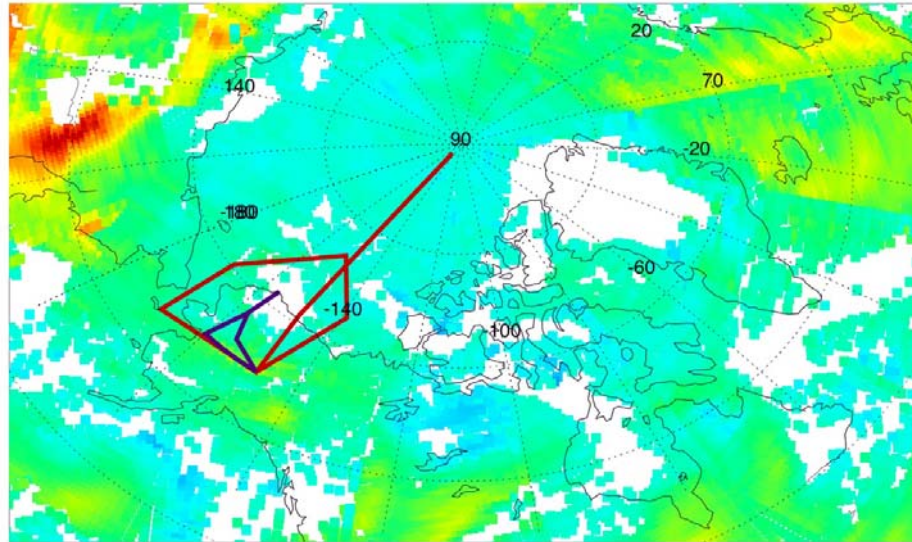
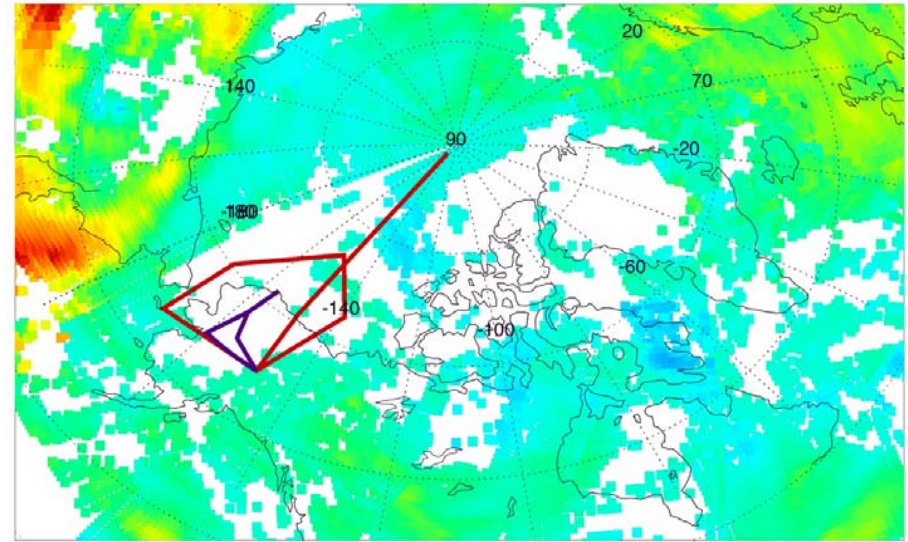


AIRS NRT ARCTAS Support: Latest AIRS CO

AIRS CO VMR (ppbv) at 500mb on 20080414 for ARCTAS



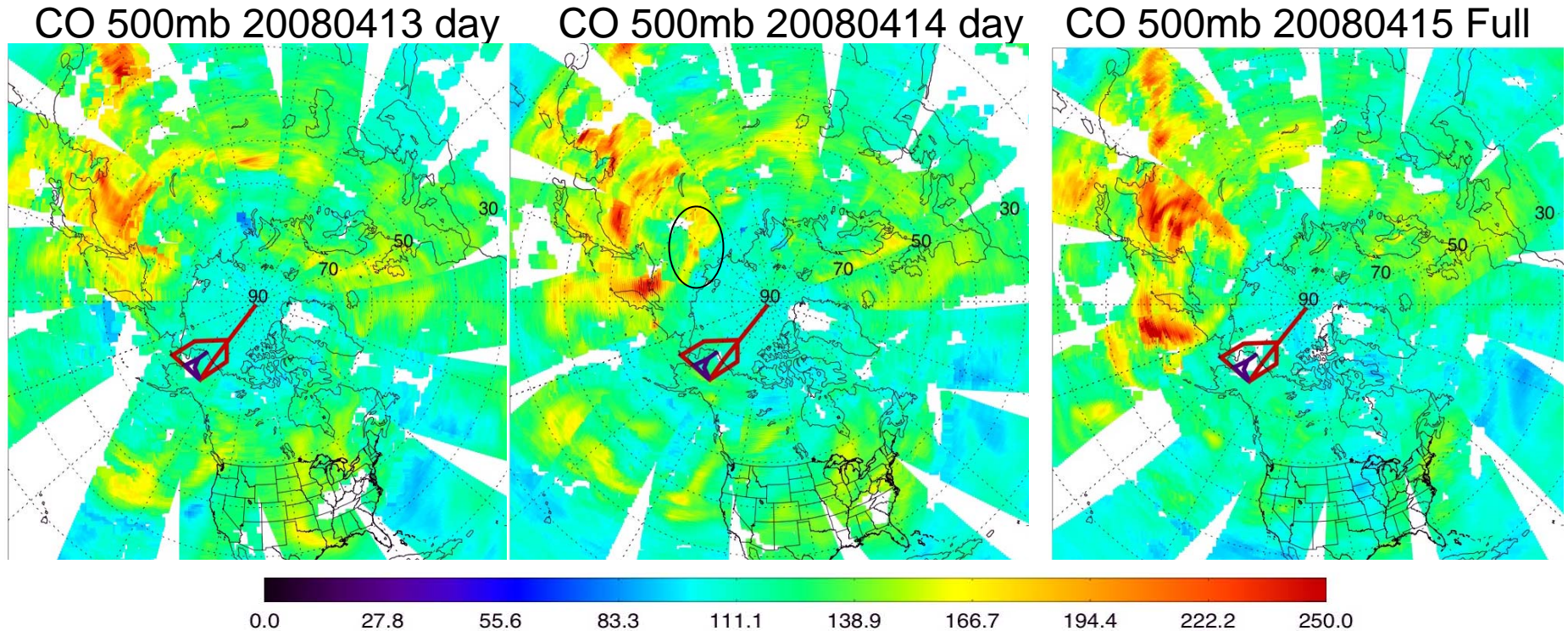
AIRS CO VMR (ppbv) at 500mb on 20080415 for ARCTAS



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

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

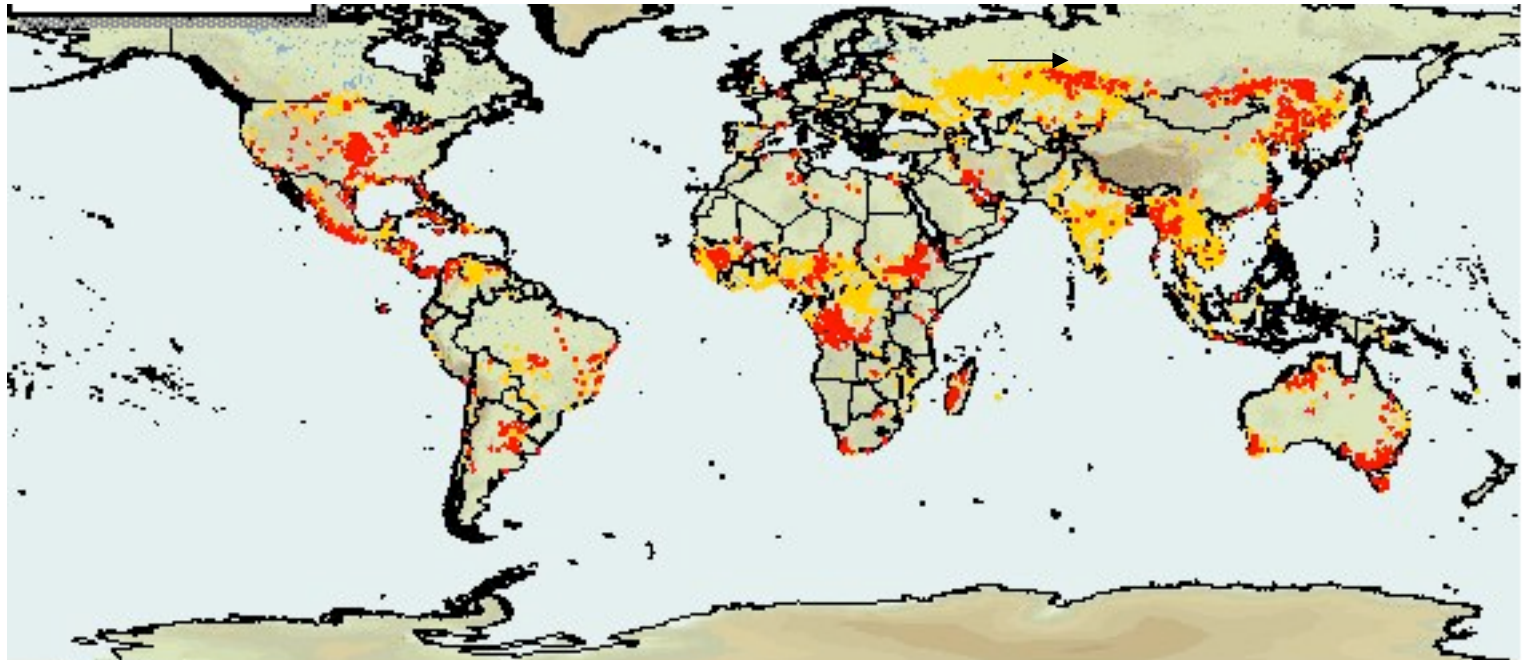
AIRS NRT ARCTAS Support:



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)

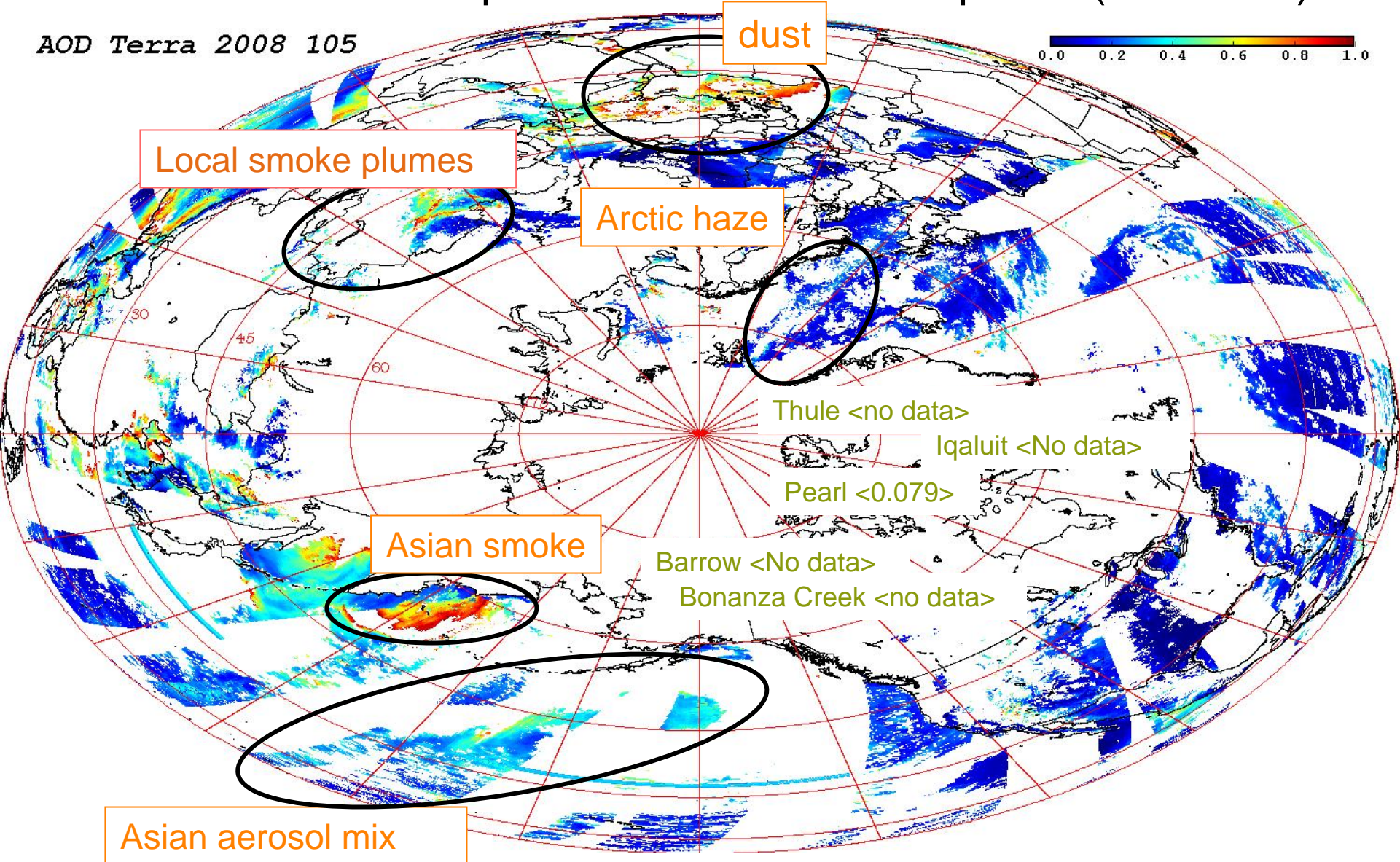


Fresh fires (superimposed in red) have started to diminish in central Asia but are still going strong in southeastern Siberia/northeastern China

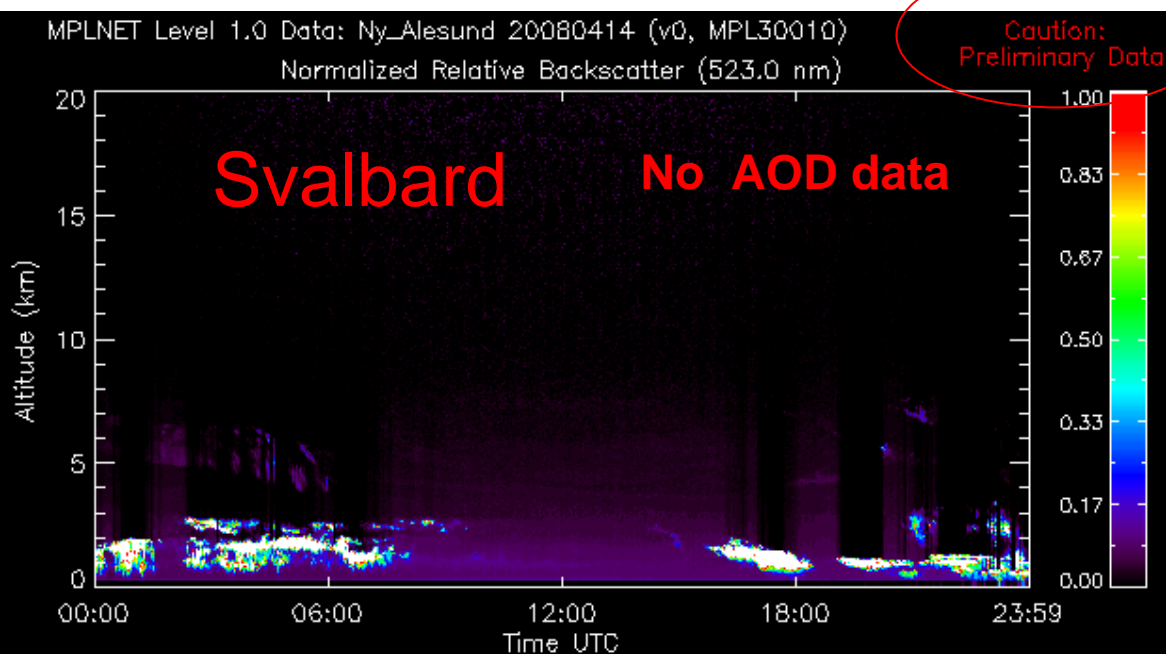
Day 105 (April 14) Monday

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

AOD Terra 2008 105



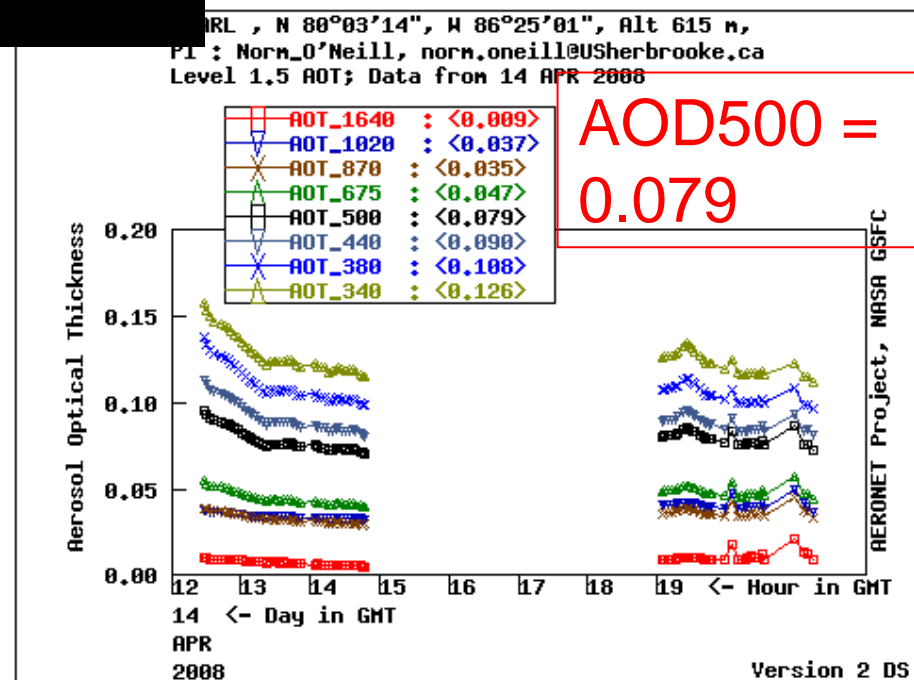
MODIS AOD at 550 nm and AERNOET daily mean <AOD> at 500 nm



PEARL

Enhanced AOD in N. Amer. Arctic is gone.

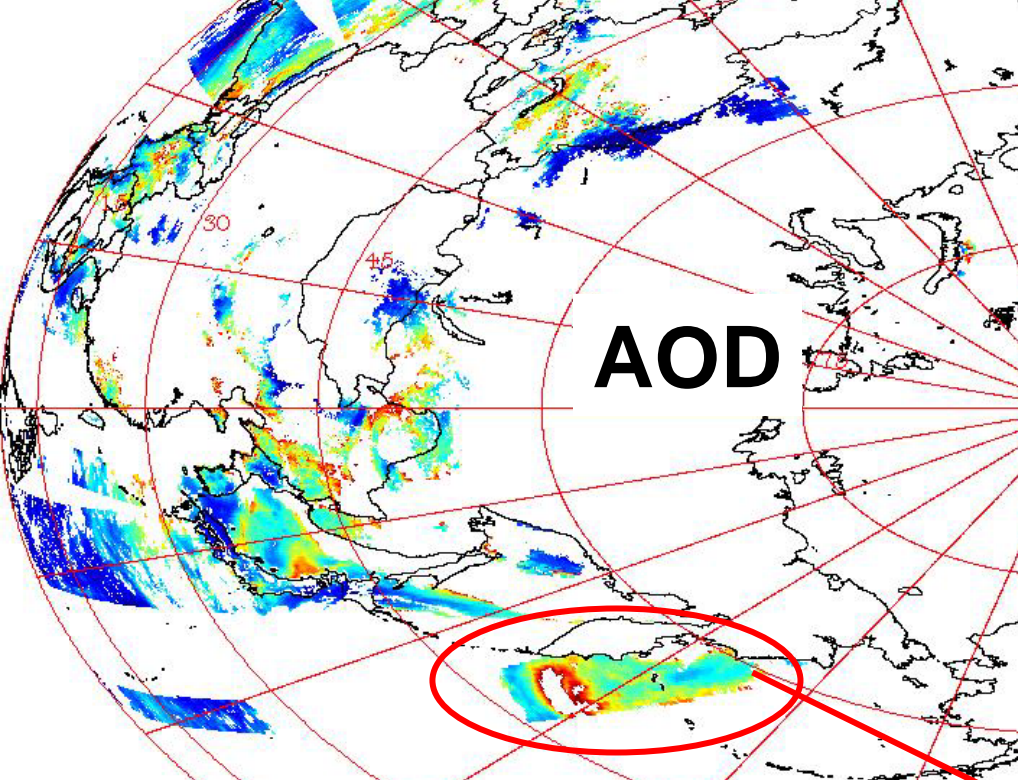
Still see some enhancement on the European - Asian side (from MODIS)



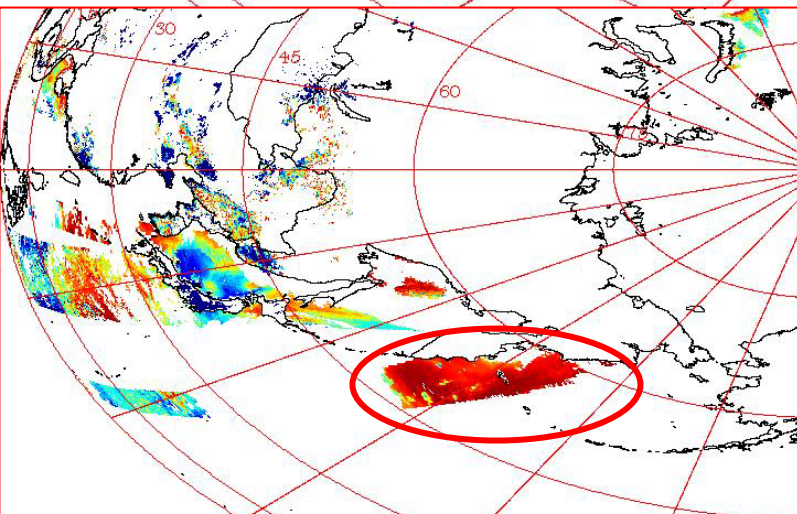
TODAY.
Tuesday April 15

Biomass burning plume
From fire flare-up over weekend

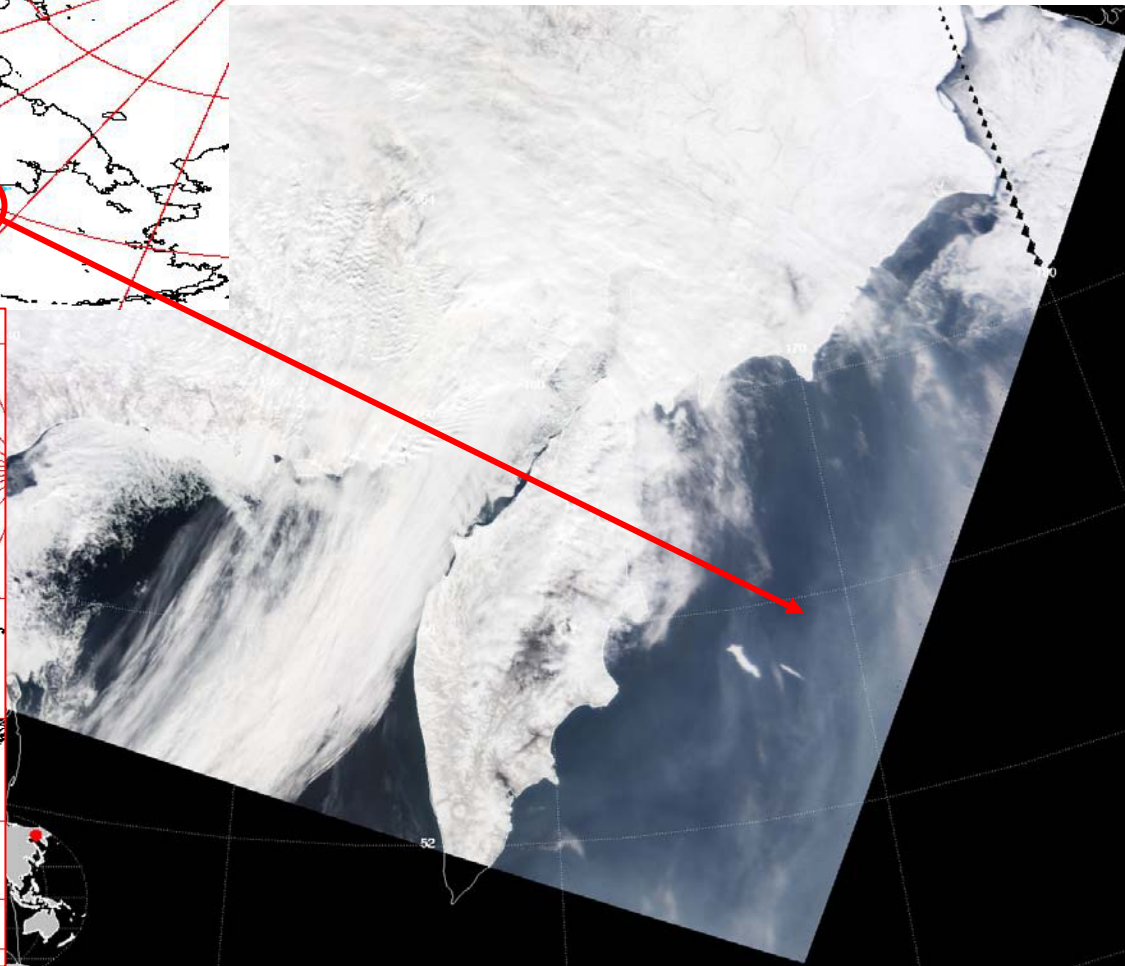
Notice $f_{mf} = 1$ >> dominated by
Small particles



AOD



Fine mode fraction

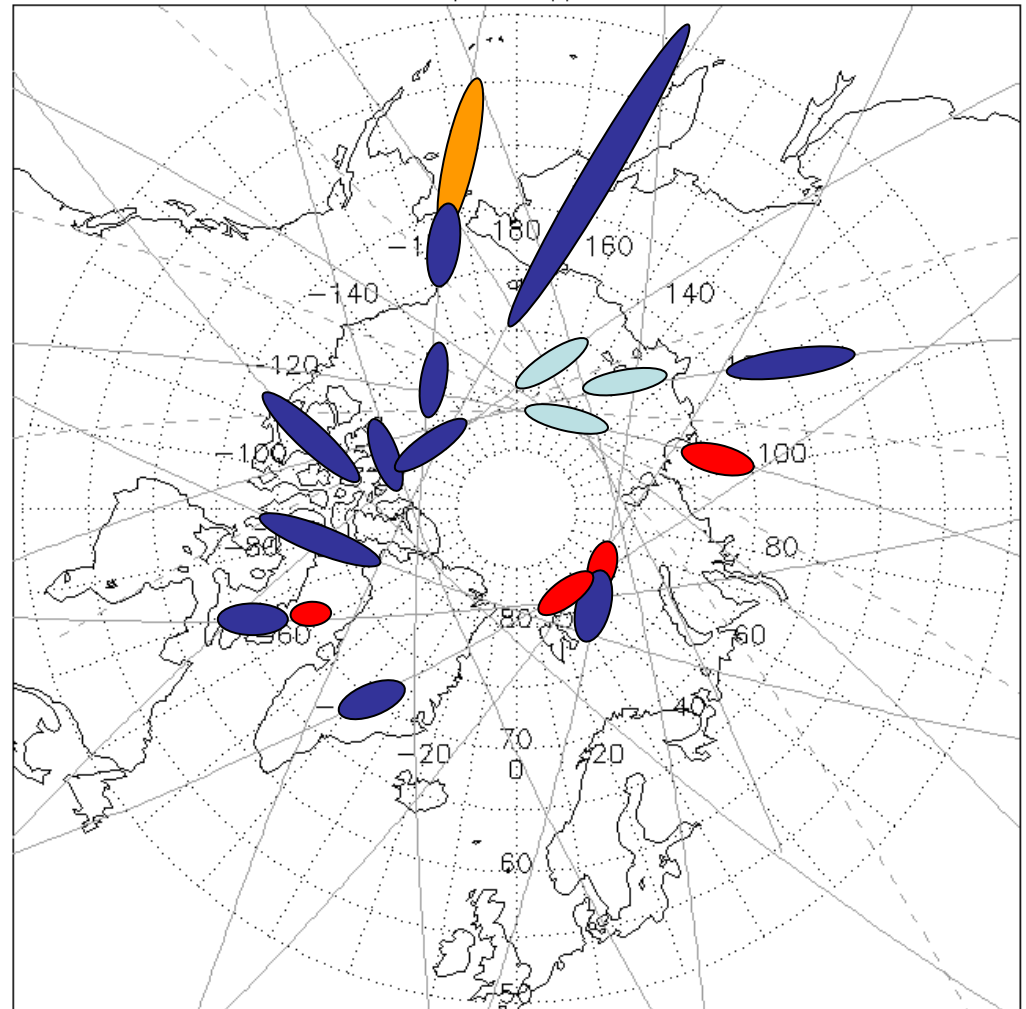
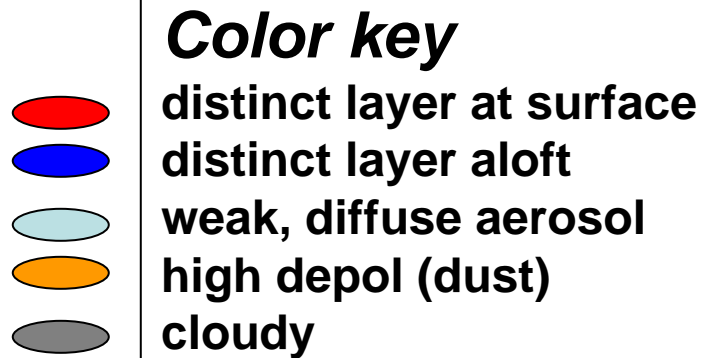


CALIPSO Observations

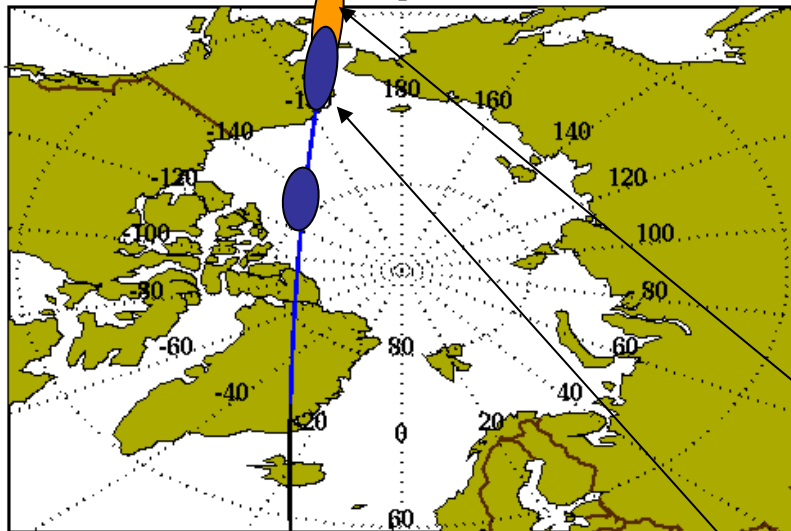
13/14 April 2008

CALIPSO Hot Spots – 13/14

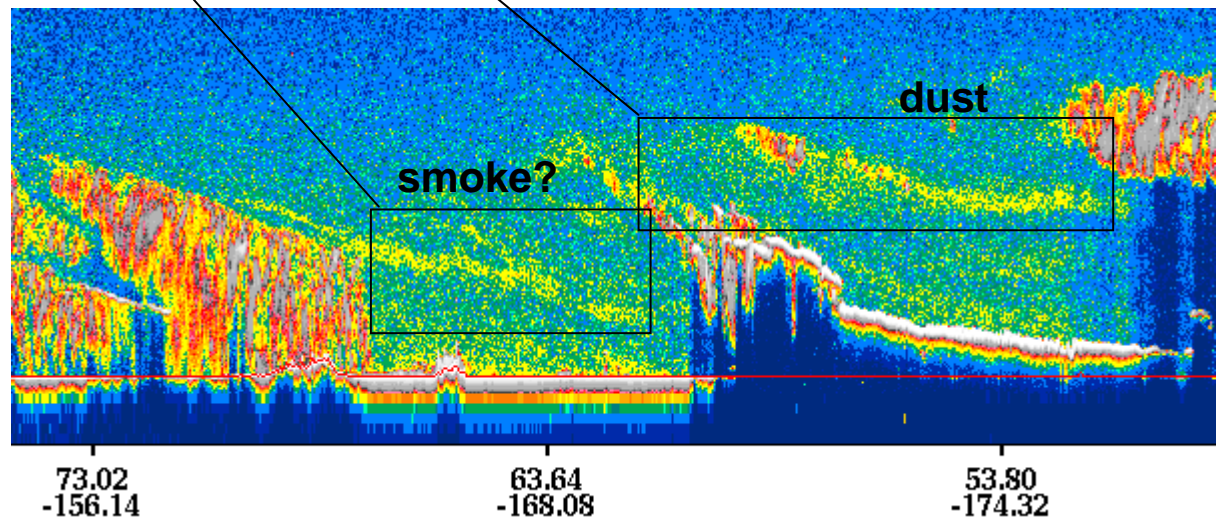
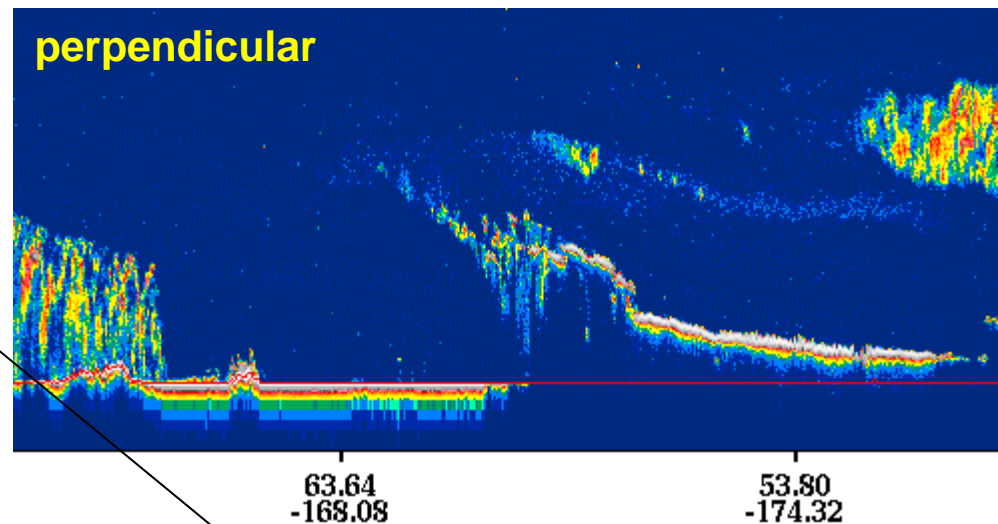
20080413(>18Z)/20080414



2008-04-14 13:30:00 UTC Half of Hour Conditions
Version: 2.0 Image Date: 04/15/2008

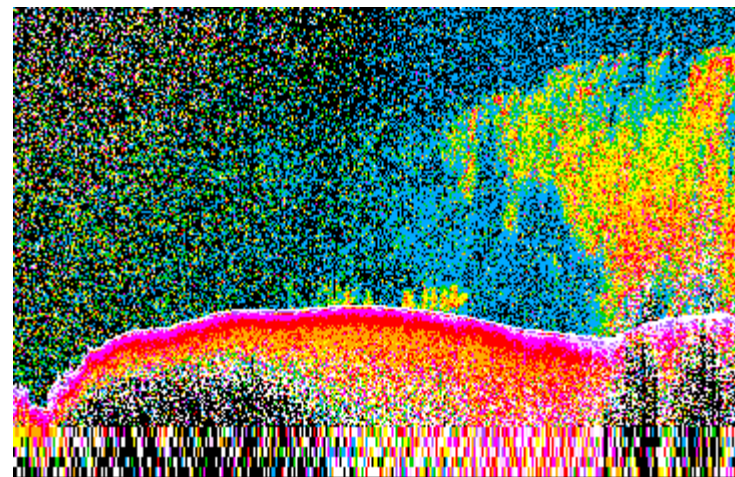
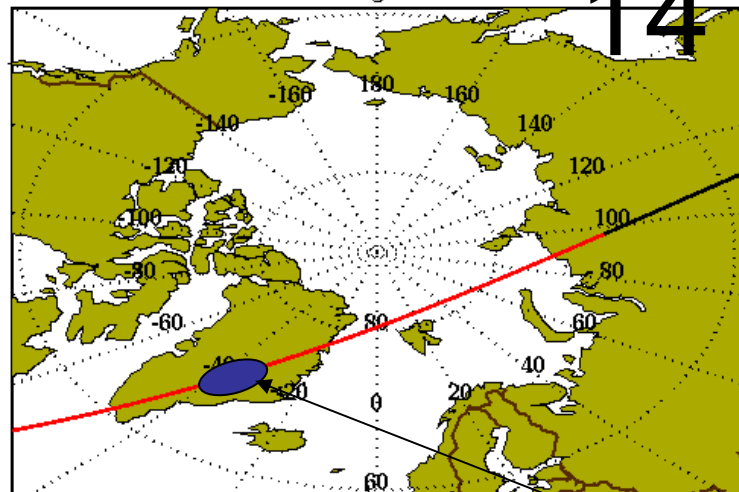


April 1330Z



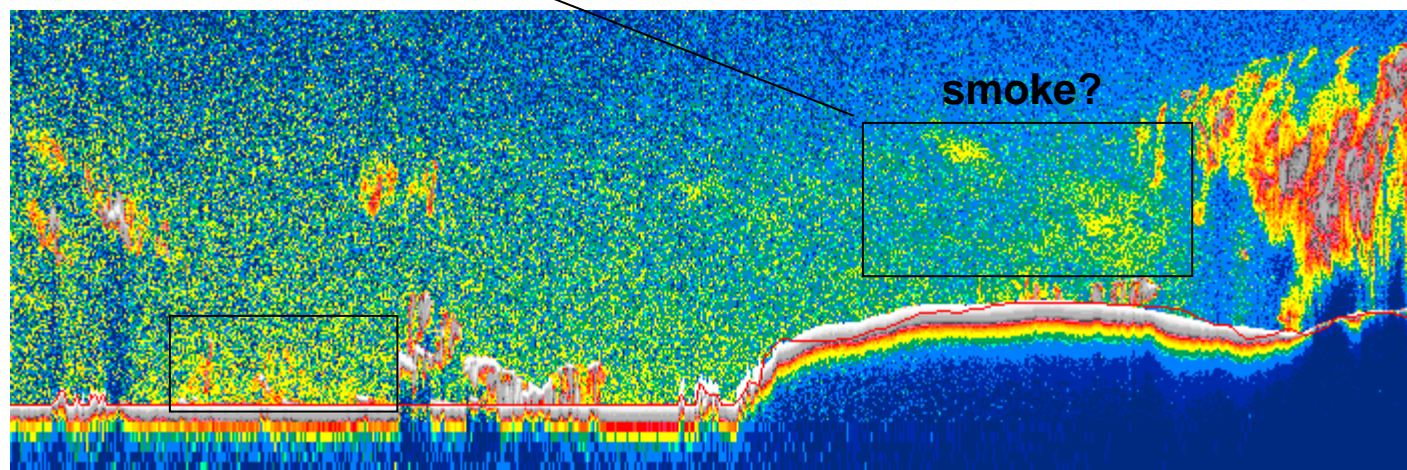
2008-04-14 04:30:00 UTC Half of Hour Conditions
Version: 2.01 Image Date: 04/15/2008

14 April 0430Z



74.29
-29.80

65.03
-43.26

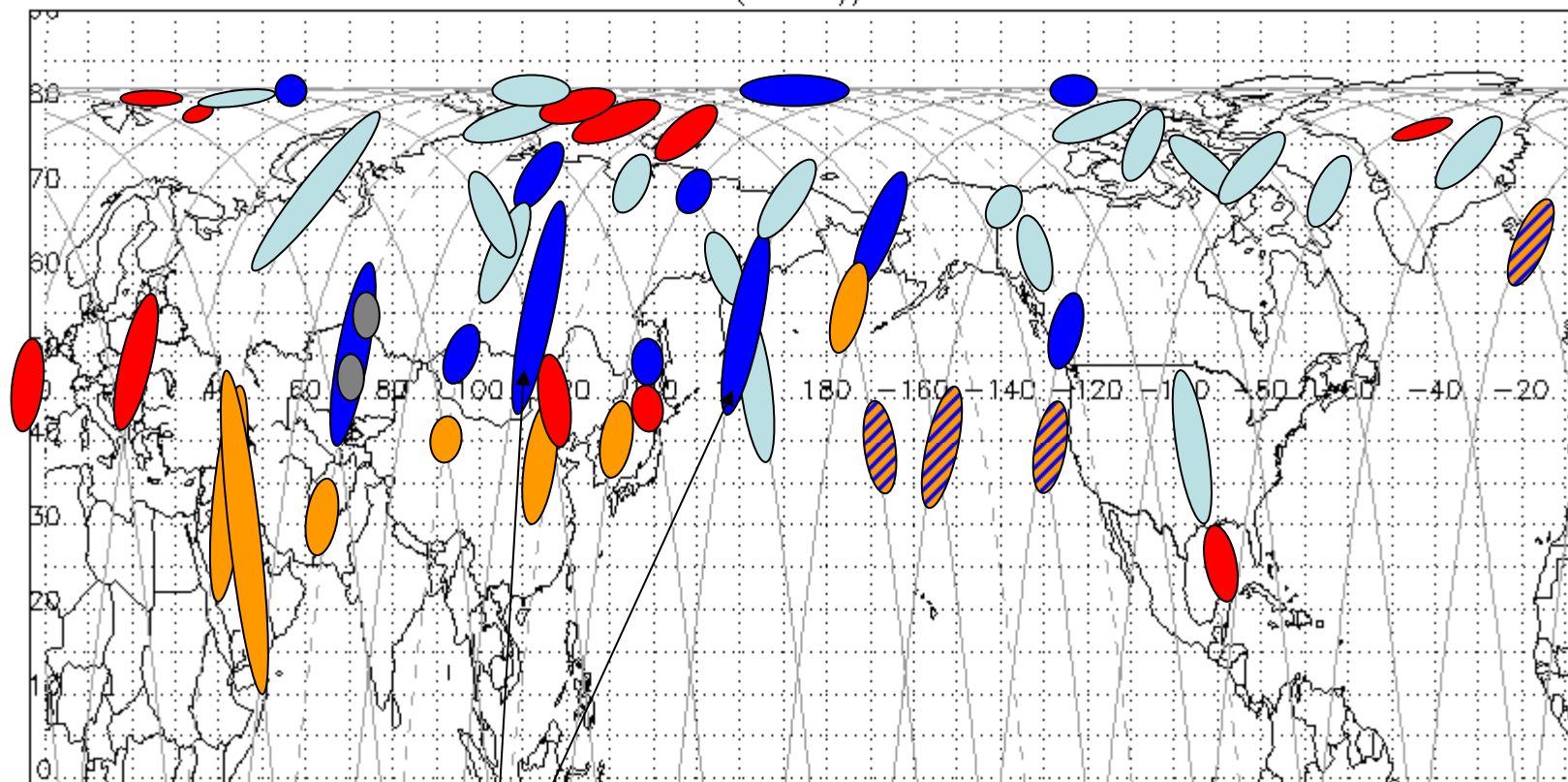


81.20
8.42

74.29
-29.80

65.03
-43.26

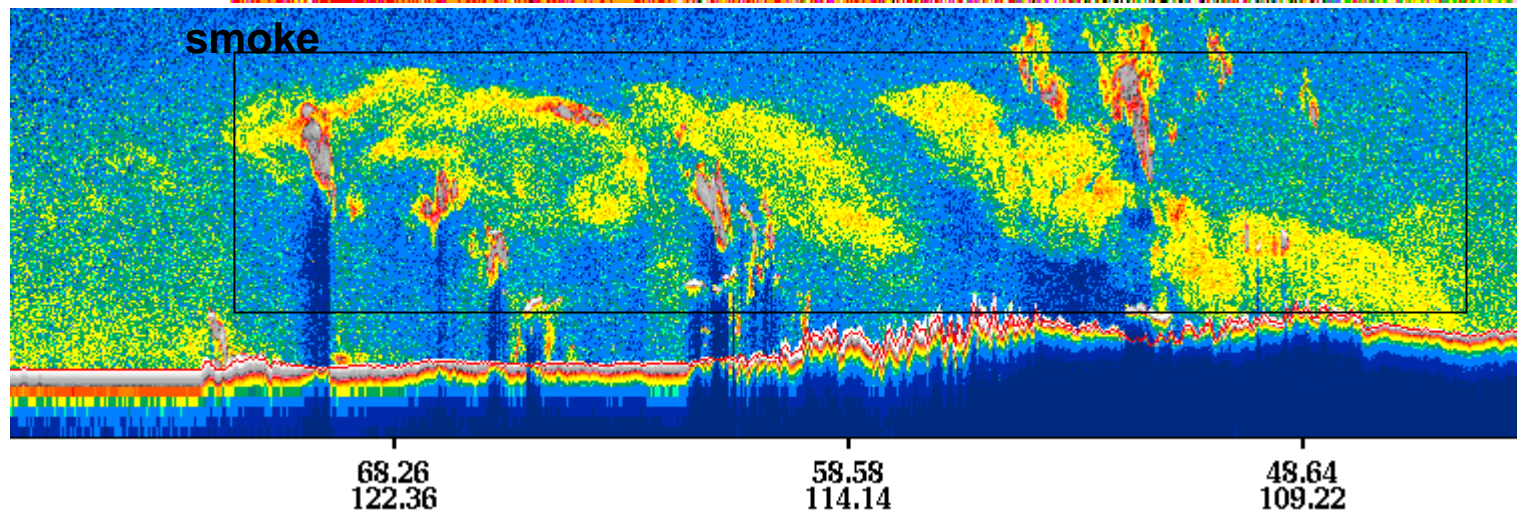
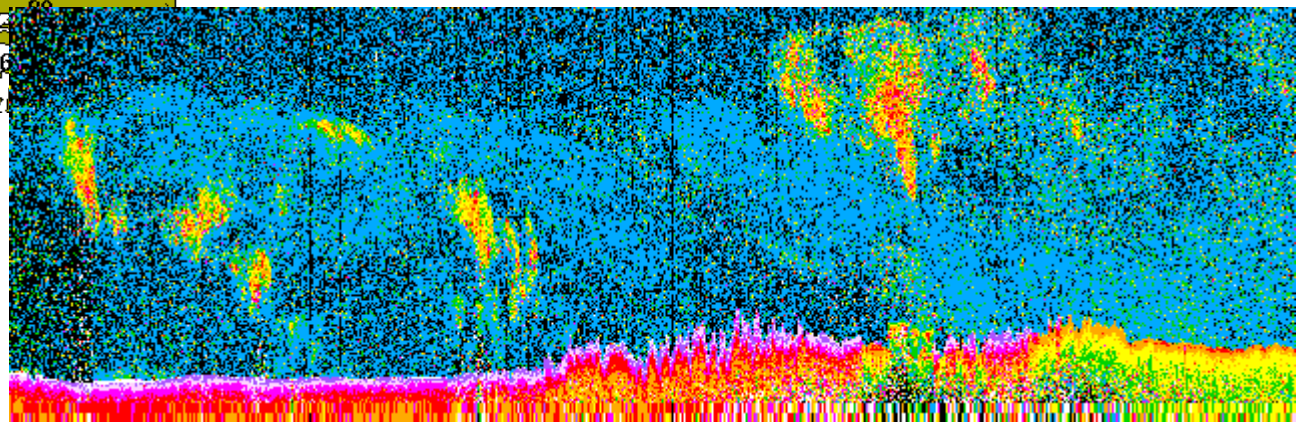
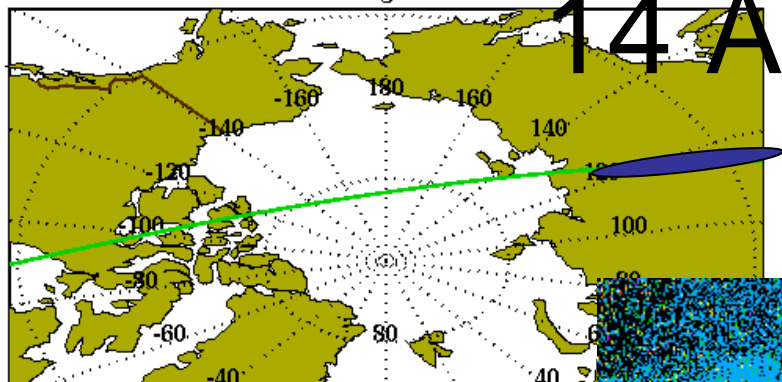
20080413(>18Z)/20080414



Huge smoke plumes

2008-04-14 18-00-00 UTC Start of Hour Conditions
Version: 2.01 Image Date: 04/15/2008

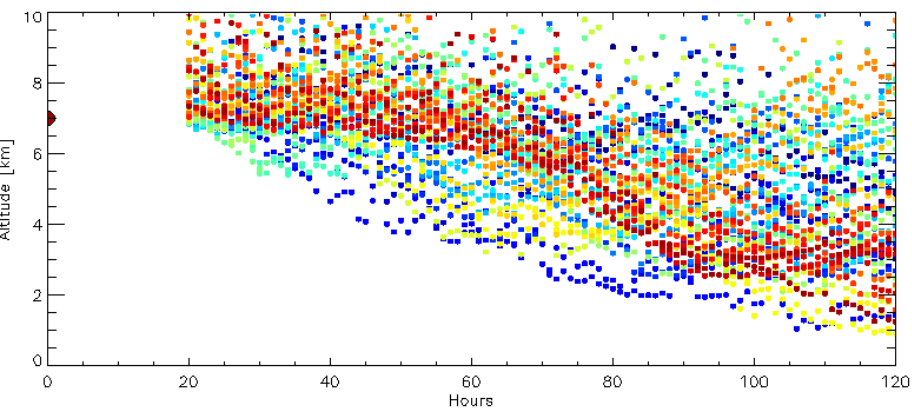
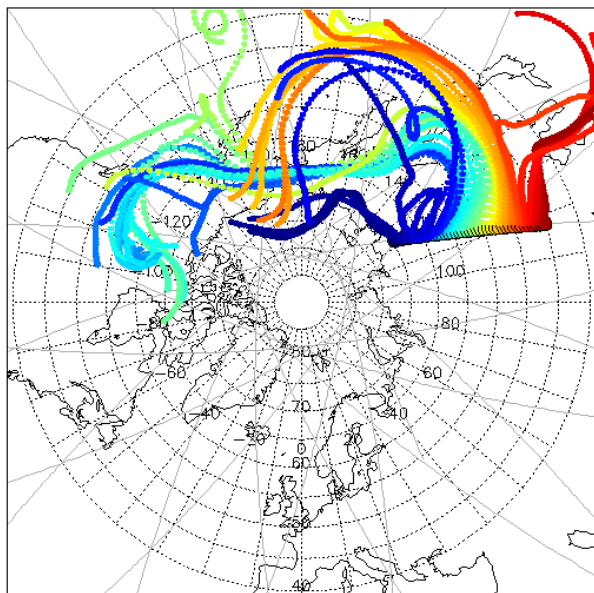
14 April 1800Z



14 April 1800Z Granule

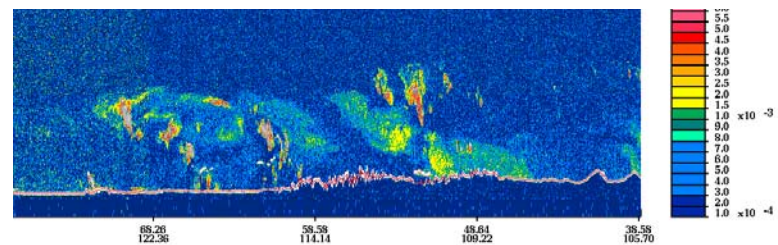
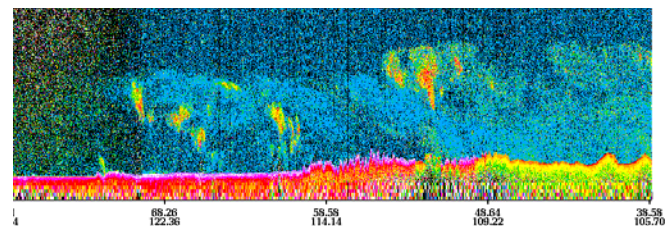
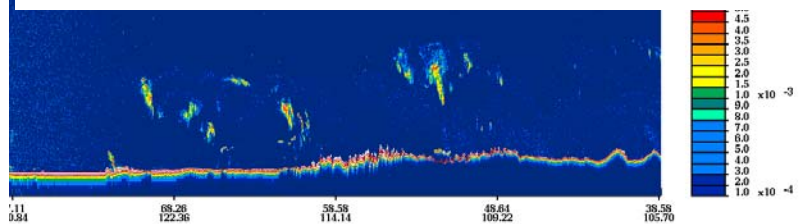
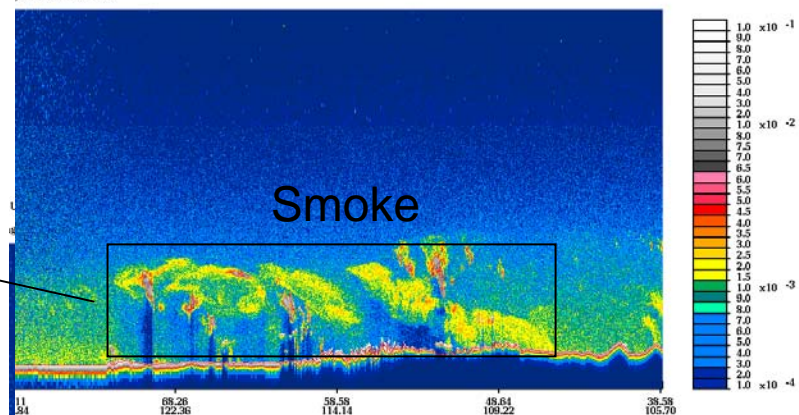
120hr CALIPSO Trajectories Initialized 2008041400 Valid 2008041900

Initial Altitude: 7000m



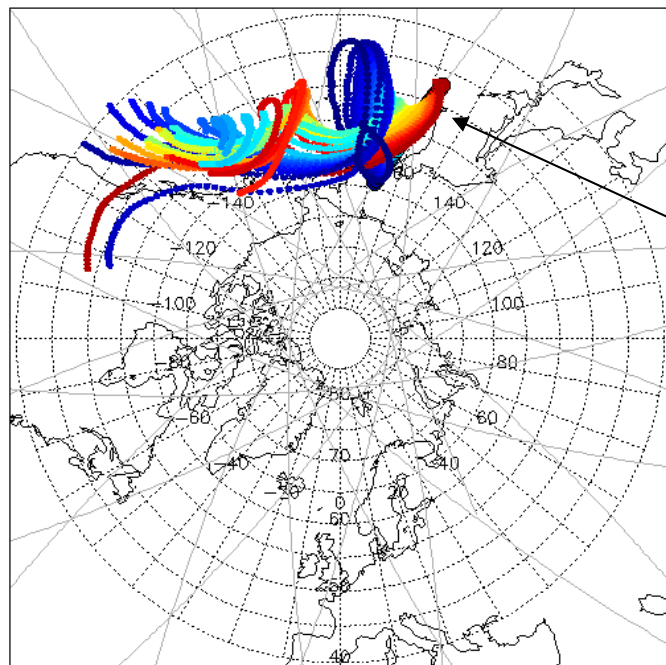
2008-04-14 18:45:00.0172 End UTC: 2008-04-14 19:07:42.2852

je Date: 04/15/2008

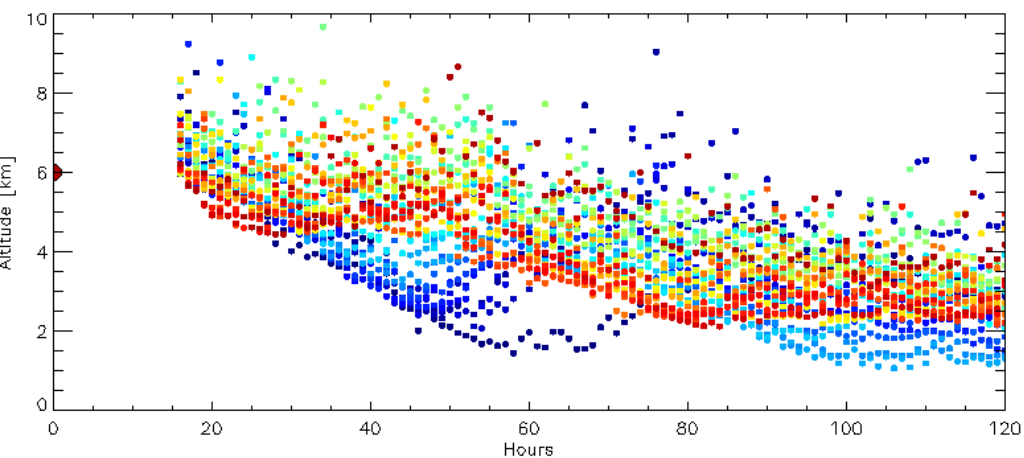
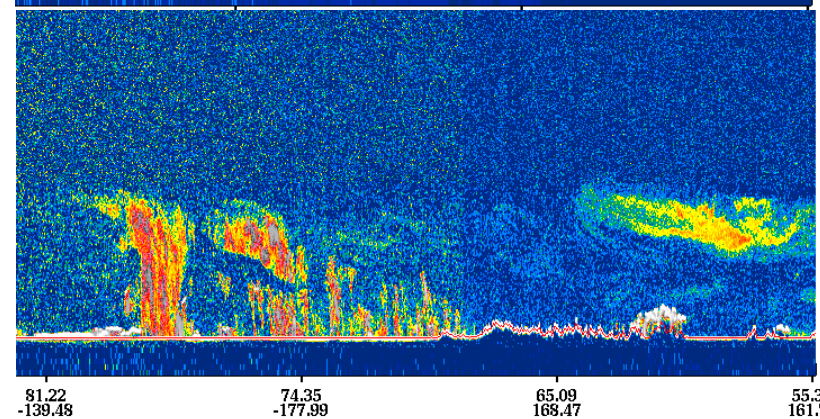
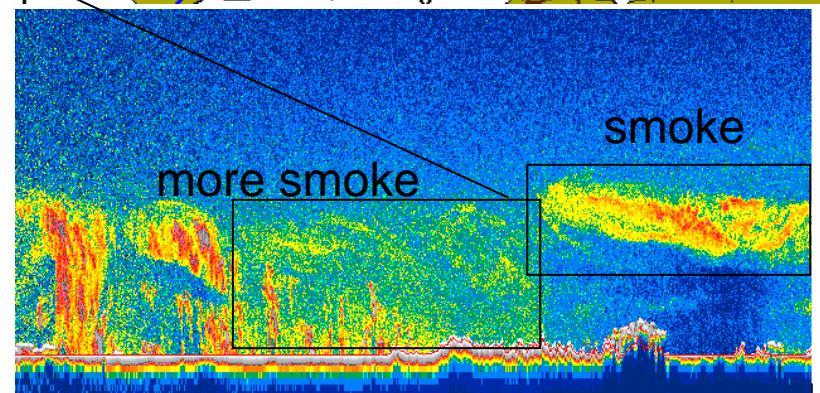
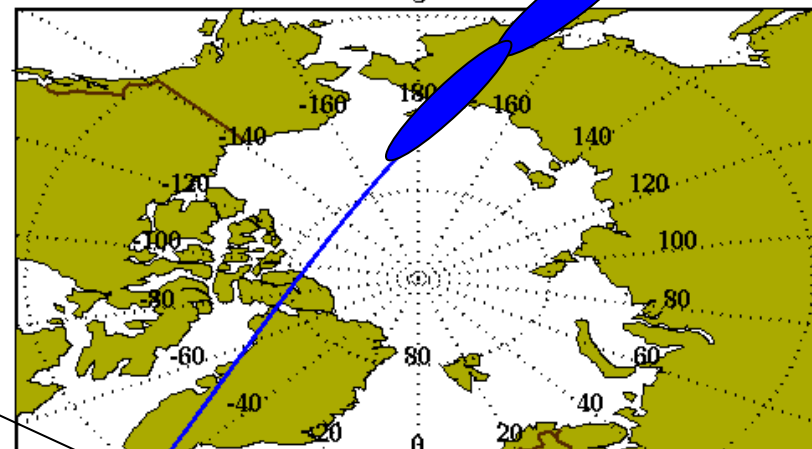


120hr CALIPSO Trajectories Initialized 2008041400 Valid 2008041900

Initial Altitude: 6000m

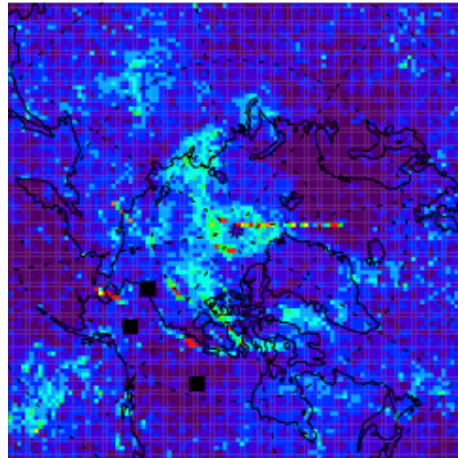


2008-04-14 15-00-00 UTC Start of Hourly Conditions
Version: 2.01 Image Date: 04/15/2008

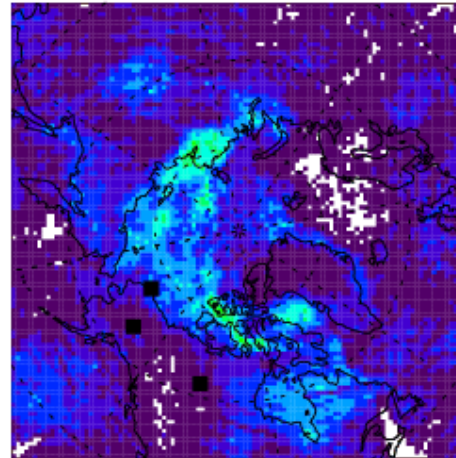


Boundary Layer BrO

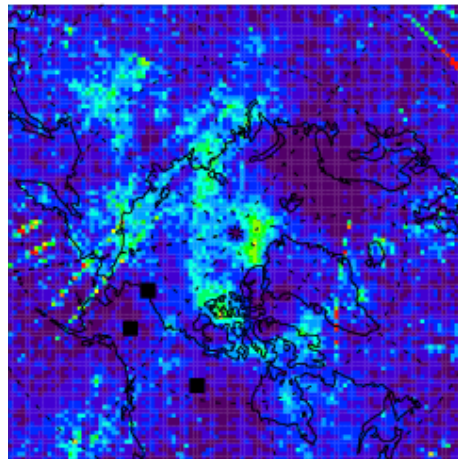
OMI_04-13



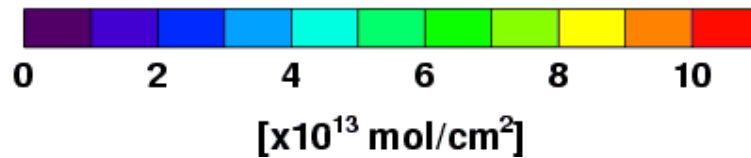
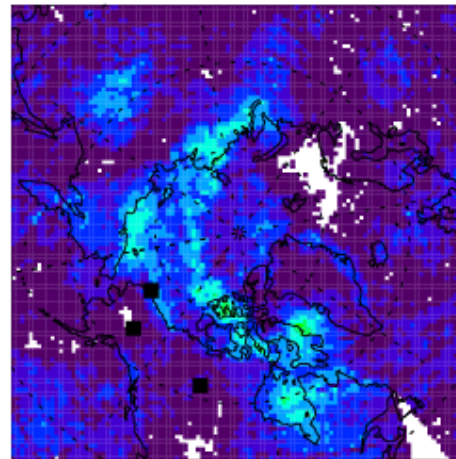
GOME2_04-13



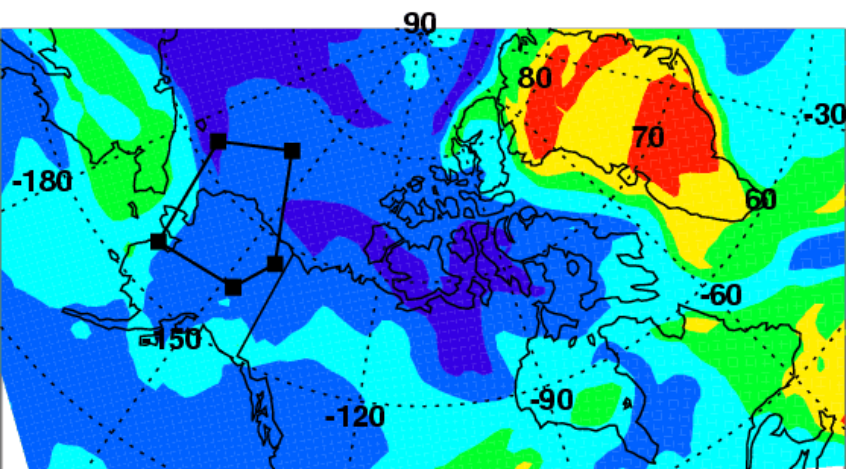
OMI_04-14



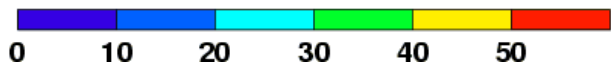
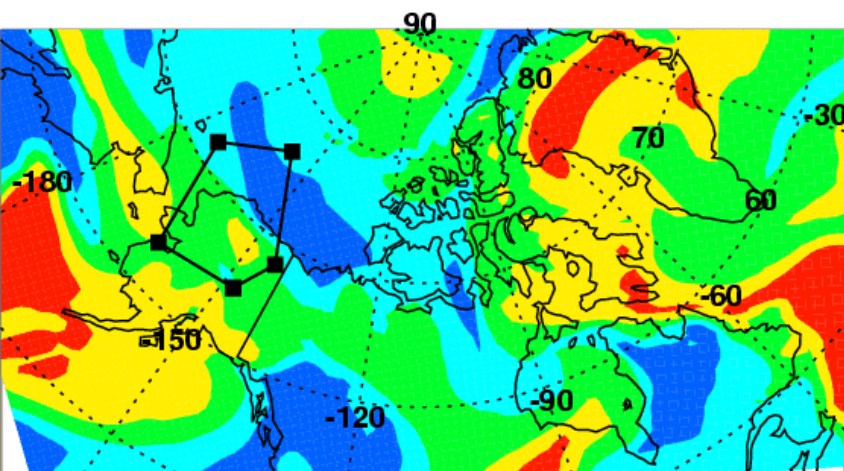
GOME2_04-14



O_3 (ppbv) at surface, Apr-16_2000 UTC

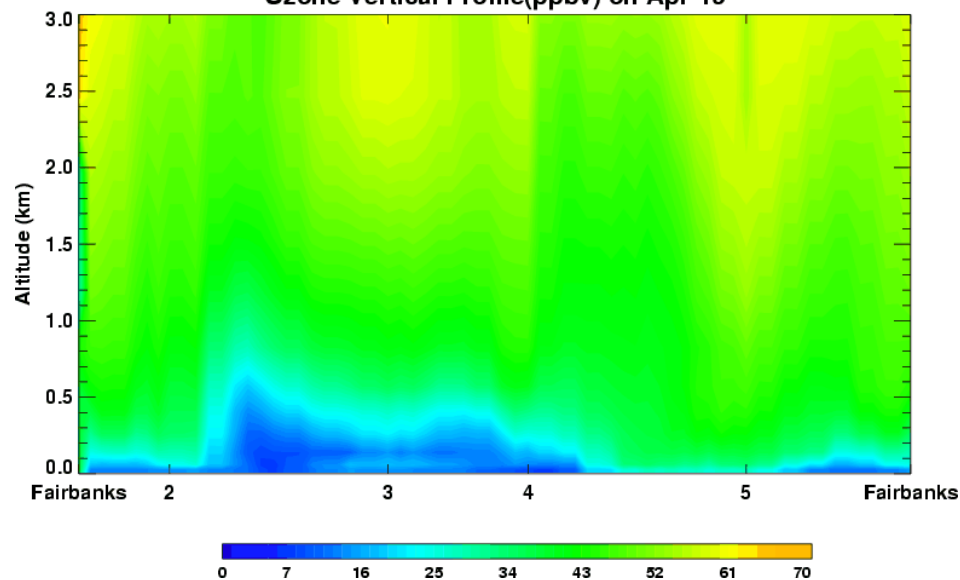


O_3 (ppbv) at 300m, Apr-16_2000 UTC

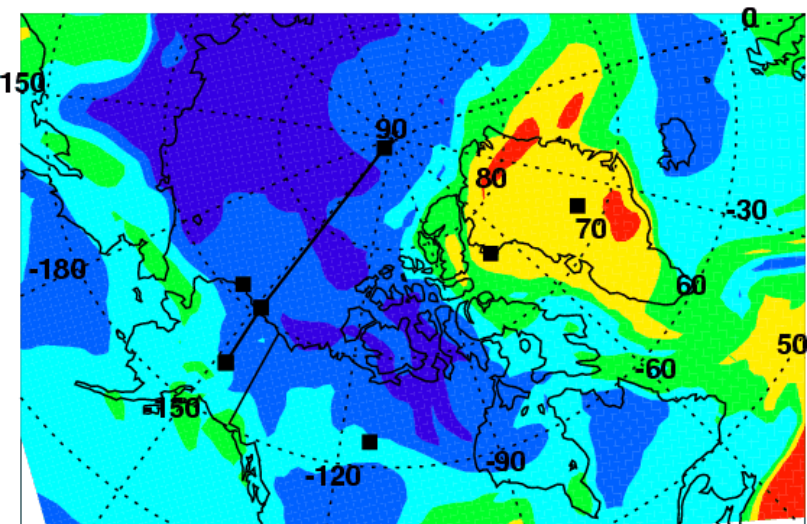


O3 profile on 4/16

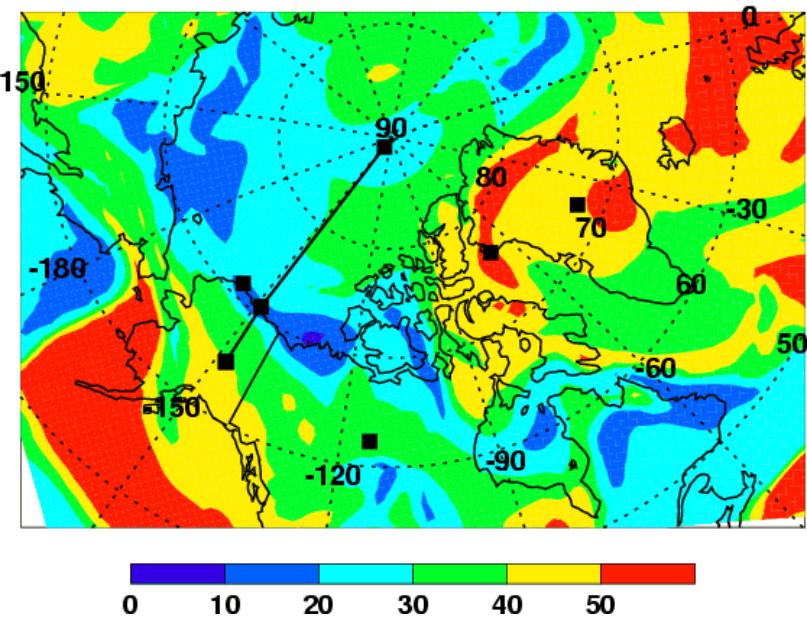
Ozone Vertical Profile(ppbv) on Apr-16



O₃ (ppbv) at surface, Apr-17_2000 UTC

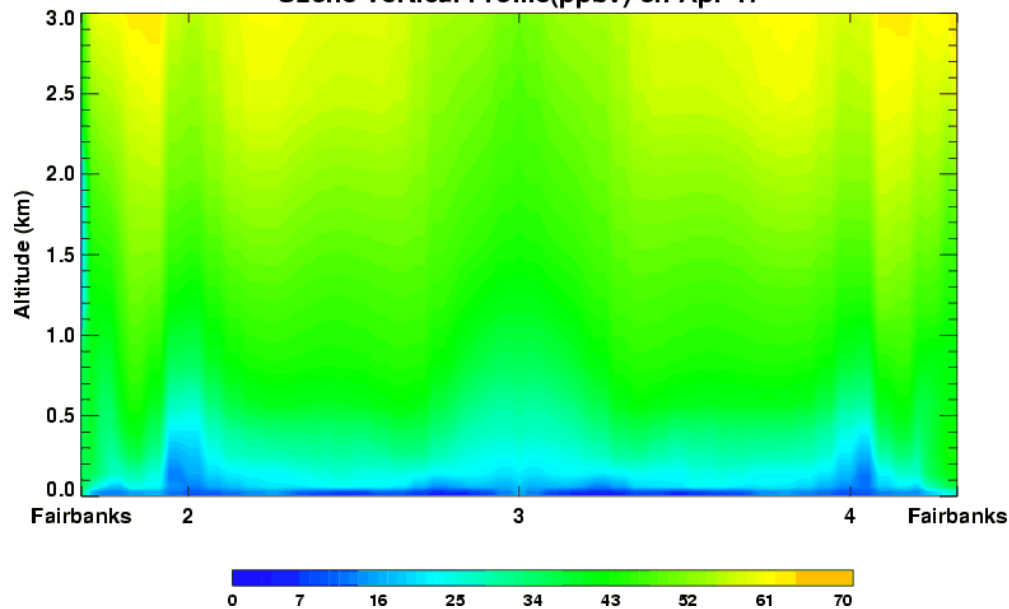


O₃ (ppbv) at 300m, Apr-17_2000 UTC



O3 profile on 4/17

Ozone Vertical Profile(ppbv) on Apr-17

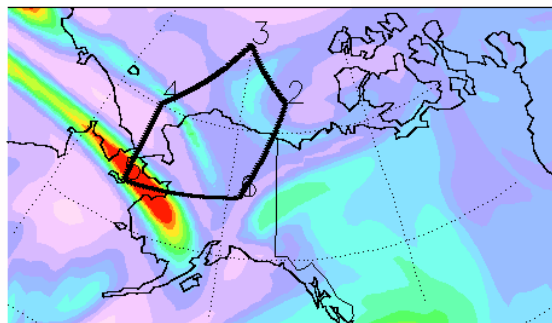


MZ4/GFS Apr 16 18Z

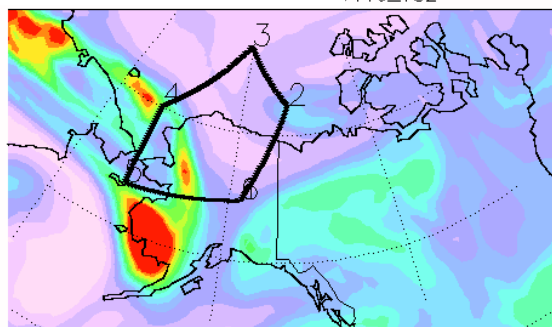
forecast from Apr 15

Alaska Loop – Fresh and Aged Asian Pollution

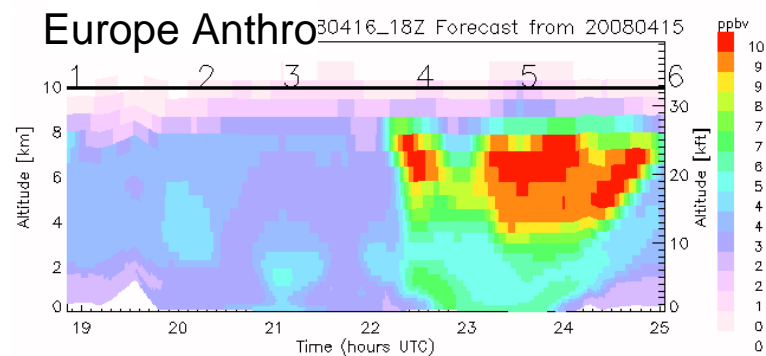
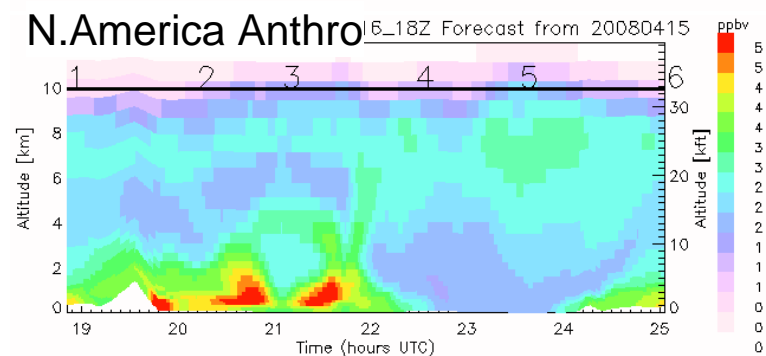
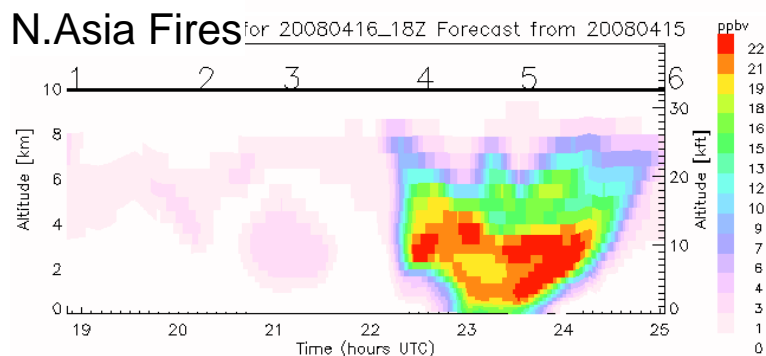
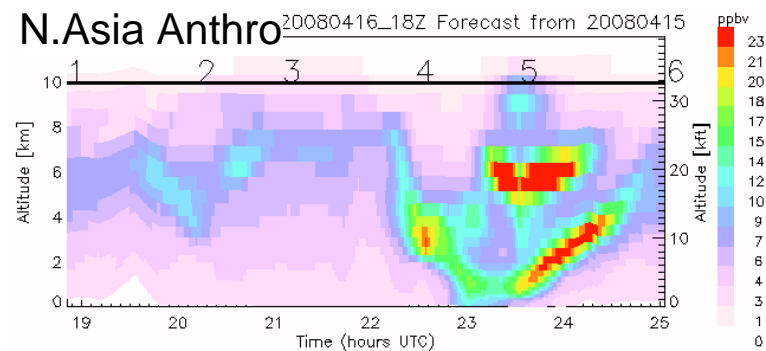
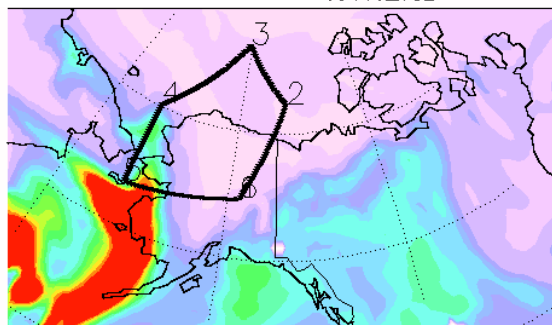
N.Asia Anthro 6 km_{416_18Z}



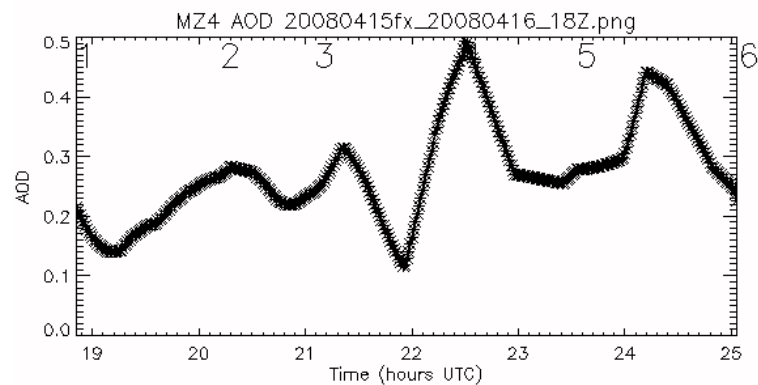
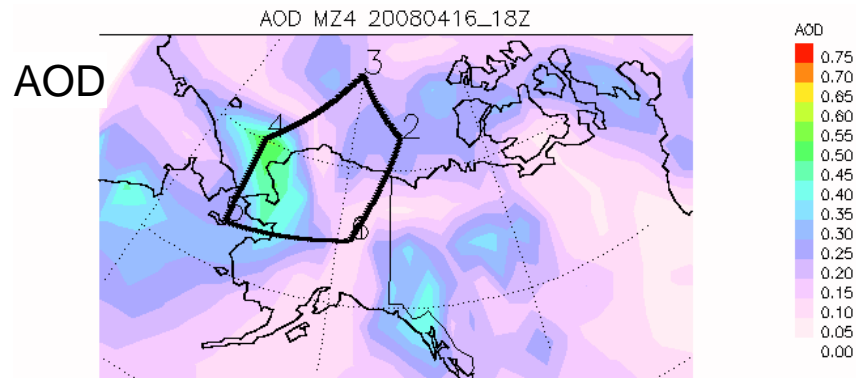
N.Asia Anthro 4 km_{416_18Z}



N.Asia Anthro 2 km_{30416_18Z}

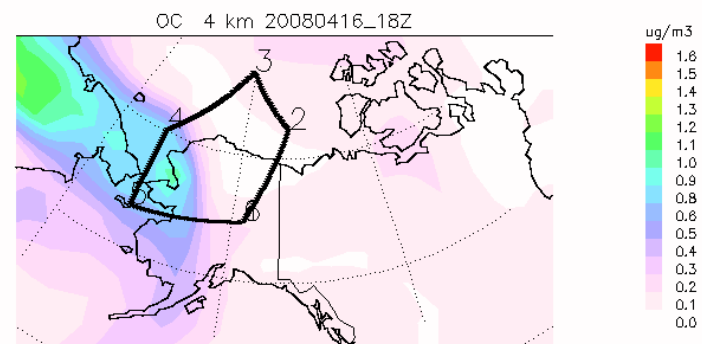
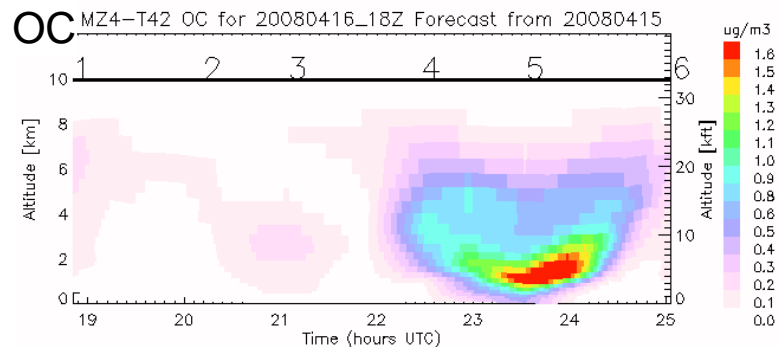
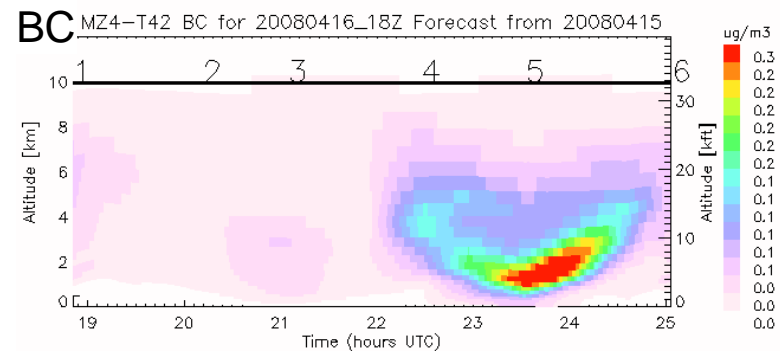
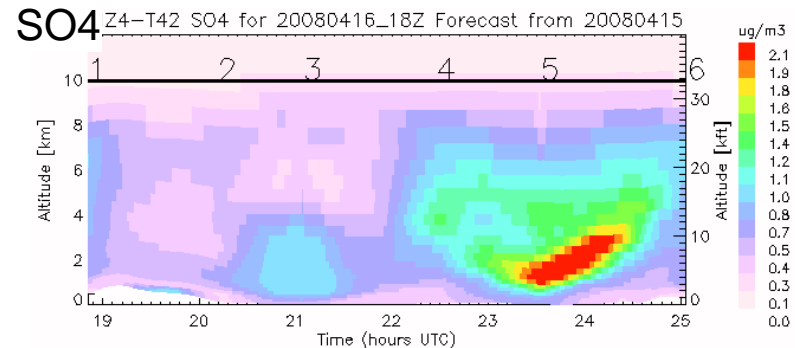
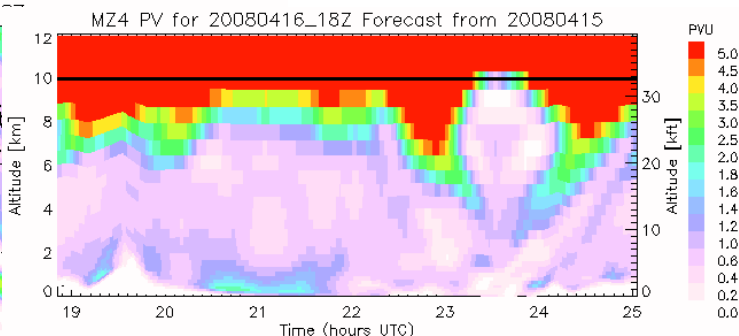
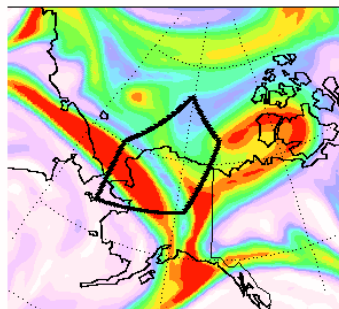


MZ4/GFS Apr 16 18Z forecast from Apr 15



Potential Vorticity

MZ4 PV 8 km 20080416_18Z

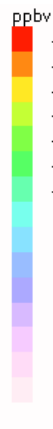
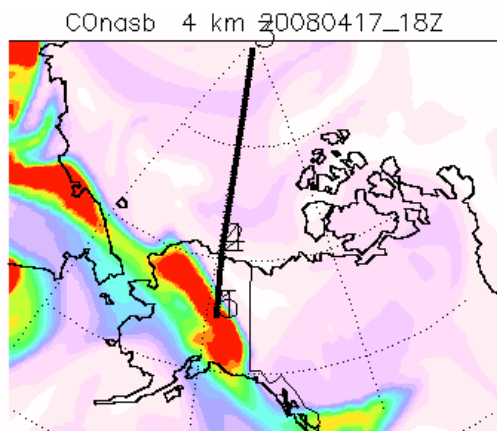


MZ4/GFS Apr 17 18Z

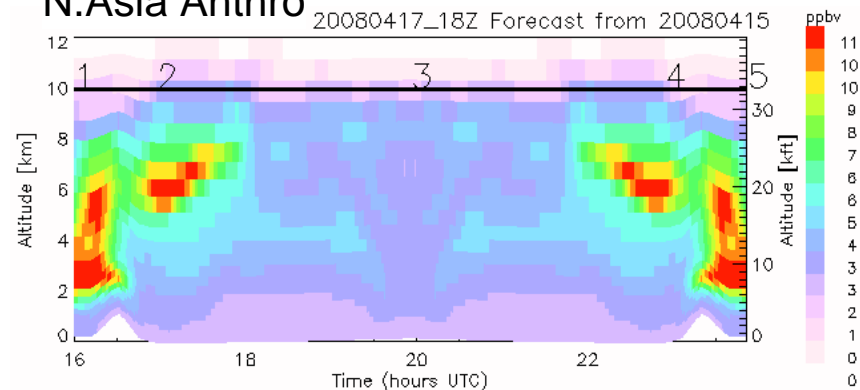
forecast from Apr 15

North Pole run

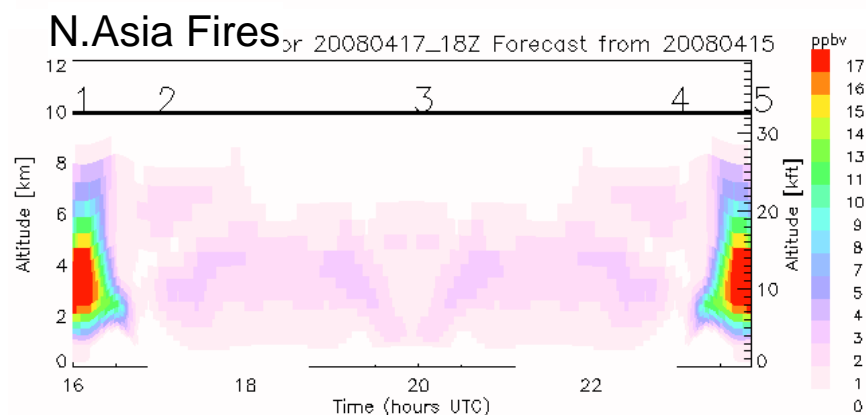
N.Asia Fires 4km



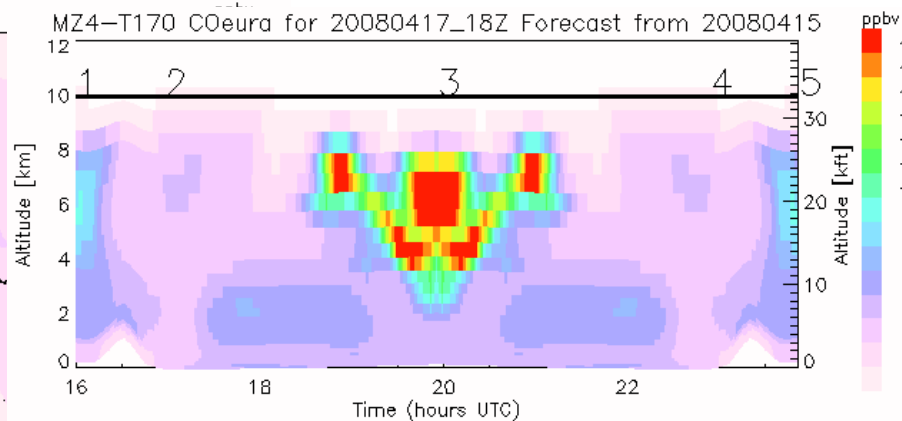
N.Asia Anthro



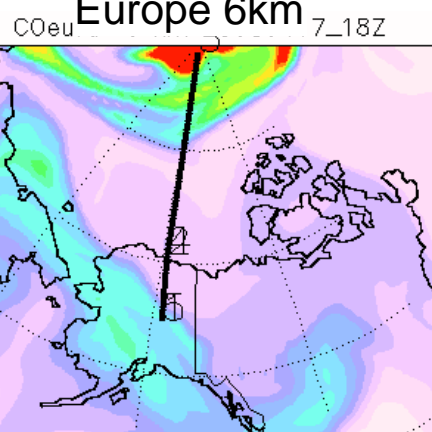
N.Asia Fires



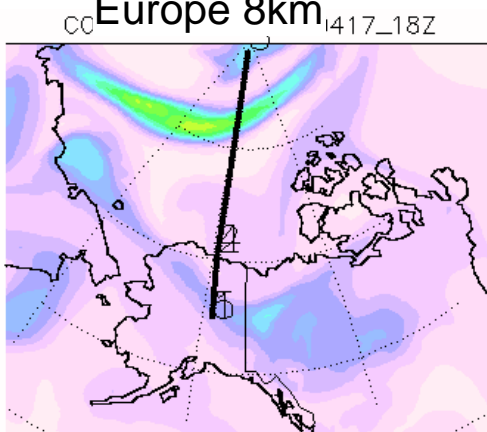
Europe Anthro



Europe 6km



Europe 8km

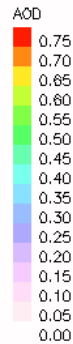
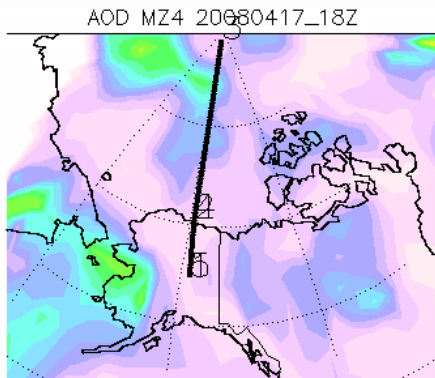


MZ4/GFS Apr 17 18Z

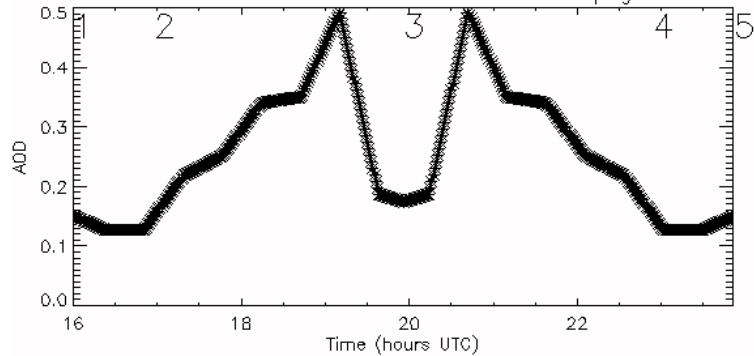
forecast from Apr 15

North Pole run

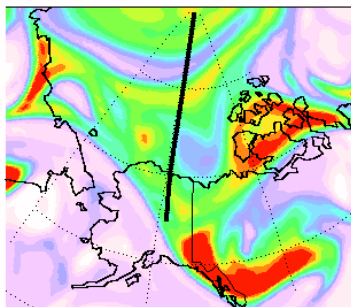
AOD



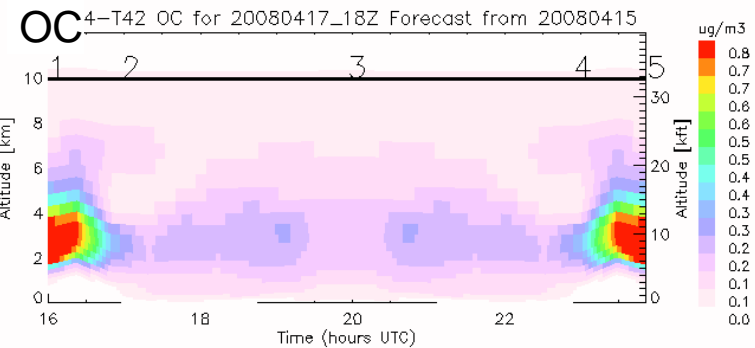
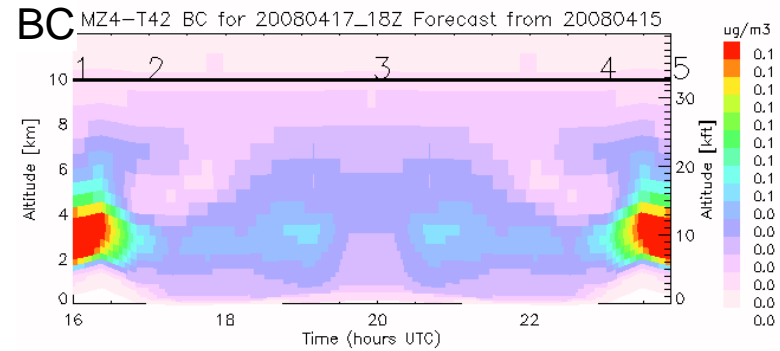
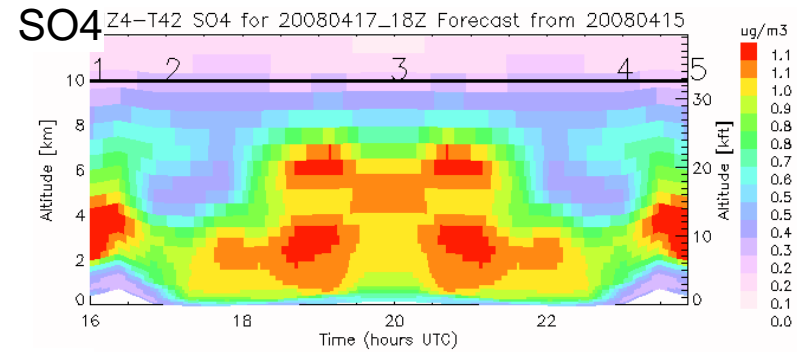
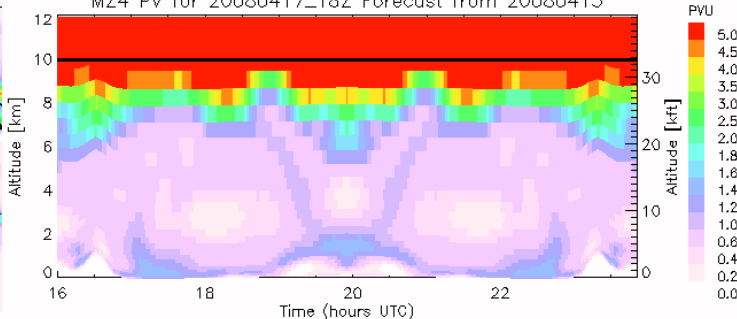
MZ4 AOD 20080415fx_20080417_18Z.png



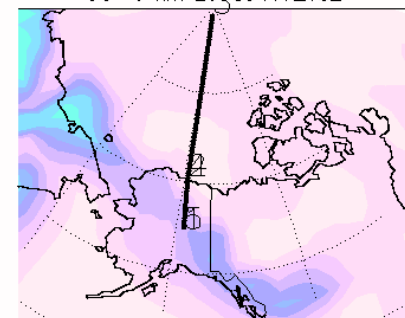
MZ4 PV 8 km 20080417_18Z



MZ4 PV for 20080417_18Z Forecast from 20080415



OC 6 km 20080417_18Z

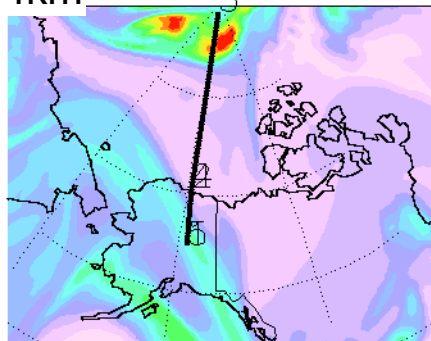


MZ4/GFS Apr 18 18Z

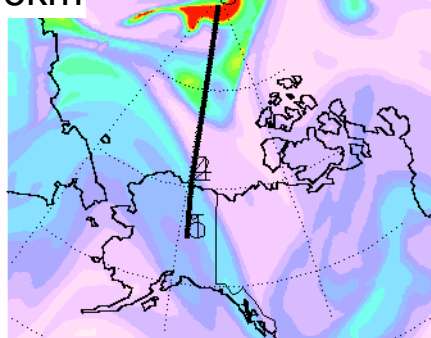
forecast from Apr 15

North Pole run

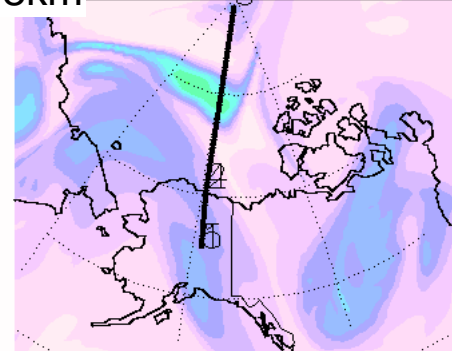
Europe 4km eura 4 km 20080418_18Z



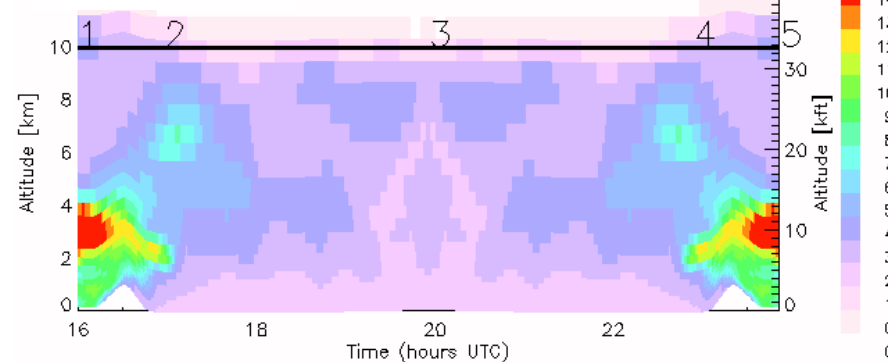
Europe 6km eura 6 km 20080418_18Z



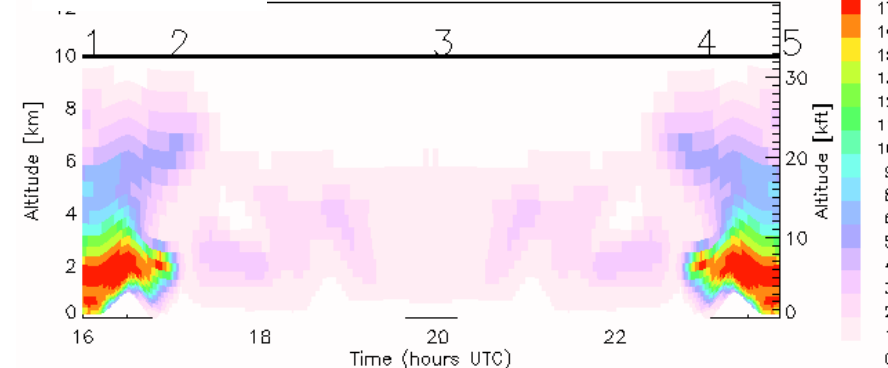
Europe 8km eura 8 km 20080418_18Z



N.Asia Anthro for 20080418_18Z Forecast from 20080415

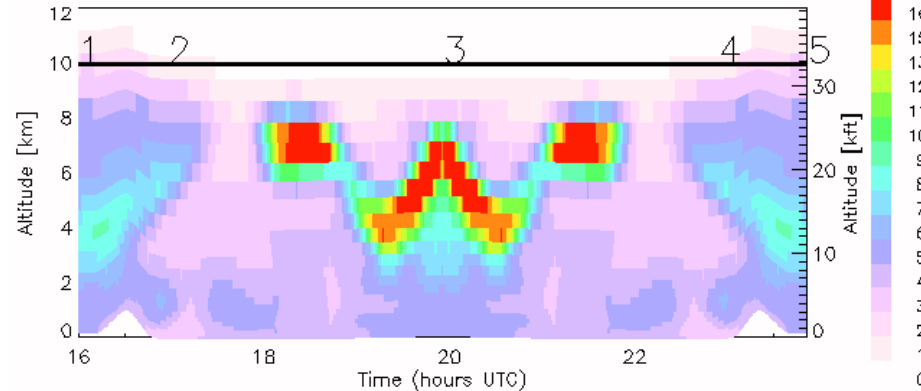


N.Asia Fires for 20080418_18Z Forecast from 20080415



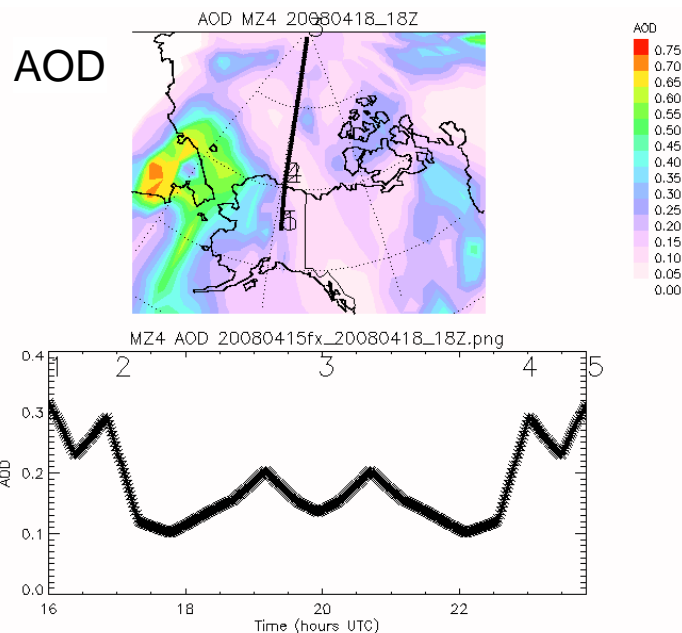
Europe Anthro

MZ4-T170 CO eura for 20080418_18Z Forecast from 20080415

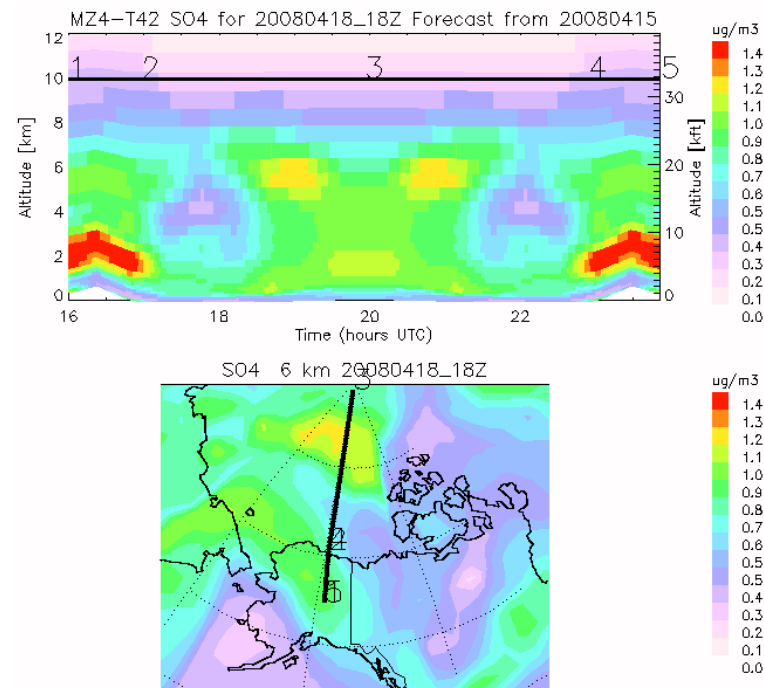


MZ4/GFS Apr 18 18Z

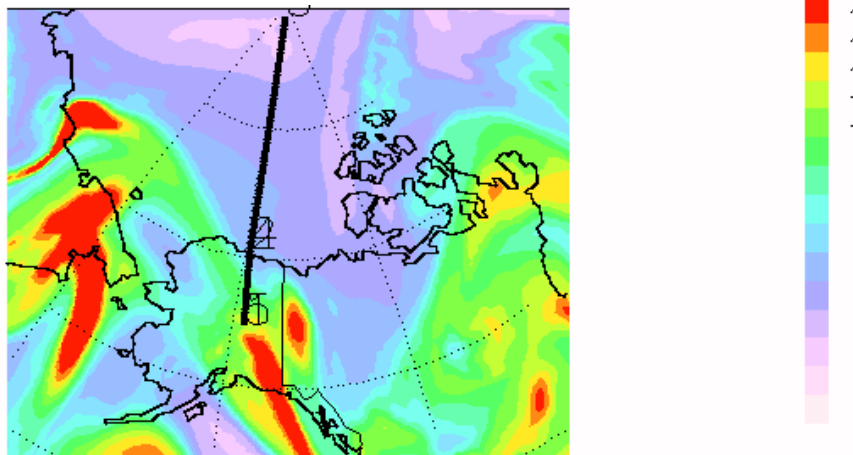
forecast from Apr 15
North Pole run



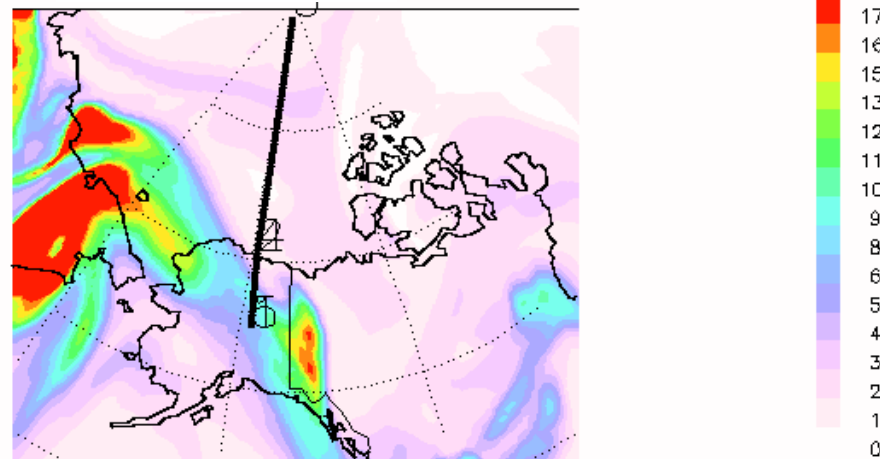
SO4



N.Asia Anthro 4 km_080418_18Z



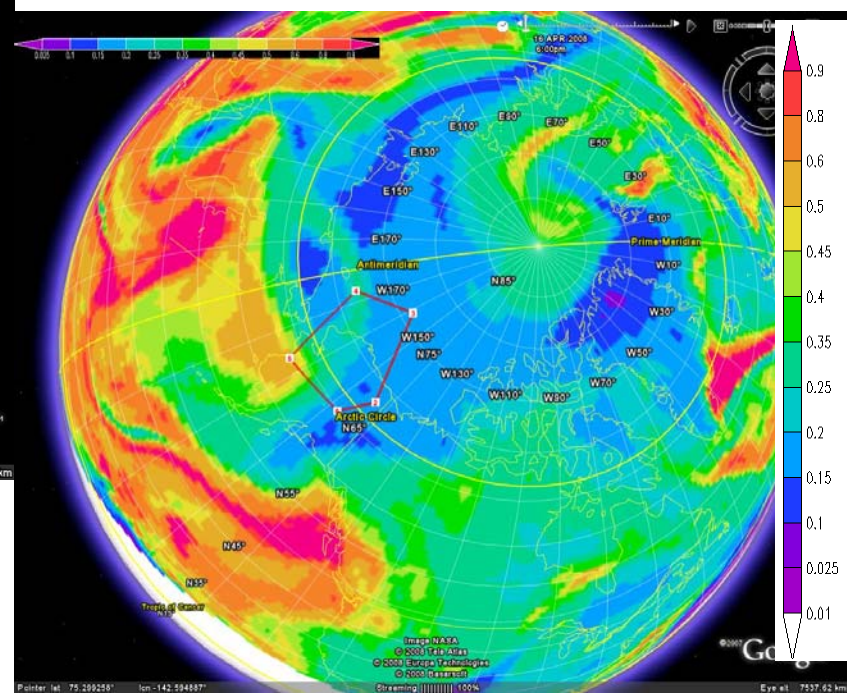
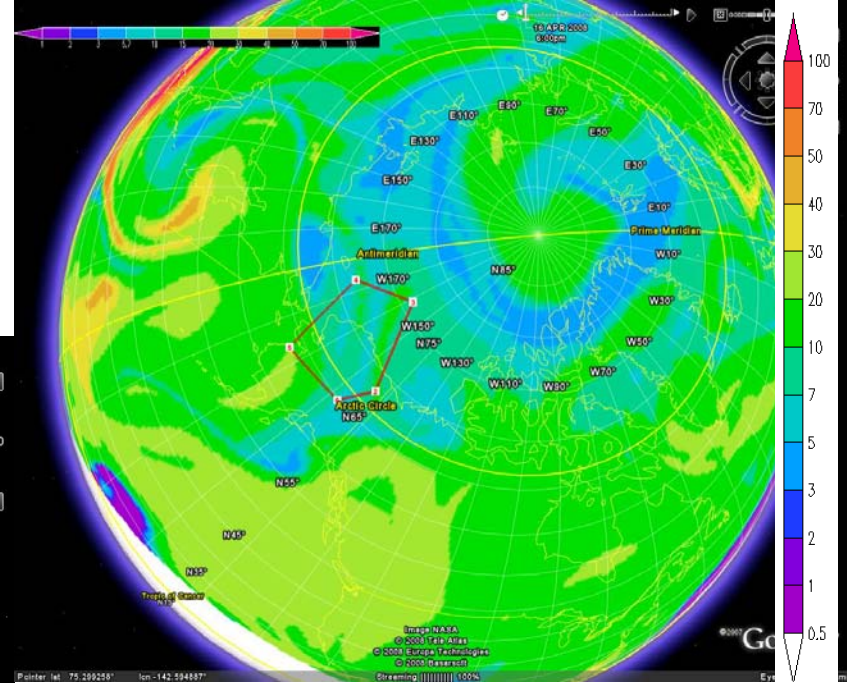
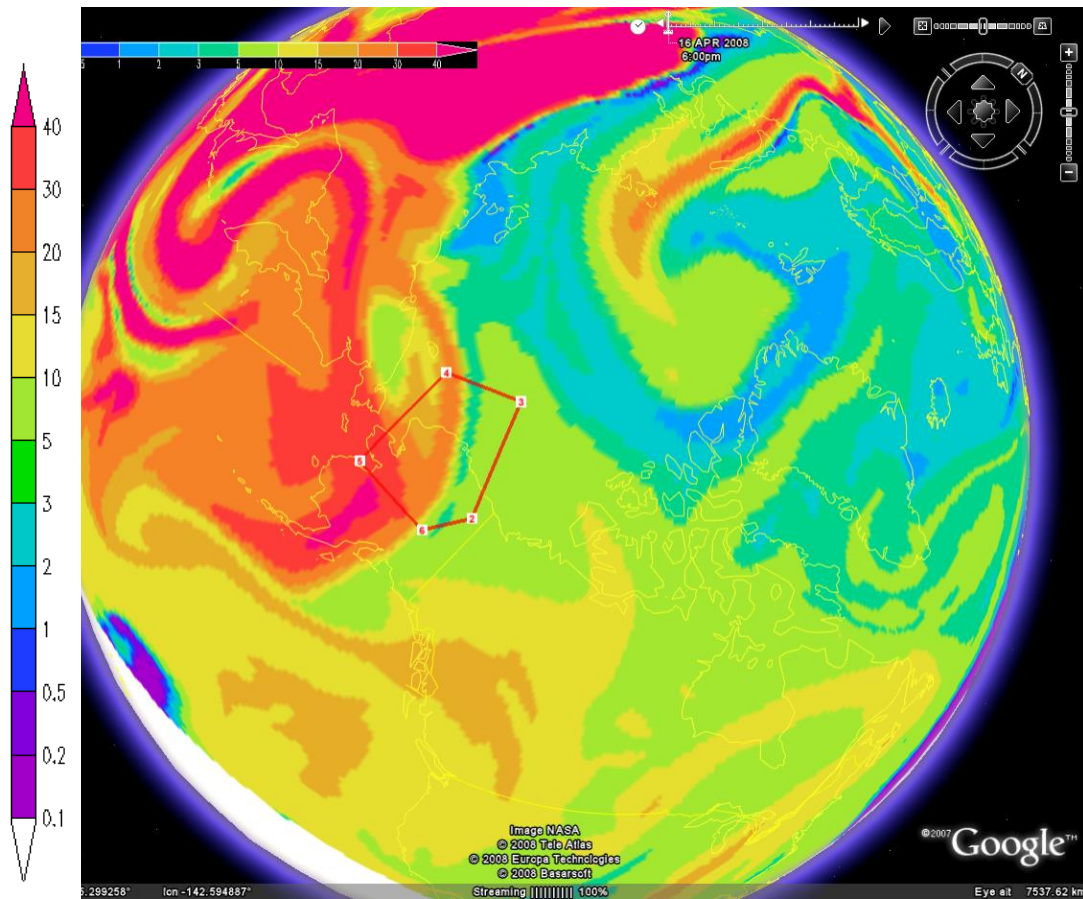
N.Asia Fires 4 km_18_18Z



Anthropogenic CO

Pentagon Flight

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

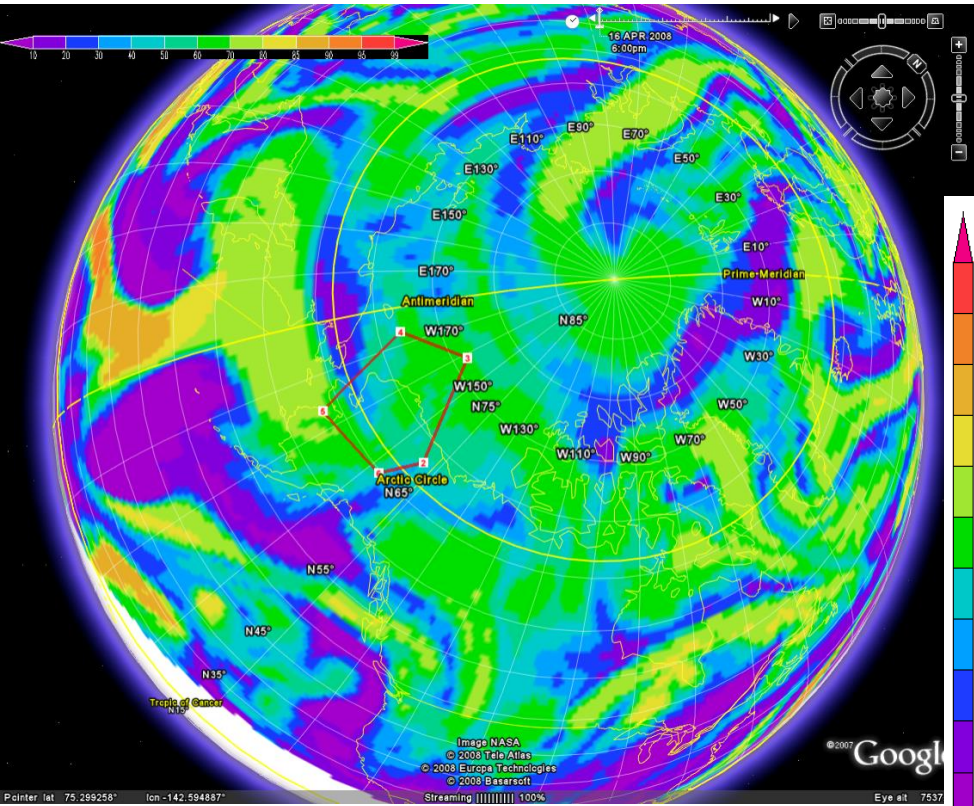


Biomass CO

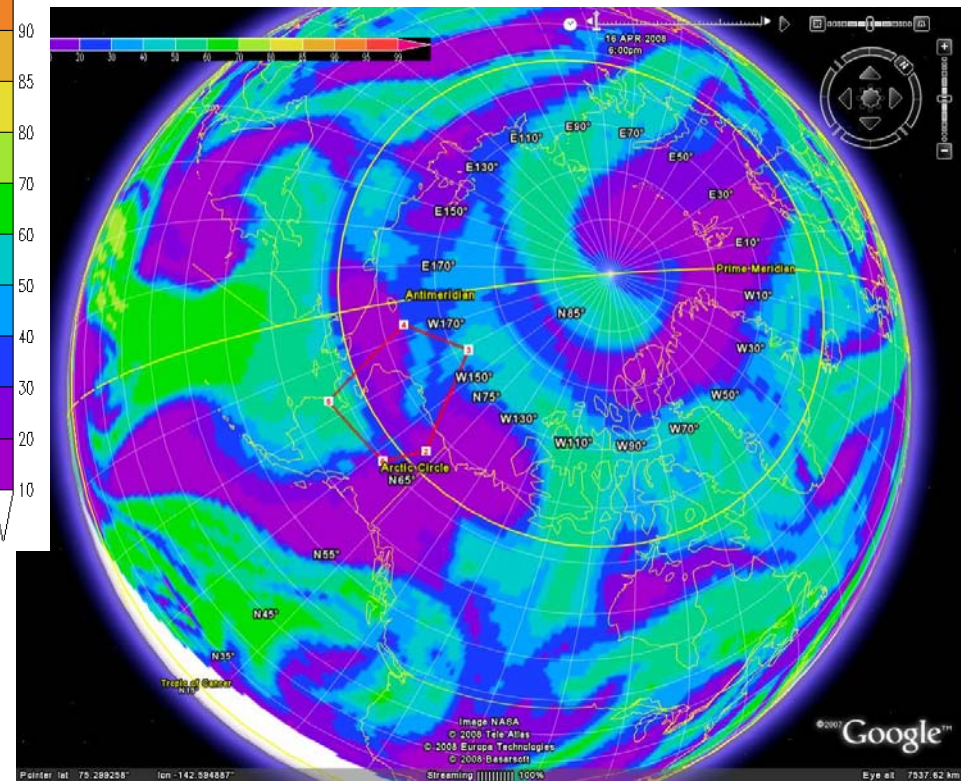
AOD

April 16th RH

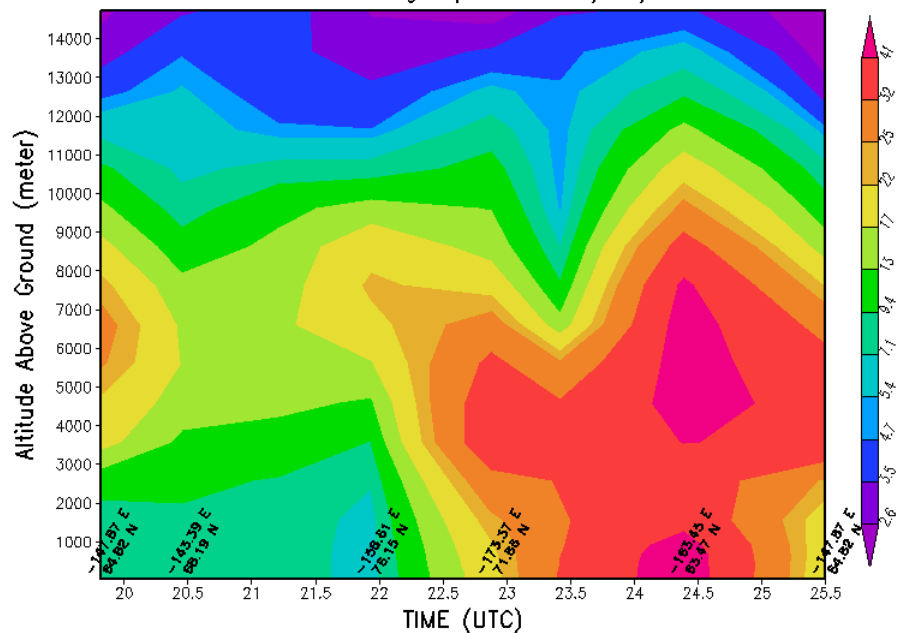
18z, 5.5 km



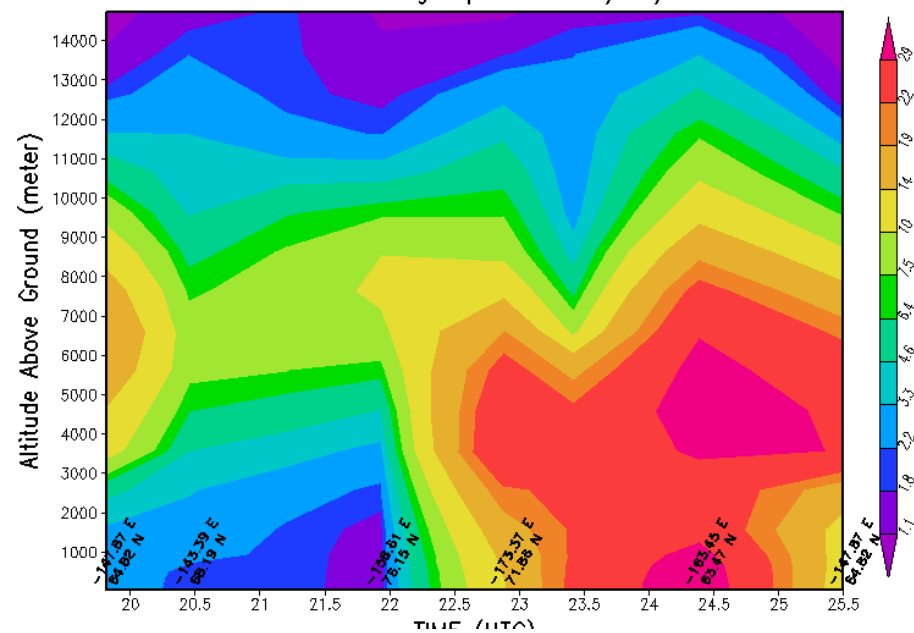
18z, 8.4 km



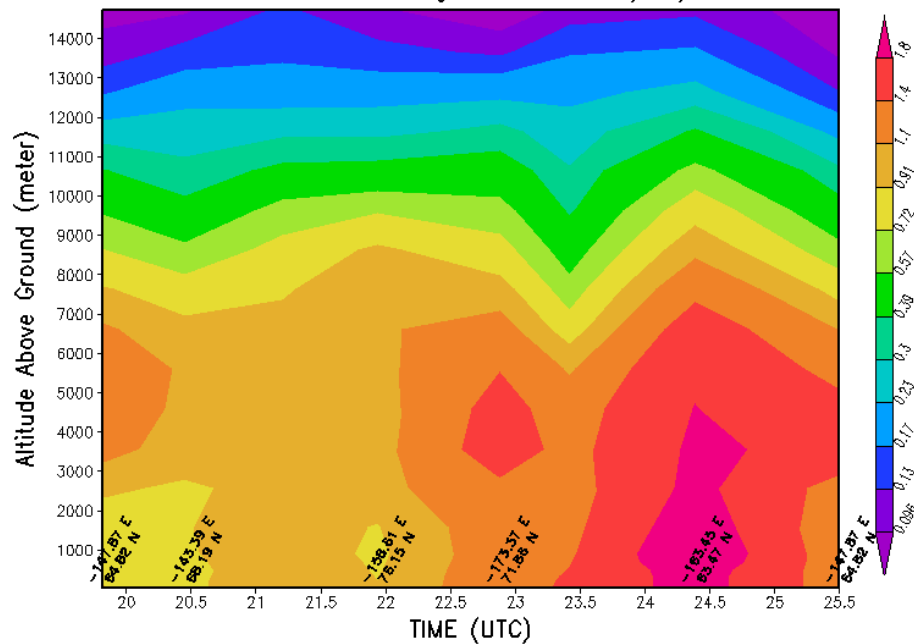
Simulated total CO (ppbv) along the
DC8-FAI-FAI Flight plan on 04/16/2008



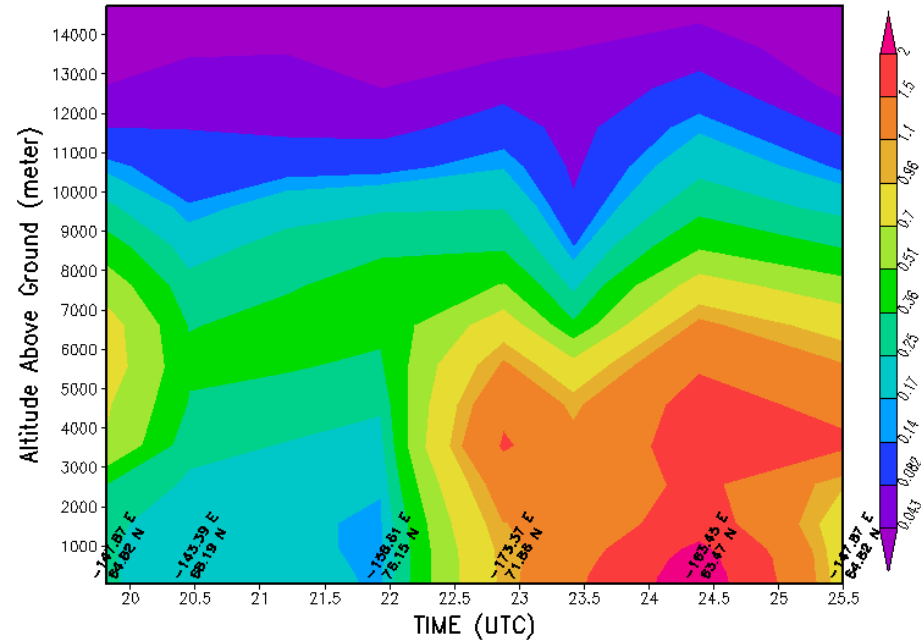
Simulated BiomassCO (ppbv) along the
DC8-FAI-FAI Flight plan on 04/16/2008



Simulated Total Sulfate ($\mu\text{g}/\text{m}^3$) along
the DC8-FAI-FAI Flight Path on 04/16/2008



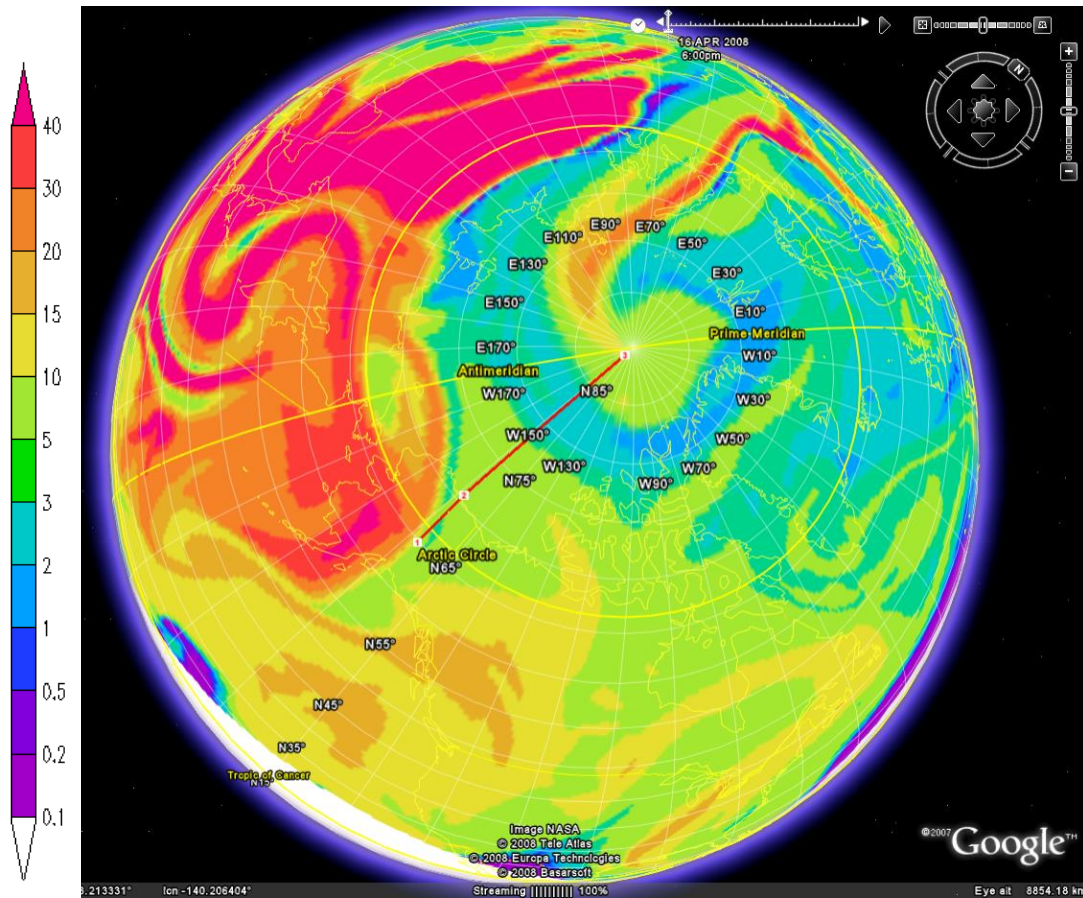
Simulated Organic Carbon ($\mu\text{g}/\text{m}^3$) along
the DC8-FAI-FAI Flight Path on 04/16/2008



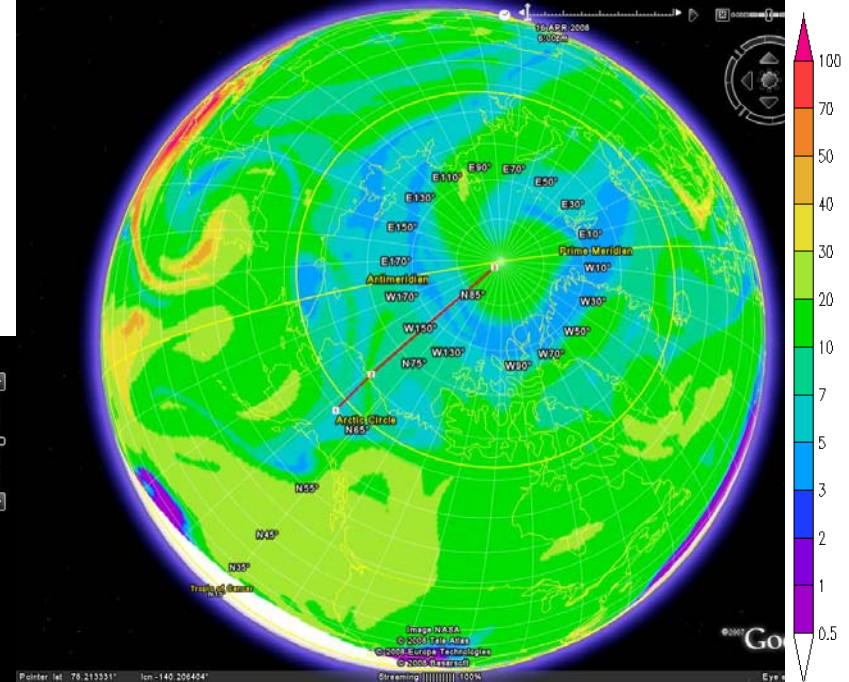
Anthropogenic CO

Europe Flight

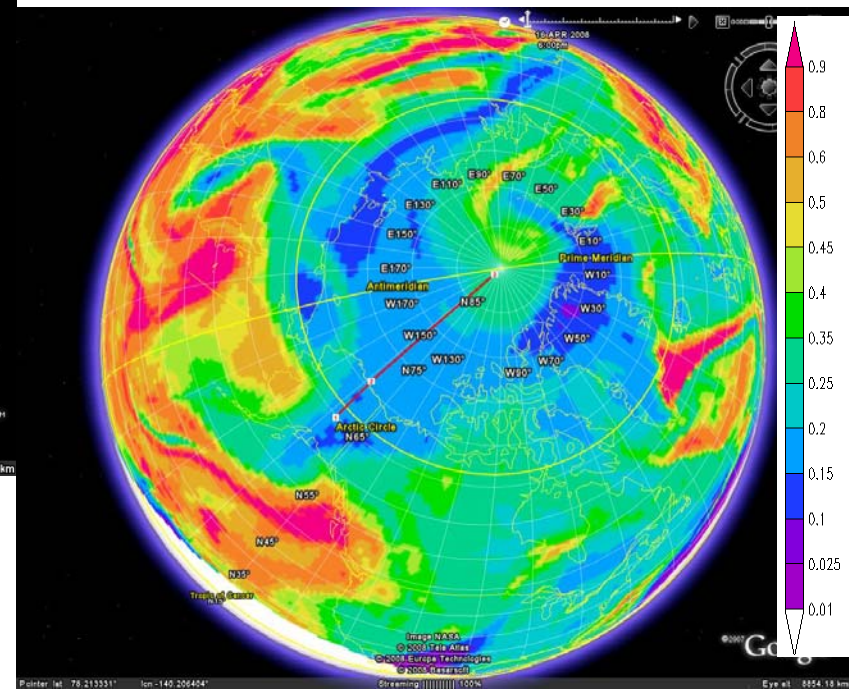
April 16th, 18Z, 5.4 km (42hr)



Biomass CO



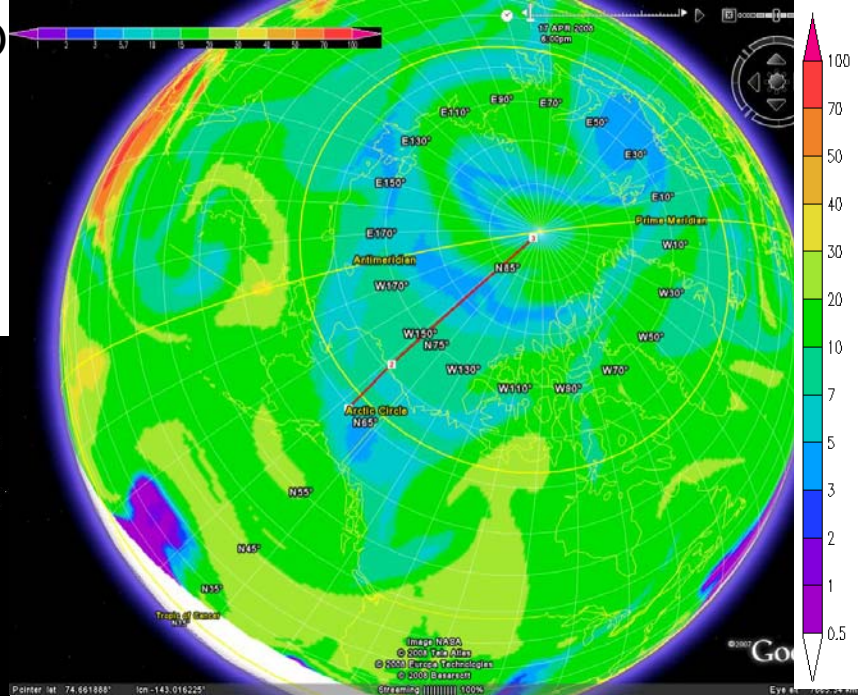
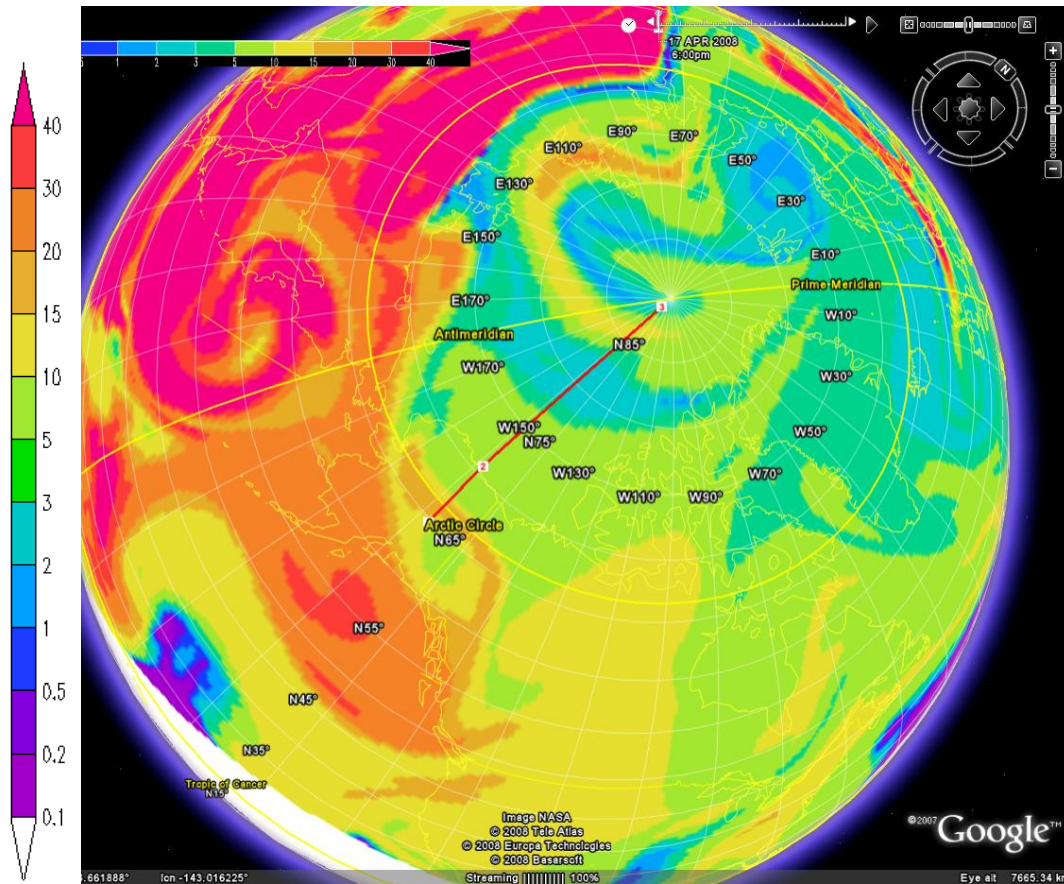
AOD



Anthropogenic CO

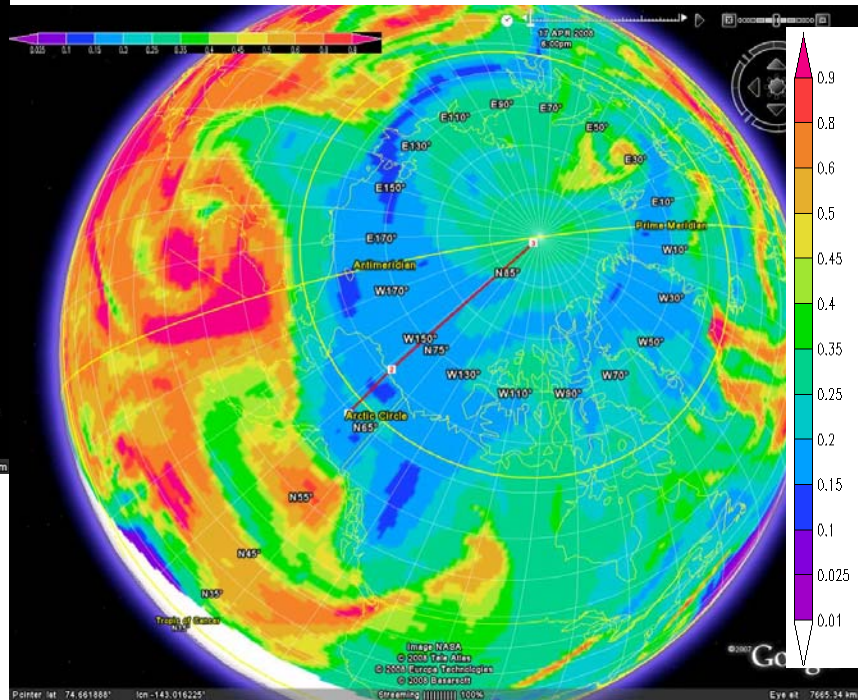
Europe Flight

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



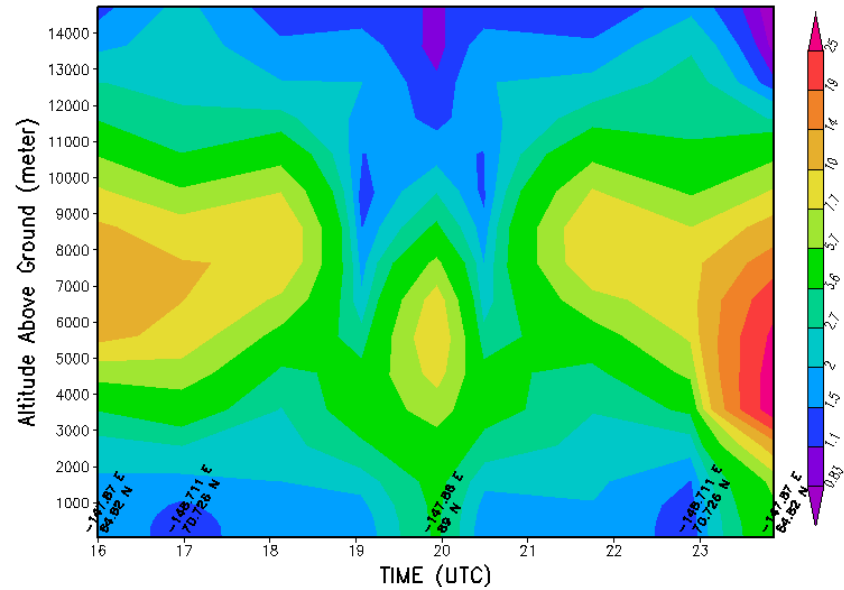
Biomass CO

AOD

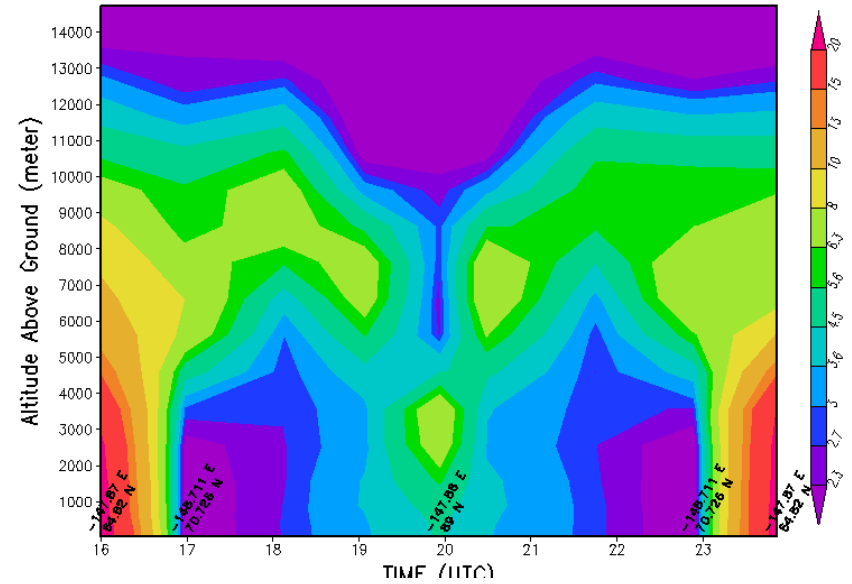


Pole-ward Flight 16-17 curtains: Scales Different

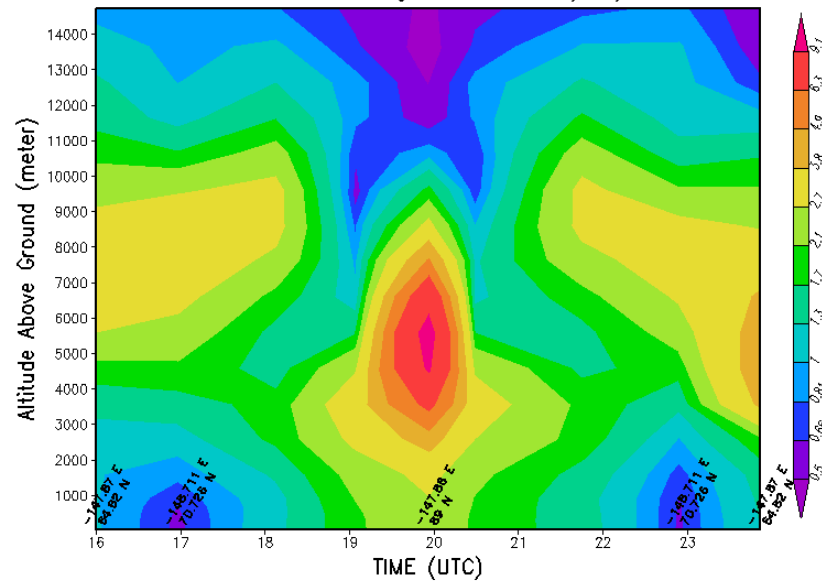
Simulated BiomassCO (ppbv) along the DC8-FAI-NP Flight plan on 04/16/2008



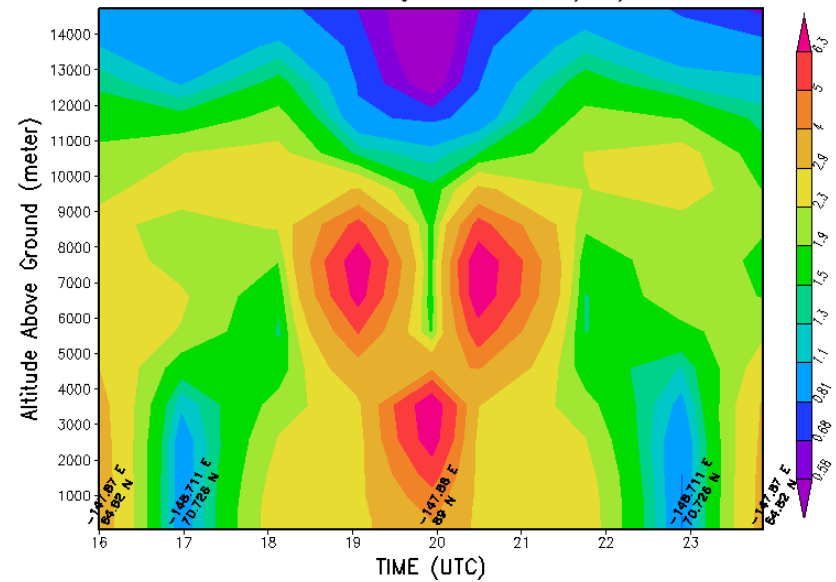
Simulated BiomassCO (ppbv) along the DC8-FAI-NP Flight plan on 04/17/2008



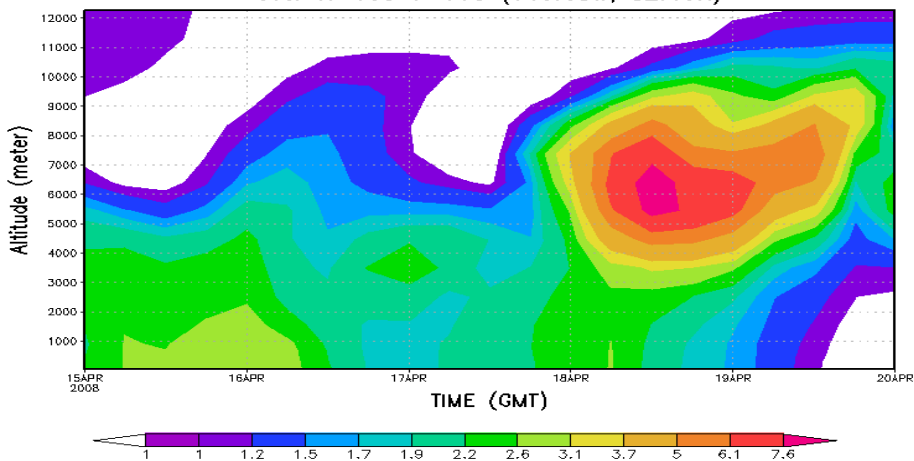
Simulated Europe CO (ppbv) along the DC8-FAI-NP Flight Path on 04/16/2008



Simulated Europe CO (ppbv) along the DC8-FAI-NP Flight Path on 04/17/2008

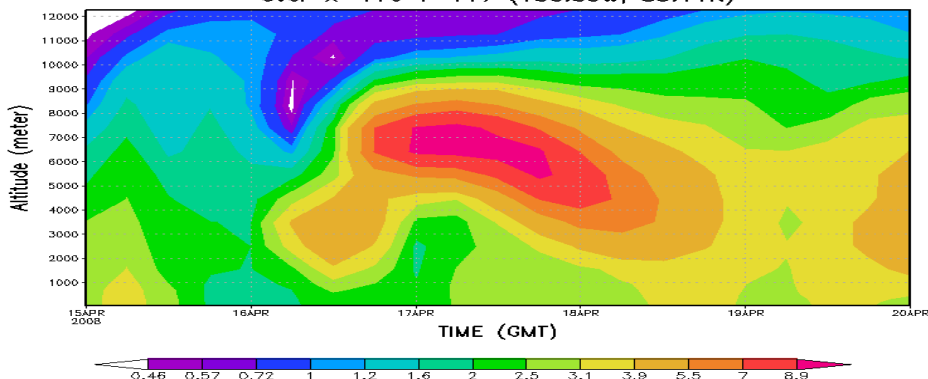


Simulated Time Series Europe CO (ppbv)
over X=105 Y=118 (149.63W, 82.46N)



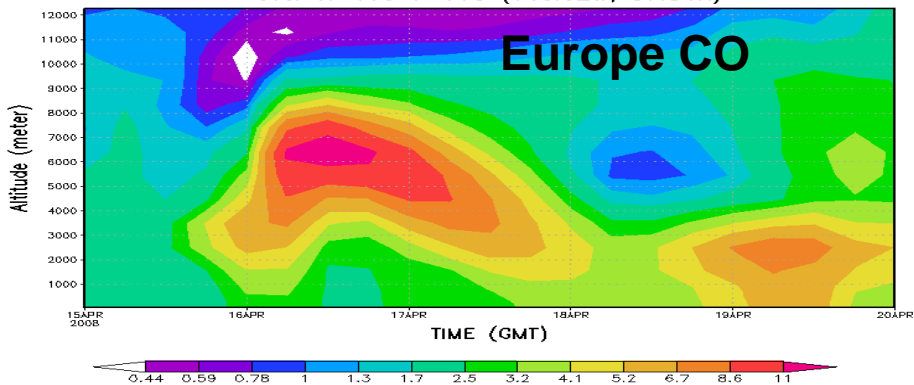
CORER, University of Iowa

Simulated Time Series Europe CO (ppbv)
over X=110 Y=117 (150.59W, 85.11N)



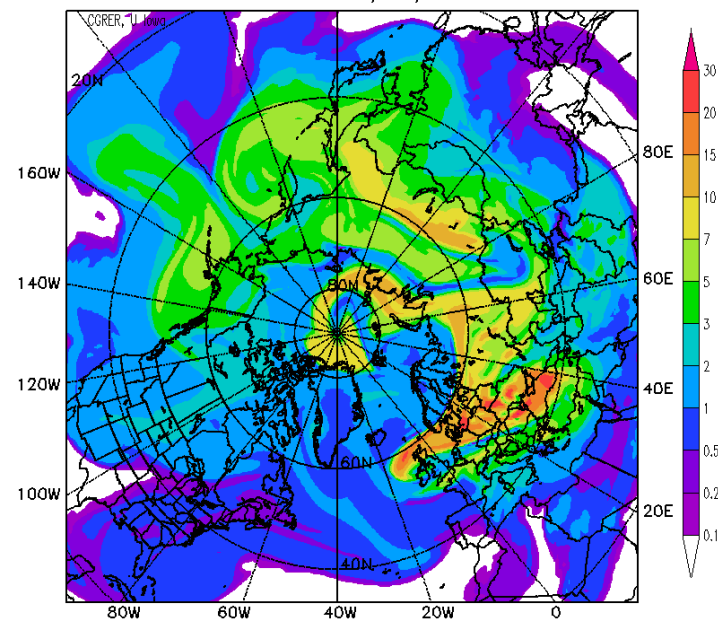
CORER, University of Iowa

Simulated Time Series Europe CO (ppbv)
over X=115 Y=115 (148.92W, 87.84N)

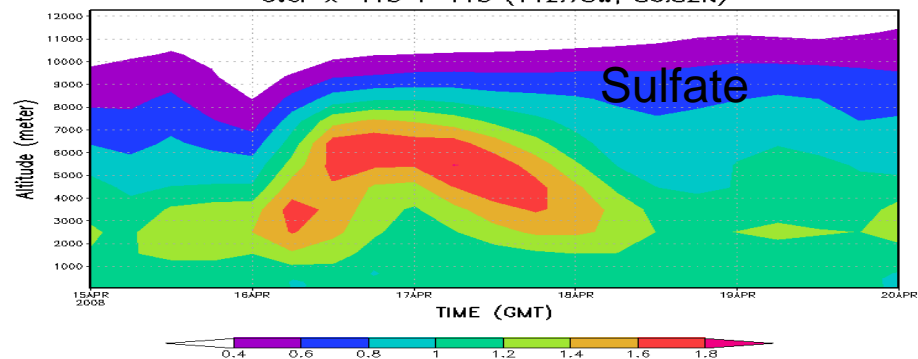


April 16 & 17 Good for Poleward Flight

Simulated Europe CO (ppbv) in the 5.5km layer
at 12UTC, 04/17/2008

CORER, University of Iowa
CORER, University of Iowa

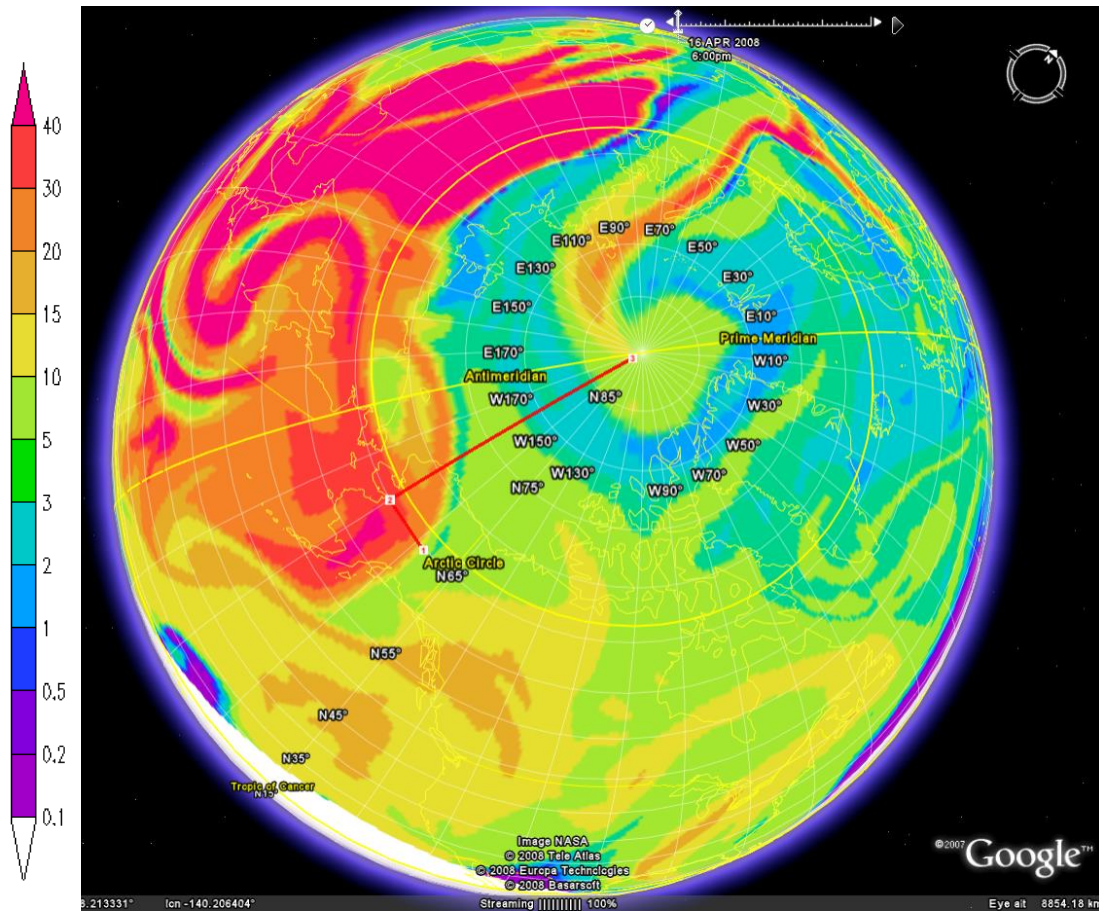
Simulated Time Series Sulfate ($\mu\text{g}/\text{std. m}^3$)
over X=113 Y=115 (142.73W, 86.82N)



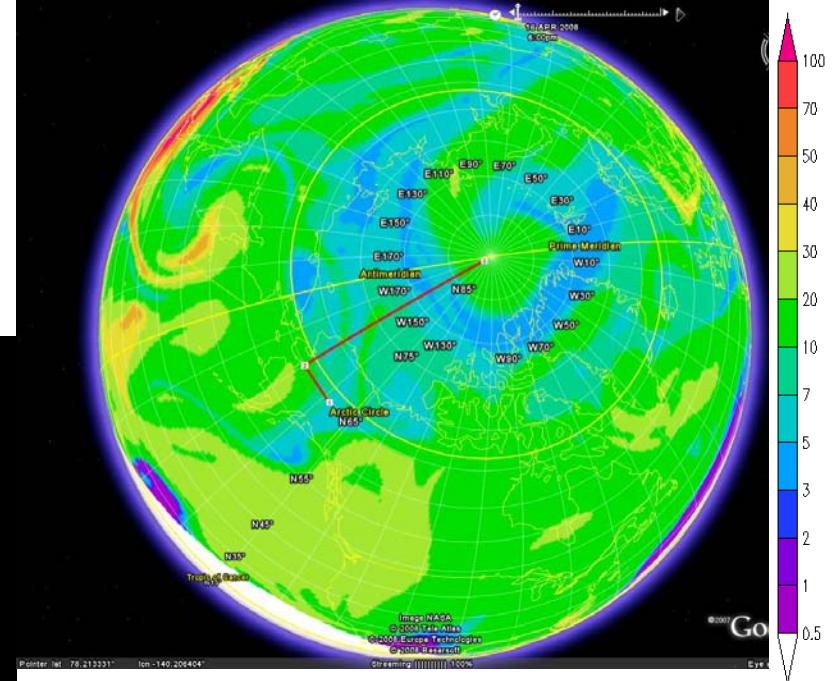
Anthropogenic CO

Asian/Europe Flight

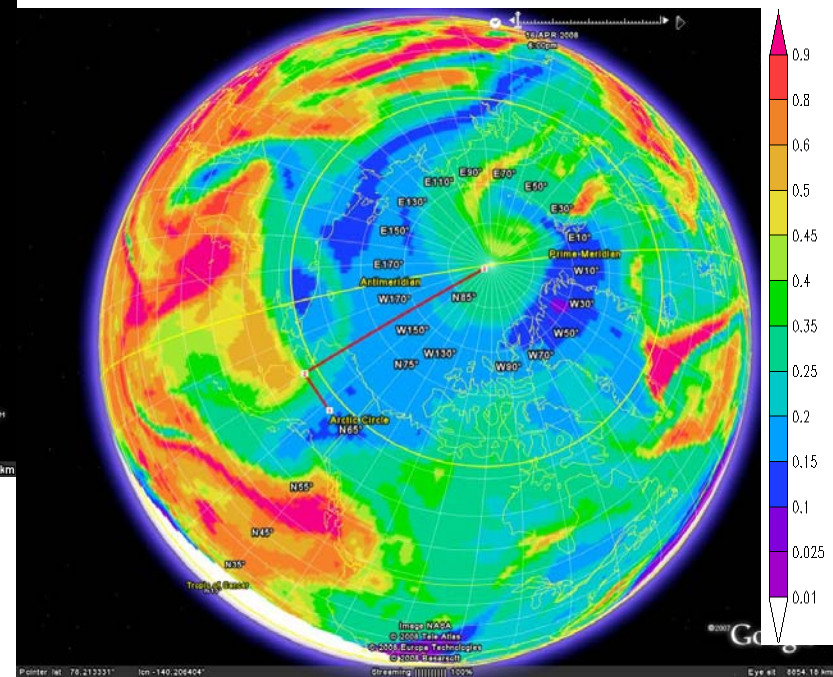
April 16th, 18Z, 5.4 km (42hr)



Biomass CO



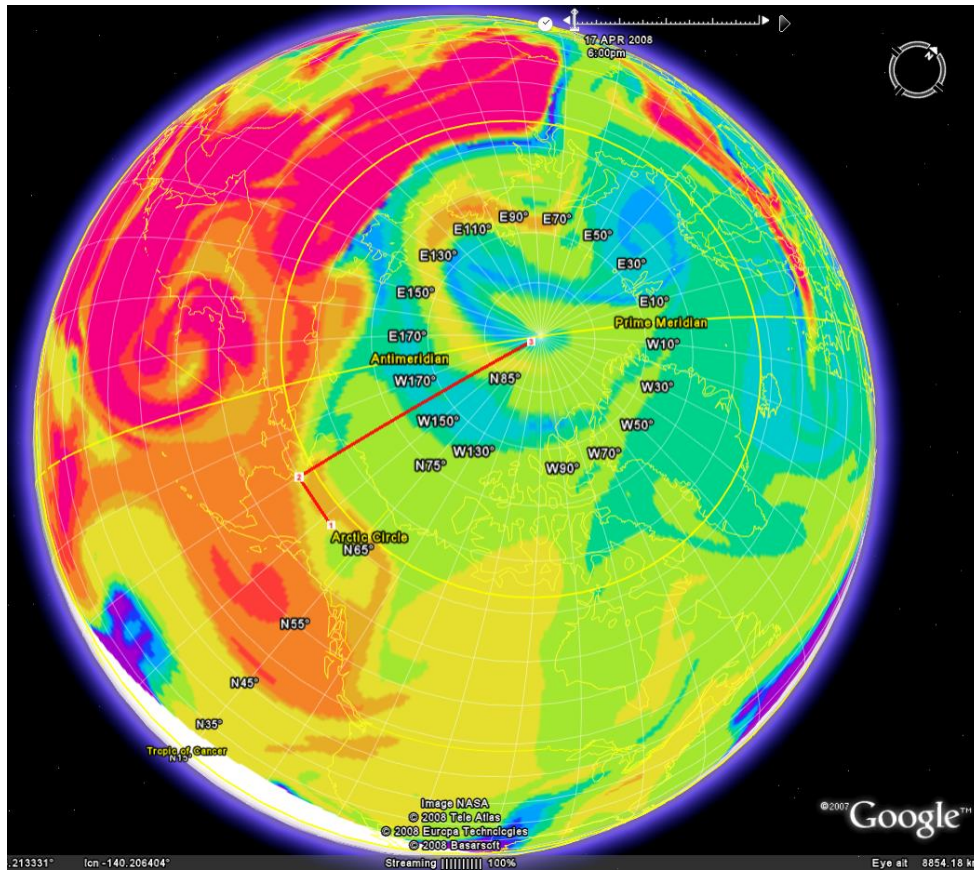
AOD



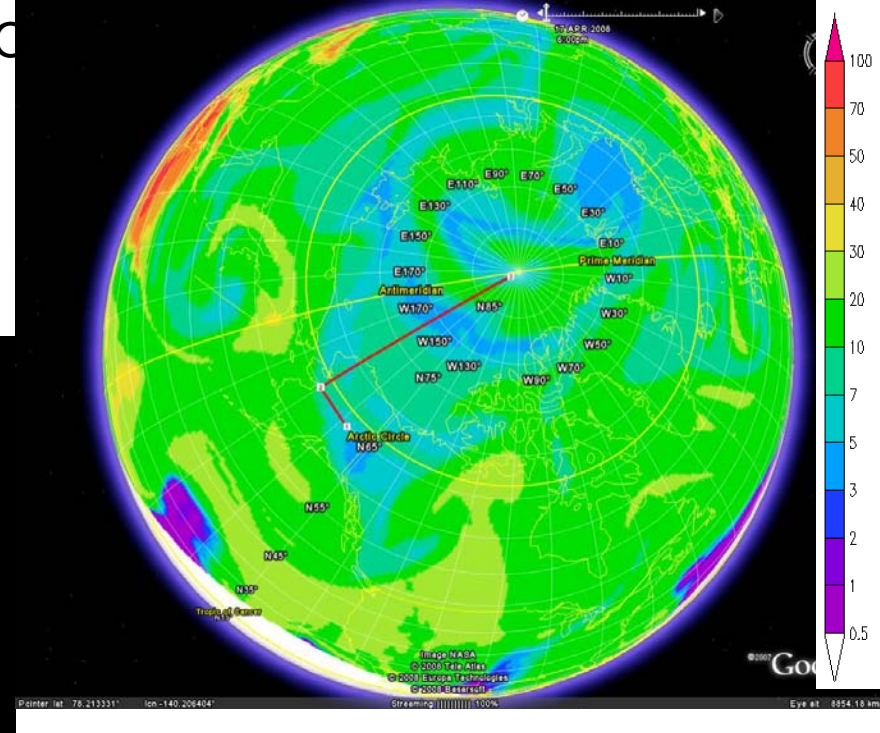
Anthropogenic CO

Asian/Europe Flight

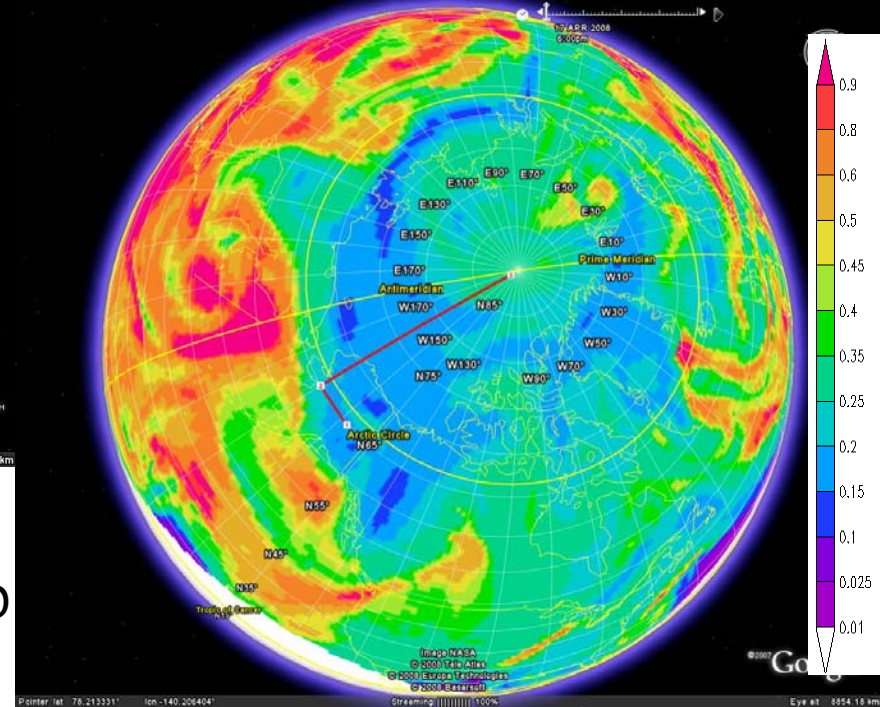
April 17th, 18Z, 5.4 km (66hr)



Biomass CO

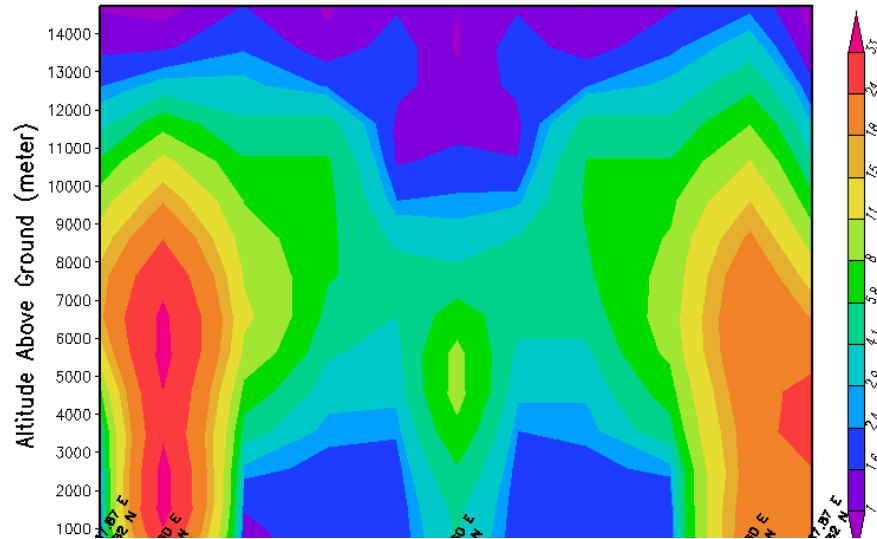


AOD

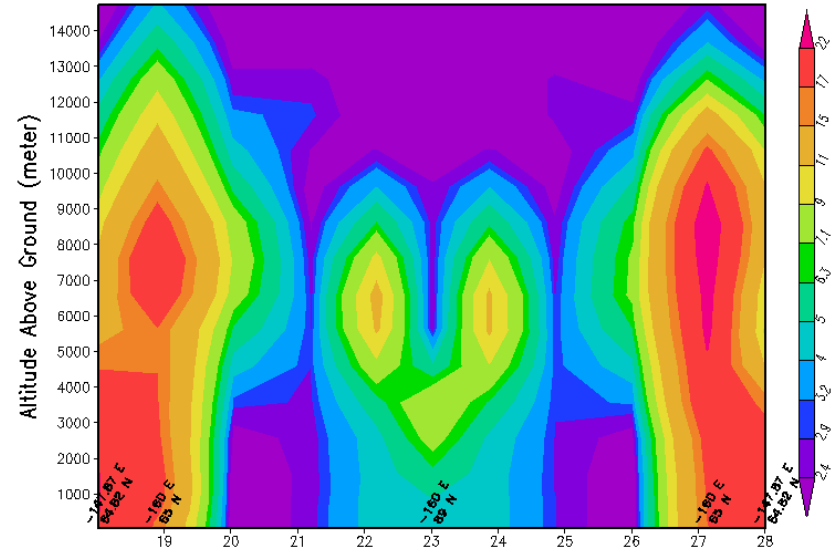


Curtains Combined Asia-Europe Scales Different

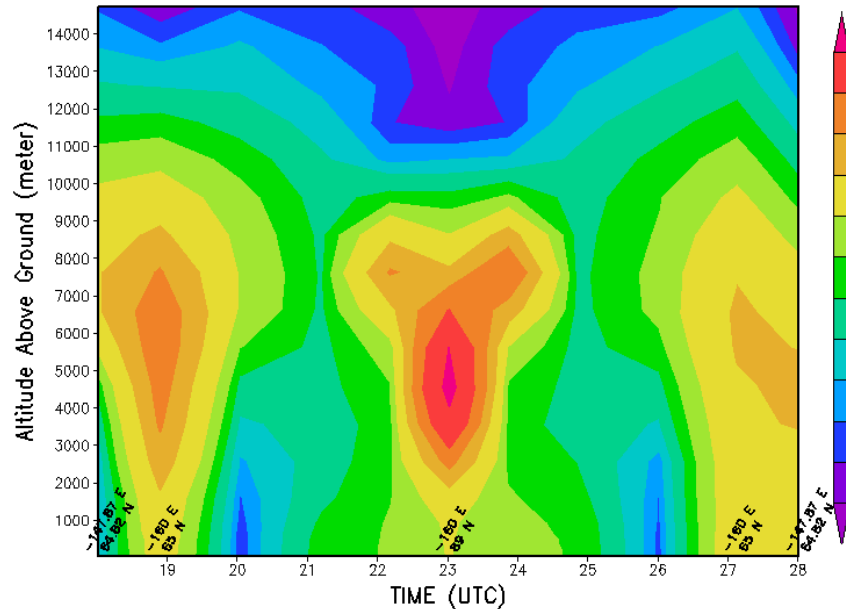
Simulated BiomassCO (ppbv) along the
DC8-FAI-Asia-NP Flight plan on 04/16/2008



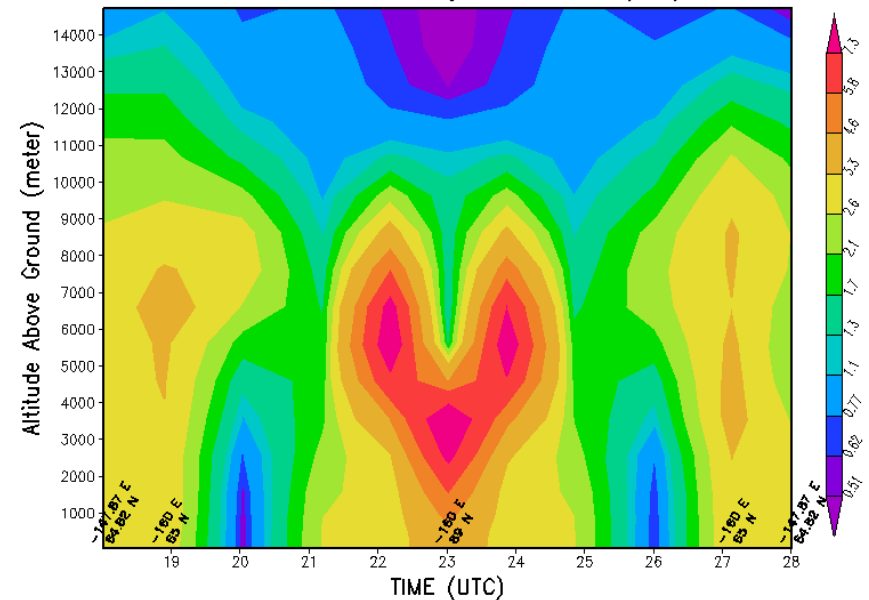
Simulated BiomassCO (ppbv) along the
DC8-FAI-Asia-NP Flight plan on 04/17/2008



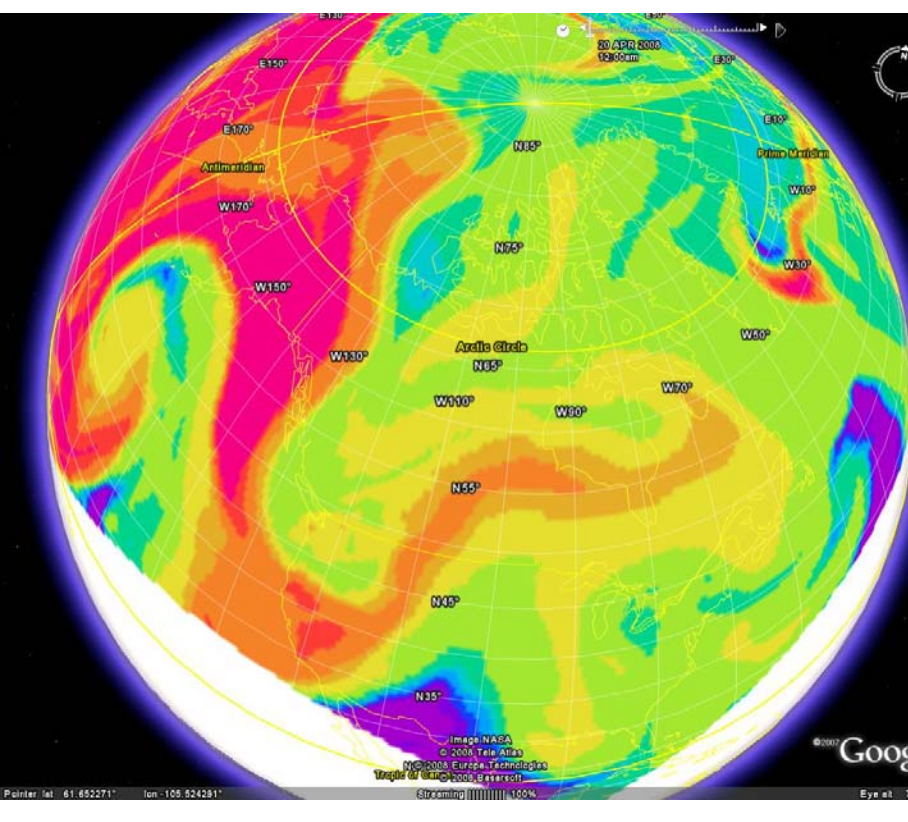
Simulated Europe CO (ppbv) along
the DC8-FAI-Asia-NP Flight Path on 04/16/2008



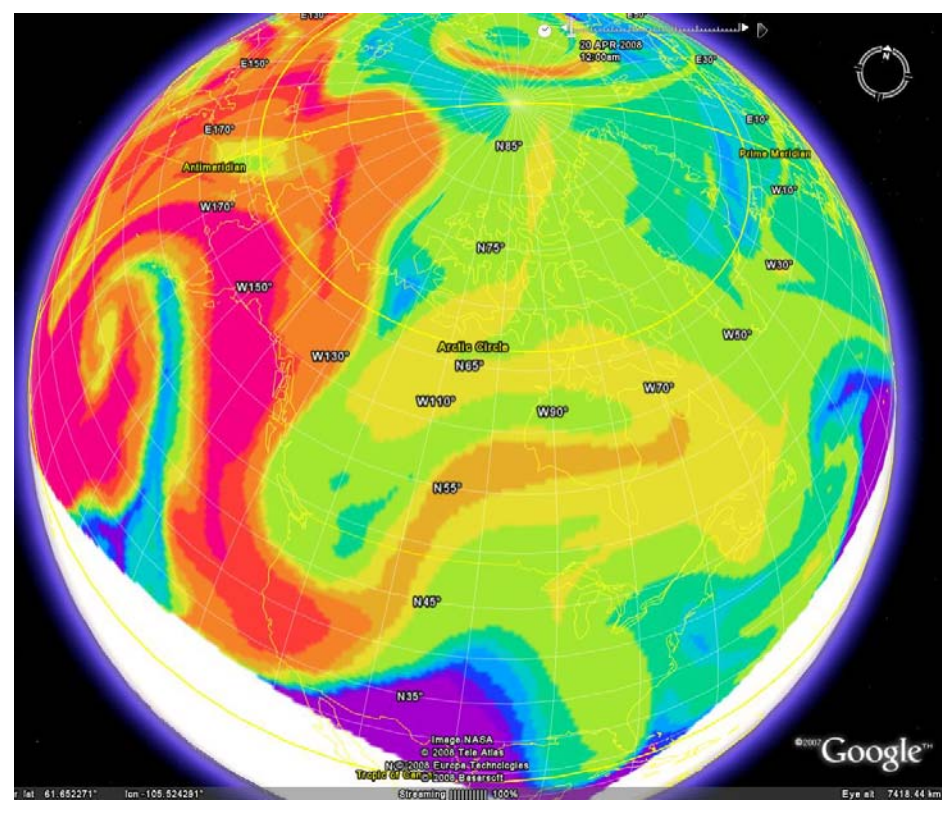
Simulated Europe CO (ppbv) along
the DC8-FAI-Asia-NP Flight Path on 04/17/2008



Transit 19th ?? (12 hr)

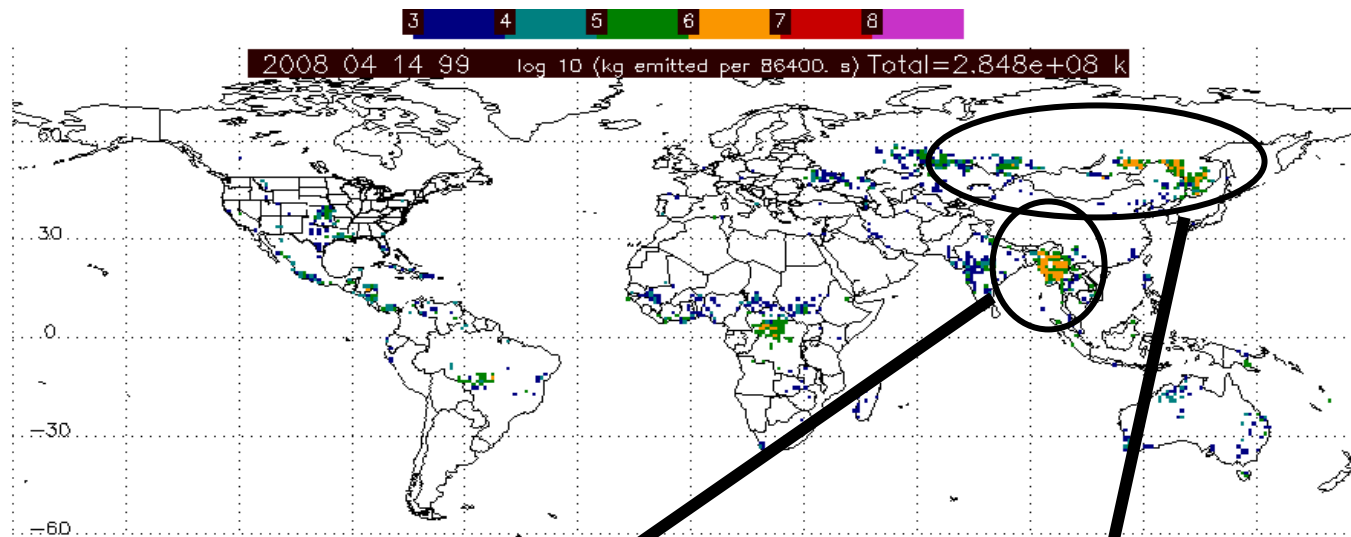


Biomass 5.5 km, 0Z, 20th

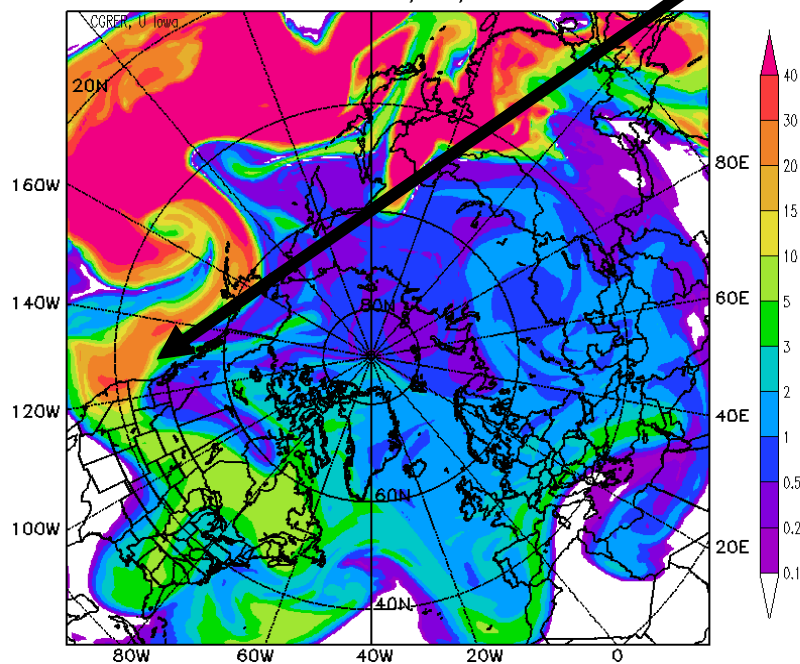


Biomass 8.4 km, 0Z, 20th

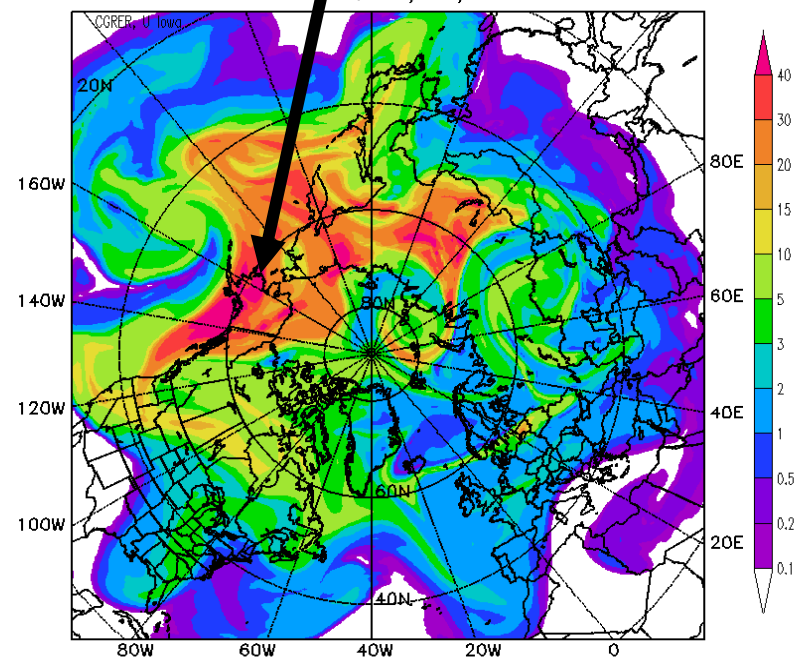
April 19 18Z: Asian Inflow into N. America



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

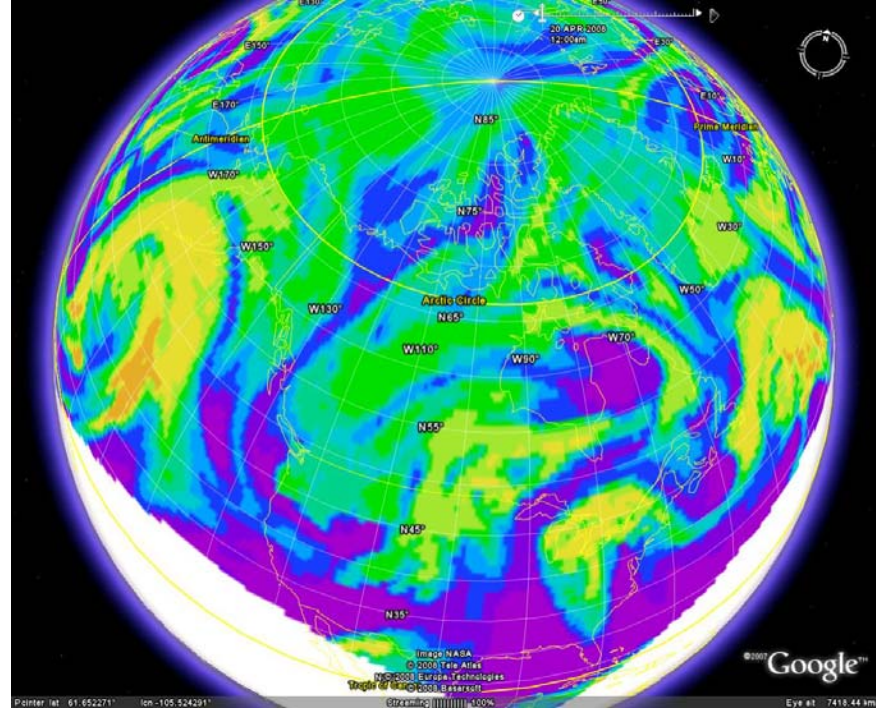
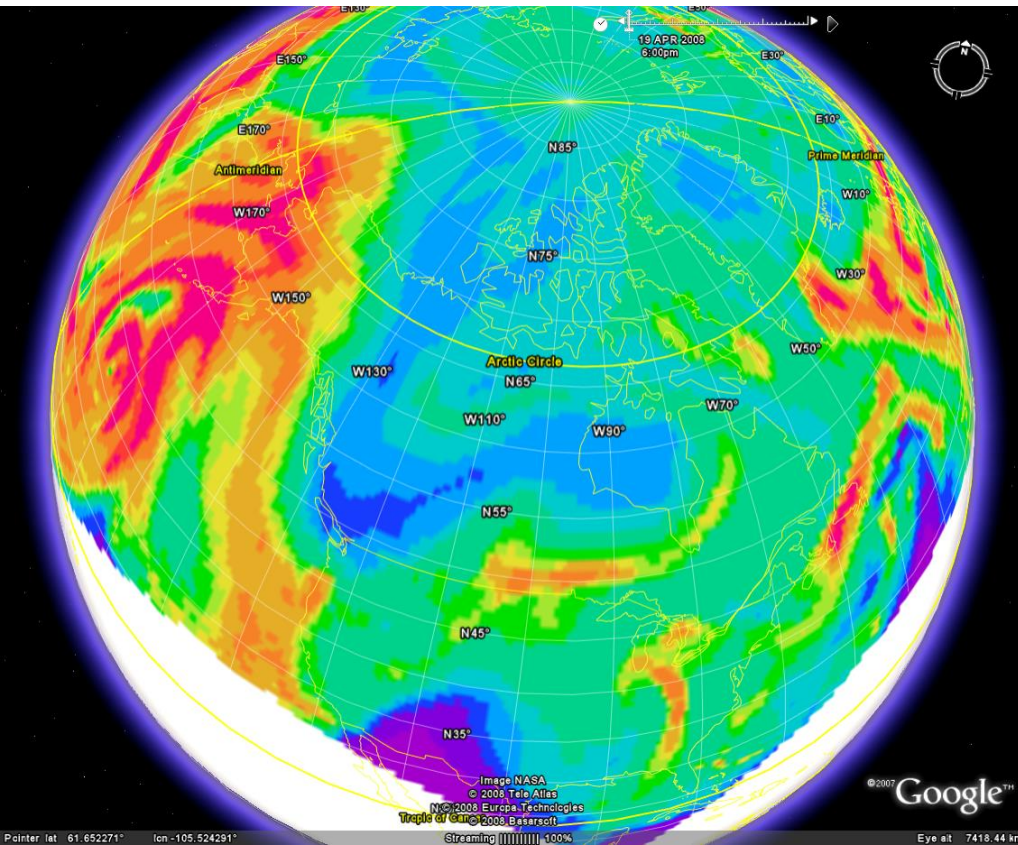


Simulated NAsia_BB_CO (ppbv) in the 8.4km layer
at 18UTC, 04/19/2008



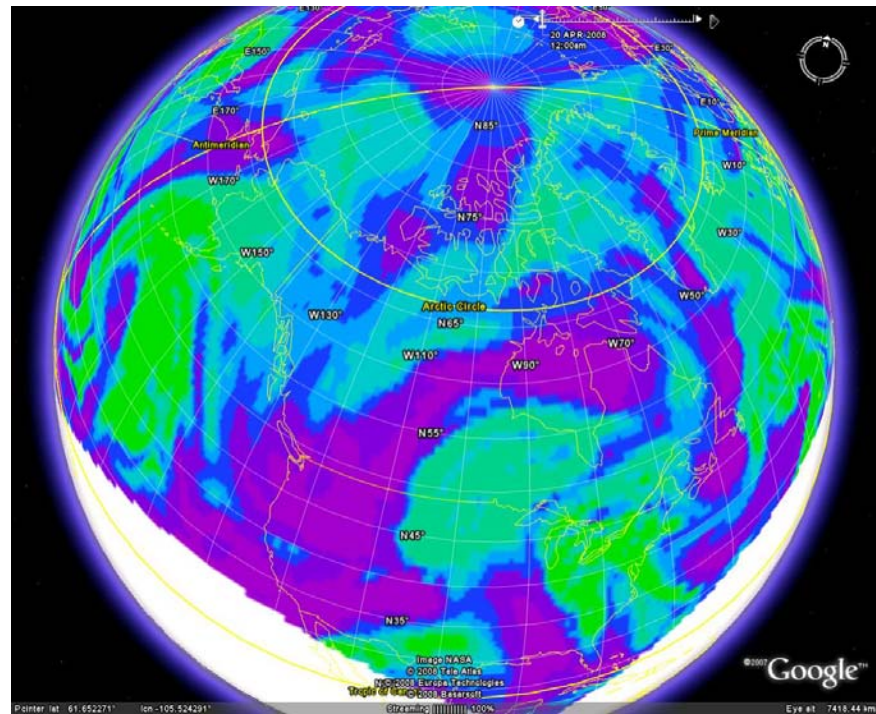
RH 120 hr 5.5km layer

Transit Home



AOD 114 hr

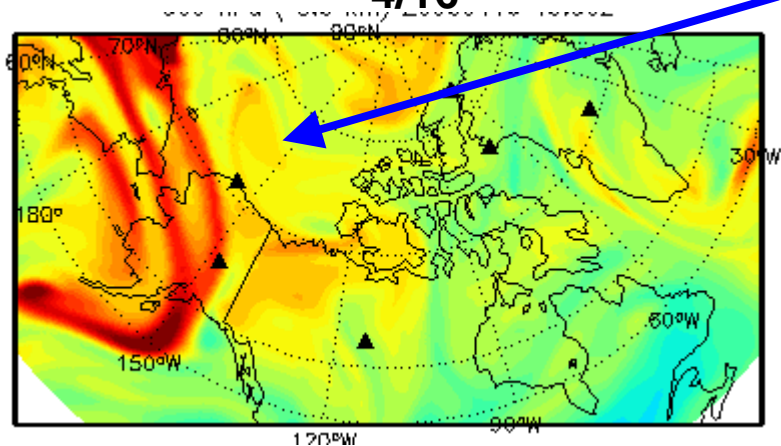
RH-120 hr 8.5 km layer



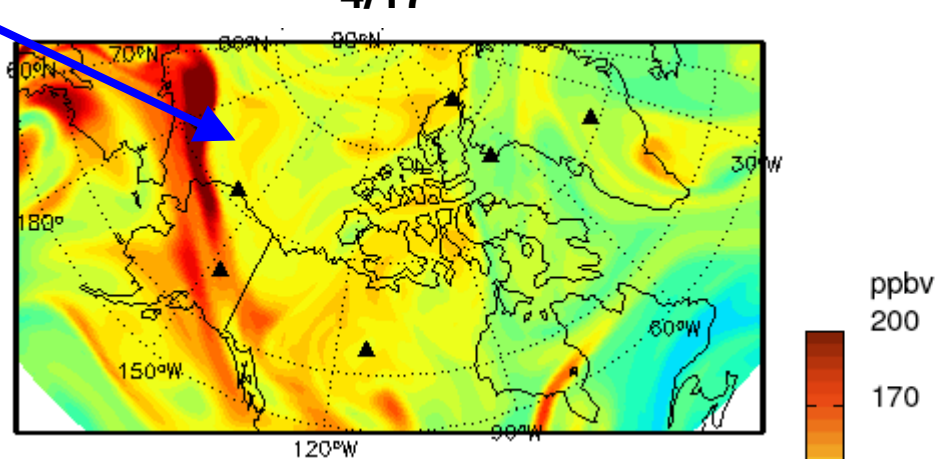
Total CO 500 hPa

Older Asian Plume

4/16

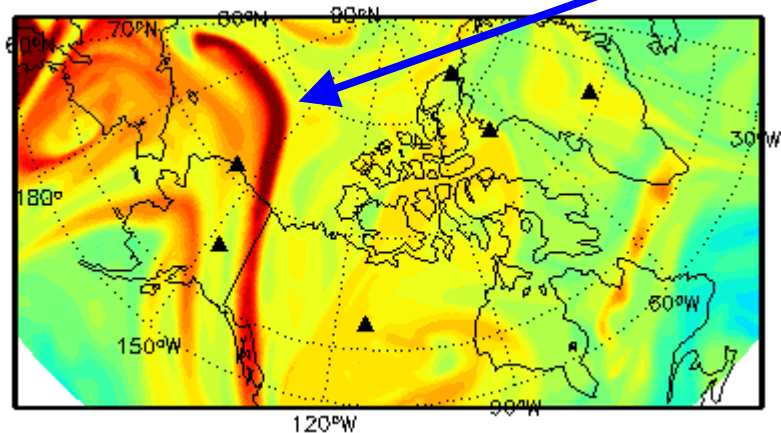


4/17

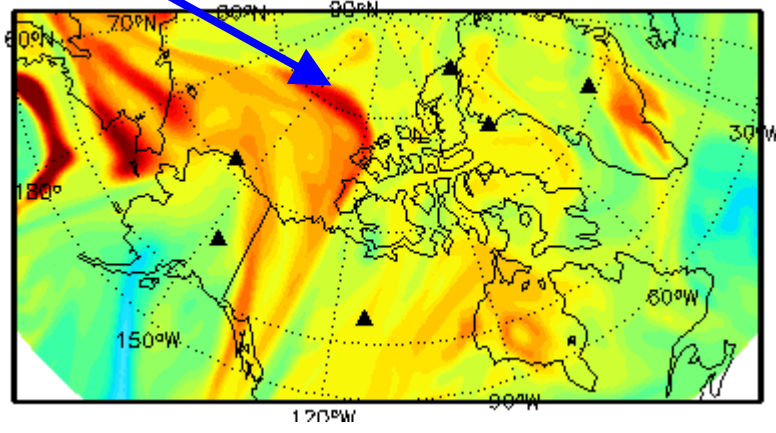


4/18

Penetration into Arctic



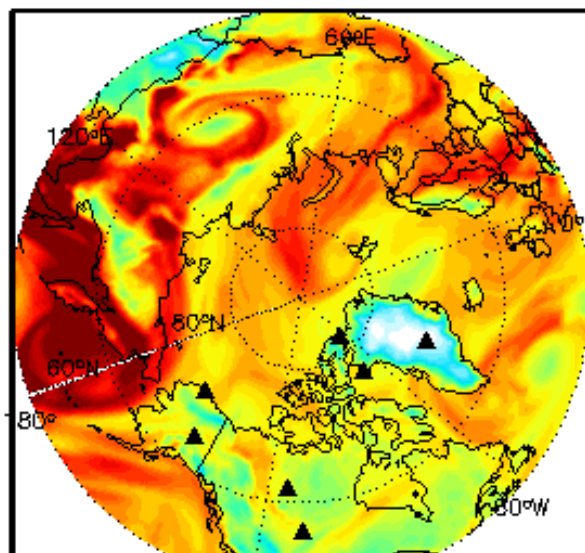
4/19



Using 4/15 6z forecast

Total CO Column

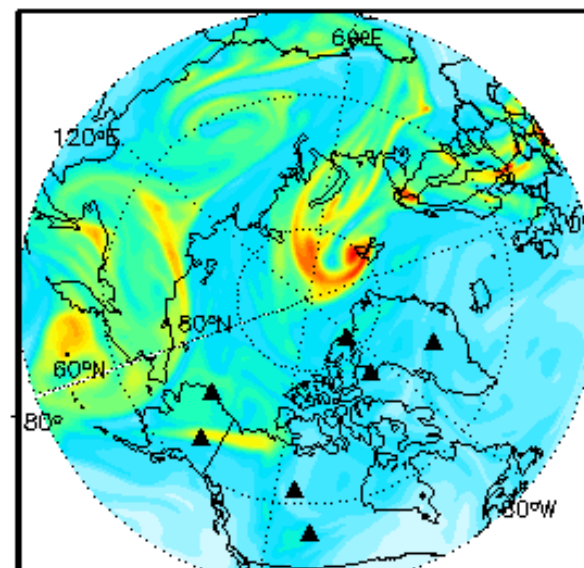
20080415 19:30Z



kg/m²
1.20e-03
1.06e-03
9.20e-04
7.80e-04
6.40e-04
5.00e-04

European Anthro. CO (ppbv) 500 mb

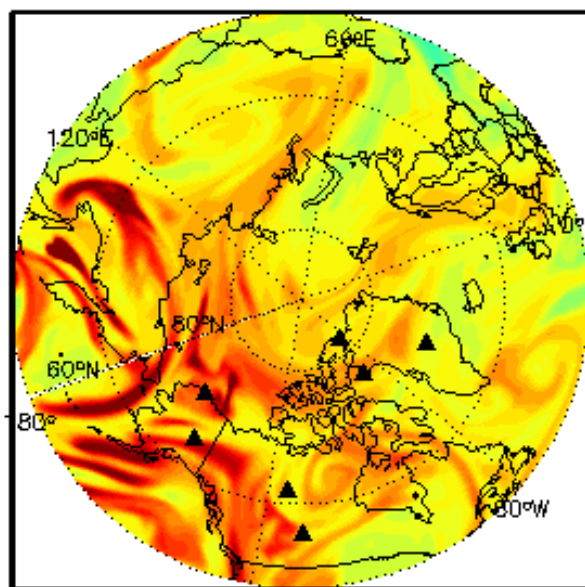
500 hPa (5.6 km) 20080415 19:30Z



ppbv
60
48
36
24
12
0

Asian Anthro. CO (ppbv) 500 mb

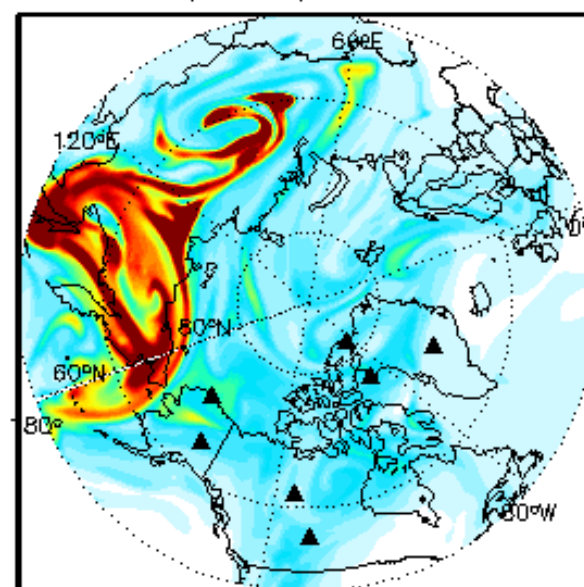
500 hPa (5.6 km) 20080415 19:30Z



ppbv
60
48
36
24
12
0

Boreal Burning CO (ppbv) 500 mb

500 hPa (5.6 km) 20080415 19:30Z



ppbv
60
48
36
24
12
0

DC-8 : FAI to North Pole

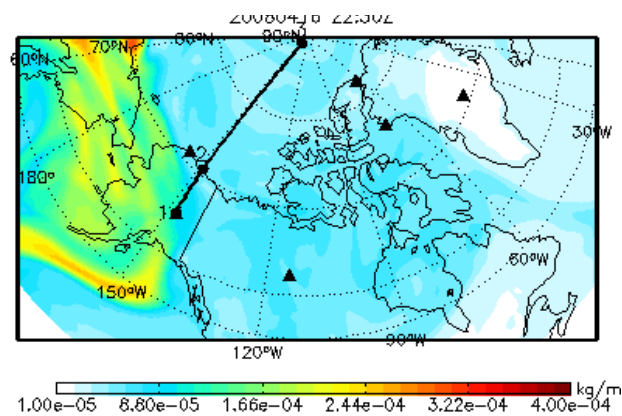
April 16th – 17th

All plots hereafter are for 22:30 UTC.

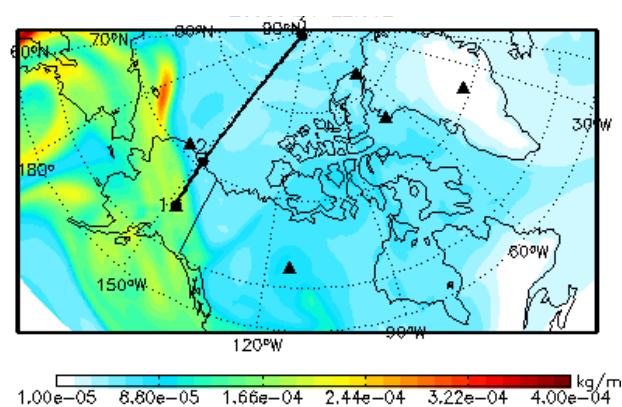
(Previous plots were 19:30 UTC.)

Boreal CO Column

16th

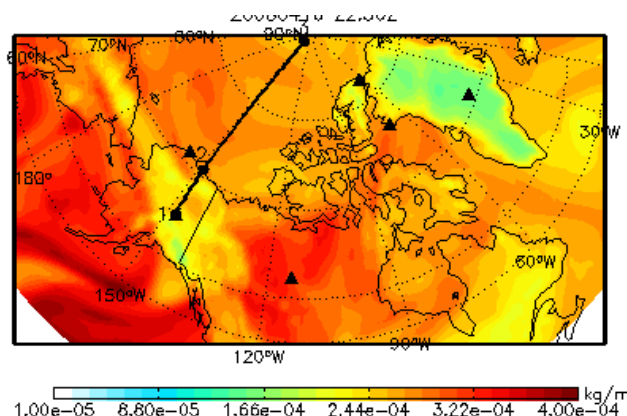


17th

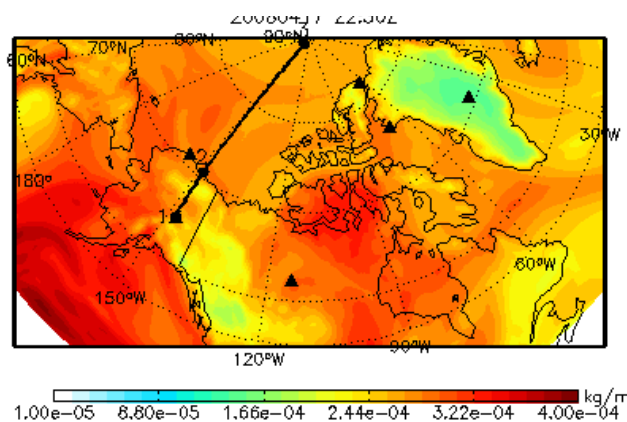


Asian Anthro. CO Column

16th

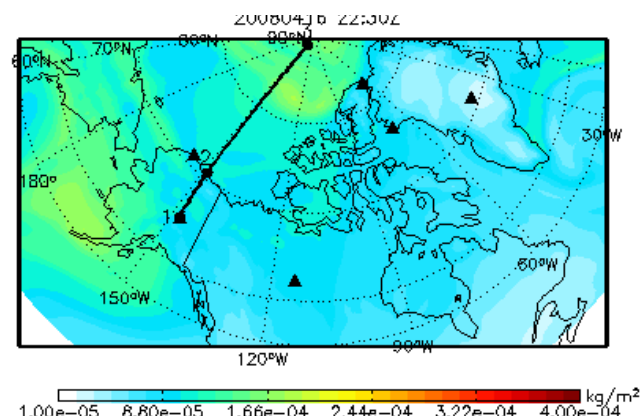


17th

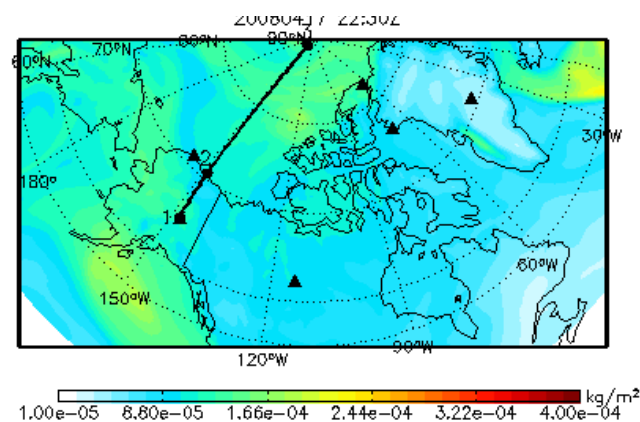


Euro. Anthro. CO Column

16th



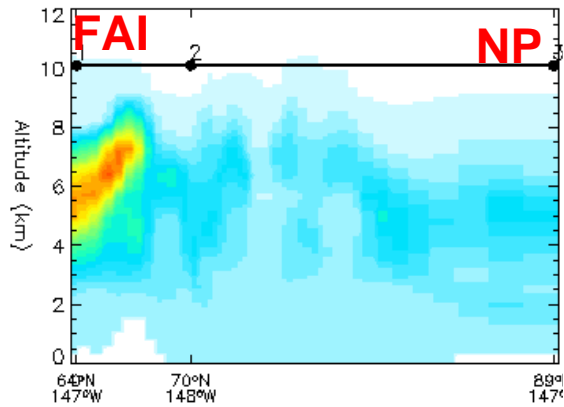
17th



Well Mixed: N. American Anthro. Nonboreal Biomass Burning

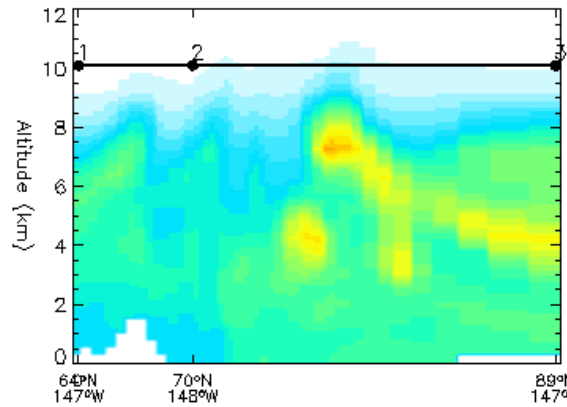
Boreal CO

16th



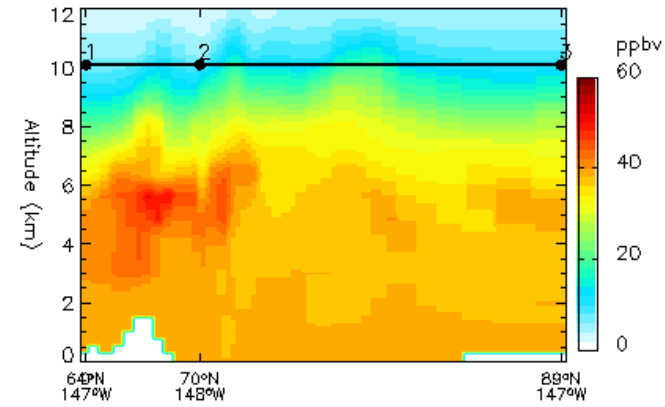
Euro. Anthro. CO

16th

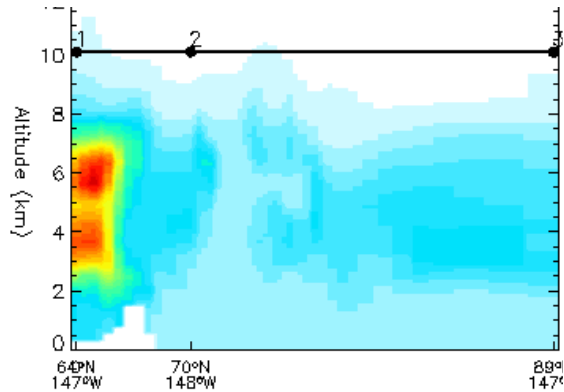


Asian Anthro. CO

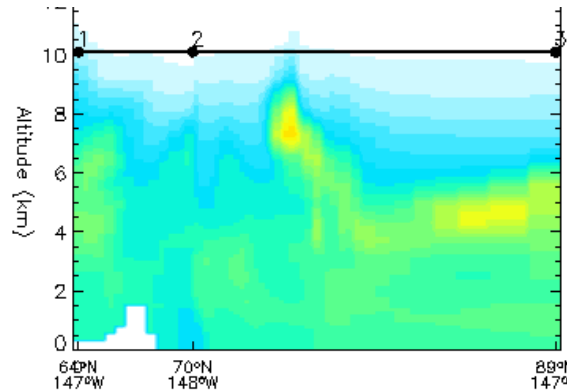
16th



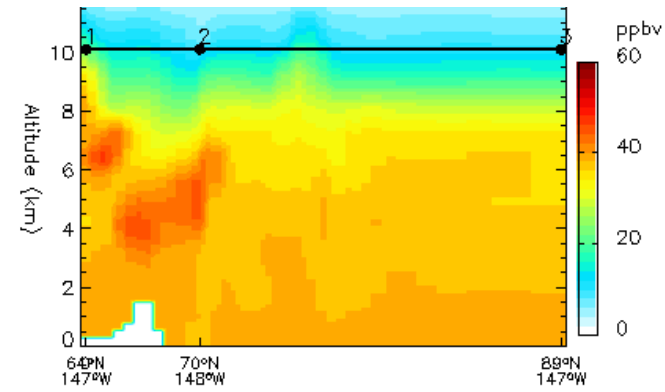
17th



17th



17th



Dust (ug/m³)

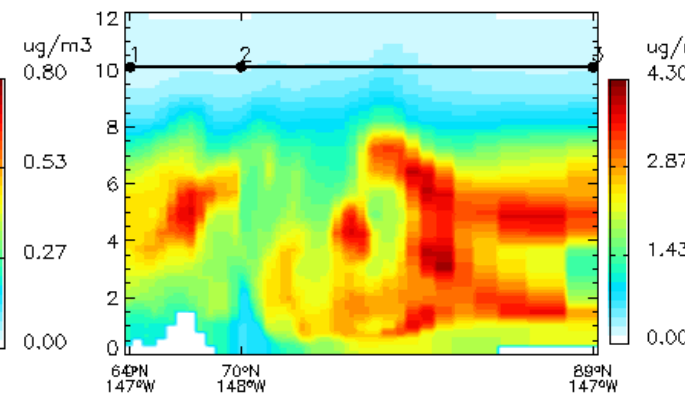
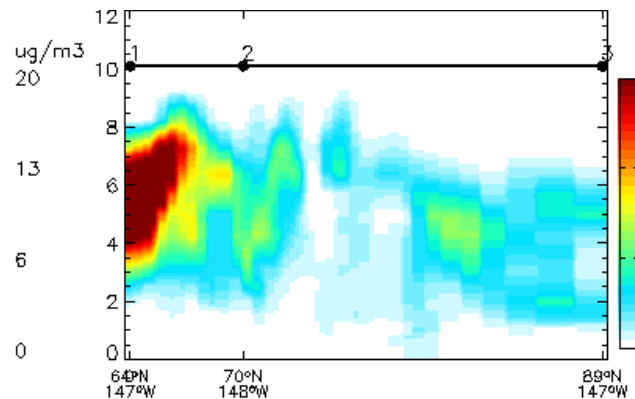
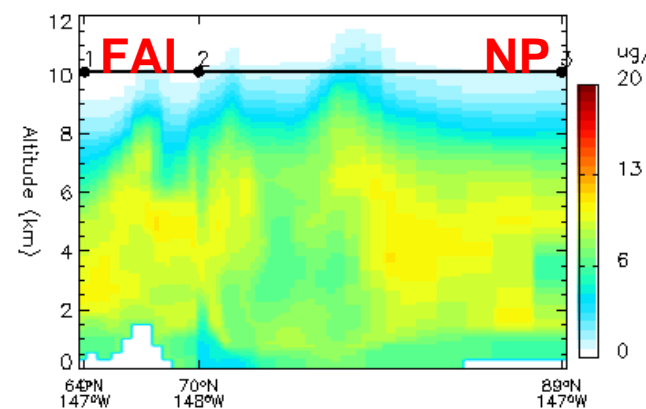
16th

Biomass OC (ug/m³)

16th

Sulfate (ug/m³)

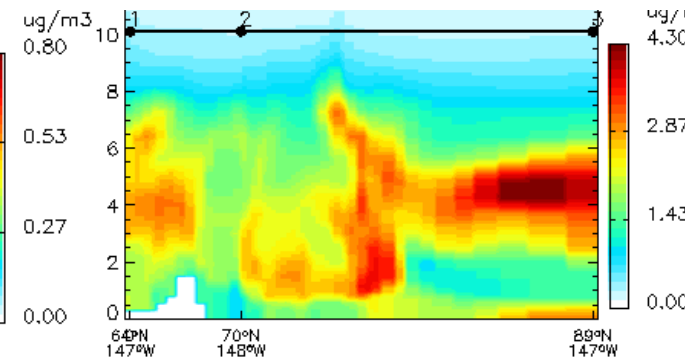
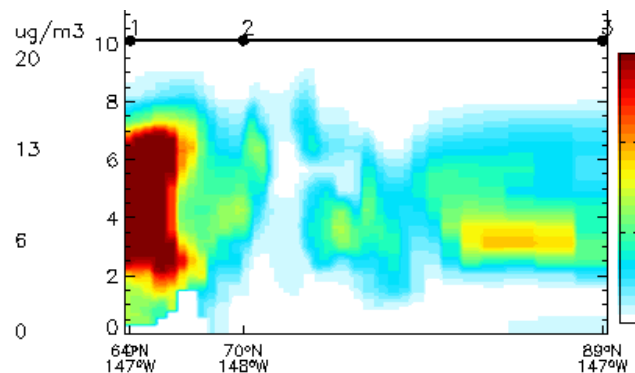
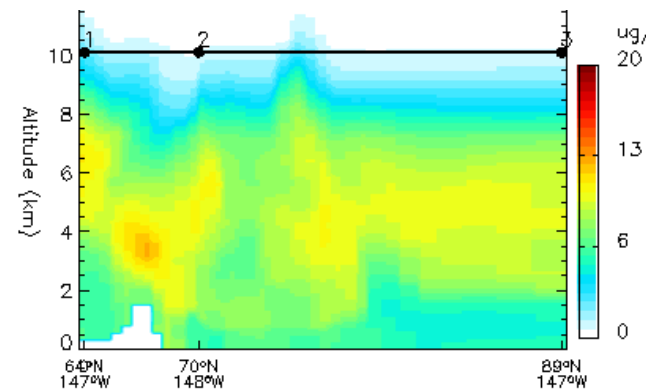
16th



17th

17th

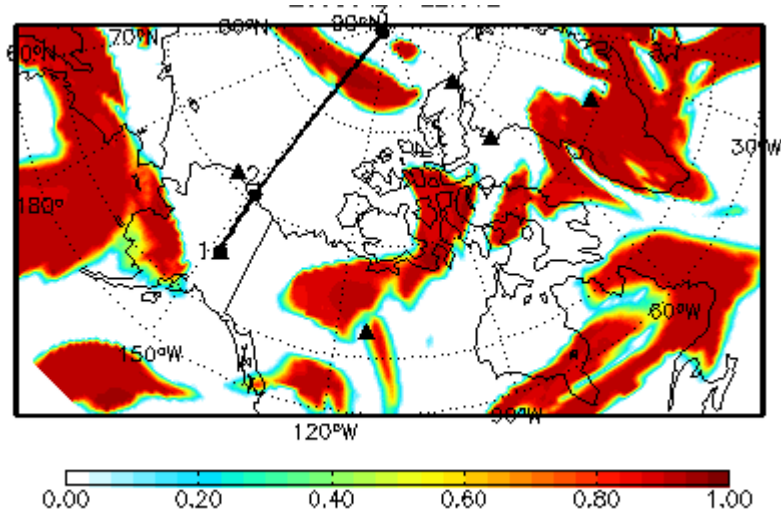
17th



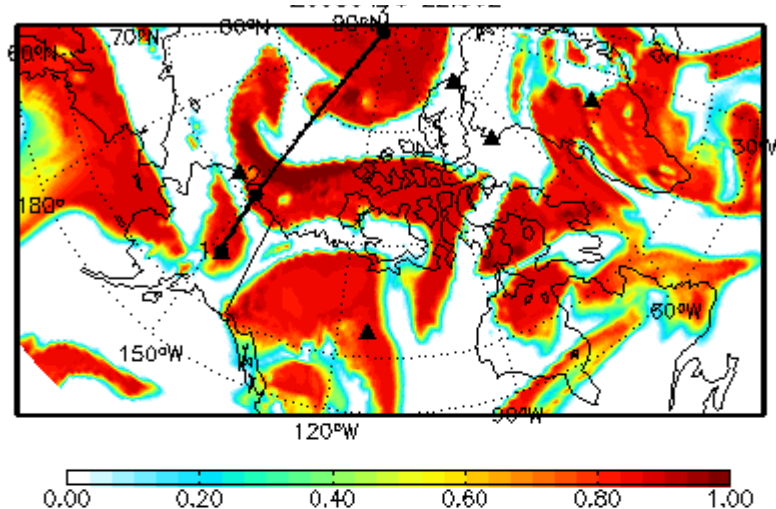
Cloud Fraction : 4/16

GEOS-5 forecast: 20080415_06z

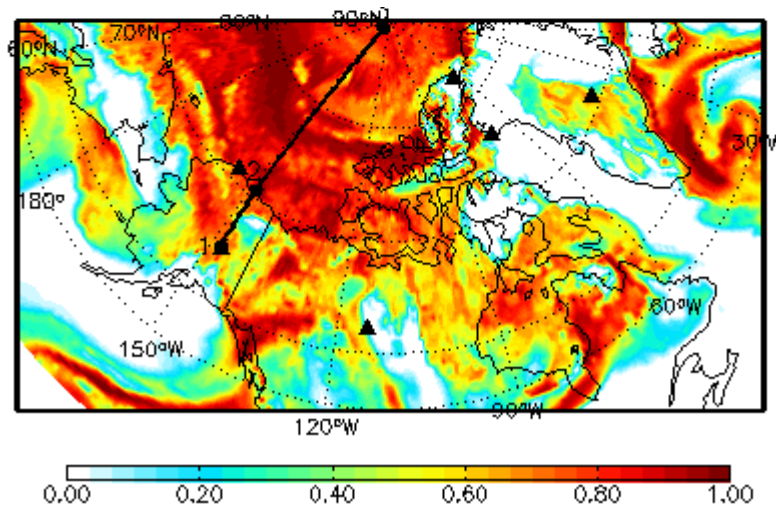
High (<400 mb)



Middle (400-700 mb)



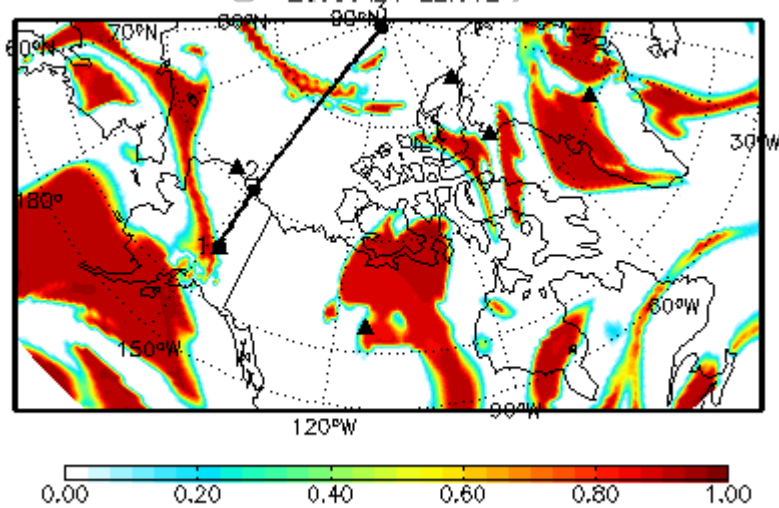
Low (700-1000 mb)



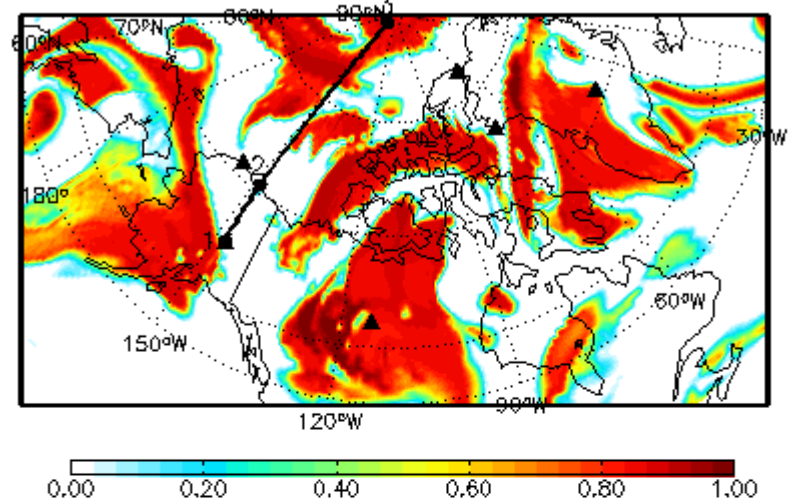
Cloud Fraction : 4/17

GEOS-5 forecast: 20080415_06z

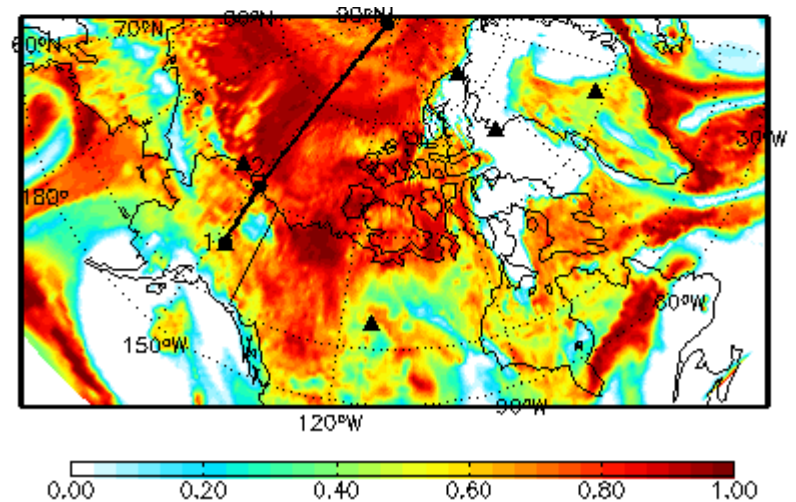
High (<400 mb)



Middle (400-700 mb)



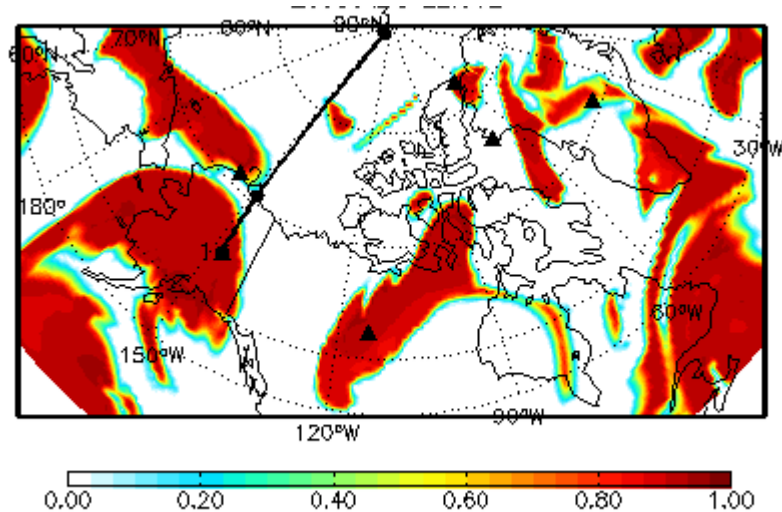
Low (700-1000 mb)



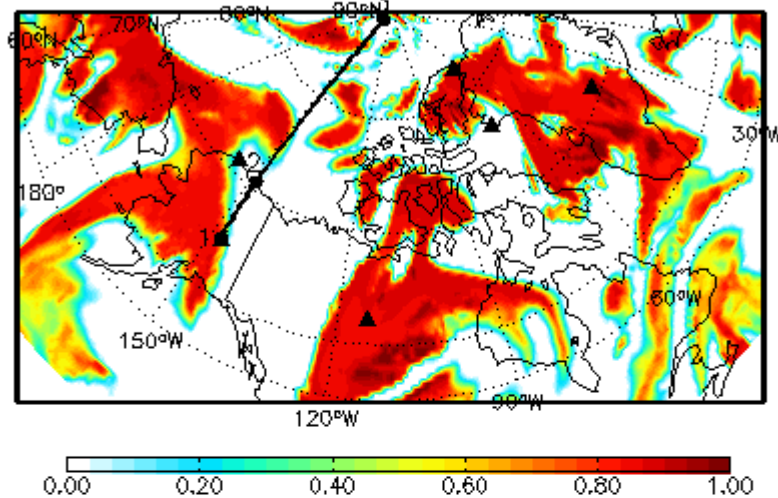
Cloud Fraction : 4/18

GEOS-5 forecast: 20080415_06z

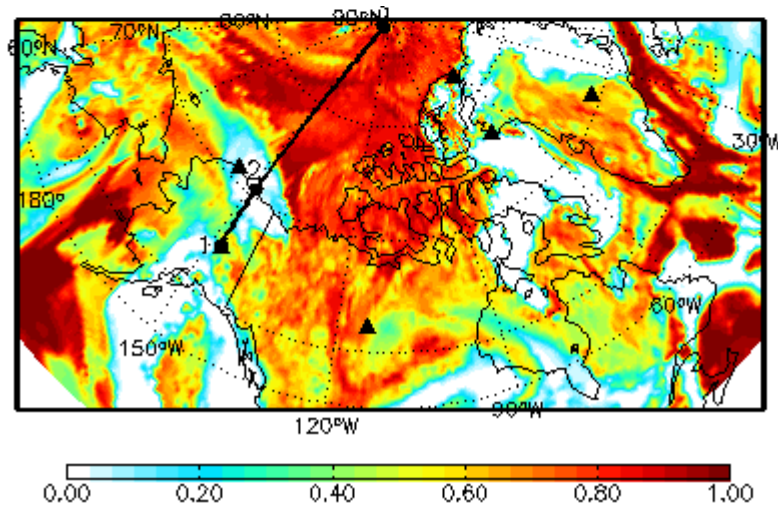
High (<400 mb)



Middle (400-700 mb)



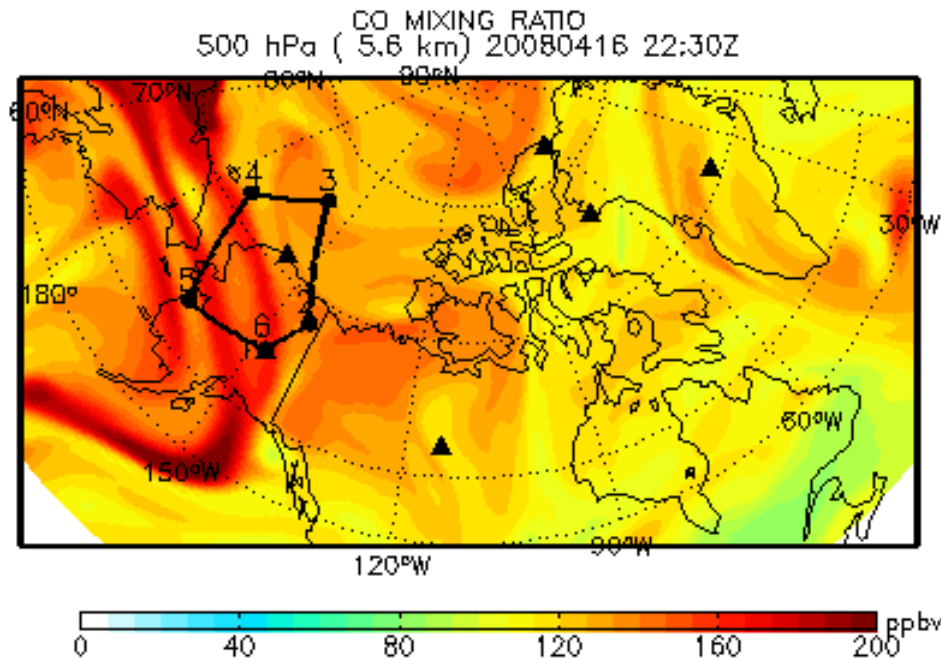
Low (700-1000 mb)



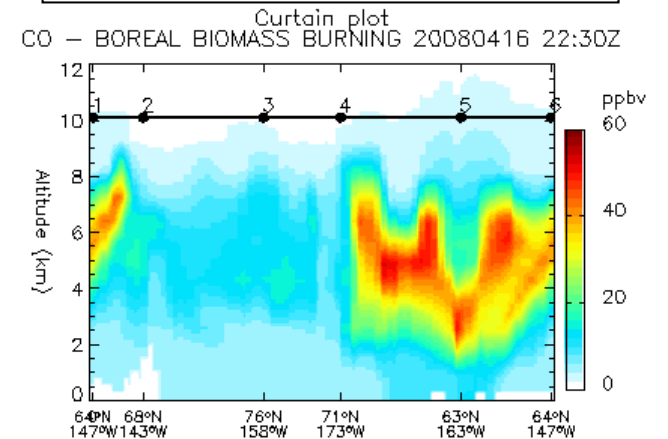
DC-8 : “Pentagon” Flight

April 16th – 17th

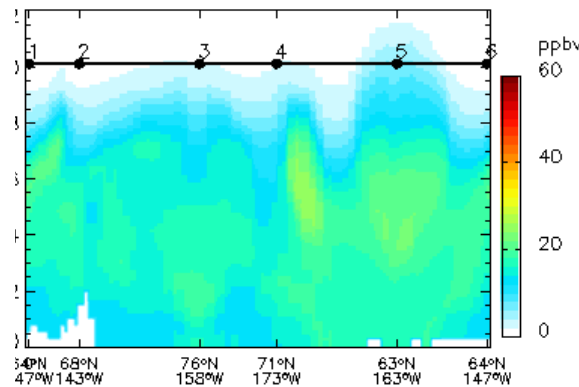
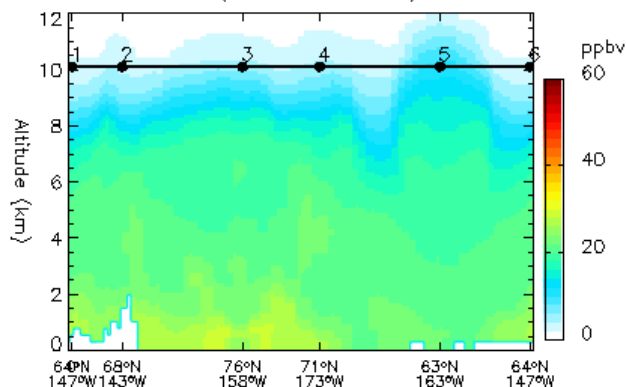
4/16/08 GEOS-5 CO



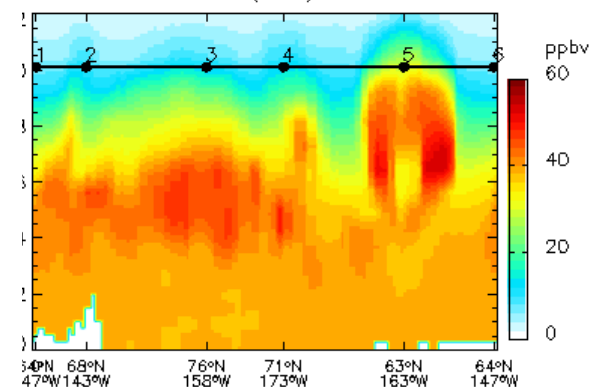
Boreal BB: below Asian pollution



CO - ANTHOPOGENIC (NORTH AMERICA) 20080416 22:30Z - ANTHOPOGENIC (EUROPE) 20080416 22:30Z



Curtain plot
CO - ANTHOPOGENIC (ASIA) 20080416 22:30Z

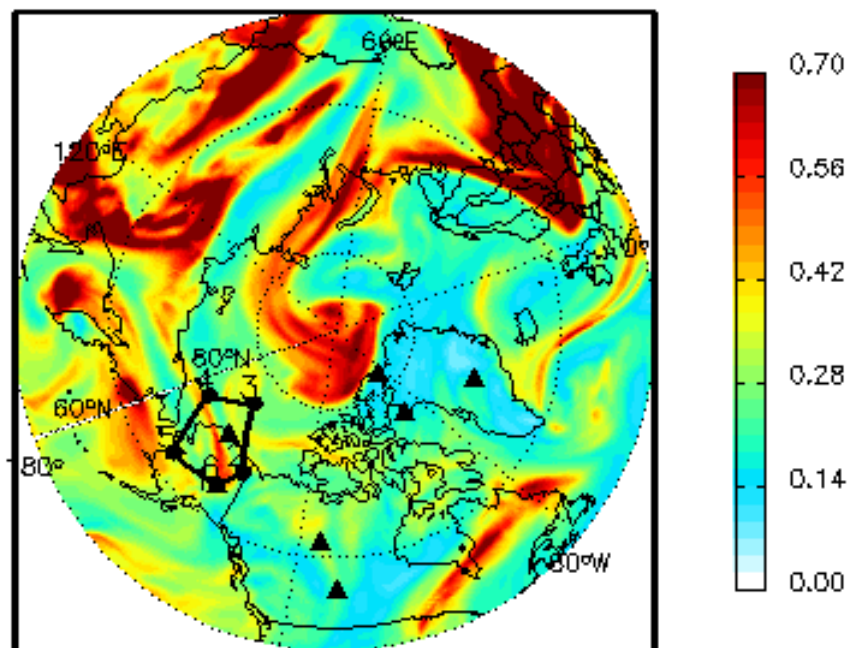


N America pollution: Boundary layer

European pollution: higher over western track than over eastern

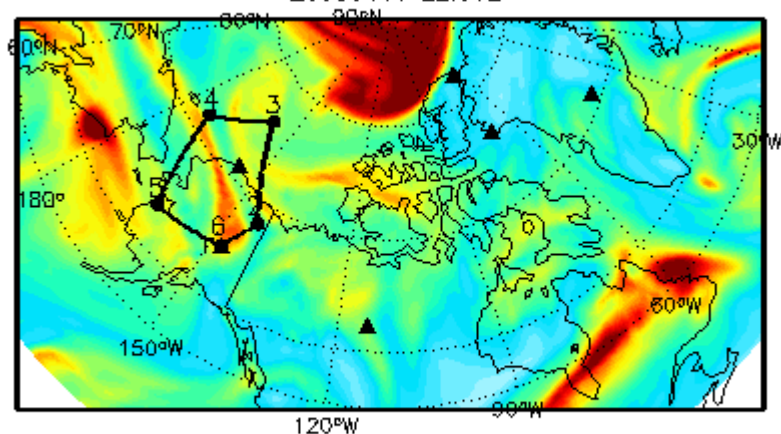
Asian plume: altitude above all plumes over western Alaska

TOTAL AEROSOL EXTINCTION AOT [550 NM]
20080416 22:30Z

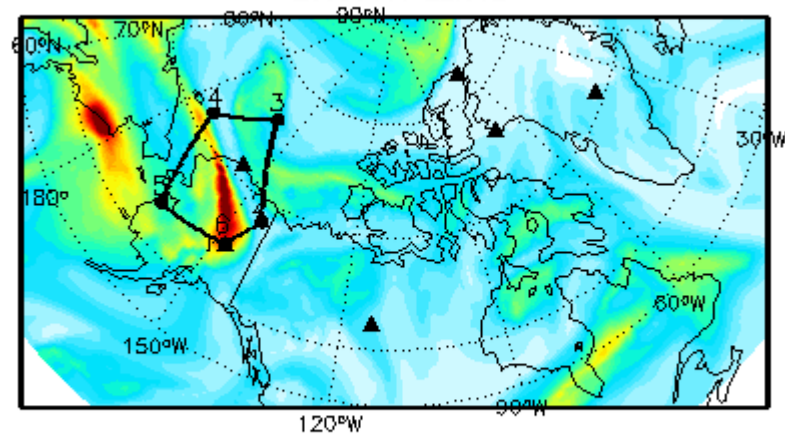


4/16/08
GEOS-5 aerosols

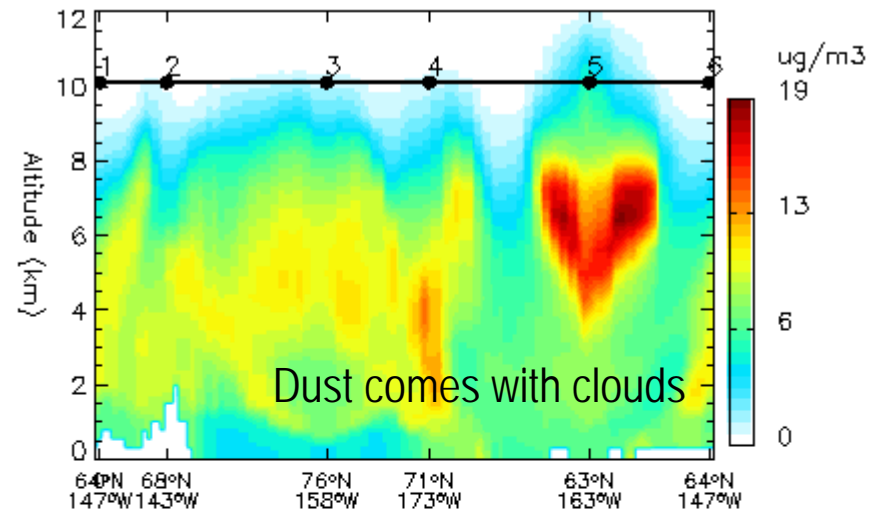
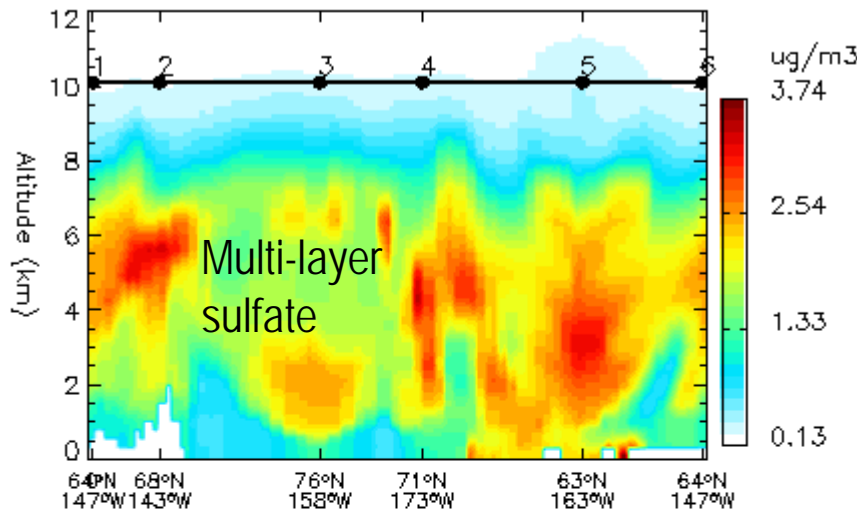
SO4 EXTINCTION AOT [550 NM]
20080416 22:30Z



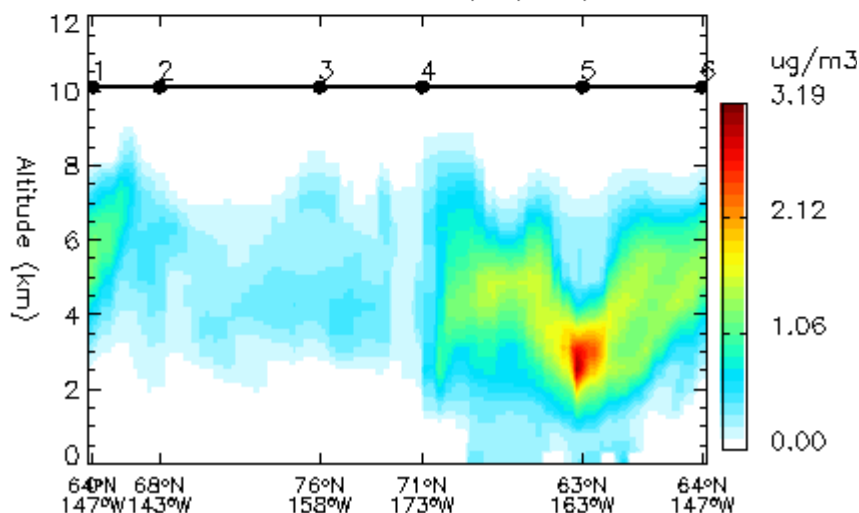
ORGANIC CARBON EXTINCTION AOT [550 NM]
20080416 22:30Z



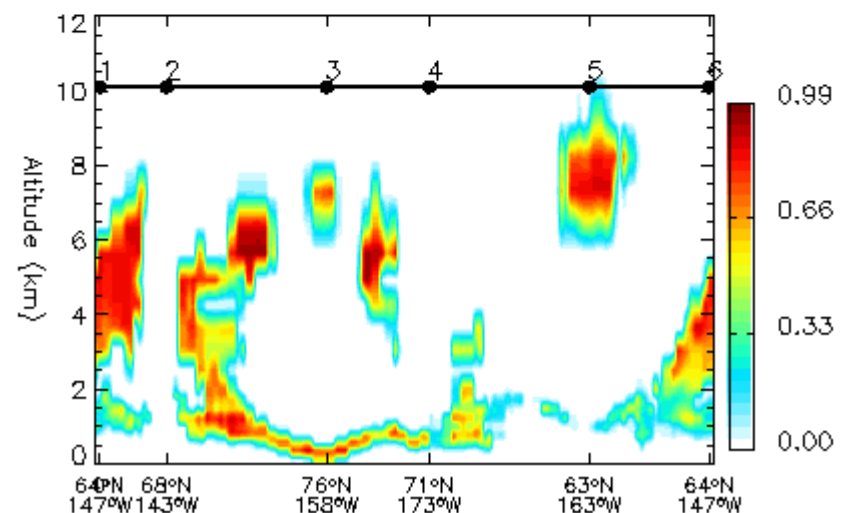
4/16/08 aerosol/clouds along pentagon track



Curtain plot
REAL BIOMASS ORGANIC CARBON (UG/M3) 20080416 22:30Z

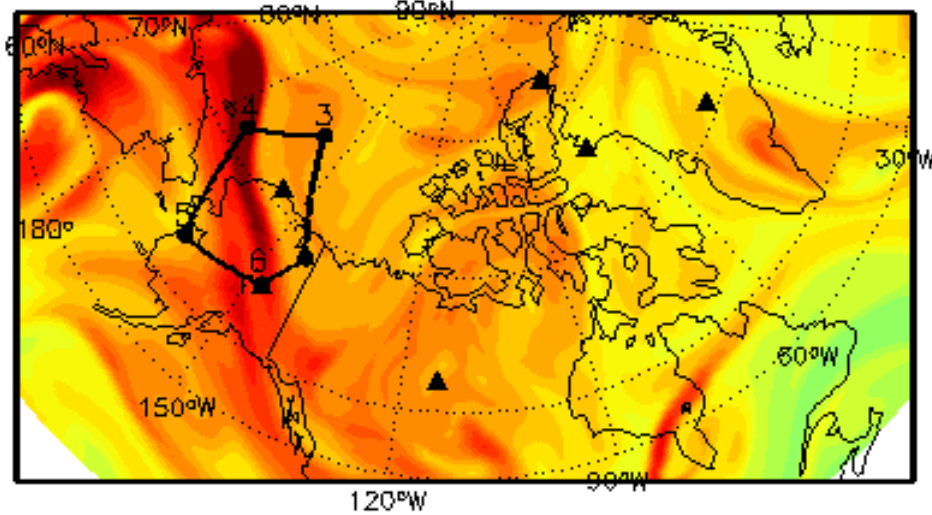


Curtain plot
CLOUD AREA FRACTION 20080416 22:30Z



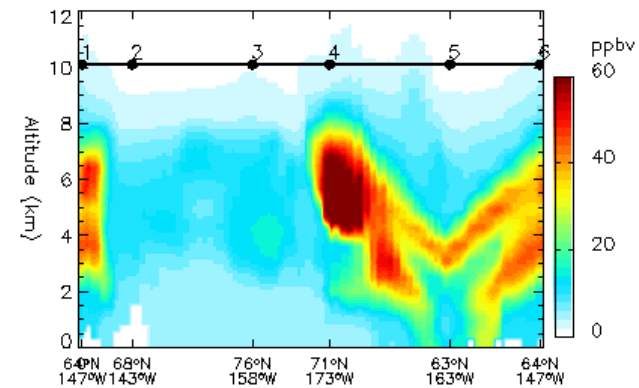
4/17/08 GEOS-5 CO

CO MIXING RATIO
500 hPa (5.6 km) 20080417 22:30Z

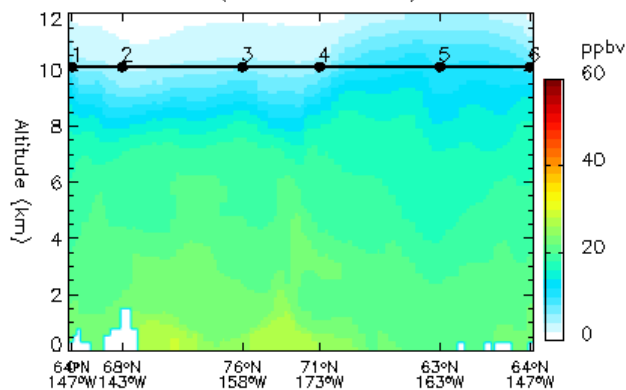


GEOS-5 forecast: 20080415_06z

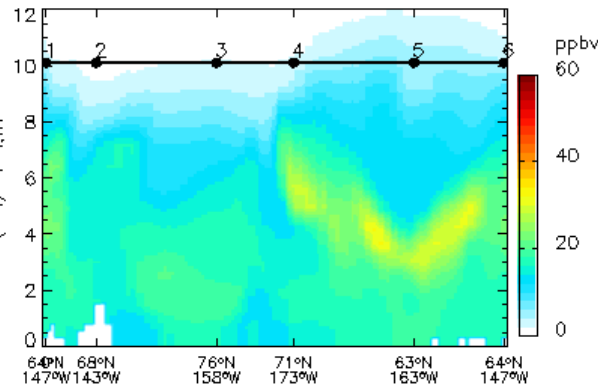
Curtain plot
CO - BOREAL BIOMASS BURNING 20080417 22:30Z



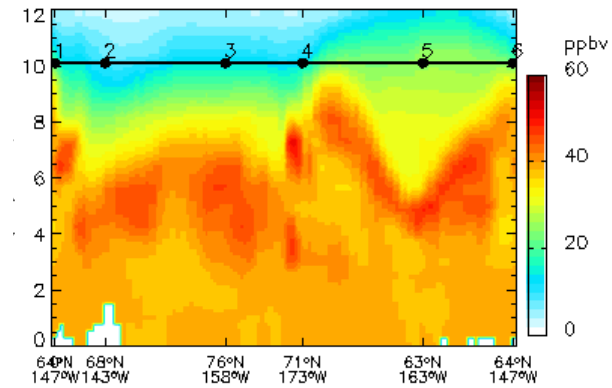
Curtain plot
CO - ANTHOPOGENIC (NORTH AMERICA) 20080417 22:30Z



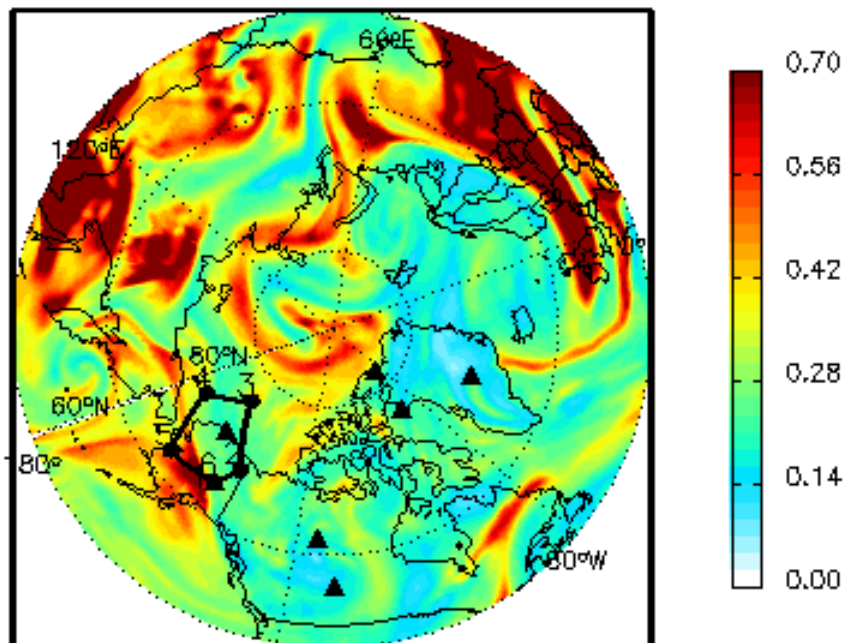
Curtain plot
CO - ANTHOPOGENIC (EUROPE) 20080417 22:30Z



Curtain plot
CO - ANTHOPOGENIC (ASIA) 20080417 22:30Z

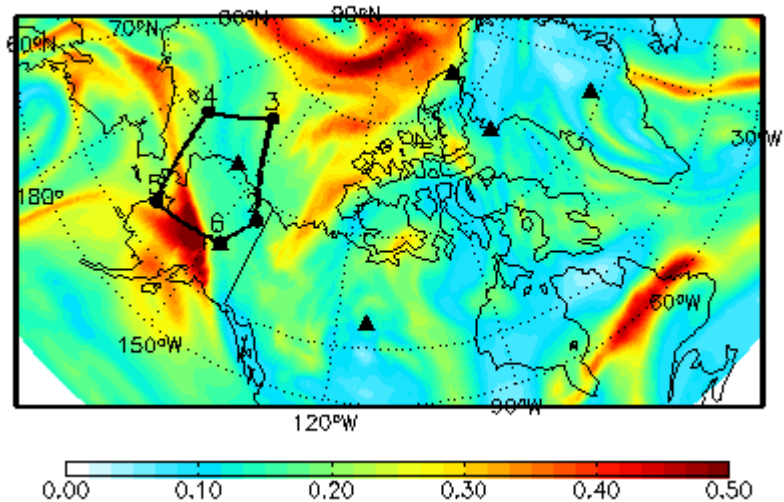


TOTAL AEROSOL EXTINCTION AOT [550 NM]
20080417 22:30Z

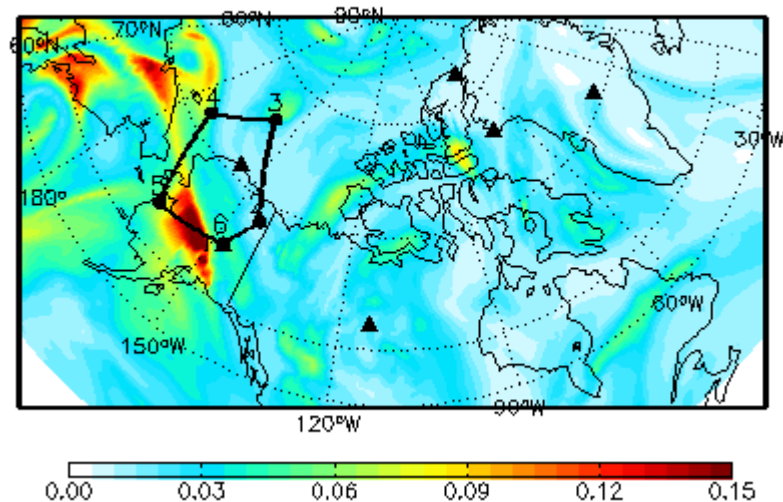


4/17/08
GEOS-5 aerosols

SO4 EXTINCTION AOT [550 NM]
20080417 22:30Z

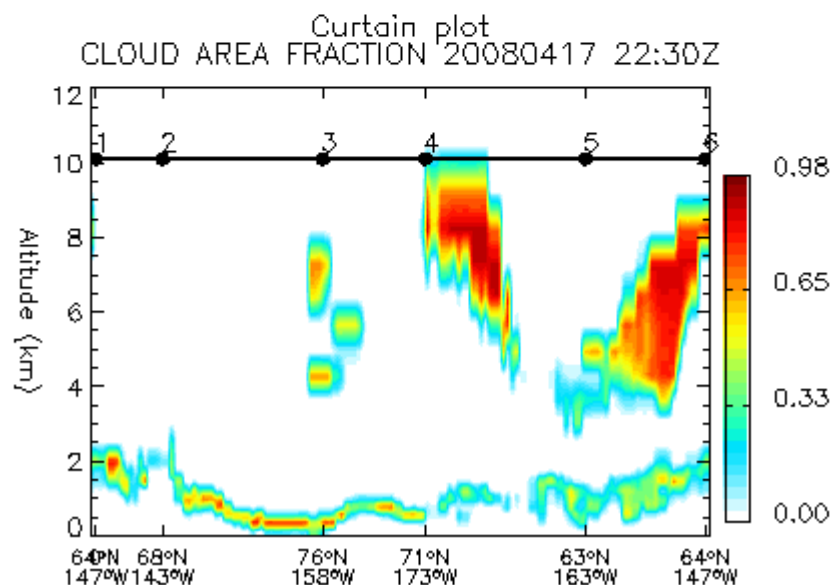
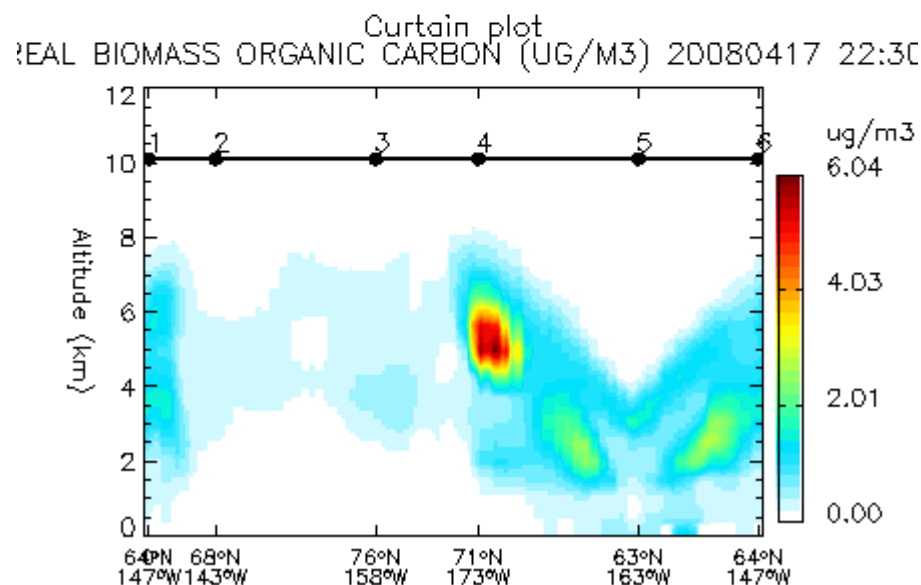
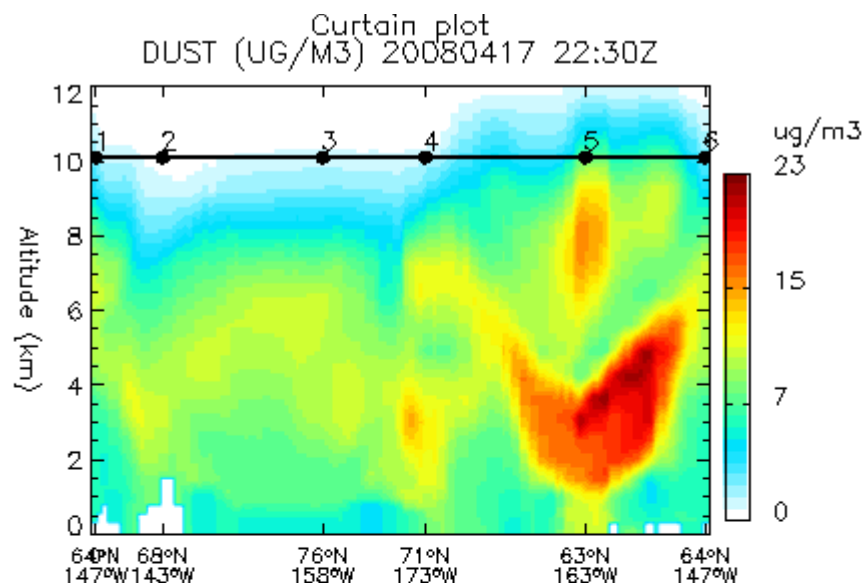
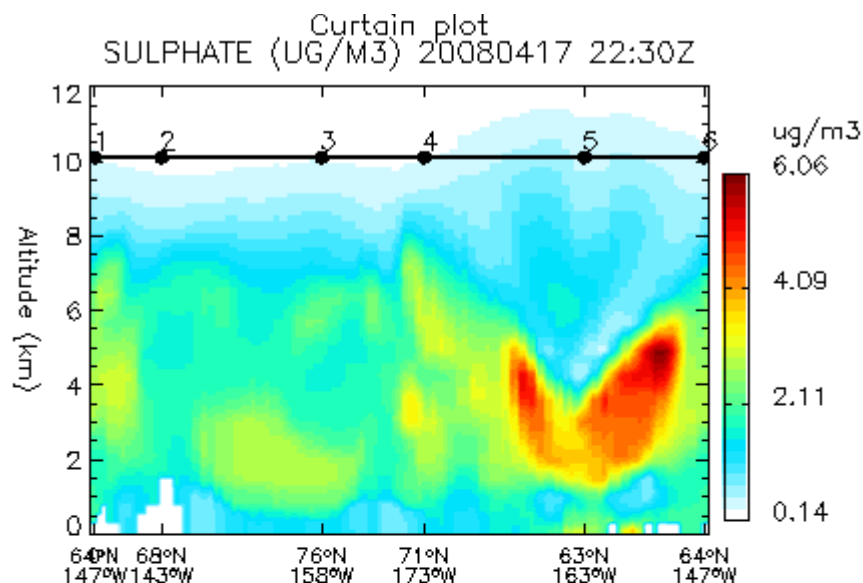


ORGANIC CARBON EXTINCTION AOT [550 NM]
20080417 22:30Z



4/17/08 aerosol/clouds along pentagon track

6z



April 18th - 19th ????

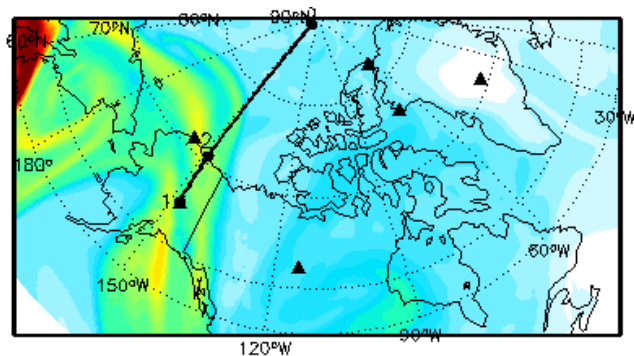
**Asian Air Penetrating High
Arctic!!!!!!**

Boreal CO Column

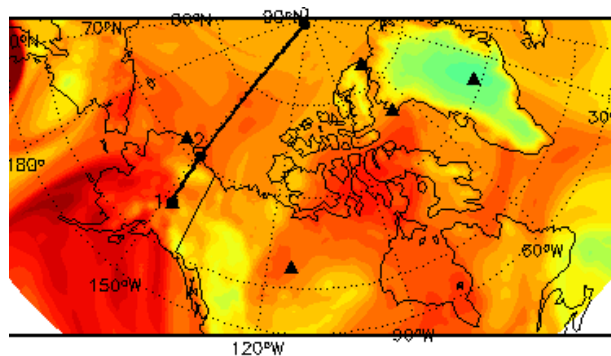
Asian Anthro. CO Column

Euro. Anthro. CO Column

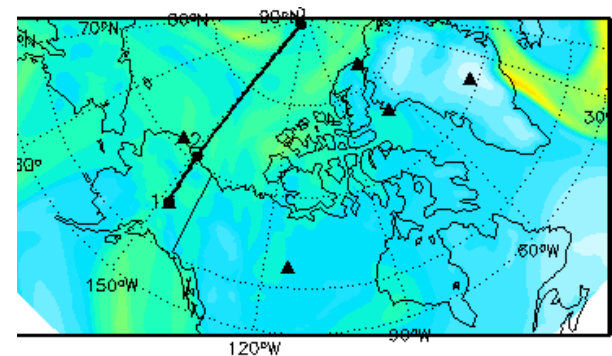
18th



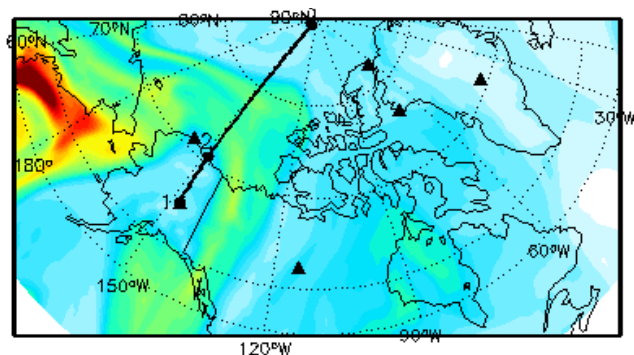
18th



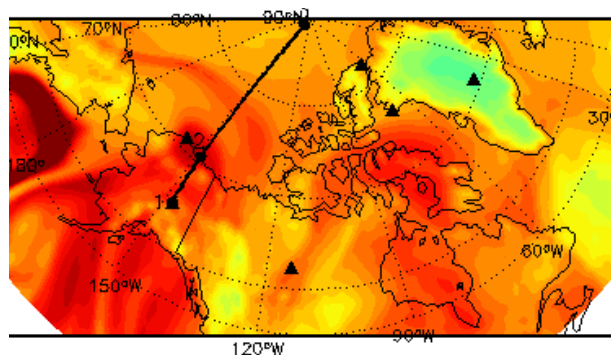
18th



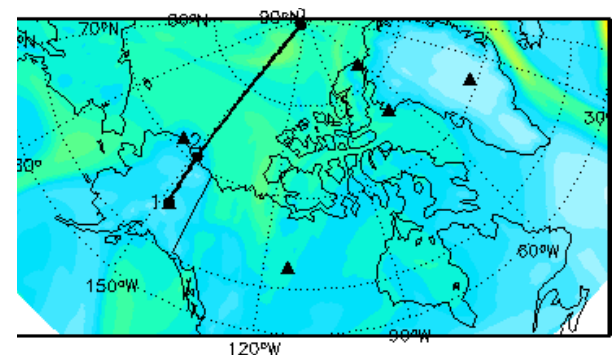
19th



19th



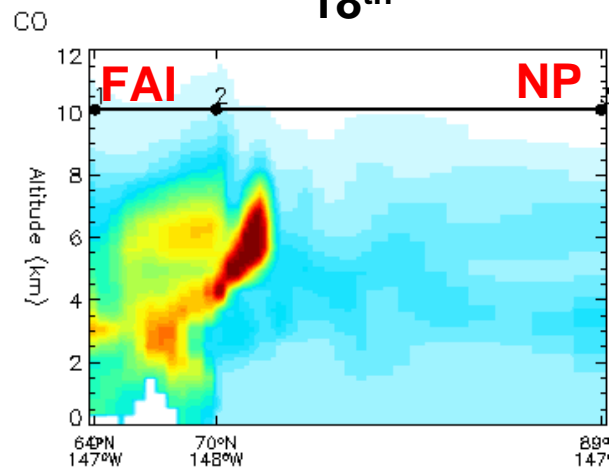
19th



Well Mixed: N. American Anthro. Nonboreal Biomass Burning

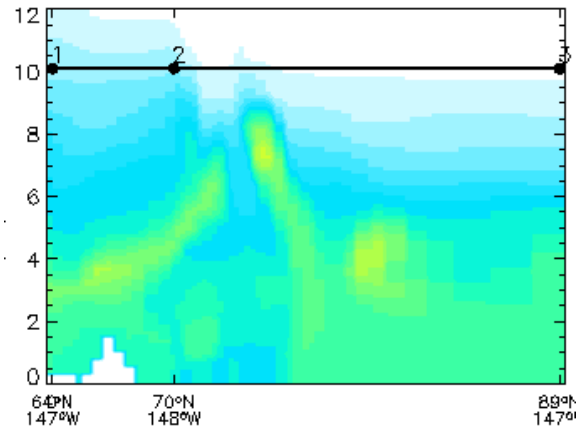
Boreal CO

18th



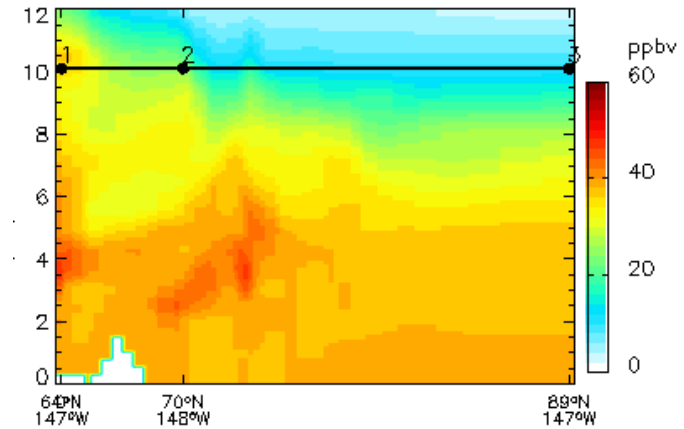
Euro. Anthro. CO

18th

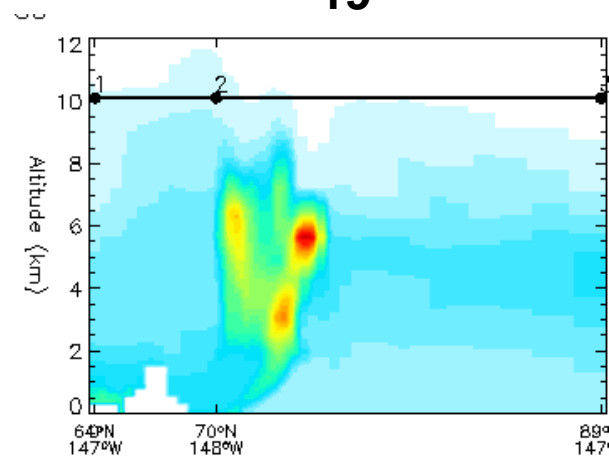


Asian Anthro. CO

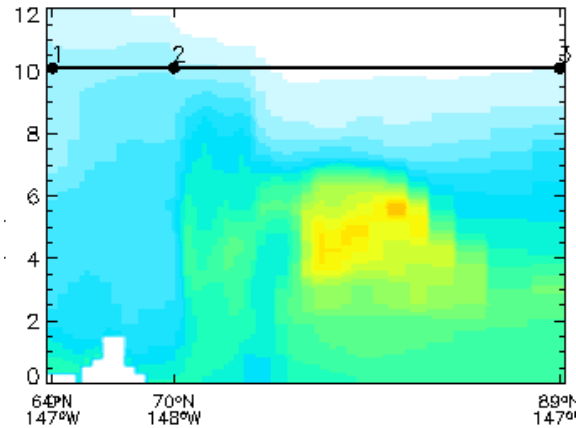
18th



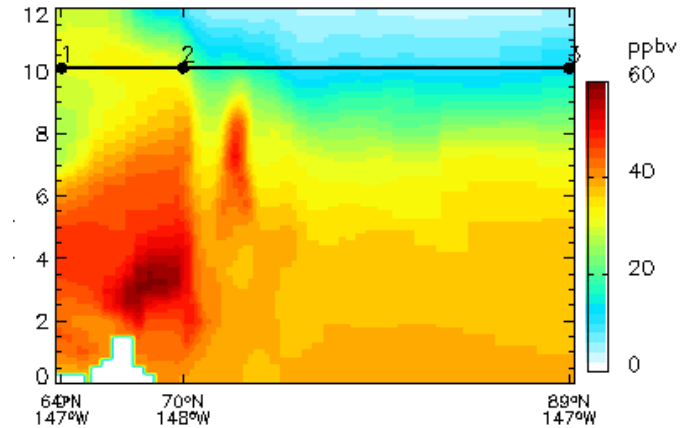
19th



19th

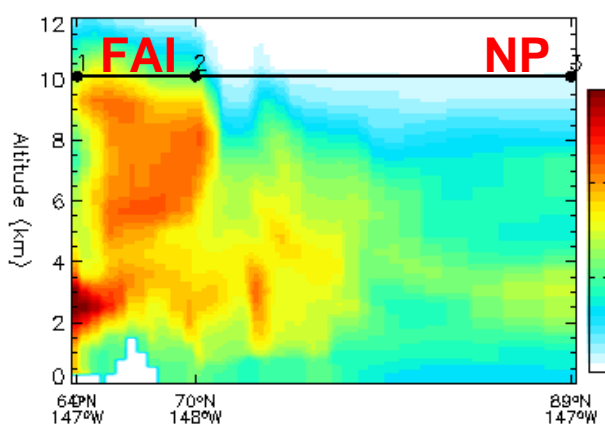


19th



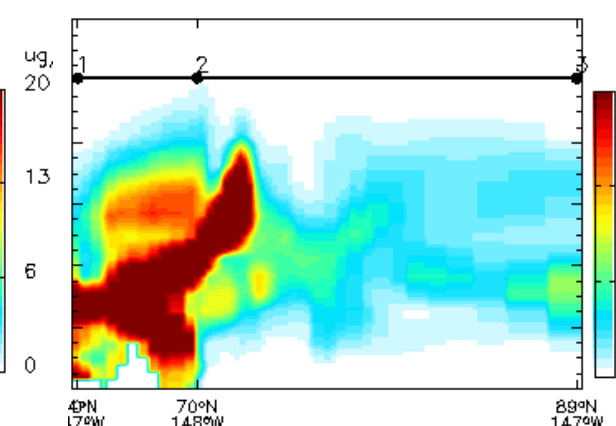
Dust (ug/m³)

18th



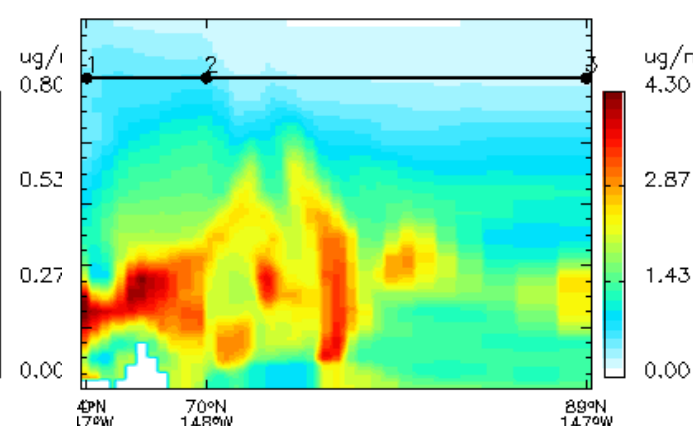
Biomass OC (ug/m³)

18th

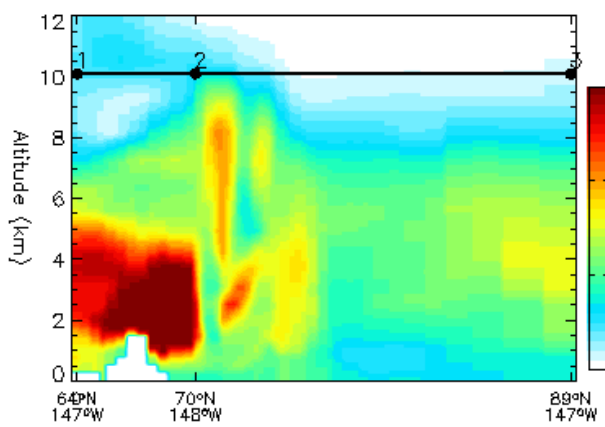


Sulfate (ug/m³)

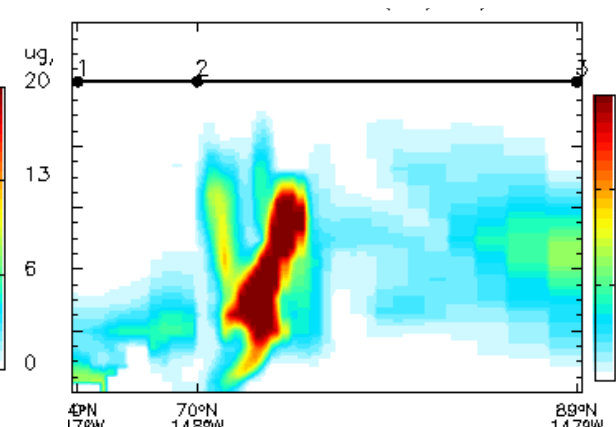
18th



19th



19th



19th

