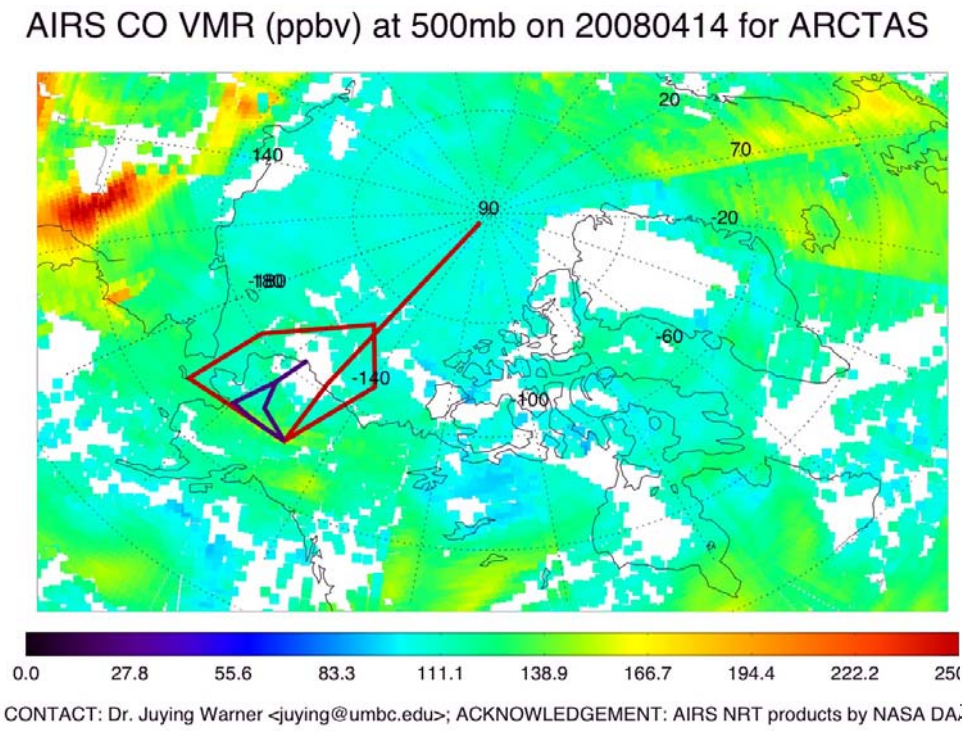
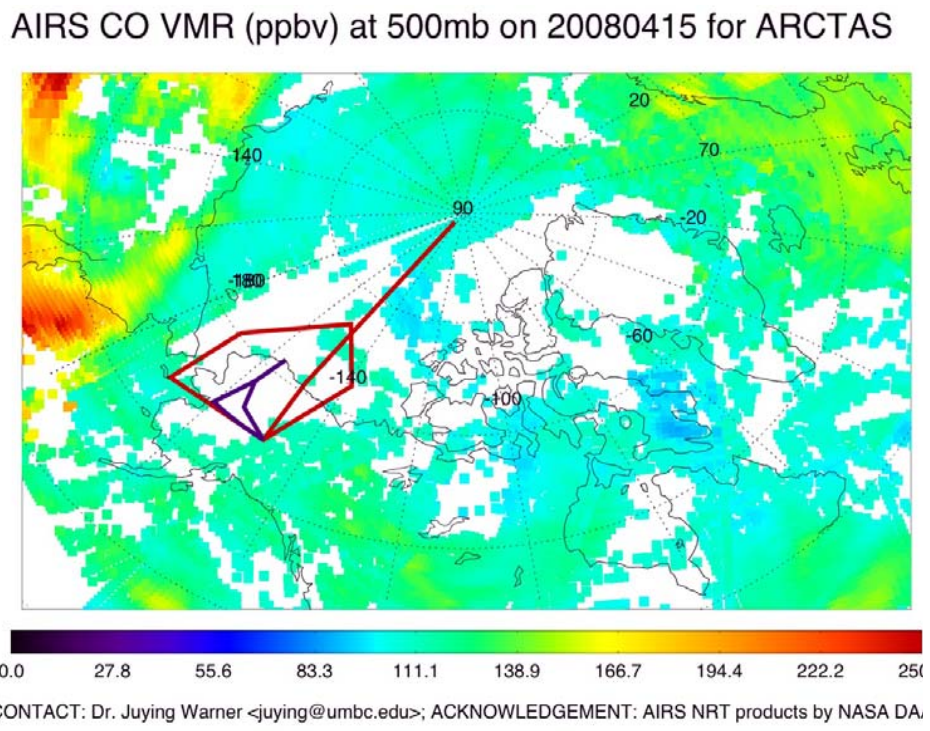
AIRS NRT ARCTAS Support: Latest AIRS CO

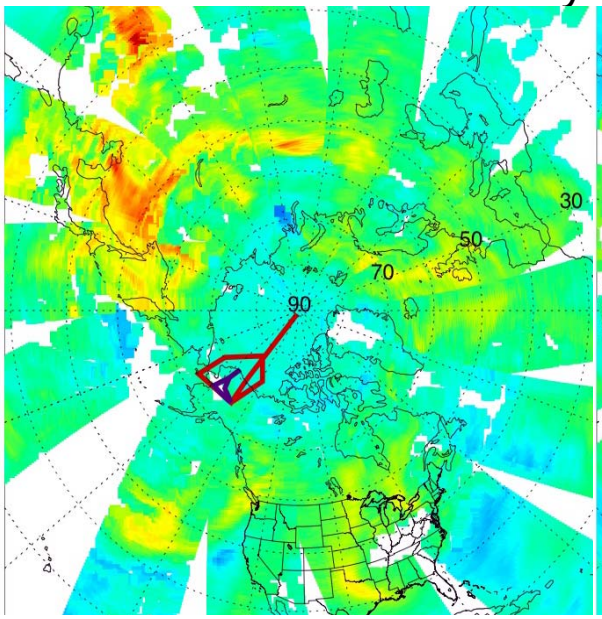




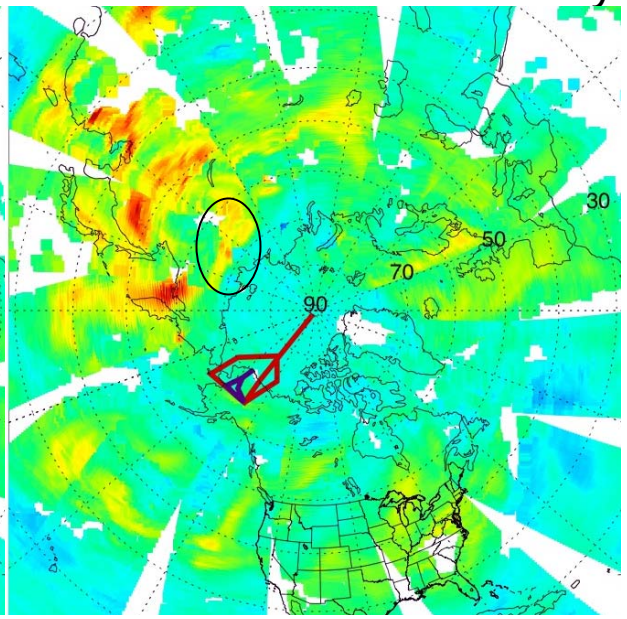
- Asian transport continues and a fast moving system.
- Transport from the European side into the Arctic circle continues.

AIRS NRT ARCTAS Support:

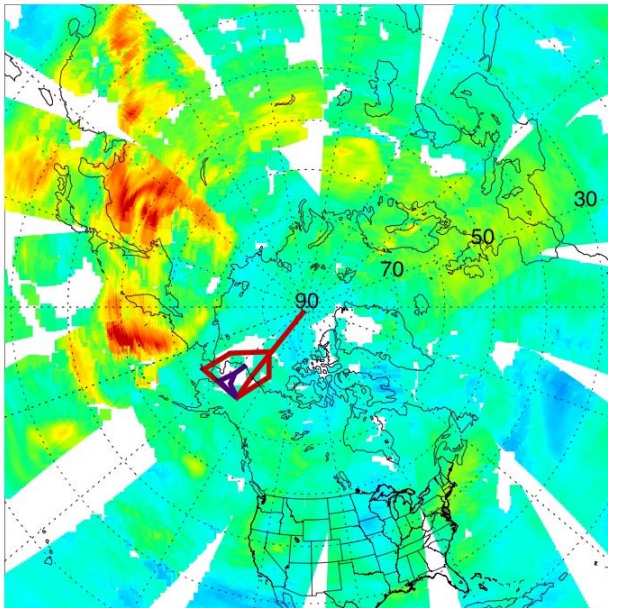
CO 500mb 20080413 day

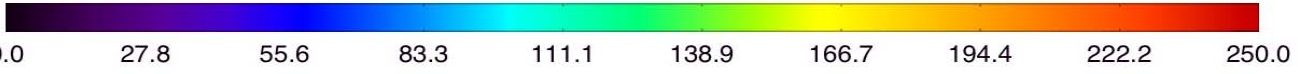


CO 500mb 20080414 day



CO 500mb 20080415 Full



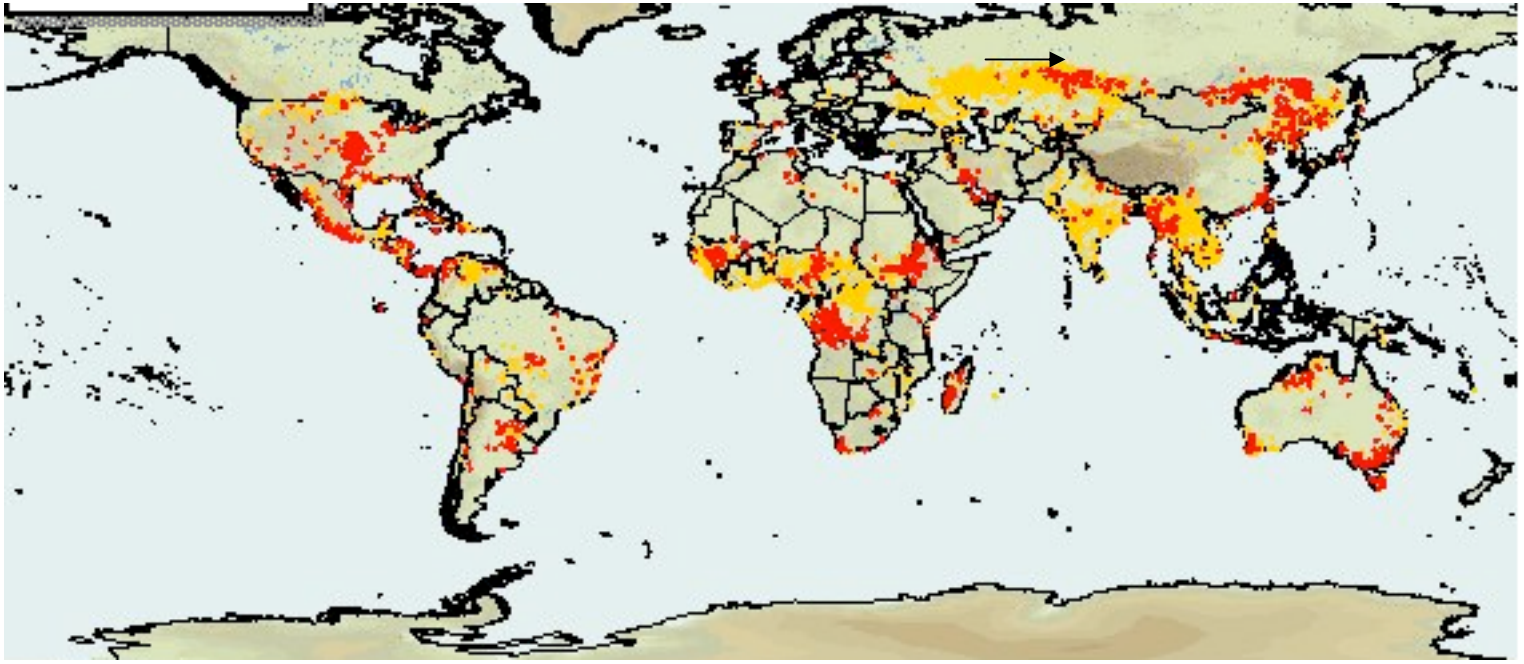


CONTACT: Dr. Juying Warner <juying@umbc.edu>; ACKNOWLEDGEMENT: AIRS NRT products by NASA DAAC

- Transport from the European side into the Arctic circle
- Asian Transport increases due to largely biomass burning events.

MODIS Global Active Fire Count Map In Last 7 days)

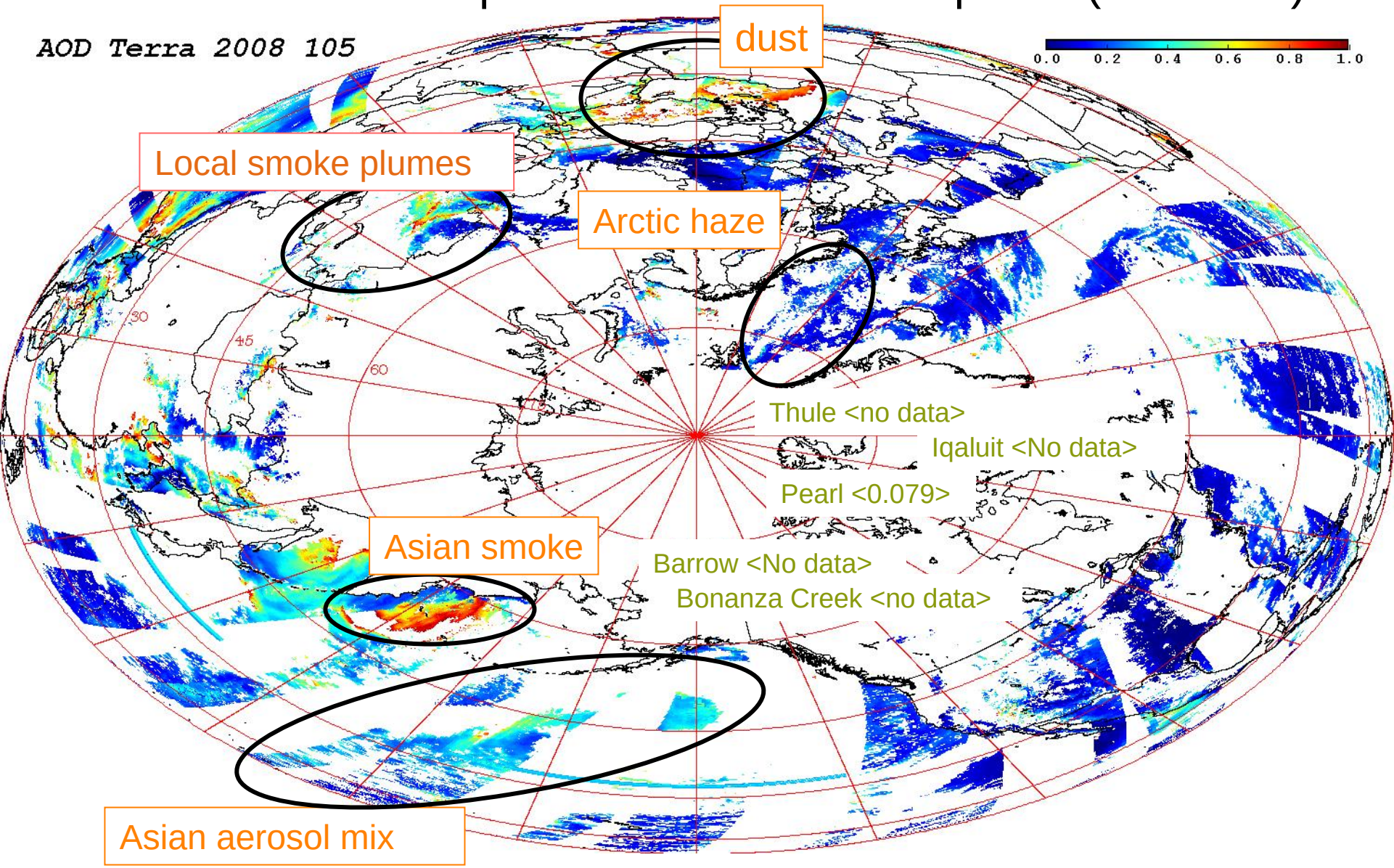
(20080406 - 20080413)



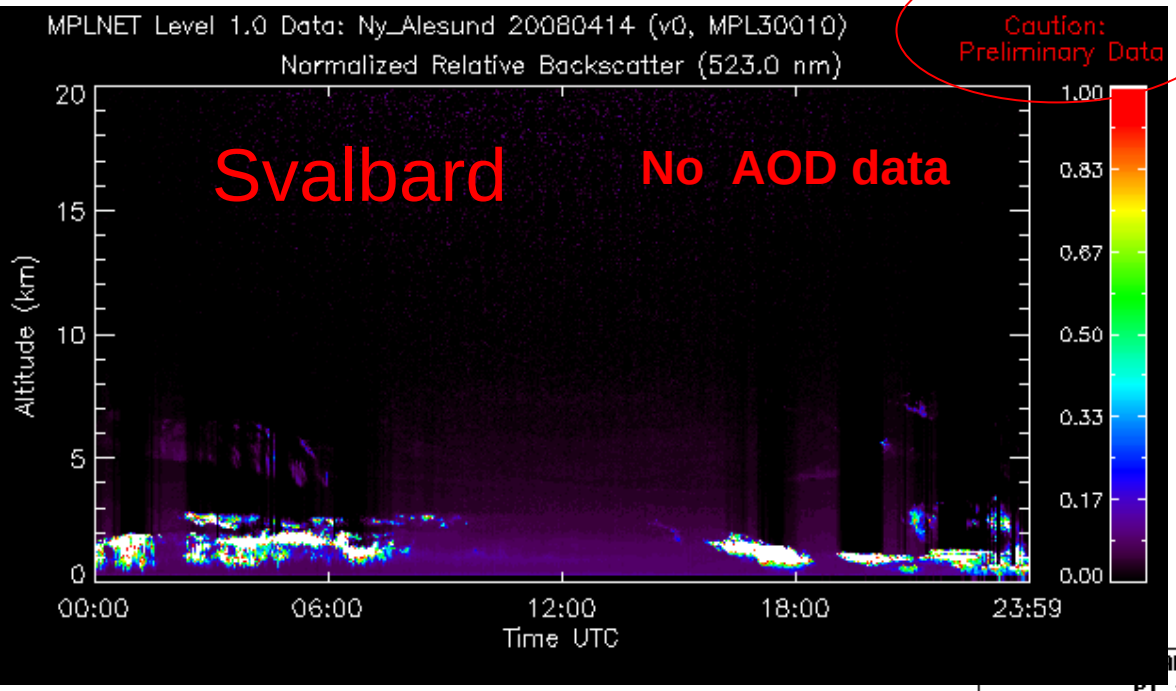
Fresh fires (superimposed in red) have started to diminish in central Asia but are still going strong in southeastern Siberia/northeastern China

Day 105 (April 14) Monday

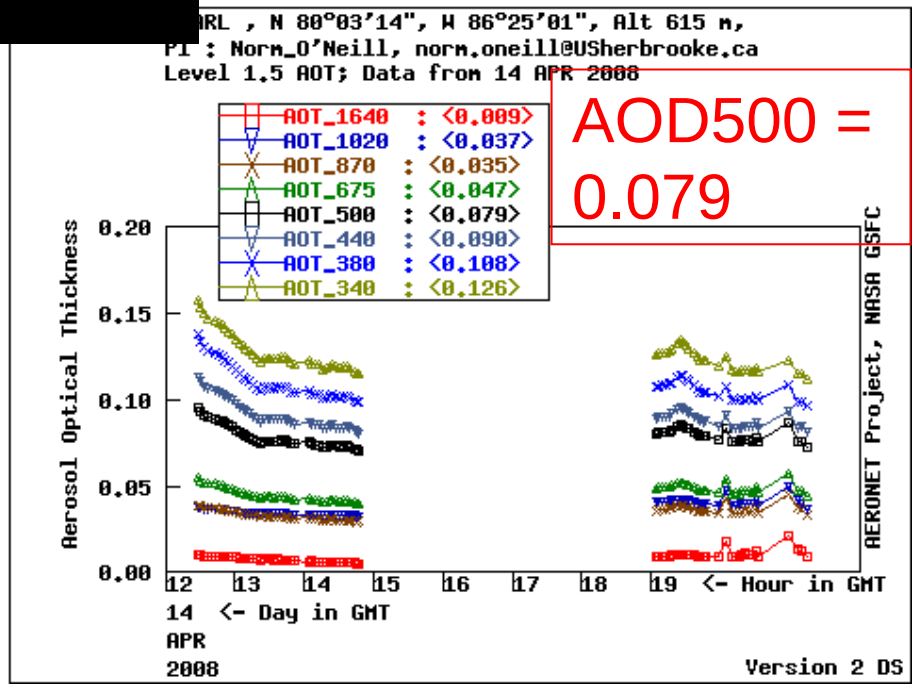
MODIS AOD Hot Spots in Northern Hemisphere (0° - 90°N)



MODIS AOD at 550 nm and AERNOET daily mean <AOD> at 500 nm



PEARL



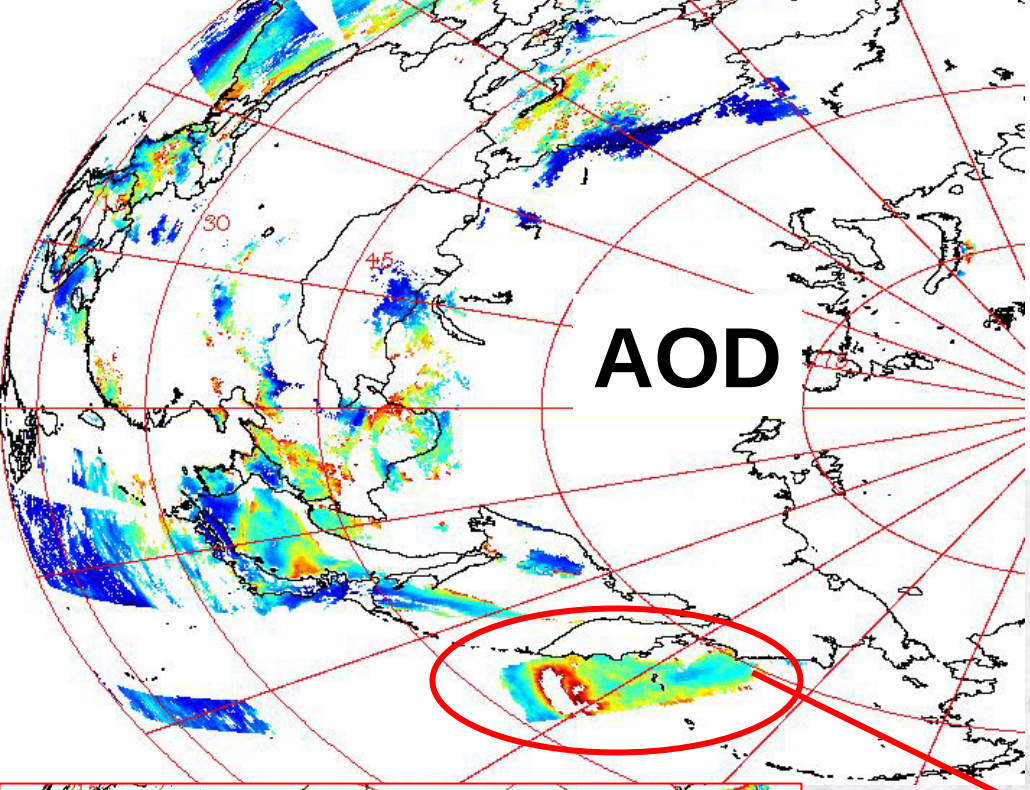
Enhanced AOD in N. Amer. Arctic is gone.

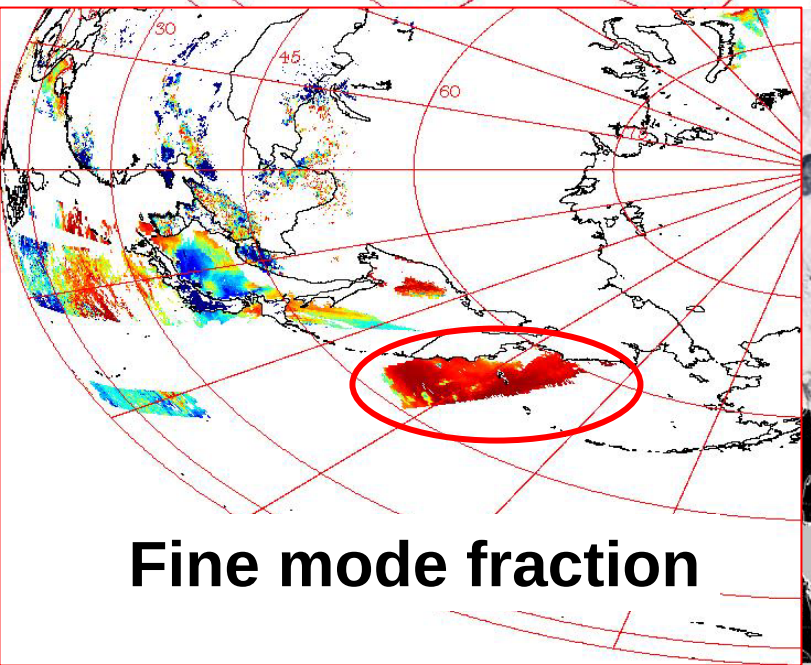
Still see some enhancement on the European - Asian side (from MODIS)

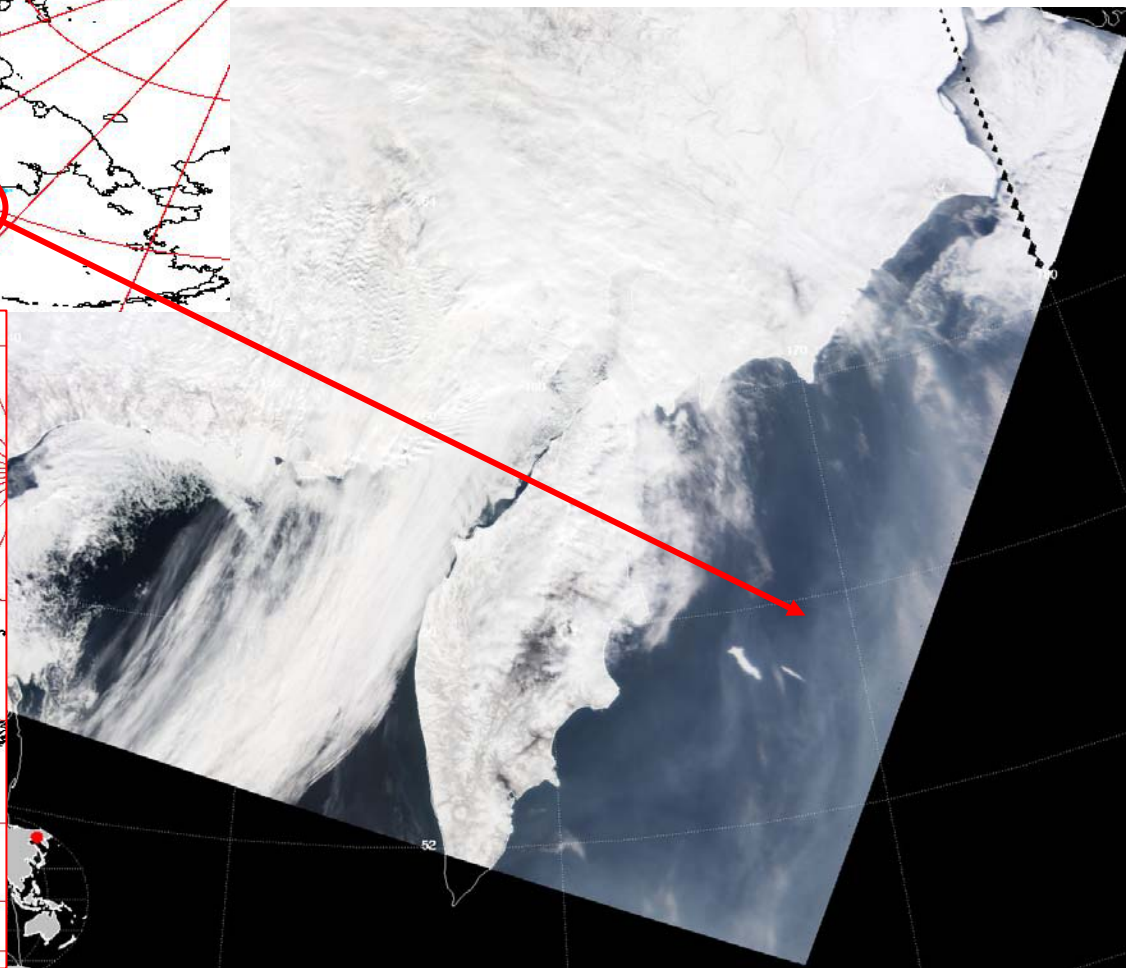
TODAY.
Tuesday April 15

Biomass burning plume
From fire flare-up over weekend

Notice fmf = 1 >> dominated by
Small particles

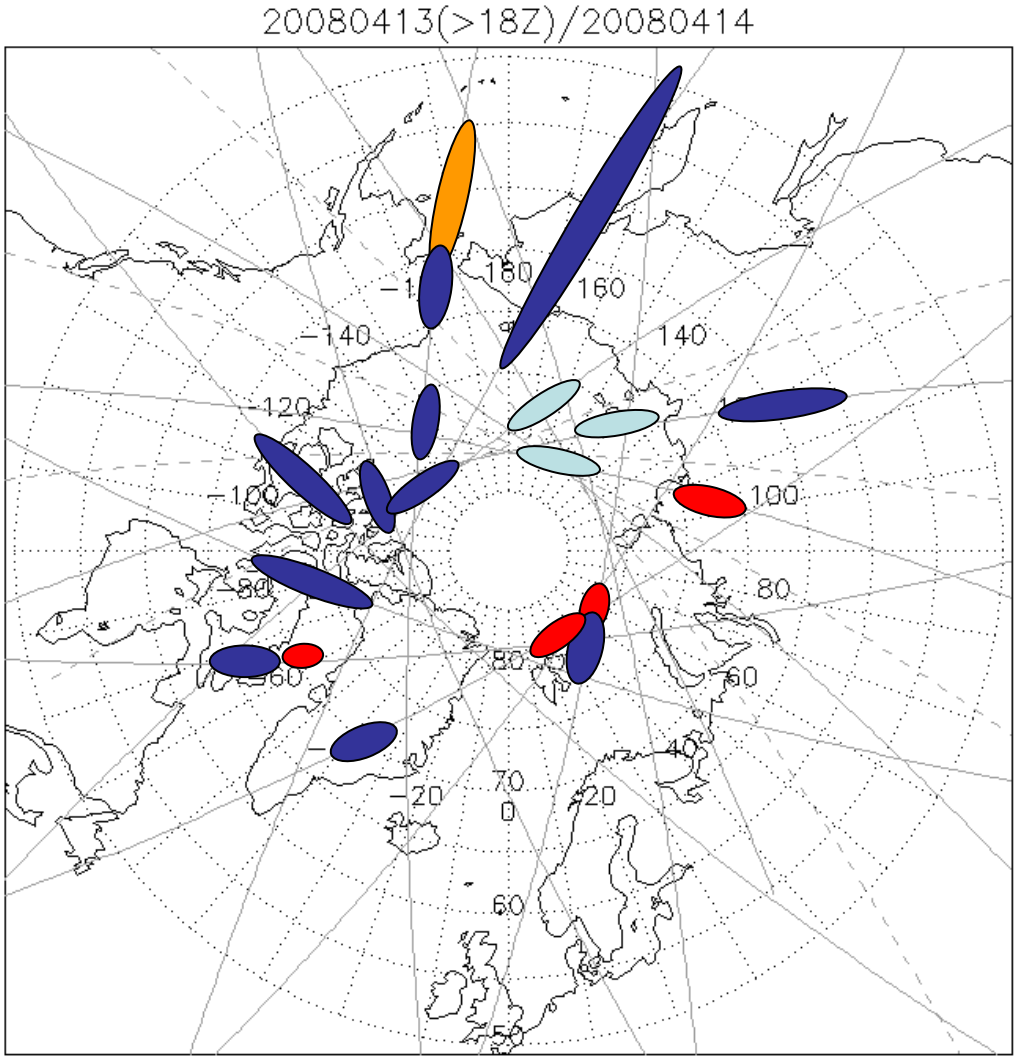






CALIPSO Observations 13/14 April 2008

CALIPSO Hot Spots – 13/14



Color key

distinct layer at surface

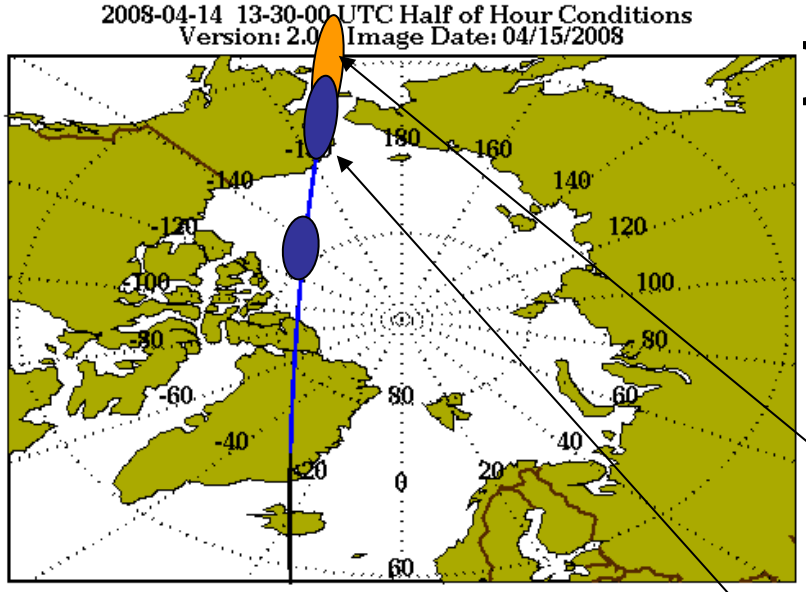
distinct layer aloft

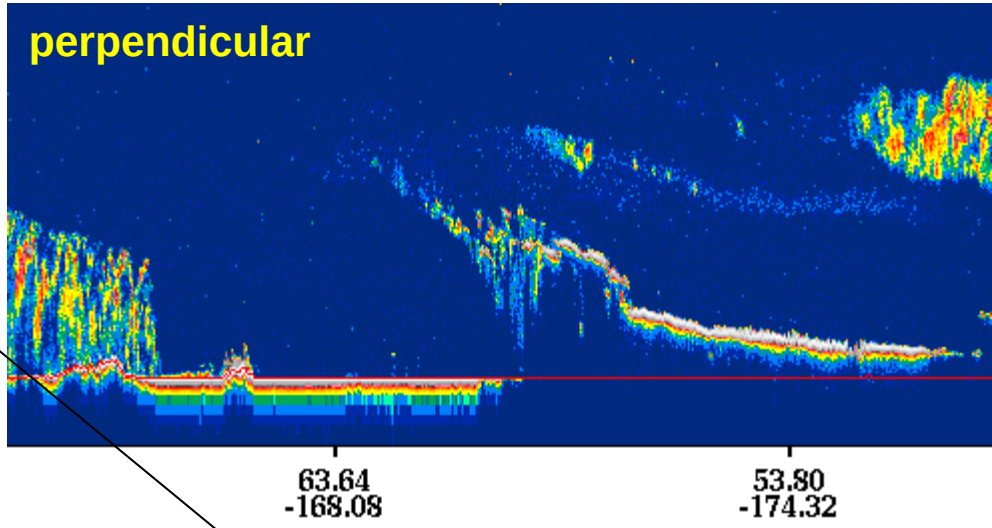
weak, diffuse aerosol

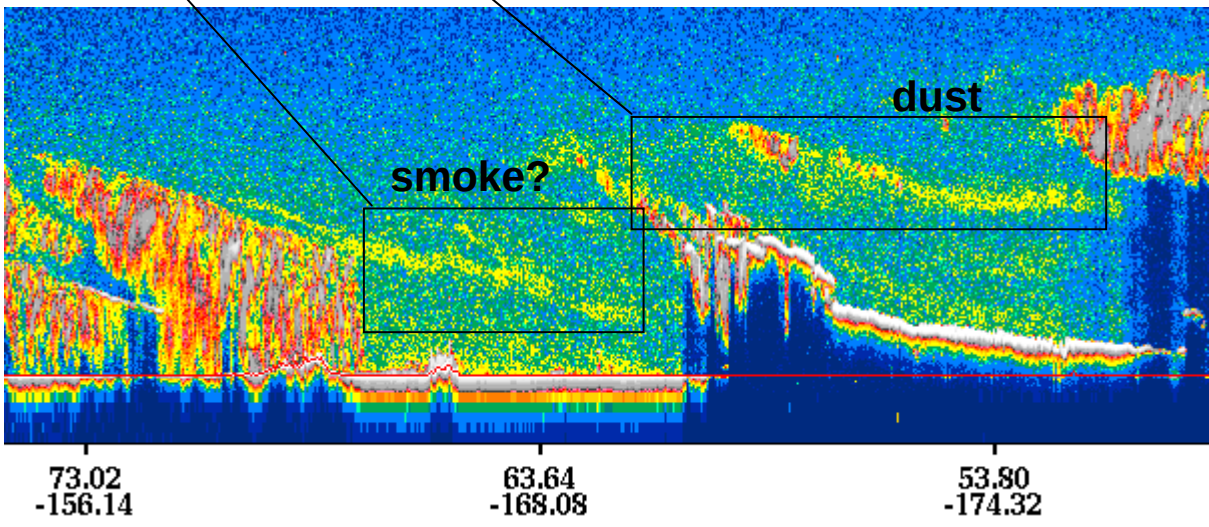
high depol (dust)

cloudy

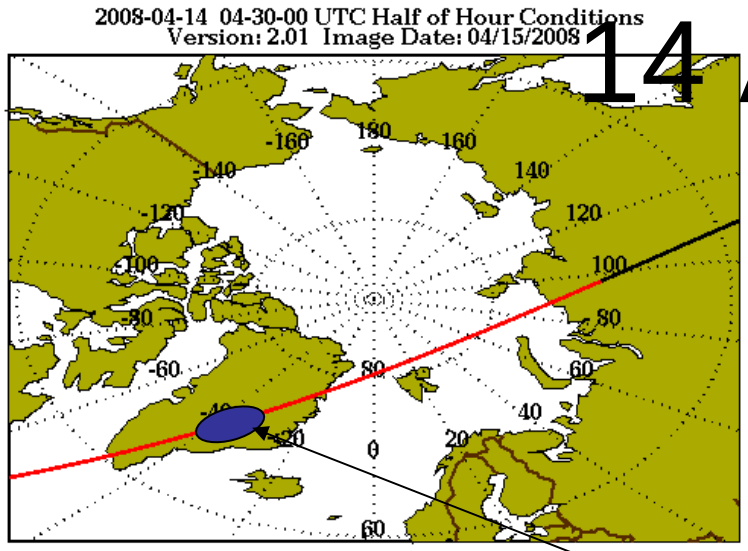
pril 1330Z

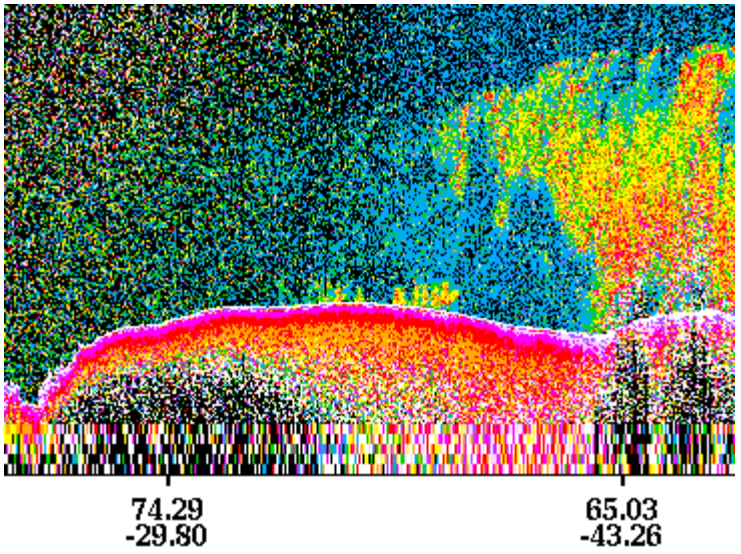

2008-04-14 13-30-00 UTC Half of Hour Conditions
Version: 2.0 Image Date: 04/15/2008
180
160
140
120
100
80
60
40
20
0
-140
-120
-100
-80
-60
-40
-20
60

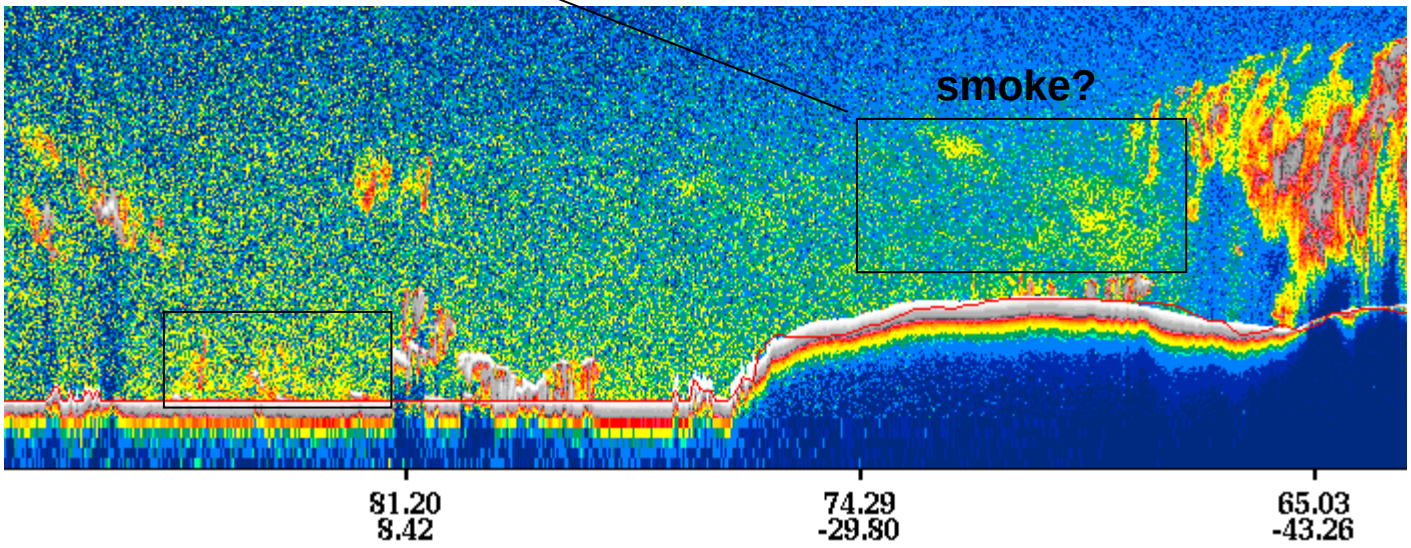

perpendicular
63.64
-168.08
53.80
-174.32

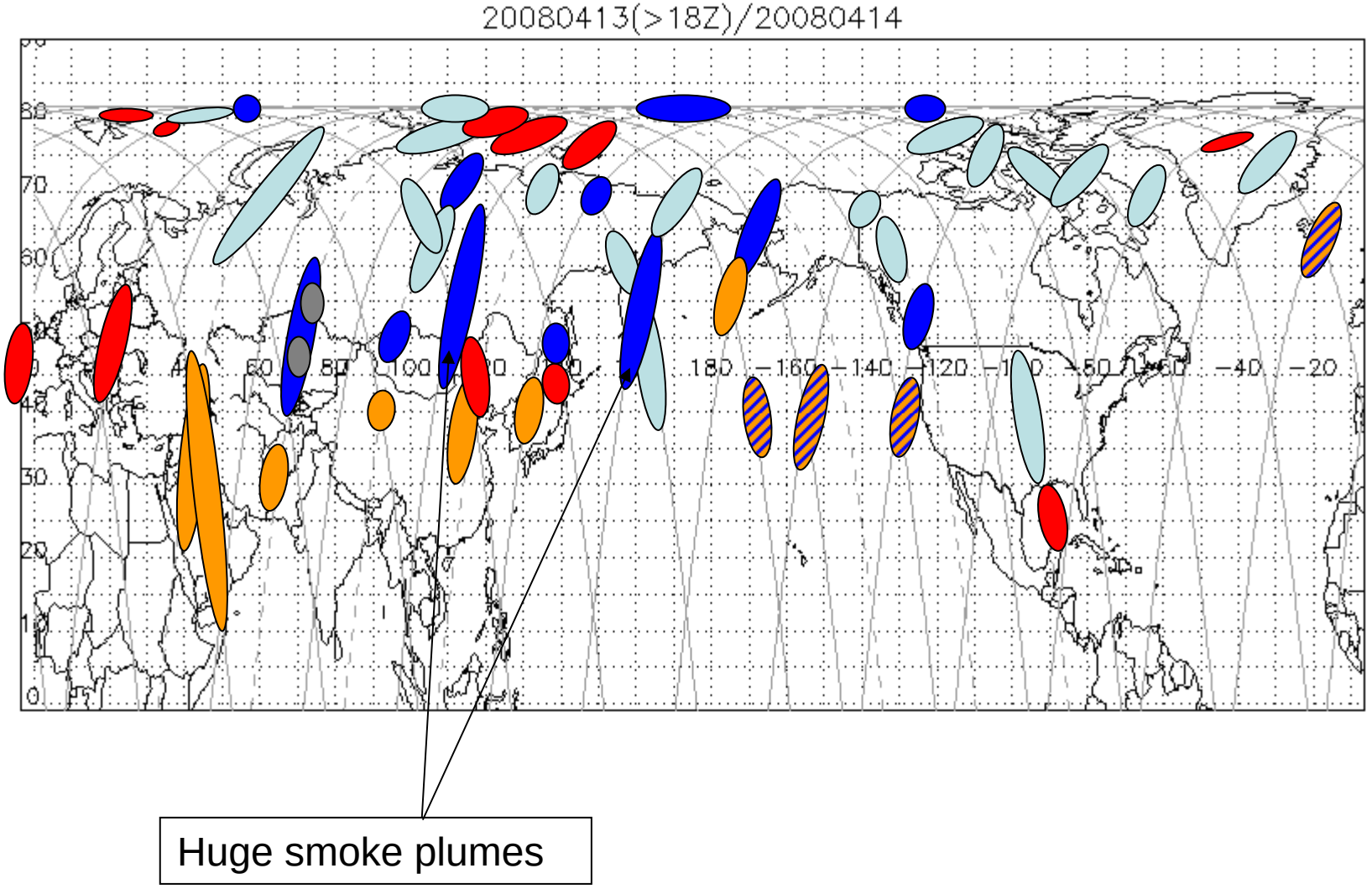

dust
smoke?
73.02
-156.14
63.64
-168.08
53.80
-174.32

14 April 0430Z

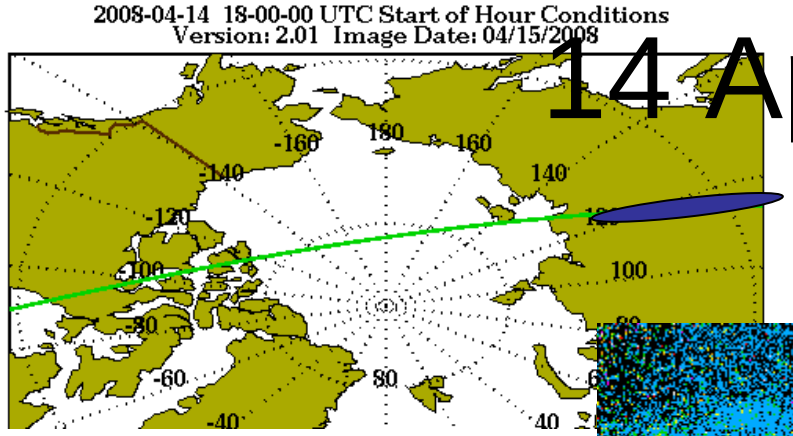


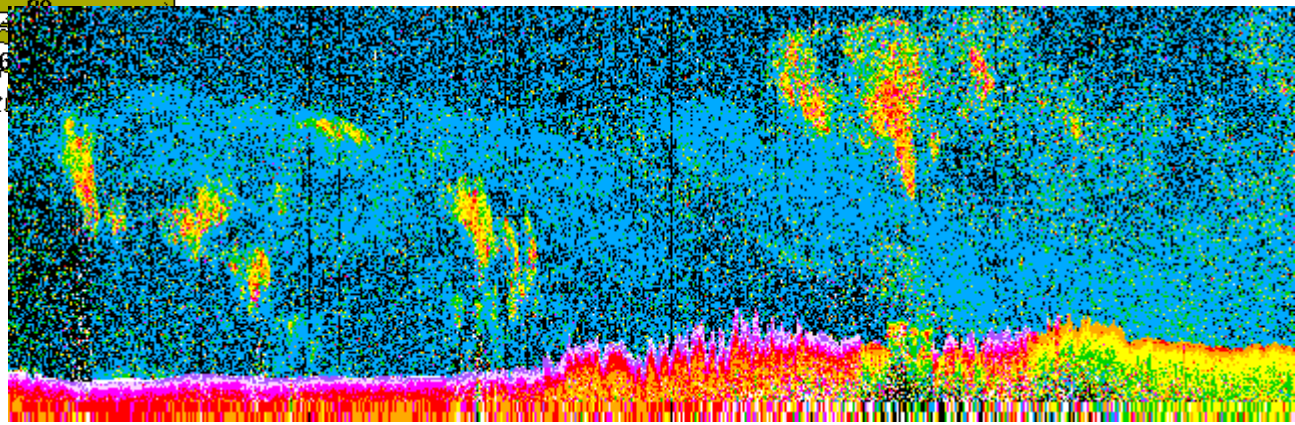


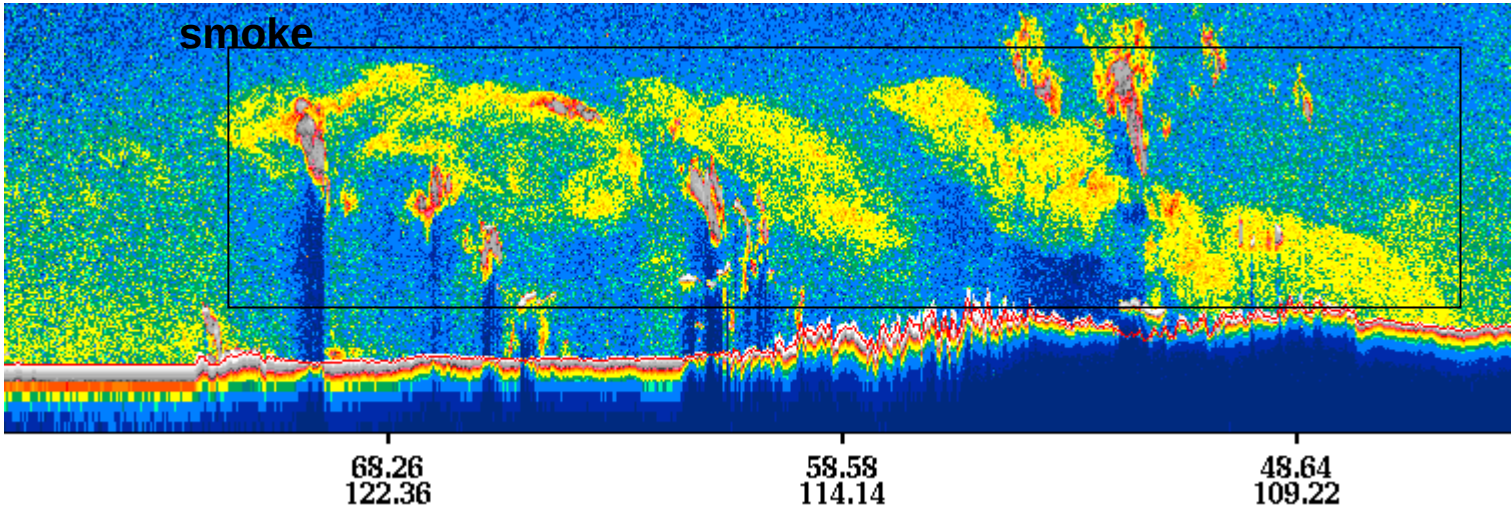



20080413(>18Z)/20080414
Huge smoke plumes

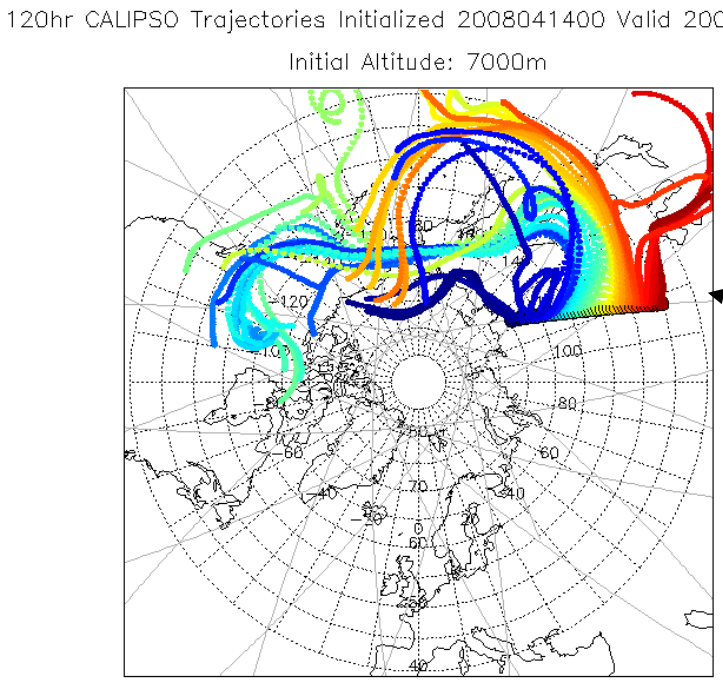
14 April 1800Z

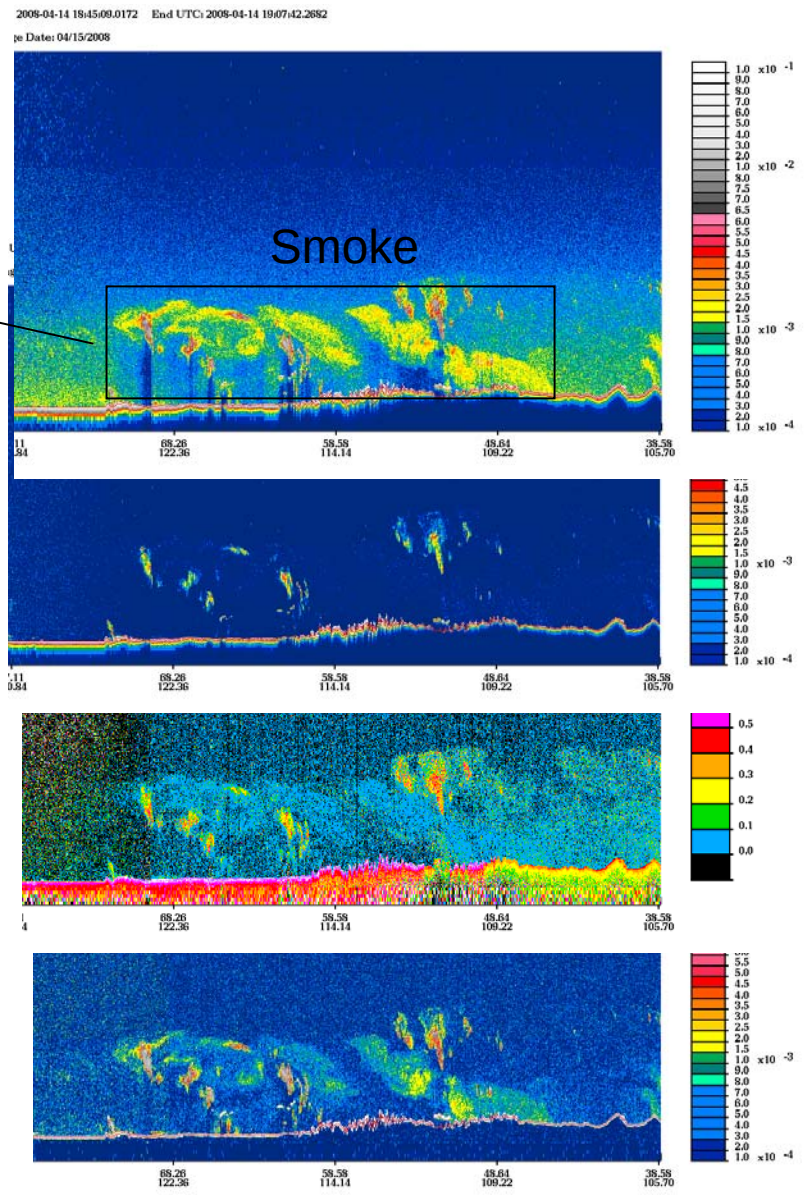


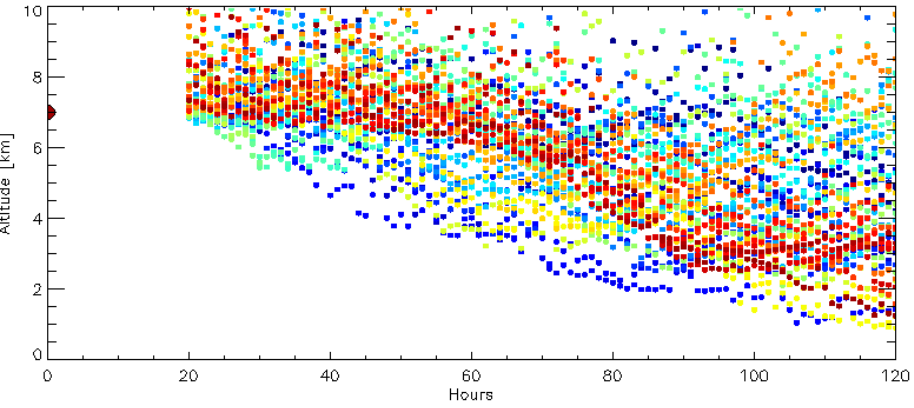


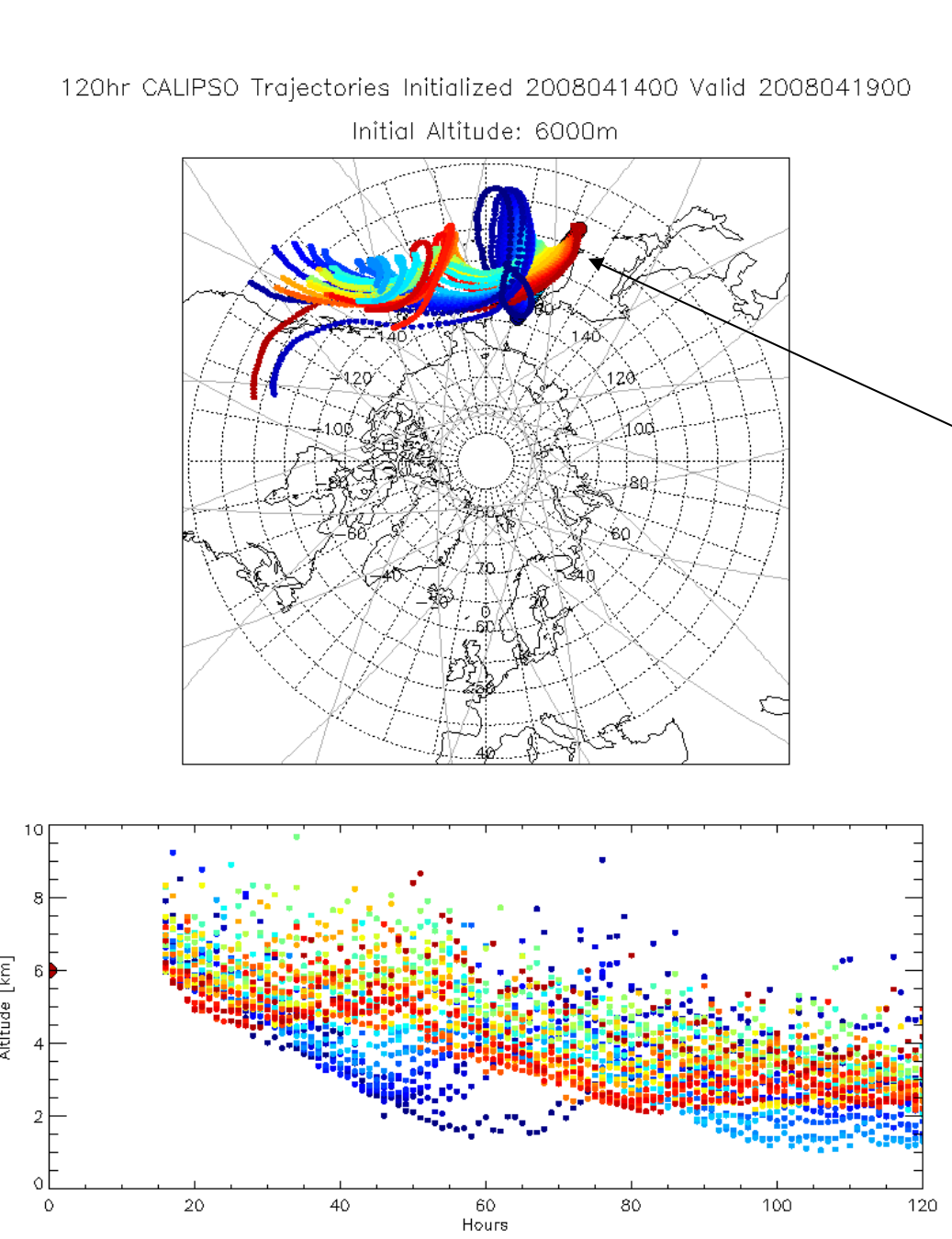


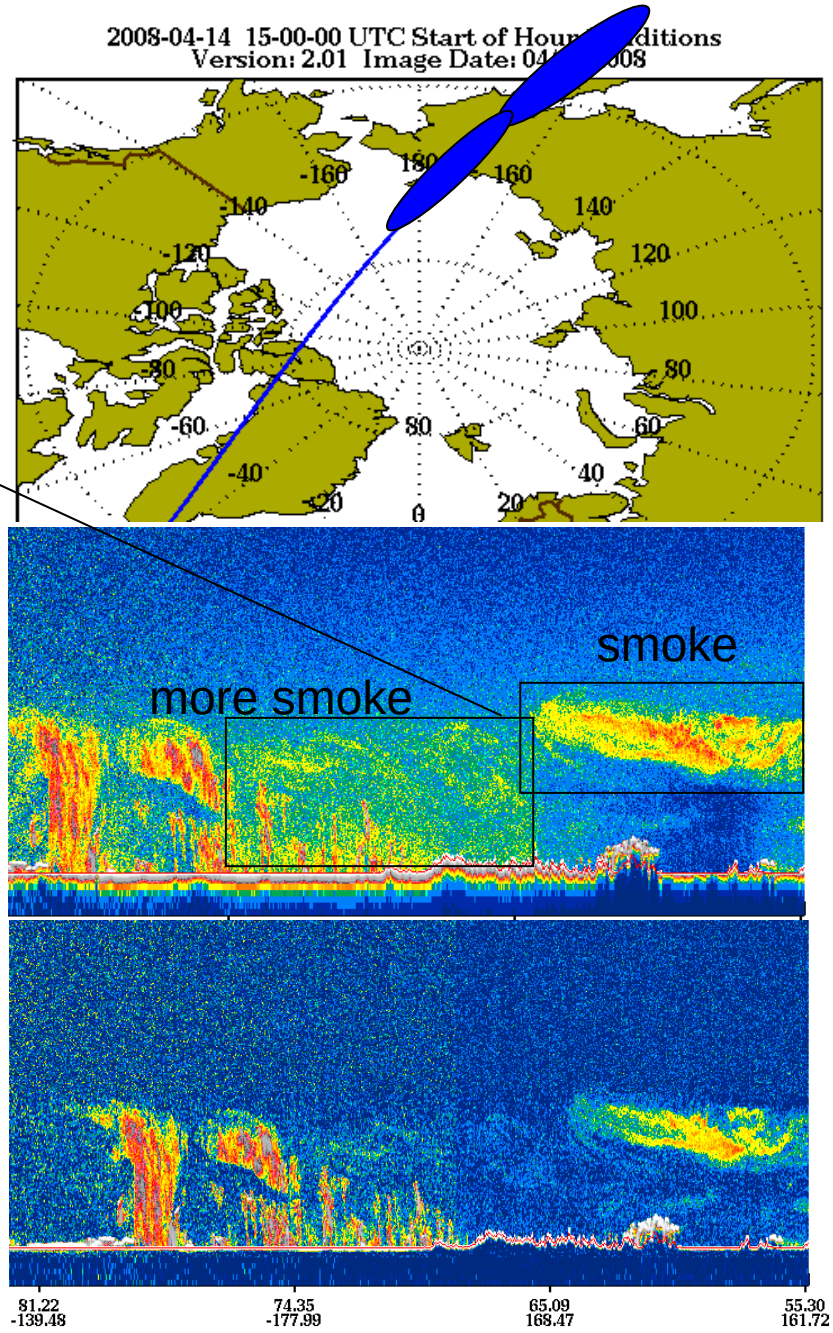
14 April 1800Z Granule



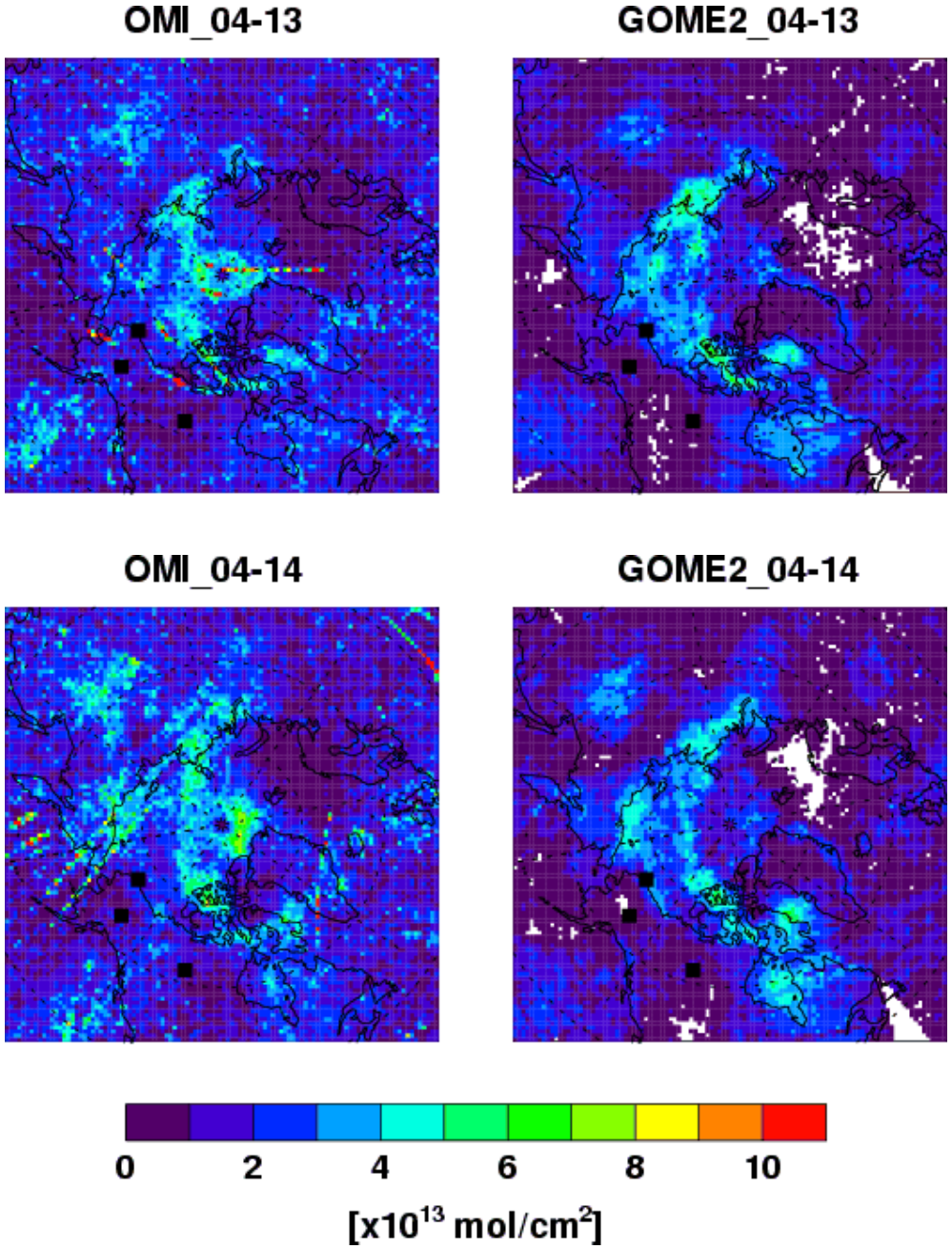


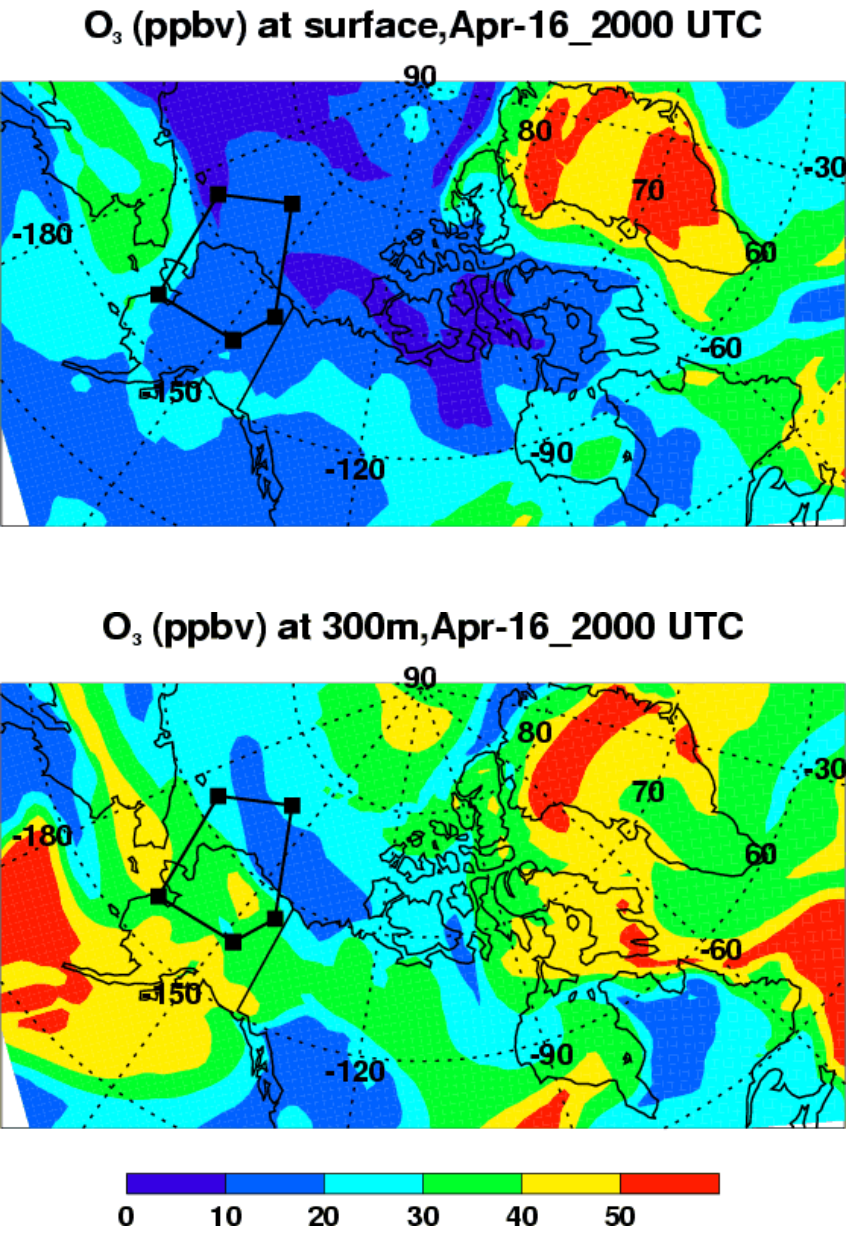



120hr CALIPSO Trajectories Initialized 2008041400 Valid 2008041900
Initial Altitude: 6000m
Altitude [km]
Hours

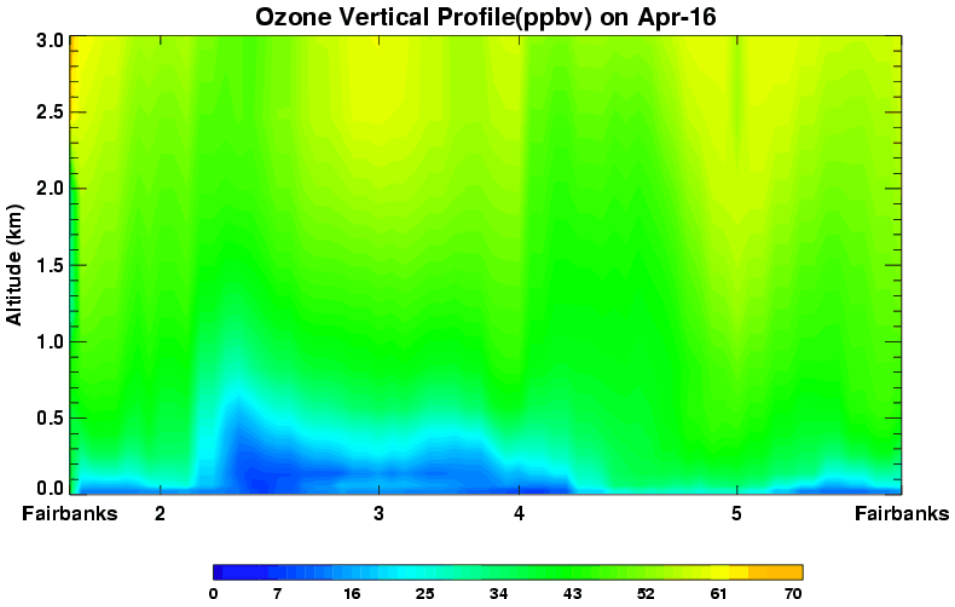

2008-04-14 15-00-00 UTC Start of Hour
Version: 2.01 Image Date: 04
smoke
more smoke
81.22
-139.48
74.35
-177.99
65.09
168.47
55.30
161.72

Boundary Layer BrO

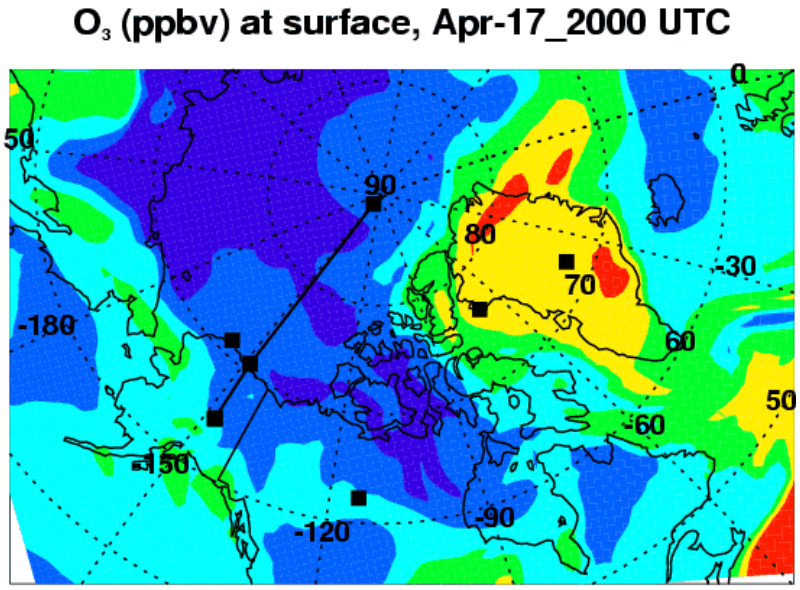


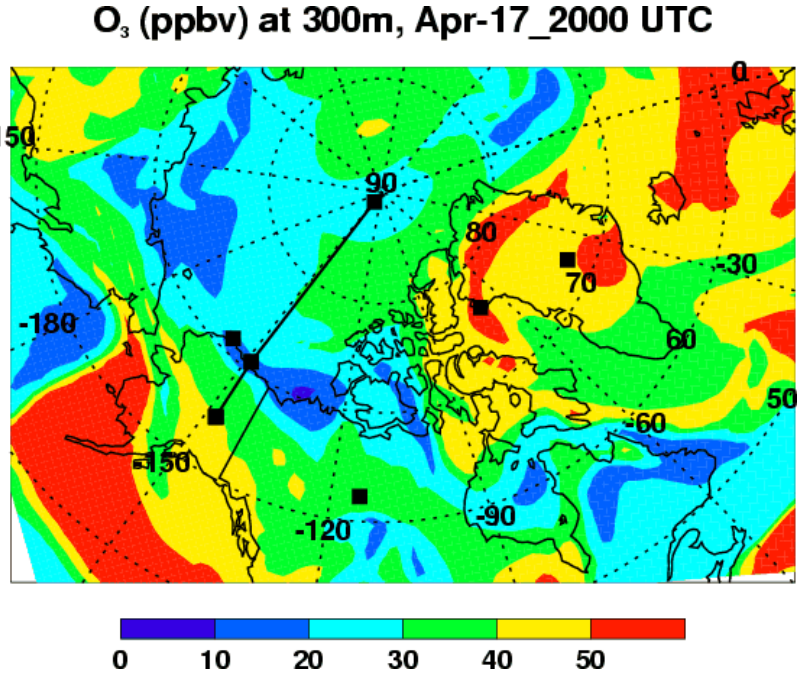


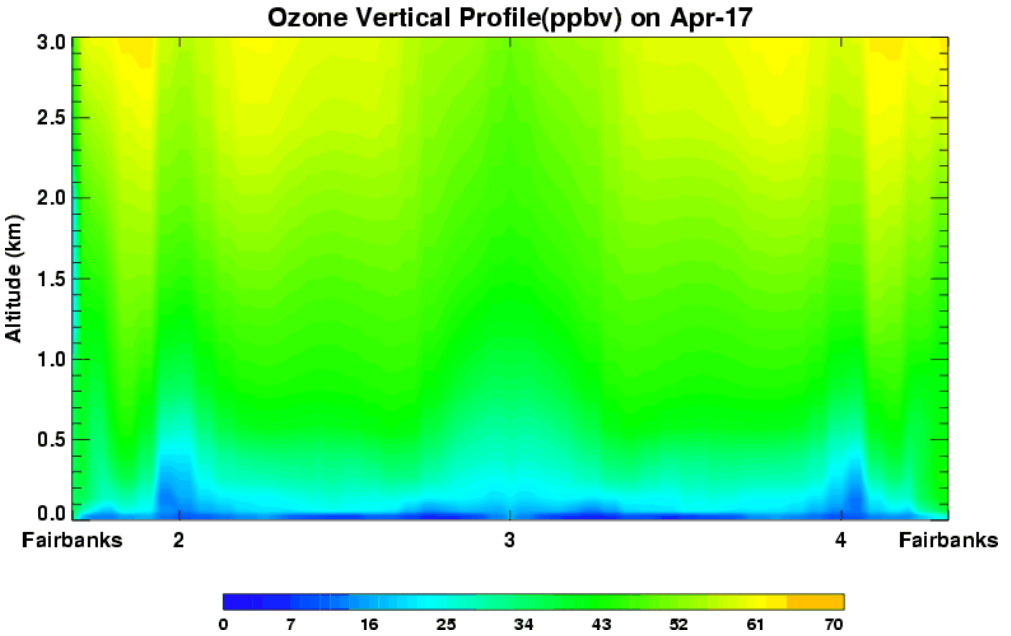
O3 profile on 4/16



O3 profile on 4/17





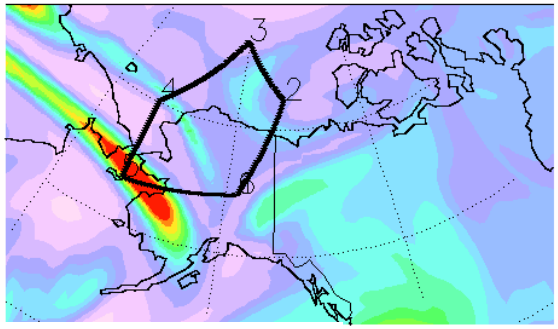


MZ4/GFS Apr 16 18Z

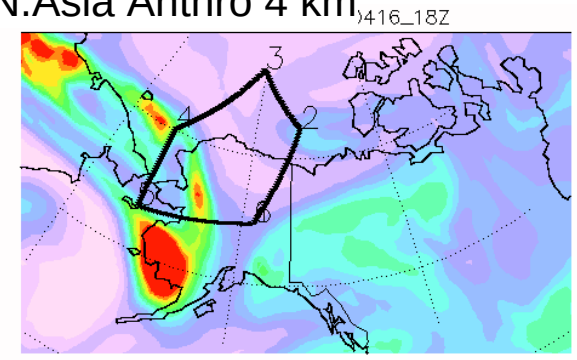
forecast from Apr 15

Alaska Loop – Fresh and Aged Asian Pollution

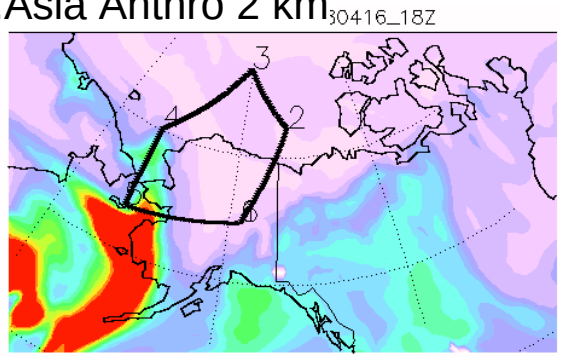
N.Asia Anthro 6 km



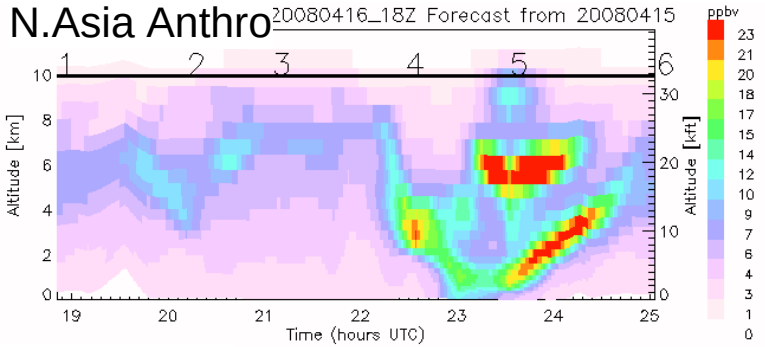
N.Asia Anthro 4 km



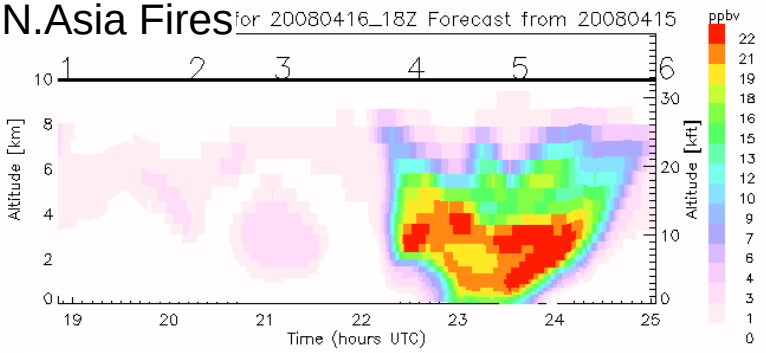
N.Asia Anthro 2 km



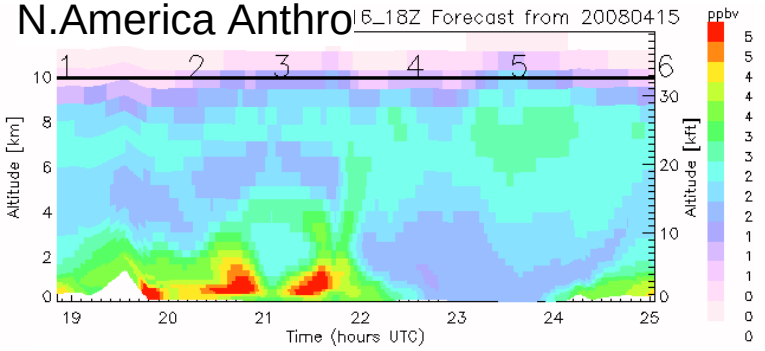
N.Asia Anthro



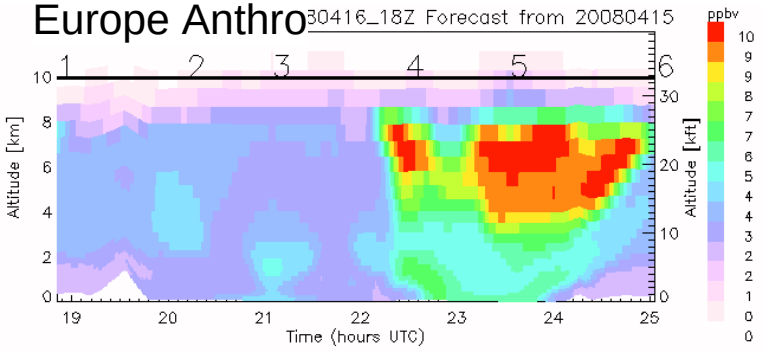
N.Asia Fires



N.America Anthro



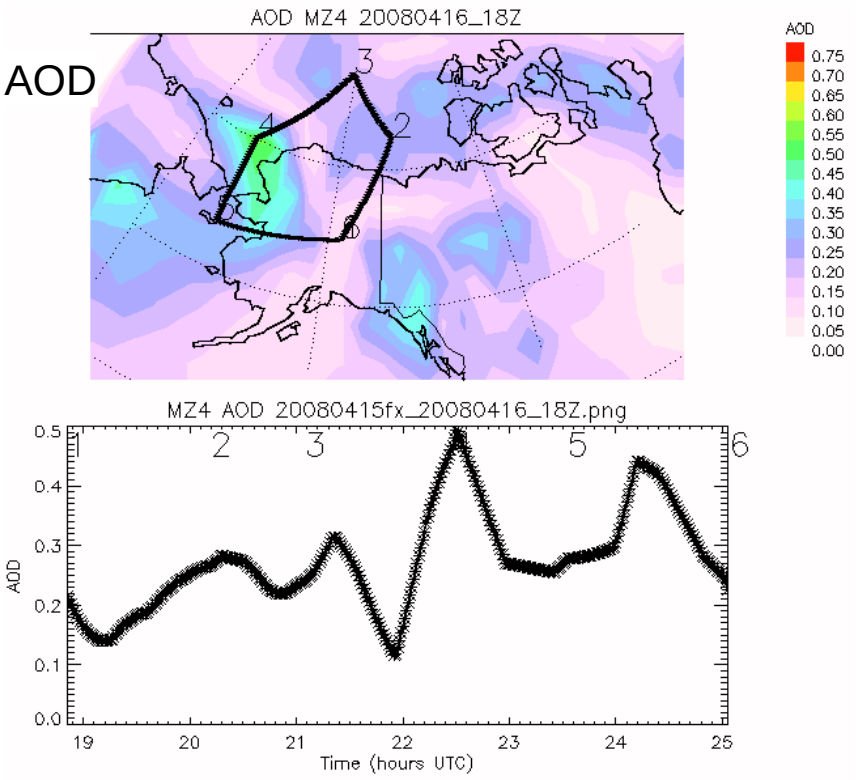
Europe Anthro



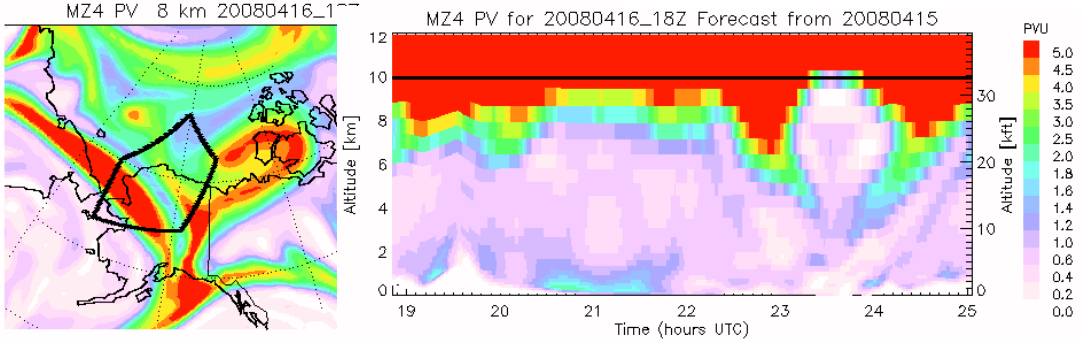
MZ4/GFS Apr 16 18Z

forecast from Apr 15

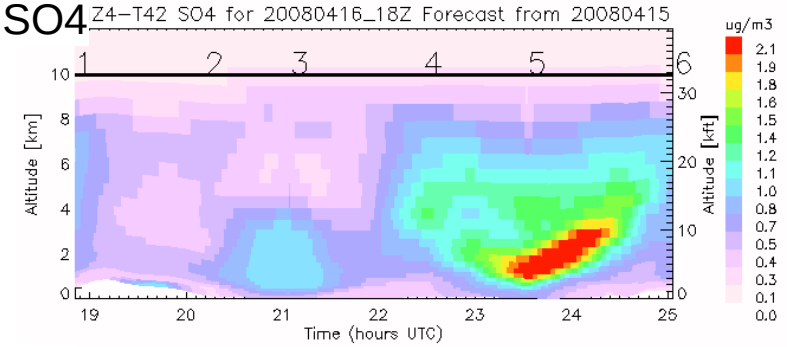
AOD



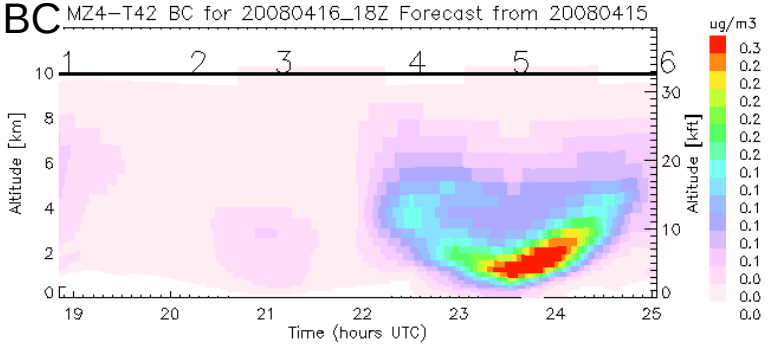
Potential Vorticity



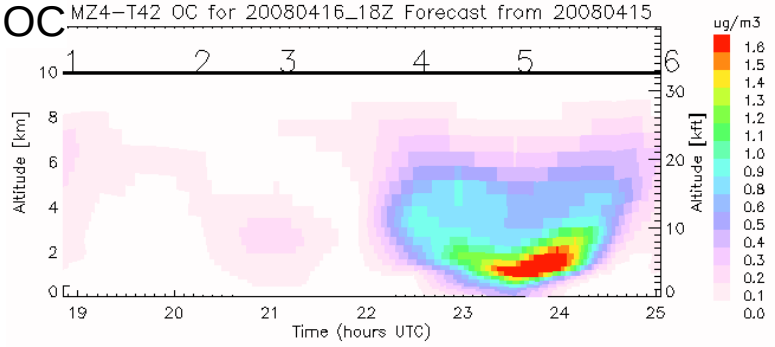
SO4

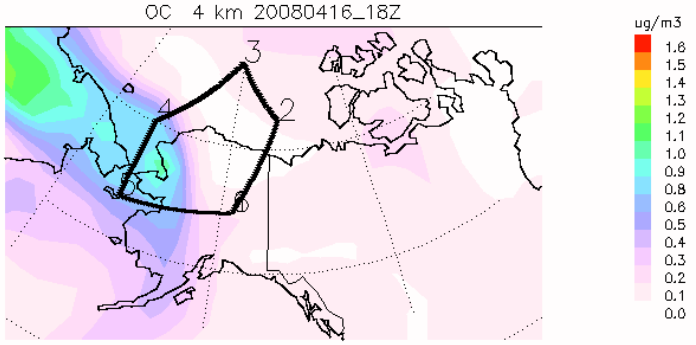


BC



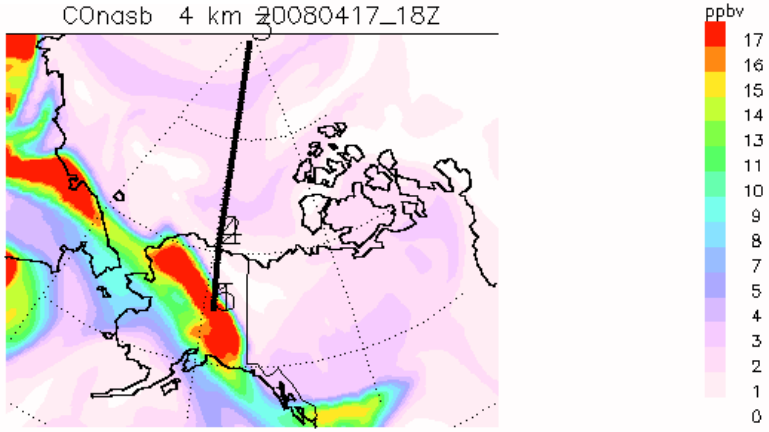
OC



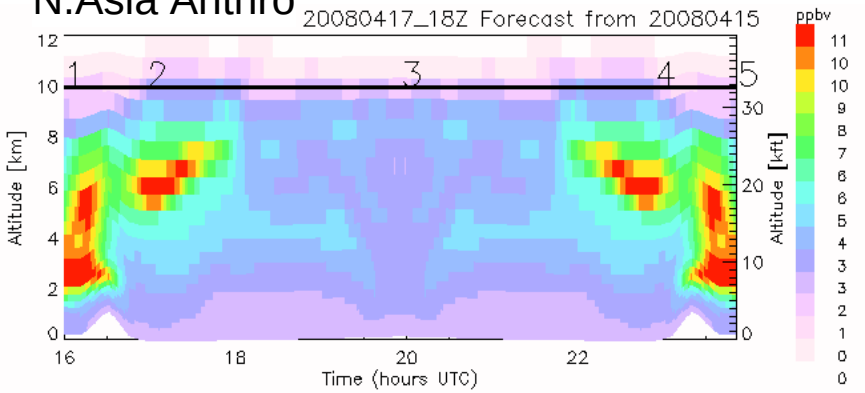


MZ4/GFS Apr 17 18Z
forecast from Apr 15
North Pole run

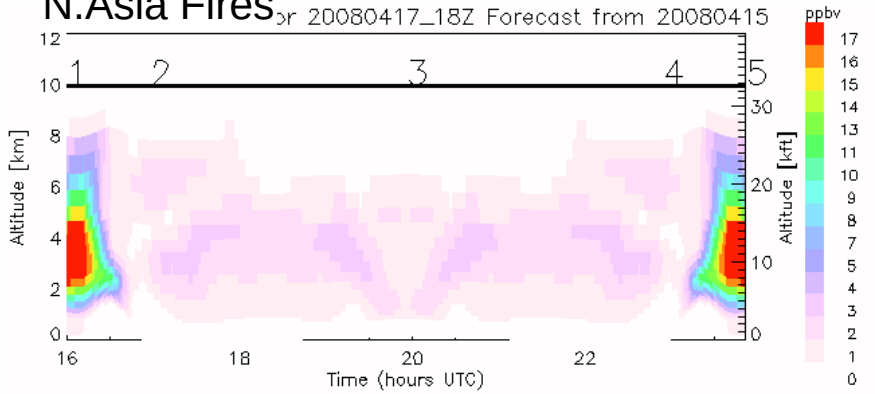
N.Asia Fires 4km



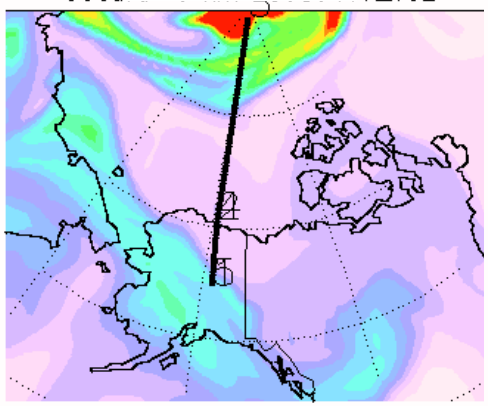
N.Asia Anthro



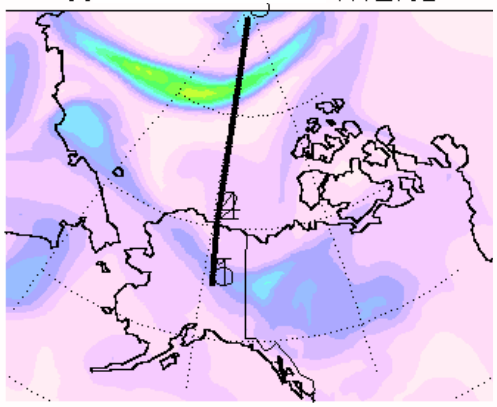
N.Asia Fires



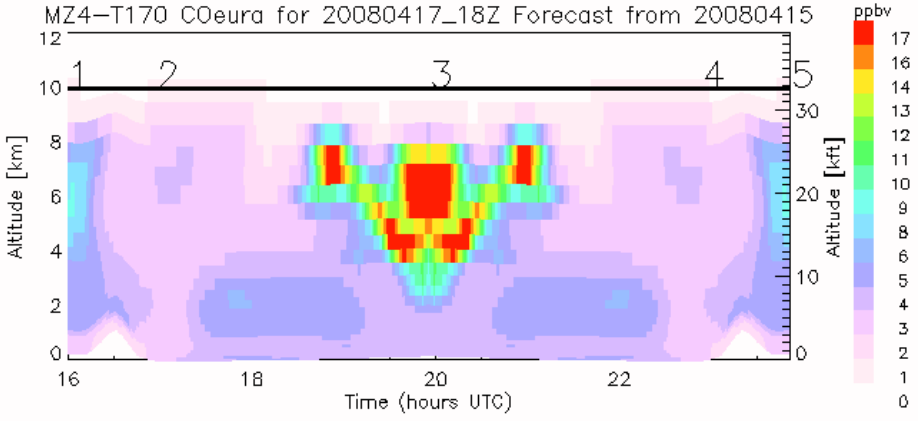
Europe 6km



Europe 8km



Europe Anthro

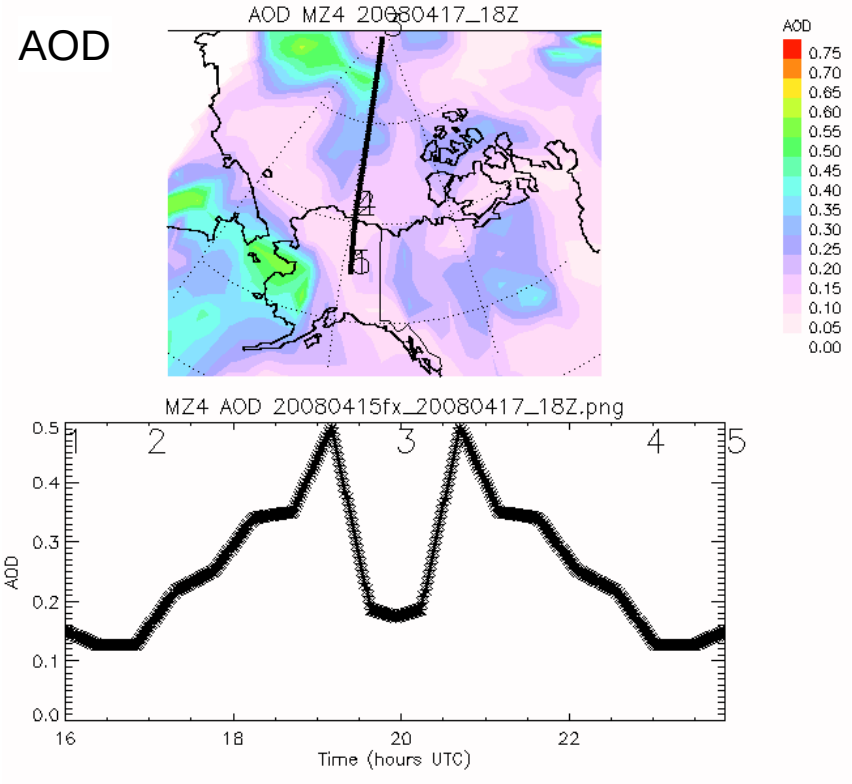


MZ4/GFS Apr 17 18Z

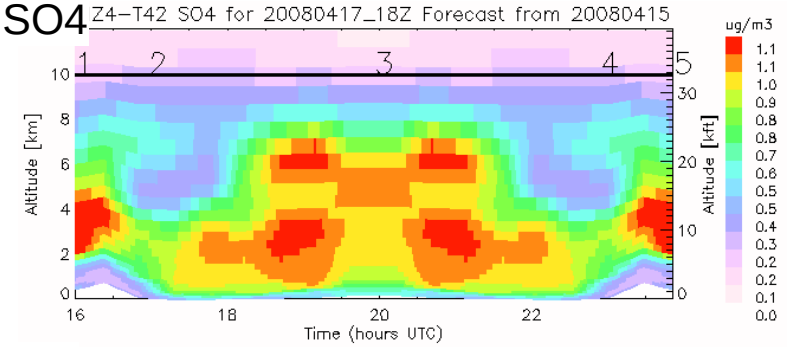
forecast from Apr 15

North Pole run

AOD



SO4



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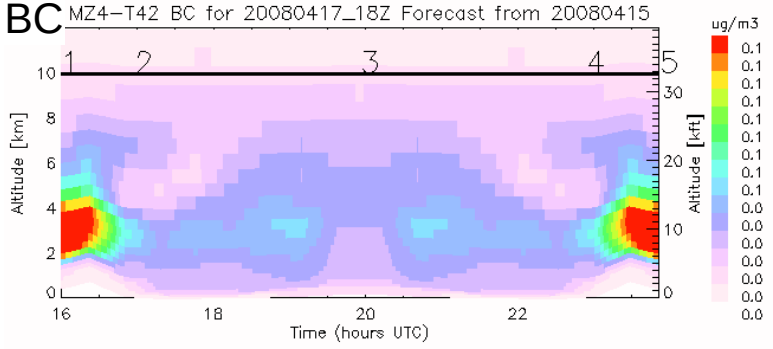

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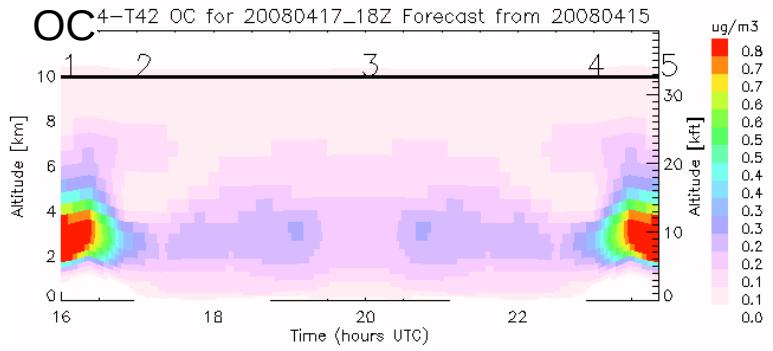
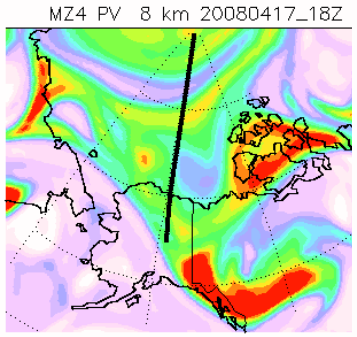
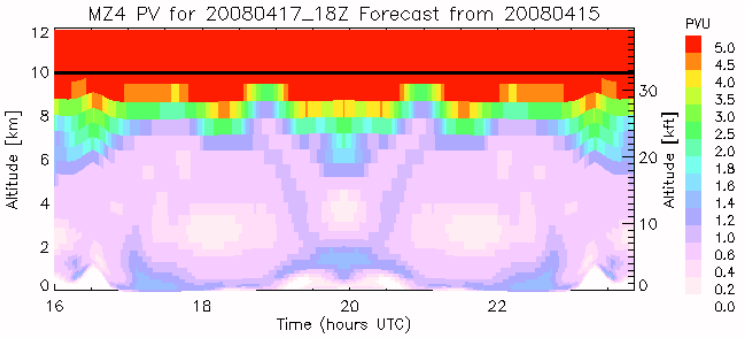
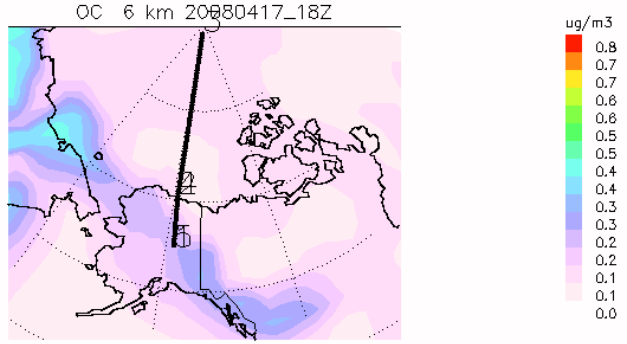


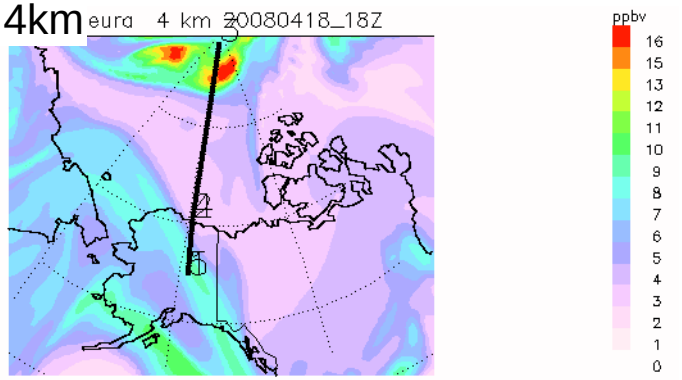




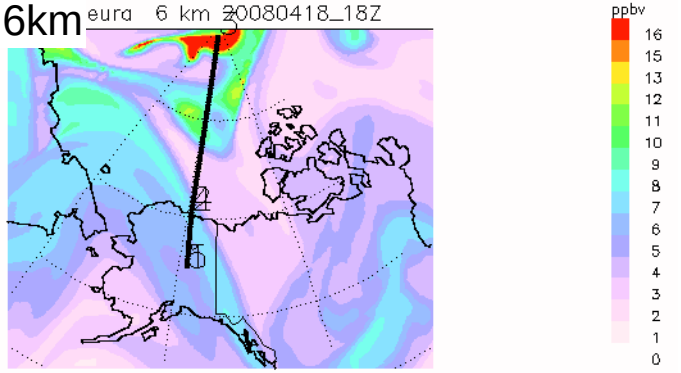


MZ4/GFS Apr 18 18Z
forecast from Apr 15
North Pole run

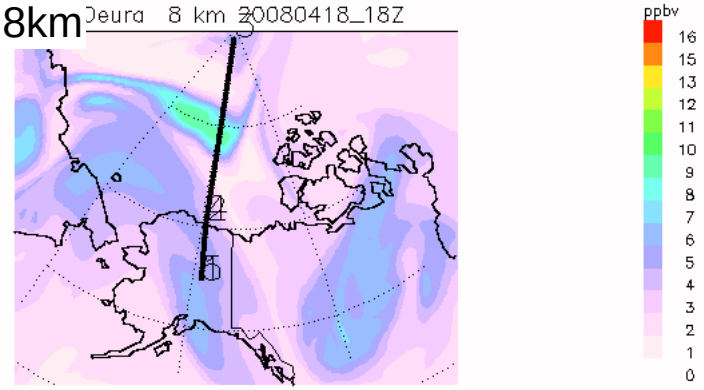
Europe 4km



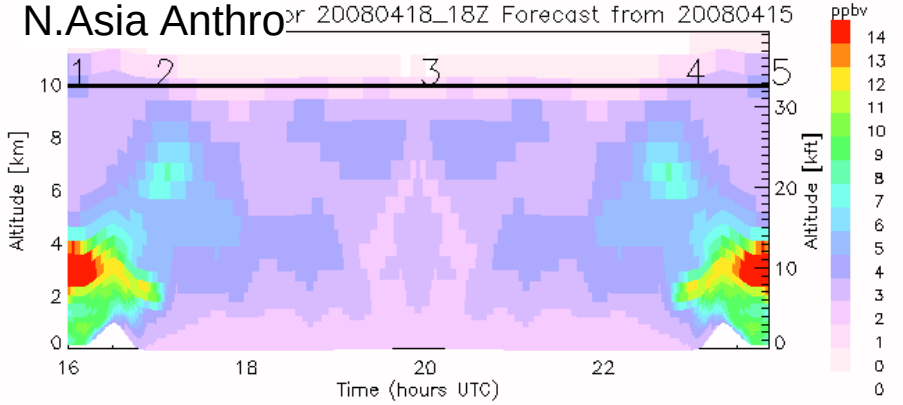
Europe 6km



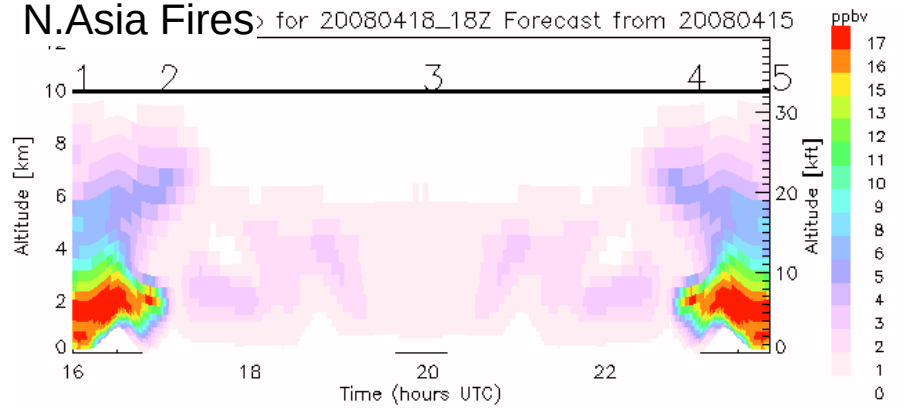
Europe 8km



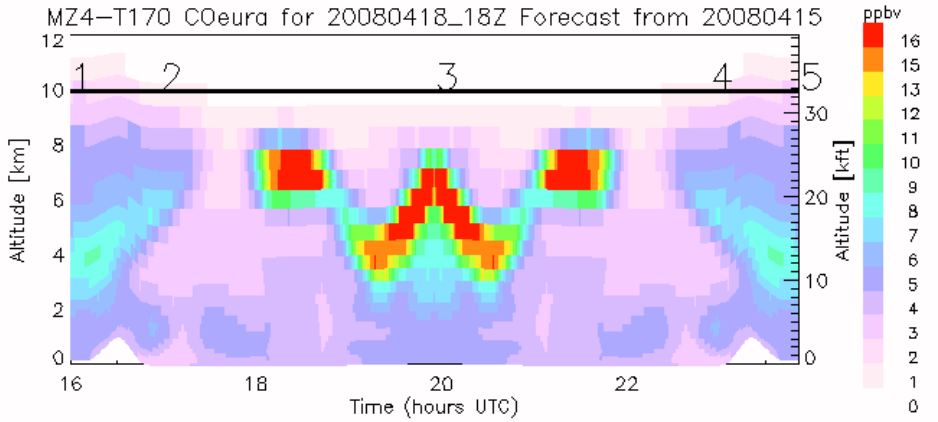
N.Asia Anthro



N.Asia Fires



Europe Anthro

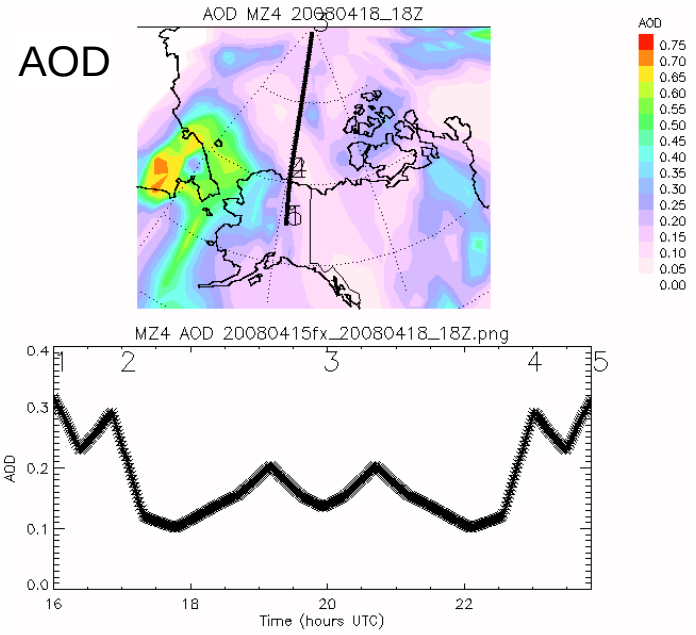


MZ4/GFS Apr 18 18Z

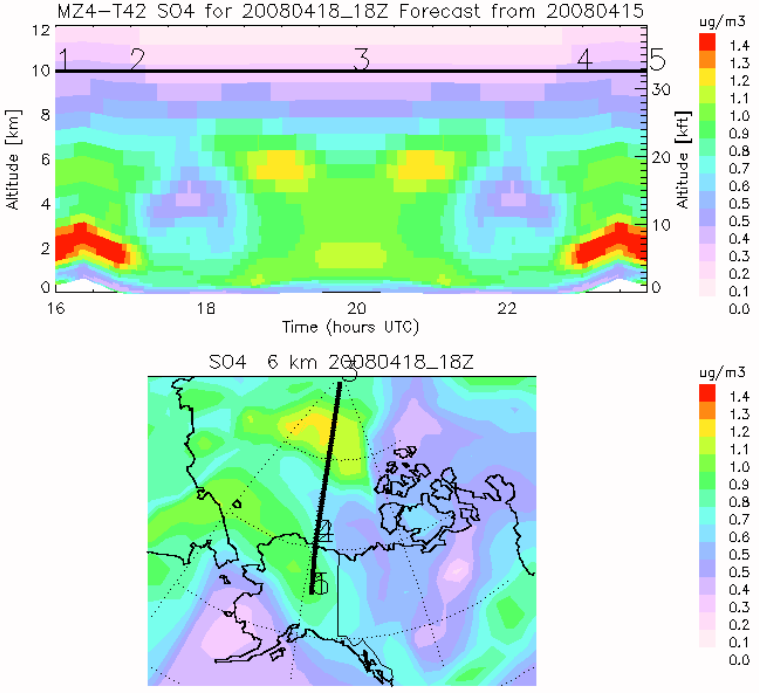
forecast from Apr 15

North Pole run

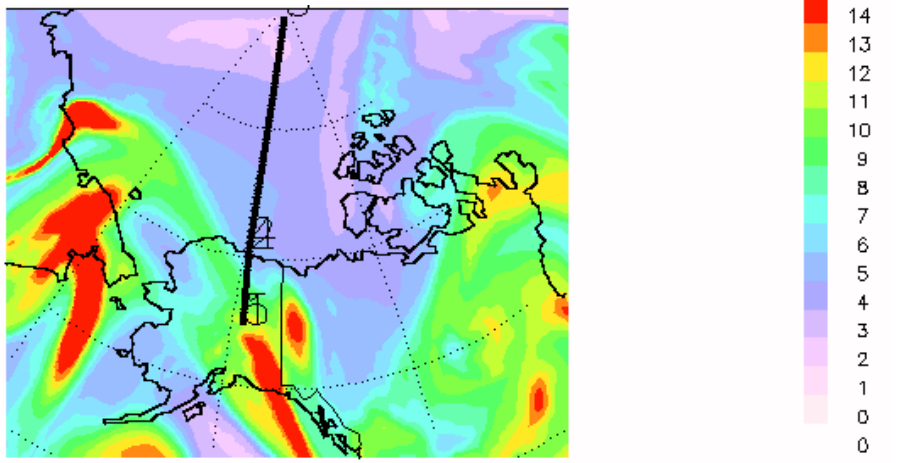
AOD



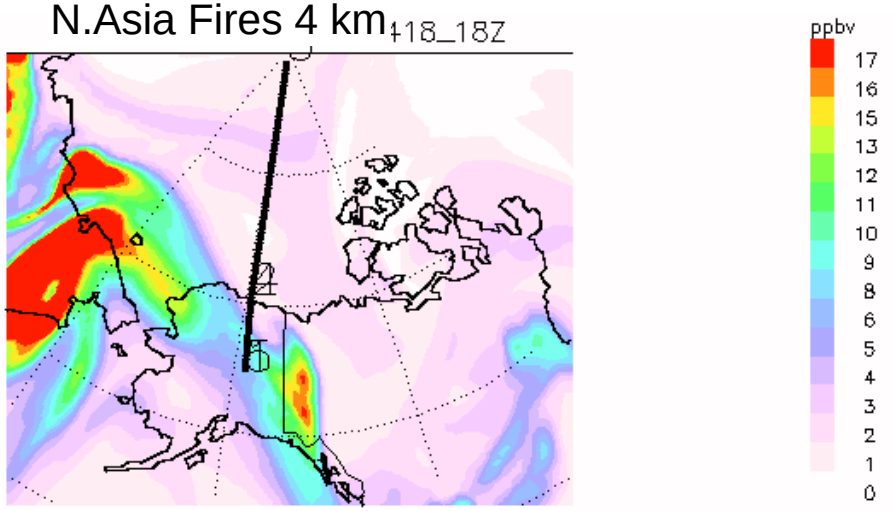
SO4



N.Asia Anthro 4 km



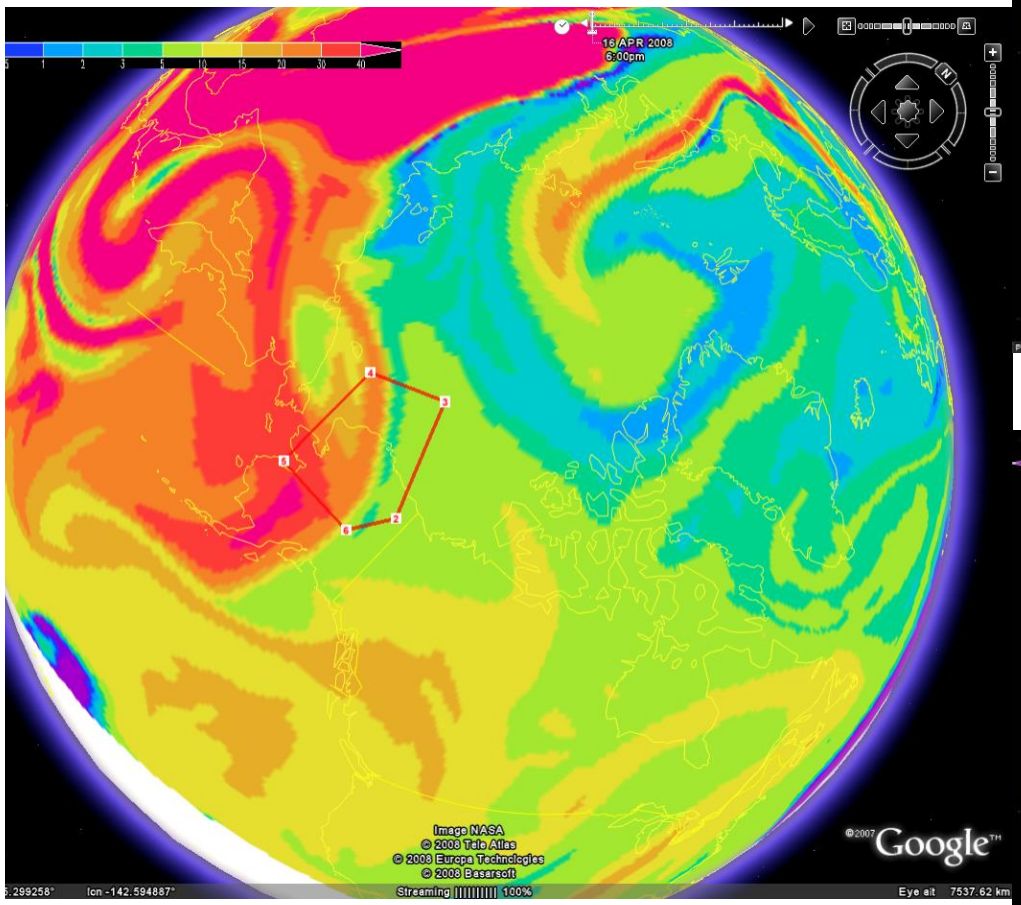
N.Asia Fires 4 km

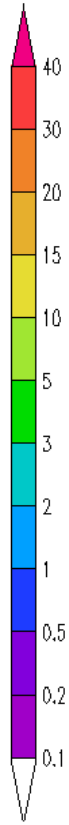


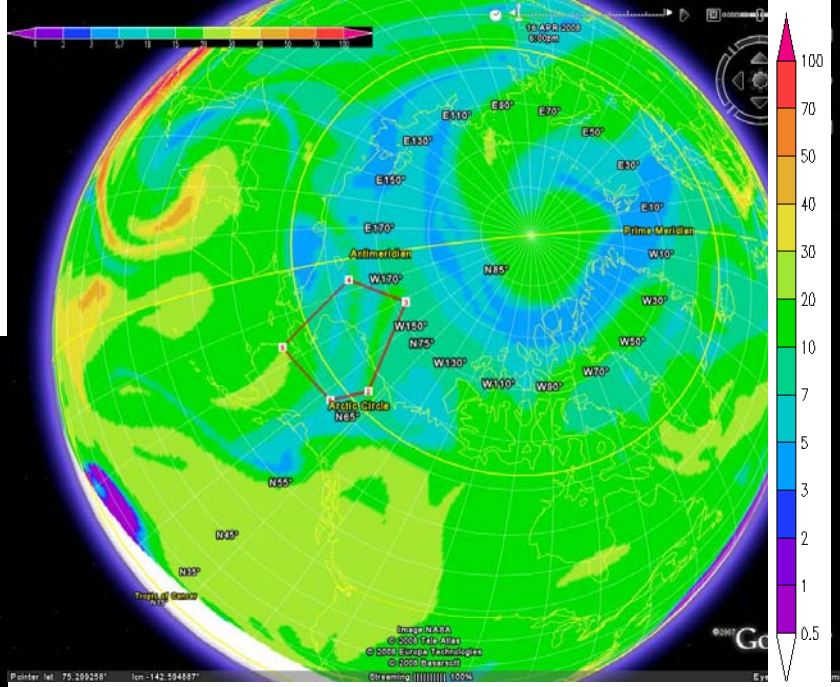
Anthropogenic CO

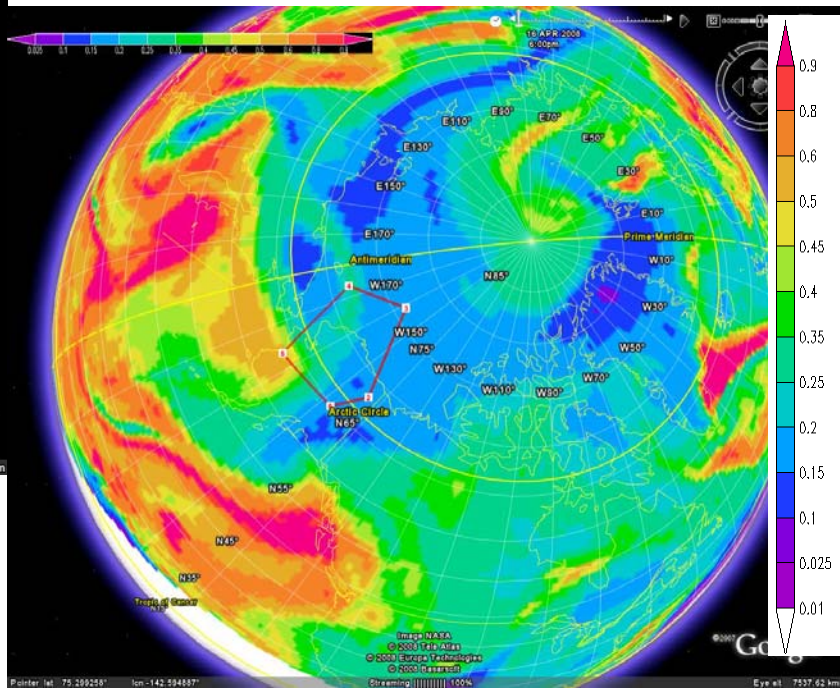
Pentagon Flight

April 16th, 18Z, 5.4 km (42hr)







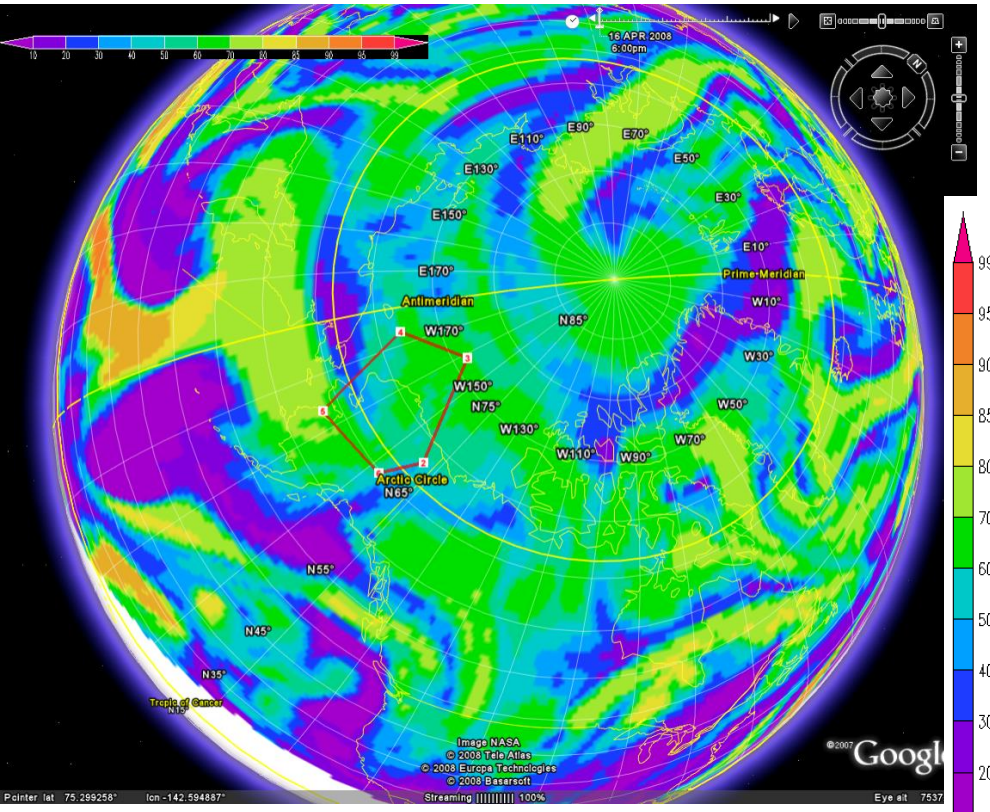


Biomass CO

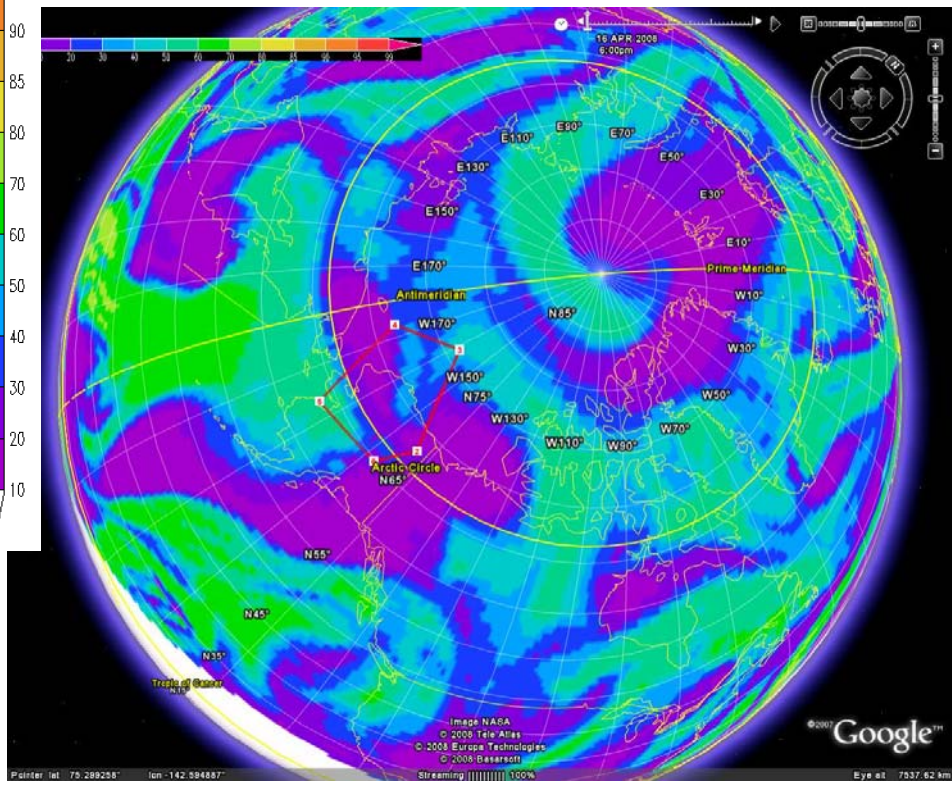
AOD

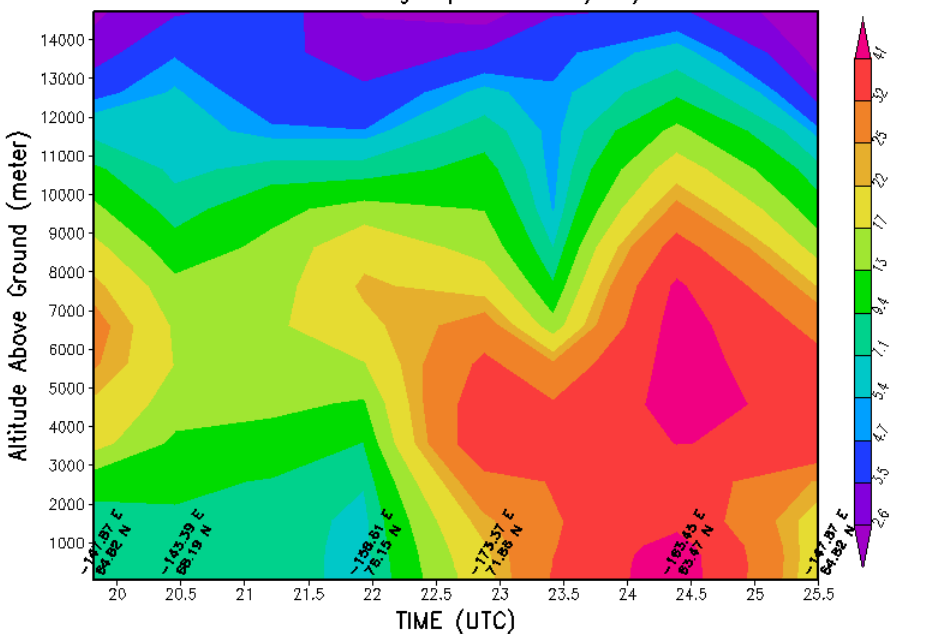
April 16th RH

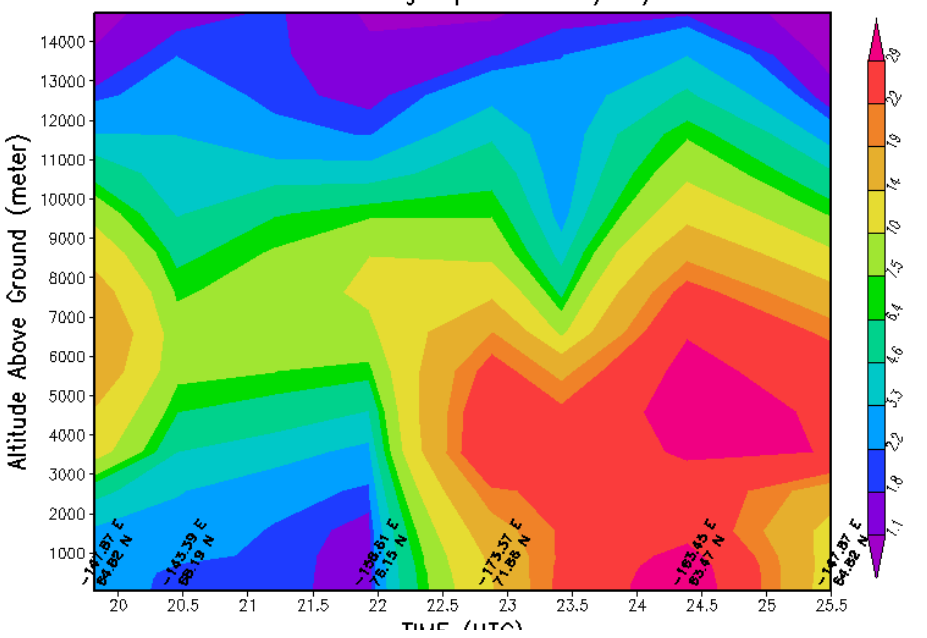
18z, 5.5 km

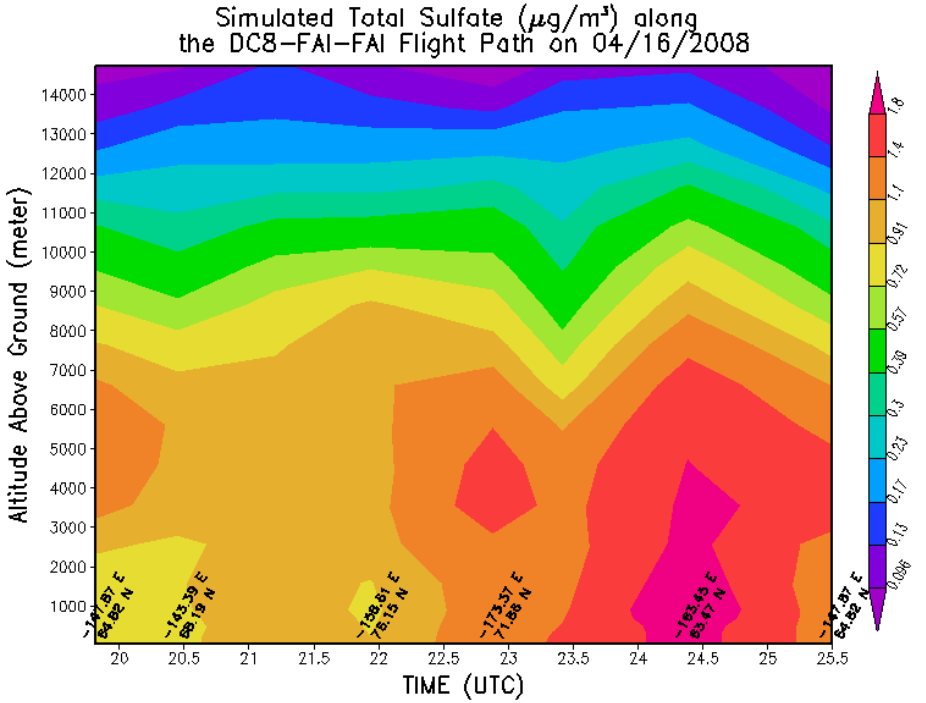


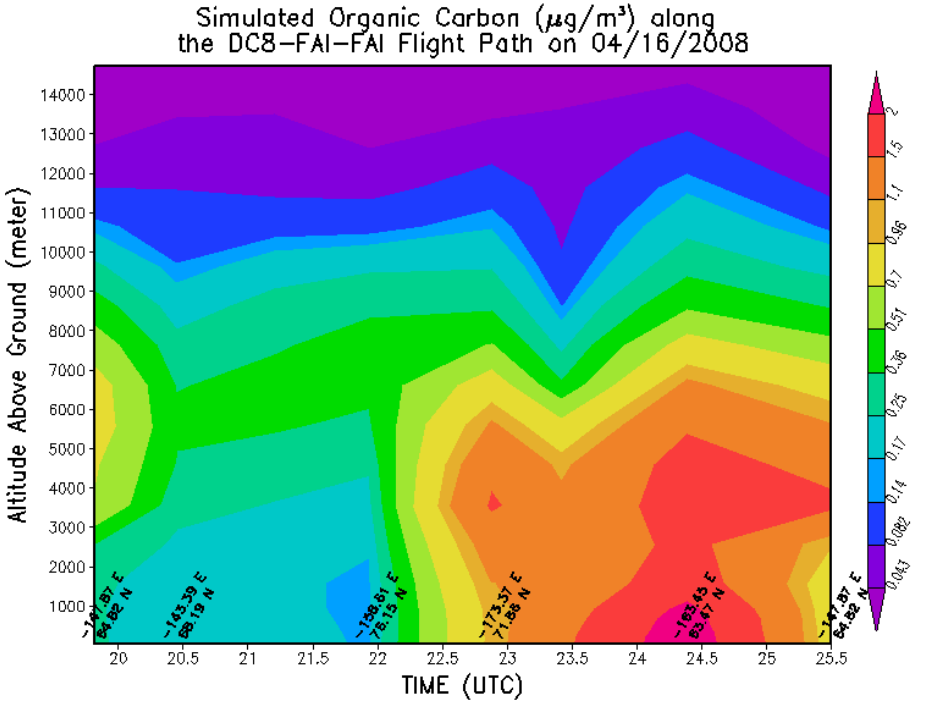
18z, 8.4 km




Simulated total CO (ppbv) along the
DC8-FAI-FAI Flight plan on 04/16/2008
Altitude Above Ground (meter)
TIME (UTC)
-147.87 E
64.82 N
-143.39 E
69.19 N
-156.61 E
76.15 N
-173.37 E
71.88 N
-165.43 E
63.47 N
-147.87 E
64.82 N


Simulated BiomassCO (ppbv) along the
DC8-FAI-FAI Flight plan on 04/16/2008
Altitude Above Ground (meter)
-147.87 E
64.82 N
-143.39 E
69.19 N
-156.61 E
76.15 N
-173.37 E
71.88 N
-165.43 E
63.47 N
-147.87 E
64.82 N

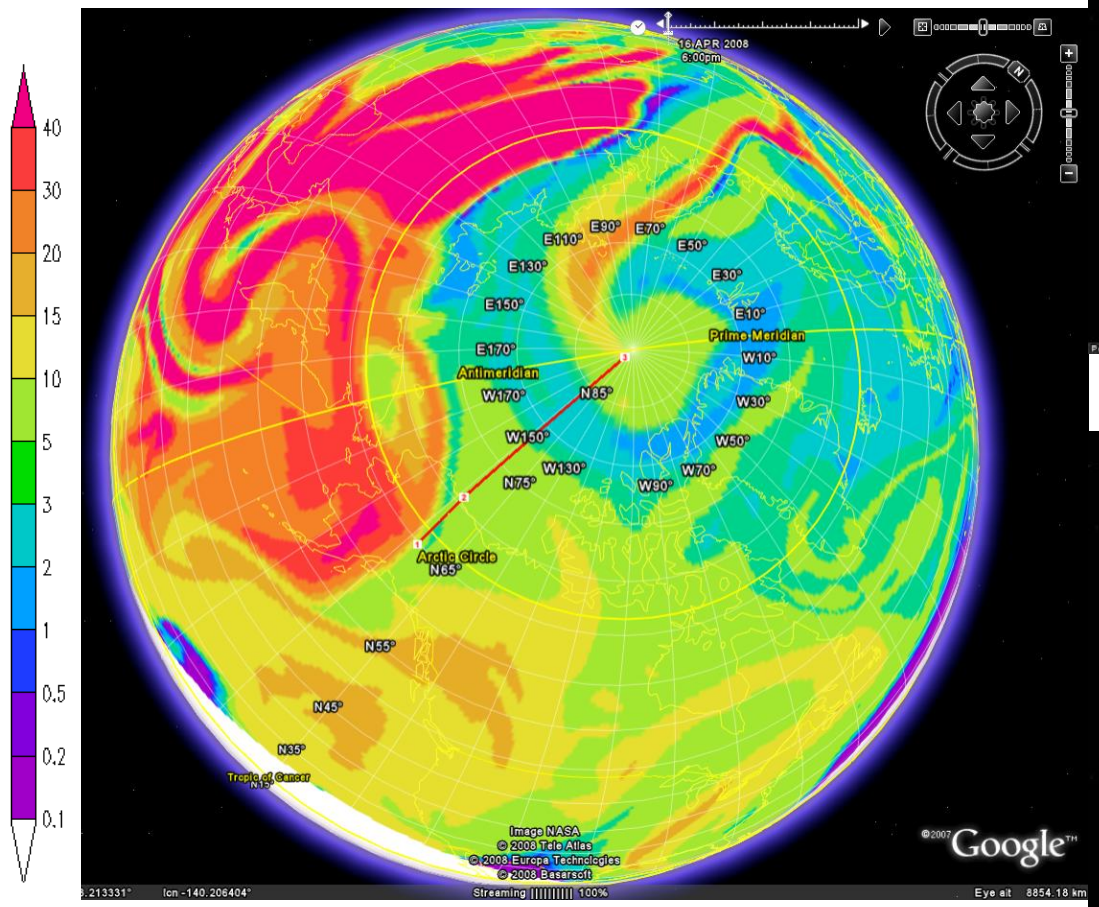

Simulated Total Sulfate (μg/m³) along
the DC8-FAI-FAI Flight Path on 04/16/2008
Altitude Above Ground (meter)
TIME (UTC)
-147.87 E
64.82 N
-143.39 E
69.19 N
-156.61 E
76.15 N
-173.37 E
71.88 N
-165.43 E
63.47 N
-147.87 E
64.82 N


Simulated Organic Carbon (μg/m³) along
the DC8-FAI-FAI Flight Path on 04/16/2008
Altitude Above Ground (meter)
TIME (UTC)
-147.87 E
64.82 N
-143.39 E
69.19 N
-156.61 E
76.15 N
-173.37 E
71.88 N
-165.43 E
63.47 N
-147.87 E
64.82 N

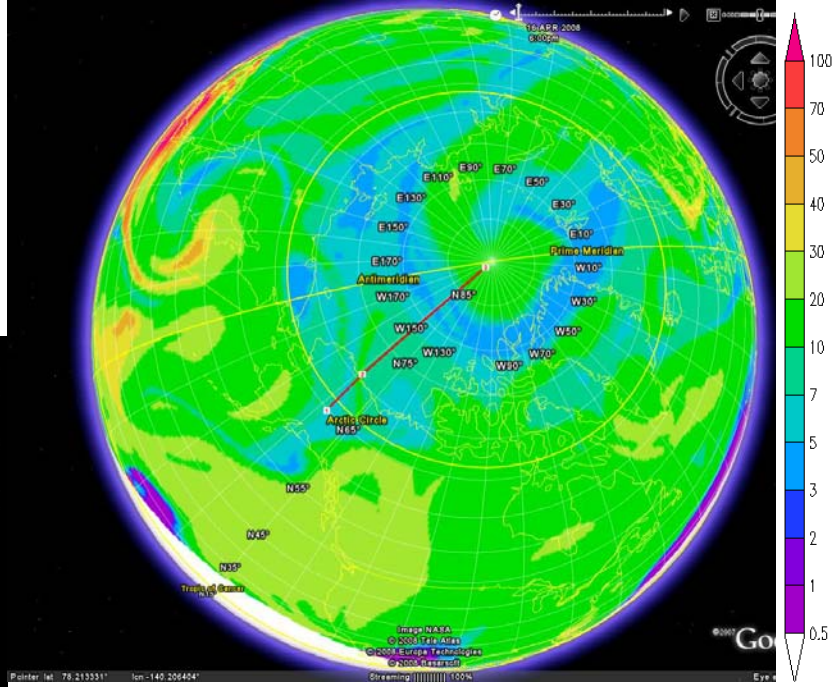
Anthropogenic CO

Europe Flight

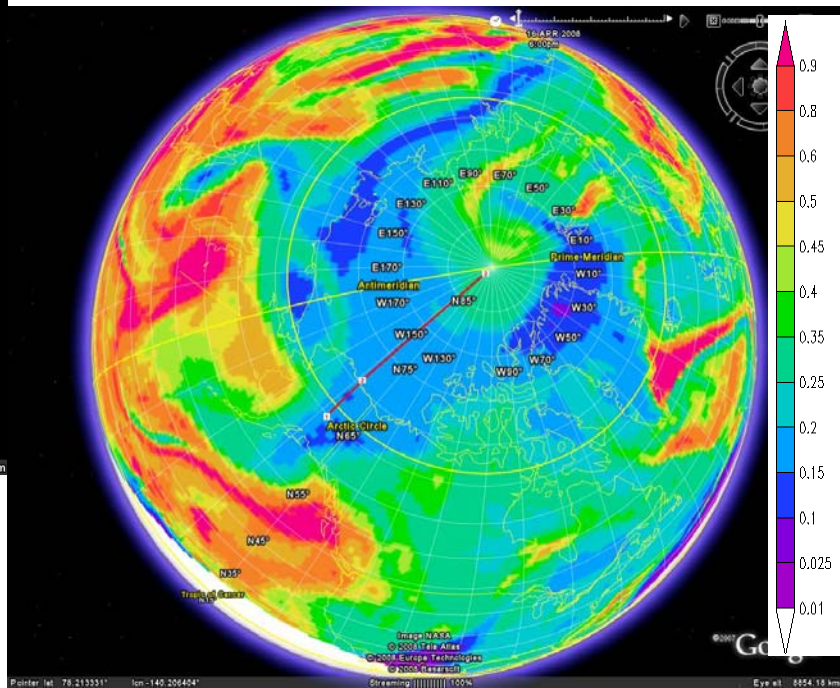
April 16th, 18Z, 5.4 km (42hr)



Biomass CO



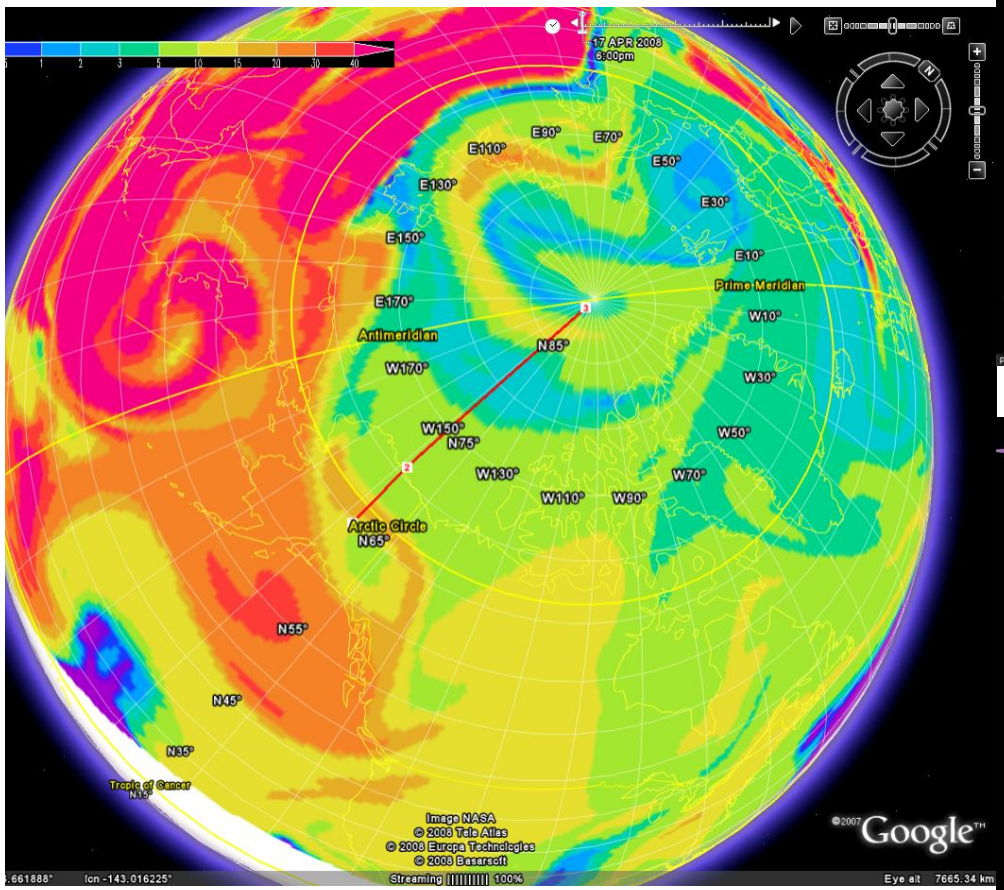
AOD

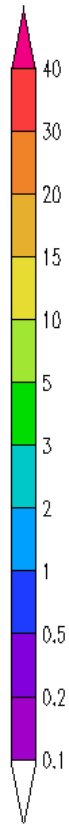


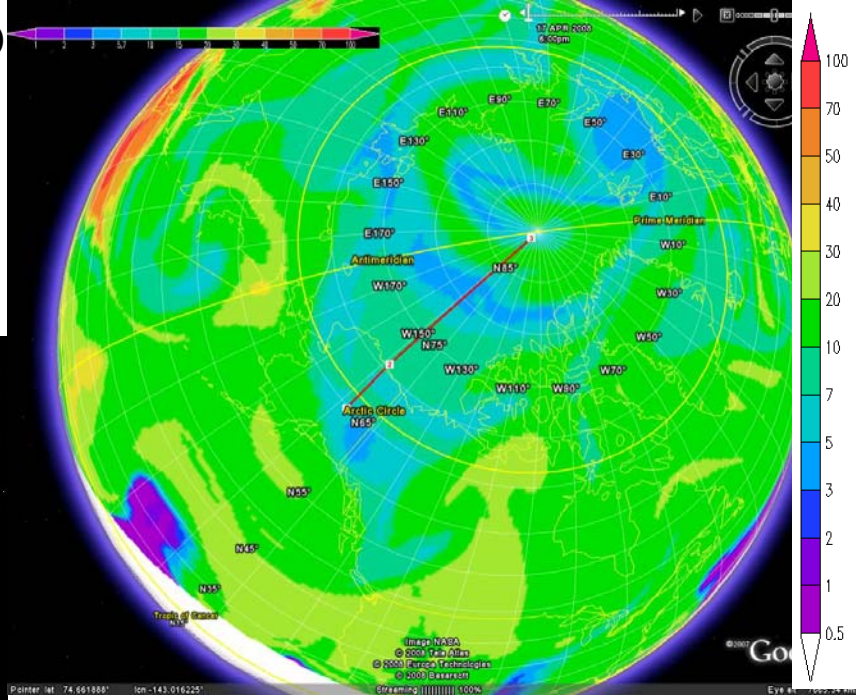
Anthropogenic CO

Europe Flight

April 17th, 18Z, 5.4 km (66hr)

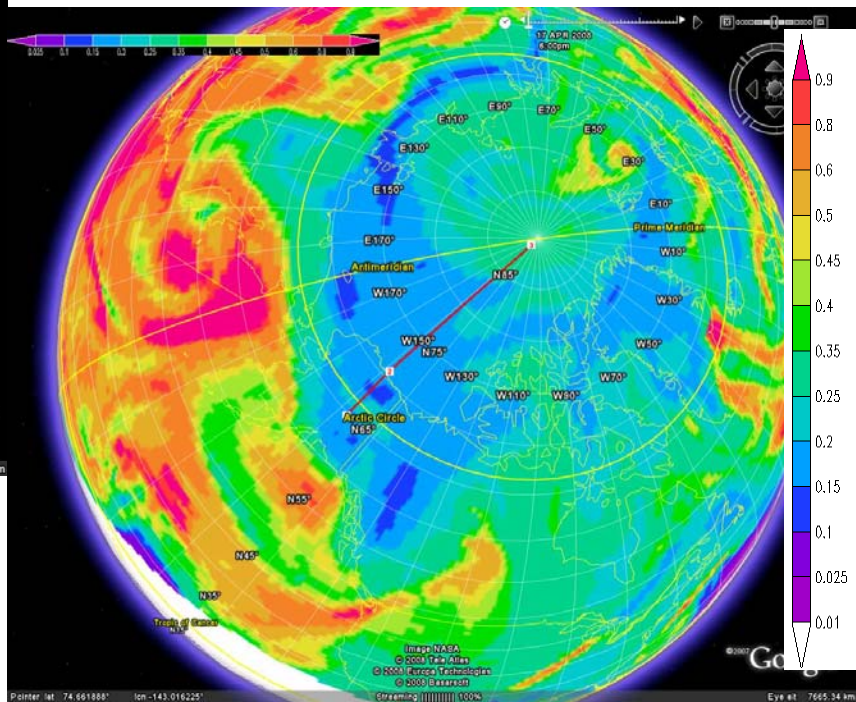




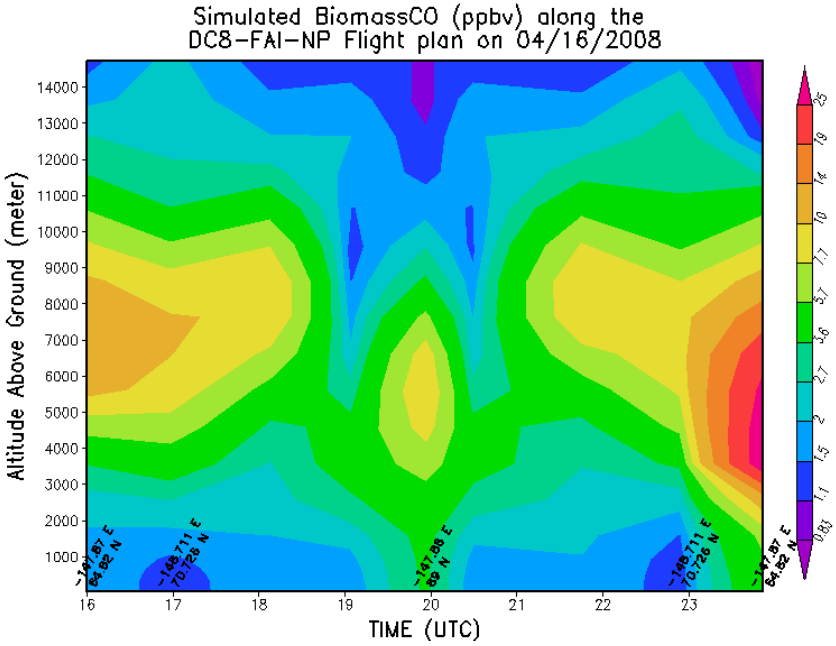


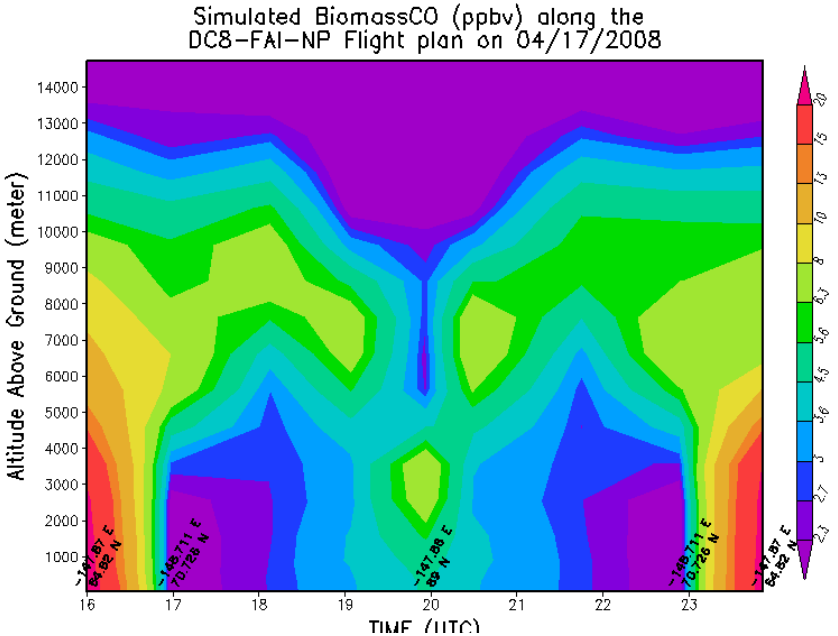
Biomass CO

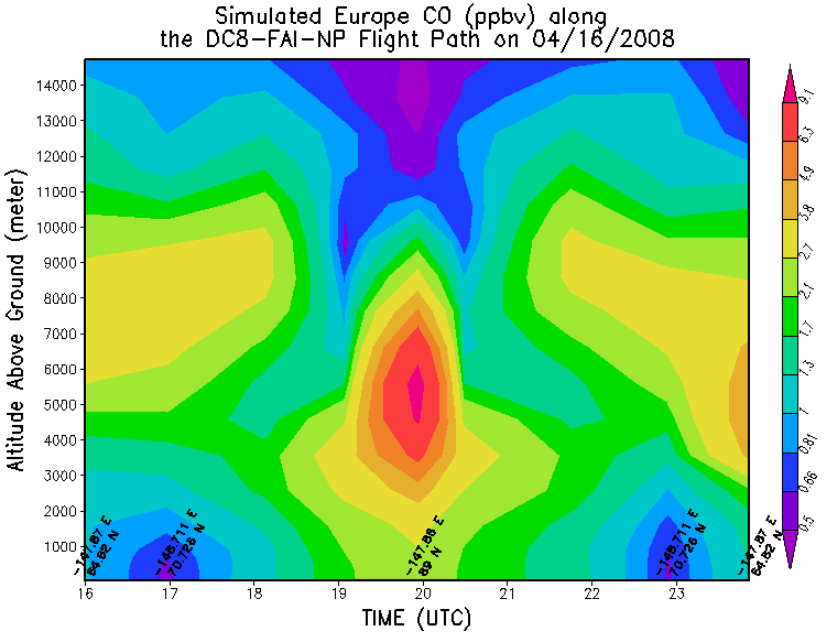
AOD

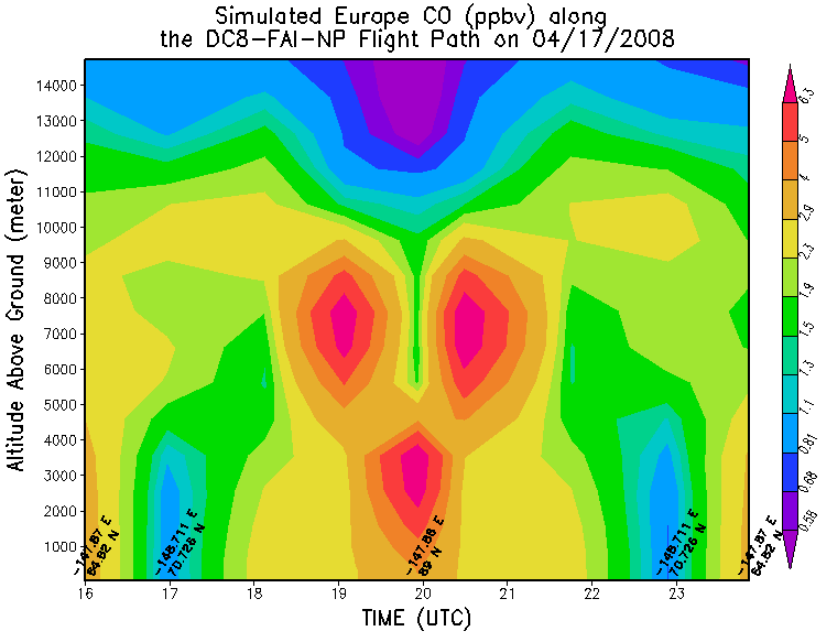


Pole-ward Flight 16-17 curtains: Scales Different

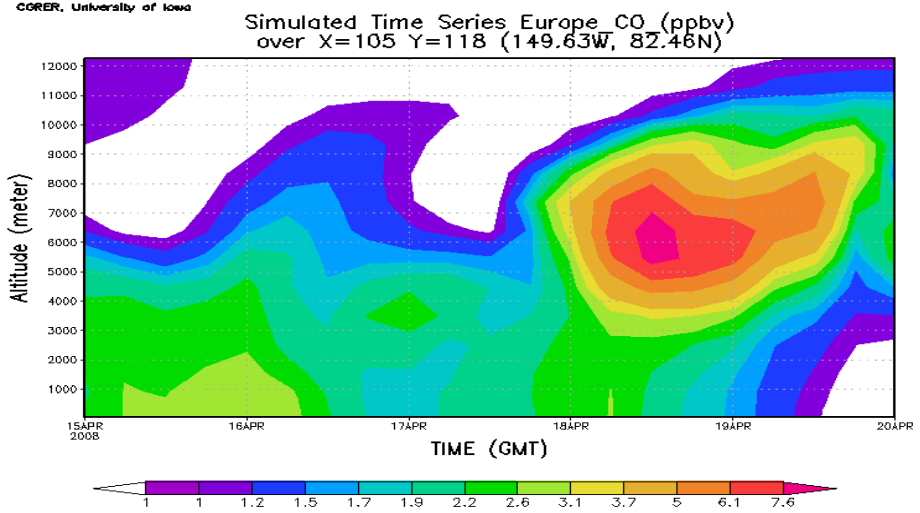


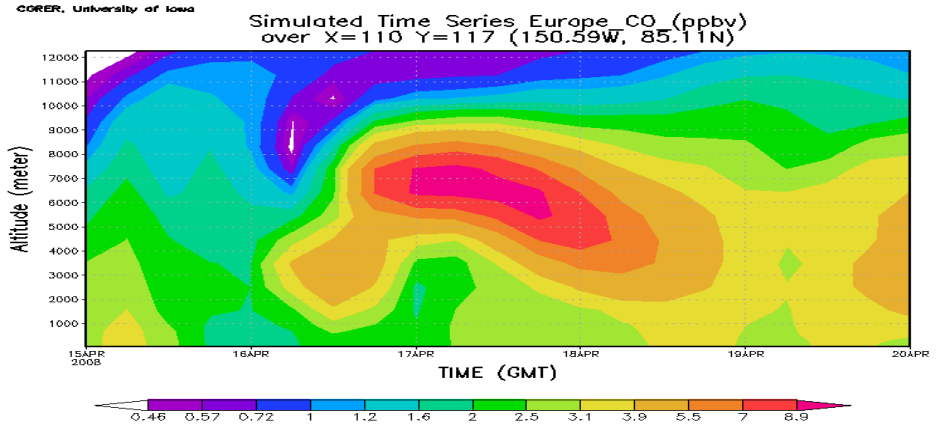


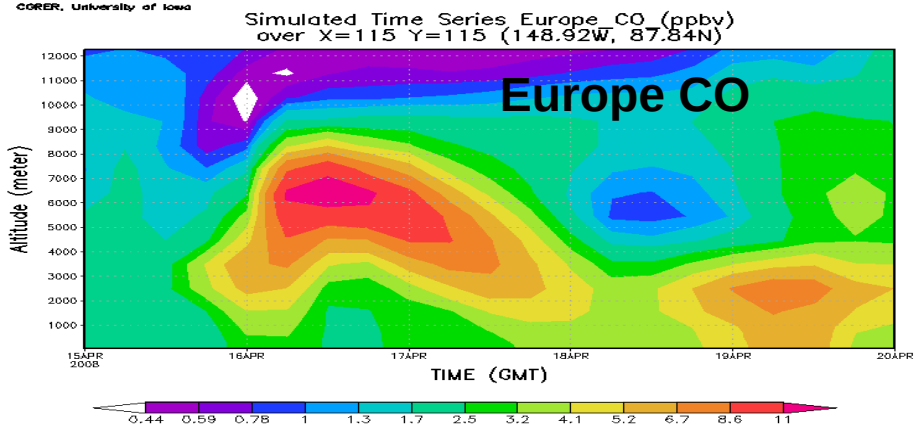


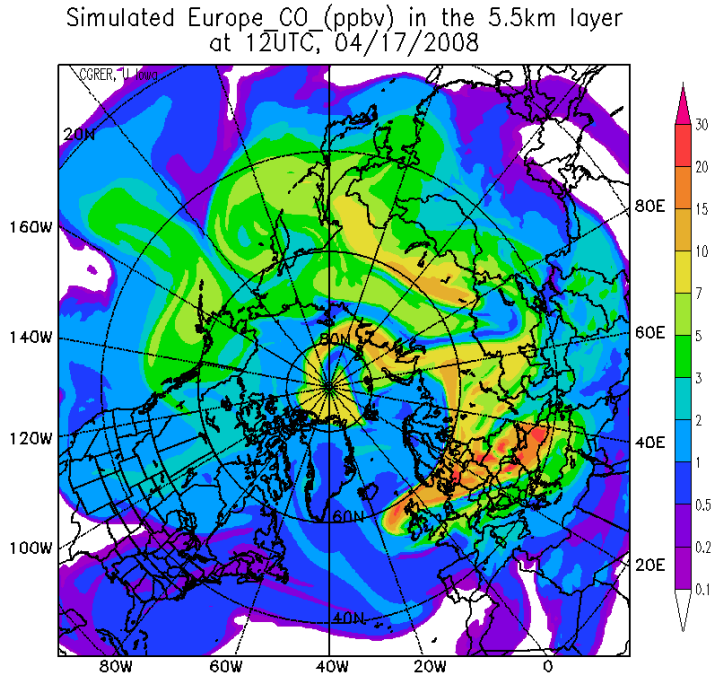


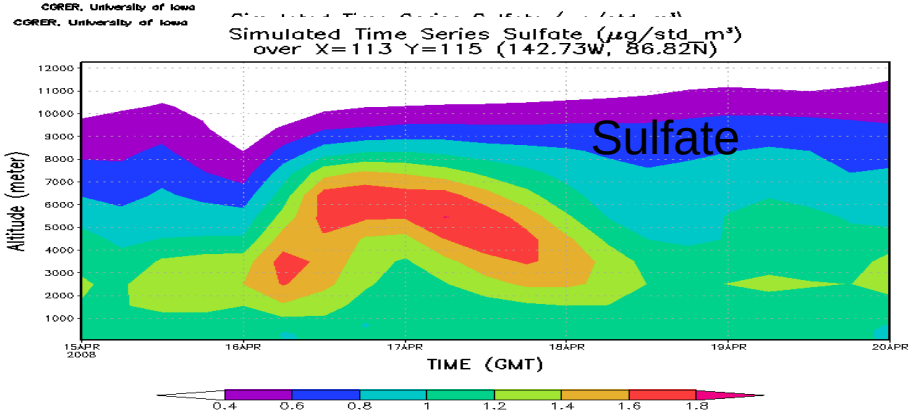
April 16 & 17 Good for Poleward Flight







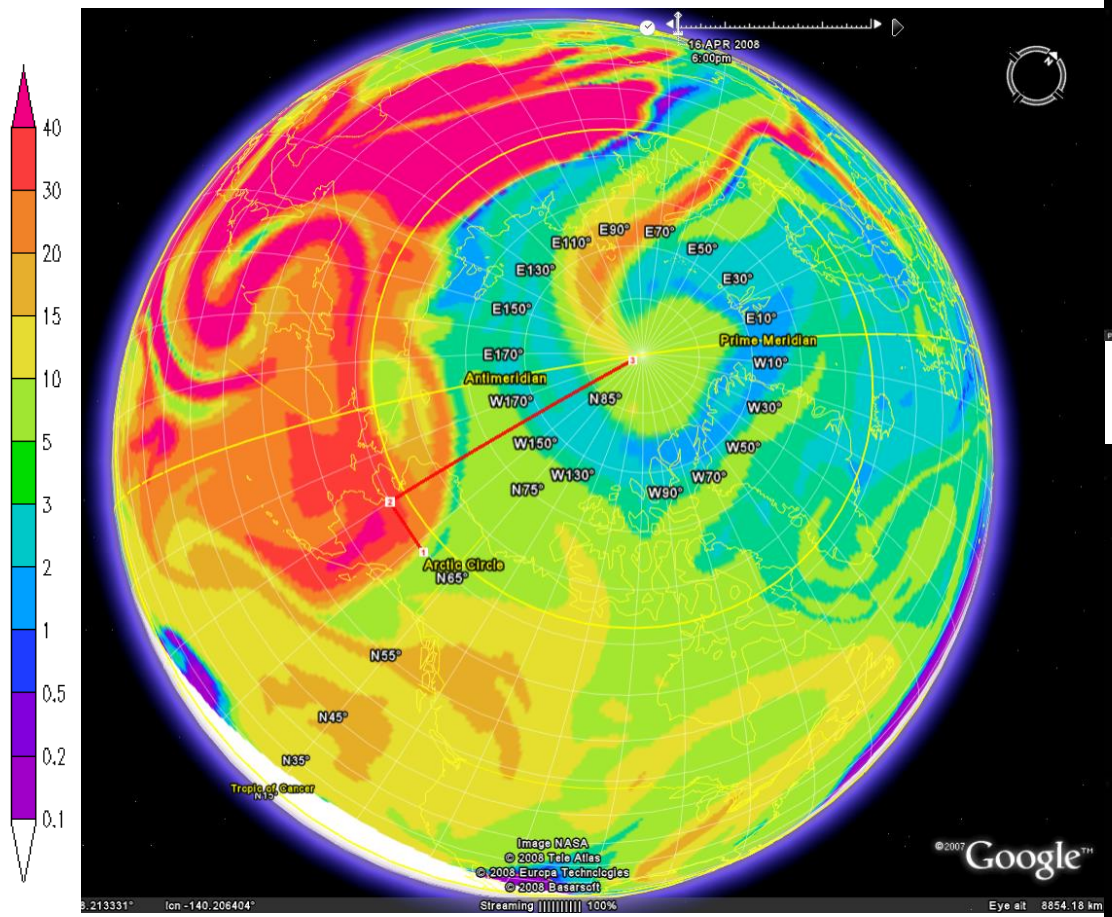




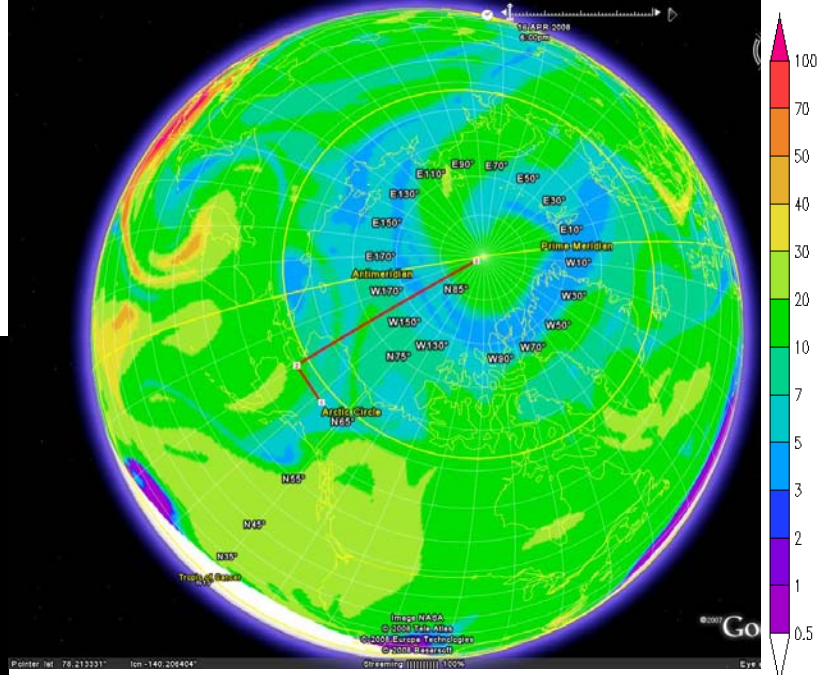
Anthropogenic CO

Asian/Europe Flight

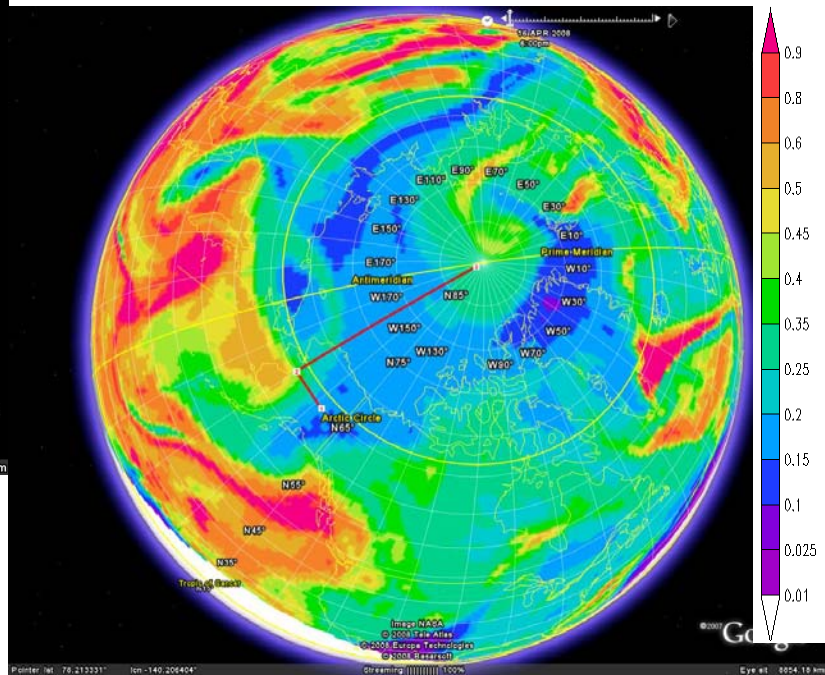
April 16th, 18Z, 5.4 km (42hr)



Biomass CO



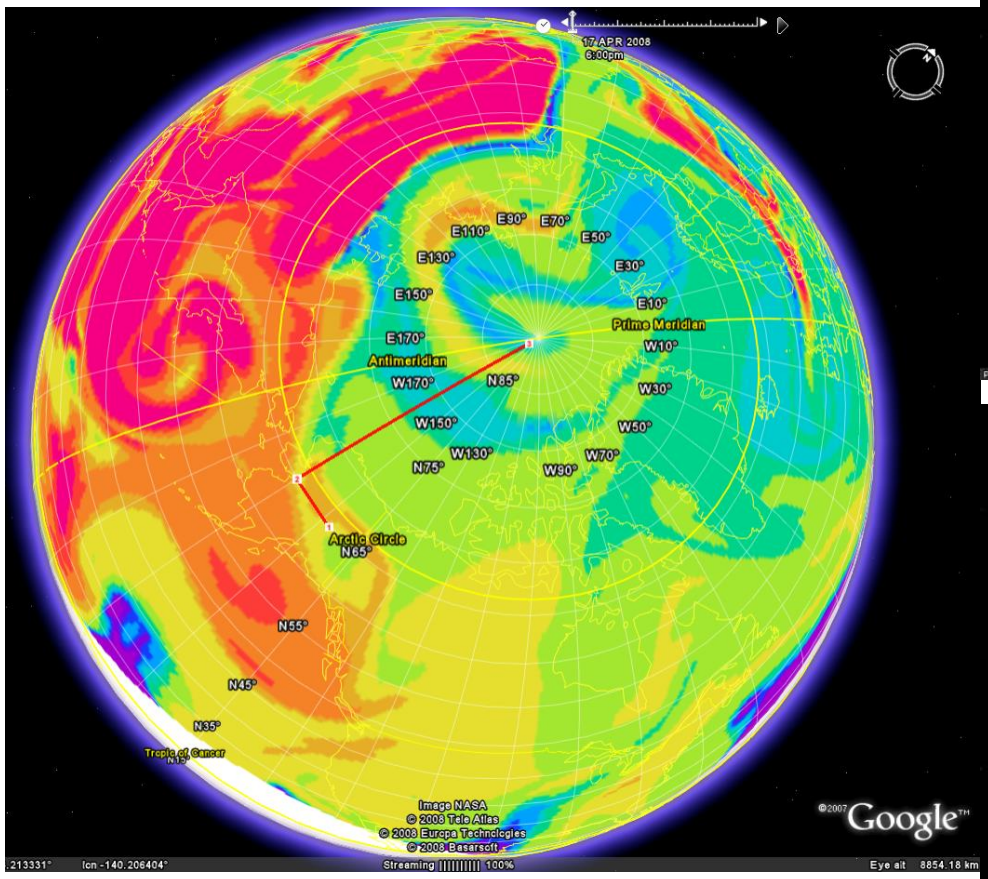
AOD

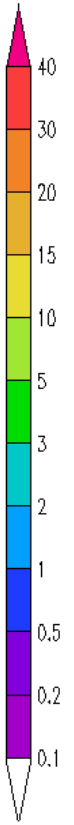


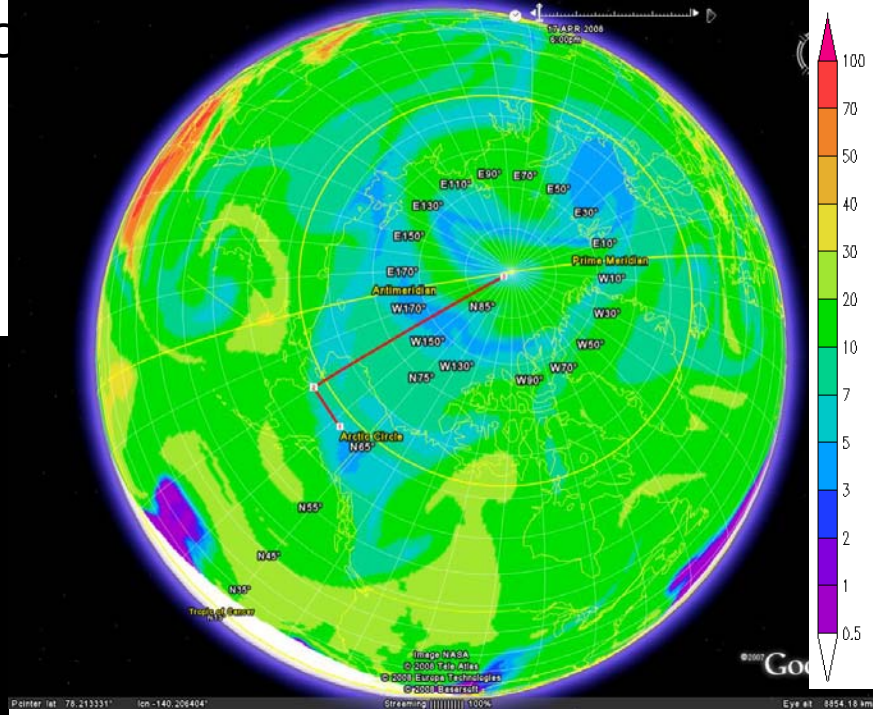
Anthropogenic CO

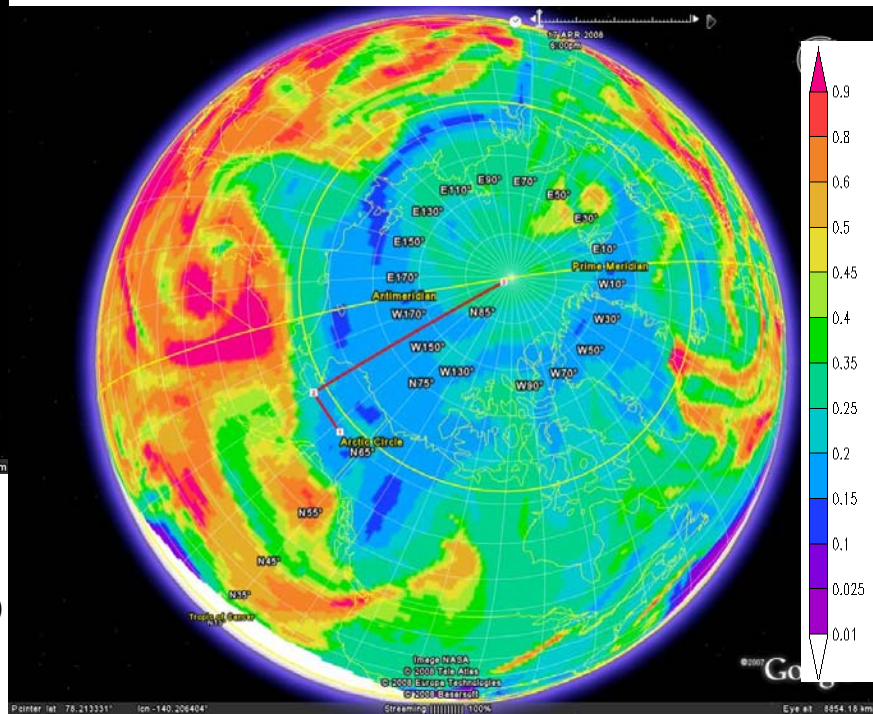
Asian/Europe Flight

April 17th, 18Z, 5.4 km (66hr)





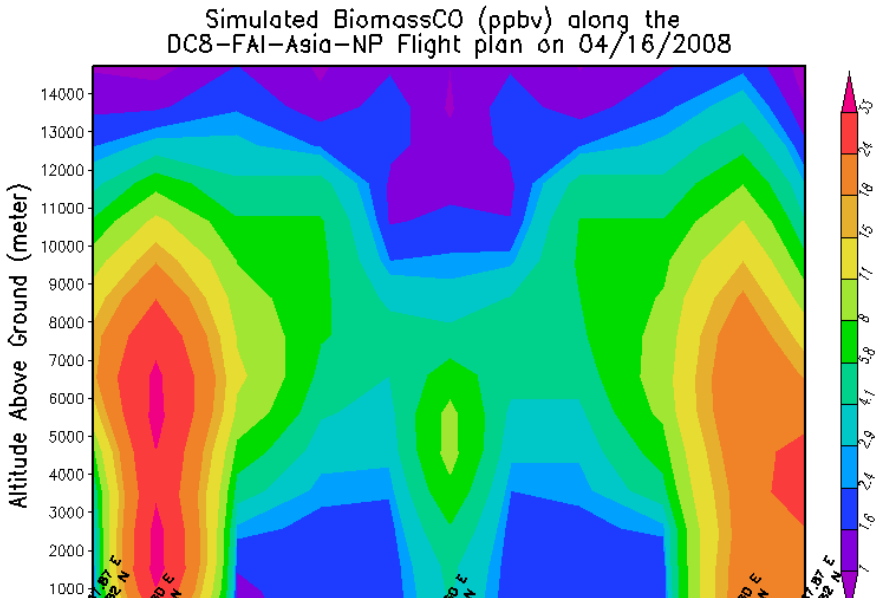


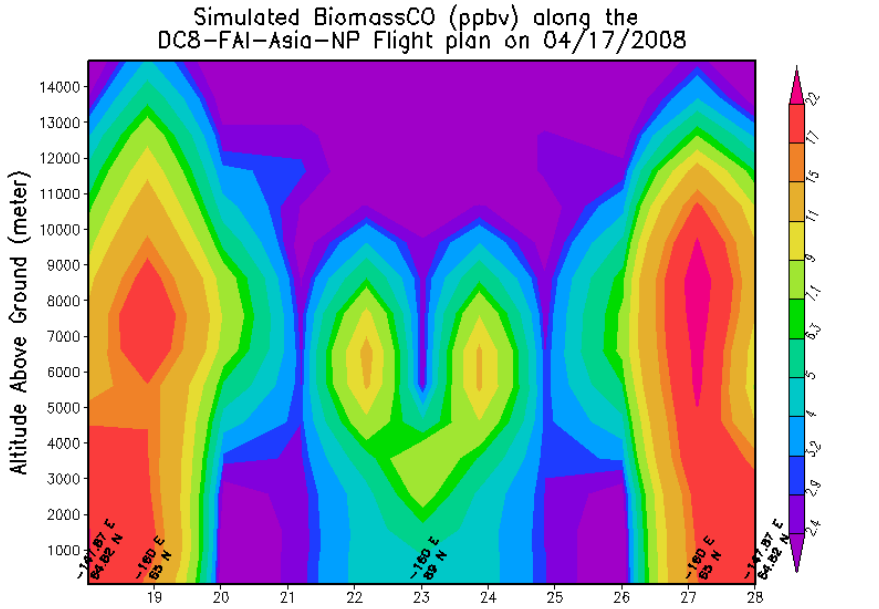


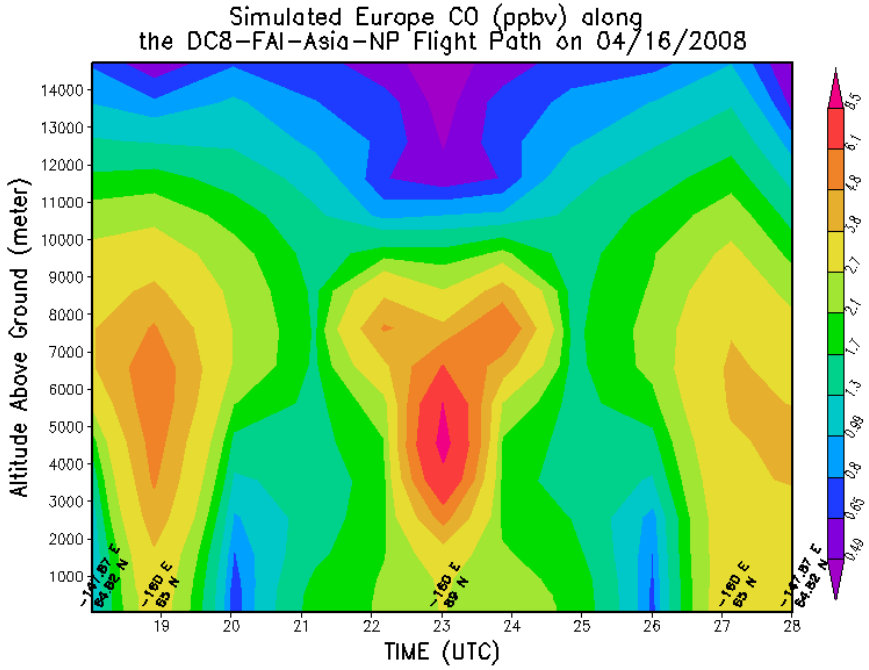
Biomass CO

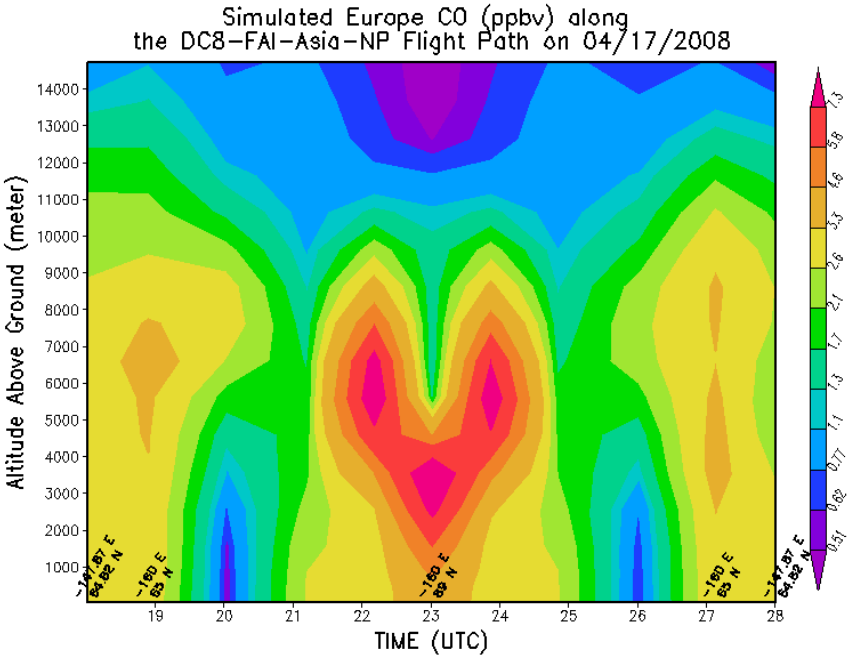
AOD

Curtains Combined Asia-Europe Scales Different

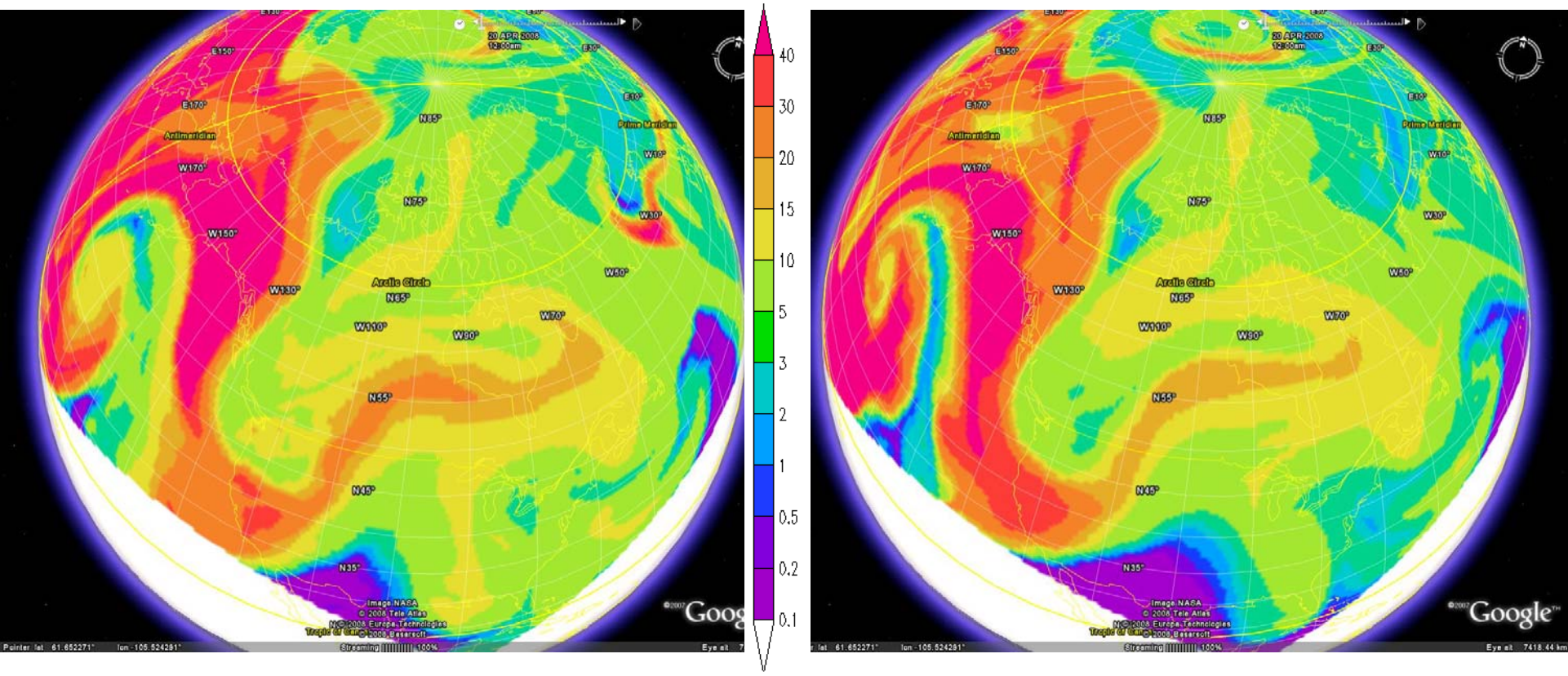








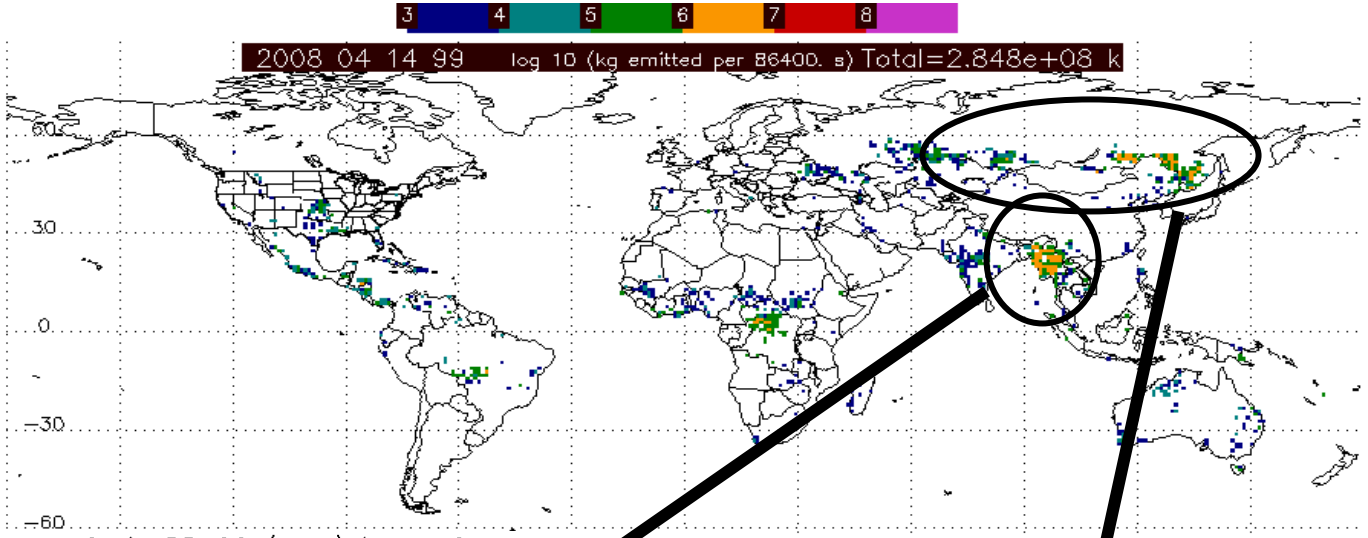
Transit 19th ??
(12 hr)



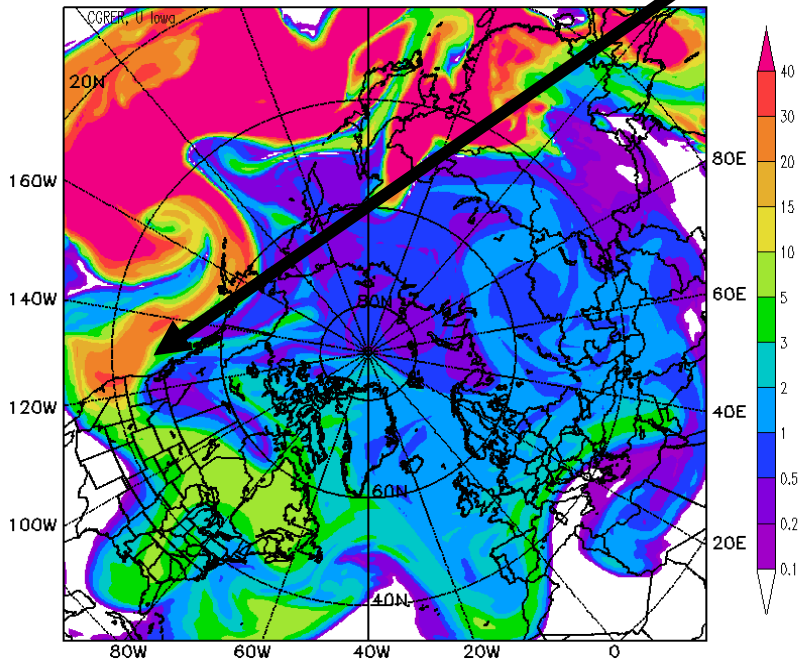
Biomass 5.5 km, 0Z, 20th

Biomass 8.4 km, 0Z, 20th

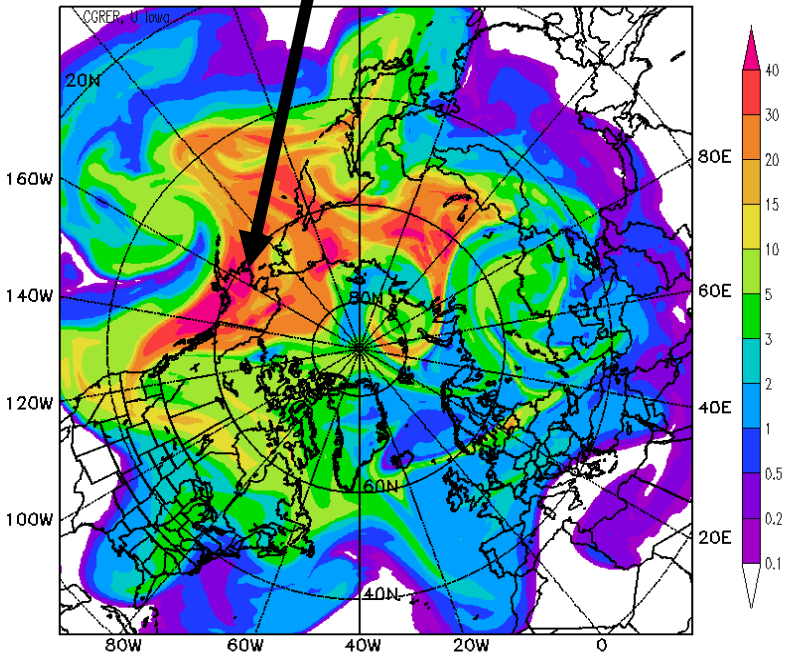
April 19 18Z: Asian Inflow into N. America



Simulated SAsia_BB_CO_(ppbv) in the 8.4km layer at 18UTC, 04/19/2008

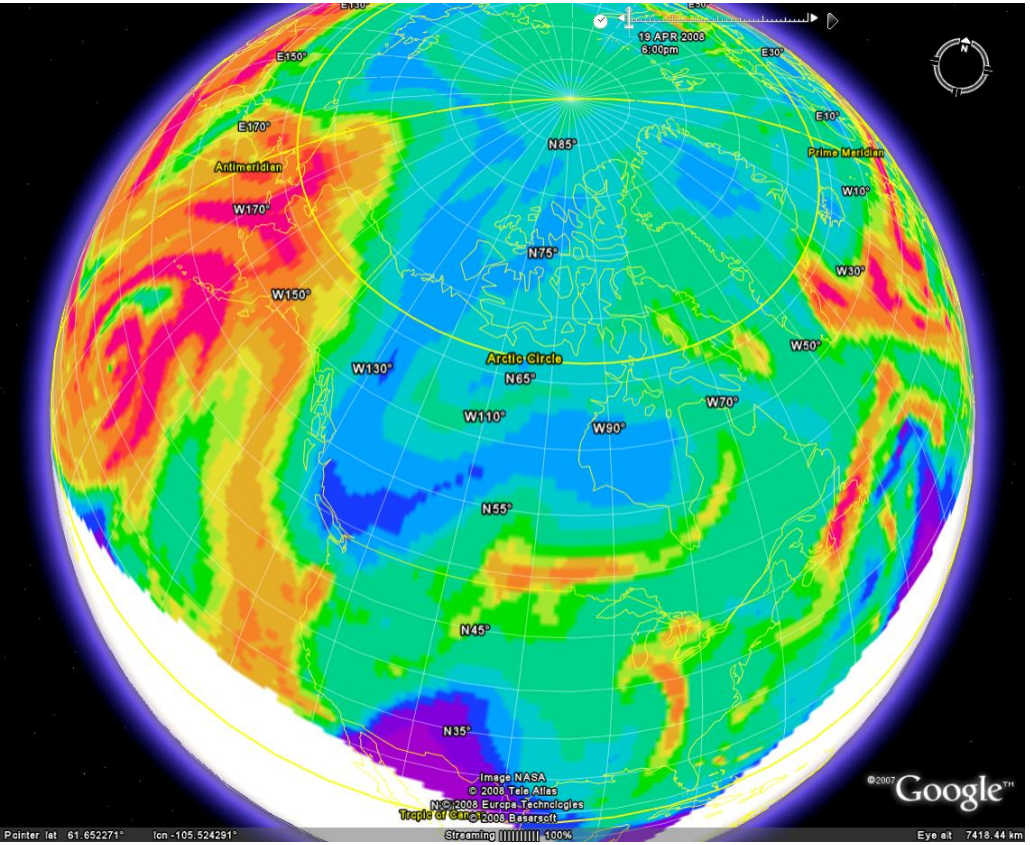


Simulated NAsia_BB_CO_(ppbv) in the 8.4km layer at 18UTC, 04/19/2008

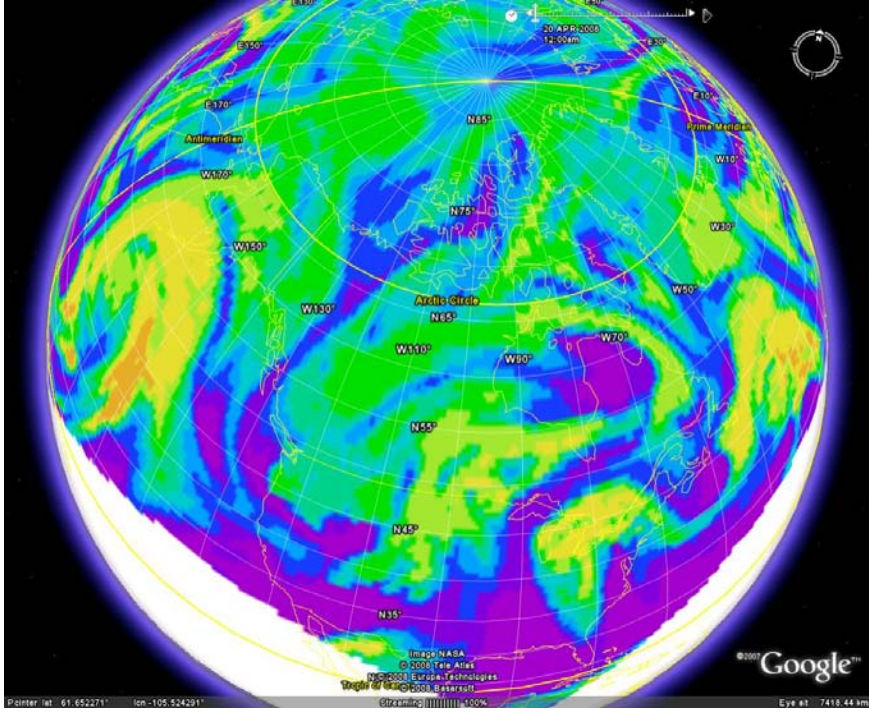


RH 120 hr 5.5km layer

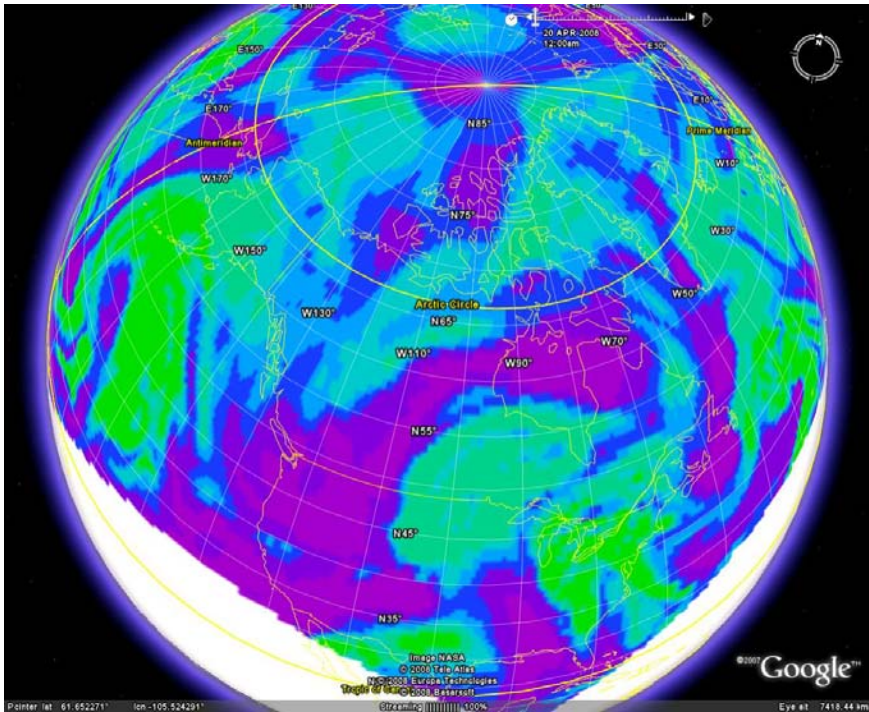
Transit Home



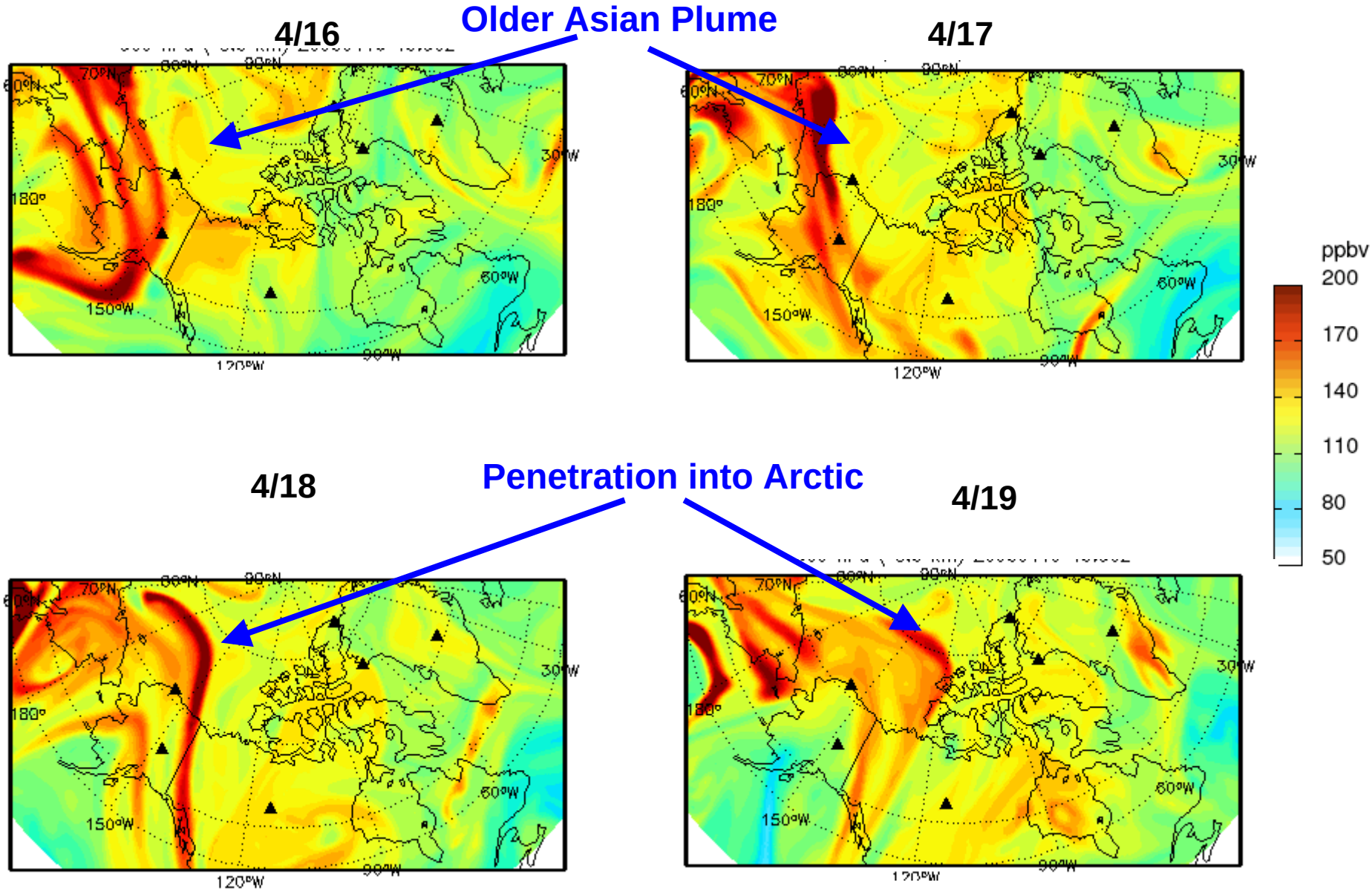
AOD 114 hr



RH-120 hr 8.5 km layer

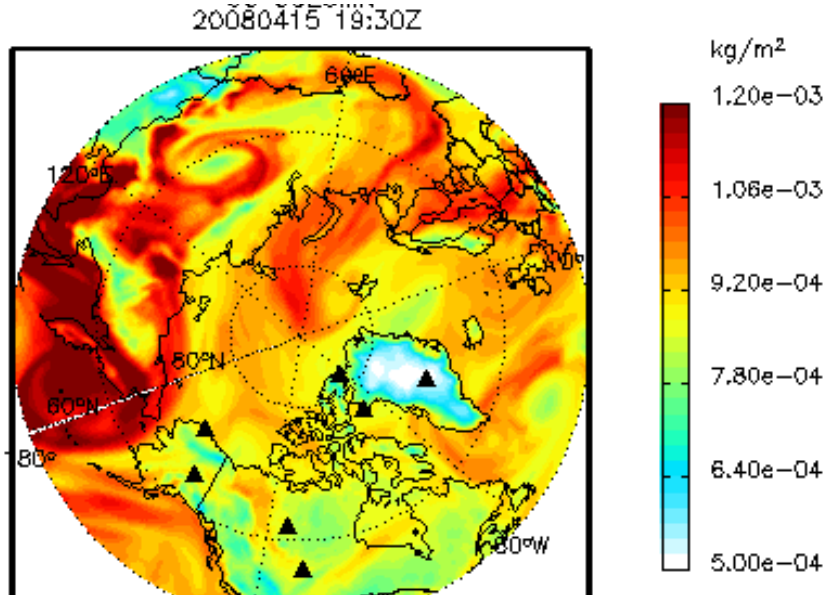


Total CO 500 hPa

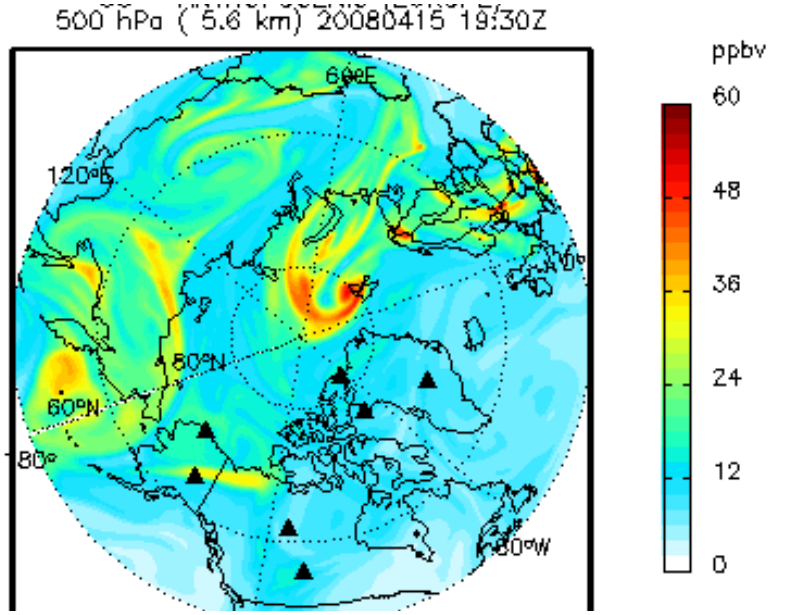


Using 4/15 6z forecast

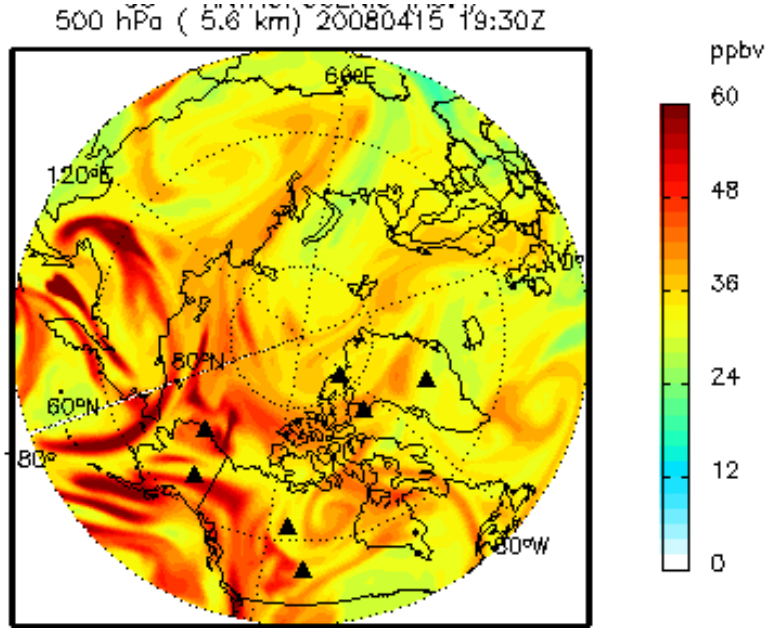
Total CO Column



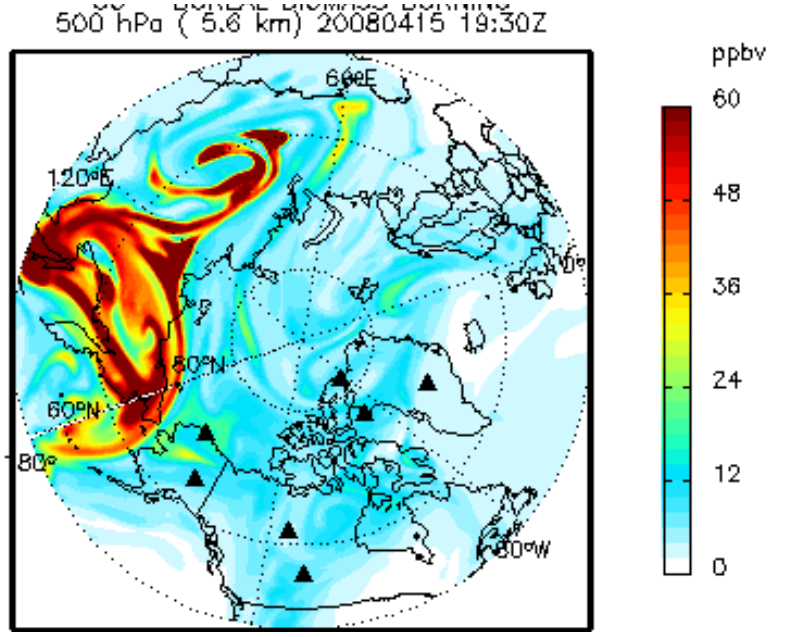
European Anthro. CO (ppbv) 500 mb



Asian Anthro. CO (ppbv) 500 mb



Boreal Burning CO (ppbv) 500 mb



DC-8 : FAI to North Pole

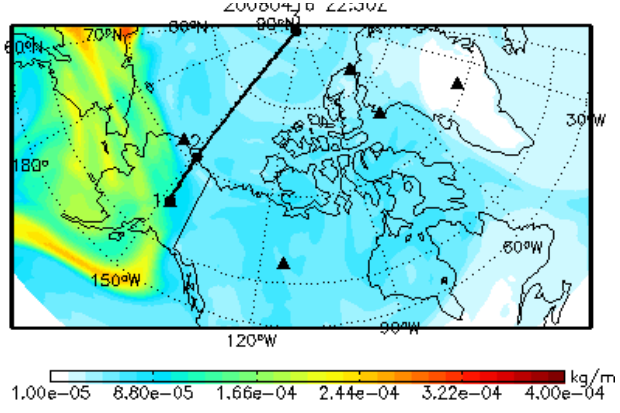
April 16th – 17th

All plots hereafter are for 22:30 UTC.

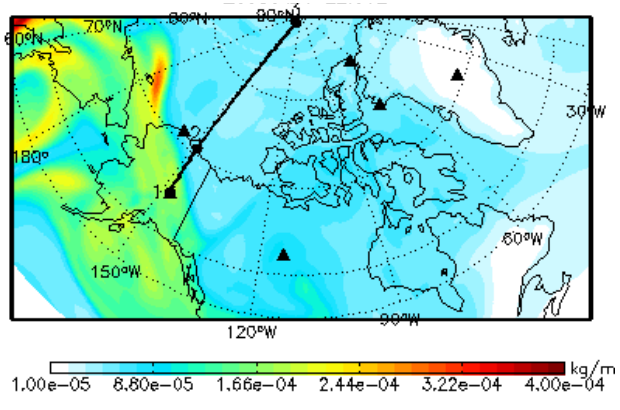
(Previous plots were 19:30 UTC.)

Boreal CO Column

16th

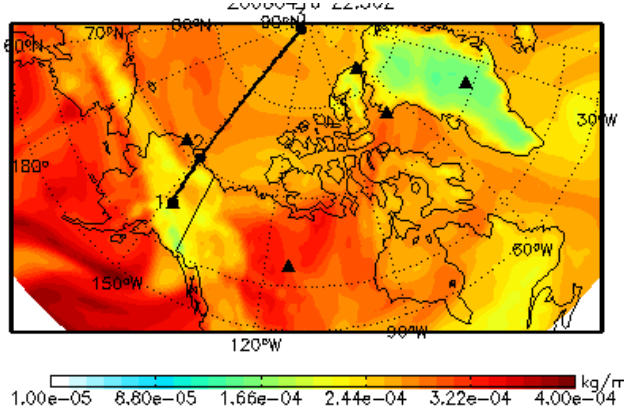


17th

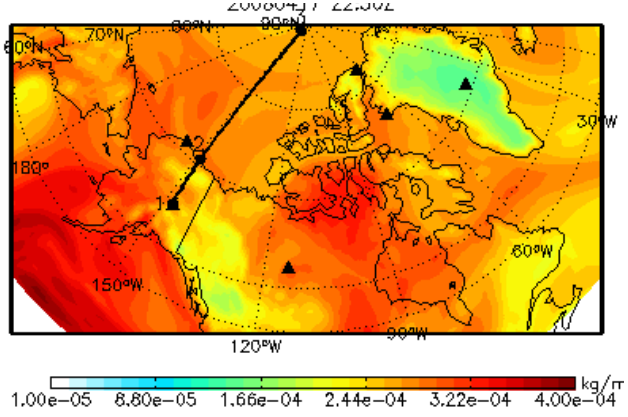


Asian Anthro. CO Column

16th

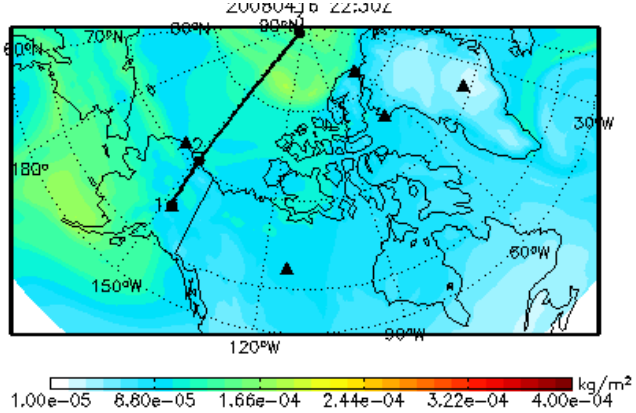


17th

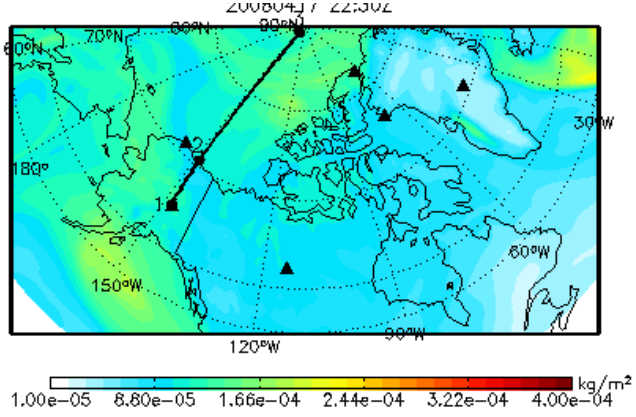


Euro. Anthro. CO Column

16th



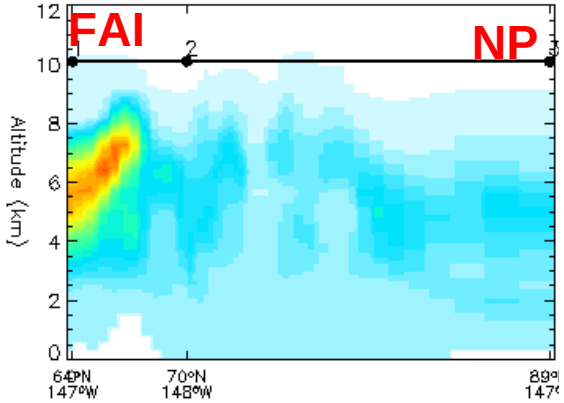
17th



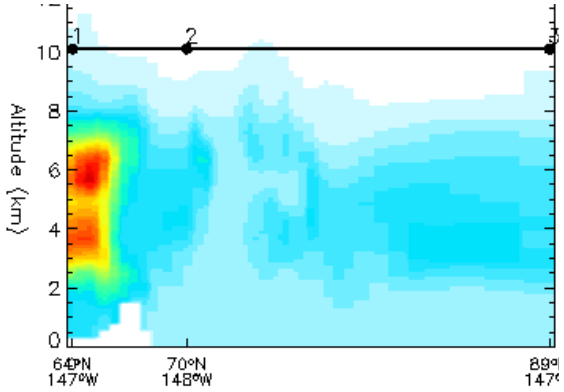
Well Mixed: N. American Anthro. Nonboreal Biomass Burning

Boreal CO

16th

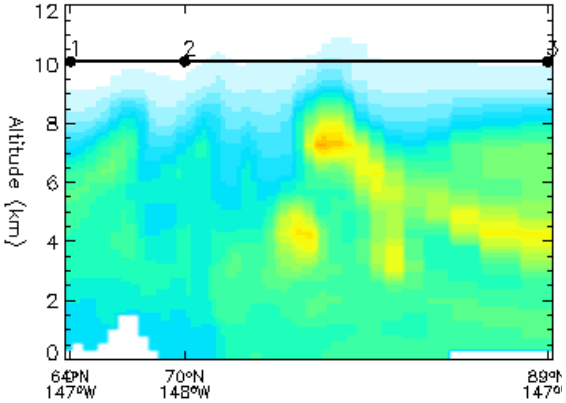


17th

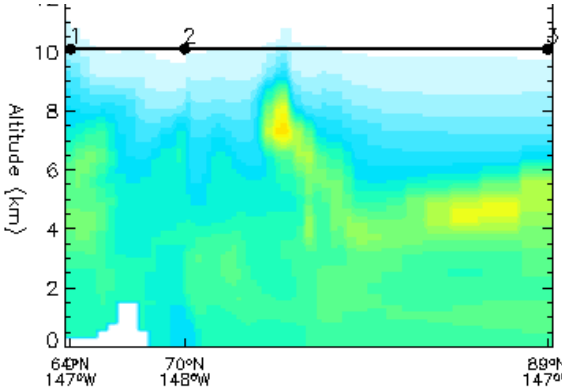


Euro. Anthro. CO

16th

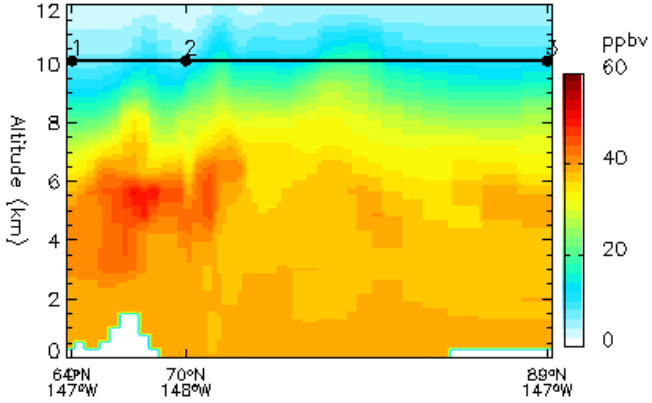


17th

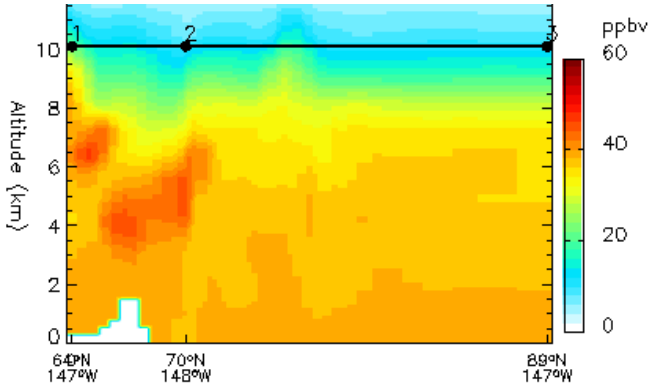


Asian Anthro. CO

16th

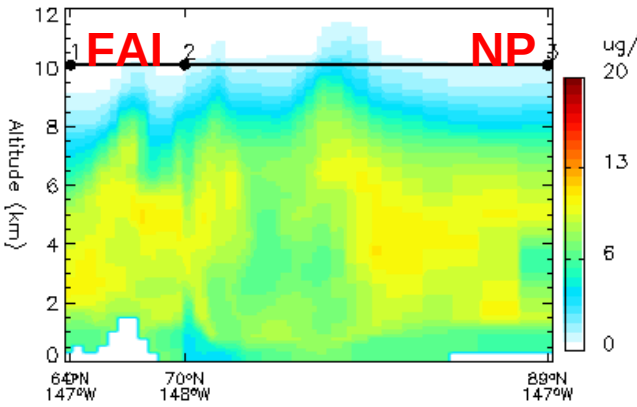


17th

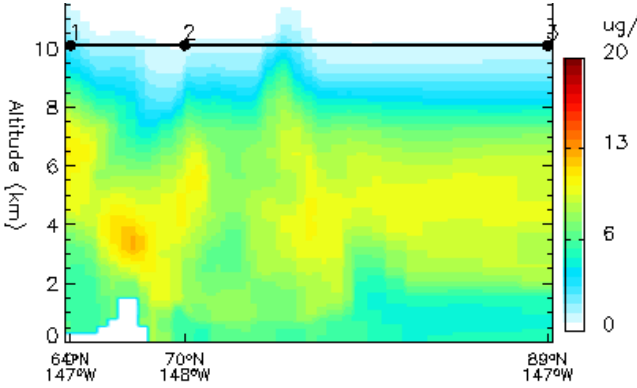


Dust (ug/m³)

16th

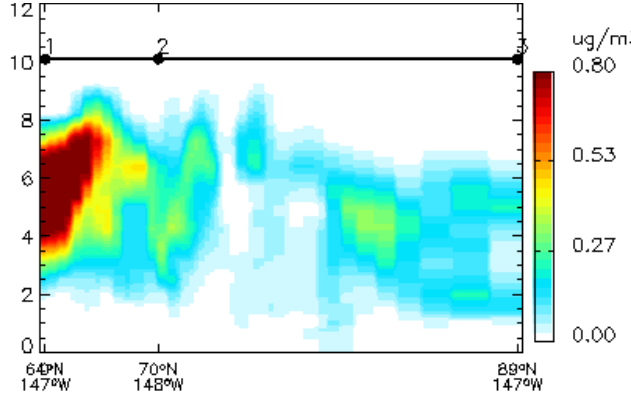


17th

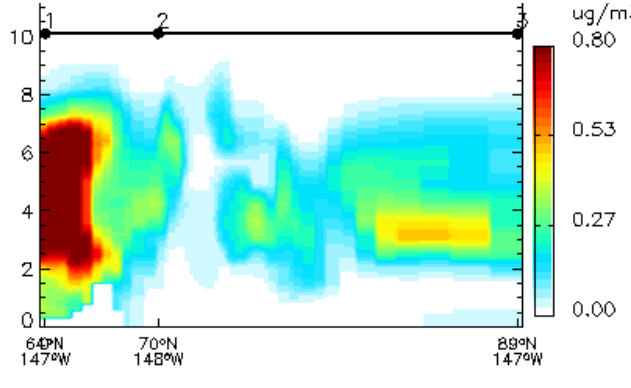


Biomass OC (ug/m³)

16th

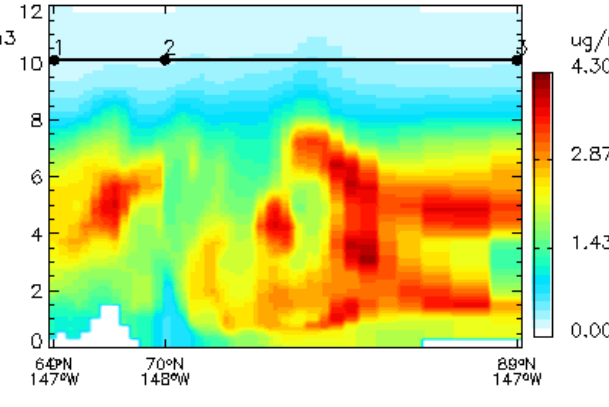


17th

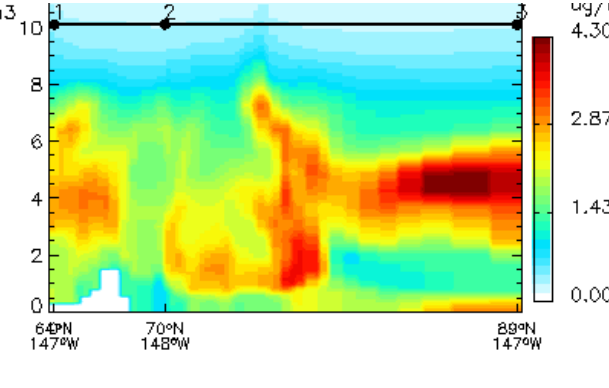


Sulfate (ug/m³)

16th



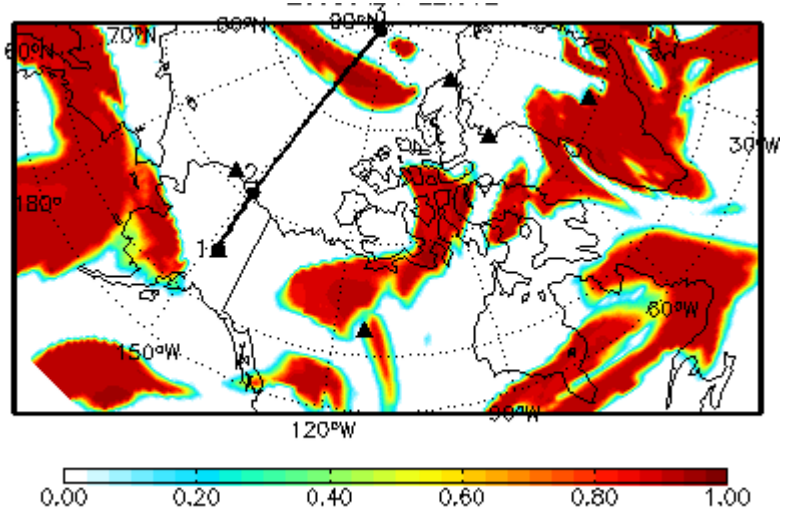
17th



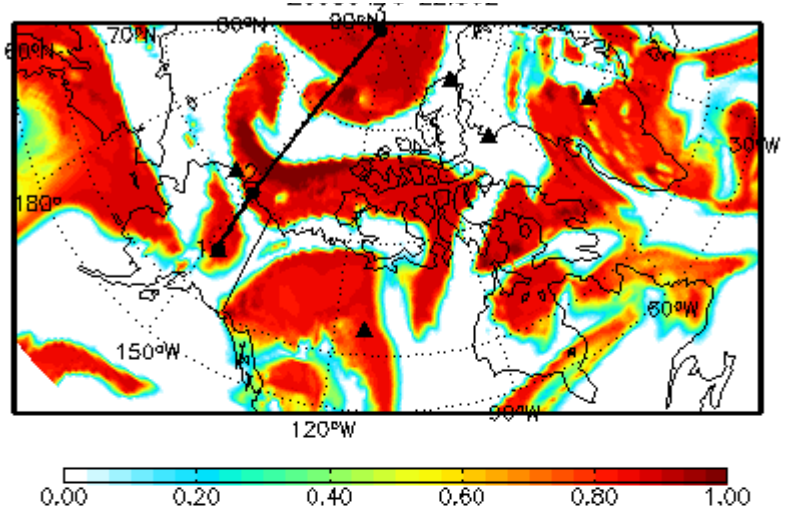
Cloud Fraction : 4/16

GEOS–5 forecast: 20080415_06z

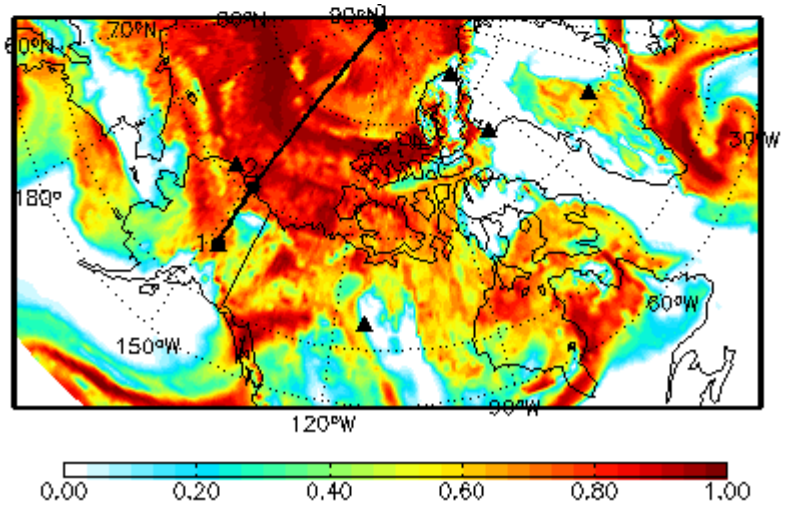
High (<400 mb)



Middle (400-700 mb)



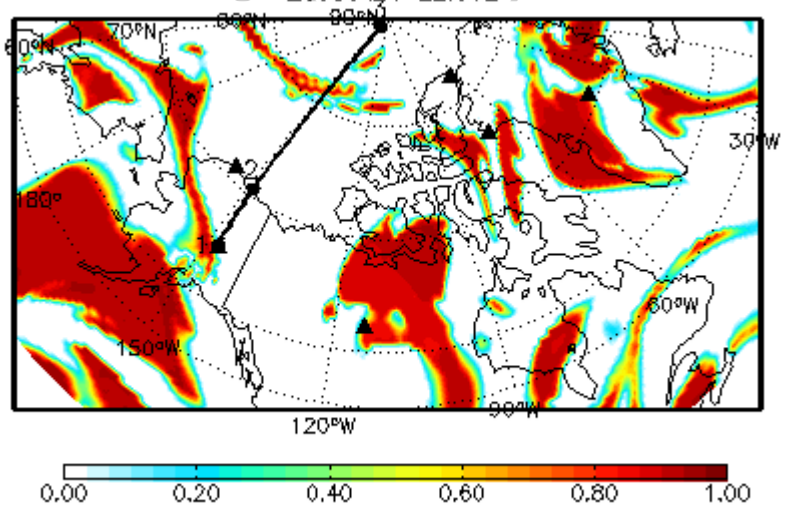
Low (700-1000 mb)



Cloud Fraction : 4/17

GEOS-5 forecast: 20080415_06z

High (<400 mb)



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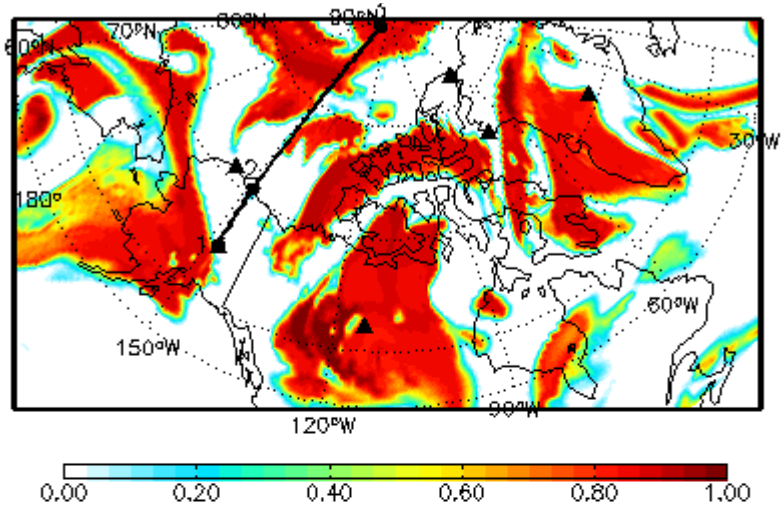

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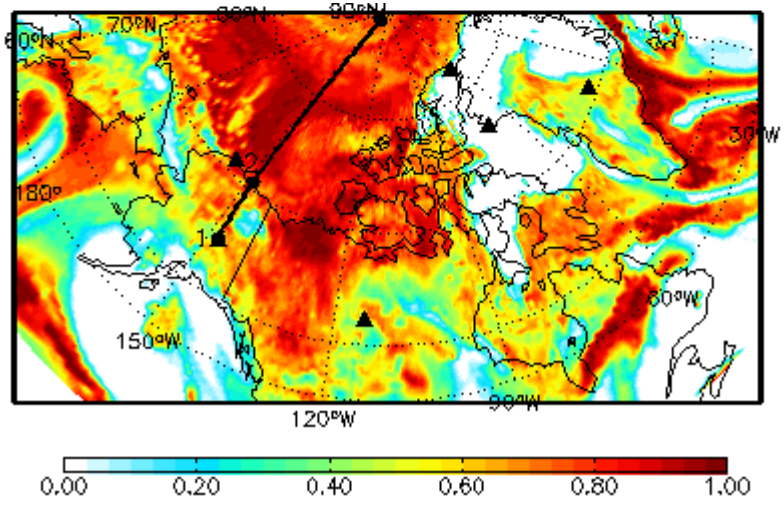
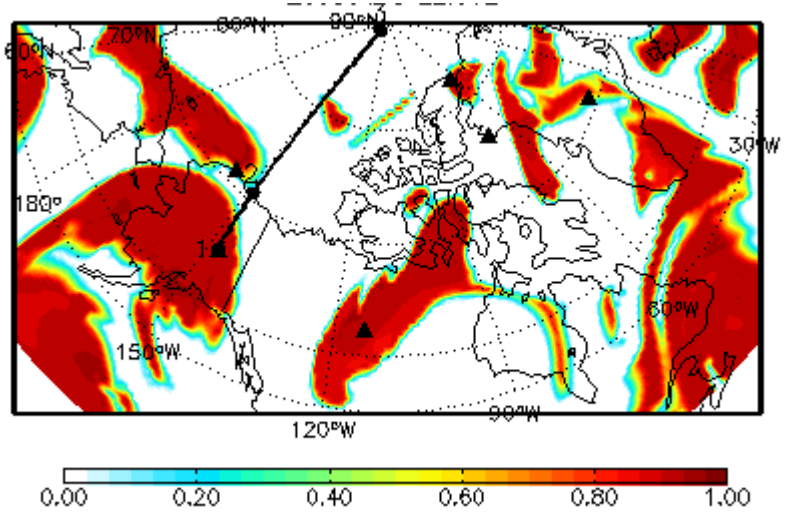


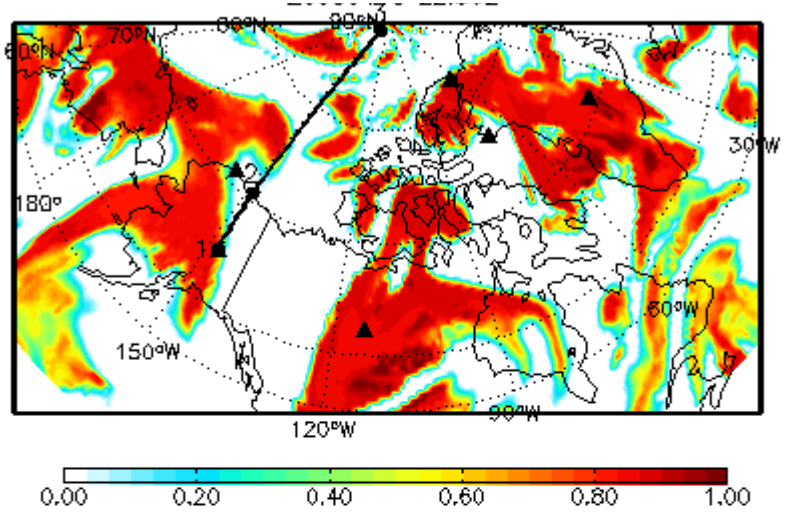
Cloud Fraction : 4/18

GEOS–5 forecast: 20080415_06z

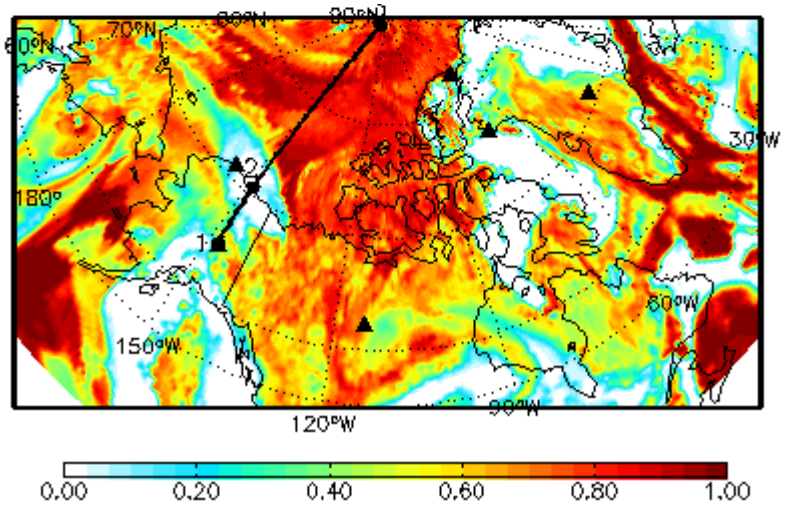
High (<400 mb)



Middle (400-700 mb)



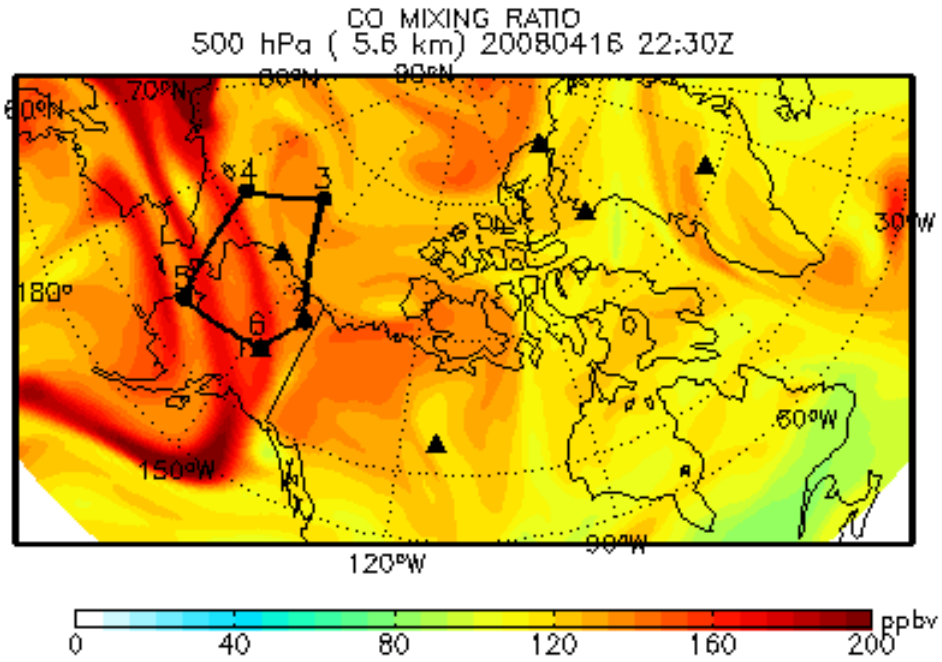
Low (700-1000 mb)



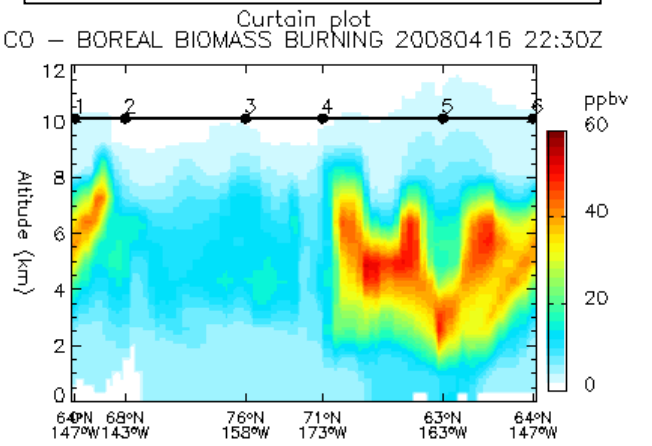
DC-8 : “Pentagon” Flight

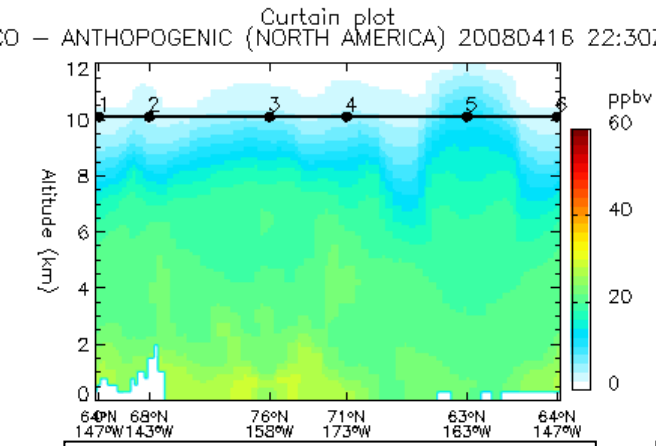
April 16th – 17th

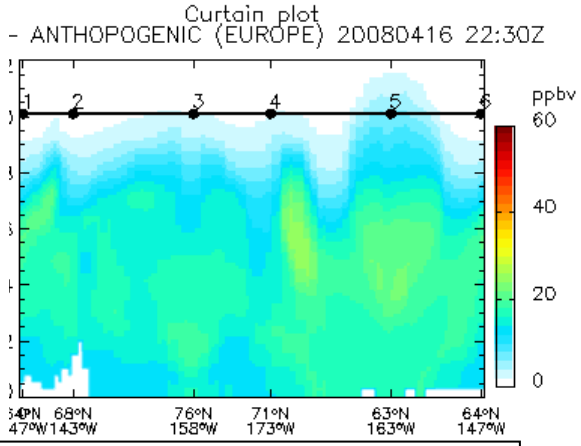
4/16/08 GEOS-5 CO

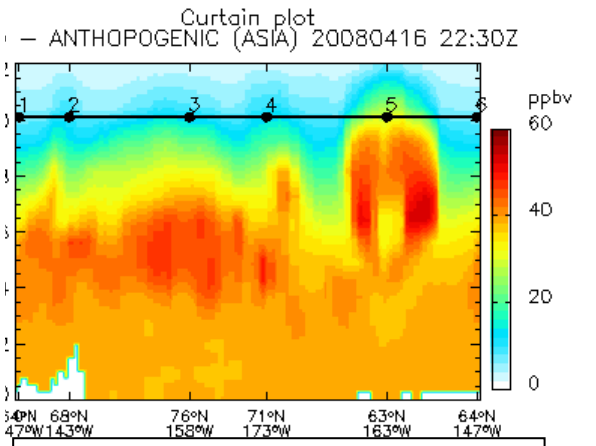


Boreal BB: below Asian pollution





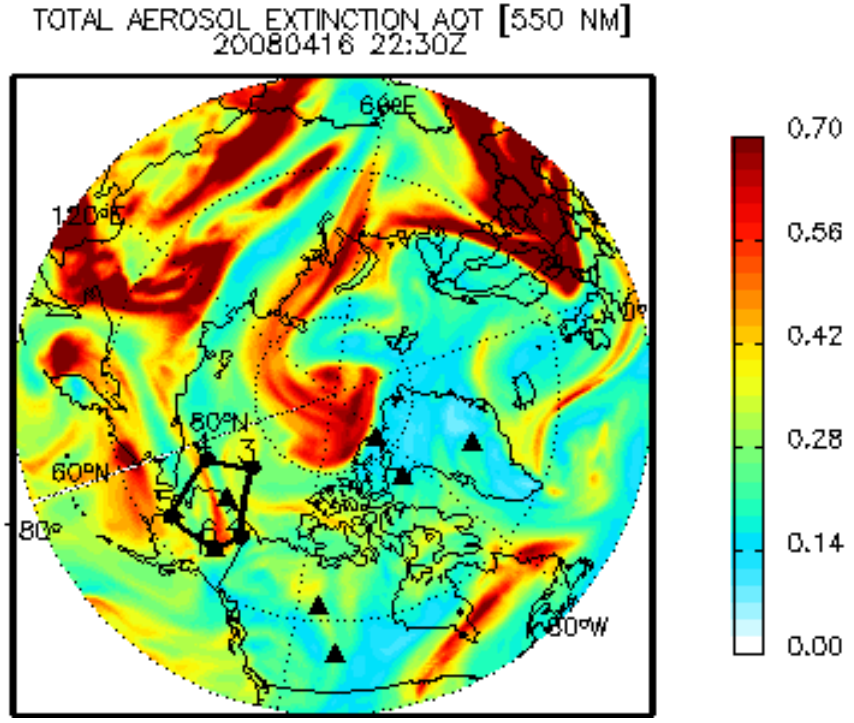




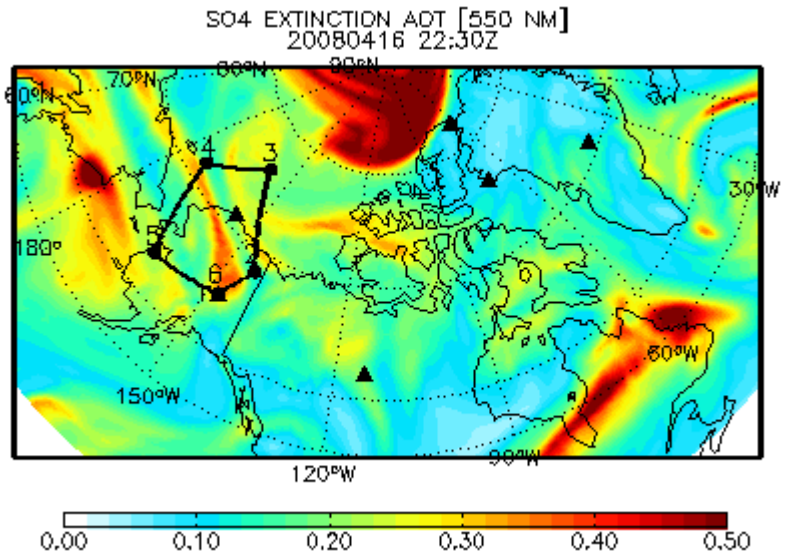
N America pollution: Boundary layer

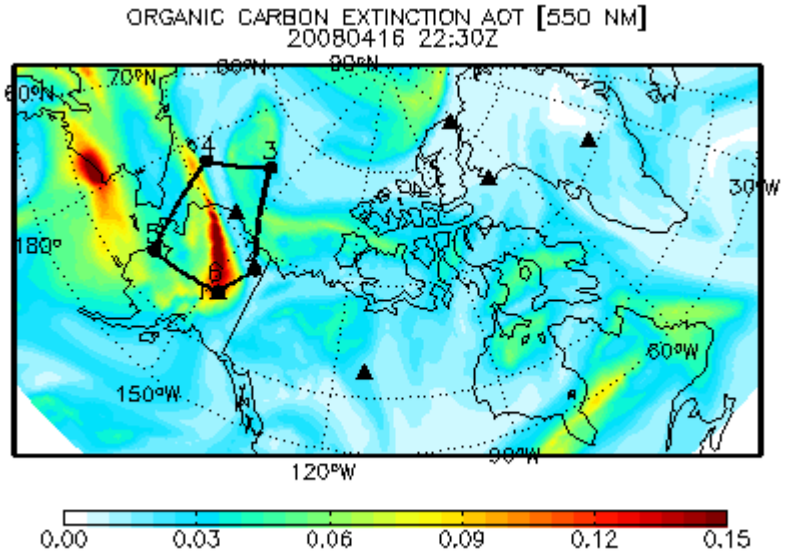
European pollution: higher over western track than over eastern

Asian plume: altitude above all plumes over western Alaska

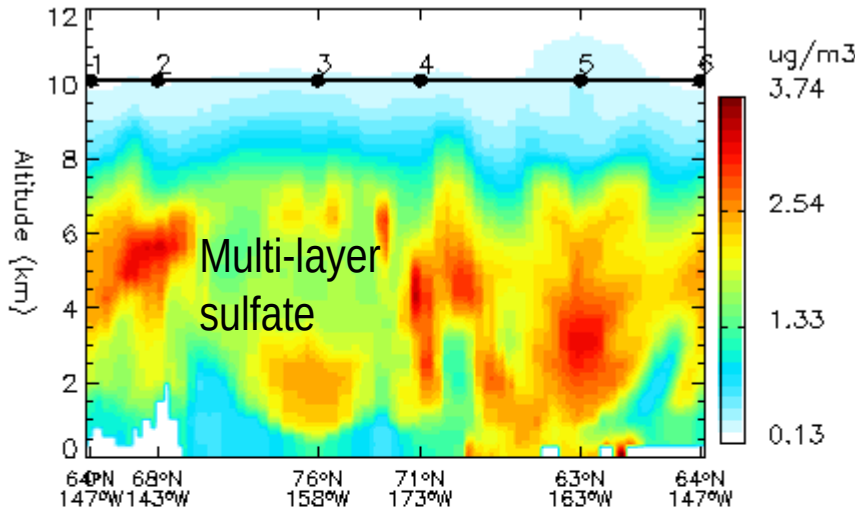


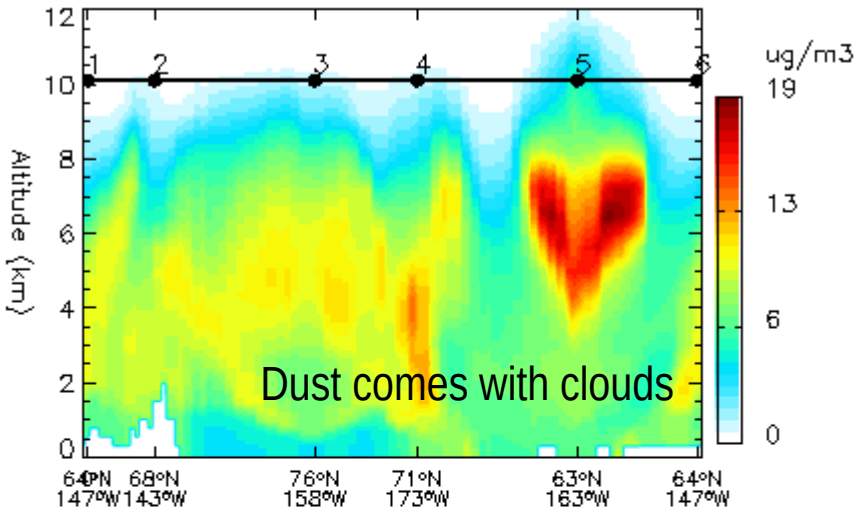
4/16/08
GEOS-5 aerosols

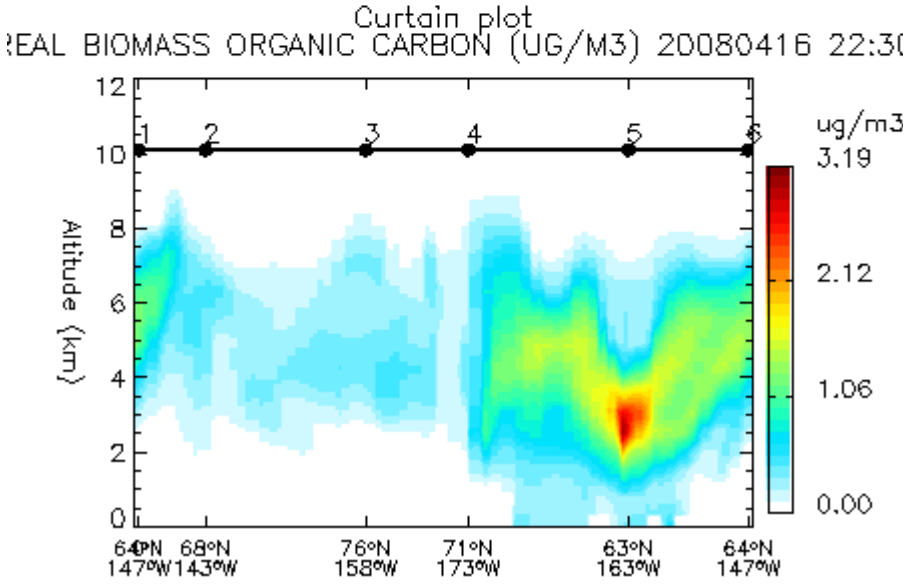


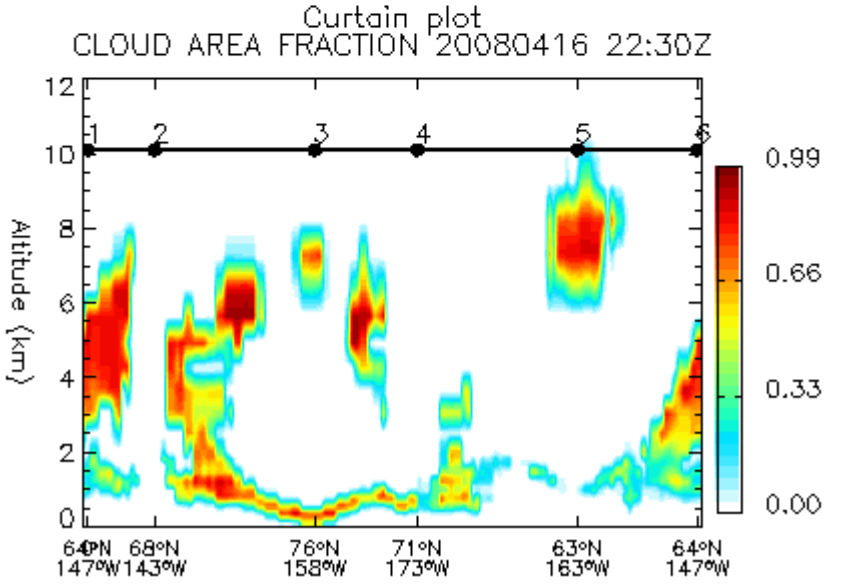


4/16/08 aerosol/clouds along pentagon track

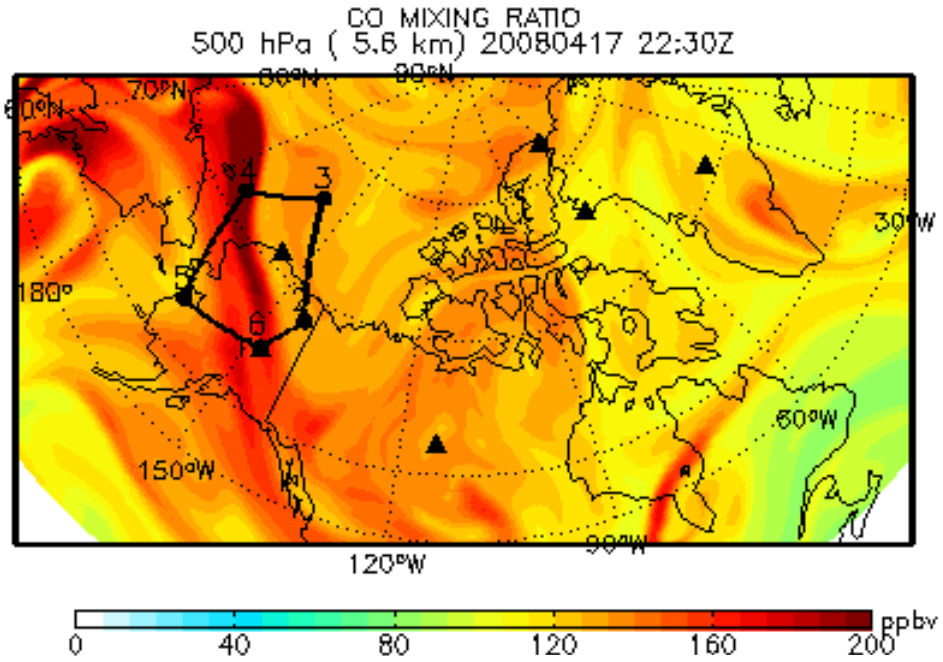


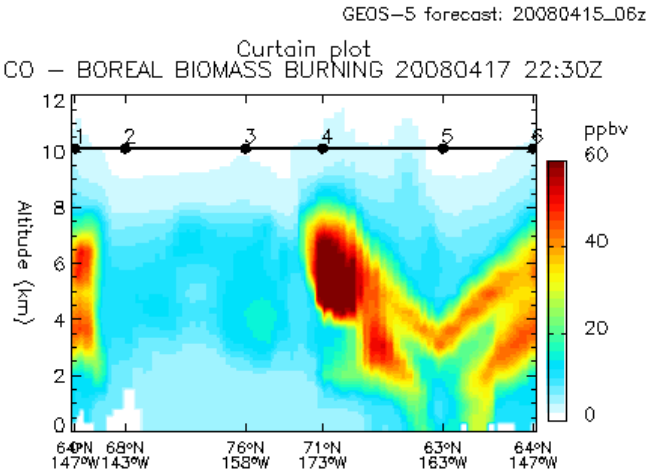


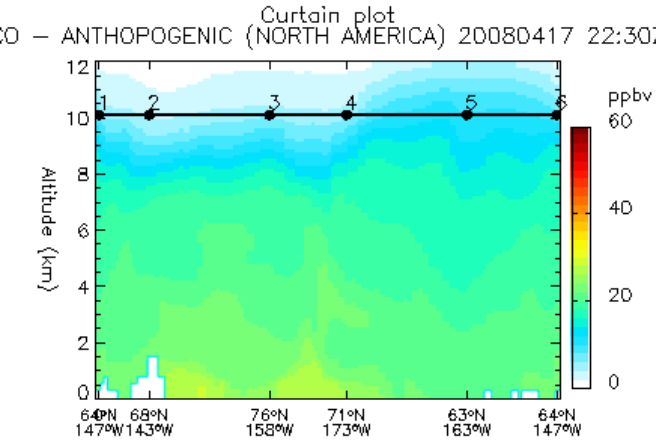


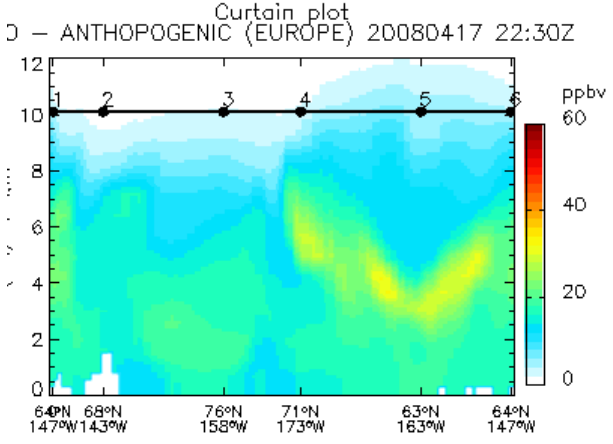


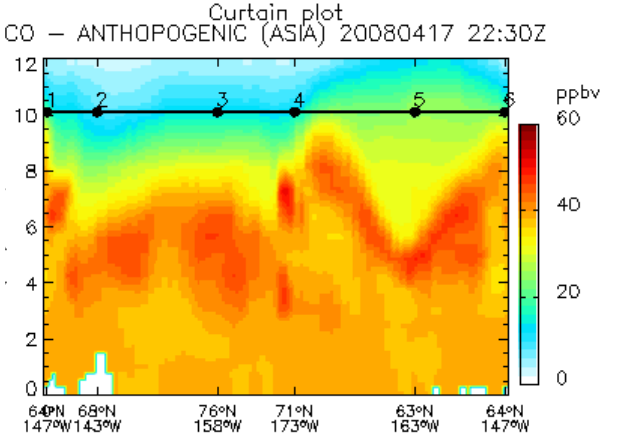
4/17/08 GEOS-5 CO

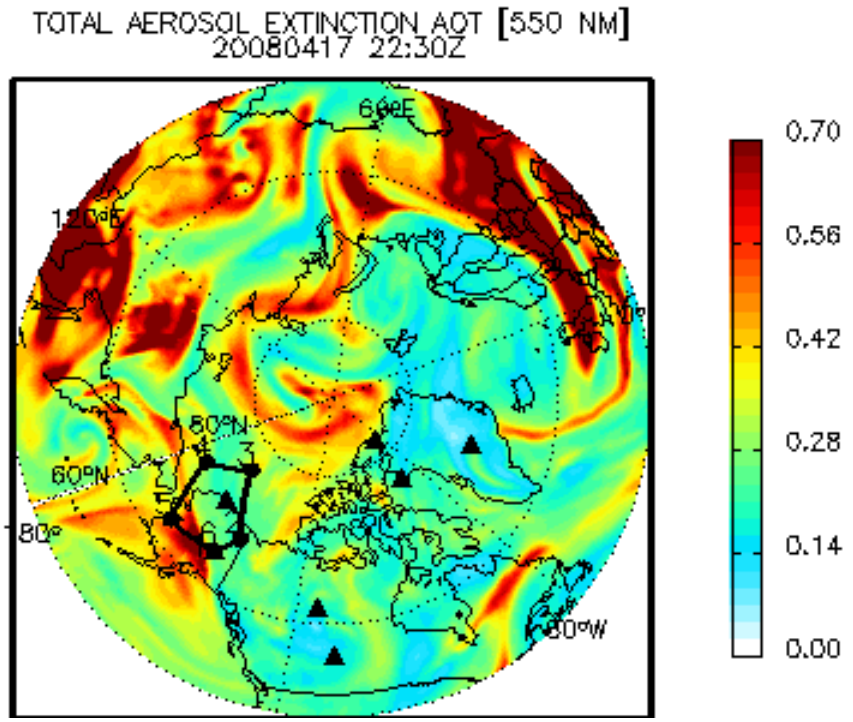




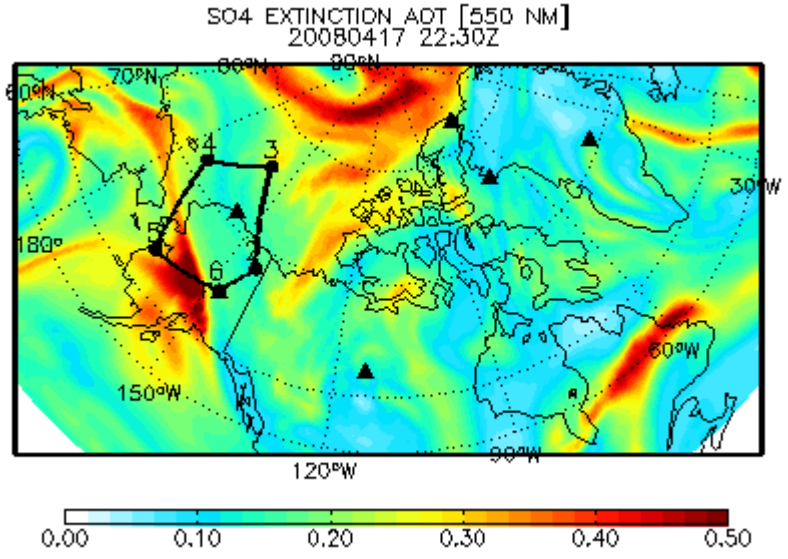


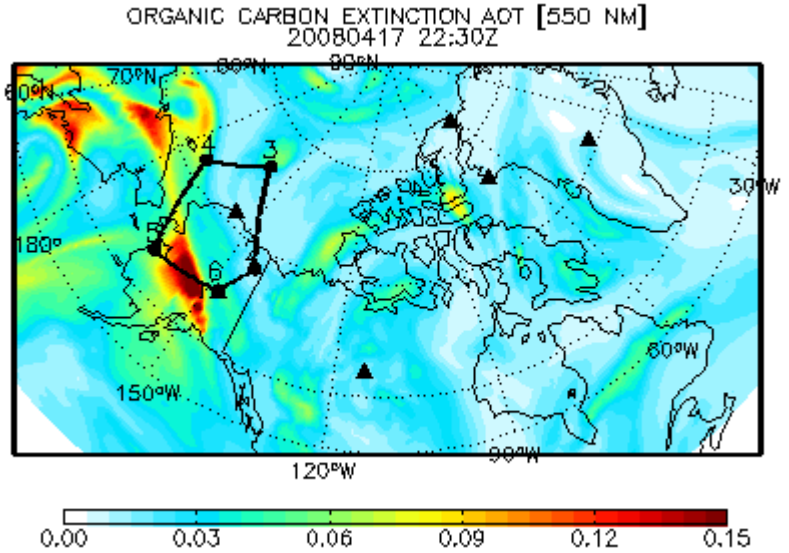




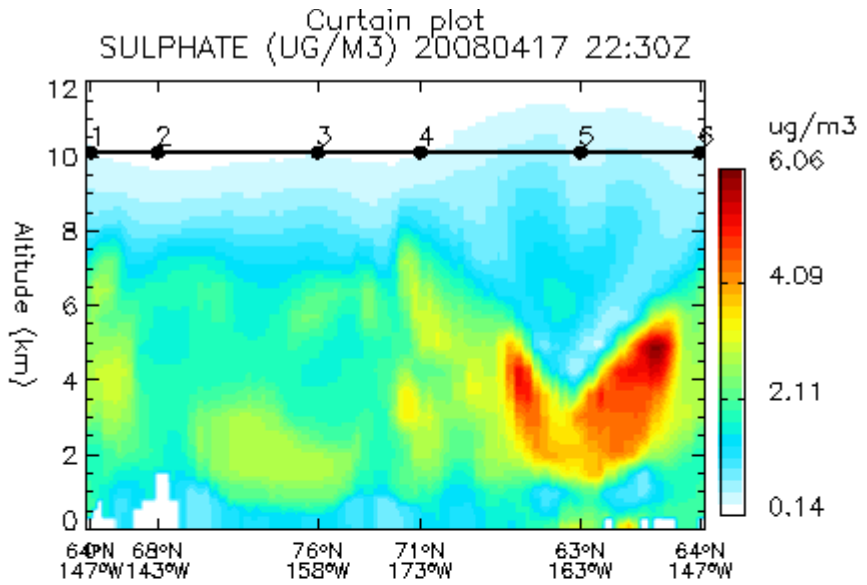


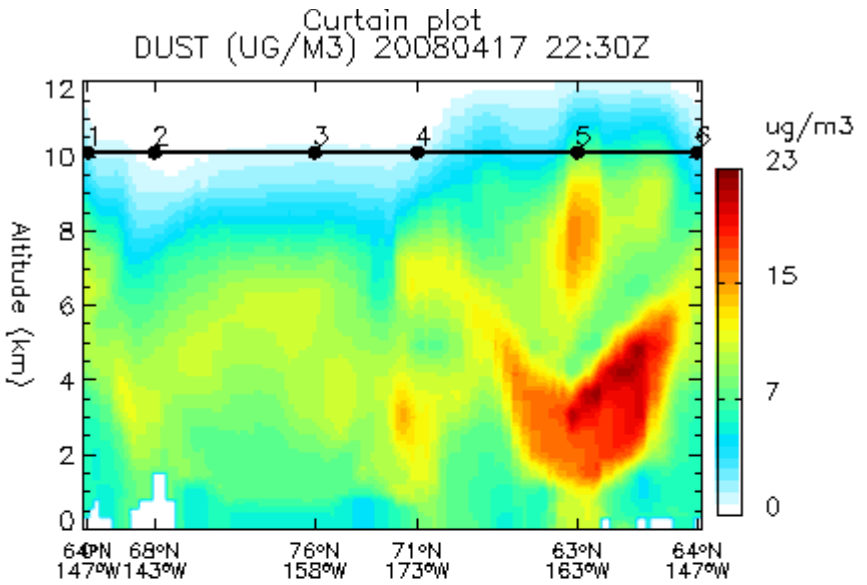
4/17/08
GEOS-5 aerosols

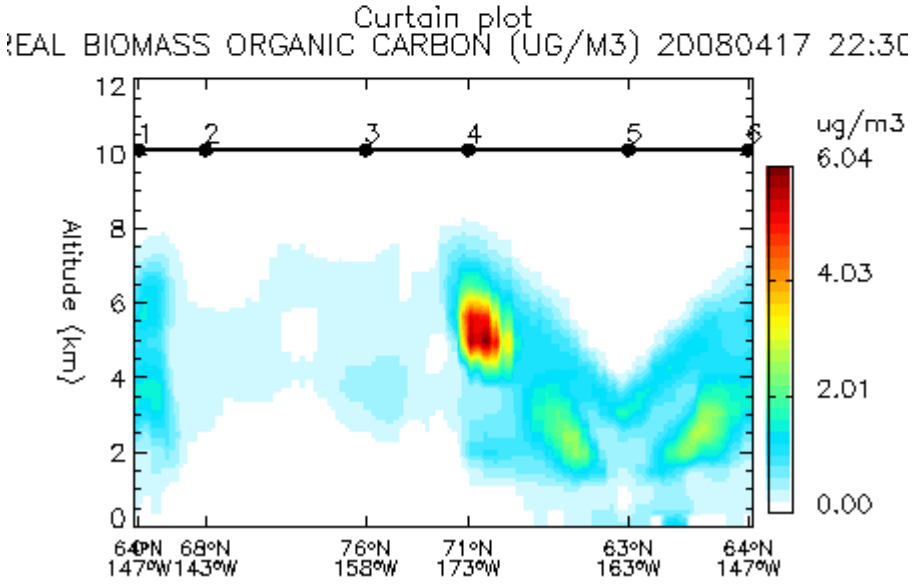


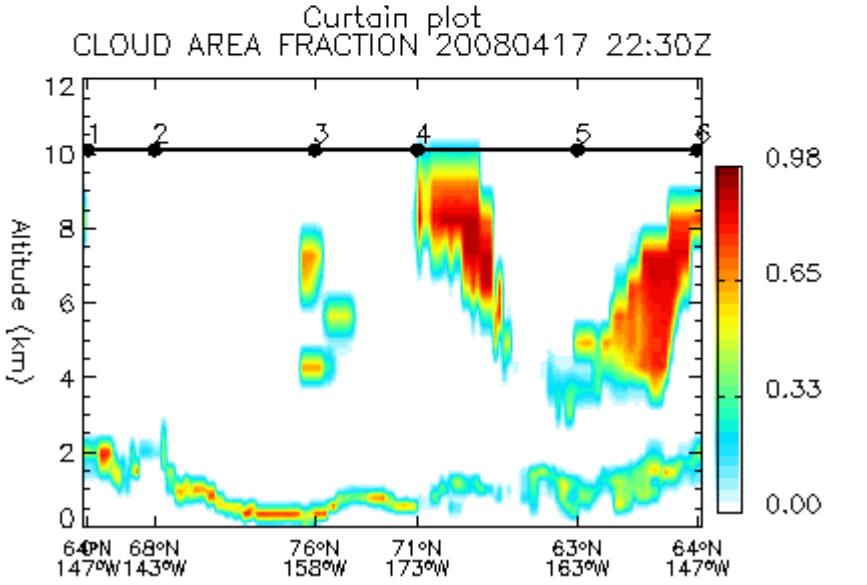


4/17/08 aerosol/clouds along pentagon track







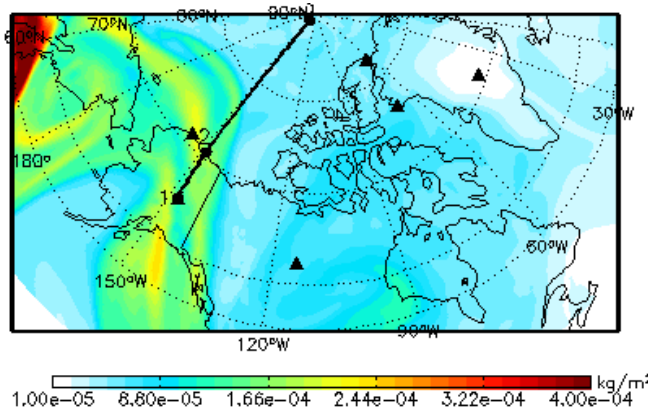


April 18th - 19th ????

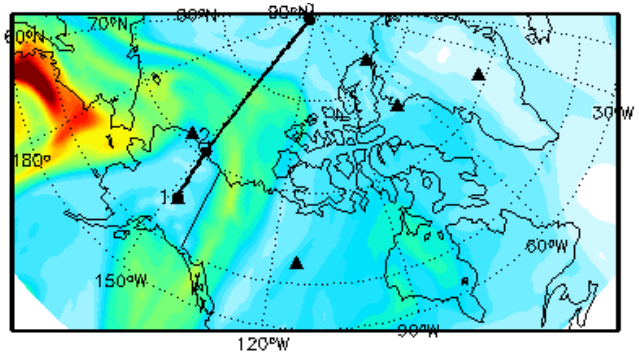
Asian Air Penetrating High Arctic!!!!!!!

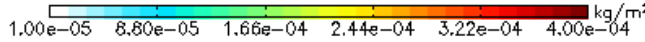
Boreal CO Column

18th



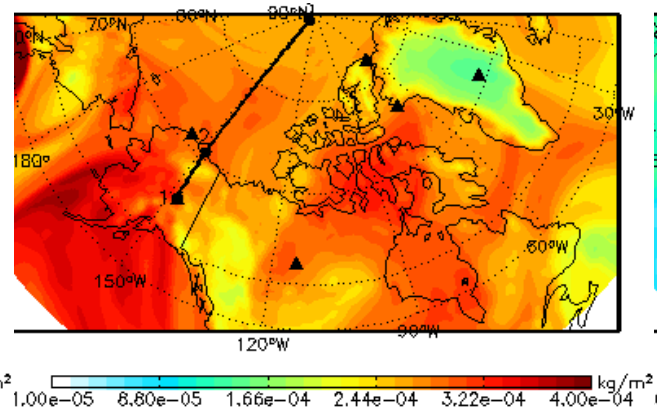
19th



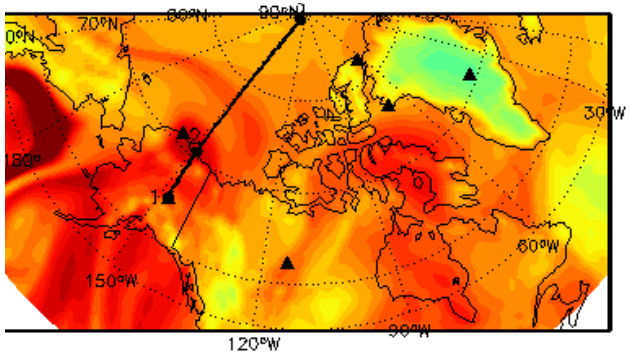


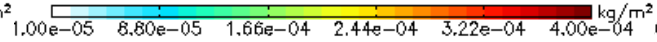
Asian Anthro. CO Column

18th



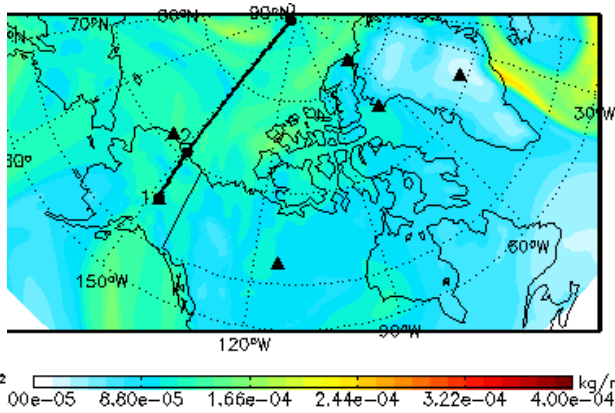
19th





Euro. Anthro. CO Column

18th



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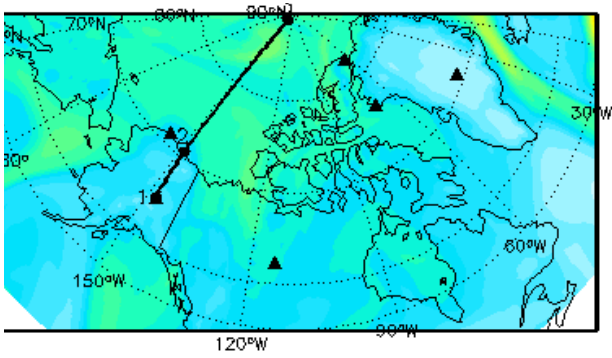
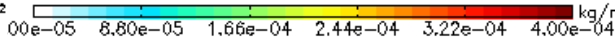




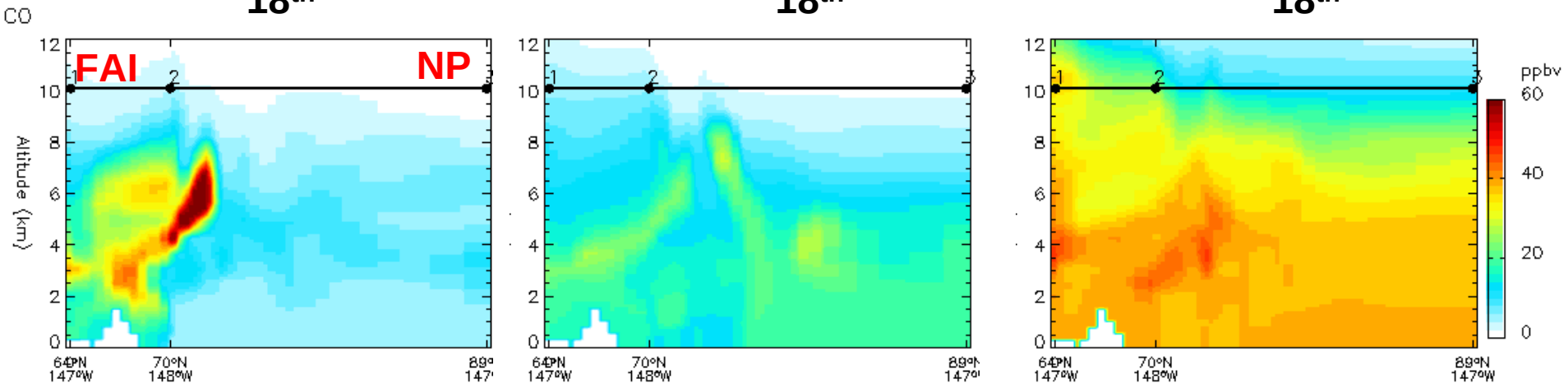
Well Mixed: N. American Anthro. Nonboreal Biomass Burning

Boreal CO

Euro. Anthro. CO

Asian Anthro. CO

18th



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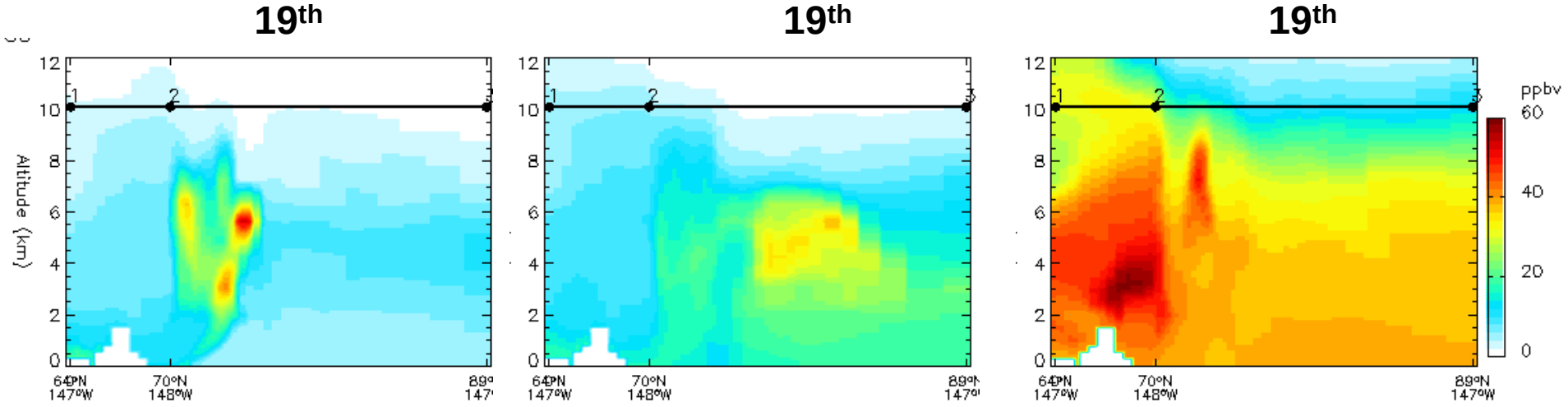
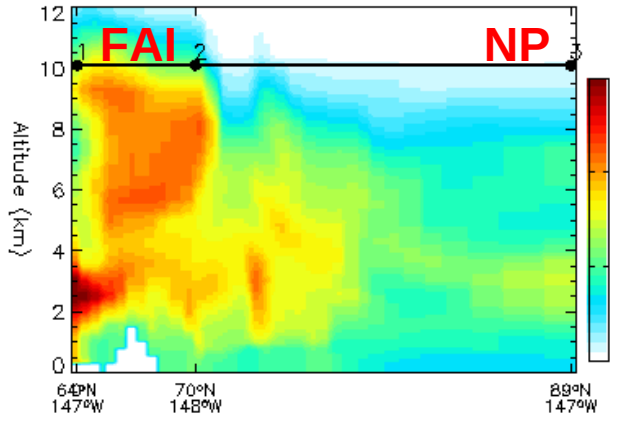


Dust (ug/m^3)

18th



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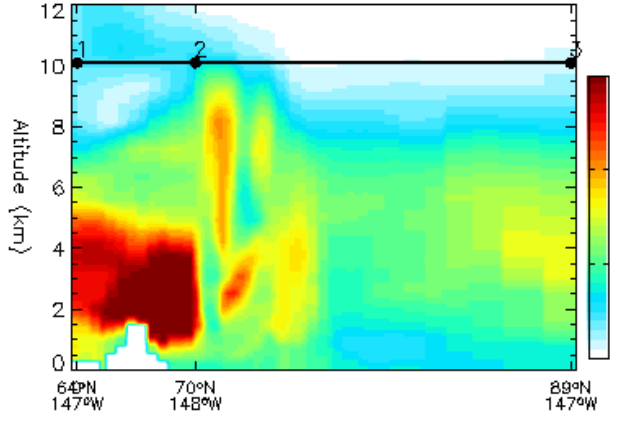
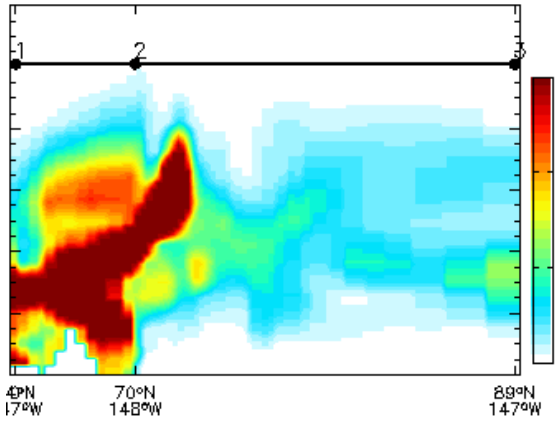


Biomass OC (ug/m^3)

18th



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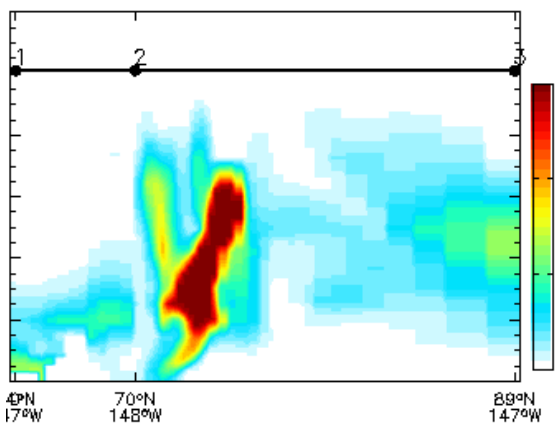
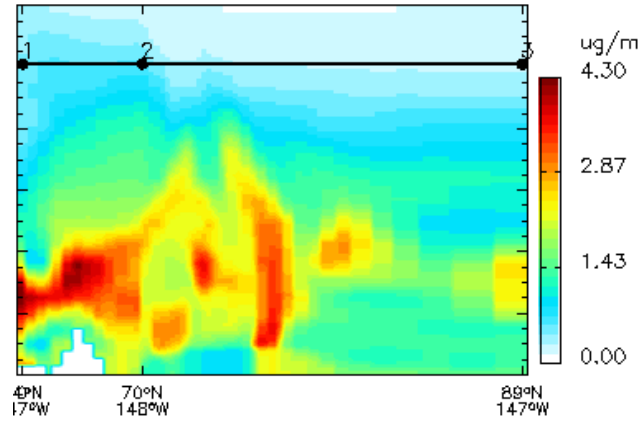


Sulfate (ug/m^3)

18th



19th