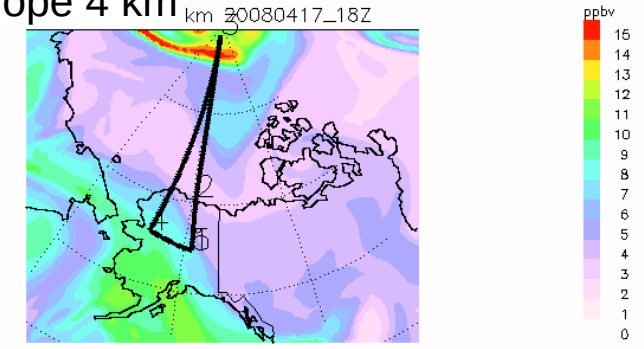
Europe 8 km



Europe 6km

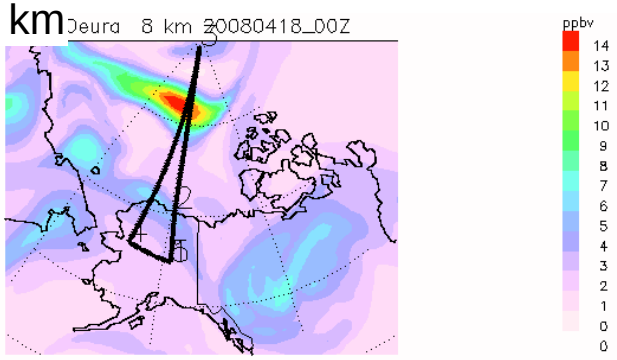


Europe 4 km

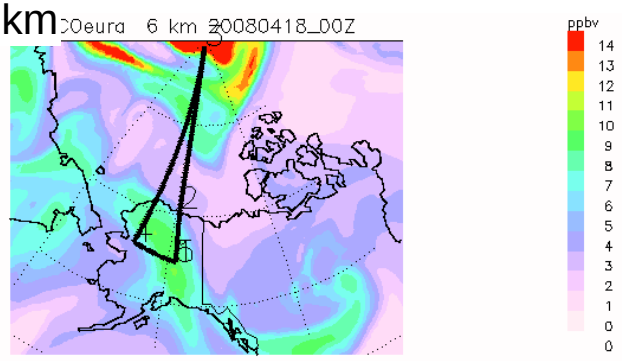


Apr 17 21Z

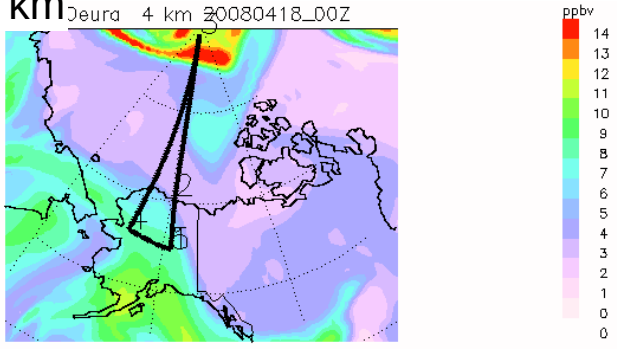
Europe 8 km



Europe 6km



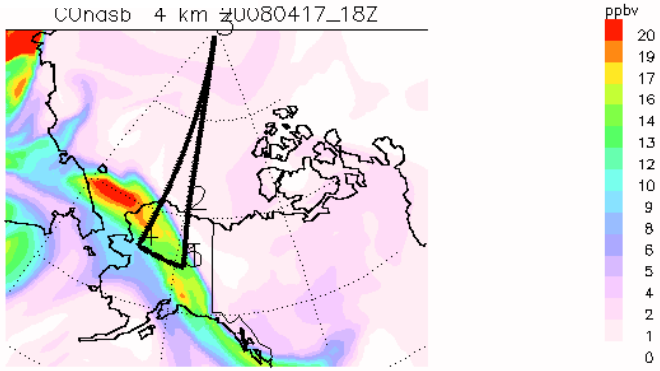
Europe 4 km



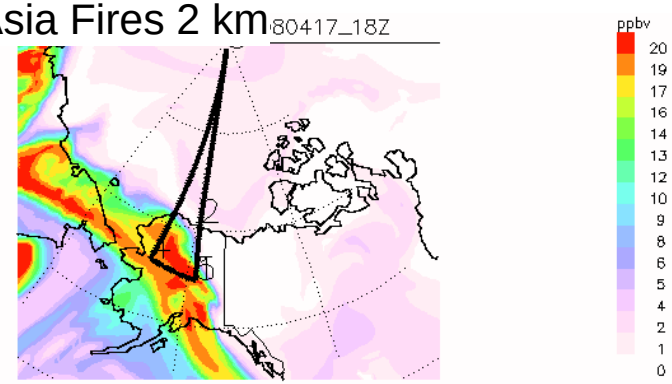
MZ4/GFS Apr 17

Apr 17 15Z

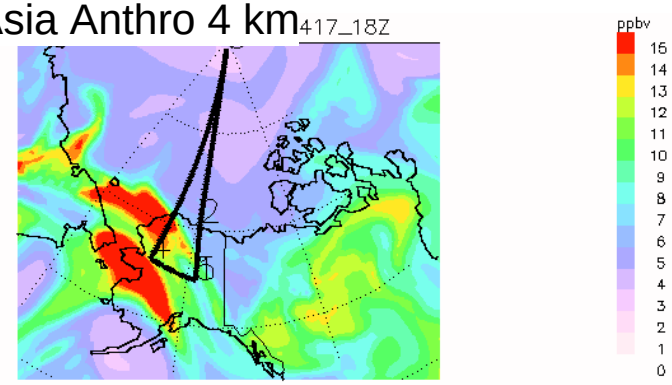
N. Asia Fires 4 km



N. Asia Fires 2 km

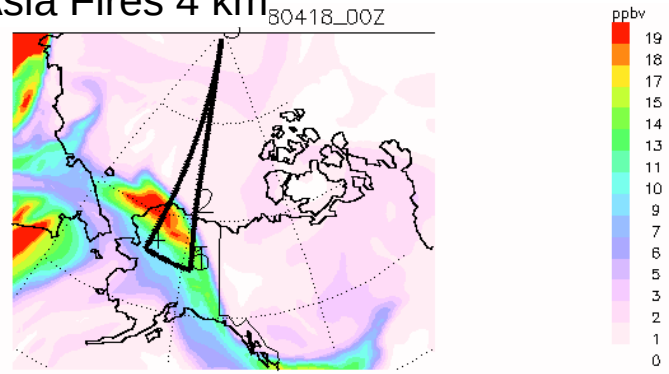


N. Asia Anthro 4 km

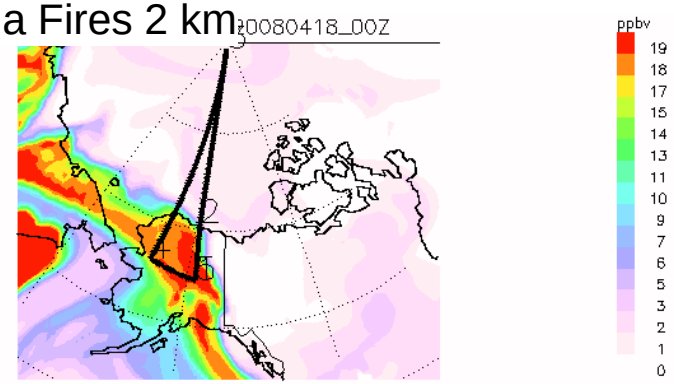


Apr 17 21Z

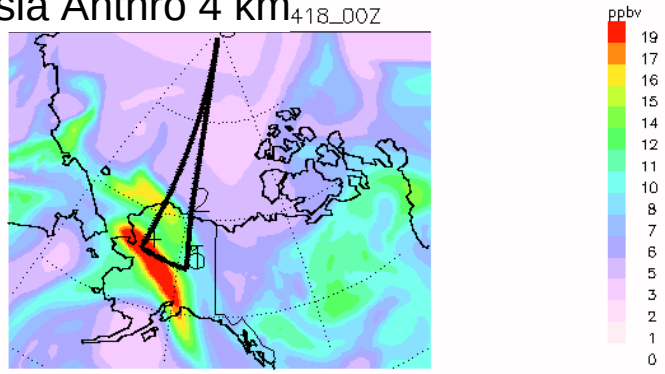
N. Asia Fires 4 km



N. Asia Fires 2 km



N. Asia Anthro 4 km

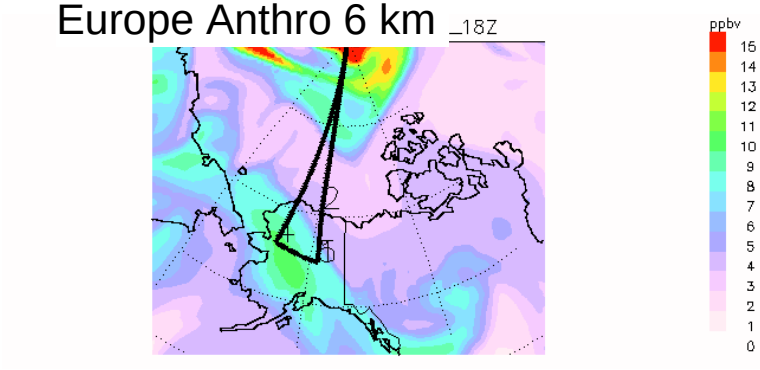


MZ4/GFS Apr 17 18Z

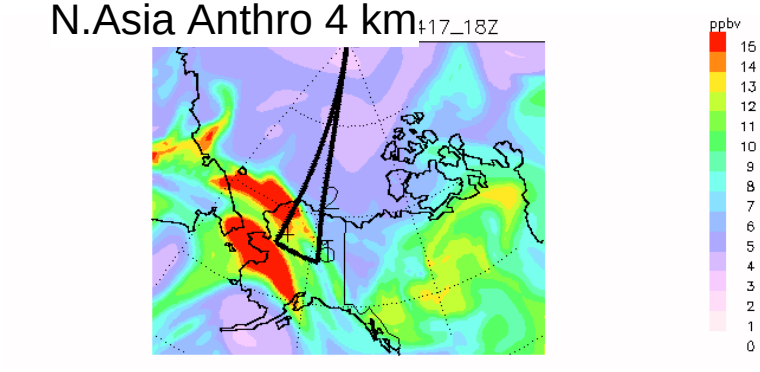
forecast from Apr 16

European Pollution at North Pole

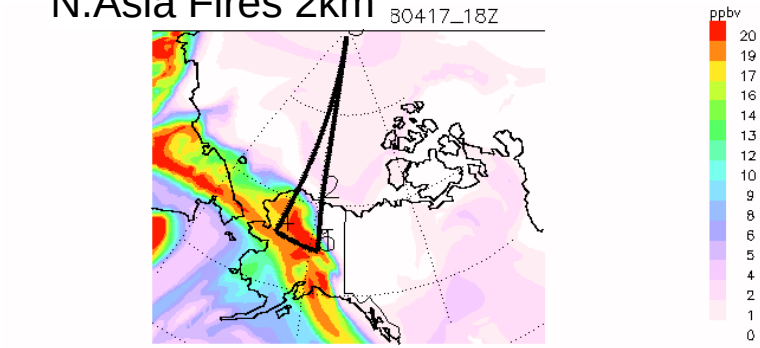
Europe Anthro 6 km



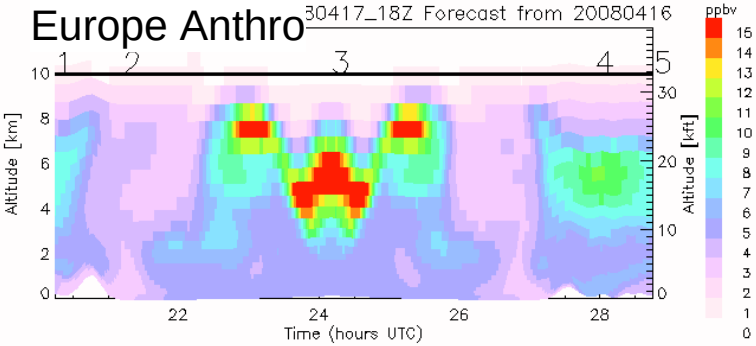
N.Asia Anthro 4 km



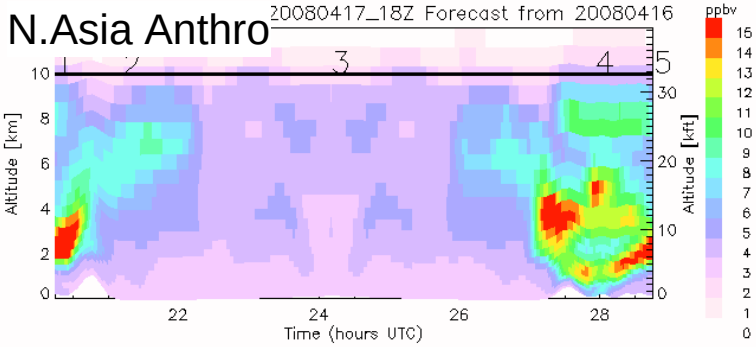
N.Asia Fires 2km



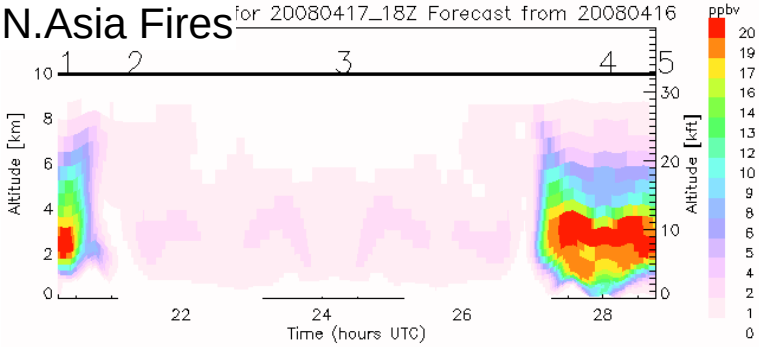
Europe Anthro



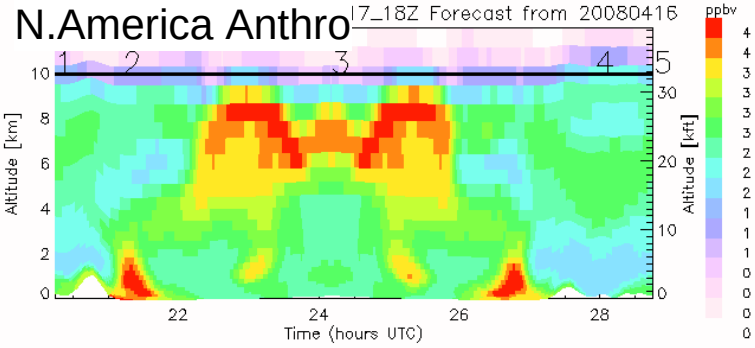
N.Asia Anthro



N.Asia Fires



N.America Anthro

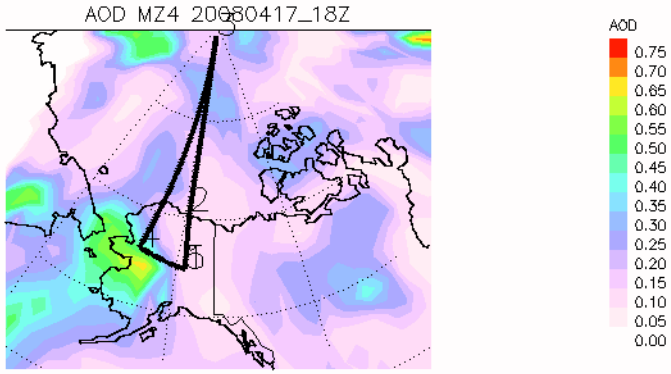


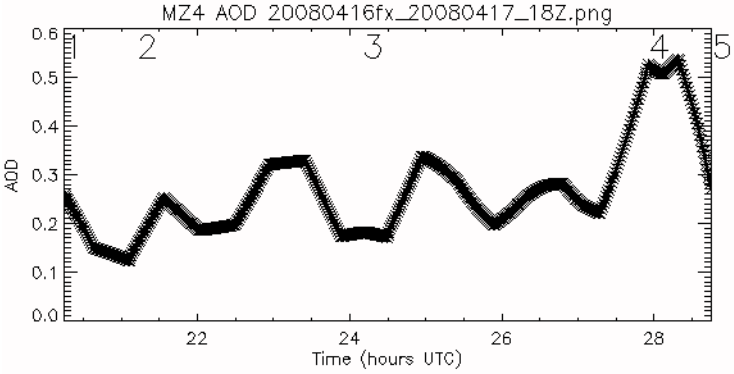
MZ4/GFS Apr 17 18Z

forecast from Apr 16

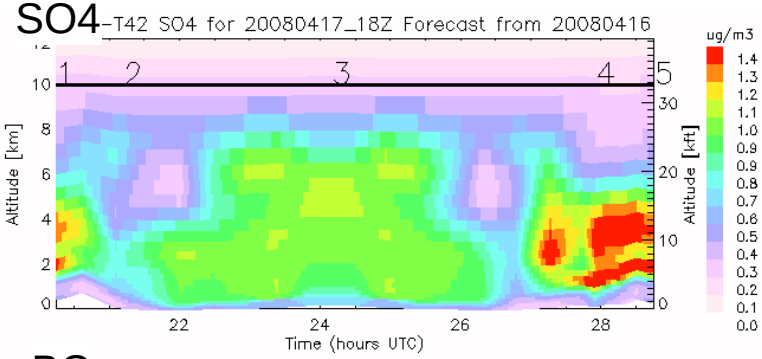
European Pollution at North Pole

AOD

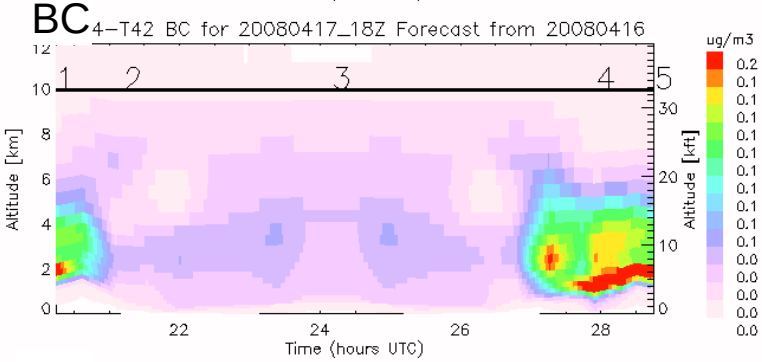




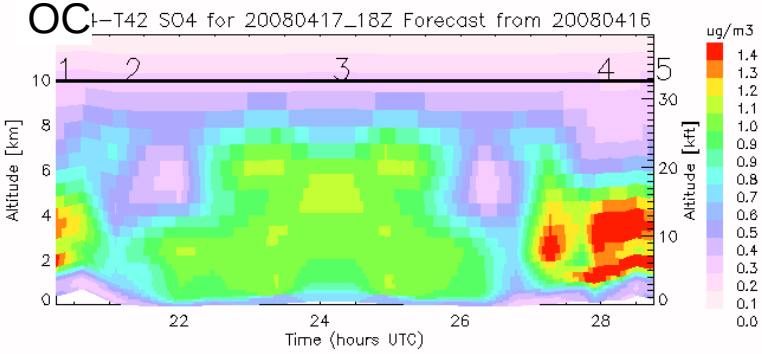
SO4



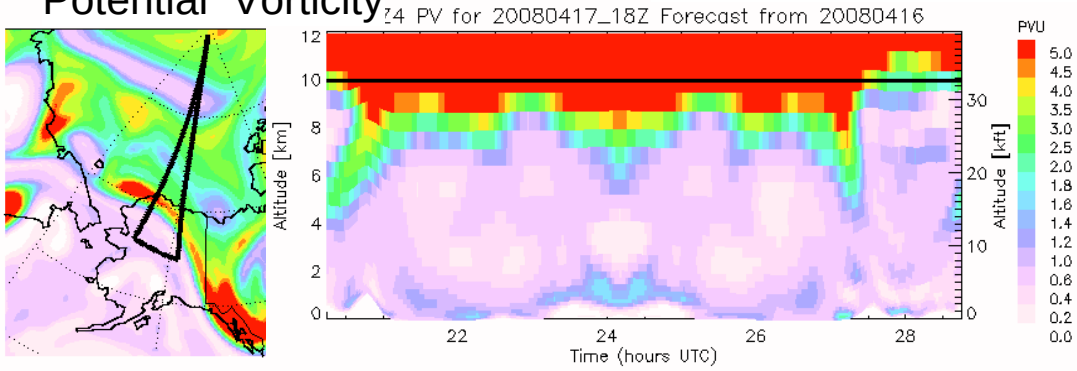
BC

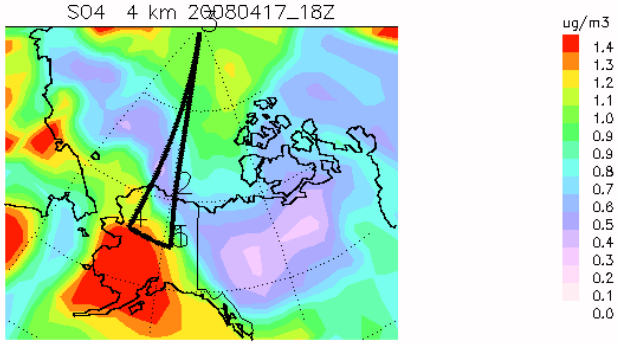


OC



Potential Vorticity



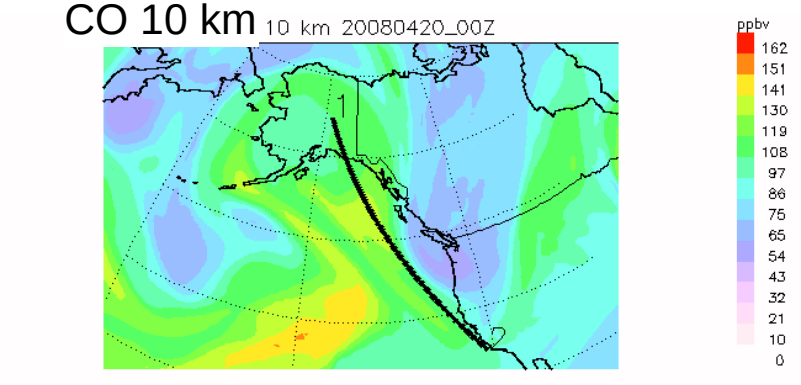


MZ4/GFS Apr 19 21Z

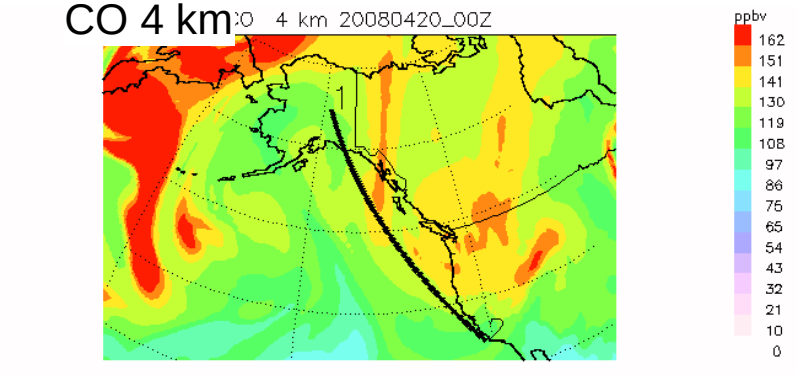
forecast from Apr 16

Transit Home

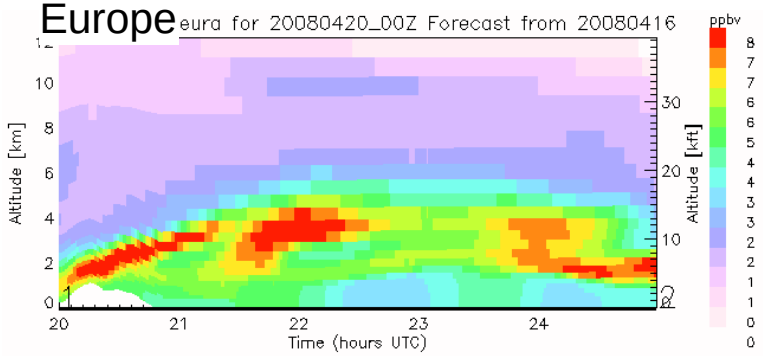
CO 10 km



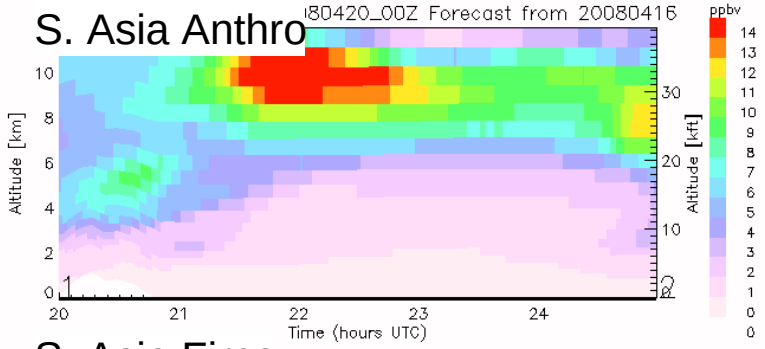
CO 4 km



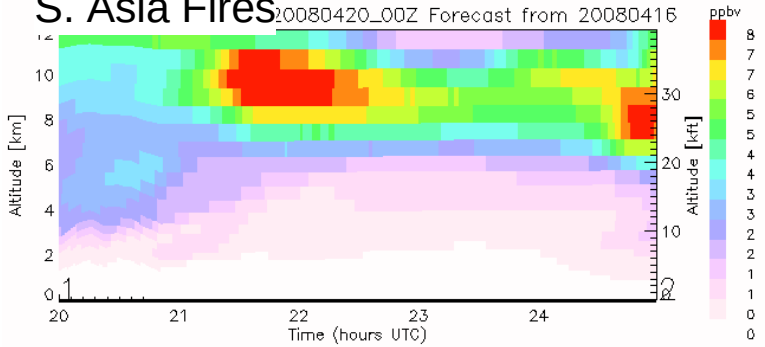
Europe



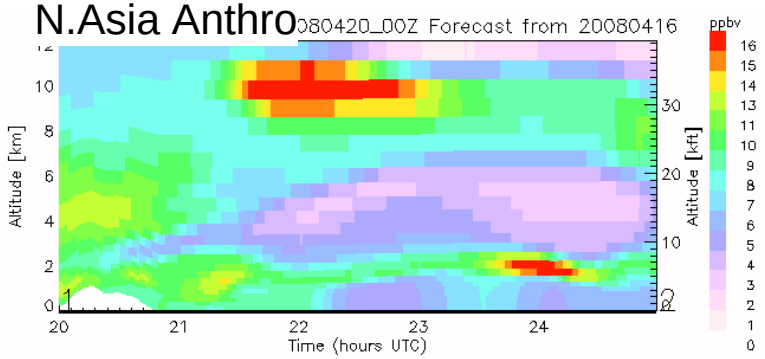
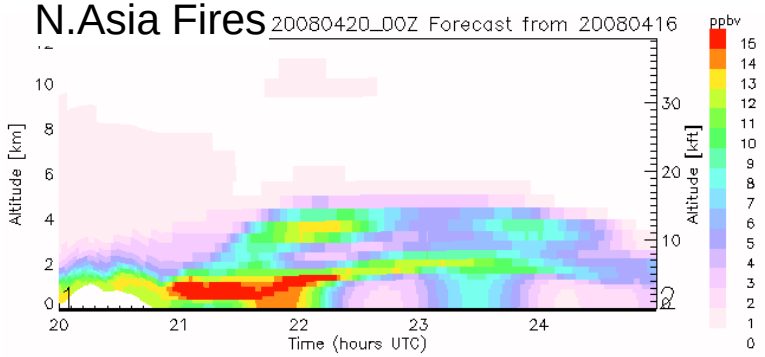
S. Asia Anthro



S. Asia Fires



N.Asia Anthro



N.Asia Fires