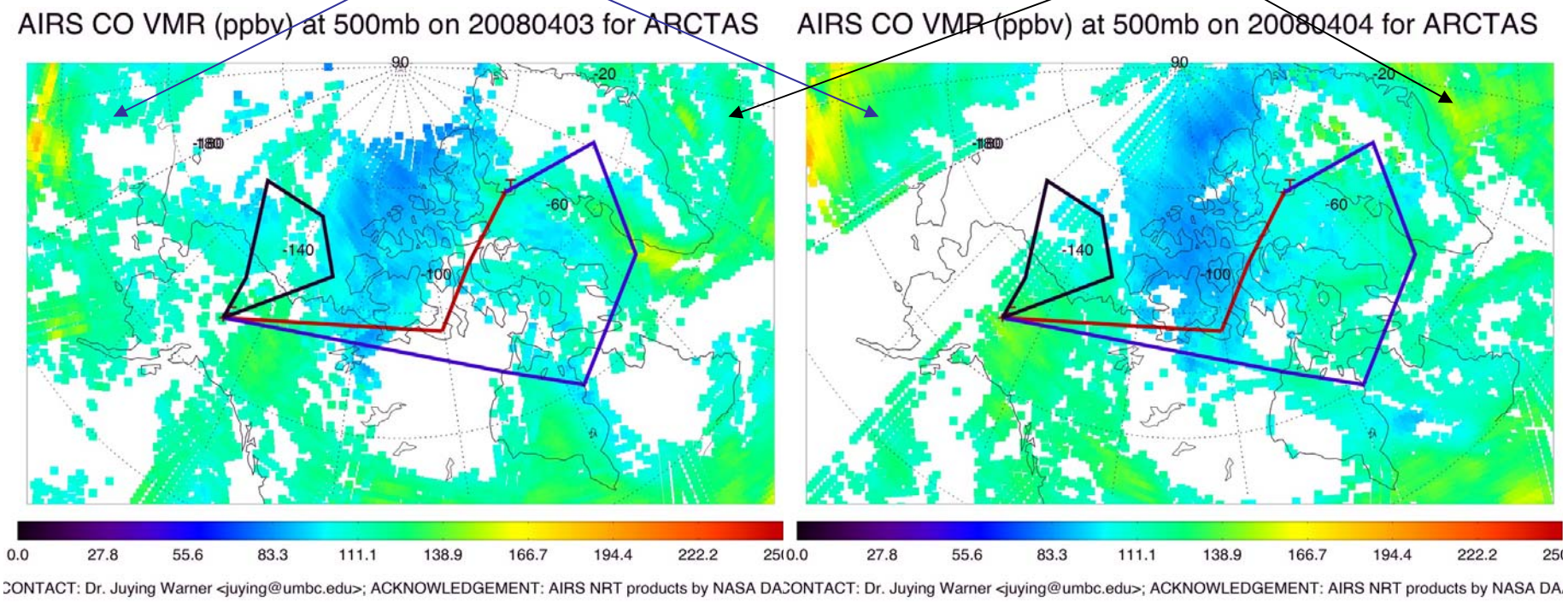
AIRS NRT ARCTAS Support:

Latest CO

Increased Asian transport

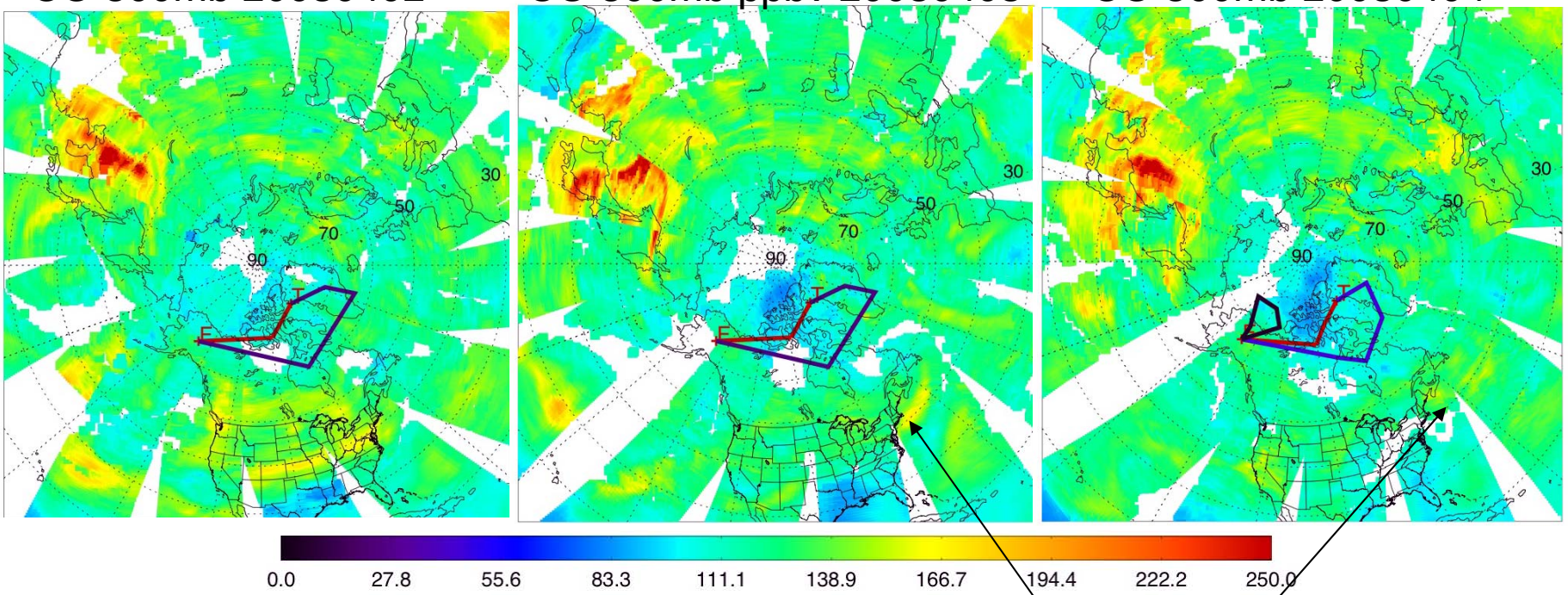
Increased CO



AIRS NRT ARCTAS Support:

CO Asian Transport Continues, but slowly

CO 500mb 20080402 | CO 500mb ppbv 20080403 | CO 500mb 20080404



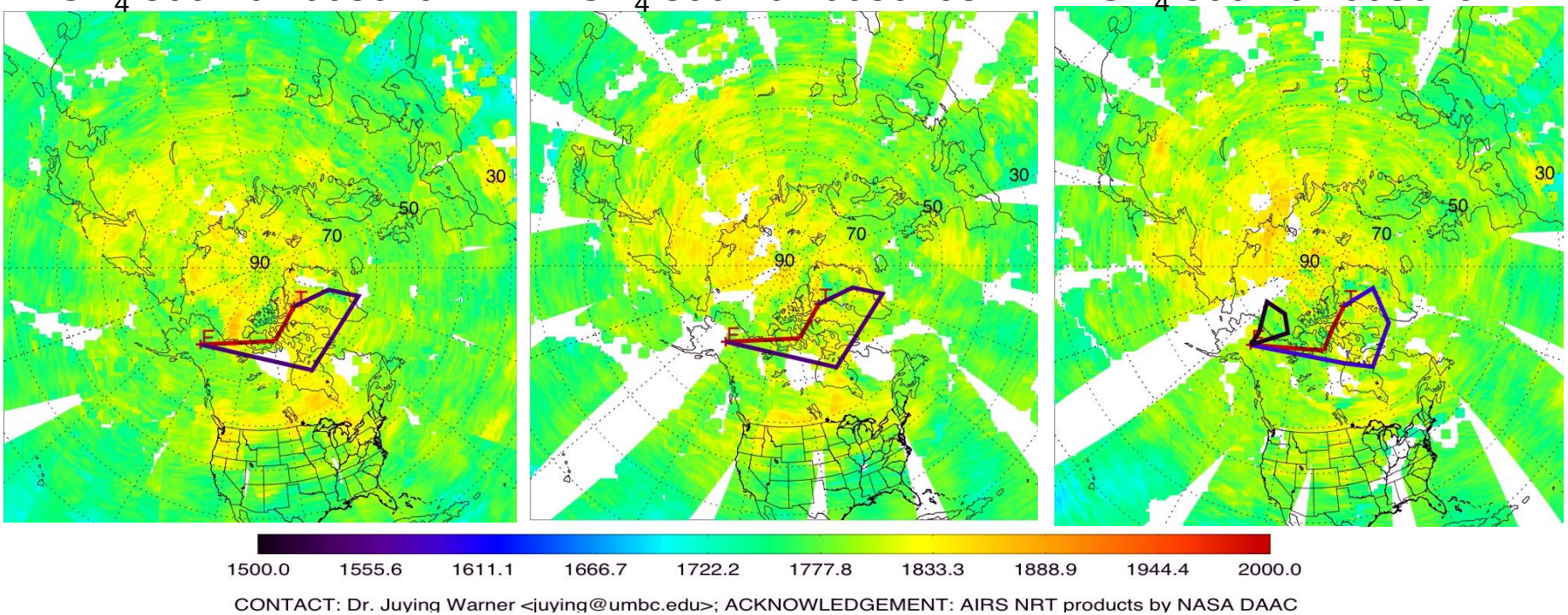
CONTACT: Dr. Juying Warner <juying@umbc.edu>; ACKNOWLEDGEMENT: AIRS NRT products by NASA DAAC

US outflow seemed dissipating

AIRS NRT ARCTAS Support:

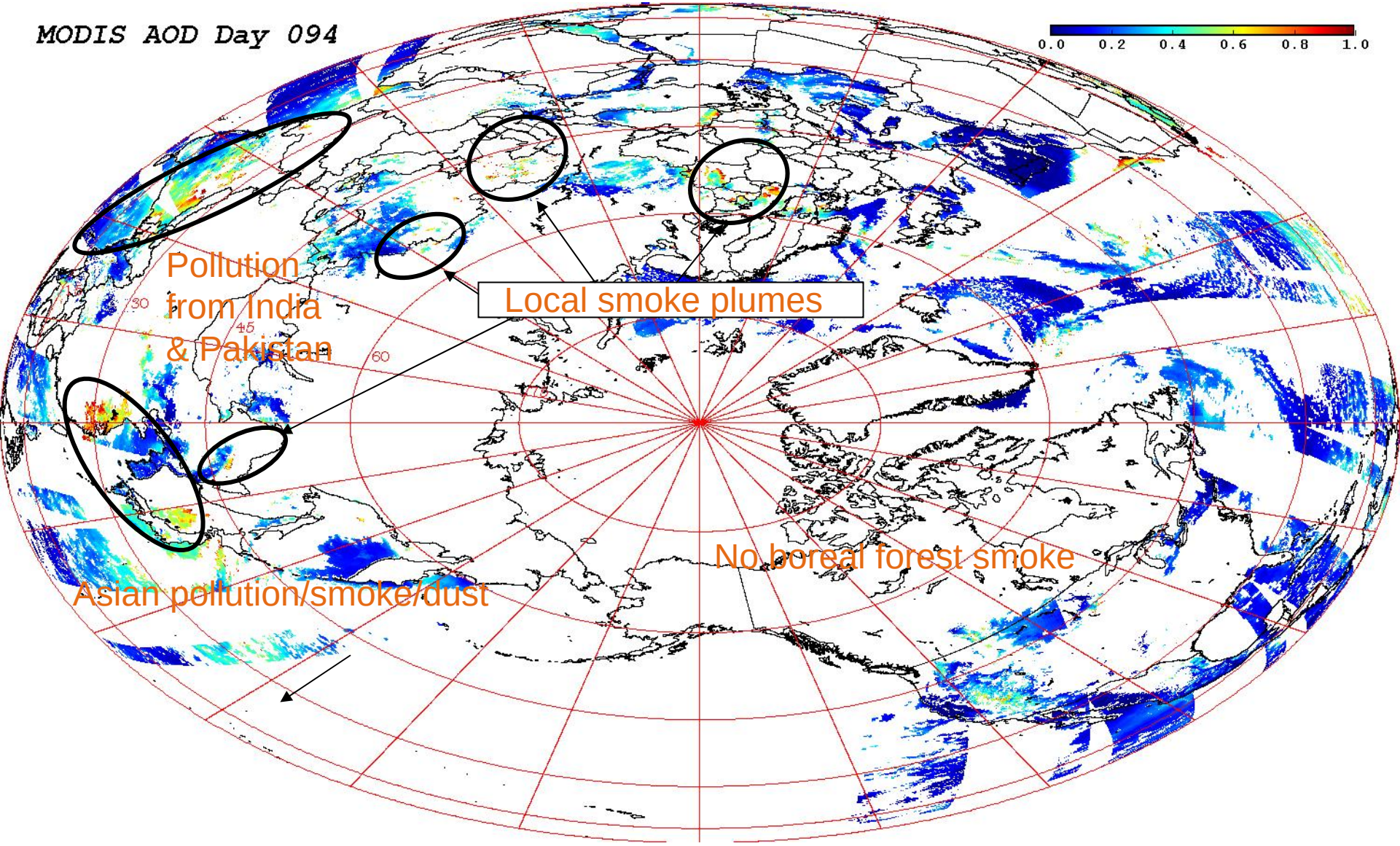
CH_4 April 2-4, 08

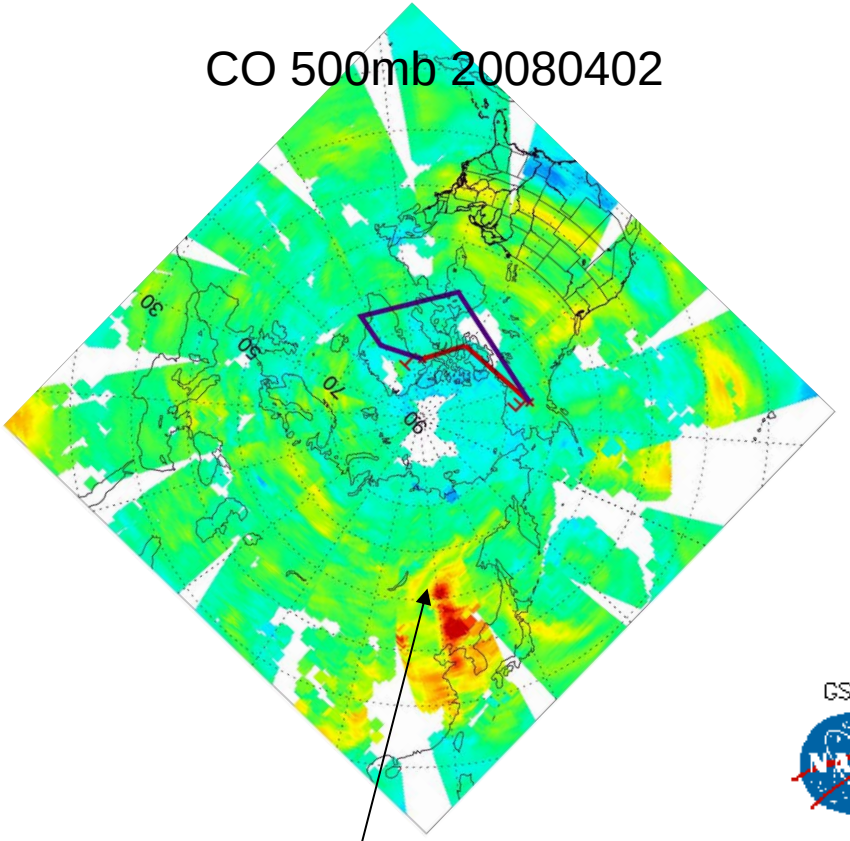
CH_4 300mb 20080402 | CH_4 300mb 20080403 | CH_4 300mb 20080404

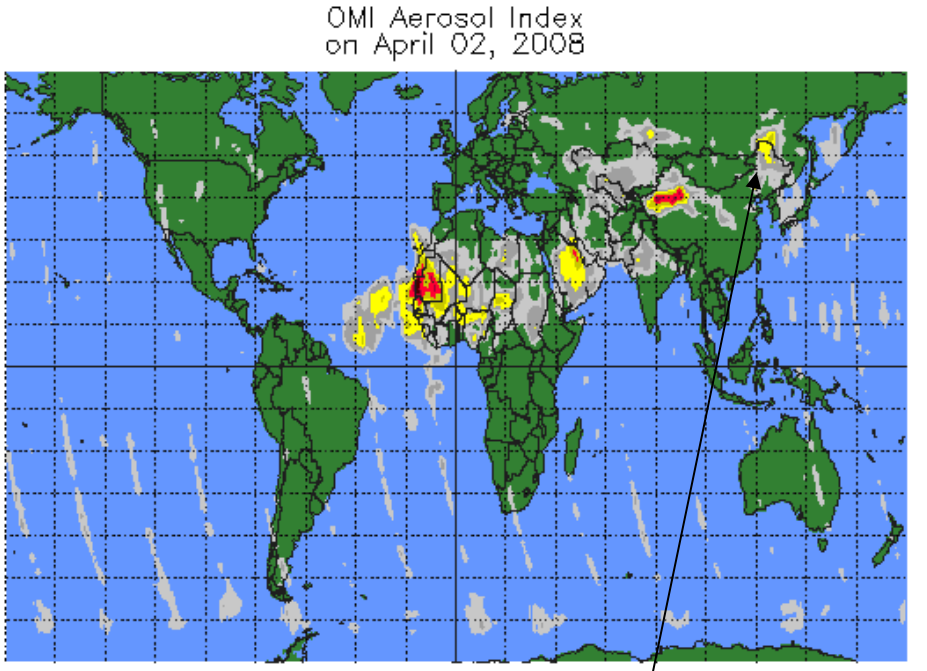


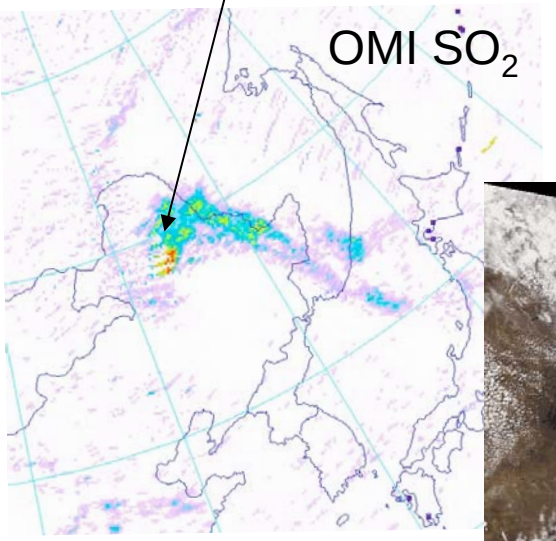
- CH4 concentrations seem to have slightly decreased over Canada or more evenly distributed.
- CH4 has been high over the Arctic compared to Mid-latitudes.

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

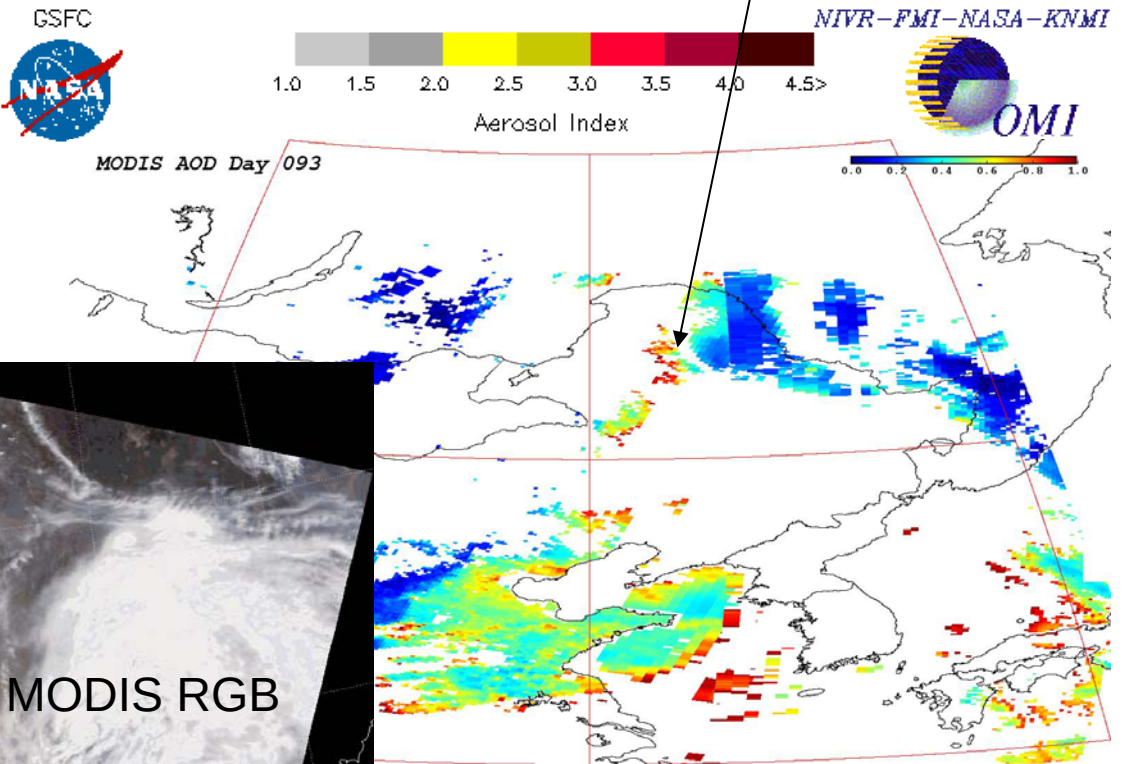



CO 500mb 20080402


OMI Aerosol Index
on April 02, 2008


OMI SO_2

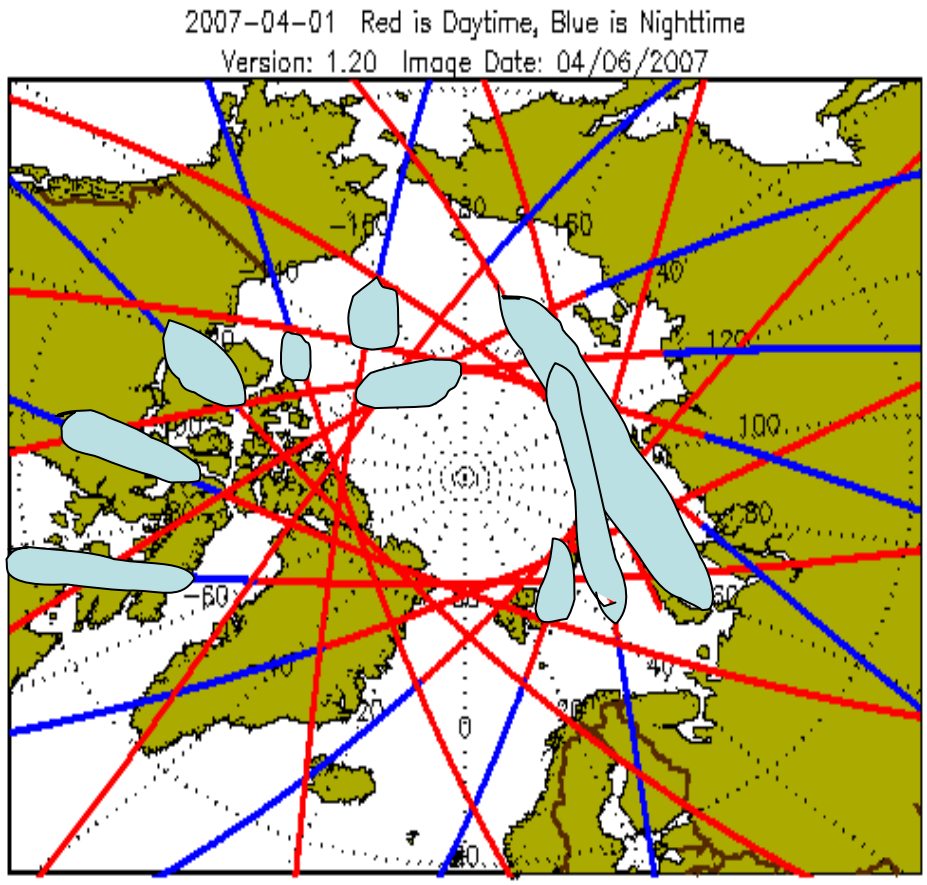
MODIS RGB


GSFC
NIVR–FMI–NASA–KNMI
1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5>
Aerosol Index
OMI
MODIS AOD Day 093
0.0 0.2 0.4 0.6 0.8 1.0

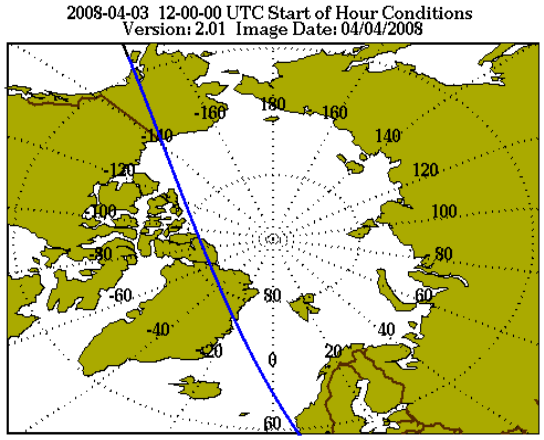
CALIPSO Observations
3 April 2008

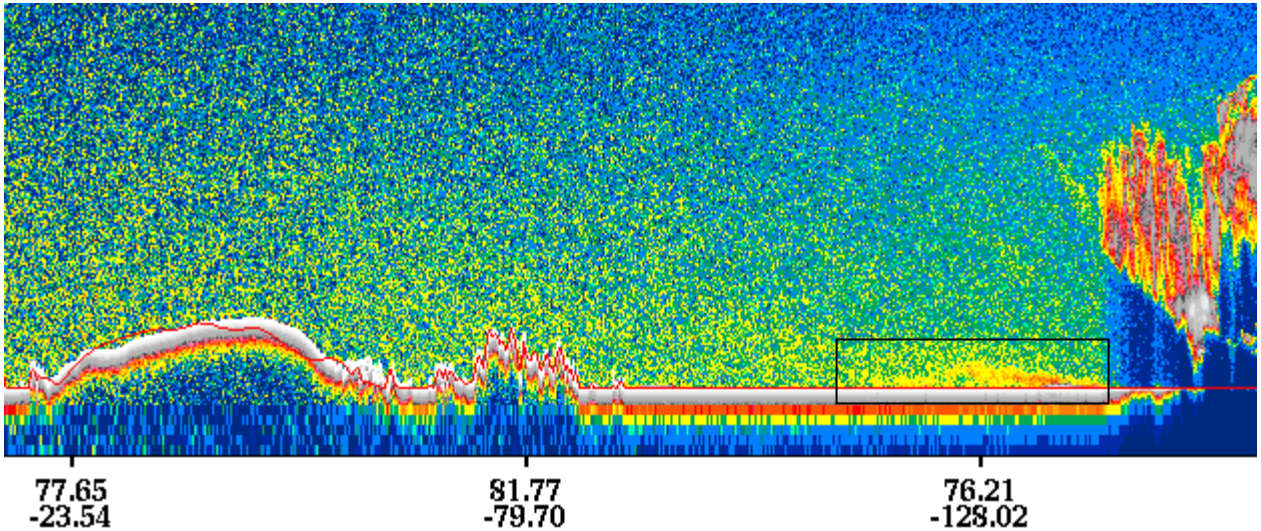
CALIPSO IAB Hot Spots

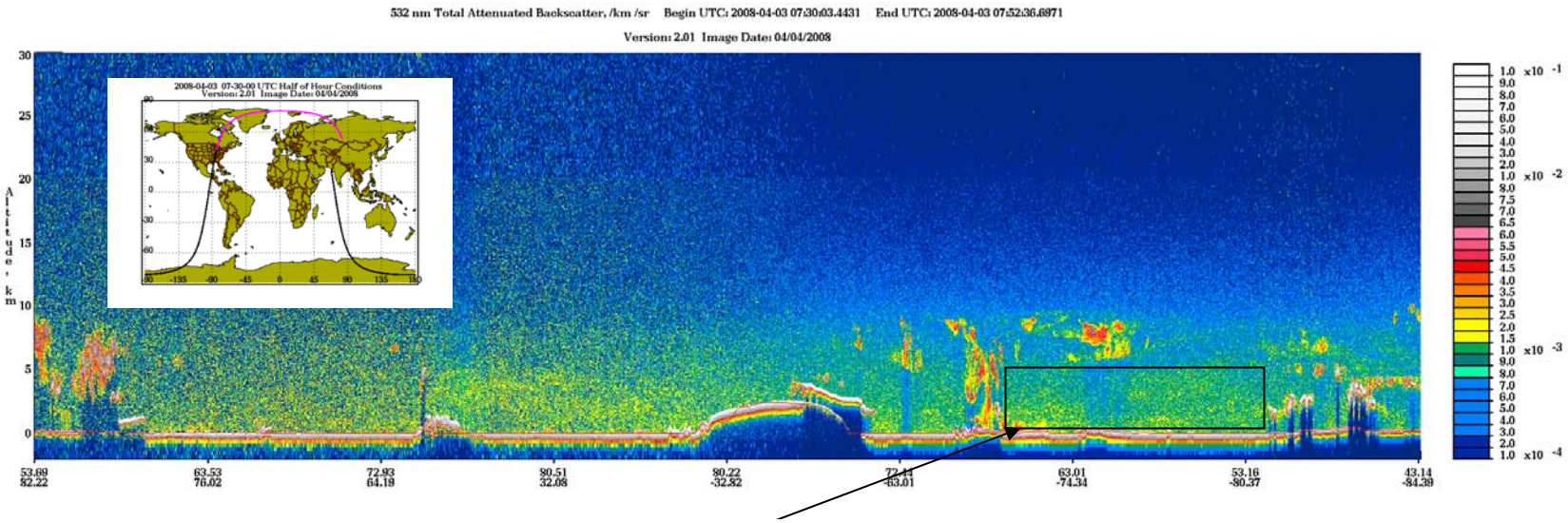
Surrogate for 3 April map:

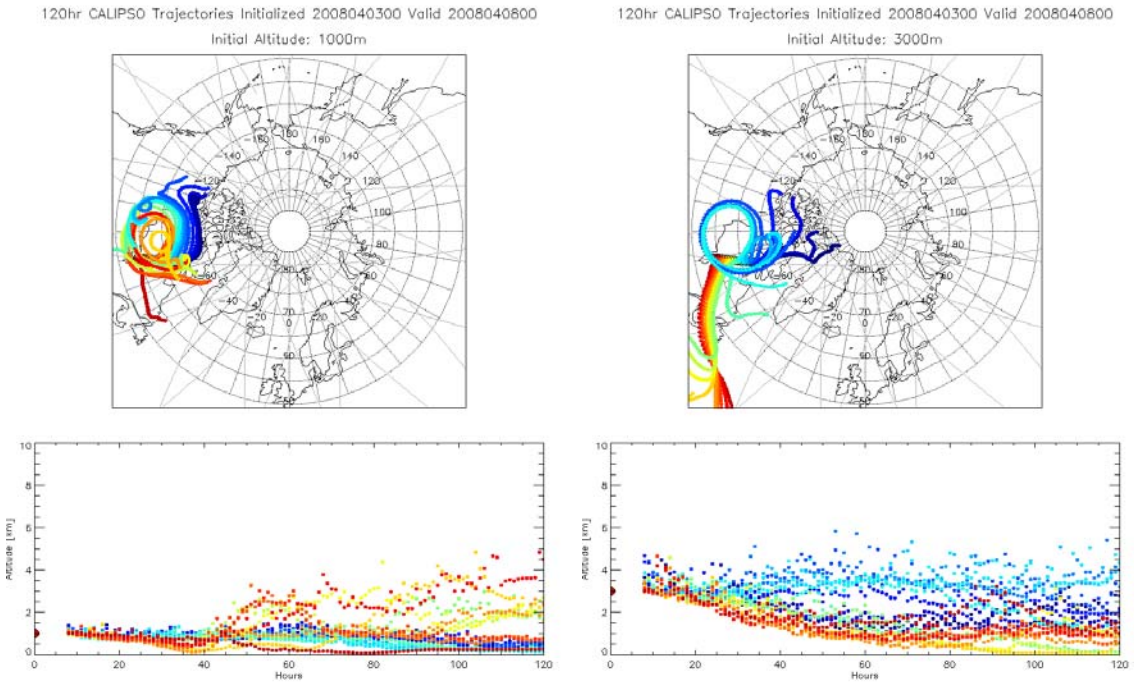


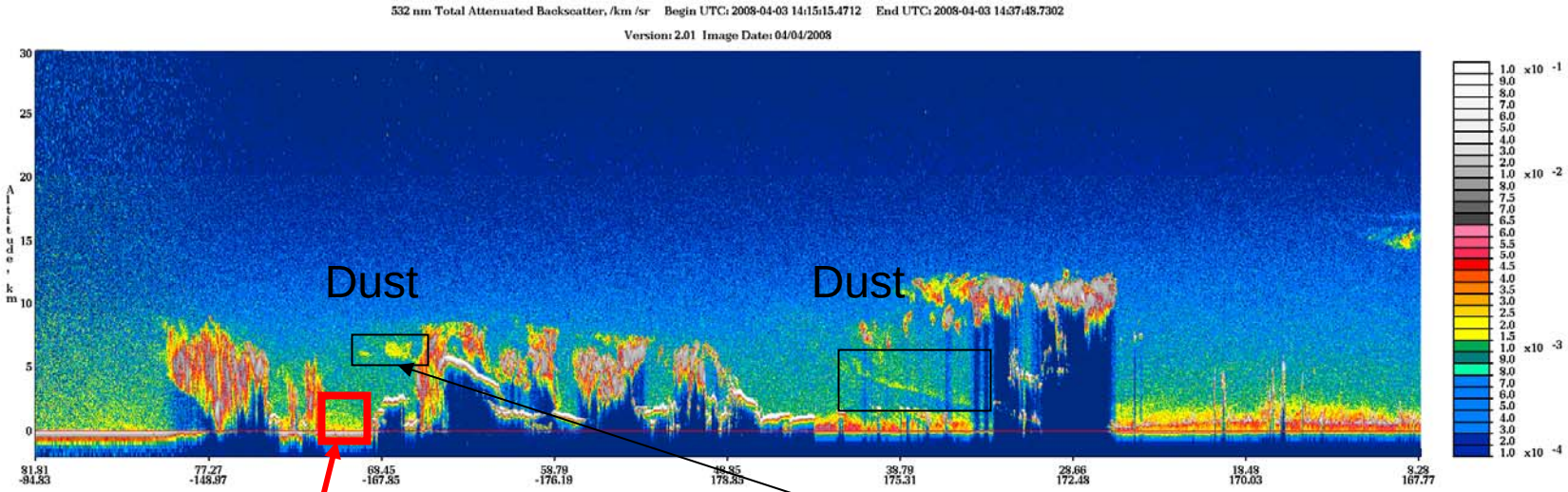
Aerosol observed north of Canadian coast

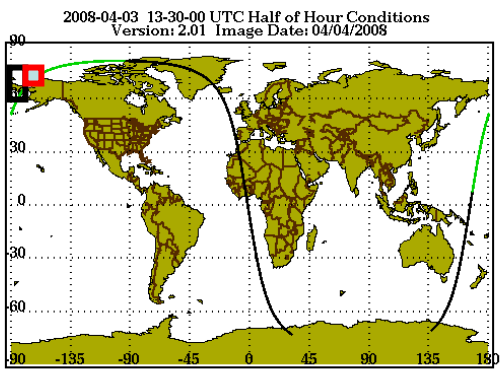


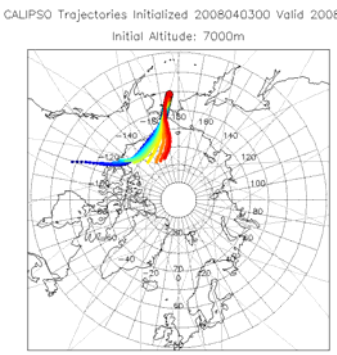



532 nm Total Attenuated Backscatter, /km /sr Begin UTC: 2008-04-03 07:30:03.4431 End UTC: 2008-04-03 07:52:36.6971
Version: 2.01 Image Date: 04/04/2008
2008-04-03 07-30-00 UTC Half of Hour Conditions
Version: 2.01 Image Date: 04/04/2008
Altitude - km
53.69 82.22
63.53 76.02
72.93 64.19
80.51 32.08
80.22 -32.82
72.14 -63.01
63.01 -74.34
53.16 -80.37
43.14 -84.39

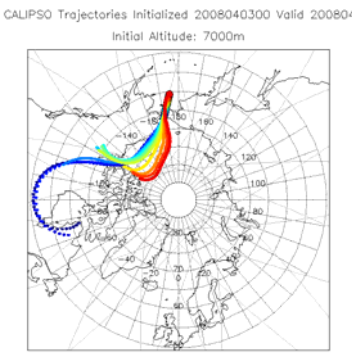

120hr CALIPSO Trajectories Initialized 2008040300 Valid 2008040800
Initial Altitude: 1000m
120hr CALIPSO Trajectories Initialized 2008040300 Valid 2008040800
Initial Altitude: 3000m
Altitude [km]
Hours



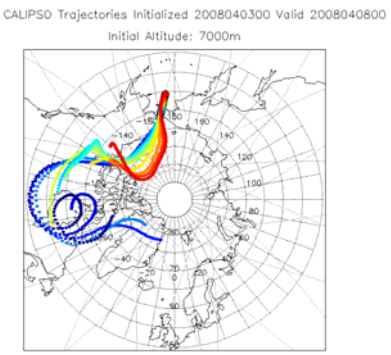


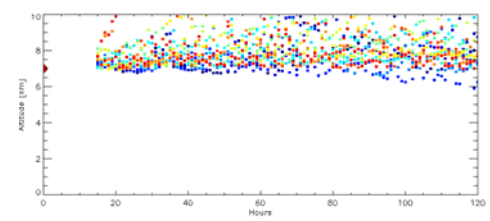


4/5 00Z

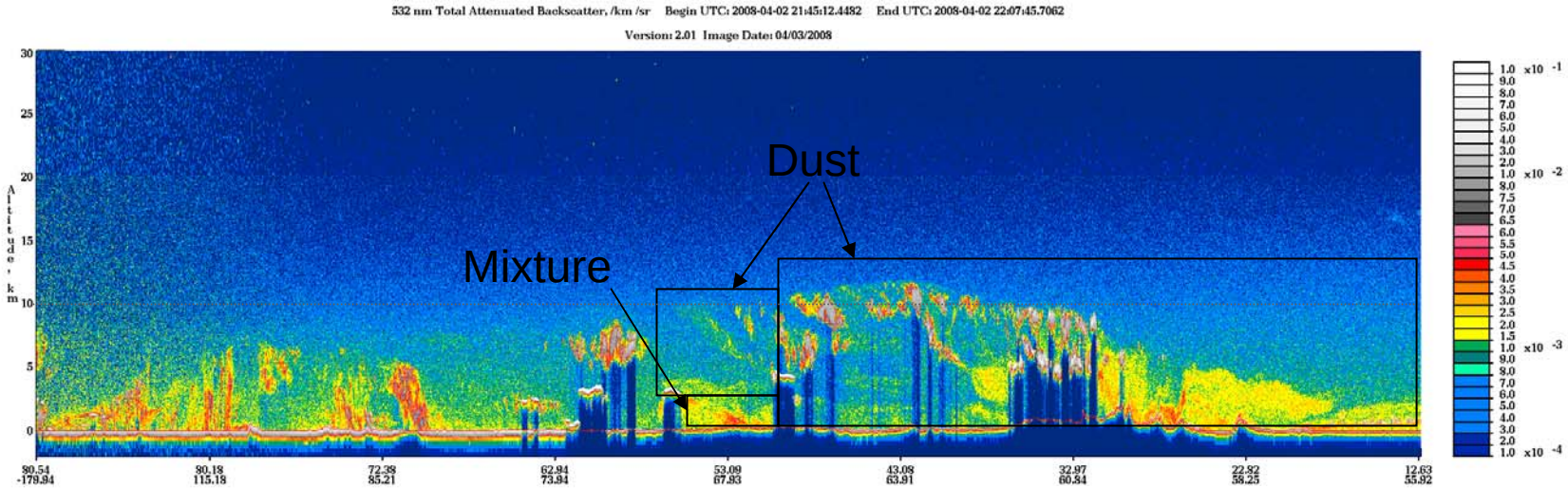


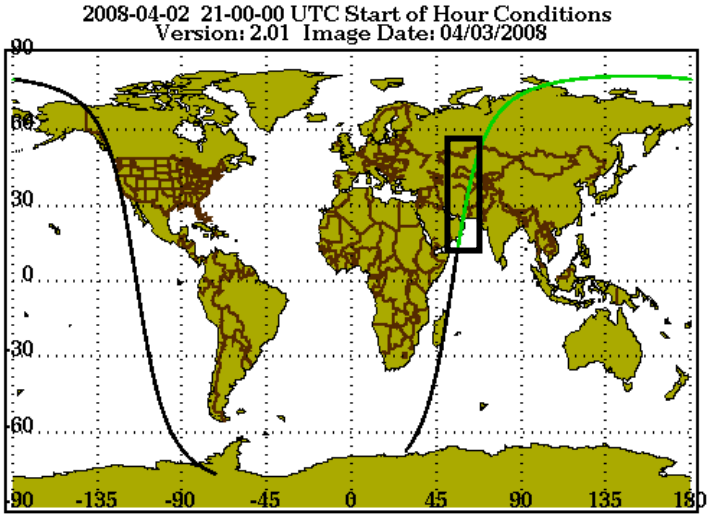
4/6 00Z

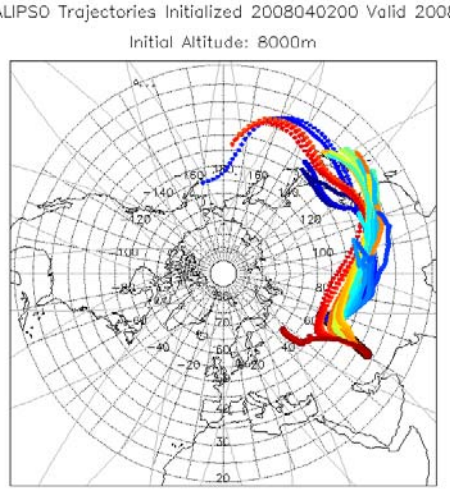




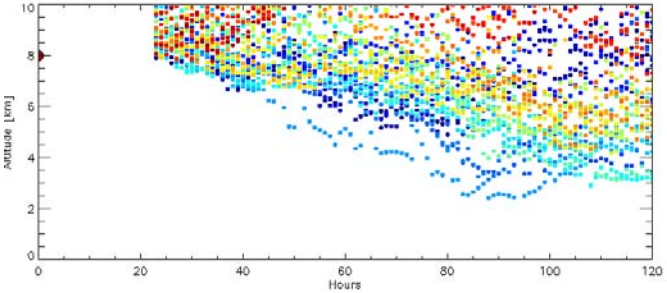
4/8 00Z



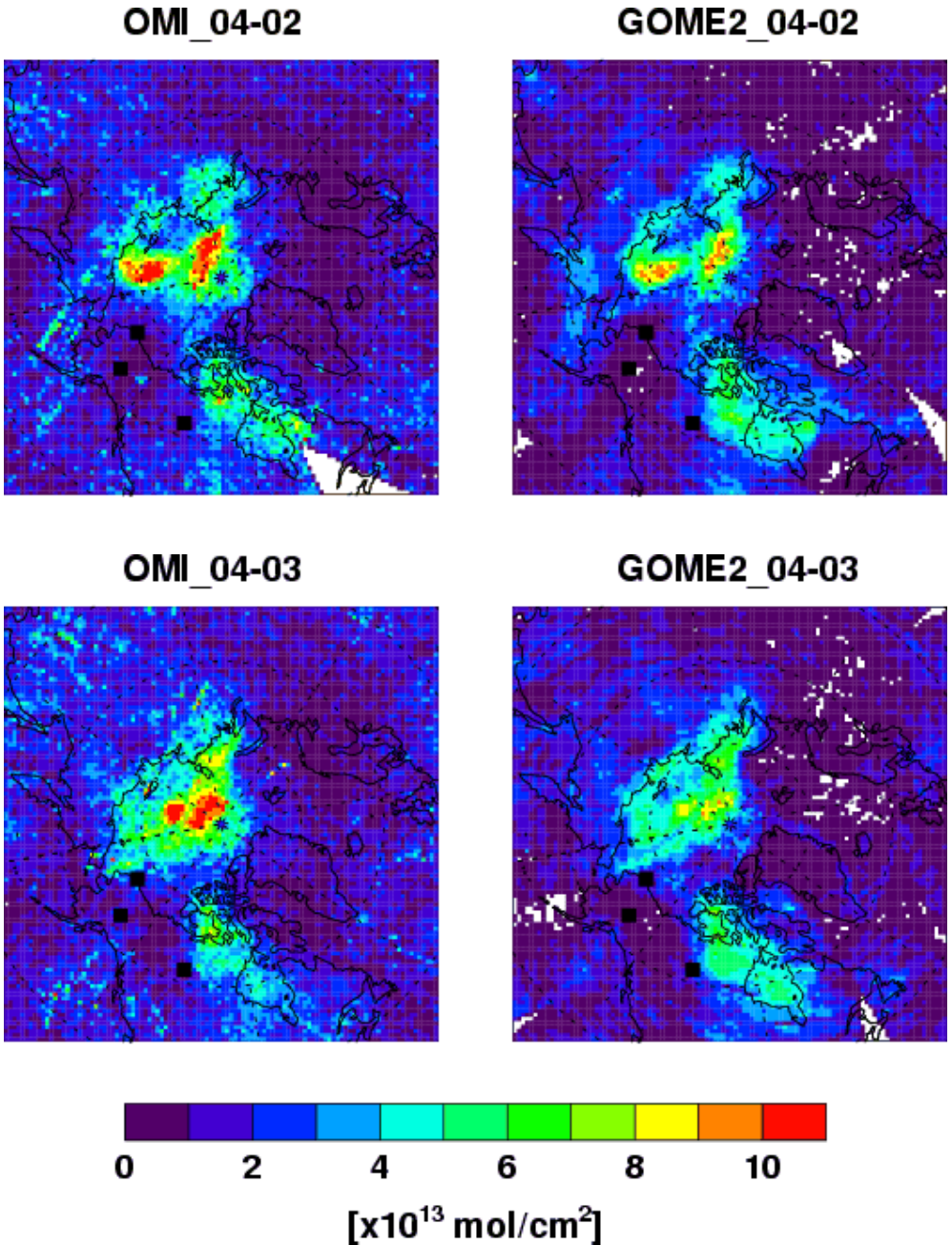




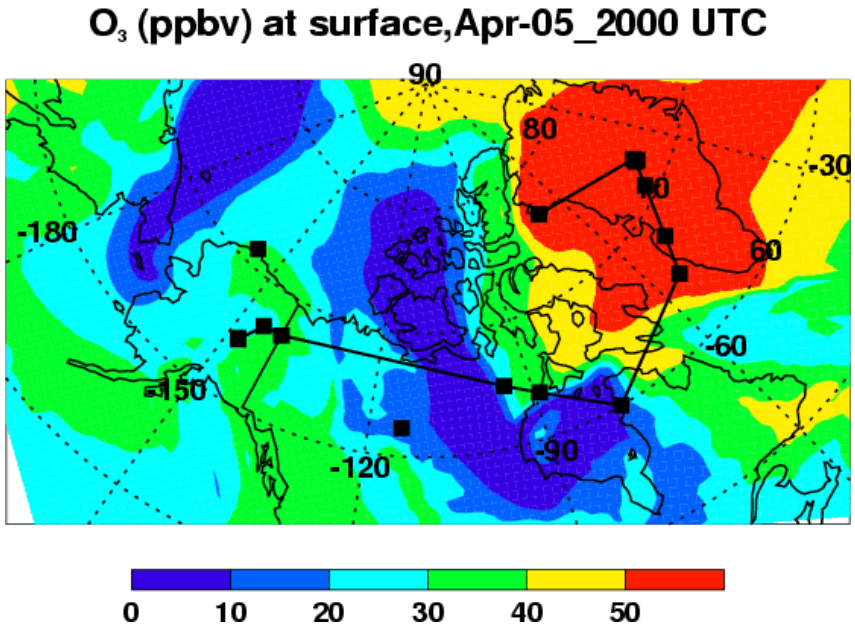
Initial Altitude=8km

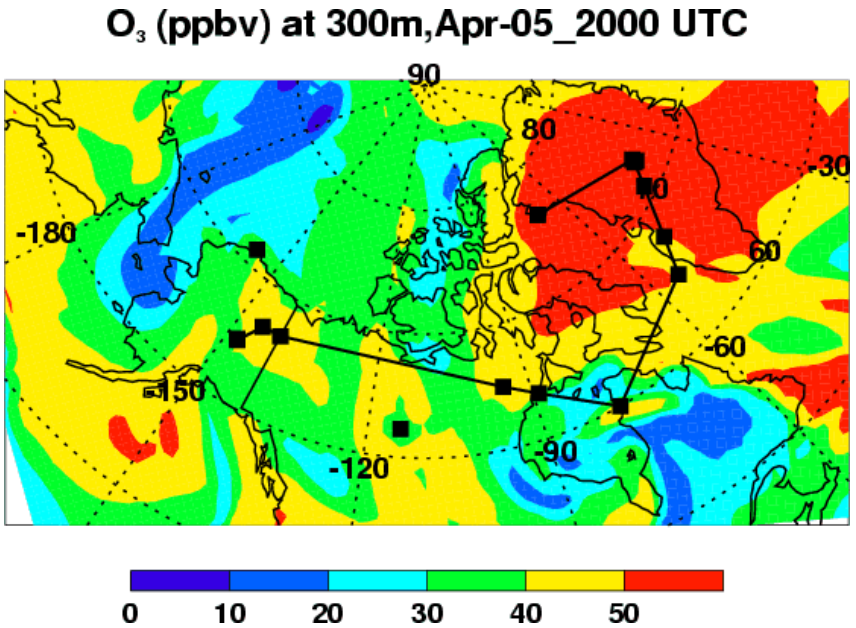


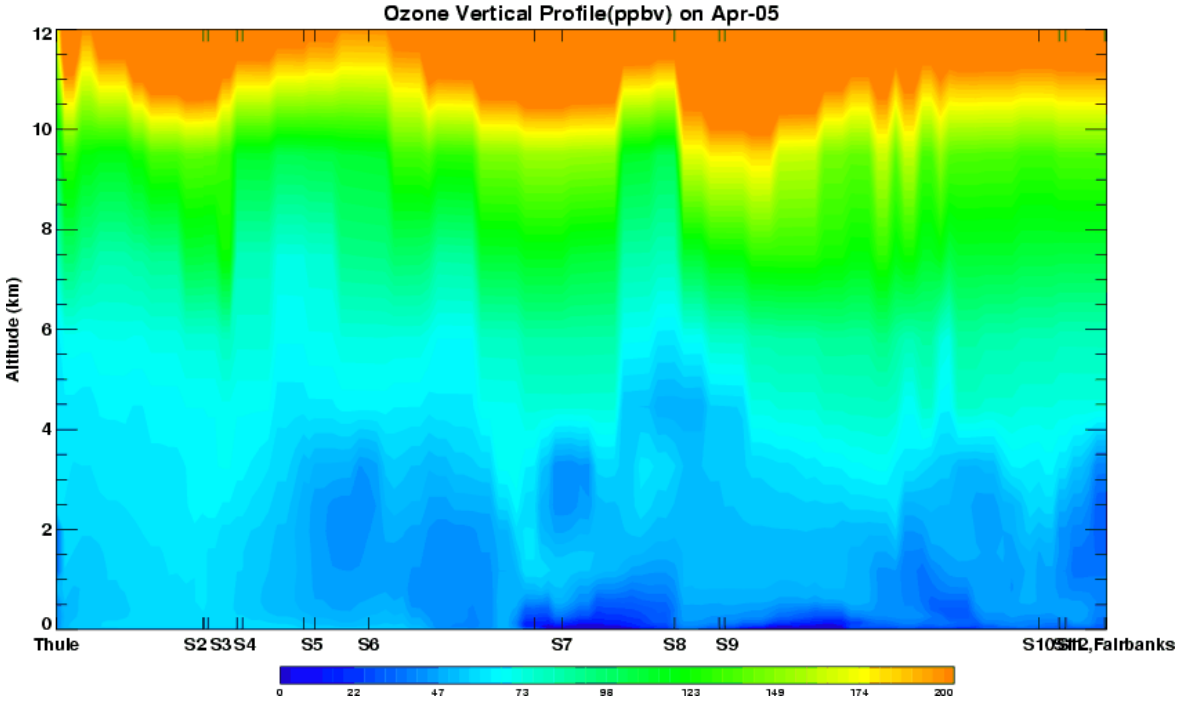
Boundary Layer BrO



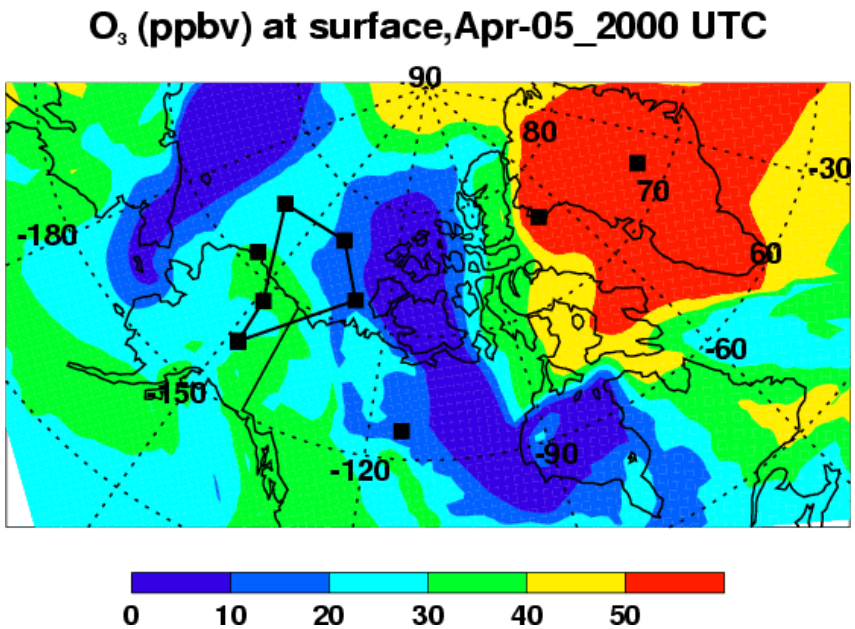
O3 profile from Thule to Fairbanks on 4/5

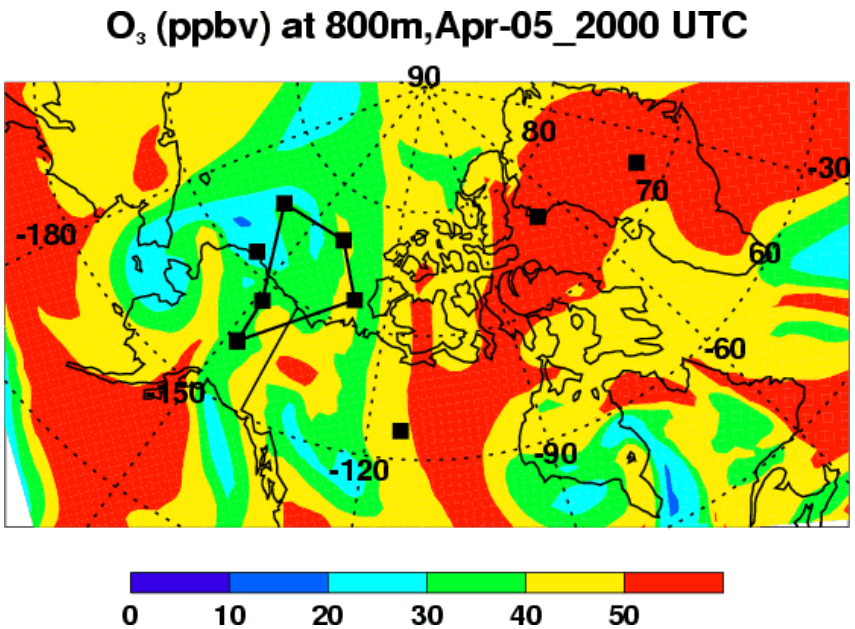


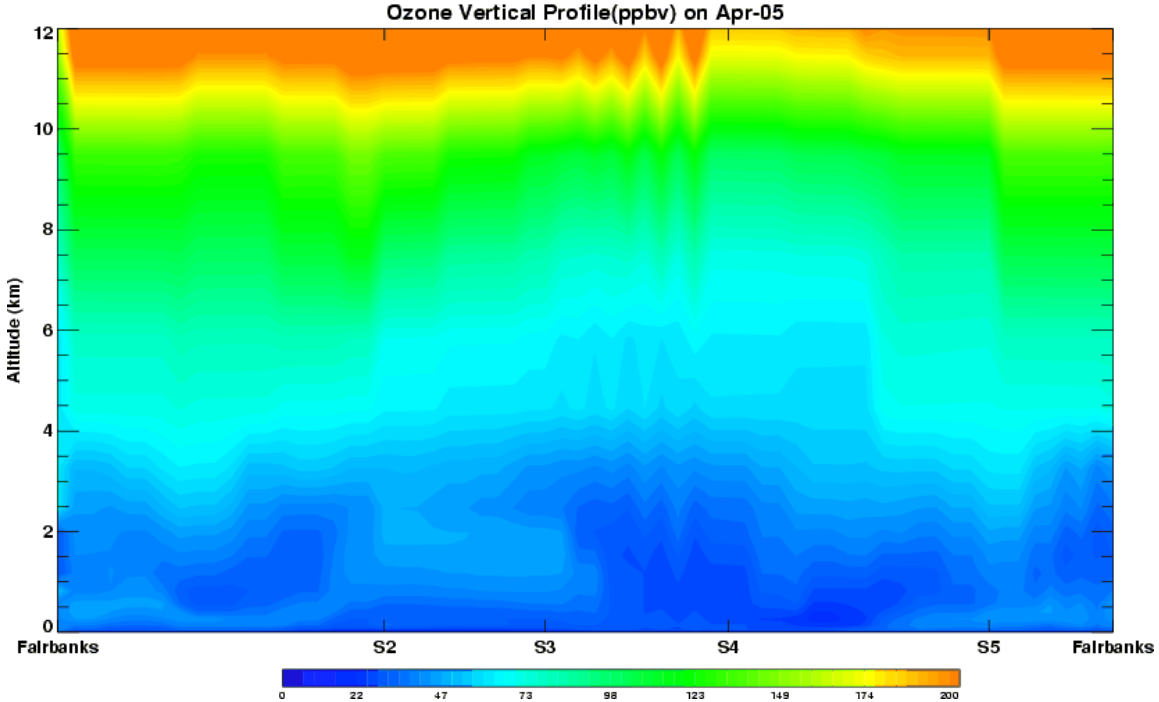




O3 profile along P3 flight track on 4/5





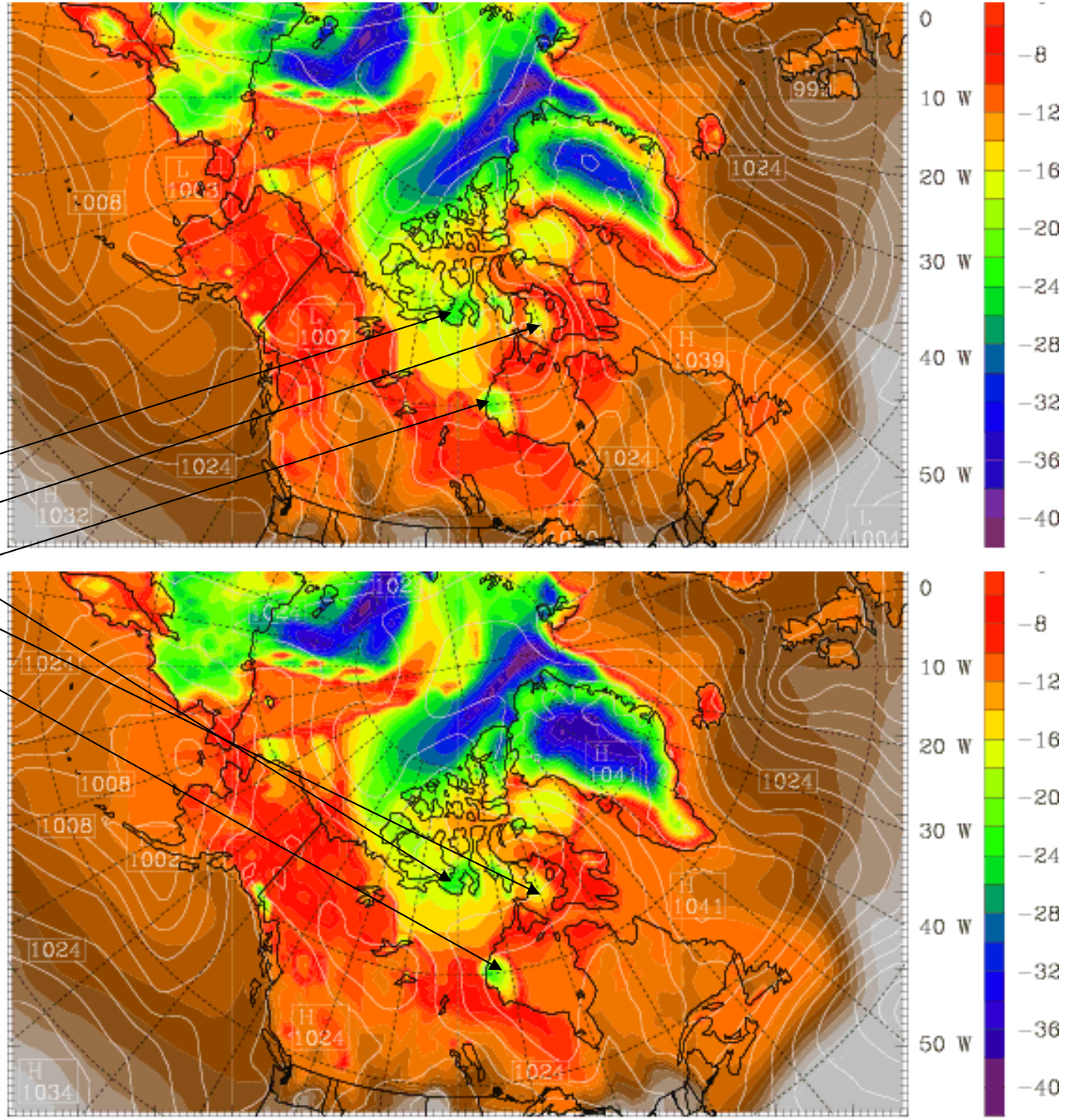


sfc T

Monday, 4/7

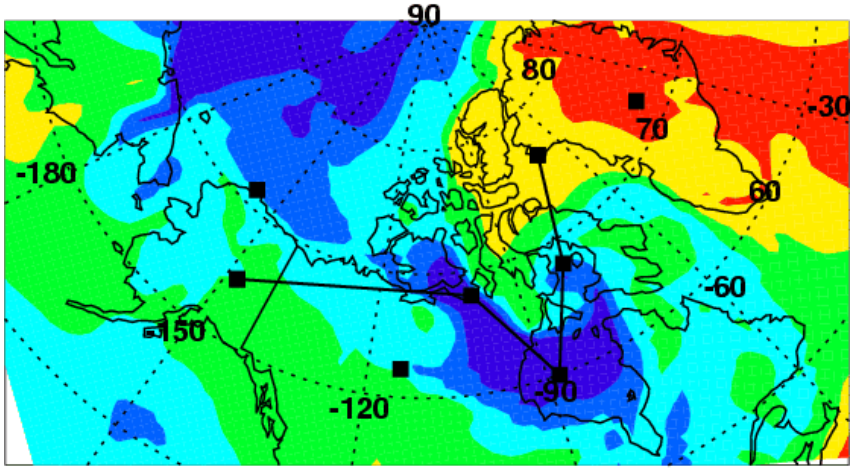
Cold center

Tuesday, 4/8

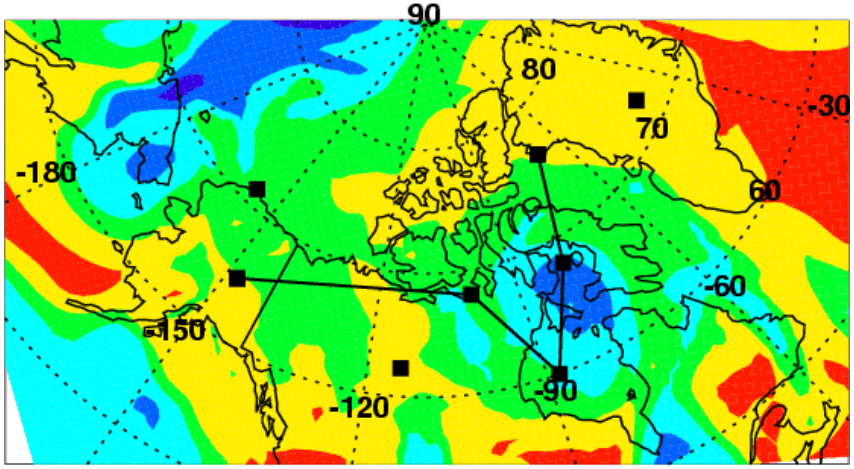


Proposed Flight from Fairbanks - Thule on 4/7 or 4/8

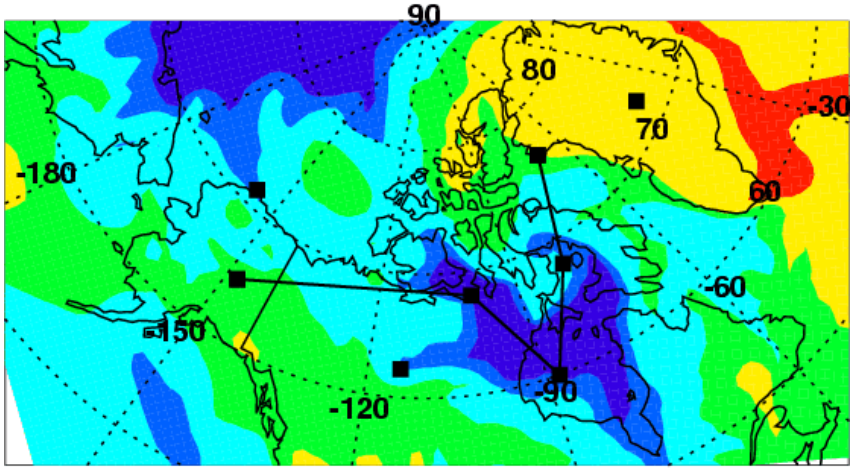
O_3 (ppbv) at surface,Apr-07_2000 UTC



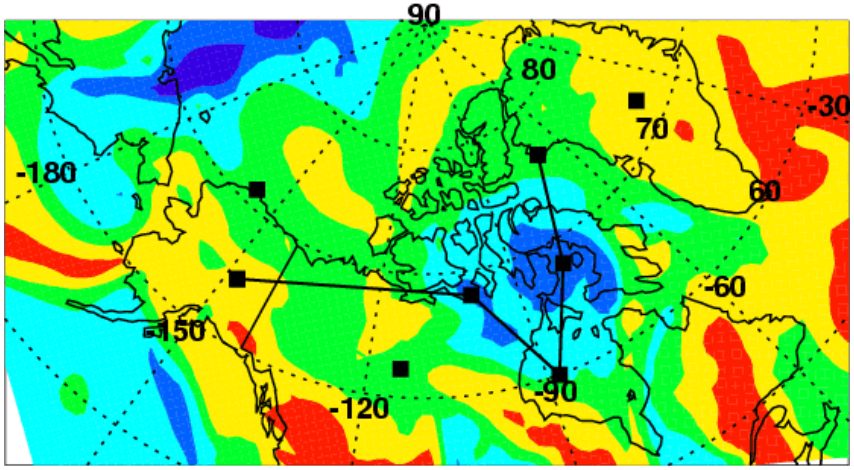
O_3 (ppbv) at 300m,Apr-07_2000 UTC

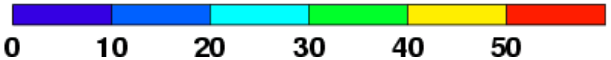


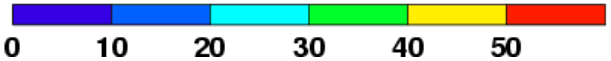
O_3 (ppbv) at surface,Apr-08_2000 UTC



O_3 (ppbv) at 300m,Apr-08_2000 UTC





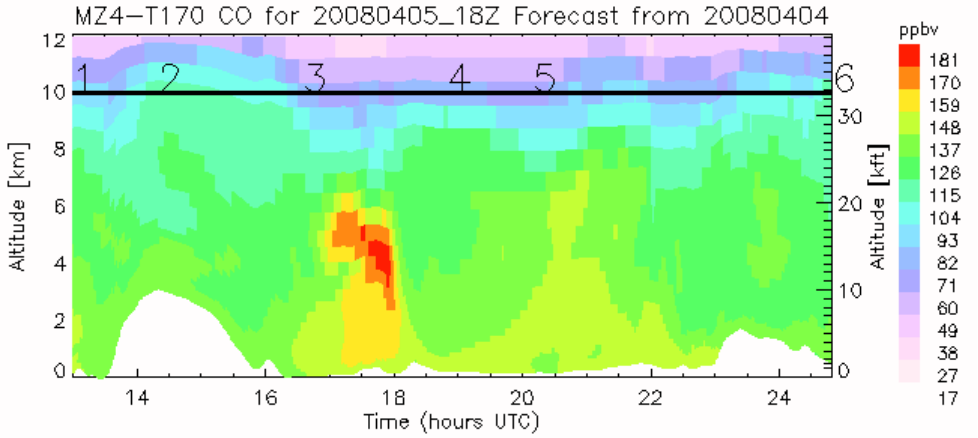


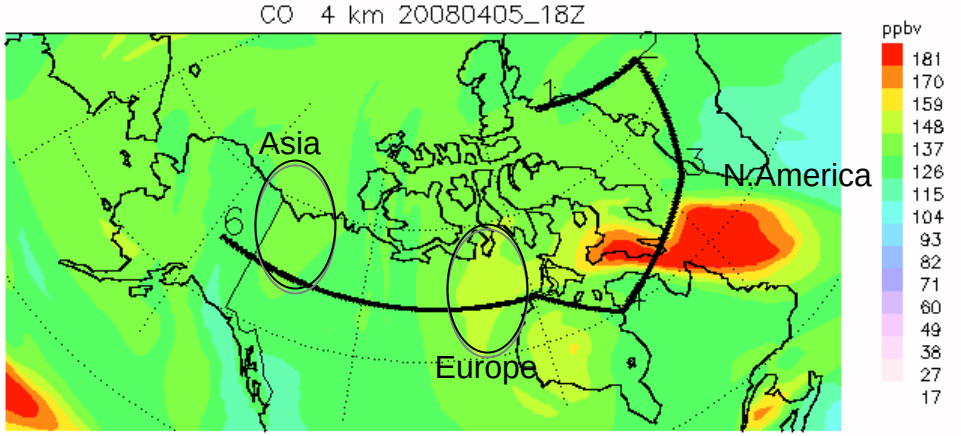
Apr 5 Thule - Fairbanks

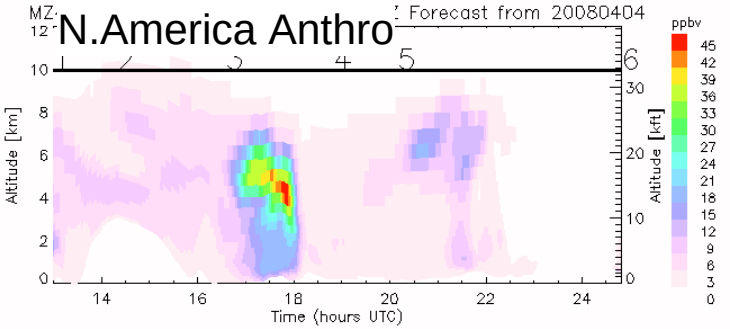
MZ4 forecast from Apr 4 for Apr 5 18Z

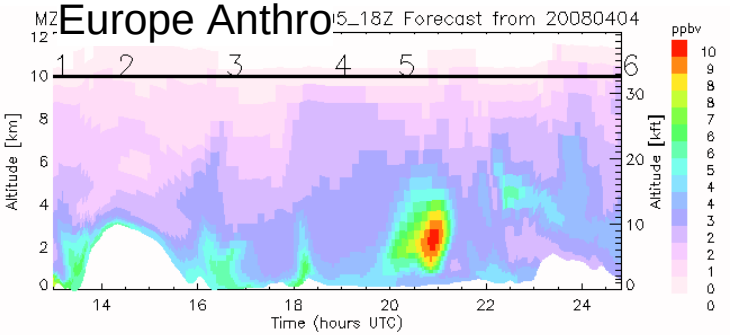
Freshest N.America Pollution S of Ellesmere I
Weak Europe plume NW of Hudson Bay
Asian pollution at end of flight

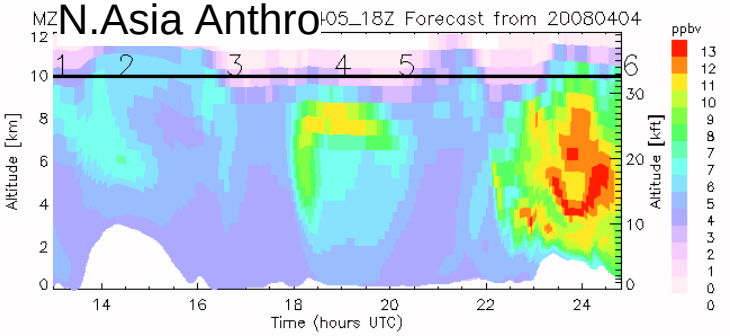
MOZART CO

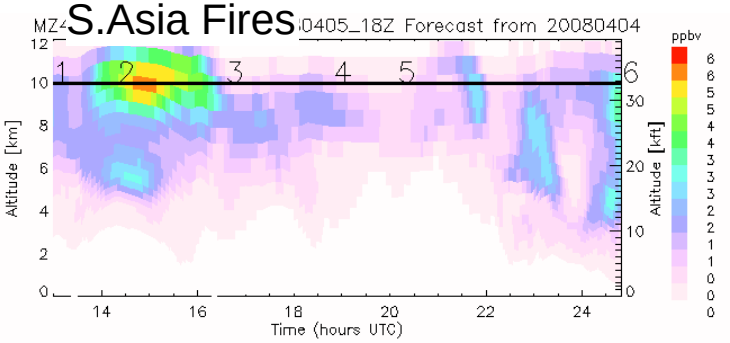










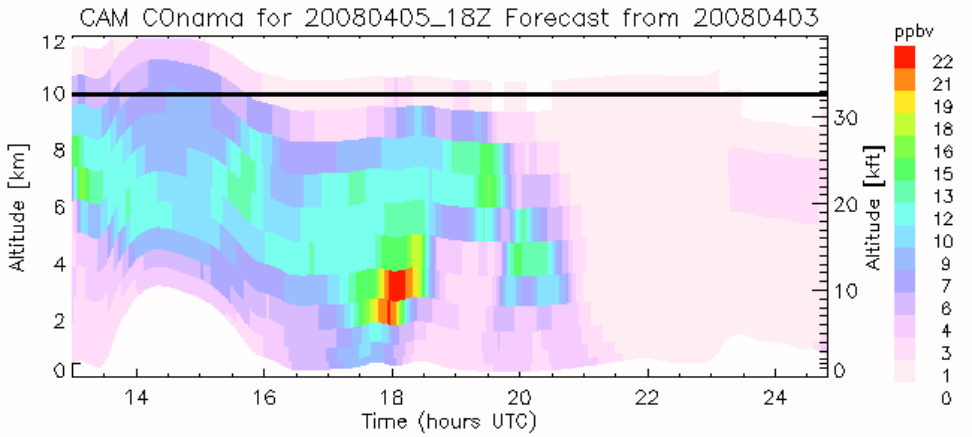


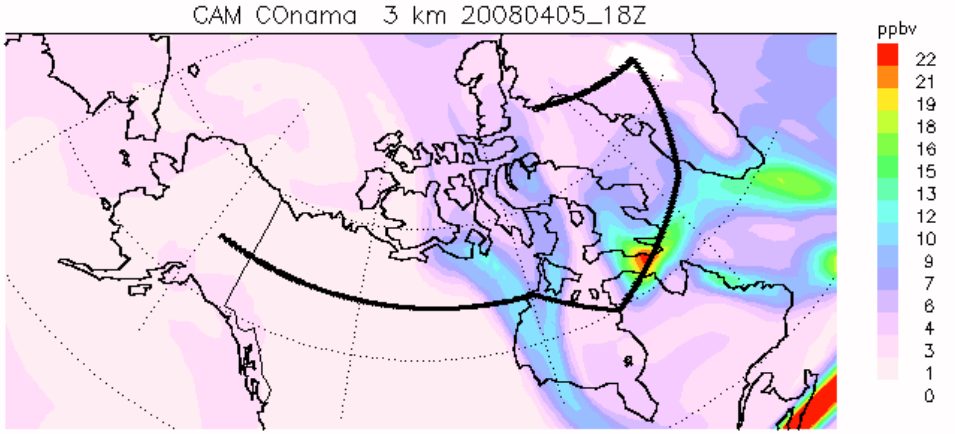
Apr 5 Thule - Fairbanks

CAM/DART forecast from Apr 3 12Z for Apr 5 18Z

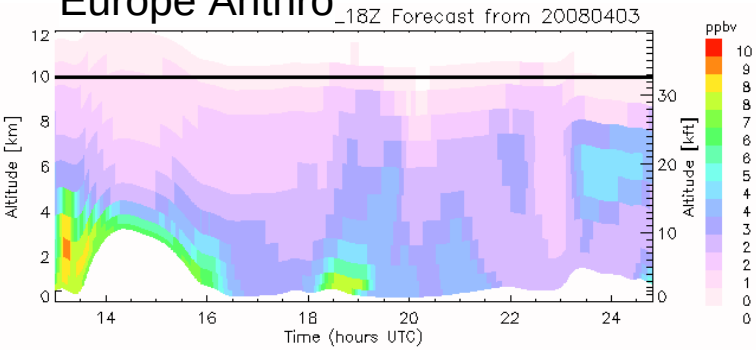
CAM-Chem – assimilation of MOPITT CO, MODIS AOD, NCEP met. obs. – free-running forecasts

CAM-Chem/DART N. America CO

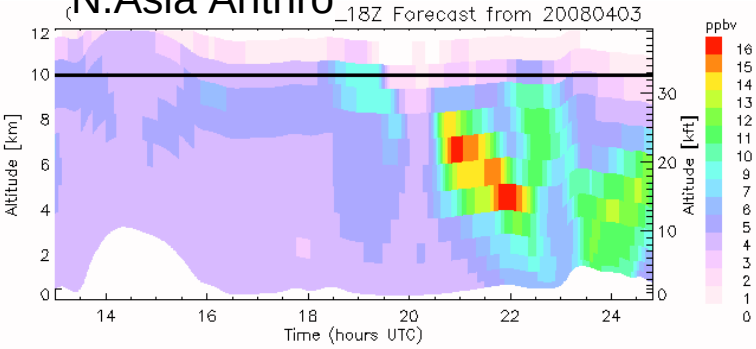




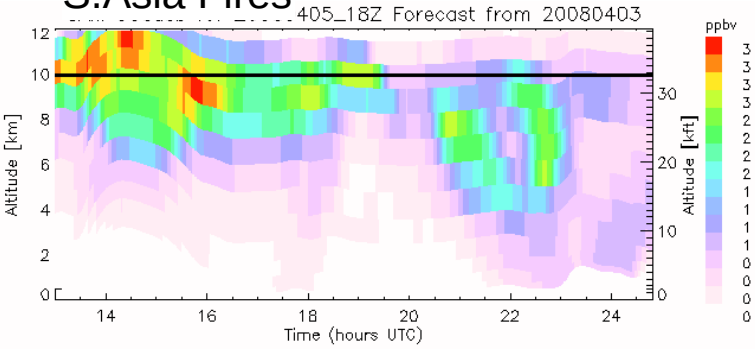
Europe Anthro



N.Asia Anthro



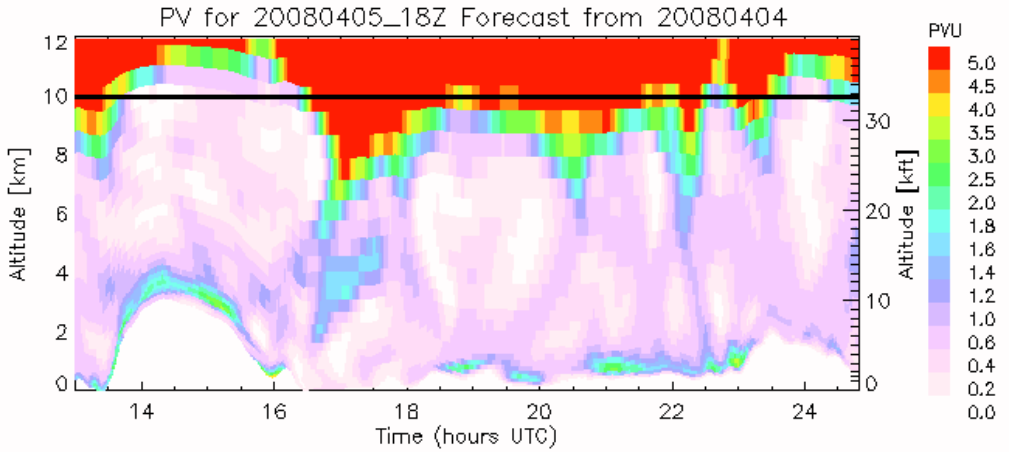
S.Asia Fires

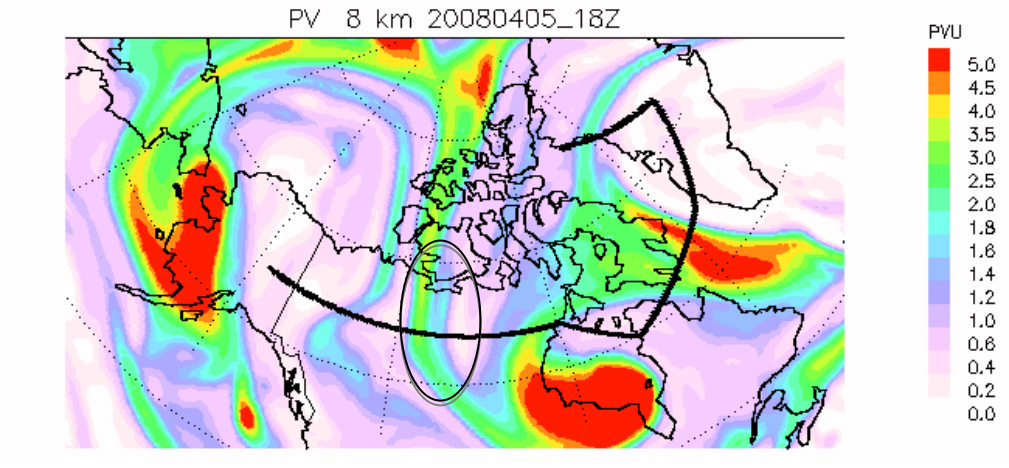


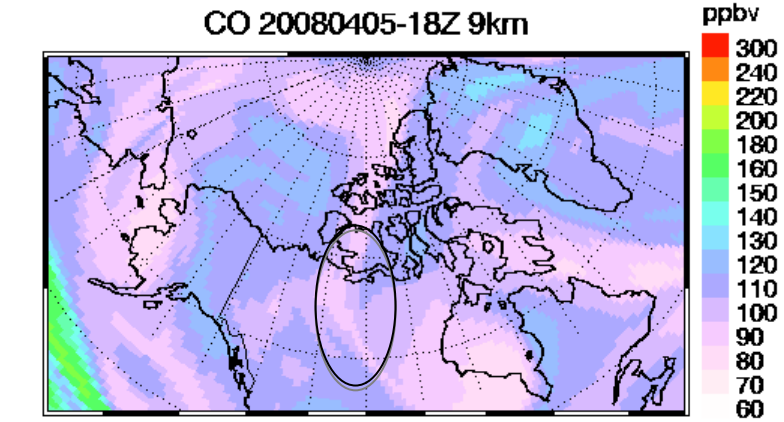
Apr 5 Thule - Fairbanks

MZ4 forecast for Apr 5 18Z

Will cross strat intrusion again – high PV and low CO

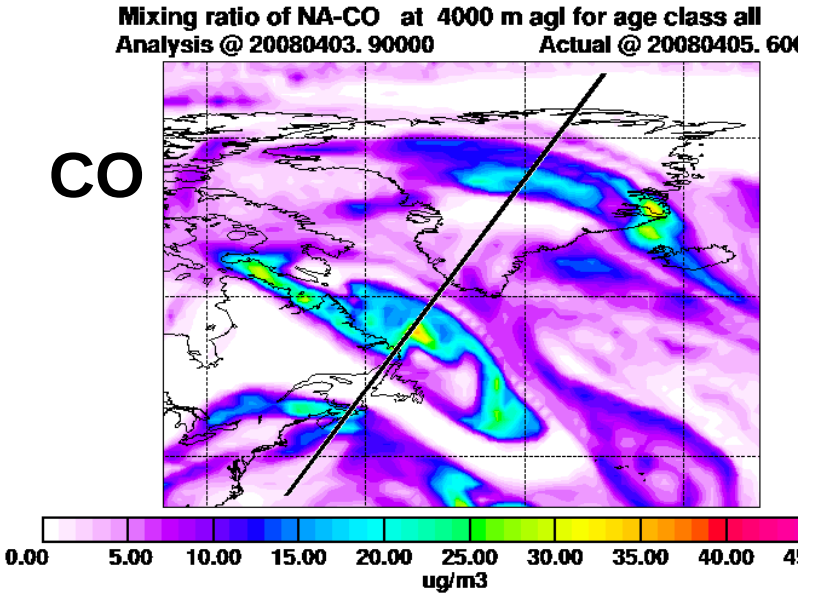


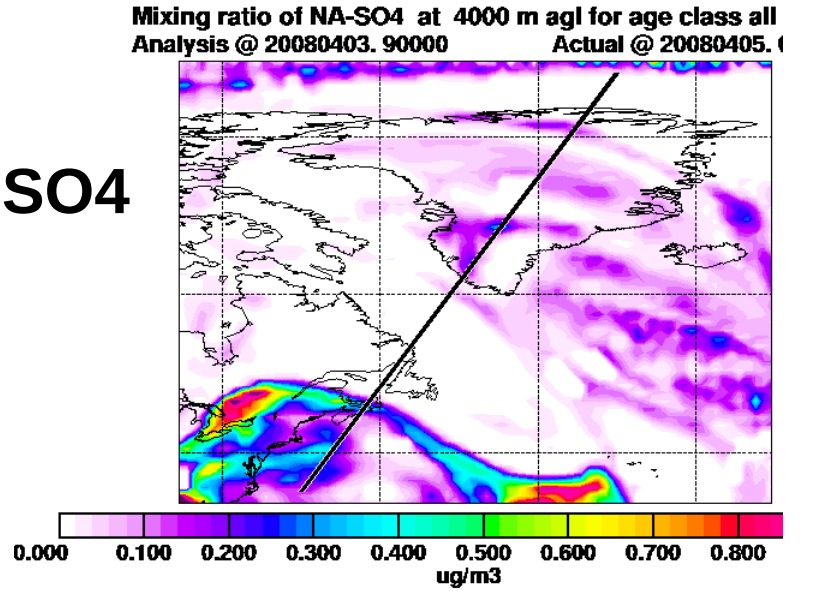


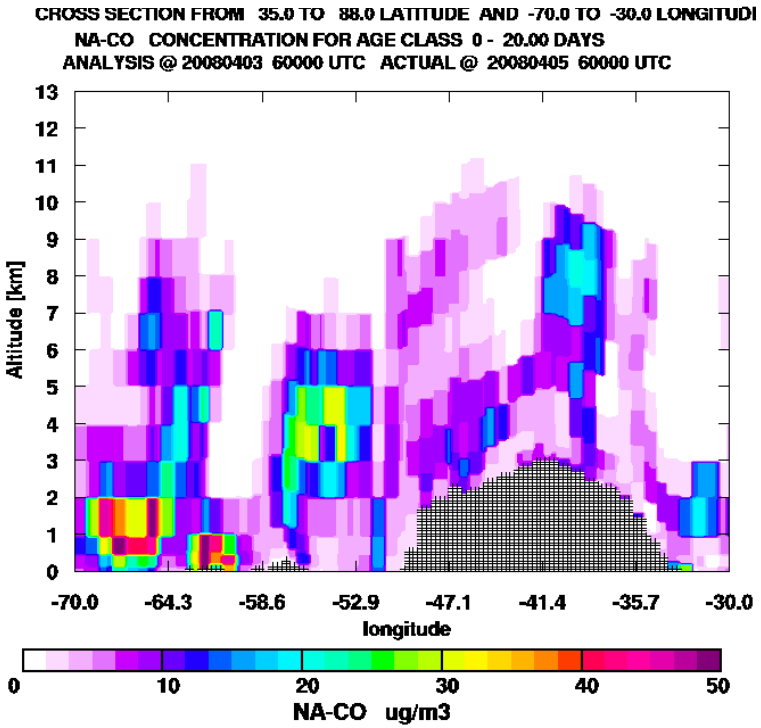


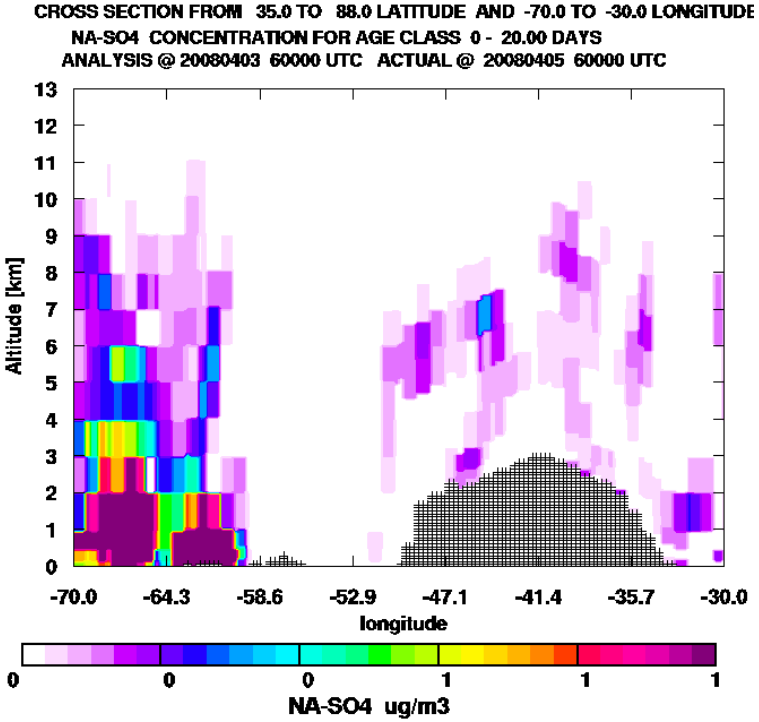
MOZART Forecast from 20080403

FLEXPART FC, 06-21 UTC 5 Apr, N. American plume

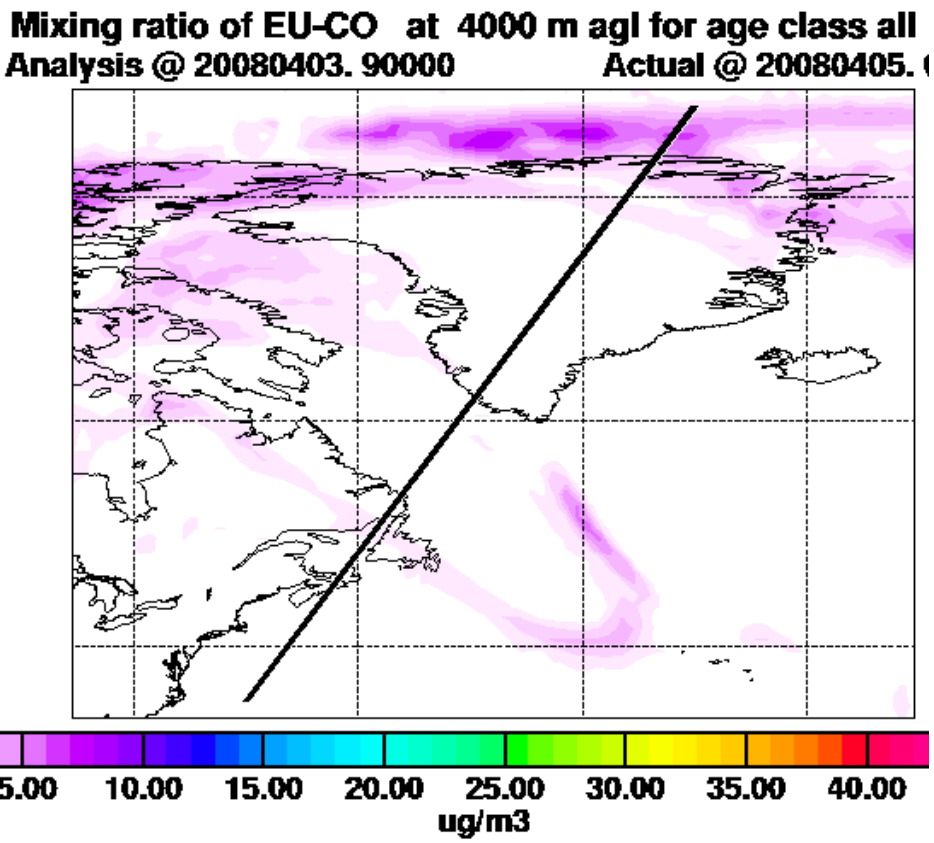


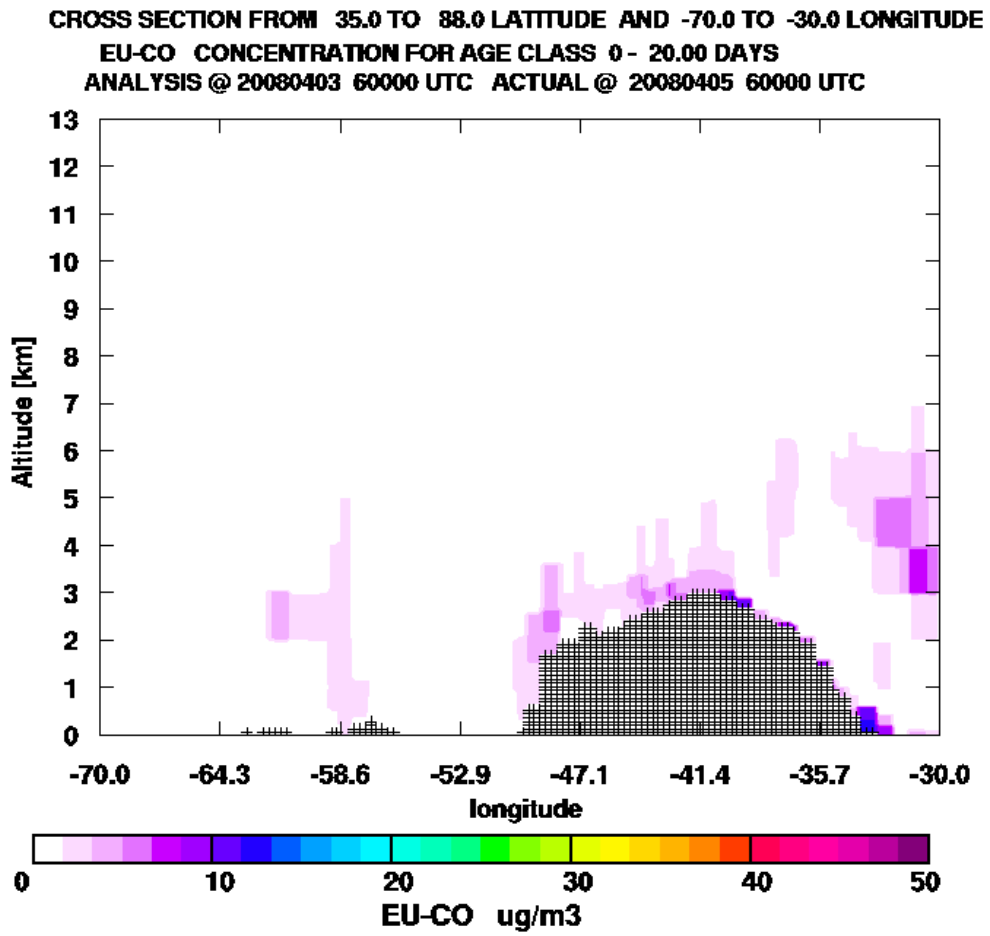






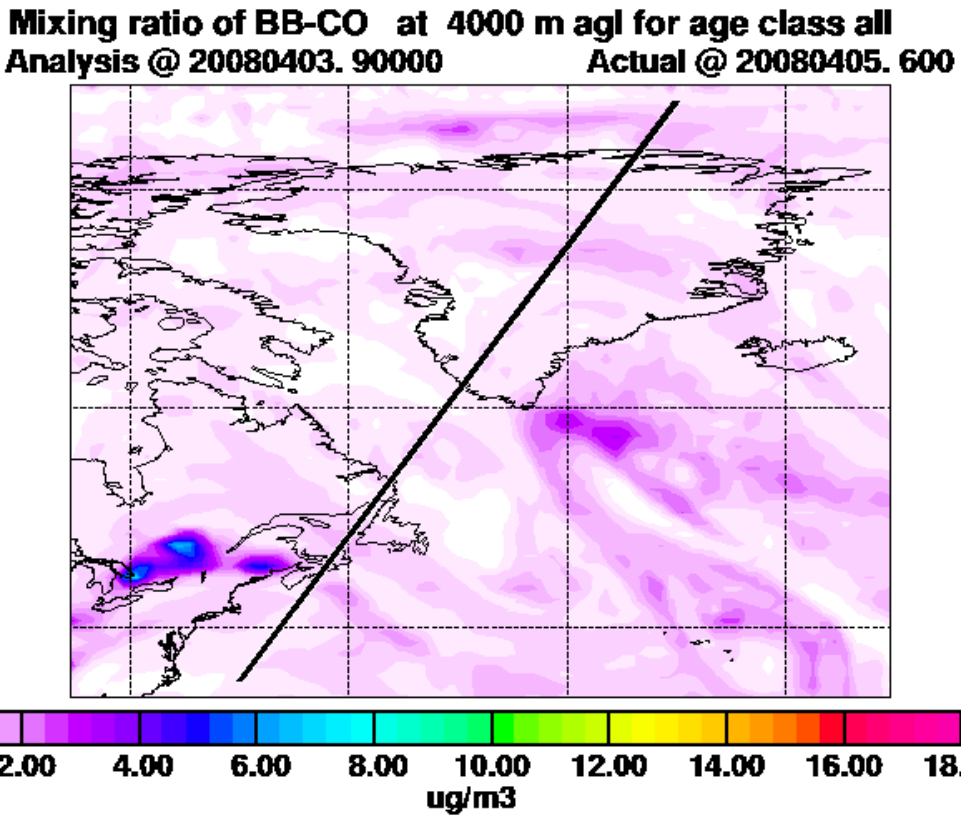
FLEXPART FC, 06-21 UTC 5 Apr, EU plume

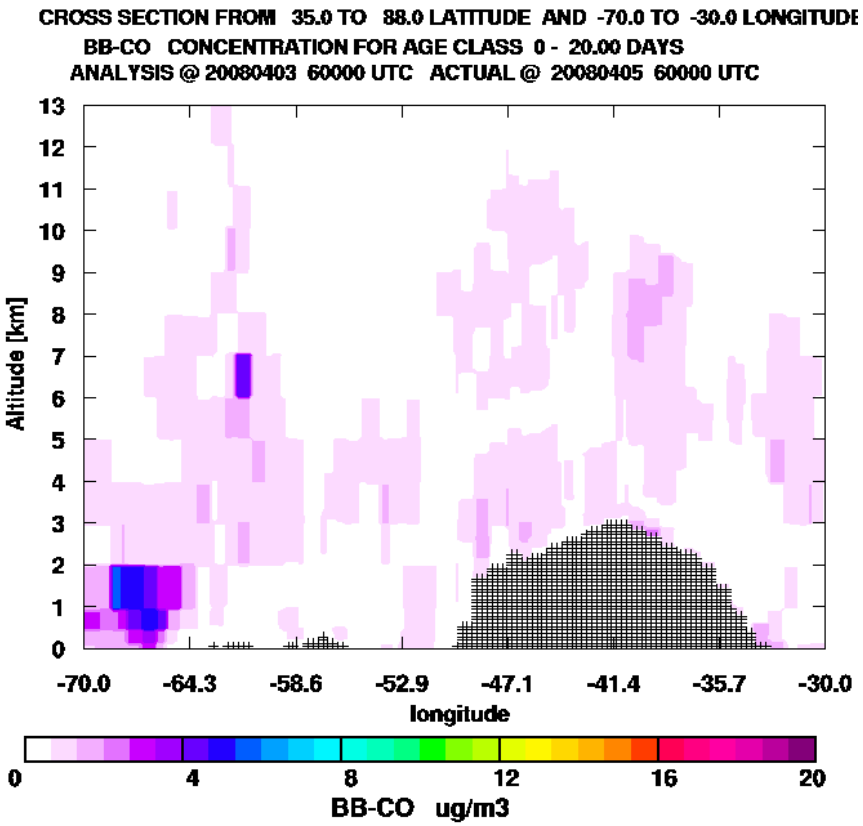




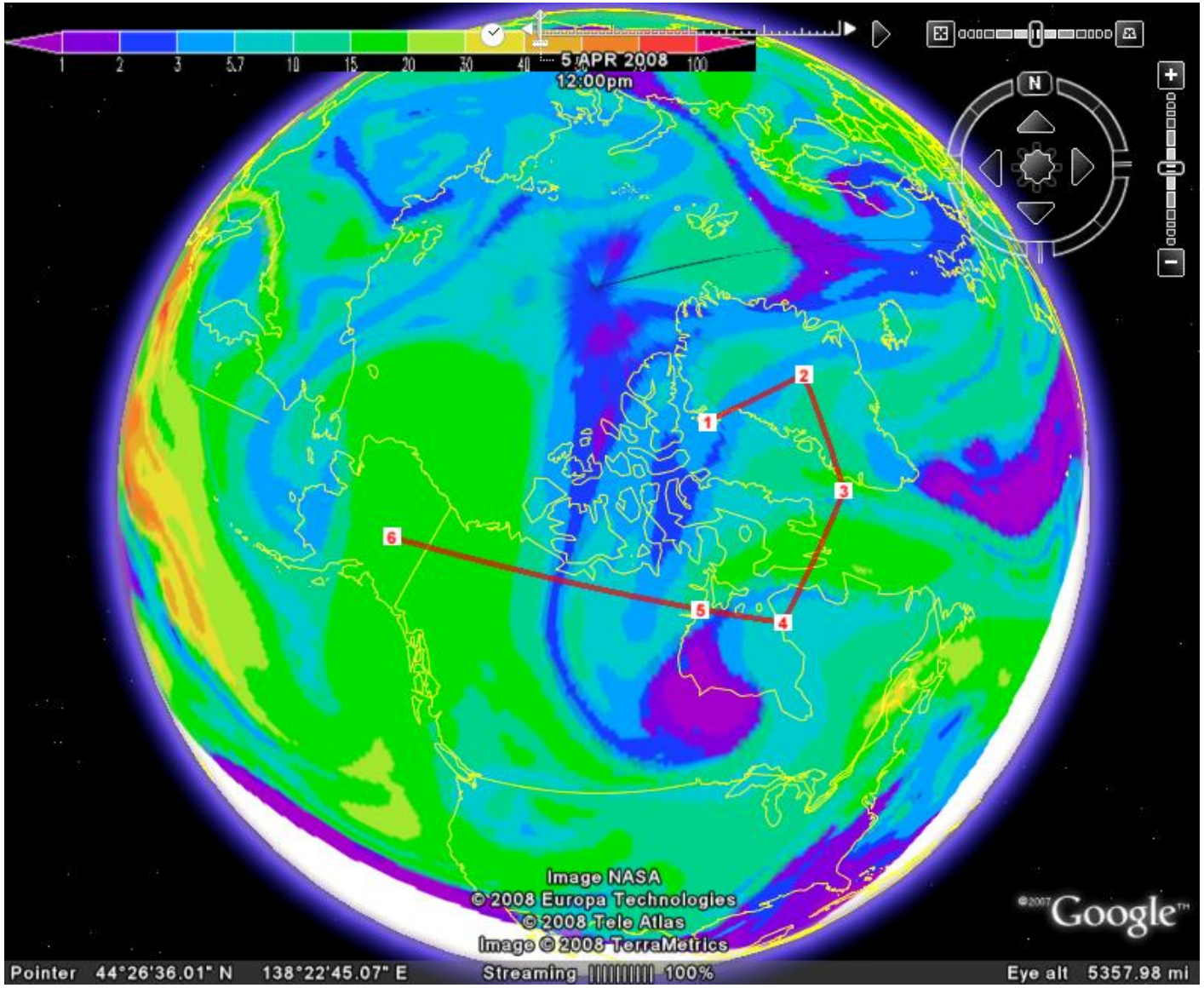
EU pollution N of Greenland?

FLEXPART FC, 06-21 UTC 5 Apr, biomass burning plume





Chance for remnants of biomass burning plume over Summit?



12Z Apr 5th , 5.5 km Anthropogenic CO

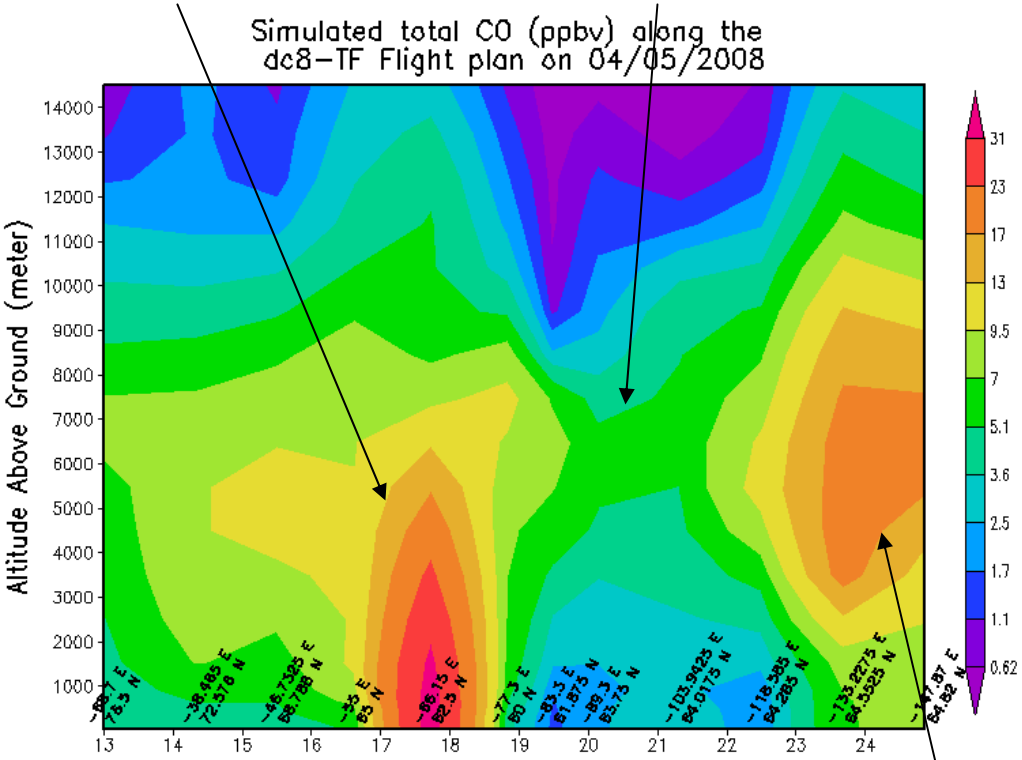
USA/Canada

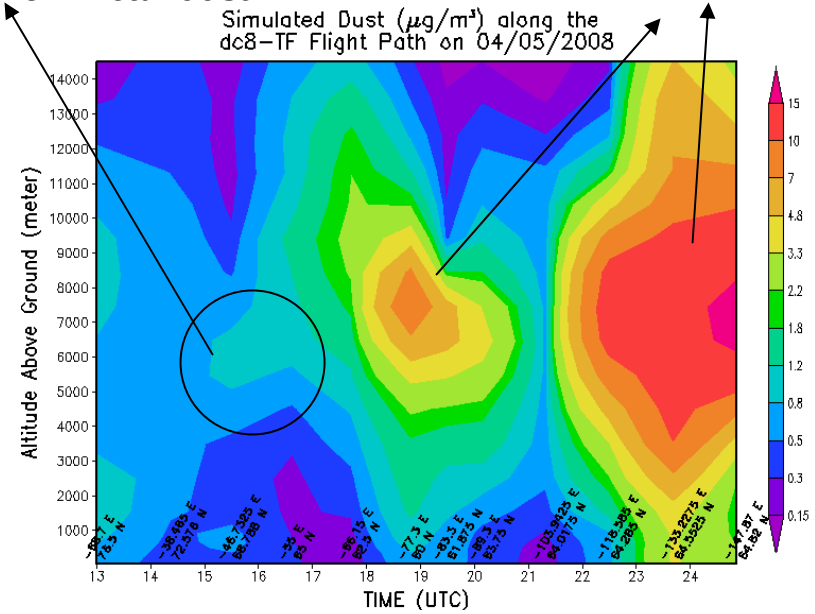
Point 3 to 4

Europe

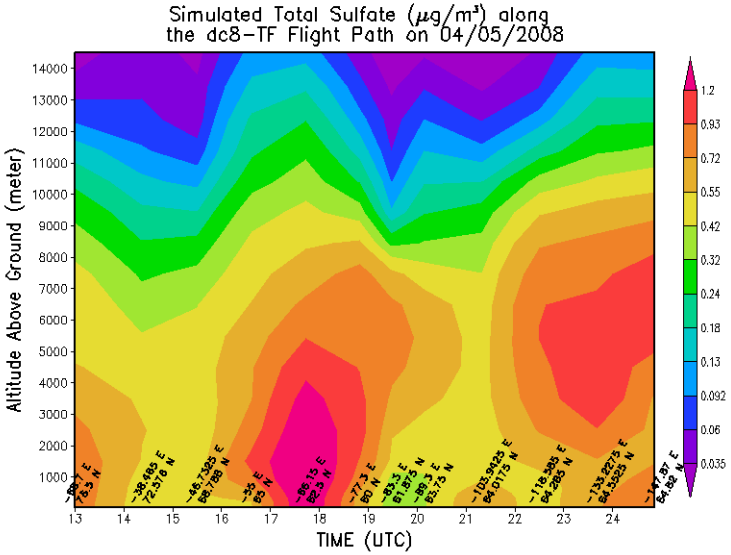
May see some African dust

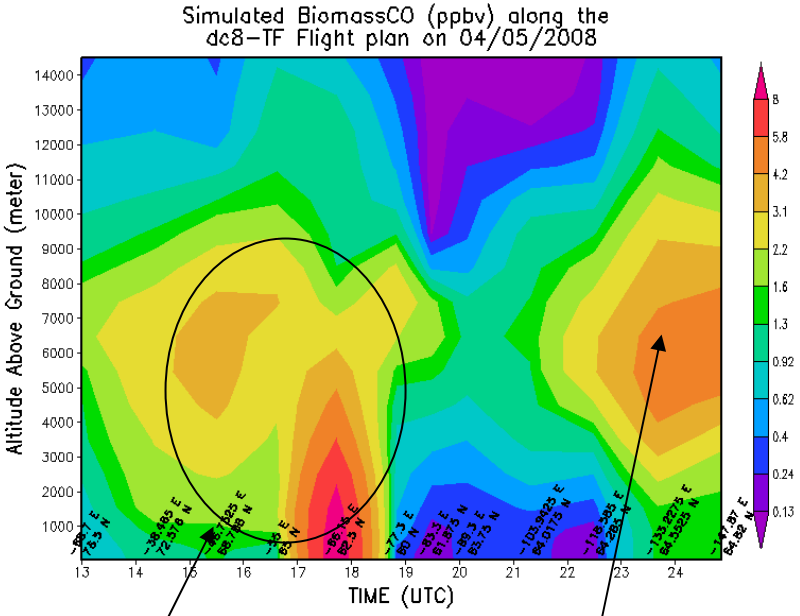
Asian





Asian



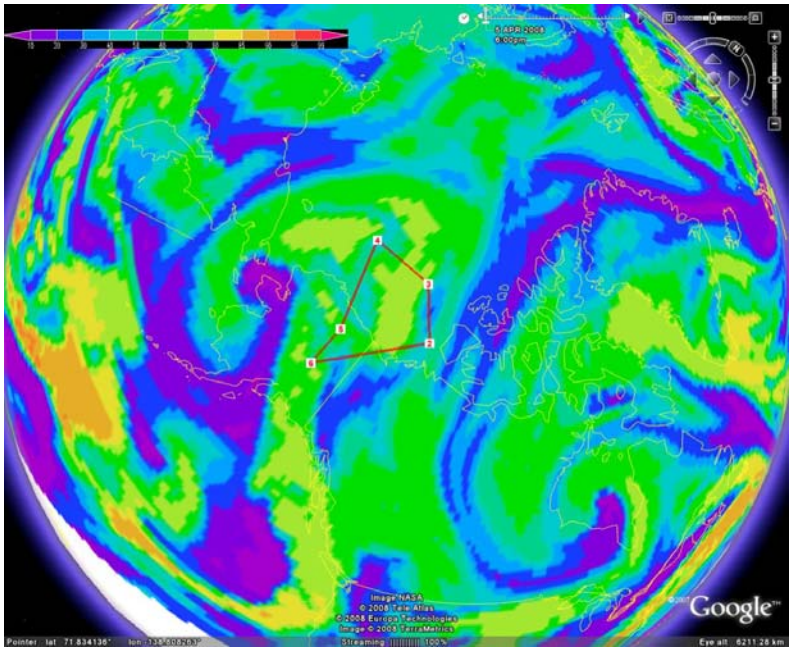


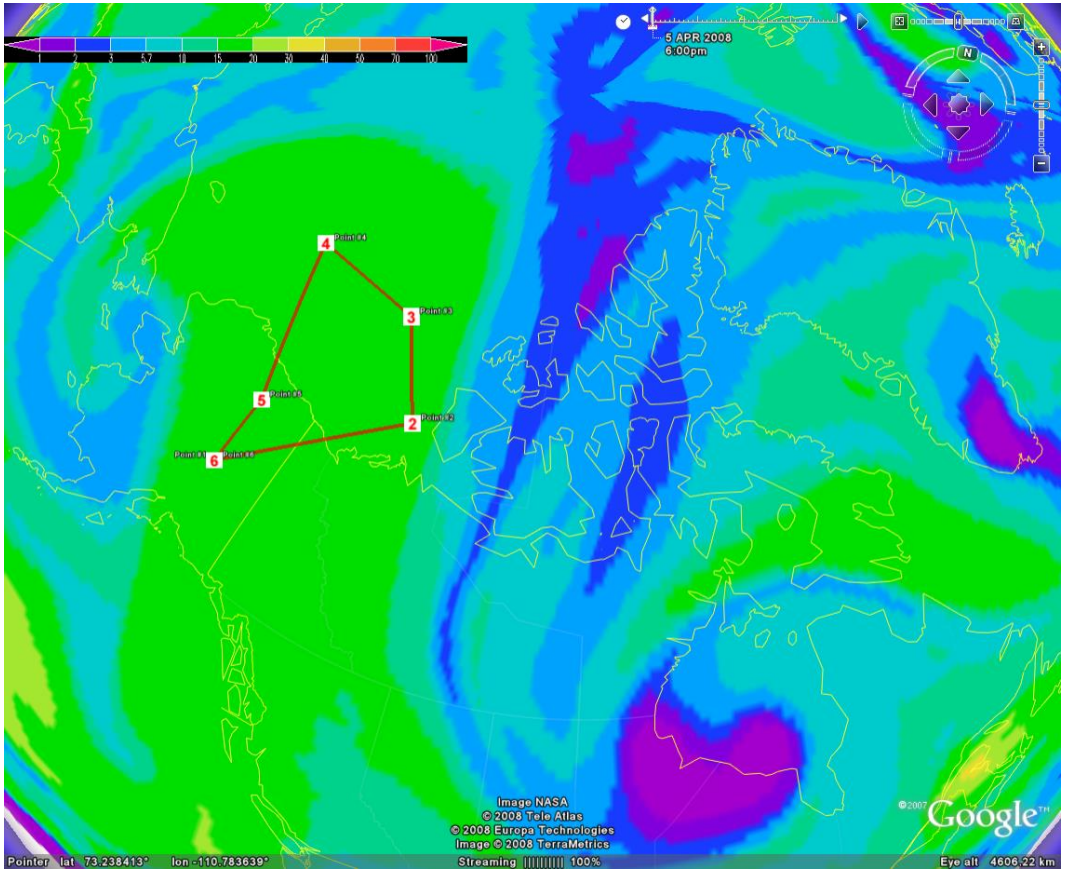
N America

Asian

For P3 flight Saturday

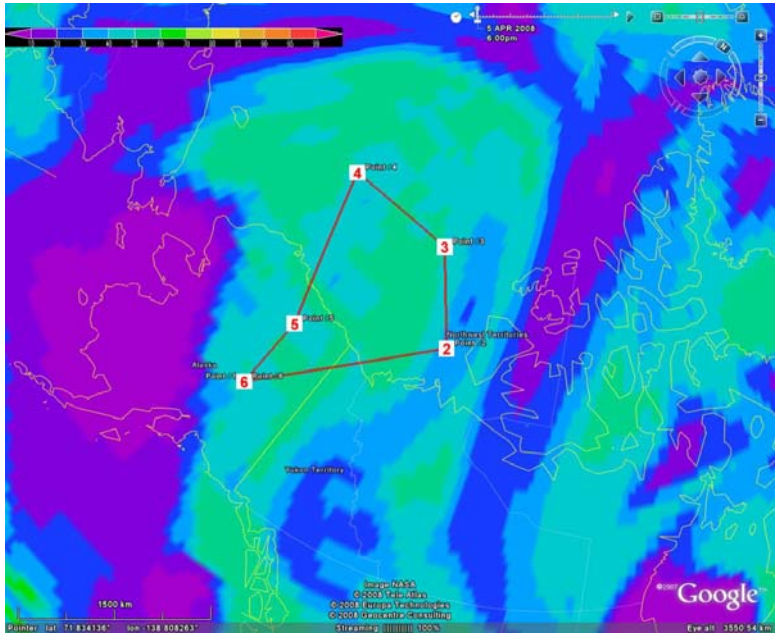
RH-5.5 km, 18Z Apr5





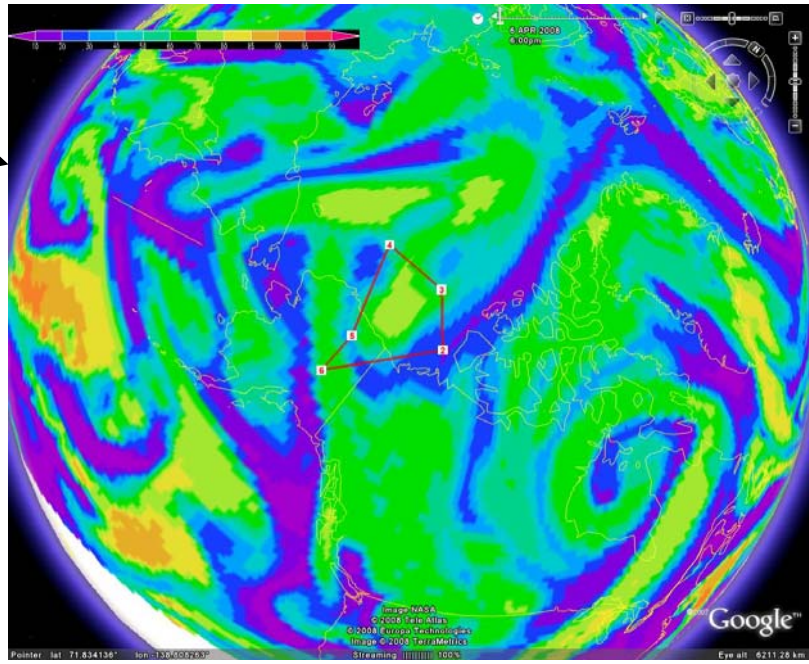
CO, 5.5km, 18z Apr 5

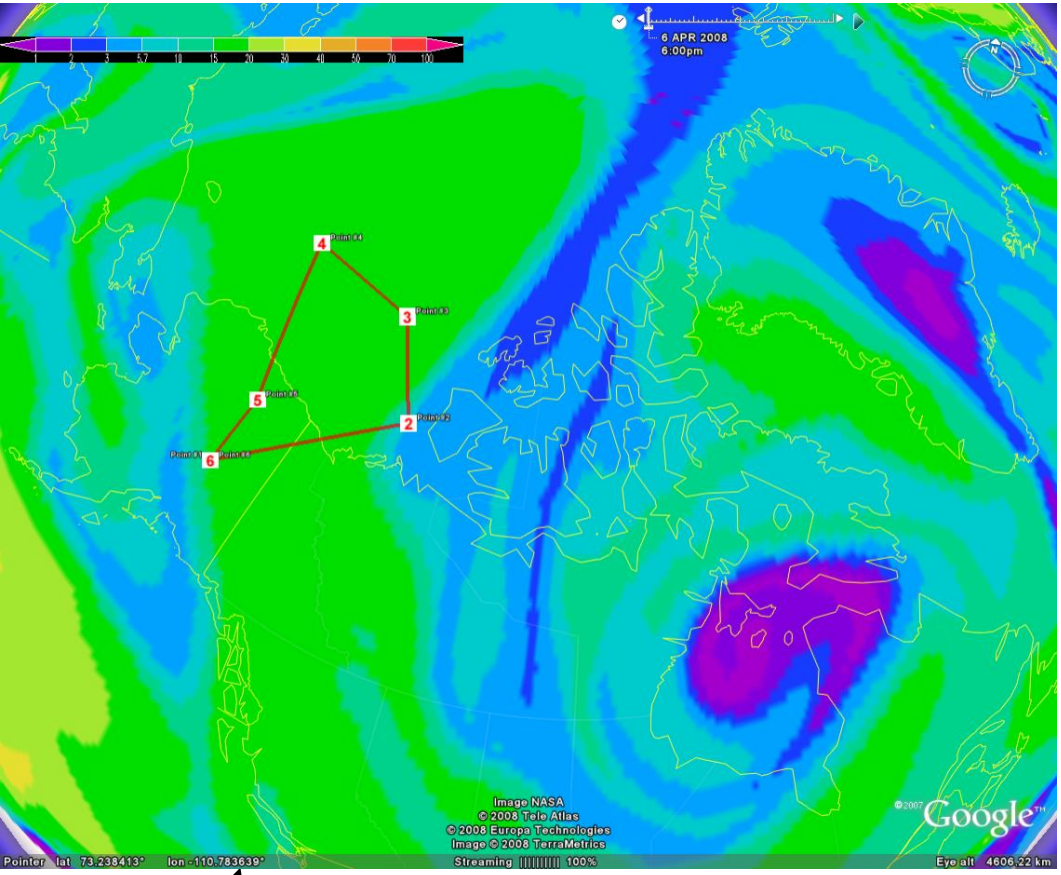
RH-8.4 km, 18Z Apr5



For P3 flight Sunday

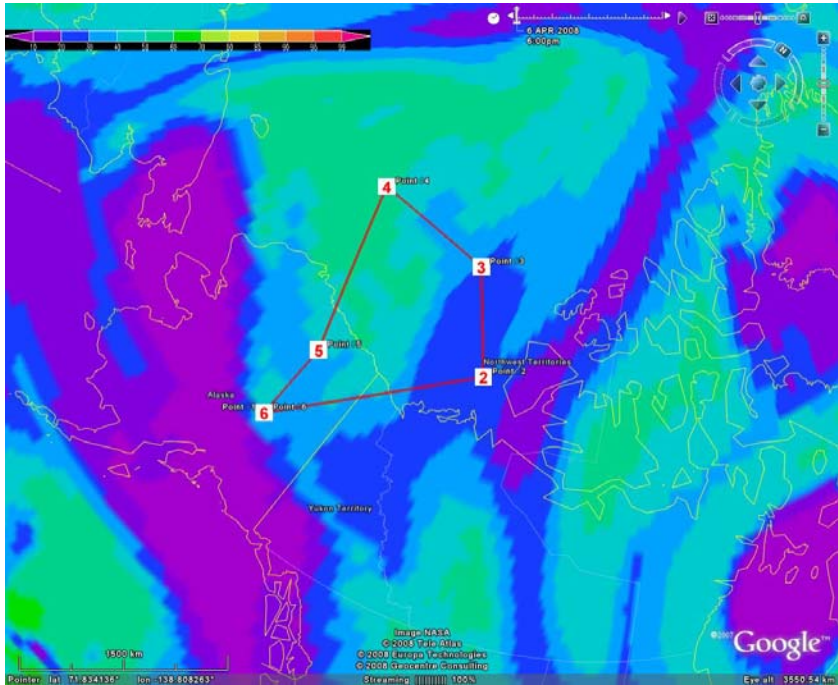
RH-5.5 km, 18Z Apr5

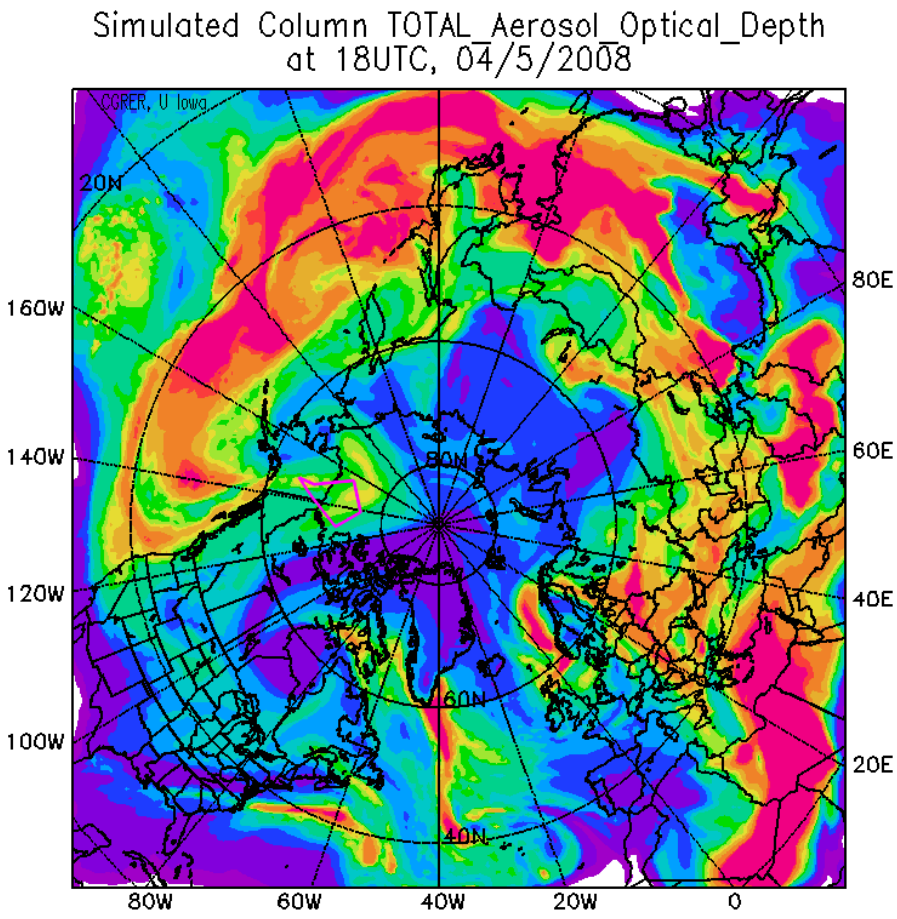


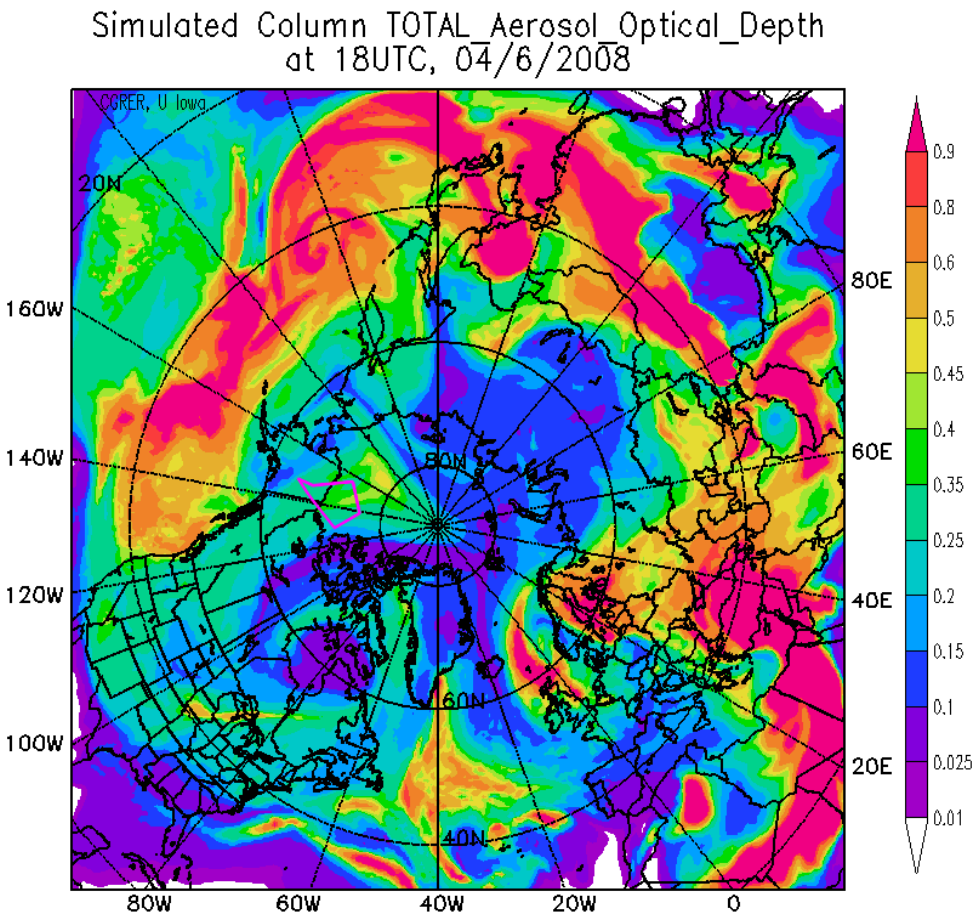


CO, 5.5km, 18z Apr 5

RH-8.4 km, 18Z Apr5





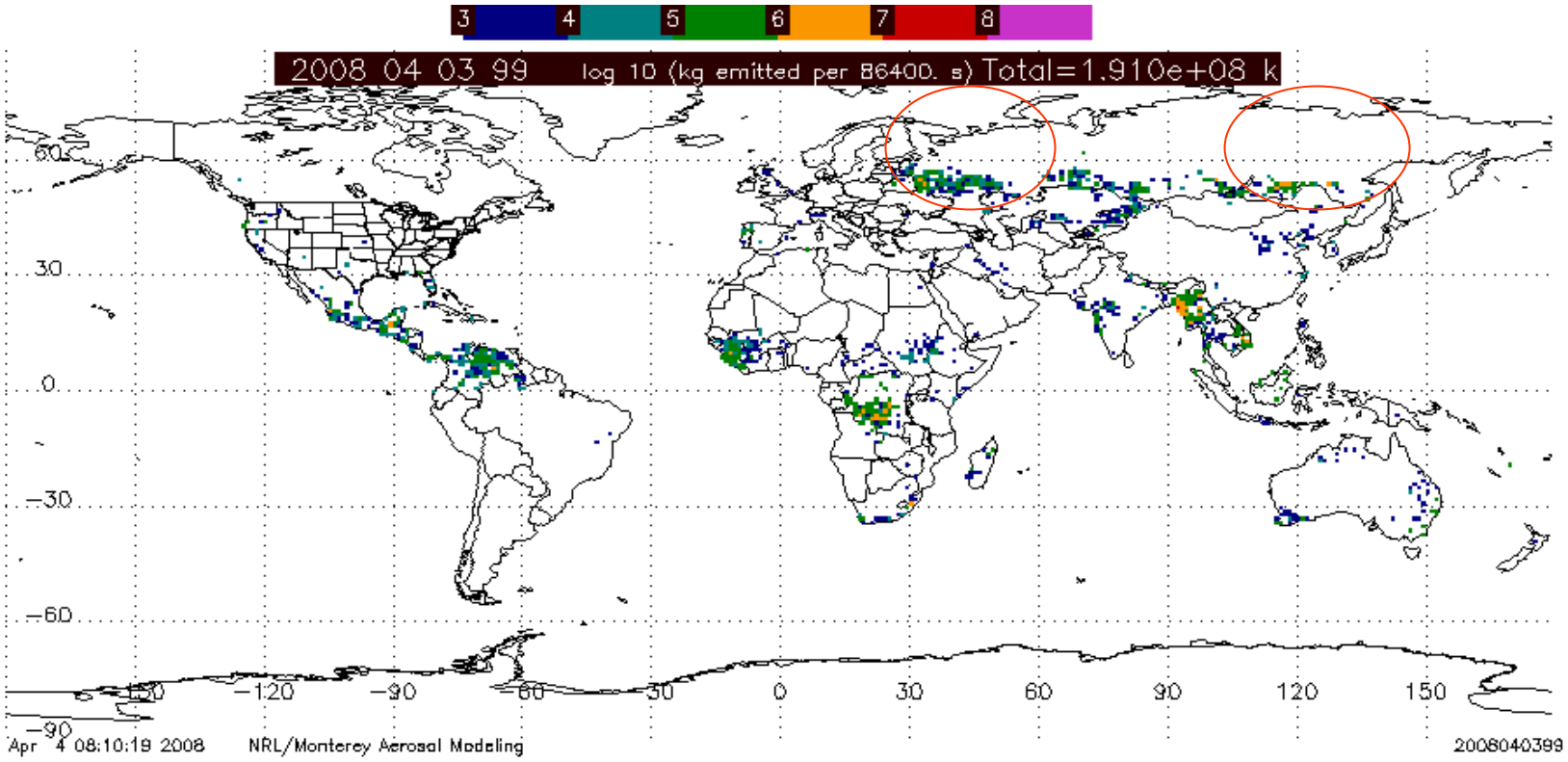


Total AOD for Apr 5 or 6th both look similar, need to find cloud free zones

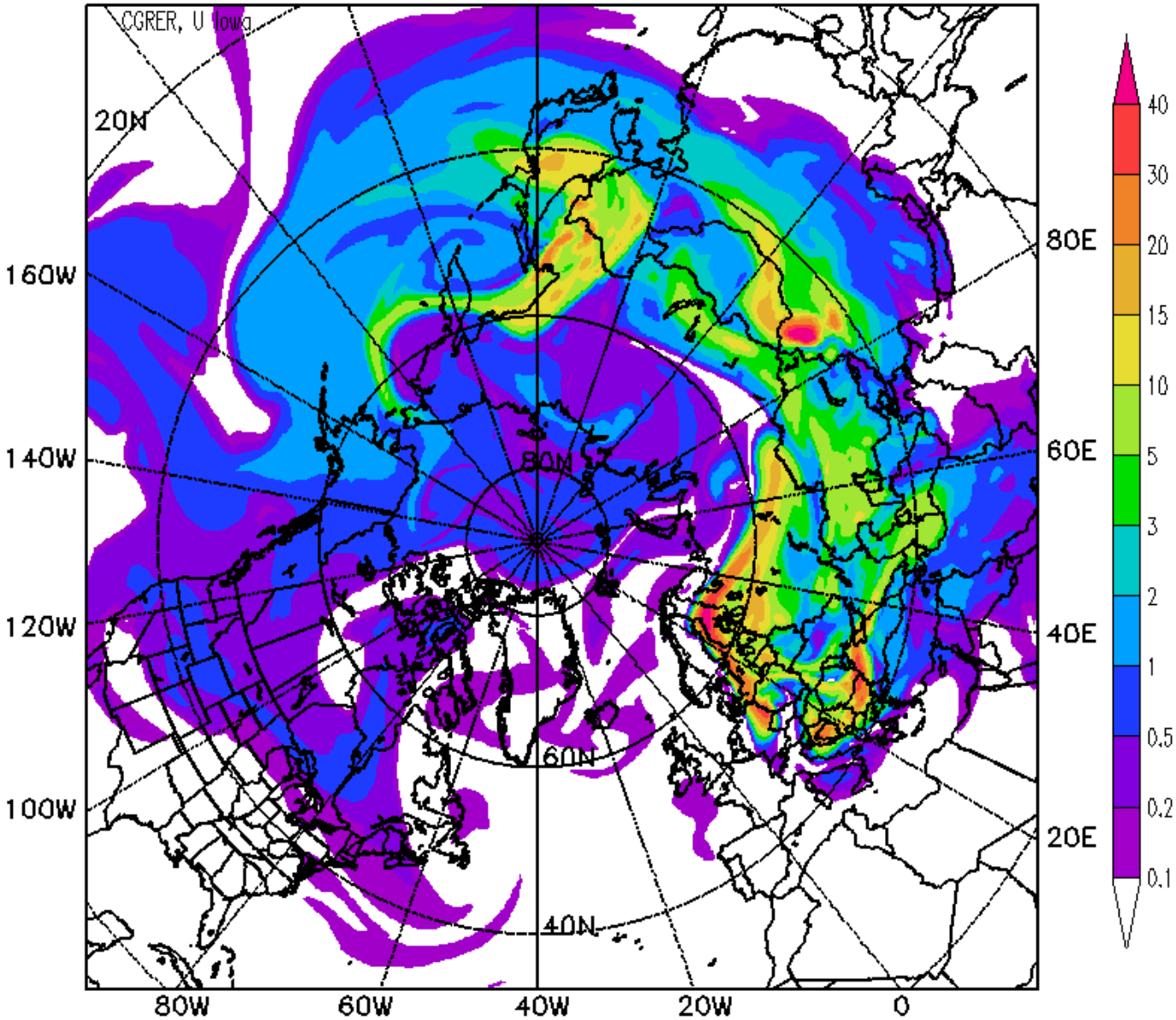
Outlook for April 7 & 8

- This period sees poleward transport of various air masses
  - The Asia airmass sampled by P3 on Sat will move just south of the pole. (will show animated North Asian Biomass later)
  - N Asia biomass burning will move to the pole heading for Greenland
  - Europe Biomass and Africa dust will move towards Greenland from the east. This could be interesting from a perspective of suitcase to Thule, taking the North route discussed yesterday for the return (but doing it on the out-bound.

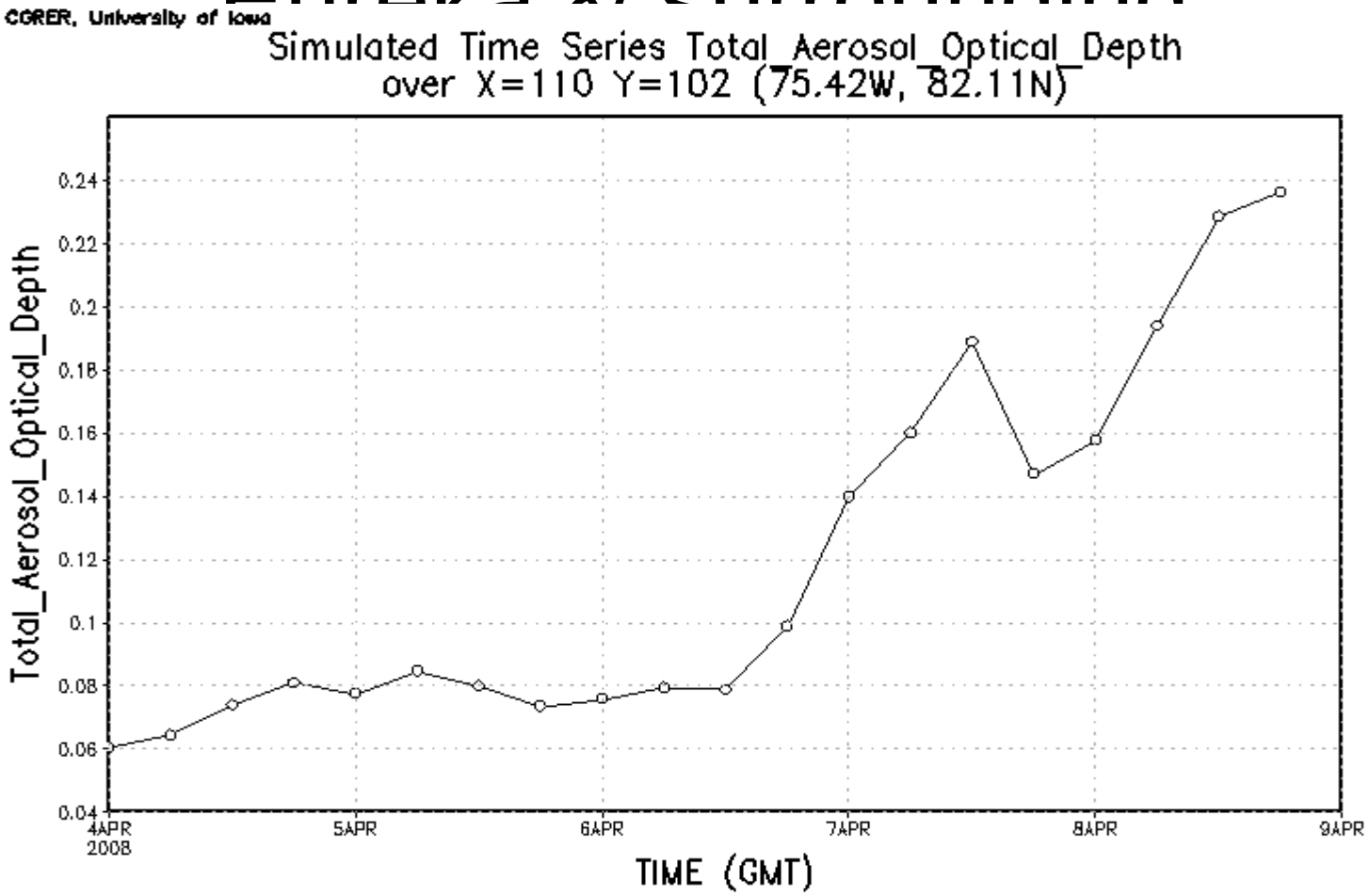
NAAPS Biomass Emissions



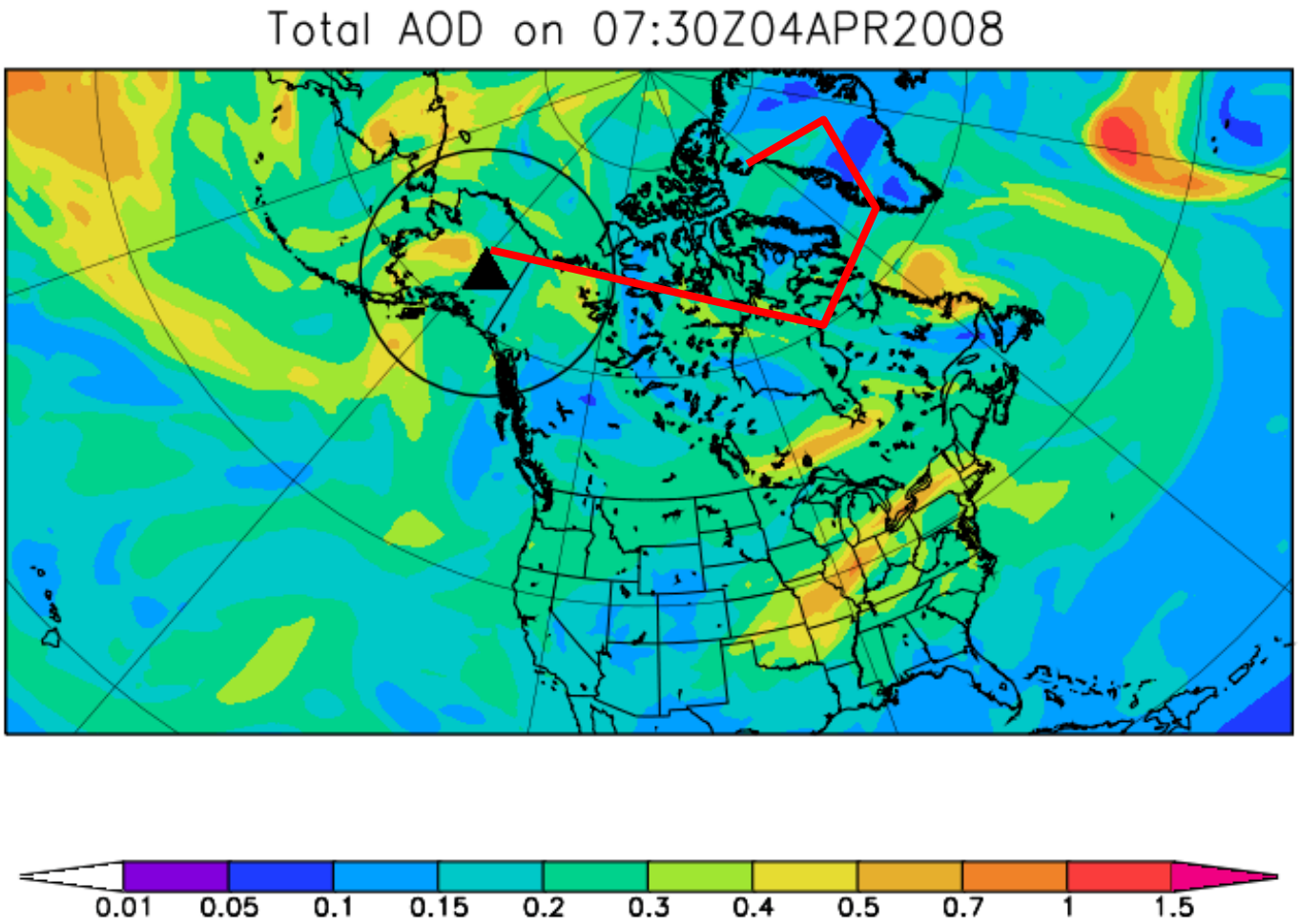
Simulated NAsia_BB_CO (ppbv) in the 5.5km layer
at 0UTC, 04/04/2008



STEM AOD Forecast for Eureka & surrounding

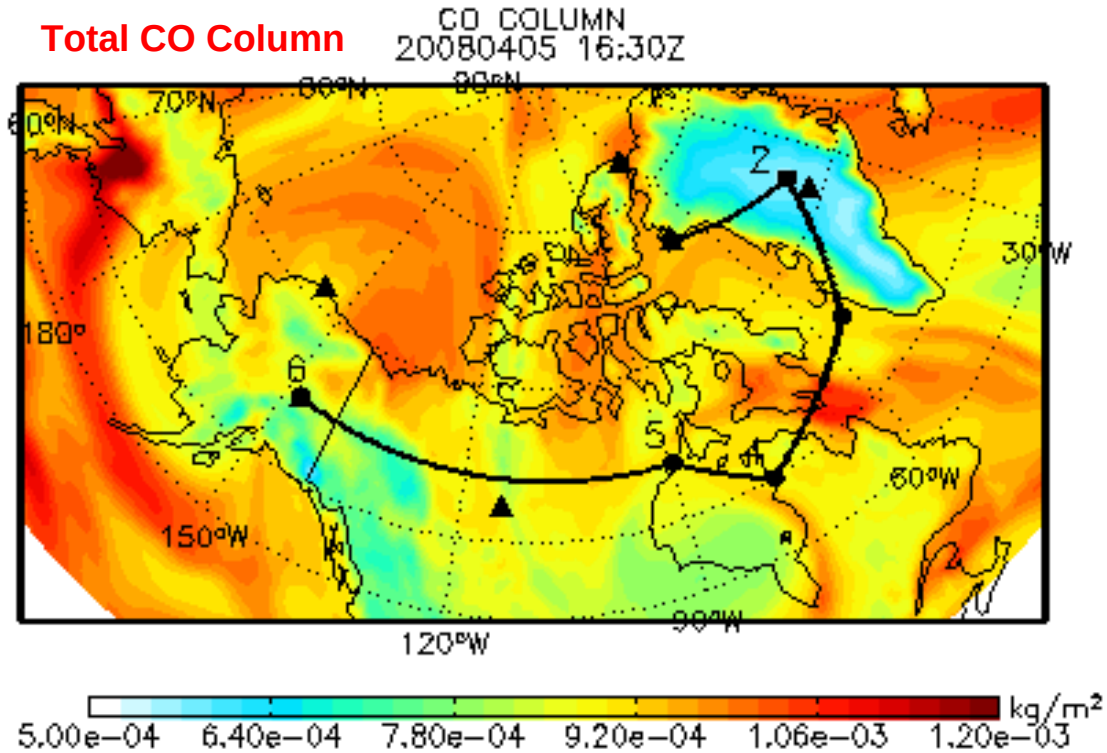


GMAO 04/04 06Z Fx Aerosol : Apr 4 – Apr 9

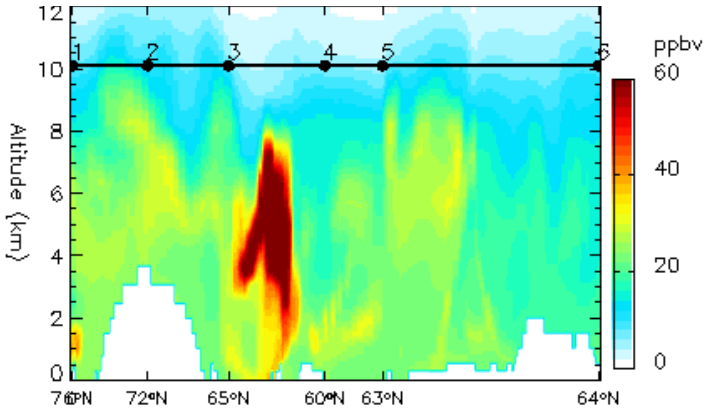


4/4 Thule -- Fairbanks

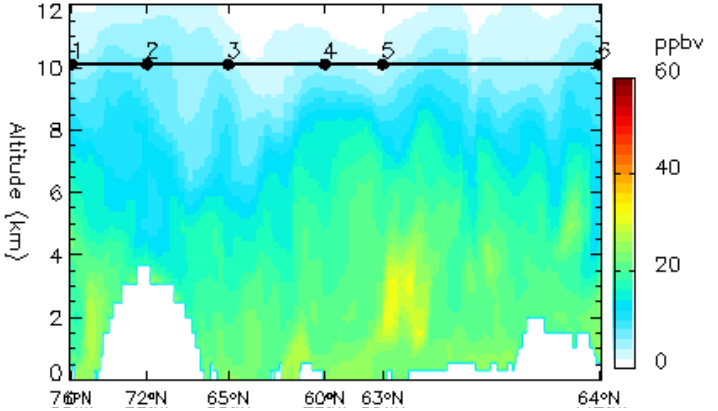
Total CO Column



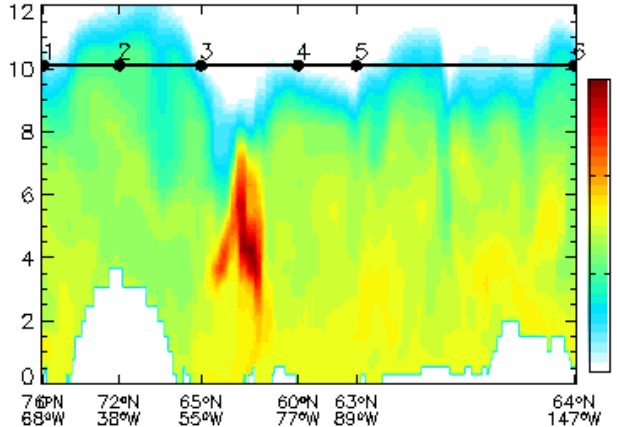
N. American CO



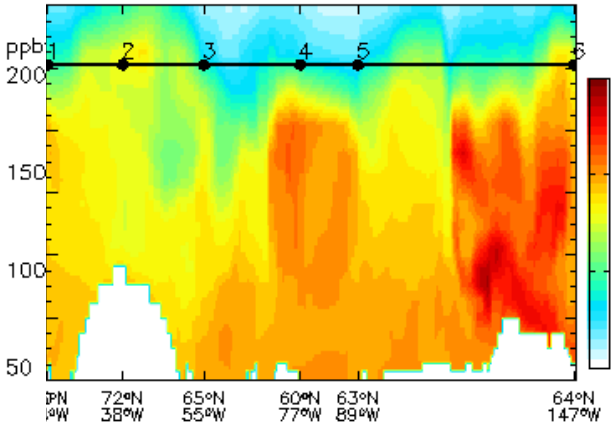
Europe+Russia CO



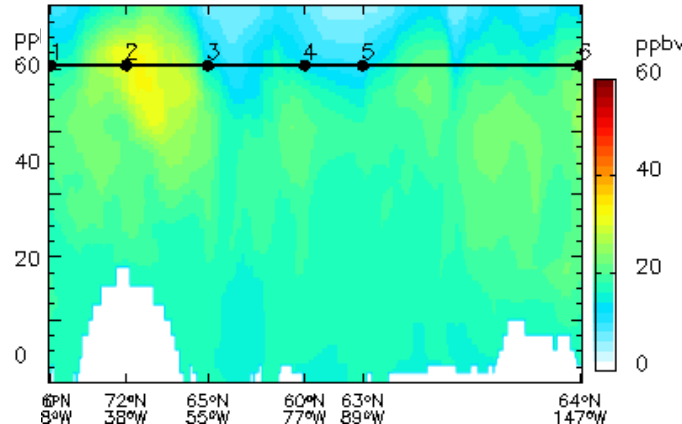
Total CO



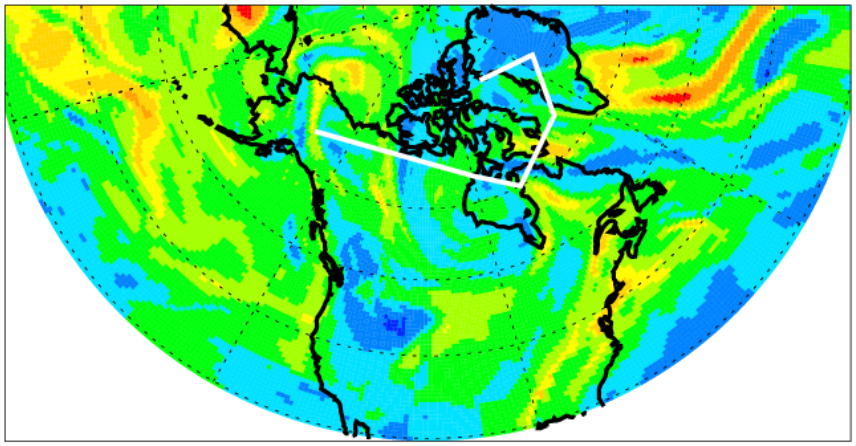
Asian CO



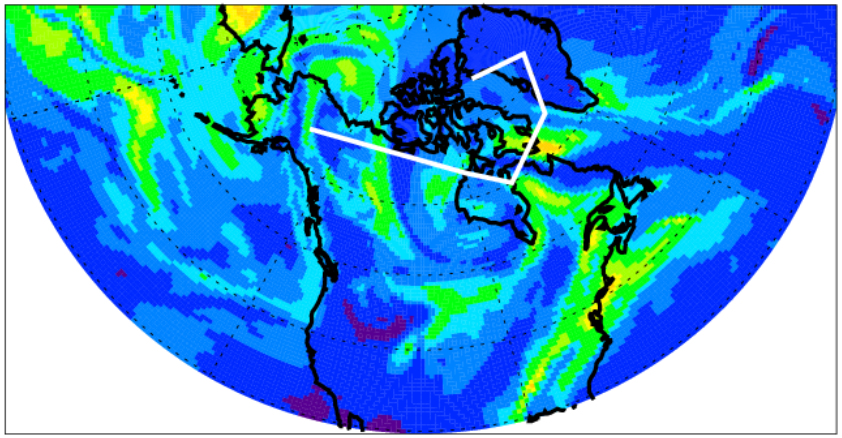
Nonboreal BB CO



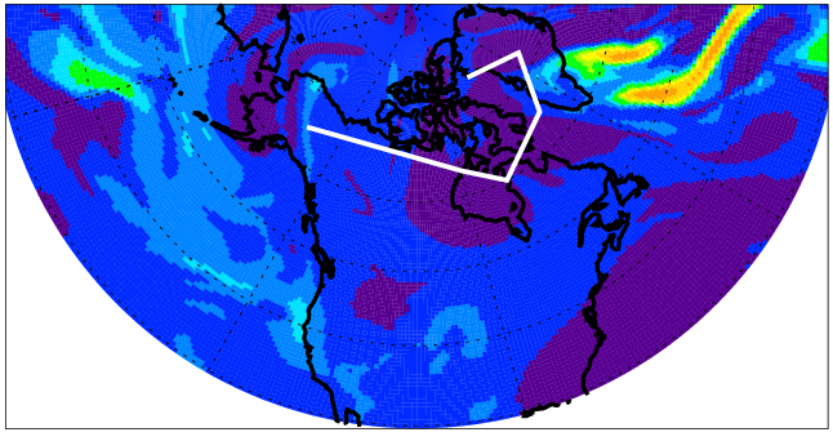
GEOS-5 AOT [550 nm] valid 16:30z05apr2008

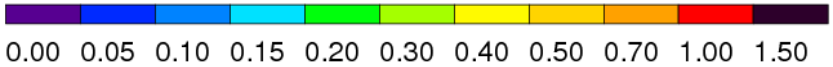


GEOS-5 Sulfate AOT [550 nm] valid 16:30z05apr2008

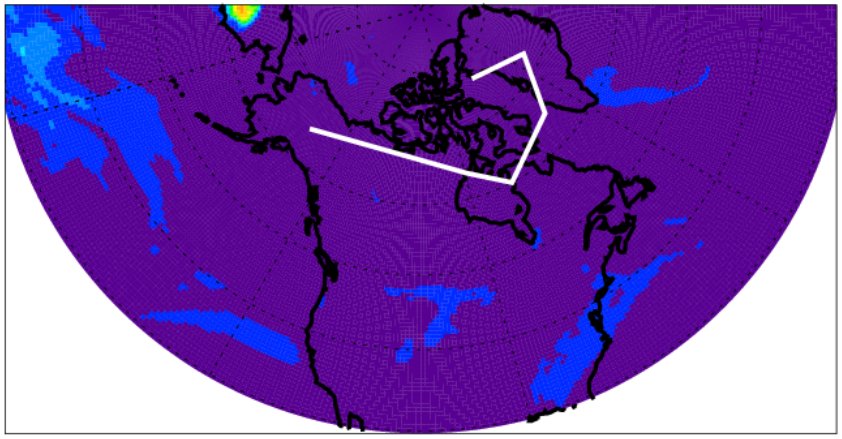


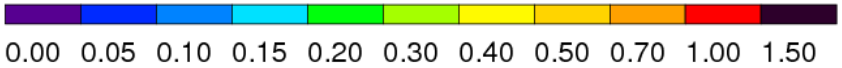
GEOS-5 Dust AOT [550 nm] valid 16:30z05apr2008

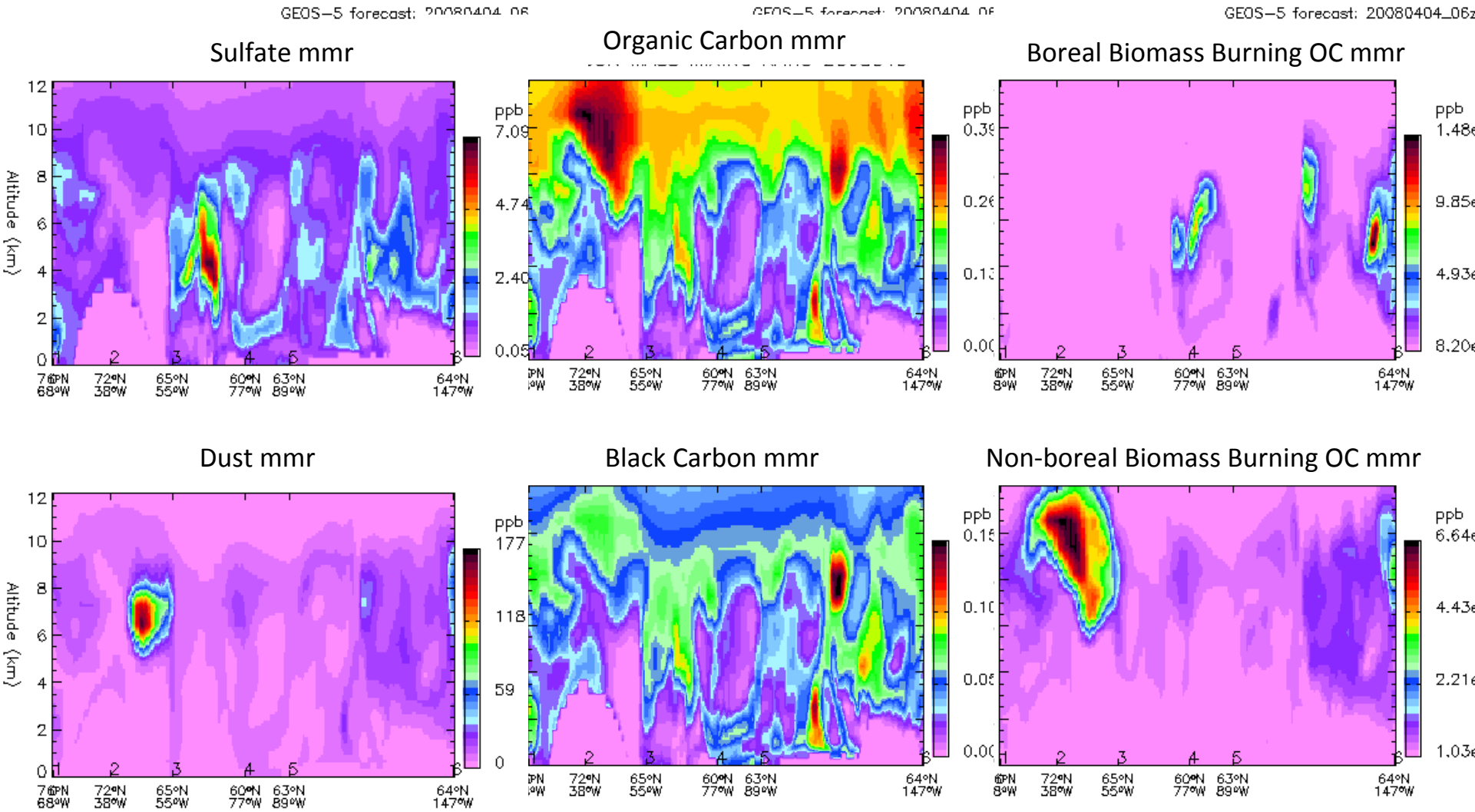




GEOS-5 Carbonaceous AOT [550 nm] valid 16:30z05apr2

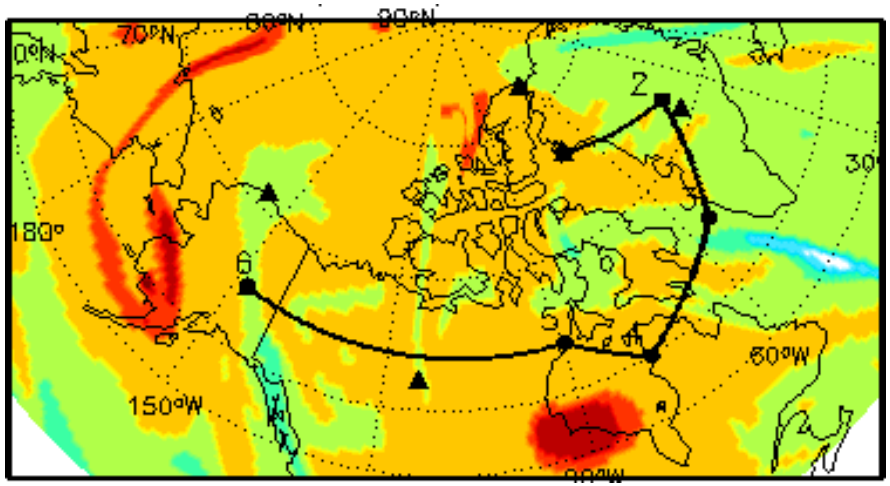




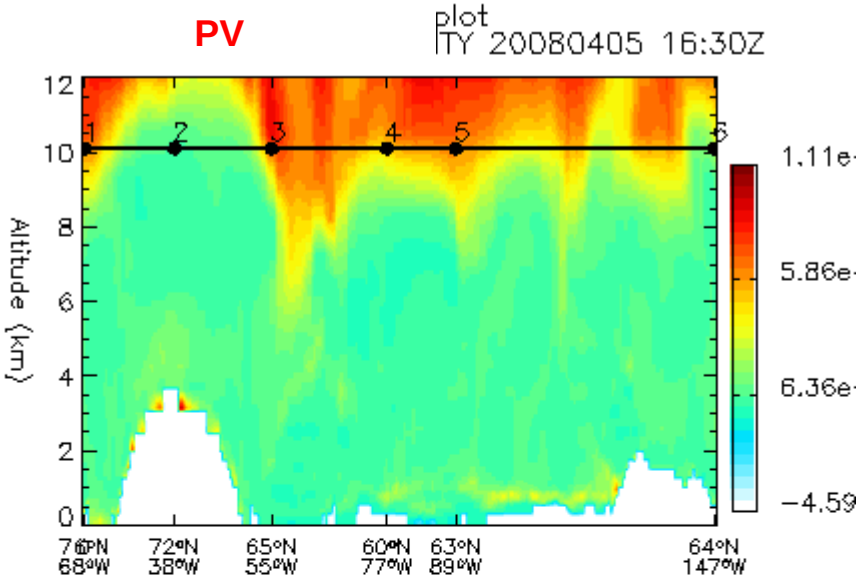

GEOS-5 forecast: 20080404_06
Sulfate mmr
Organic Carbon mmr
Boreal Biomass Burning OC mmr
Dust mmr
Black Carbon mmr
Non-boreal Biomass Burning OC mmr
Altitude (km)
ppb
7.09
4.74
2.40
0.05
177
118
59
0
72°N 38°W
65°N 55°W
60°N 77°W
63°N 89°W
64°N 147°W

GEOS-5 forecast: 20080404_06z

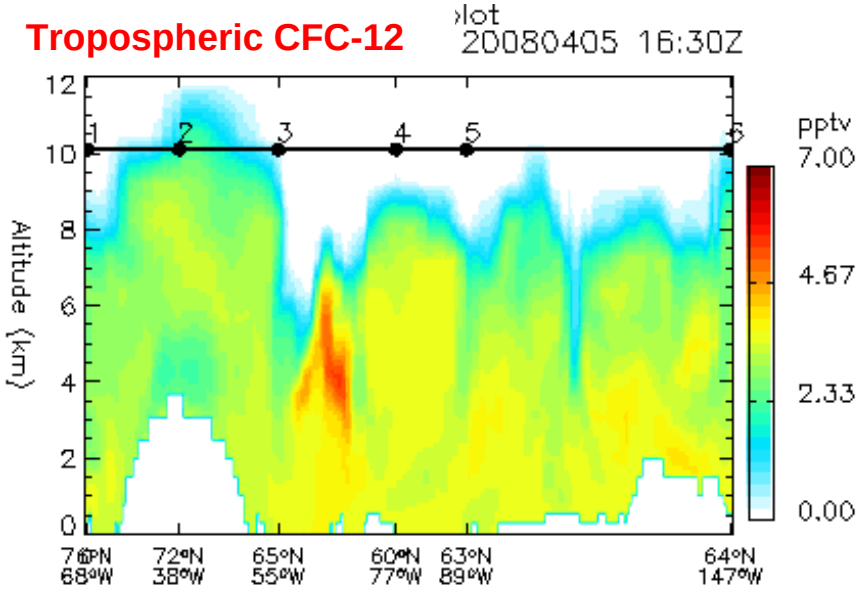
Stratospheric CFC-12 @ 500mb



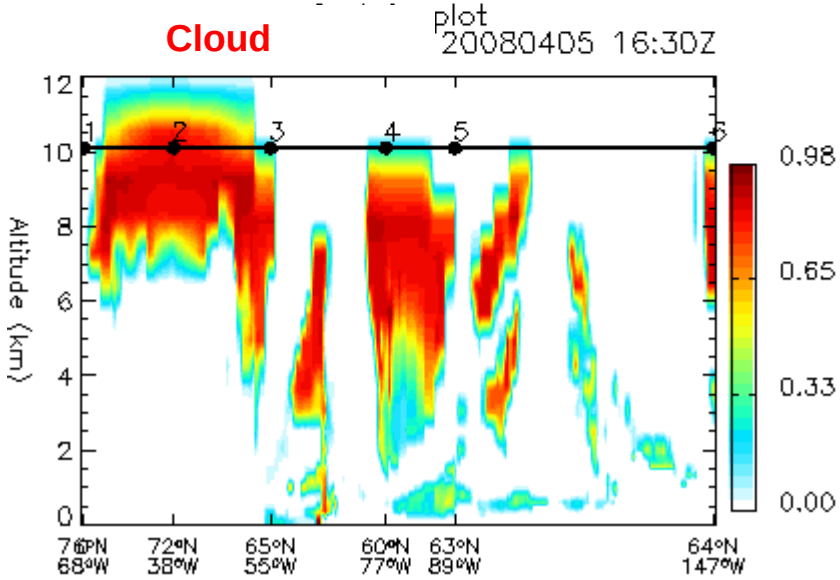
PV



Tropospheric CFC-12

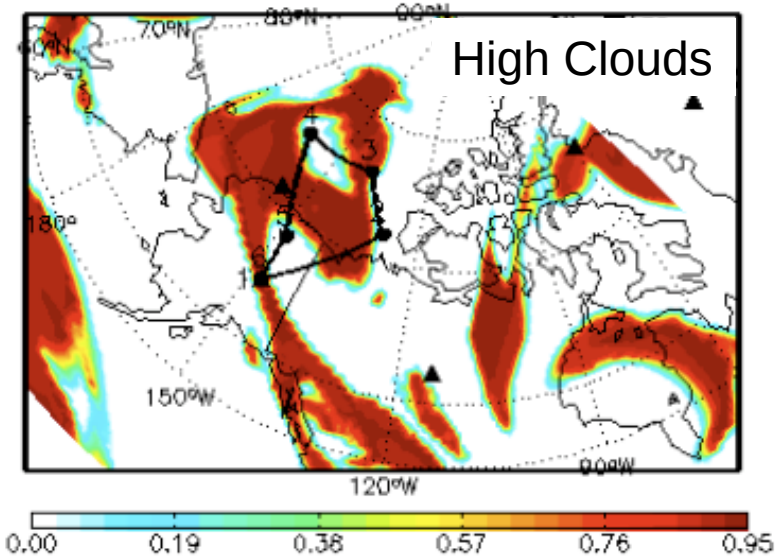


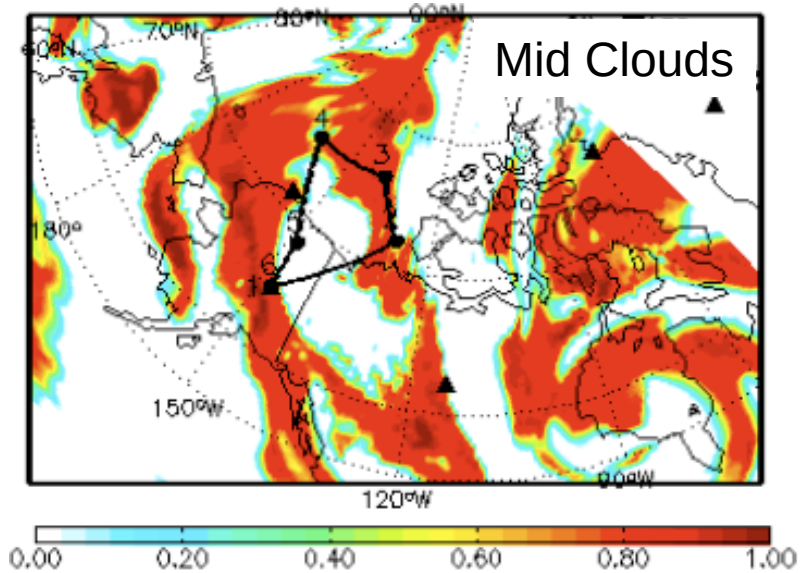
Cloud



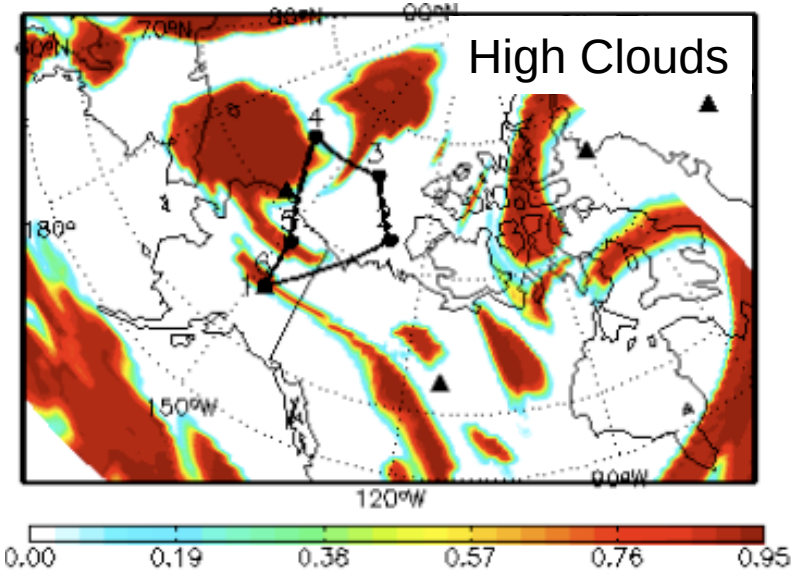
P3 Flight – 4/5 looks cloudier than 4/6 in GEOS5; some low level aerosol on both days

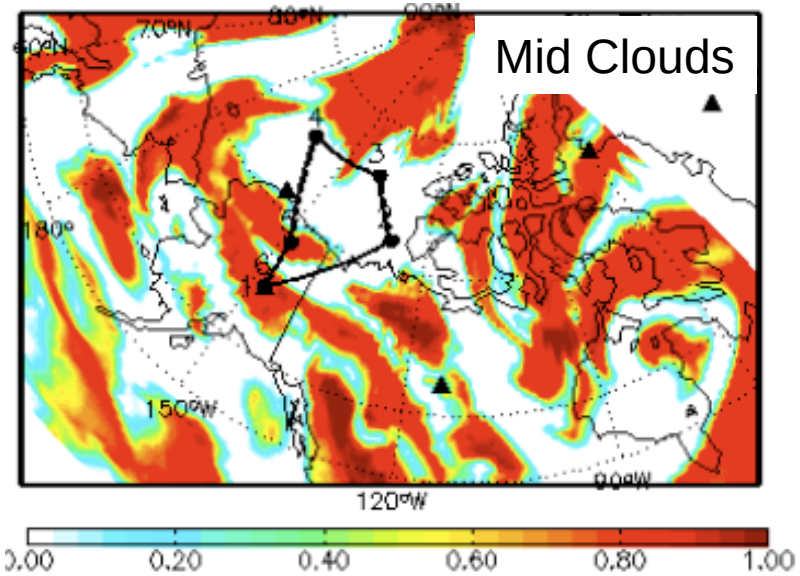
20080405 – 19:30Z





20080406 – 19:30Z



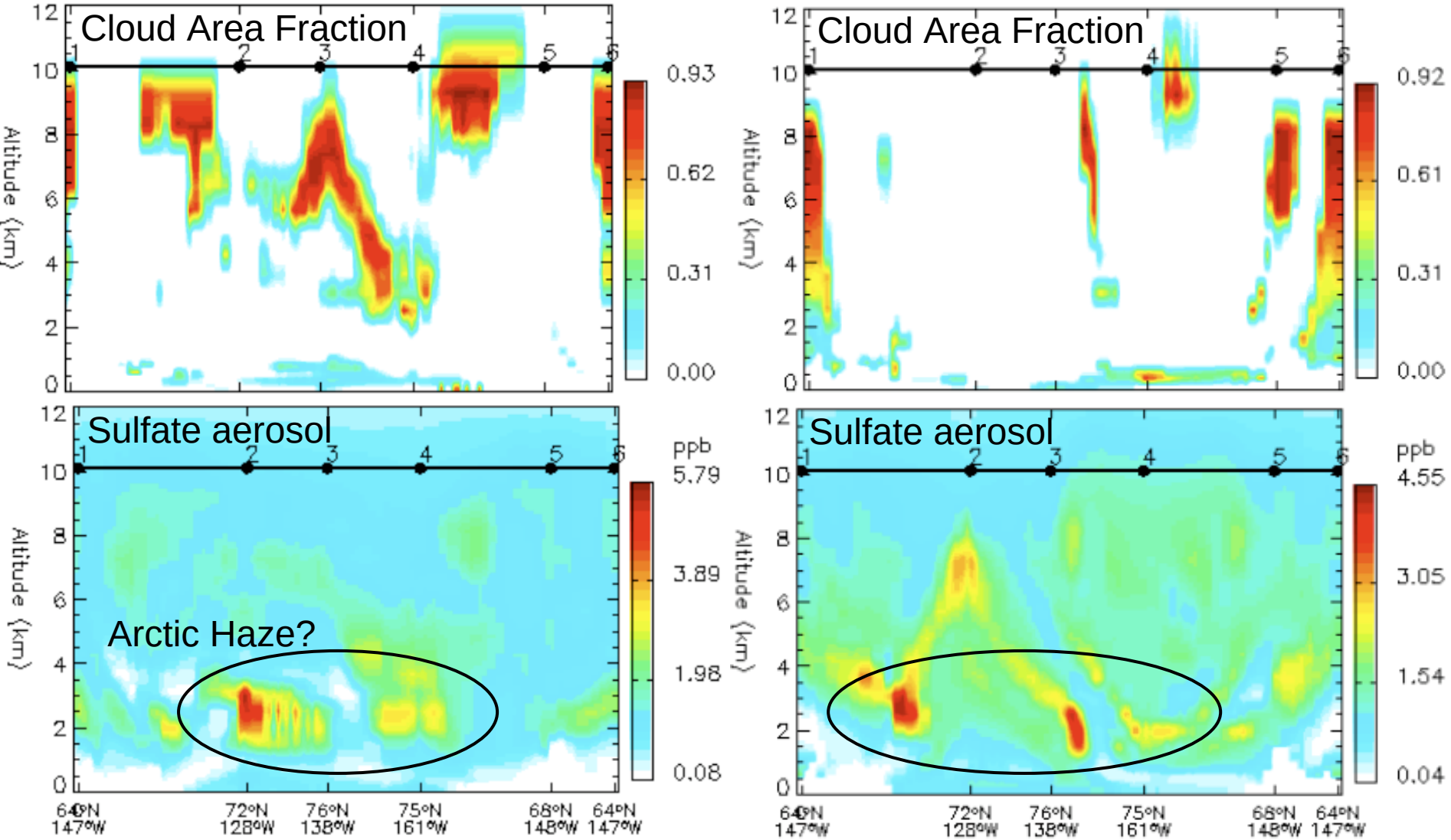


Initialized 20080404 – 06Z

P3 Flight – 4/5 looks cloudier than 4/6 in GEOS5; some low level aerosol on both days

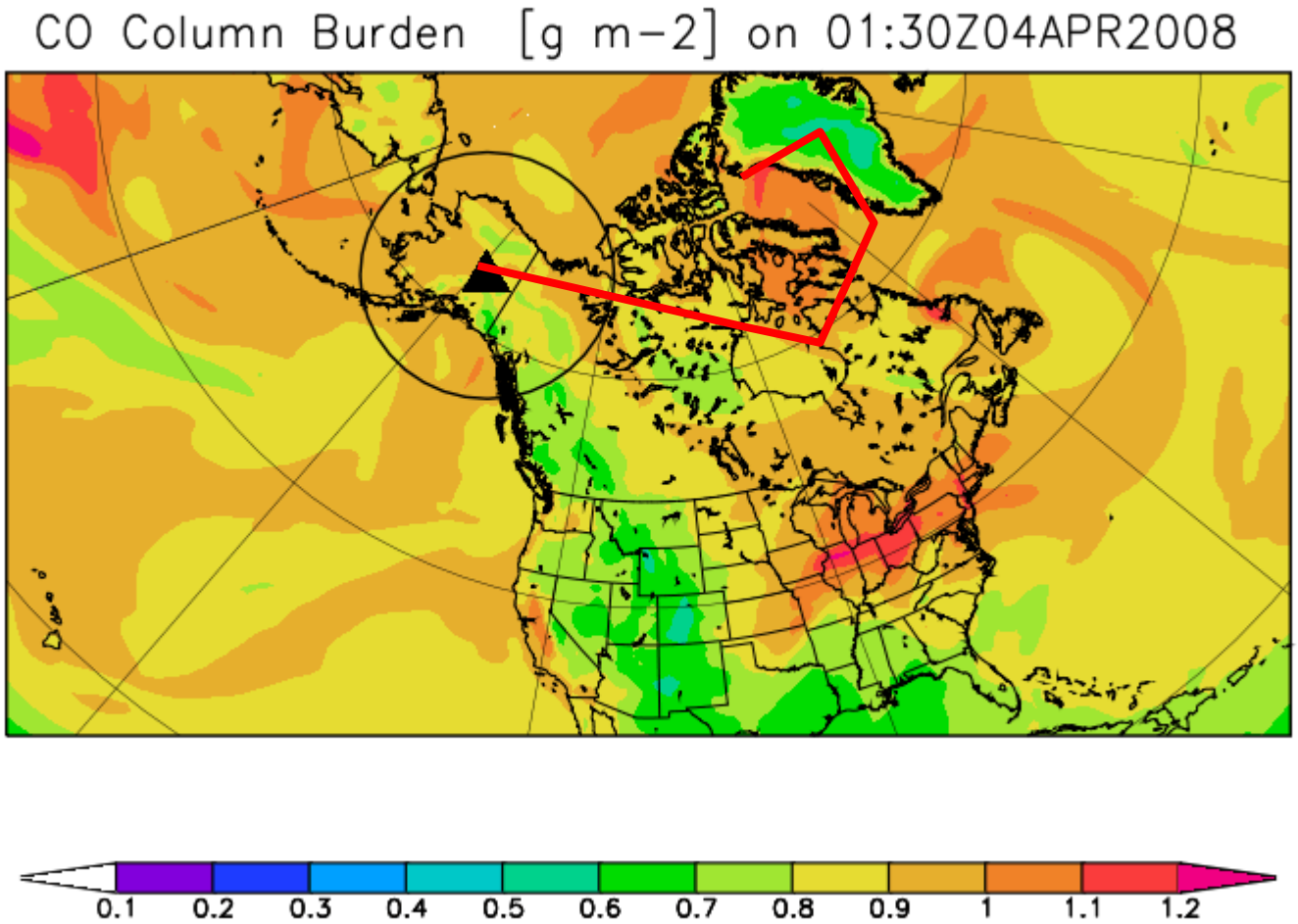
20080405 – 19:30Z

20080406 – 19:30Z

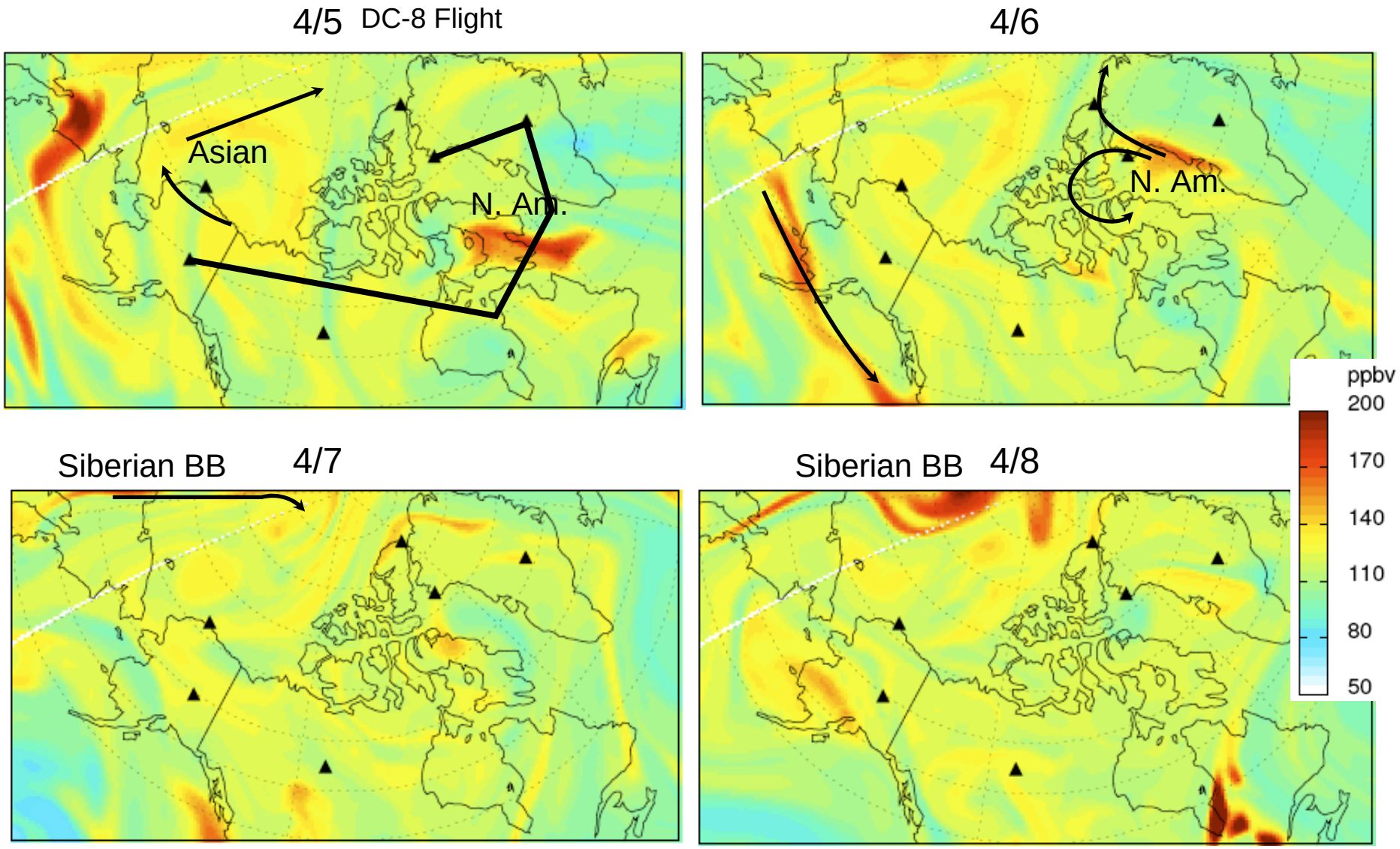


Initialized 20080404 – 06Z

GMAO 04/04 06Z Fx CO evolution: Apr 4 – Apr 9



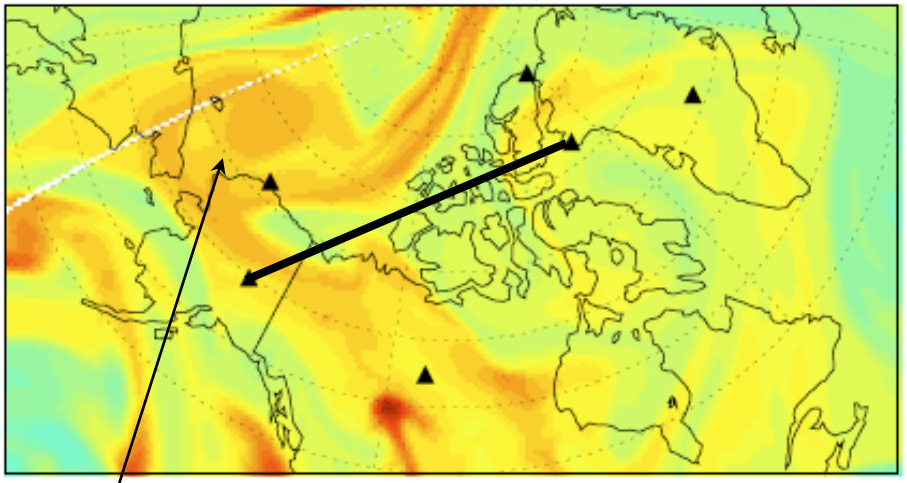
GEOS Total CO 500 hPa



Initialized 04/04/2008 – 06z

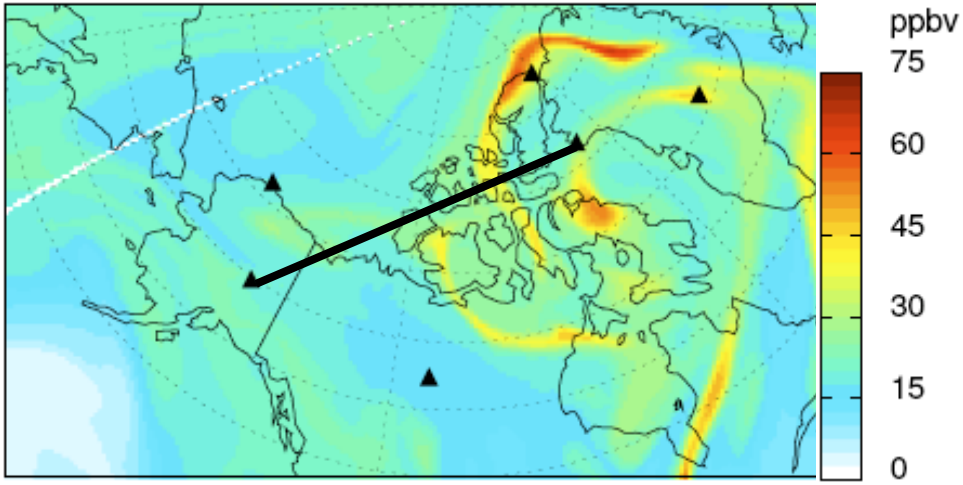
DC-8 Flight Opportunity: 4/7

Asian CO 500 hPa

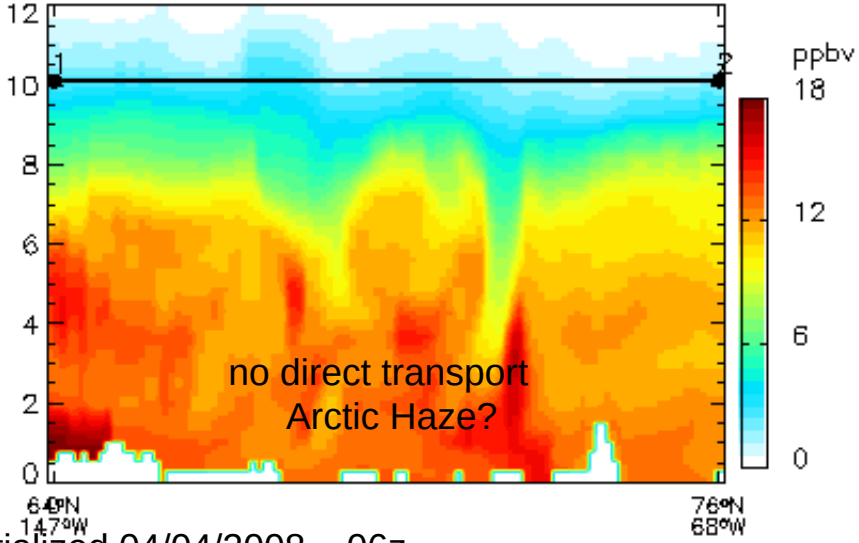


Subsidence

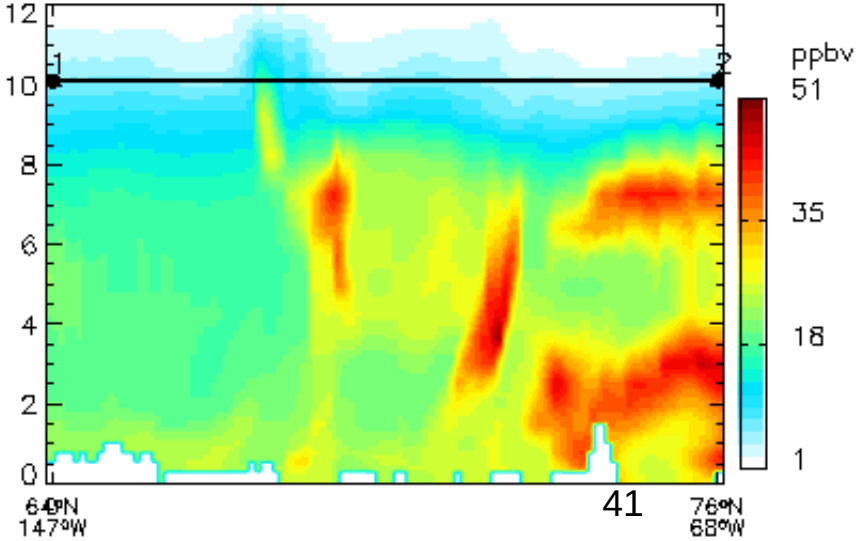
N. American CO 500 hPa



European CO



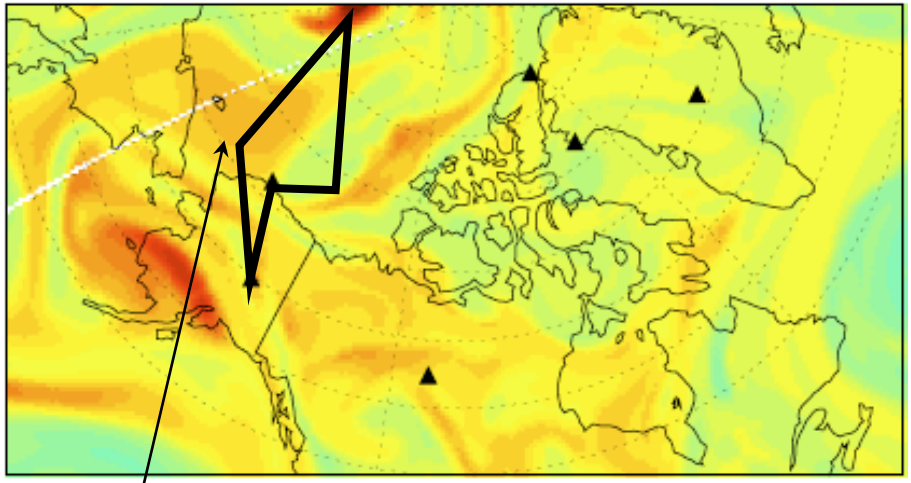
N. American CO



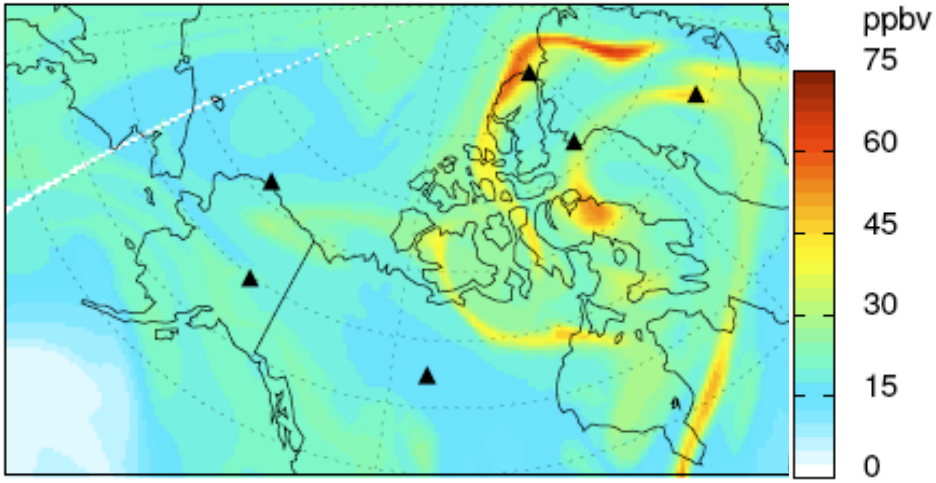
Initialized 04/04/2008 – 06z

DC-8 Flight Opportunity: 4/8

Asian CO 500 hPa



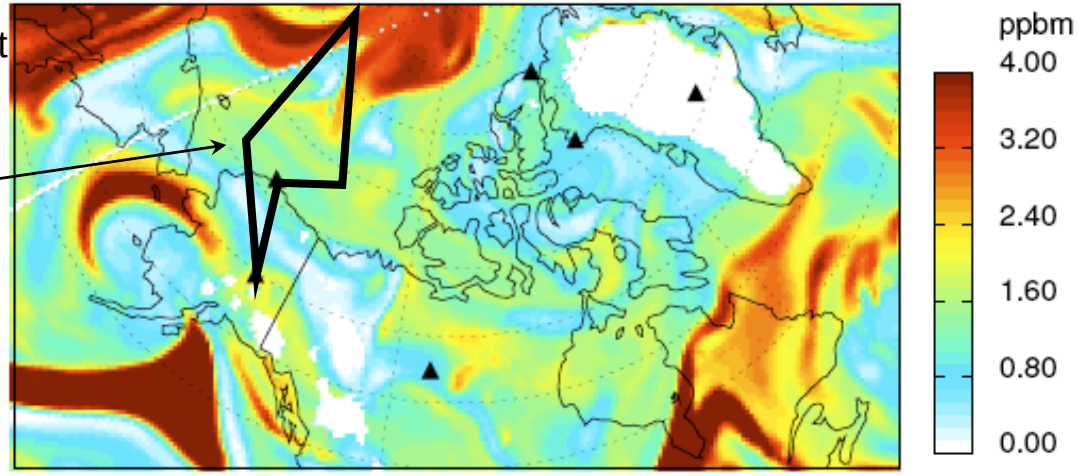
Boreal BB CO 500 hPa



Sulfate 850 hPa

Direct transport

Subsidence



Initialized 04/04/2008 – 06z