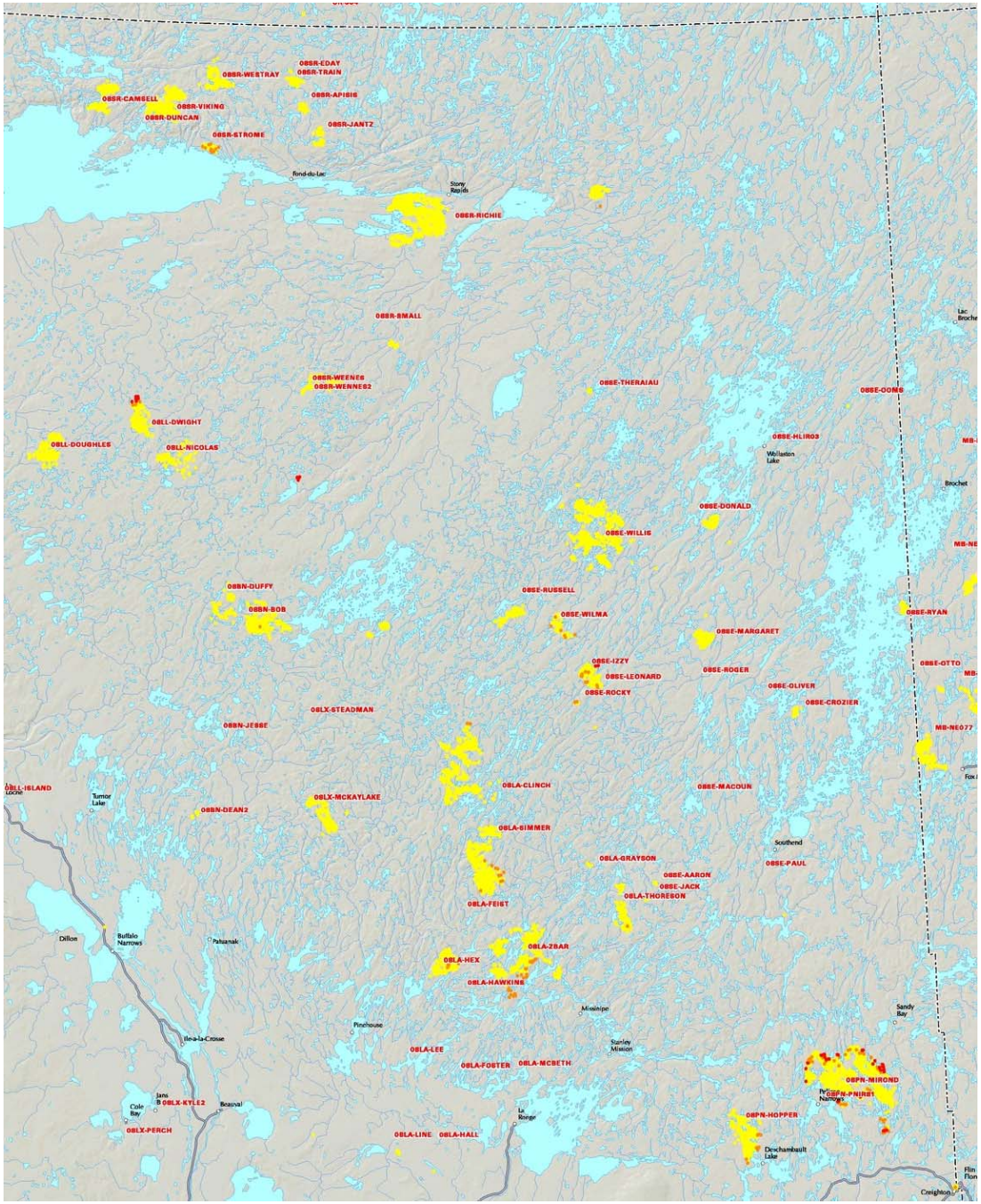
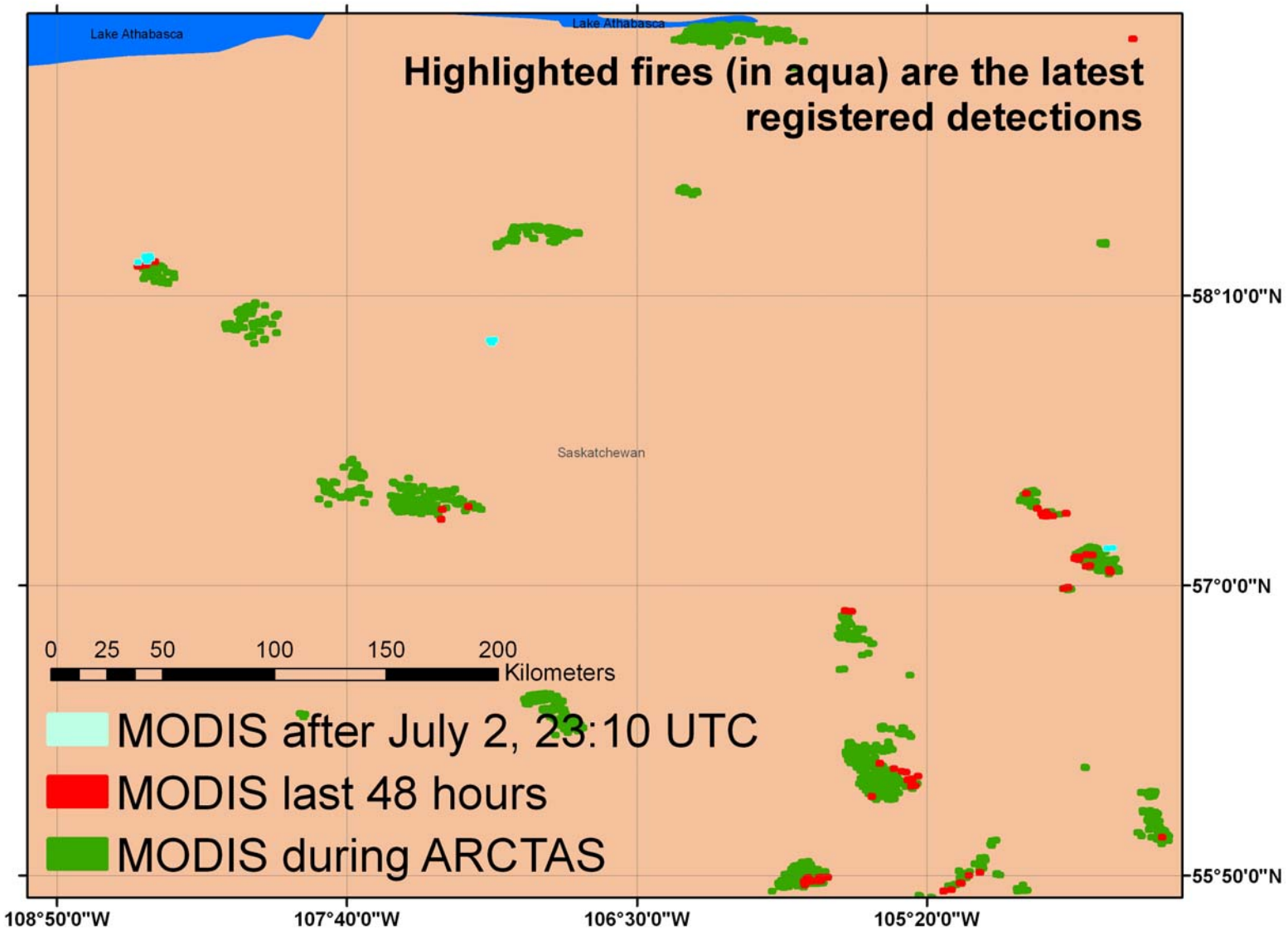
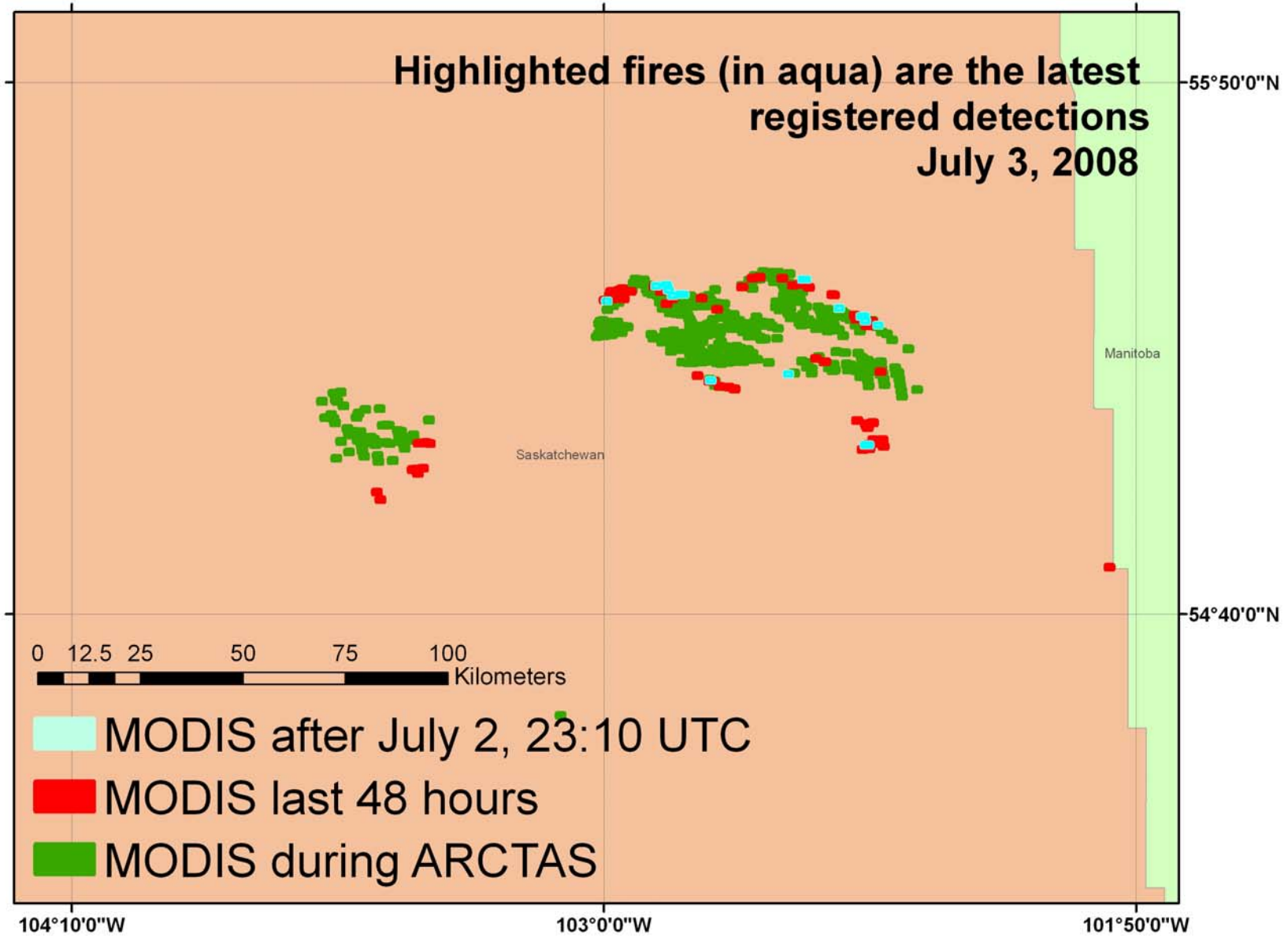
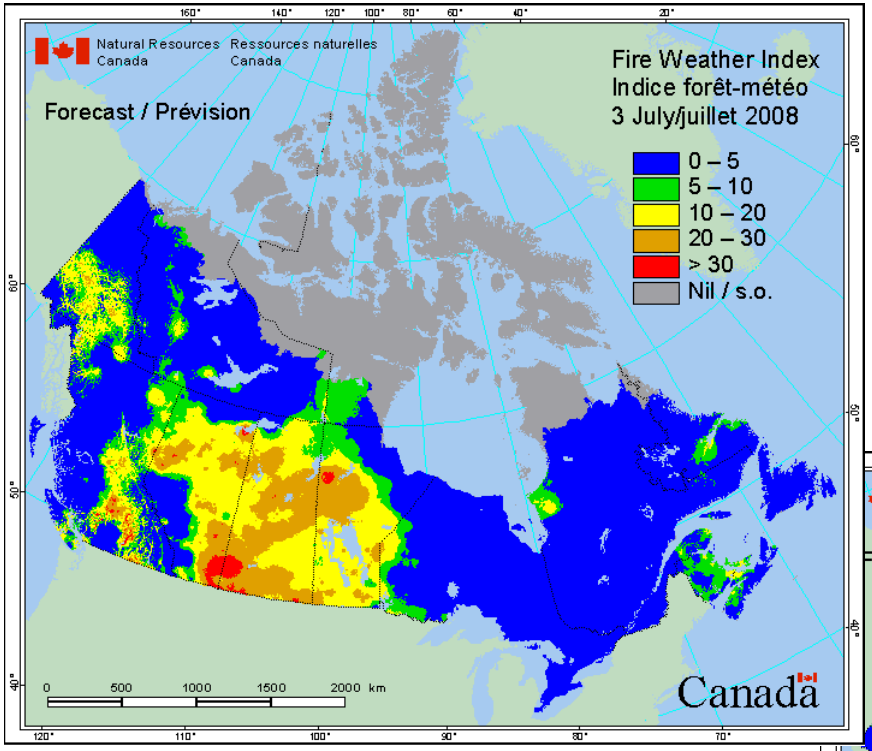
Fire Activity/Potential
July 3, 2008

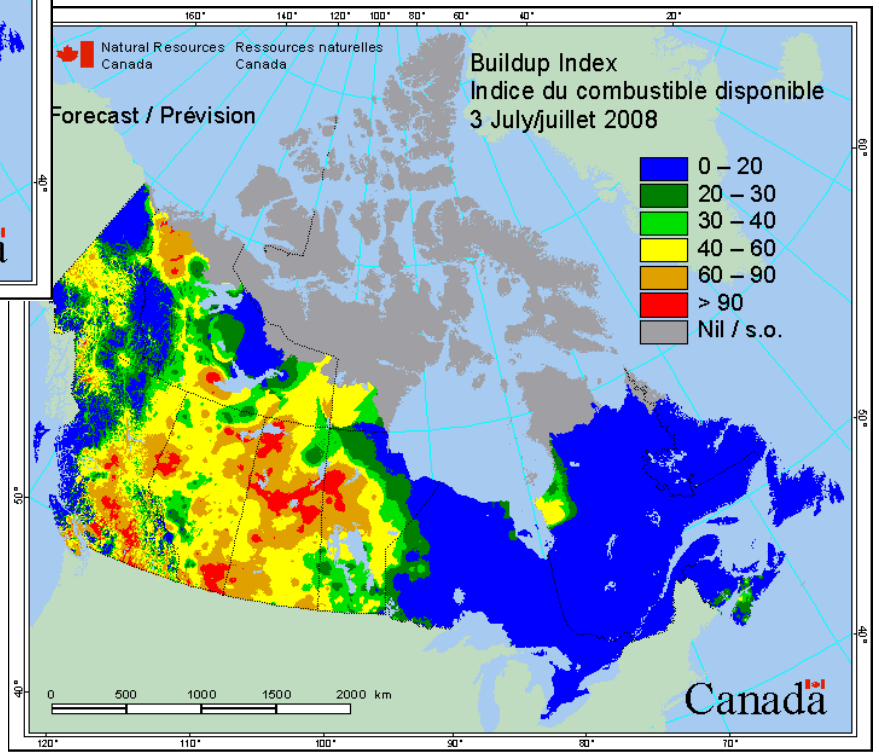
- Fires still very active in SK
- Expected to get worse before better
- Numerous communities evacuated
- Communication with SK re aircraft
- PN fire at 85,000 hectares
- Cold front tomorrow, cooler and wetter Saturday
- Communication with SK weather folks


08SR-EDAY
08SR-TRAIN
08SR-WESTRAY
08SR-CAMSELL
08SR-APISIS
08SR-VIKING
08SR-DUNCAN
08SR-JANTZ
08SR-STROME
Fond-du-Lac
Stony Rapids
08SR-RICHIE
08SR-SMALL
08SR-WEENES
08SR-WENNES2
08SE-THERAIAU
08SE-OONS
08LL-DWIGHT
08LL-DOUGHLES
08LL-NICOLAS
08SE-HLIR03
Wollaston Lake
Brochet
08SE-DONALD
08SE-WILLIS
08SN-DUFFY
08SN-BOB
08SE-RUSSELL
08SE-WILMA
08SE-RYAN
08SE-MARGARET
08SE-IZZY
08SE-OTTO
08SE-ROGER
08SE-LEONARD
08SE-OLIVER
08SE-ROCKY
08SE-CROZIER
08LX-STEADMAN
08SN-JESSE
MB-NE077
08LL-ISLAND
Turnor Lake
08LA-CLINCH
08SE-MACOUN
08LX-MCKAYLAKE
08SN-DEAN2
08LA-SIMMER
Southend
08LA-GRAYSON
08SE-PAUL
08SE-AARON
08SE-JACK
08LA-THORESON
08LA-FEIST
Dillon
Buffalo Narrows
Patuanak
08LA-ZBAR
08LA-HEX
08LA-HAWKINE
Missinipe
Sandy Bay
Pinehouse
Ile-a-la-Crosse
Stanley Mission
08LA-LEE
08LA-FOSTER
08LA-MCBETH
08PN-MIROND
Pelican Narrows
08PN-PNIRS1
Jans Bay
08LX-KYLE2
Beauval
Cole Bay
La Ronge
08PN-HOPPER
08LX-PERCH
08LA-LINE
08LA-HALL
Deschambault Lake
Creighton


Lake Athabasca
Lake Athabasca
Highlighted fires (in aqua) are the latest registered detections
Saskatchewan
58°10'0"N
57°0'0"N
55°50'0"N
0 25 50 100 150 200
Kilometers
MODIS after July 2, 23:10 UTC
MODIS last 48 hours
MODIS during ARCTAS
108°50'0"W
107°40'0"W
106°30'0"W
105°20'0"W

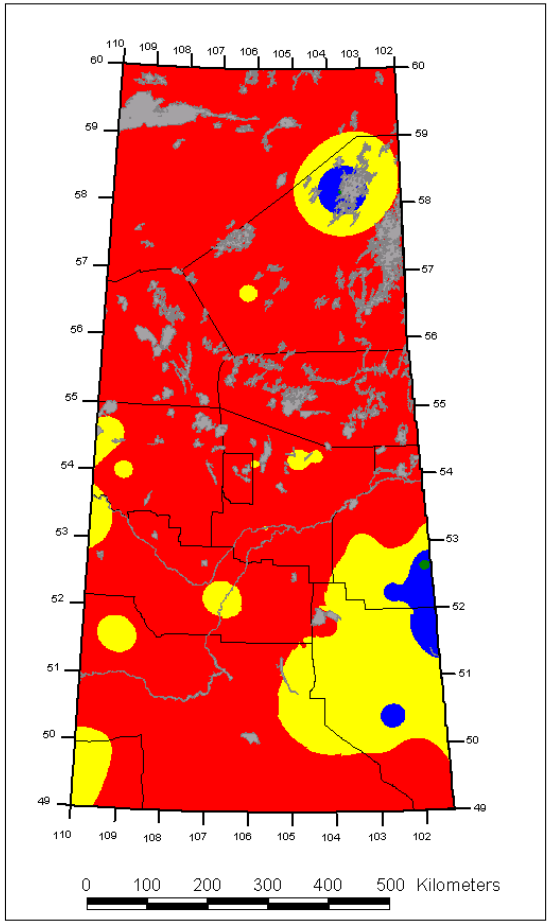

Highlighted fires (in aqua) are the latest registered detections
July 3, 2008
55°50'0"N
54°40'0"N
Manitoba
Saskatchewan
0 12.5 25 50 75 100
Kilometers
MODIS after July 2, 23:10 UTC
MODIS last 48 hours
MODIS during ARCTAS
104°10'0"W
103°0'0"W
101°50'0"W


Natural Resources Canada
Ressources naturelles Canada
Forecast / Prévision
Fire Weather Index
Indice forêt-météo
3 July/juillet 2008
0 – 5
5 – 10
10 – 20
20 – 30
> 30
Nil / s.o.
0 500 1000 1500 2000 km
Canada


Natural Resources Canada
Ressources naturelles Canada
Forecast / Prévision
Buildup Index
Indice du combustible disponible
3 July/juillet 2008
0 – 20
20 – 30
30 – 40
40 – 60
60 – 90
> 90
Nil / s.o.
0 500 1000 1500 2000 km
Canada

Saskatchewan

Spatial Fire Management System



N
W E
S

Noon Actuals issued on 2 Jul 2008

Buildup Index
- 0 - 24
- 25 - 40
- 41 - 60
- 60 +

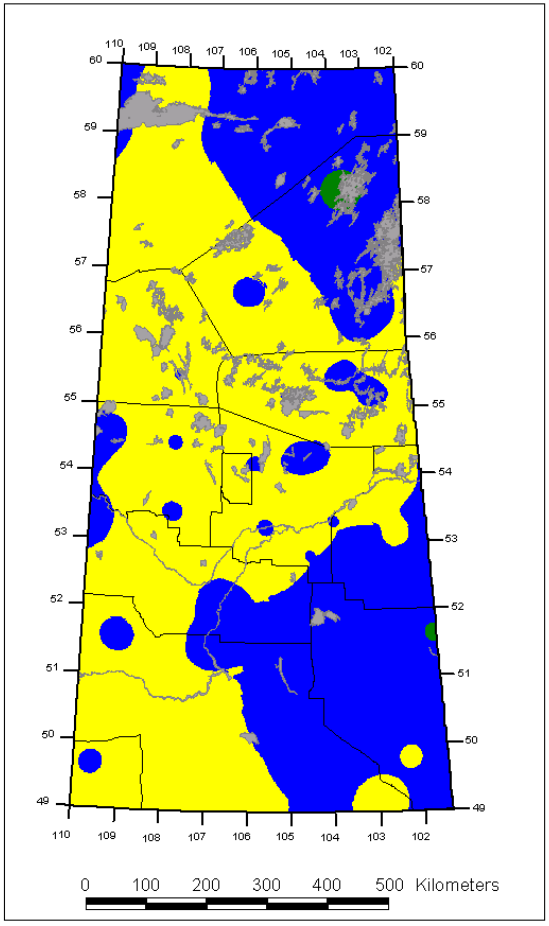
Prepared By:

Ministry of
Saskatchewan Environr
Fire Management and
Forest Protection Branc

GIS Services

Saskatchewan

Spatial Fire Management System



N
W E
S

Noon Actuals issued on 2 Jul 2008

Fire Weather Index
- 0 - 5 / LOW
- 6 - 16 / MODERATE
- 17 - 30 / HIGH
- 30 + / EXTREME

Prepared By:

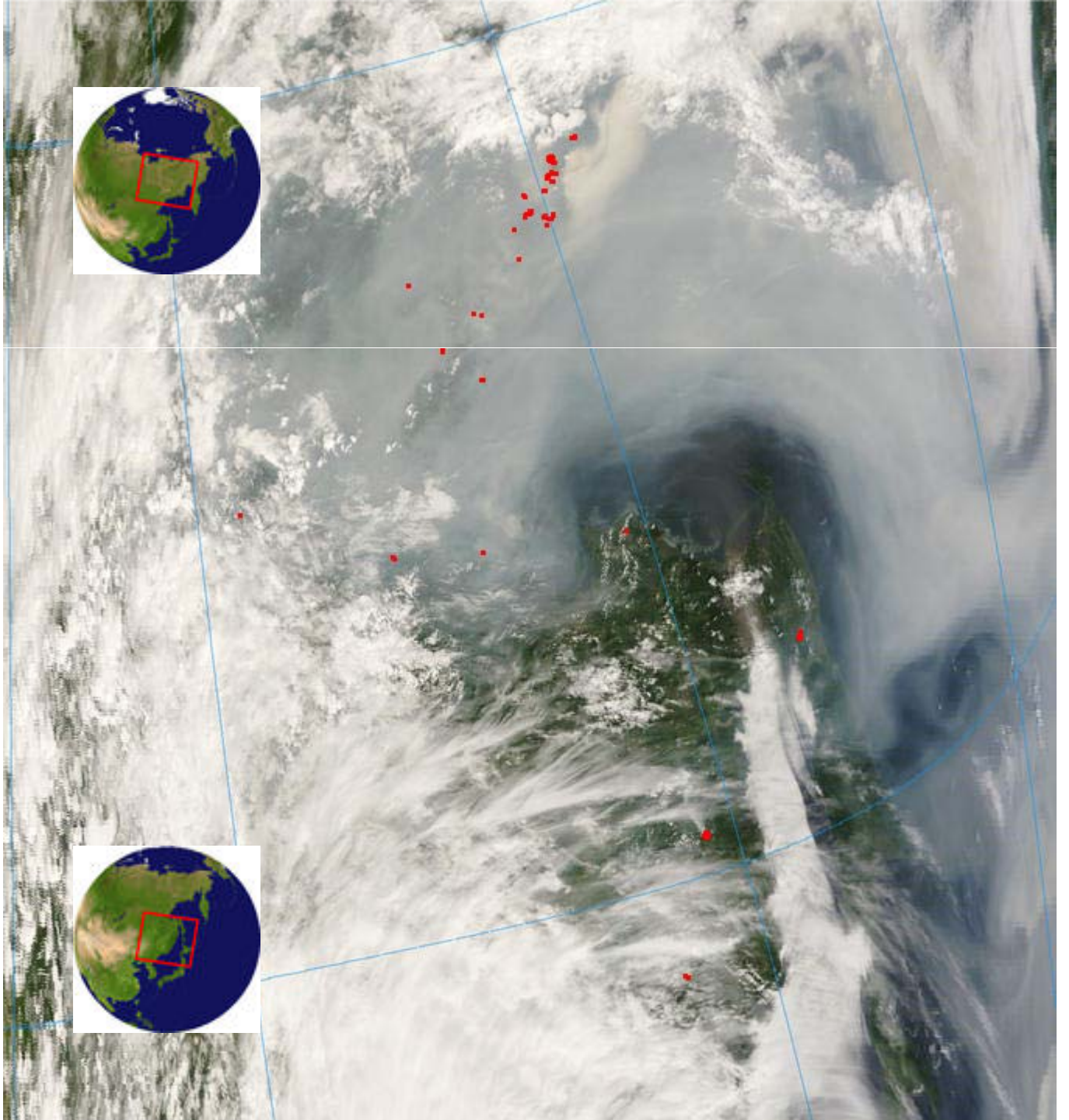
Ministry of
Saskatchewan Environment
Fire Management and
Forest Protection Branch

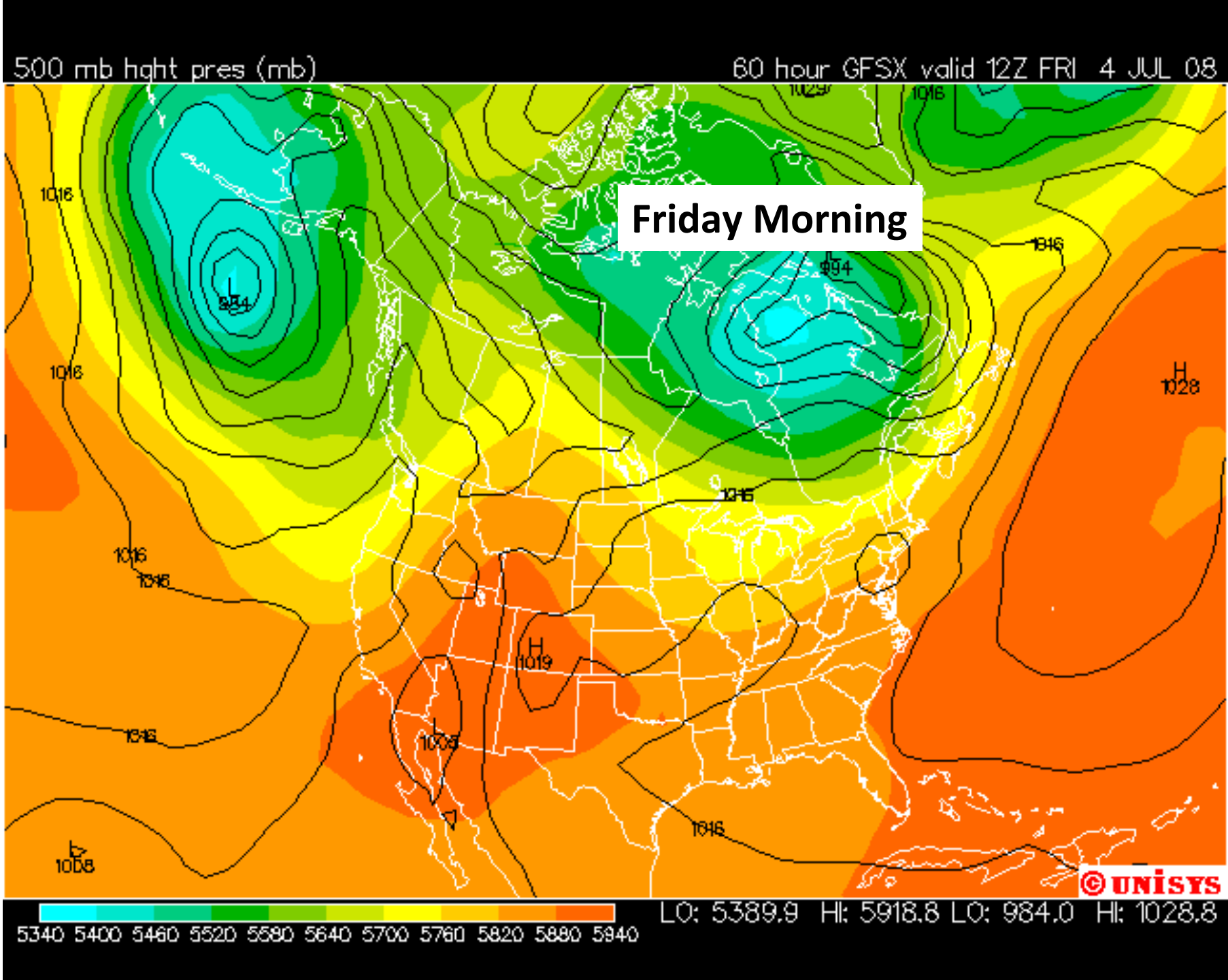
GIS Services

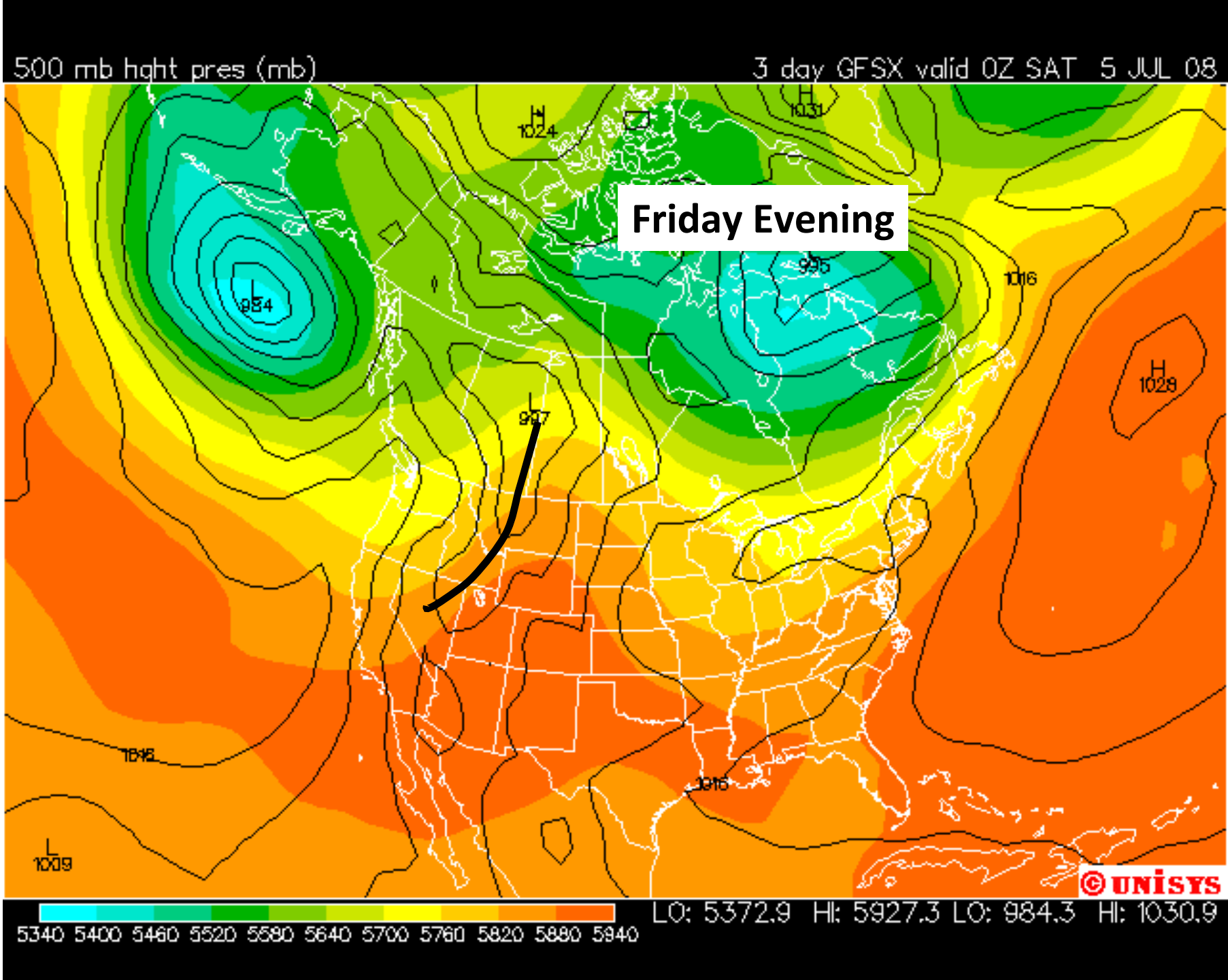
MODIS Terra
July 03, 2008

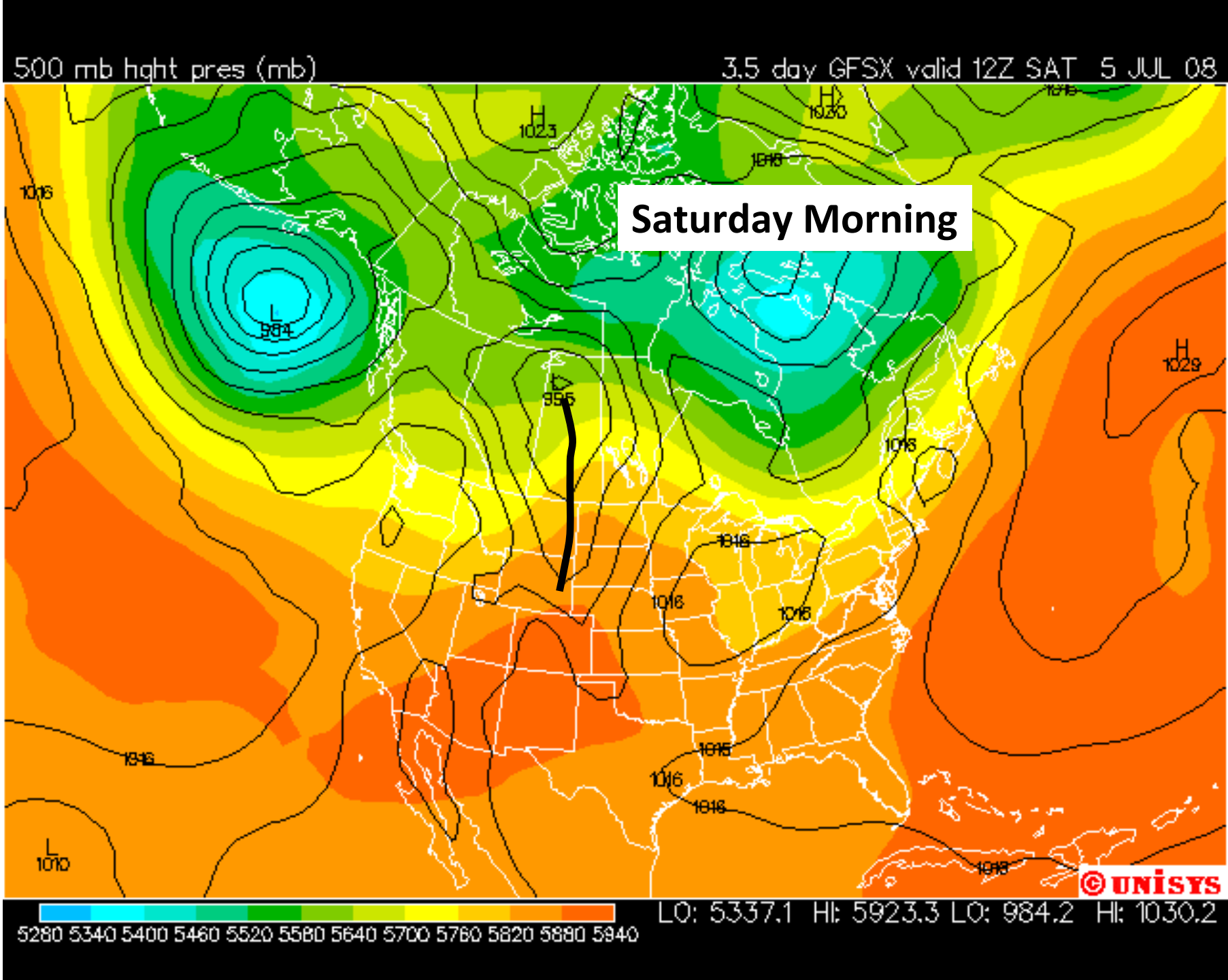
02:00 UTC

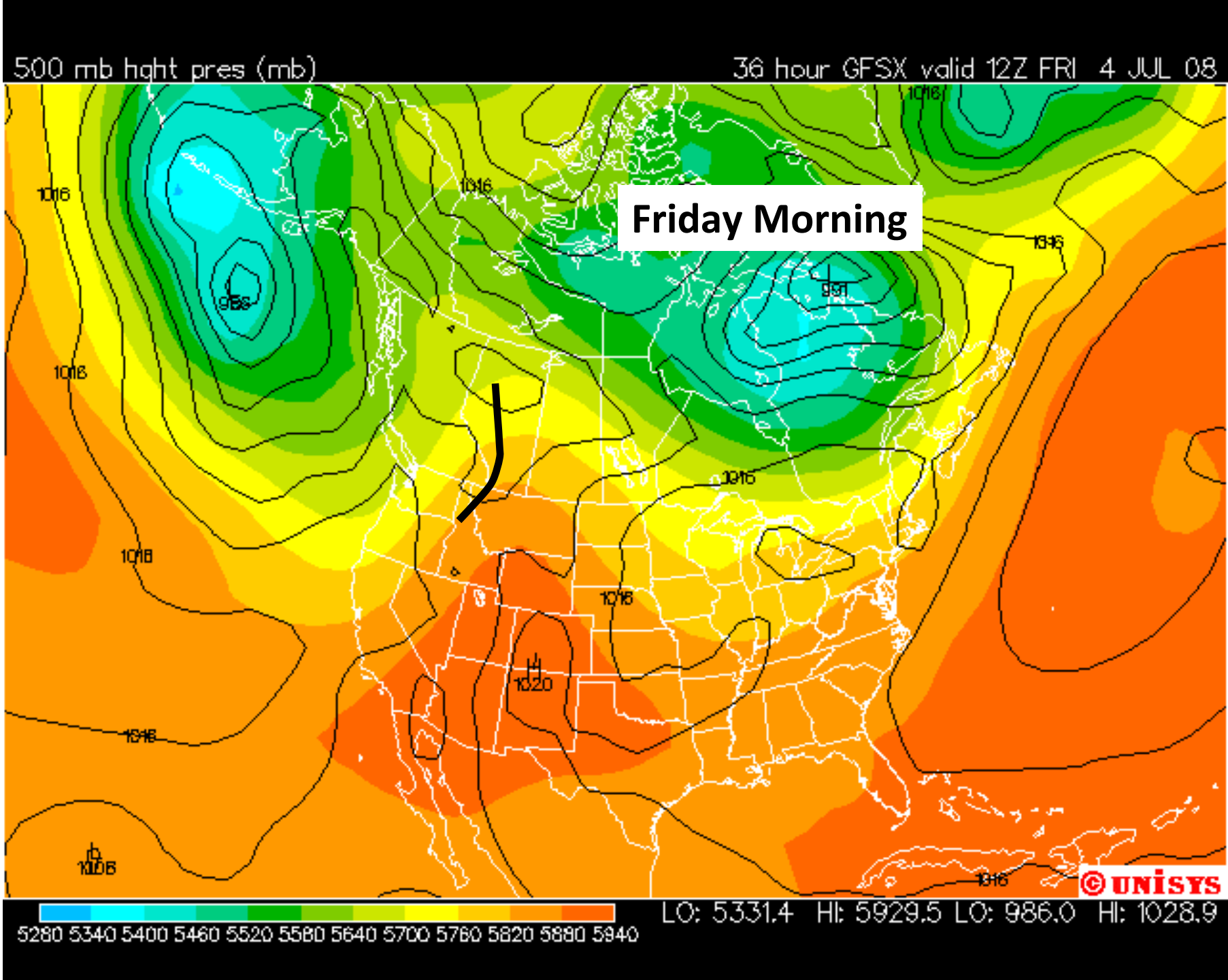
02:05 UTC

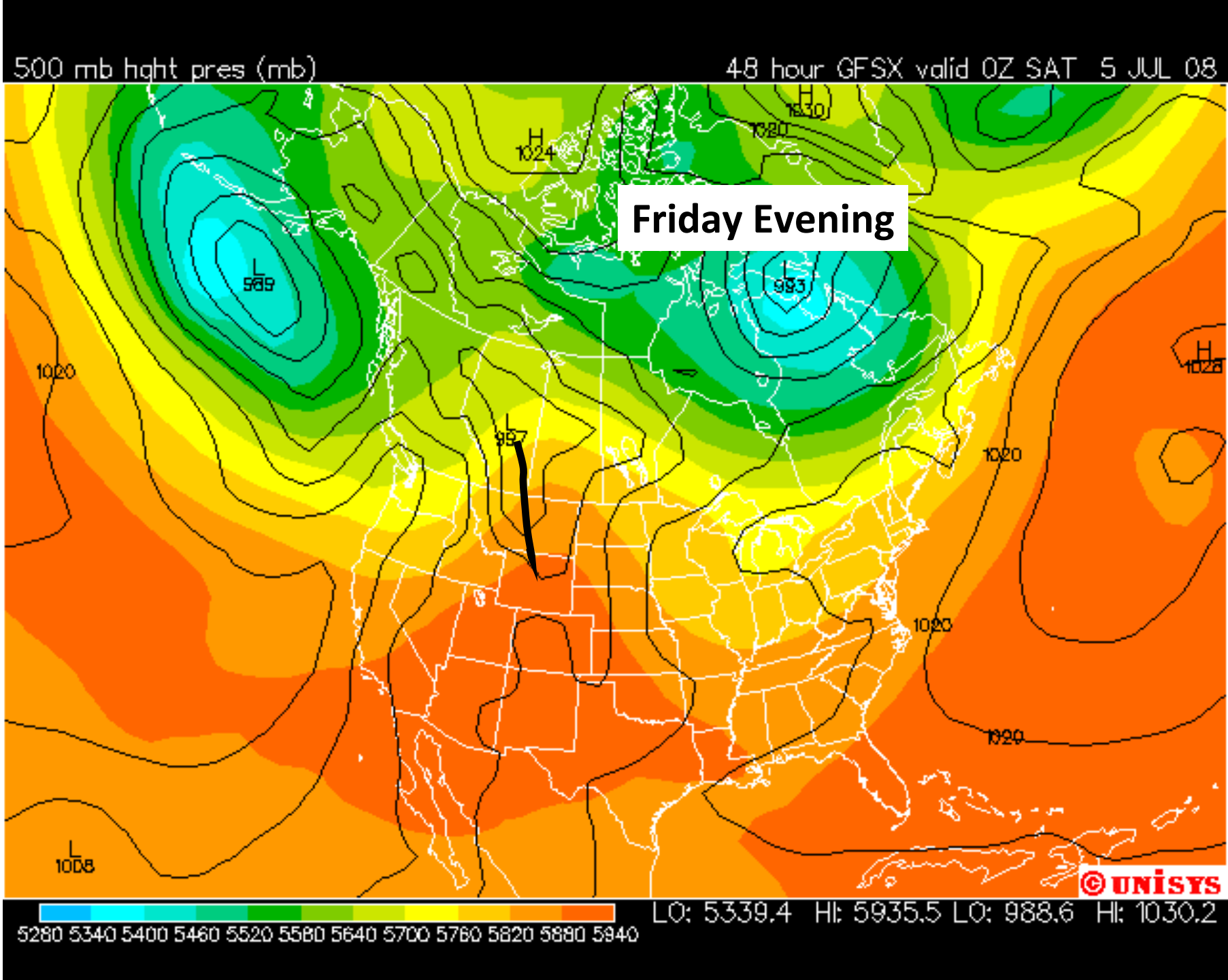


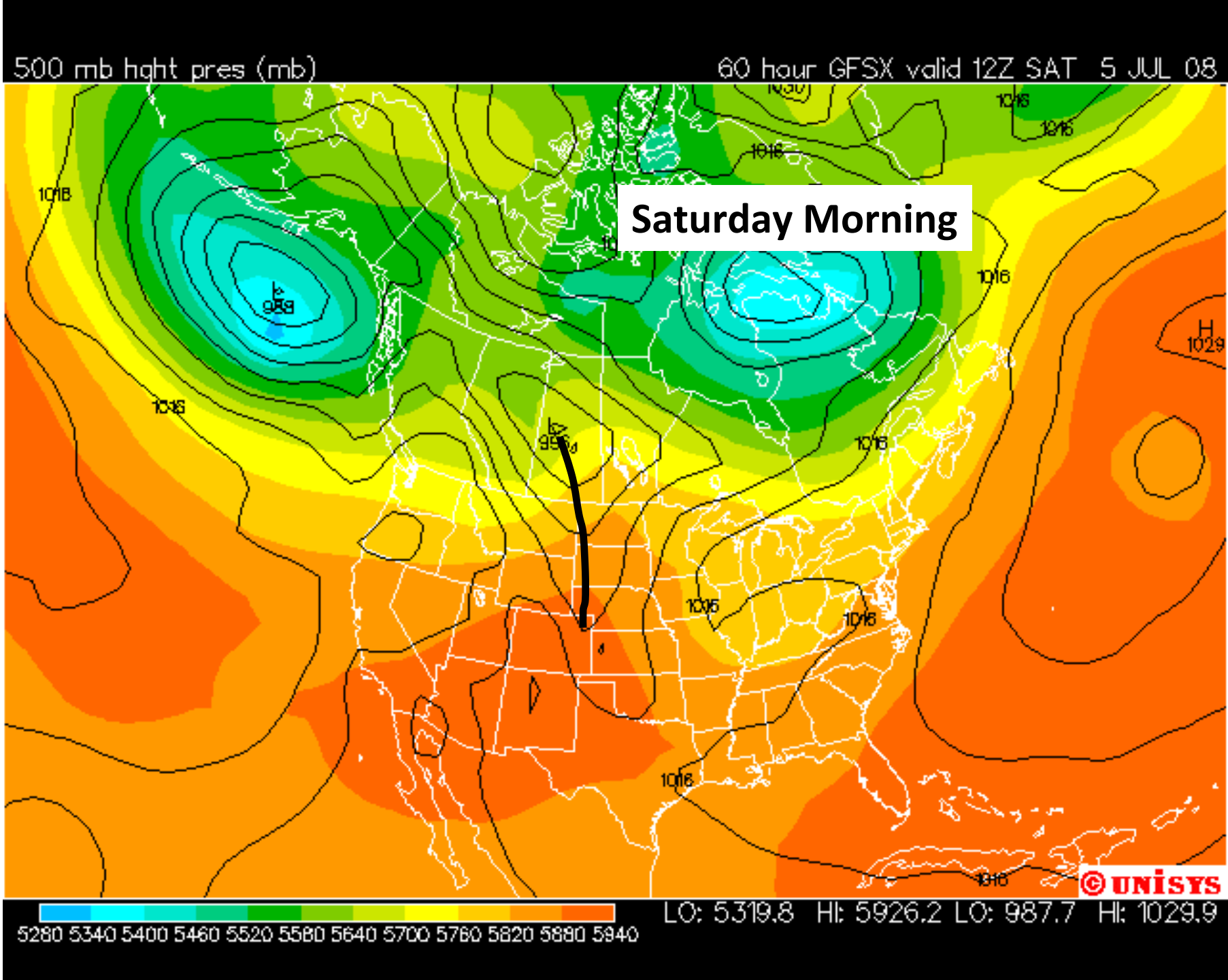

500 mb hght pres (mb)
60 hour GFSX valid 12Z FRI 4 JUL 08
Friday Morning
5340 5400 5460 5520 5580 5640 5700 5760 5820 5880 5940
LO: 5389.9 HI: 5918.8 LO: 984.0 HI: 1028.8
©UNISYS


500 mb hght pres (mb)
3 day GFSX valid 0Z SAT 5 JUL 08
Friday Evening
1024
1031
954
995
1016
1028
997
1012
1016
1009
©UNISYS
5340 5400 5460 5520 5580 5640 5700 5760 5820 5880 5940
LO: 5372.9 HI: 5927.3 LO: 984.3 HI: 1030.9

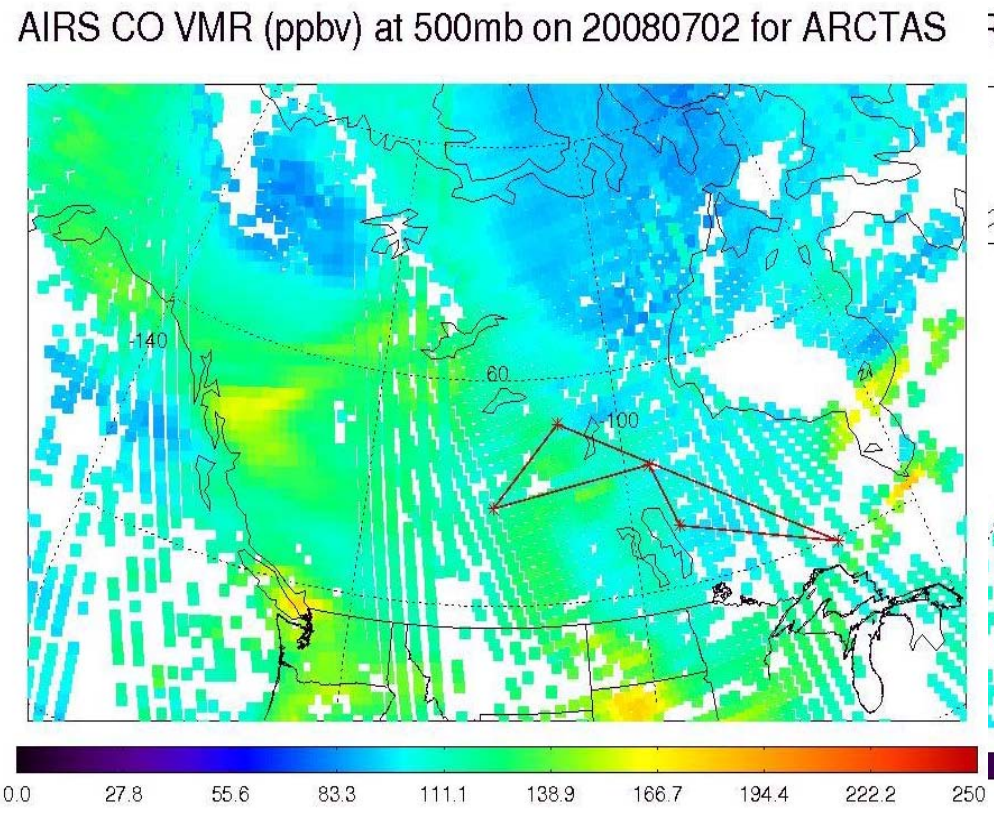

500 mb hght pres (mb)
3.5 day GFSX valid 12Z SAT 5 JUL 08
Saturday Morning
5280 5340 5400 5460 5520 5580 5640 5700 5760 5820 5880 5940
LO: 5337.1 HI: 5923.3 LO: 984.2 HI: 1030.2
©UNISYS

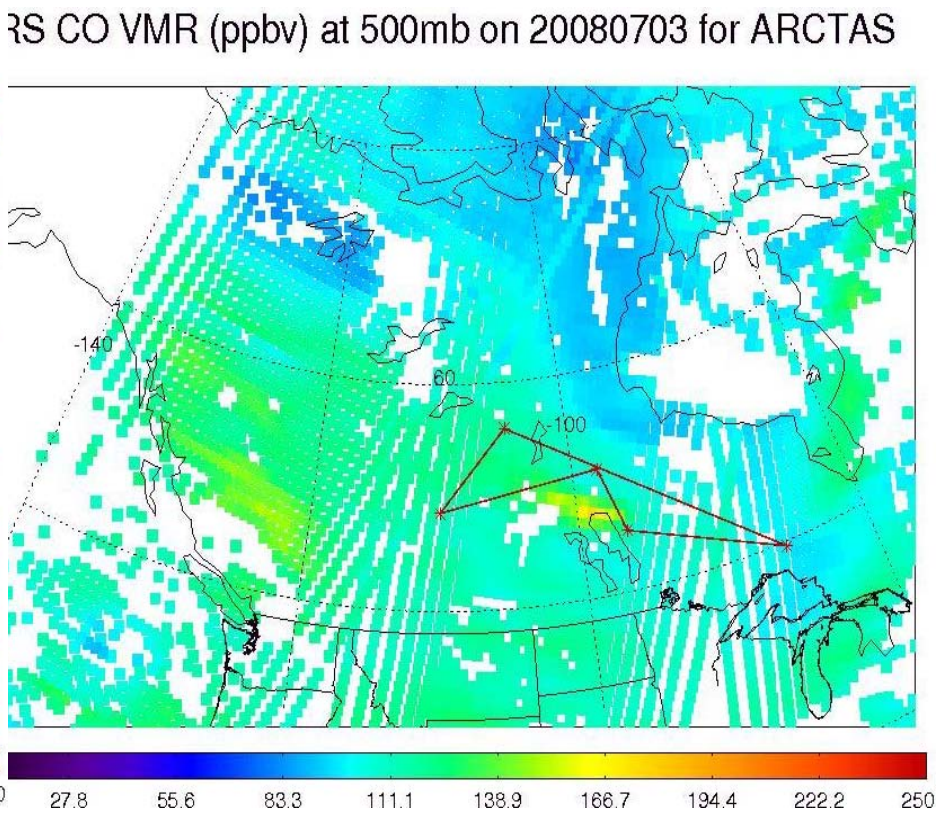

500 mb hght pres (mb)
36 hour GFSX valid 12Z FRI 4 JUL 08
Friday Morning
1016
1020
5280 5340 5400 5460 5520 5580 5640 5700 5760 5820 5880 5940
LO: 5331.4 HI: 5929.5 LO: 986.0 HI: 1028.9
©UNISYS


500 mb hght pres (mb)
48 hour GFSX valid 0Z SAT 5 JUL 08
Friday Evening
H 1030
1020
H 1024
L 989
L 993
1020
H 1028
L 997
1020
1020
1020
L 1008
© UNISYS
5280 5340 5400 5460 5520 5580 5640 5700 5760 5820 5880 5940
LO: 5339.4 HI: 5935.5 LO: 988.6 HI: 1030.2


500 mb hght pres (mb)
60 hour GFSX valid 12Z SAT 5 JUL 08
Saturday Morning
5280 5340 5400 5460 5520 5580 5640 5700 5760 5820 5880 5940
LO: 5319.8 HI: 5926.2 LO: 987.7 HI: 1029.9
©UNISYS

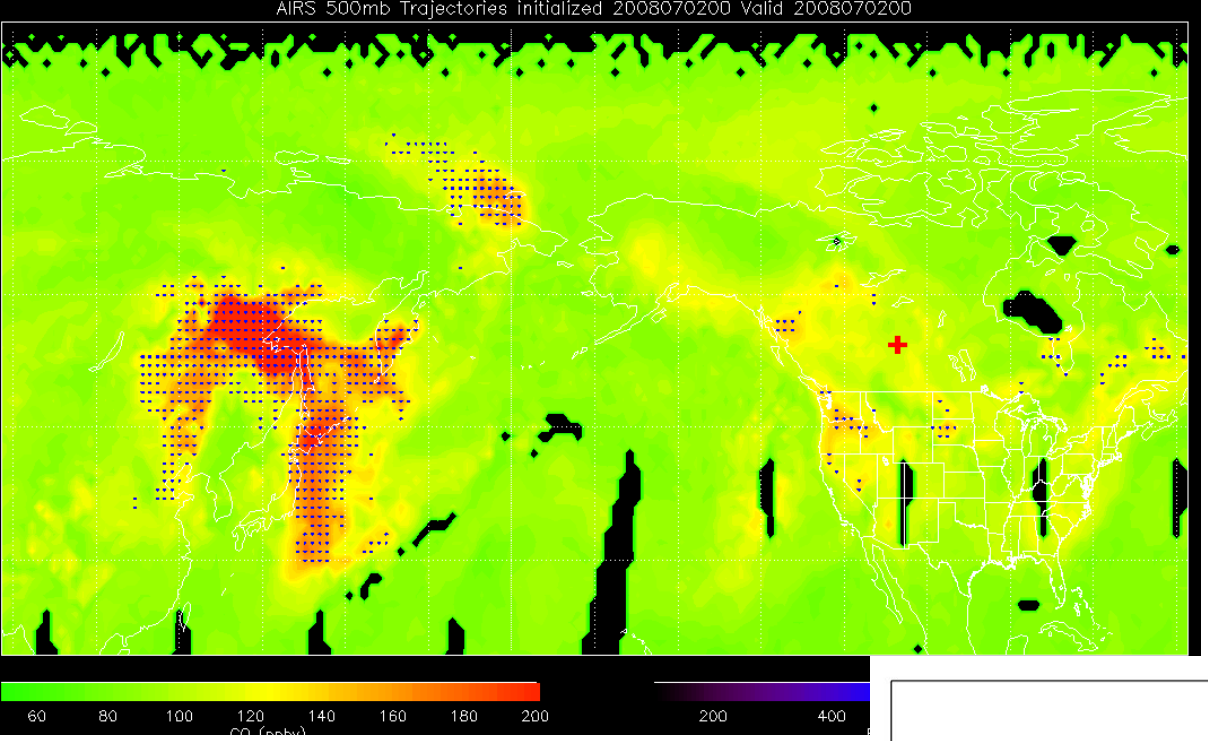
AIRS Support for ARCTAS

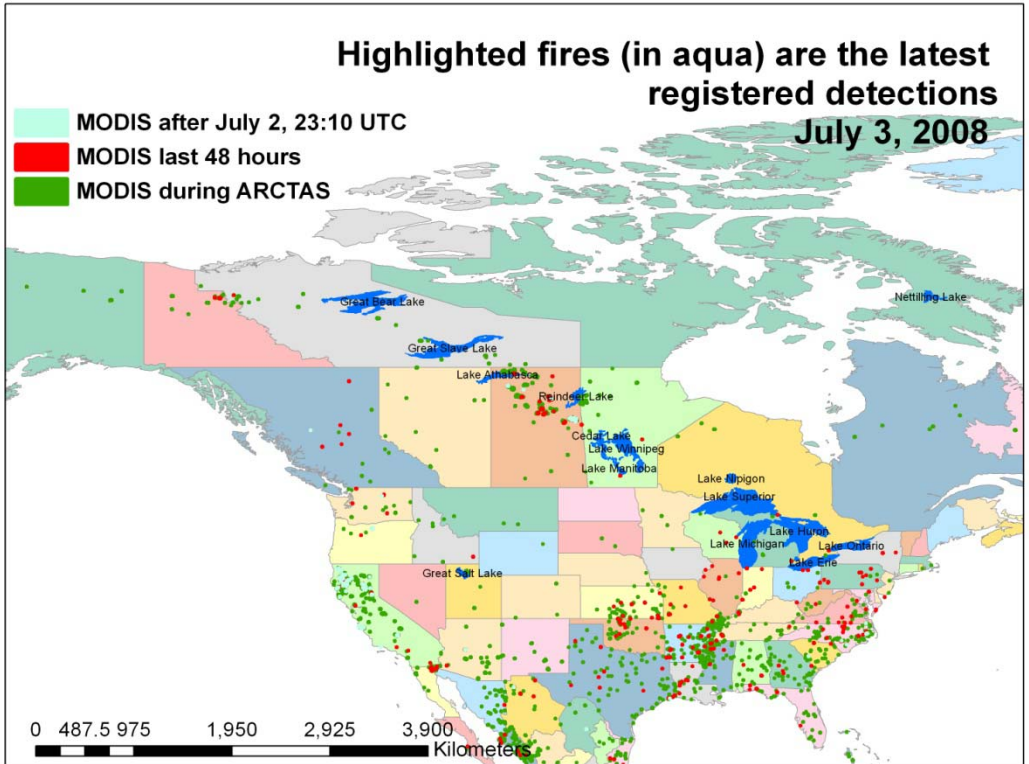


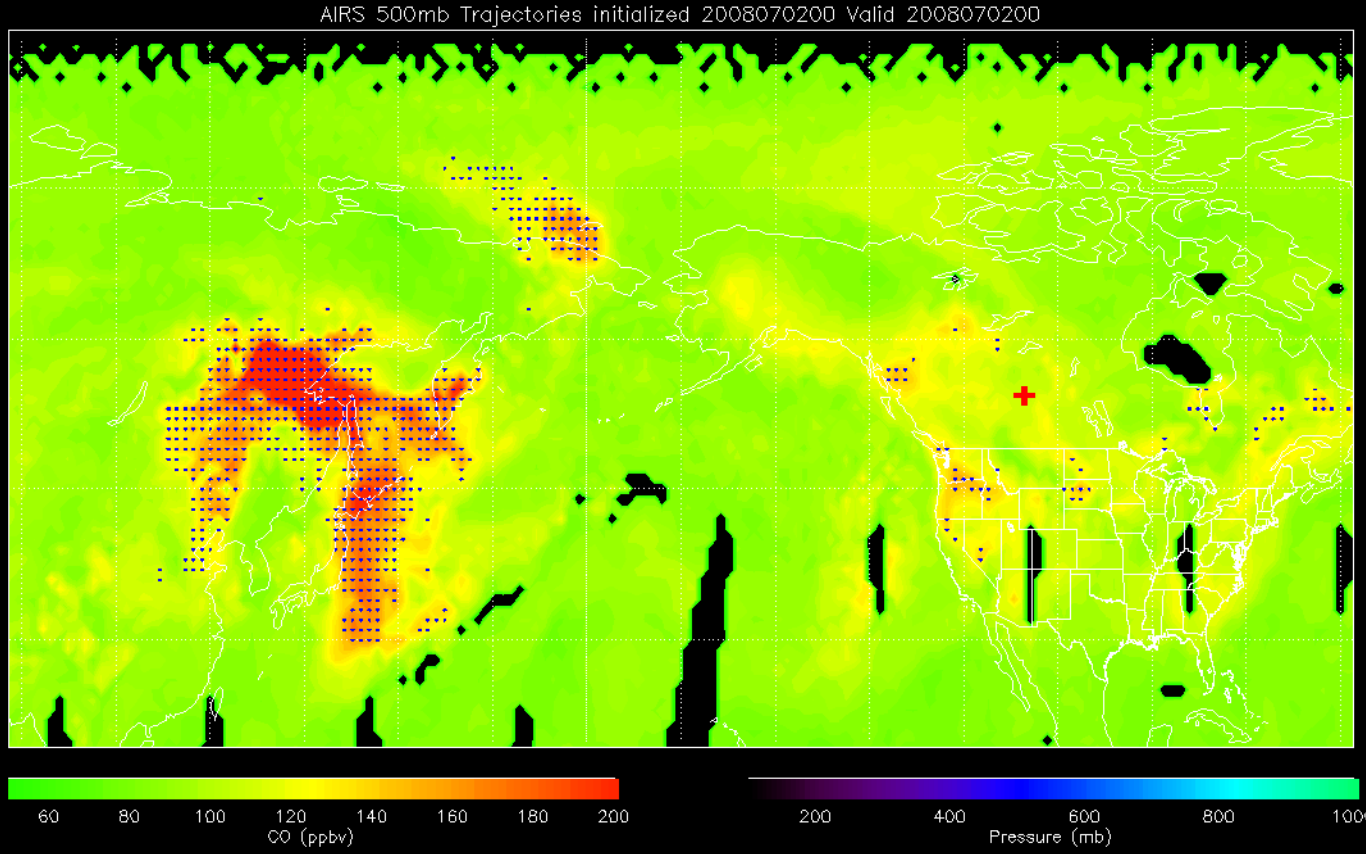


Emissions from four locations:

- Siberian long range transport and CA fire transport merged.
- Yukon transported southeastly and merge with Saskatchewan fires.
- Saskatchewan fire emissions above 250mb and transporting into US.

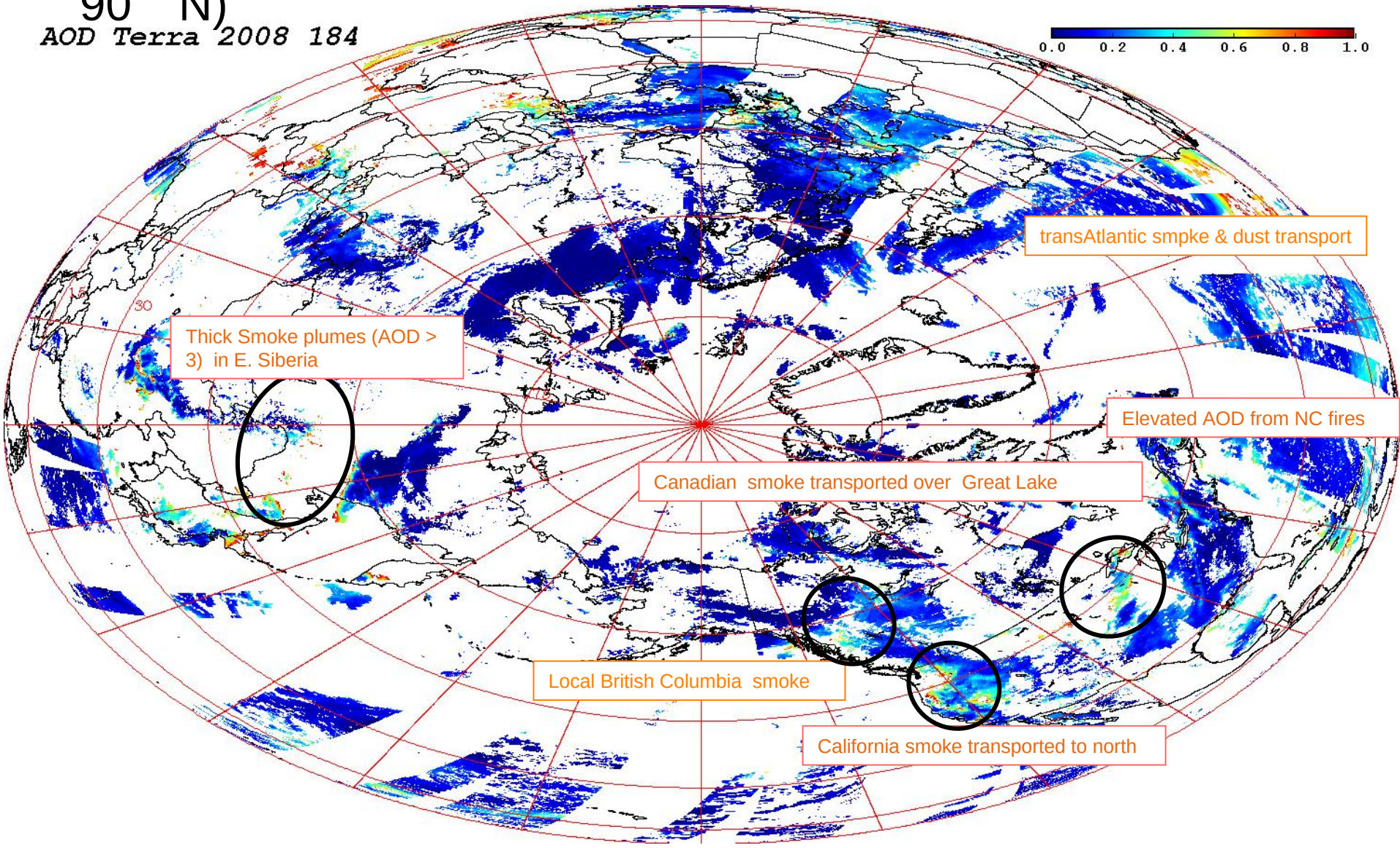

AIRS 500mb Trajectories initialized 2008070200 Valid 2008070200
60
80
100
120
140
160
180
200
200
400


Highlighted fires (in aqua) are the latest registered detections
July 3, 2008
MODIS after July 2, 23:10 UTC
MODIS last 48 hours
MODIS during ARCTAS
Great Bear Lake
Great Slave Lake
Lake Athabasca
Reindeer Lake
Cedar Lake
Lake Winnipeg
Lake Manitoba
Nettilling Lake
Lake Nipigon
Lake Superior
Lake Huron
Lake Michigan
Lake Ontario
Lake Erie
Great Salt Lake
0 487.5 975 1,950 2,925 3,900
Kilometers


AIRS 500mb Trajectories initialized 2008070200 Valid 2008070200
60
80
100
120
140
160
180
200
CO (ppbv)
200
400
600
800
1000
Pressure (mb)

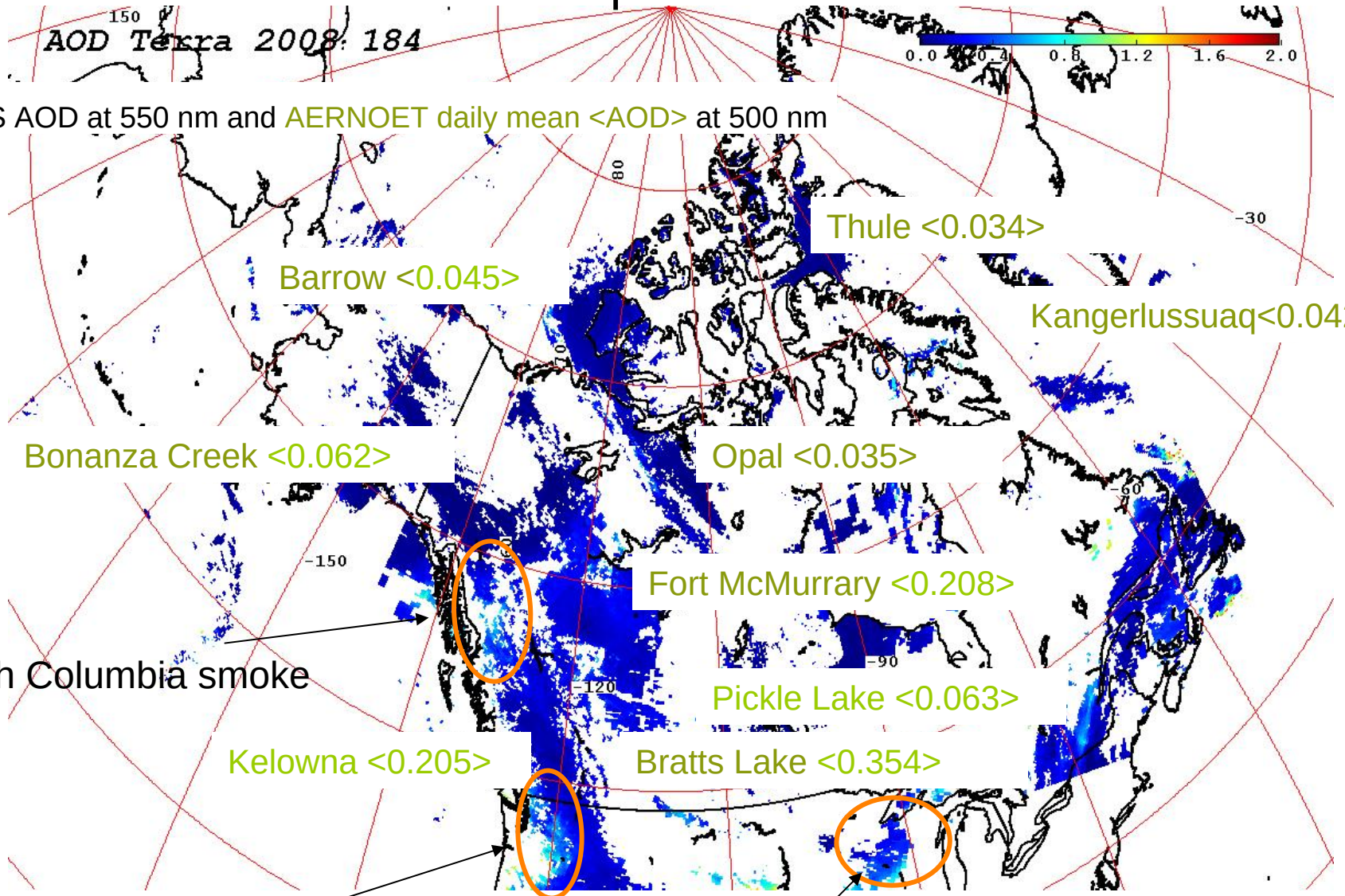
Day 184 (July 2) Wednesday

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



Day 183 (July 1) Tuesday

MODIS AOD Hot Spots in Northern America



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

Thule <0.034>

Barrow <0.045>

Kangerlussuaq<0.042>

Bonanza Creek <0.062>

Opal <0.035>

Fort McMurrary <0.208>

British Columbia smoke

Pickle Lake <0.063>

Kelowna <0.205>

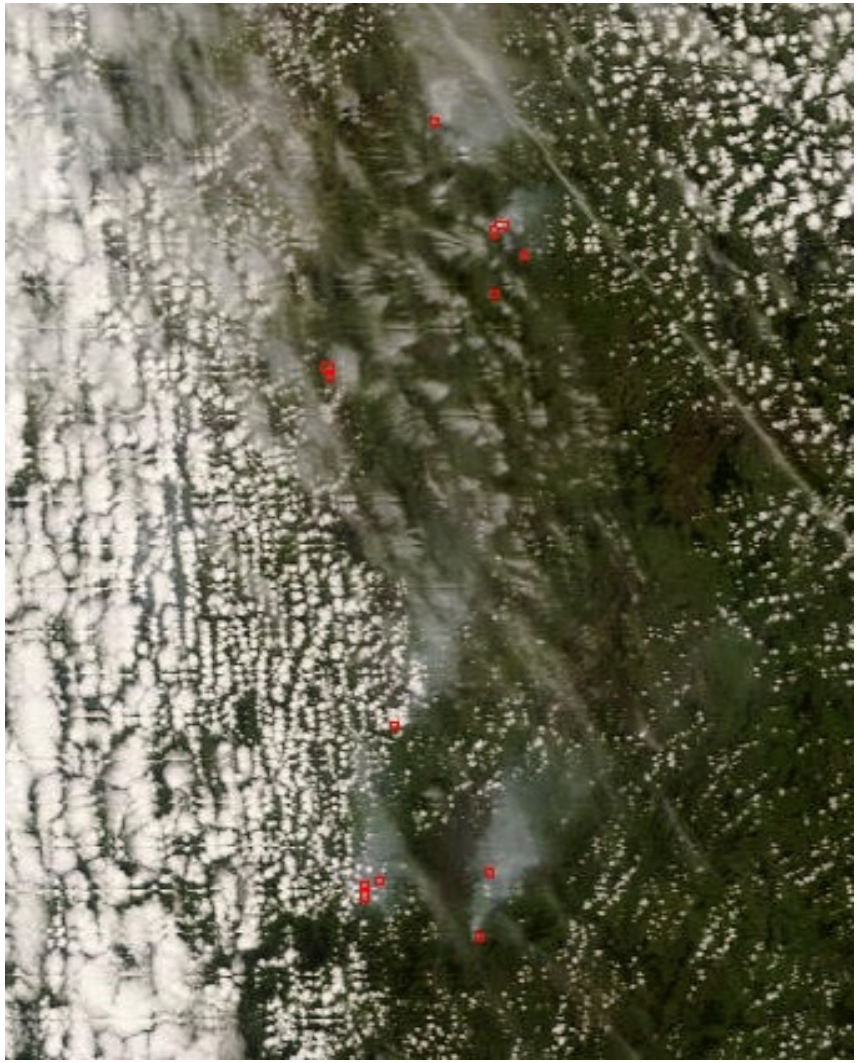
Bratts Lake <0.354>

California smoke

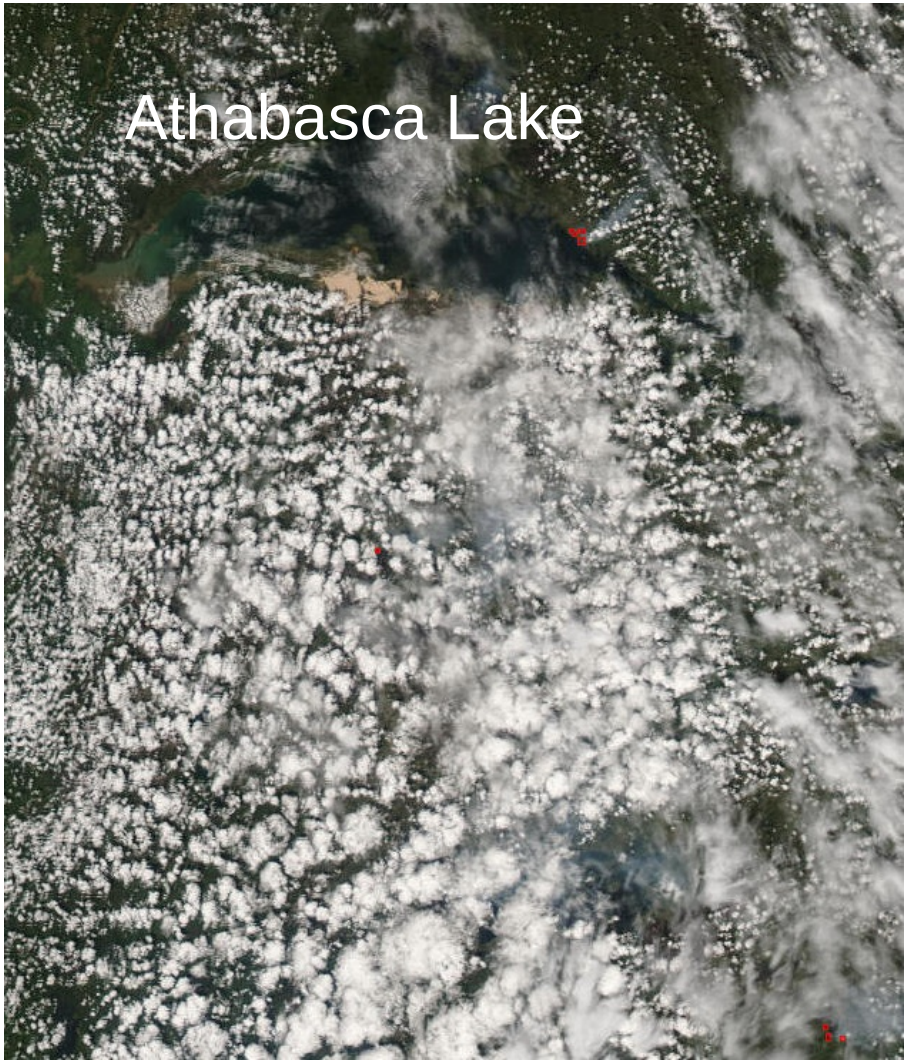
Saskatchewan smoke moving over Great Lakes and E. US

No AOD retrieval but nice to see…..

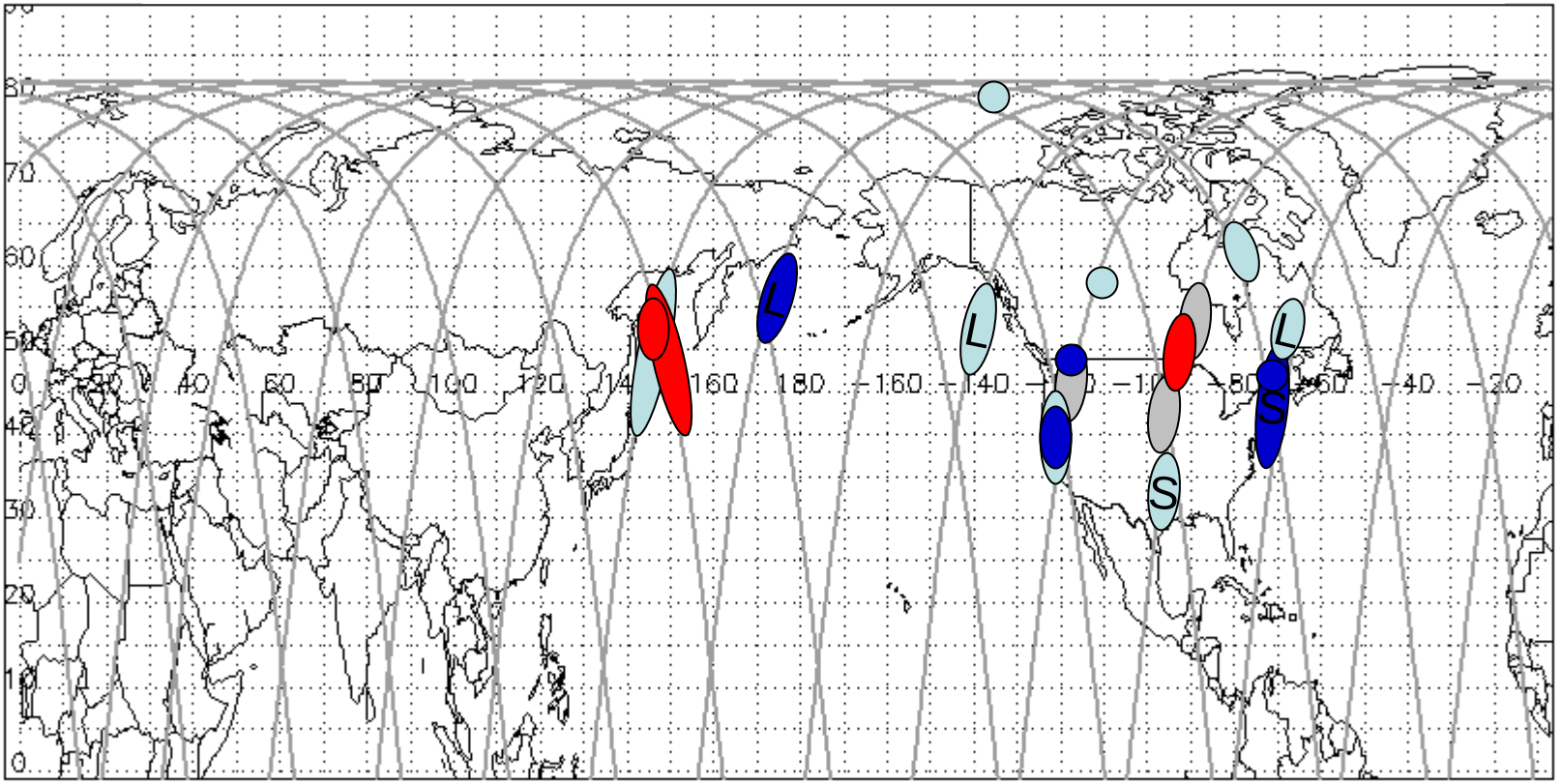
Smoke plumes developed in N Saskatchewan



Isolated smoke plumes in N. Alberta and Saskatchewan



Aerosol Layer Locations based on CALIPSO Obs from 07/02

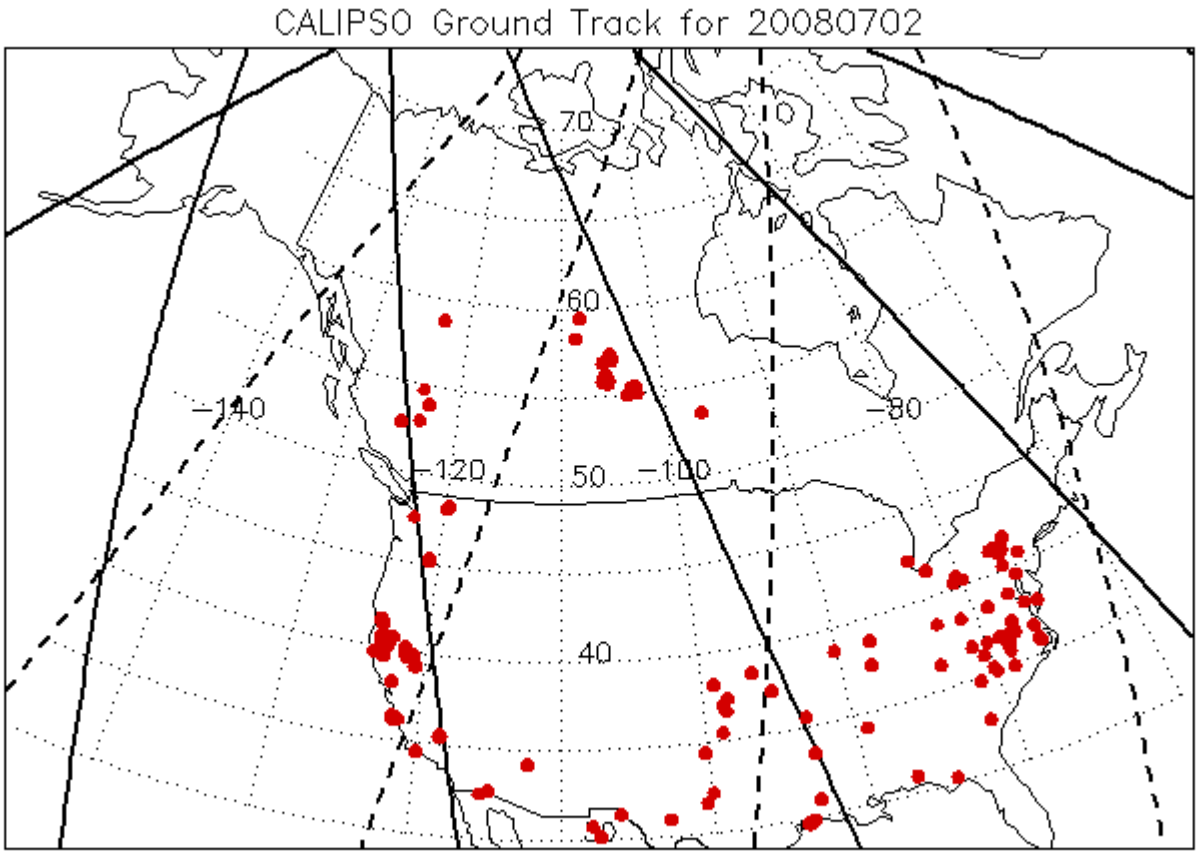


Cloud

Aerosol Layer- low aerosol loading

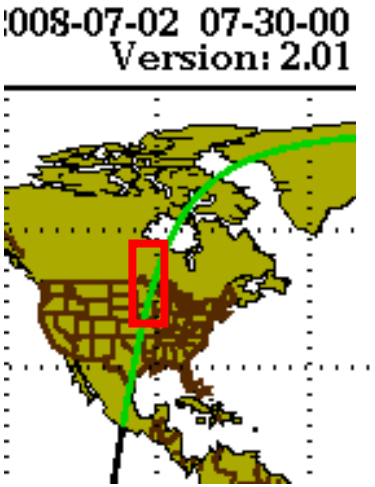
Aerosol Layer- medium aerosol loading

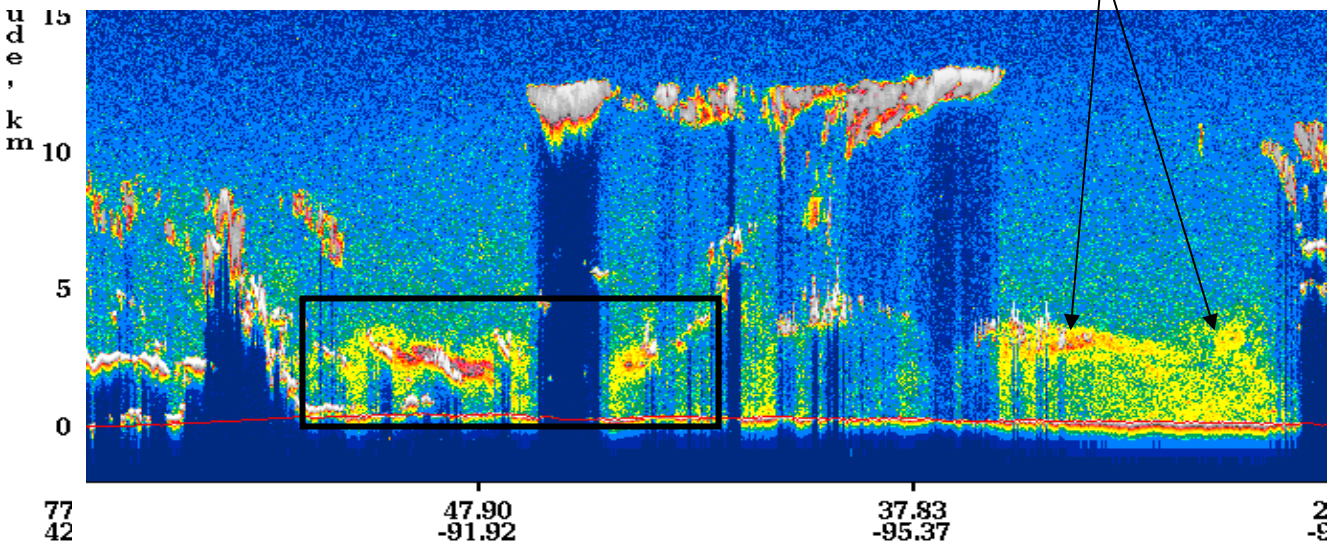
Aerosol Layer- high aerosol loading

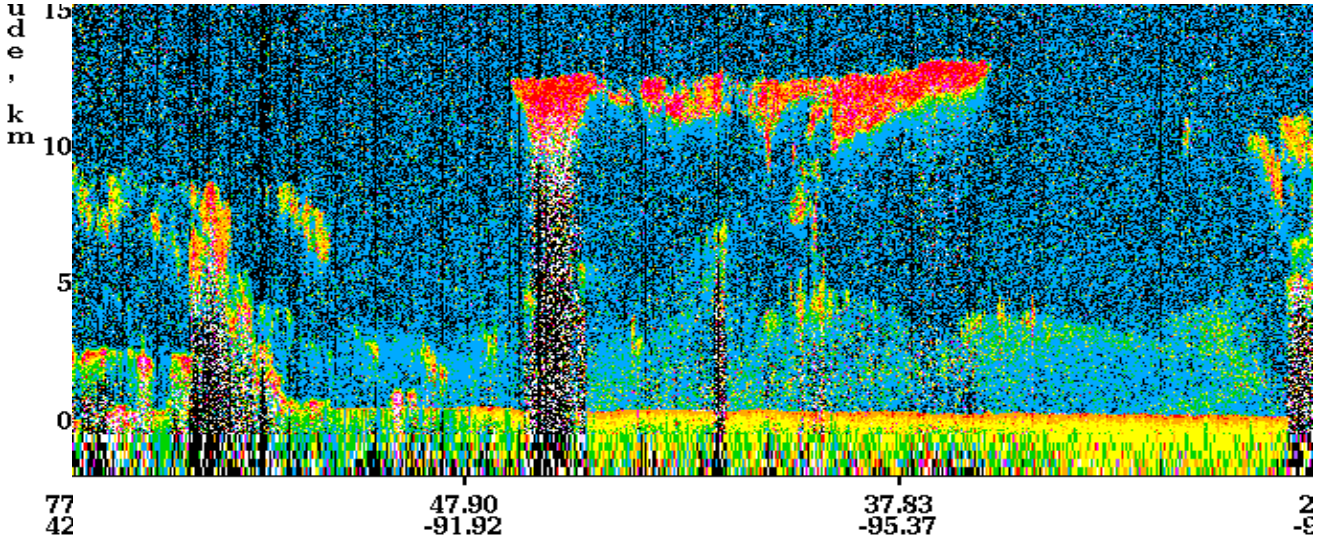


Fire locations from MODIS Terra and Aqua

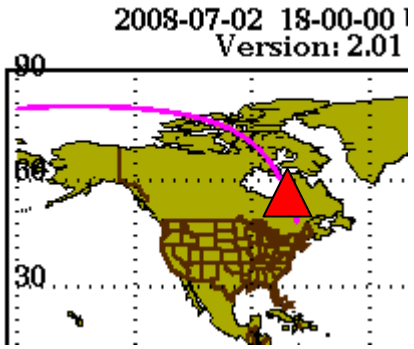
CALIPSO Obs 7/2: Smoke from Central Canada







Smoke
8.5km


2008-07-02 18-00-00
Version: 2.01
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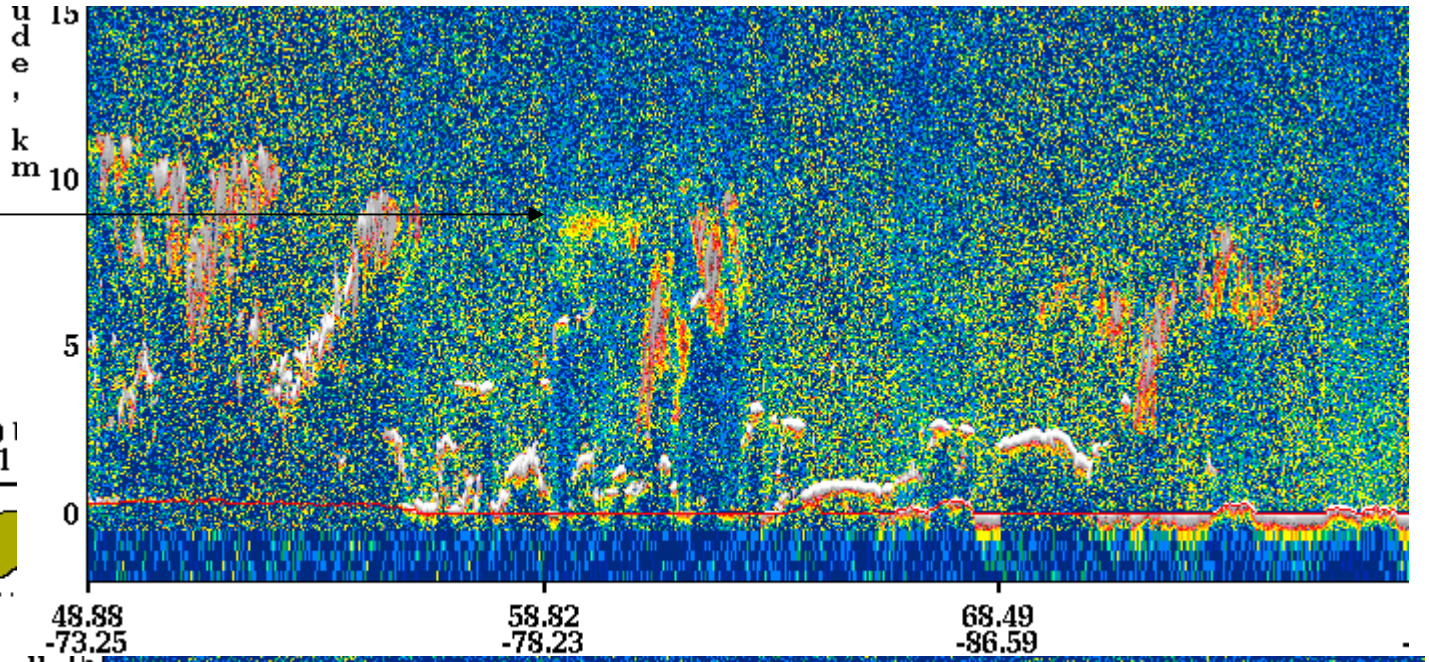
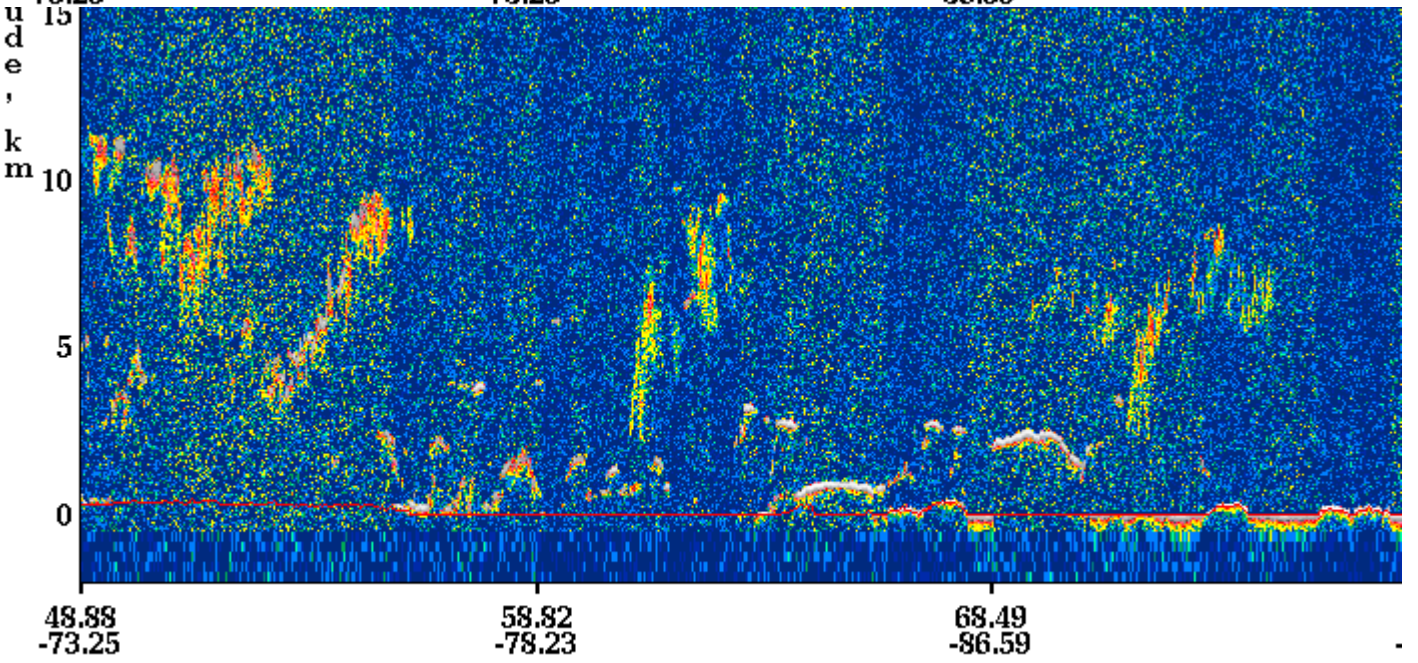

u
d
e
,
k
m
15
10
5
0
48.88
-73.25
58.82
-78.23
68.49
-86.59


u
d
e
,
k
m
15
10
5
0
48.88
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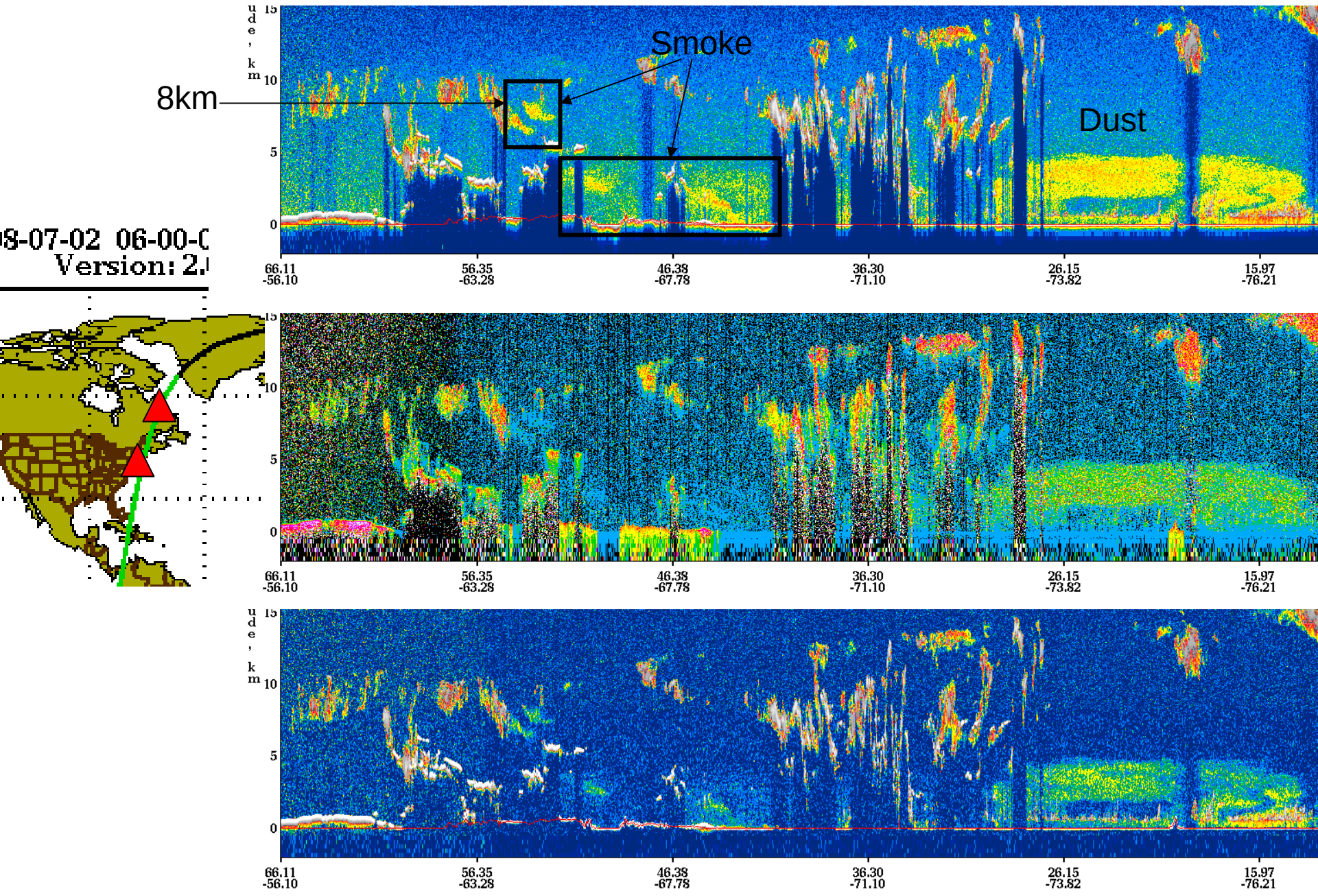
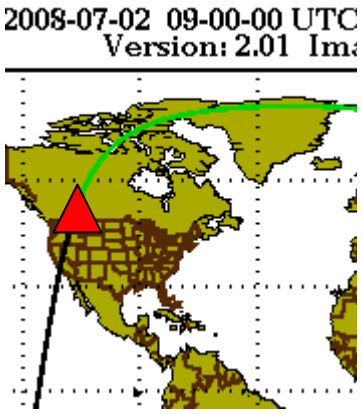
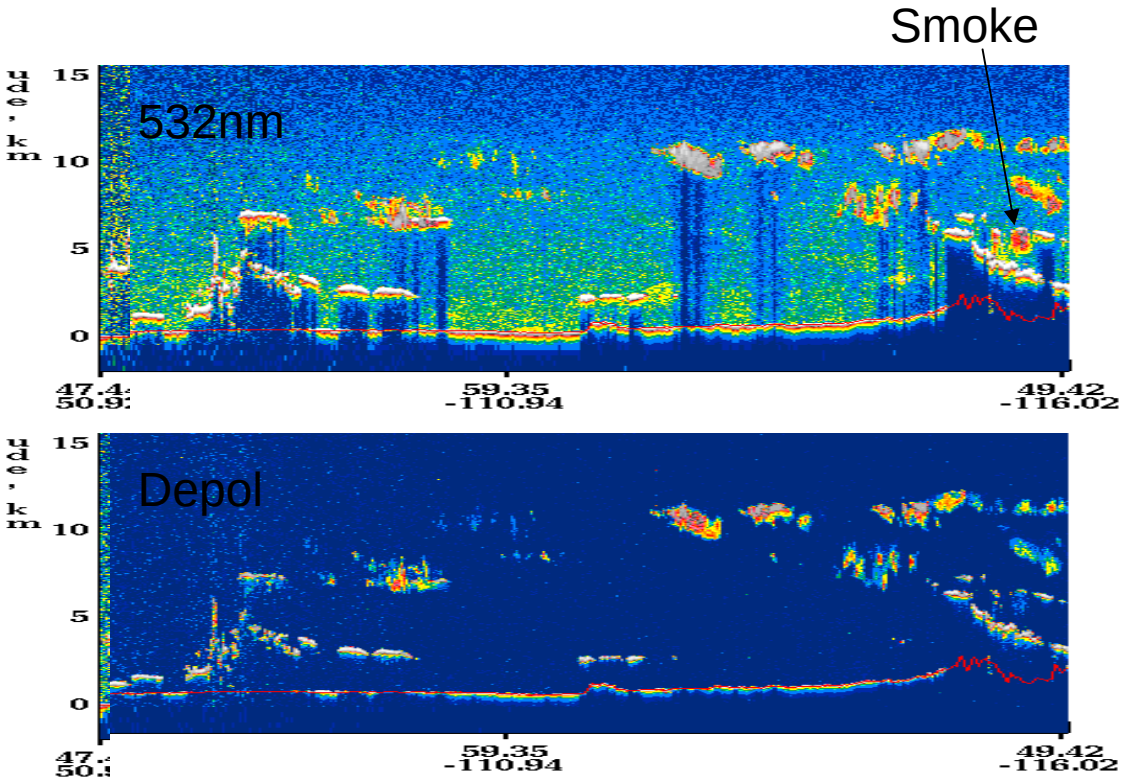
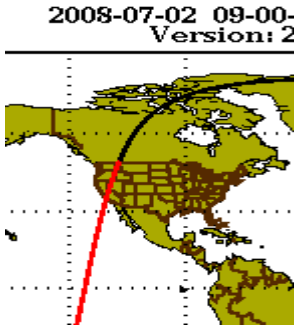
58.82
-78.23
68.49
-86.59

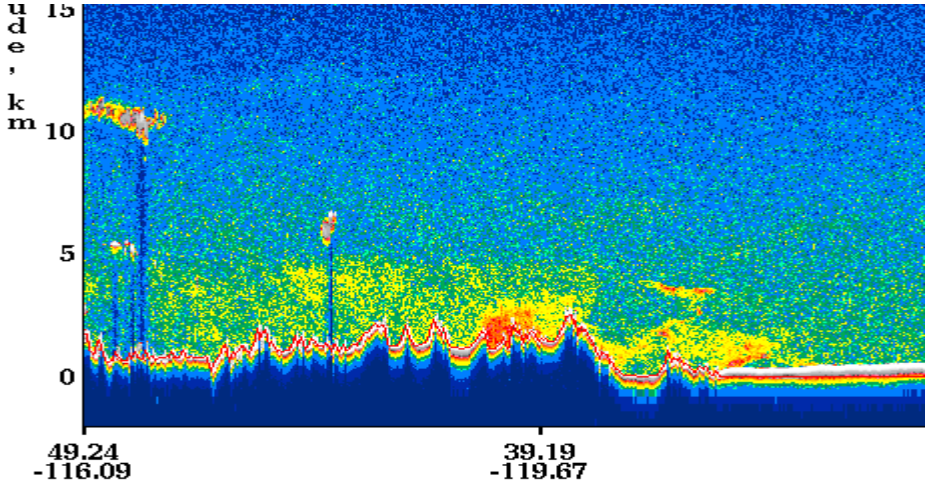

Smoke
8km
Dust
Version: 2.
15
10
5
0
km
66.11
-56.10
56.35
-63.28
46.38
-67.78
36.30
-71.10
26.15
-73.82
15.97
-76.21

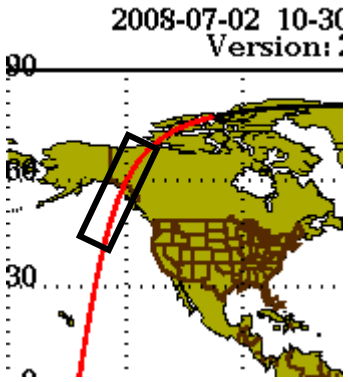




CALIPSO Obs 7/2: California Smoke



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Version:
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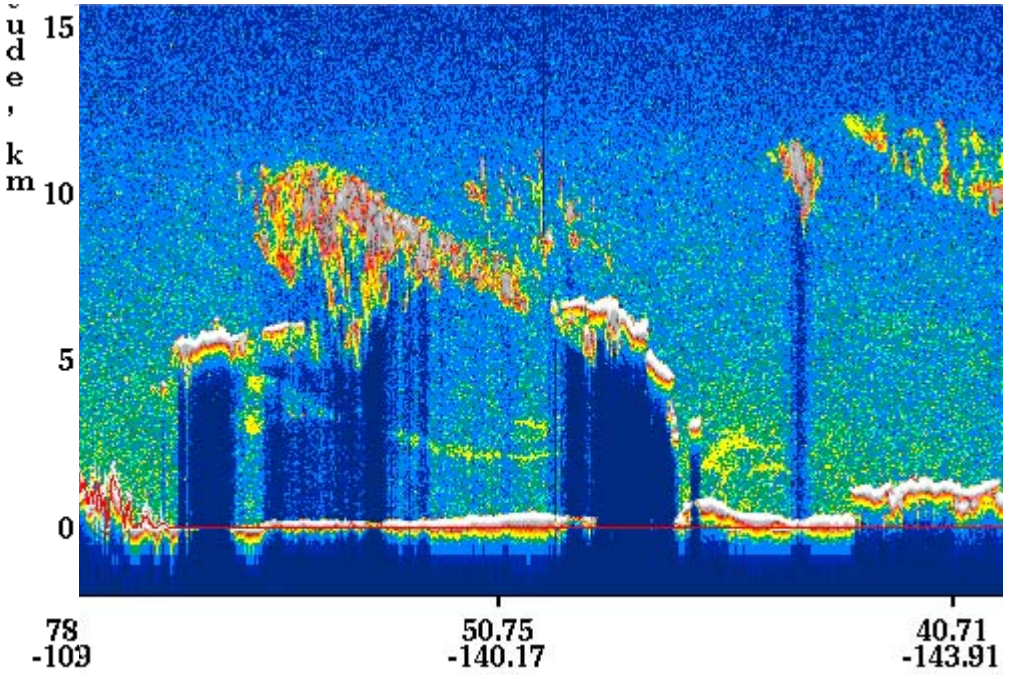
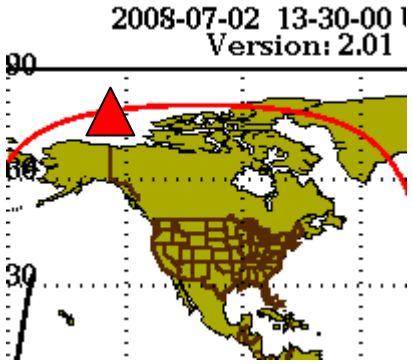

ude, km
15
10
5
0
78
-109
50.75
-140.17
40.71
-143.91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Version: 2.01
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60
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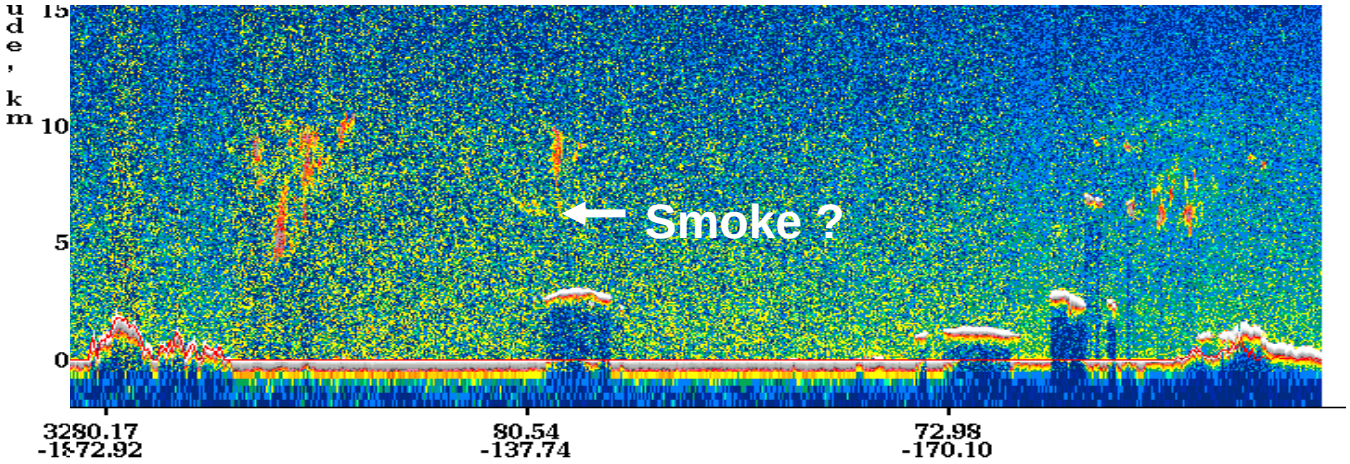
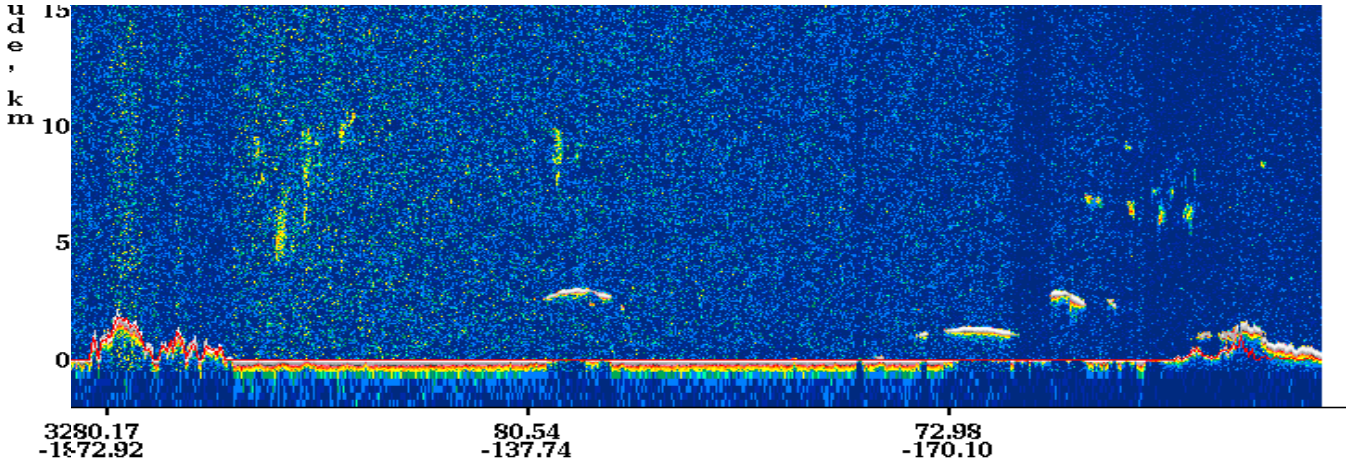

ude, km
15
10
5
0
Smoke ?
3280.17
-1872.92
80.54
-137.74
72.98
-170.10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5
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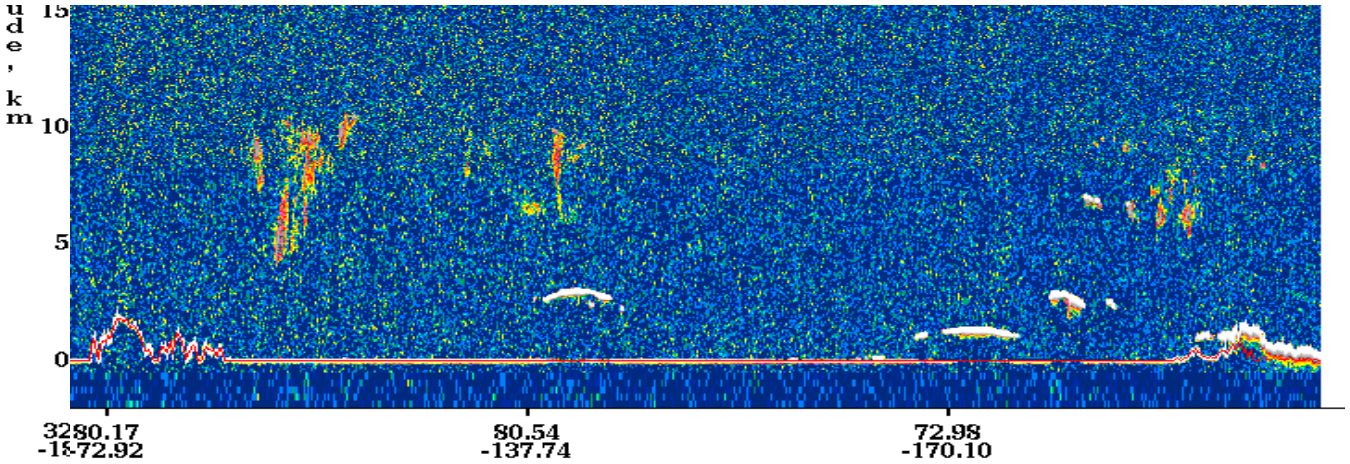
3280.17
-1872.92
80.54
-137.74
72.98
-170.10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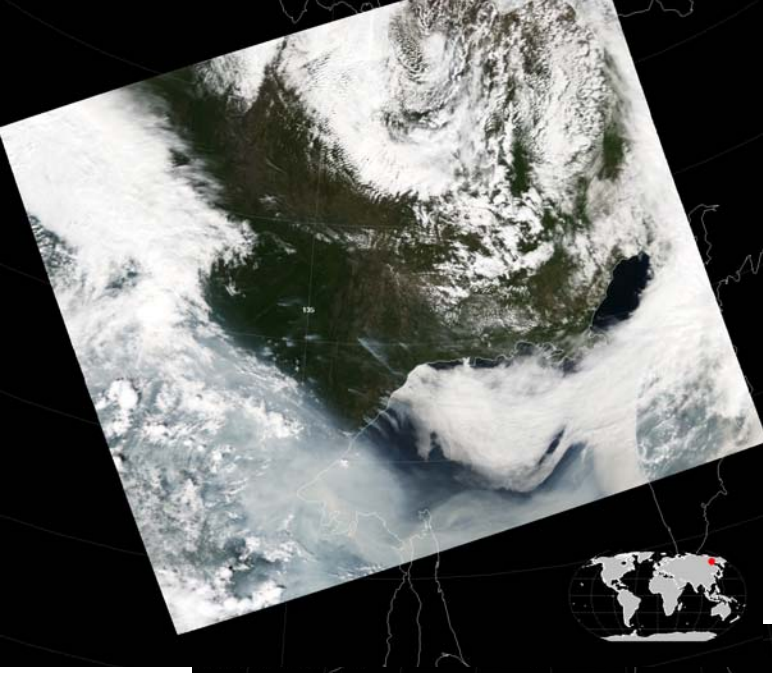
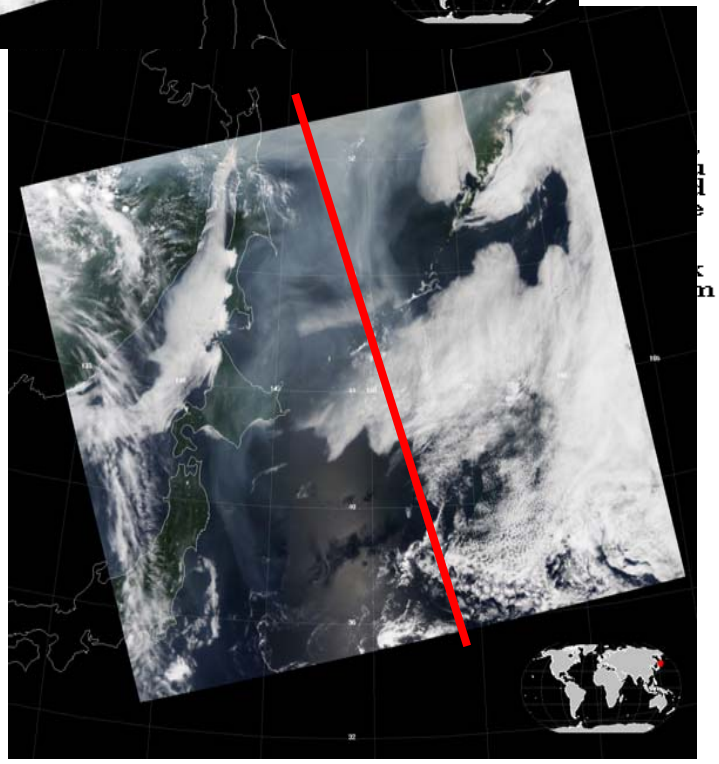
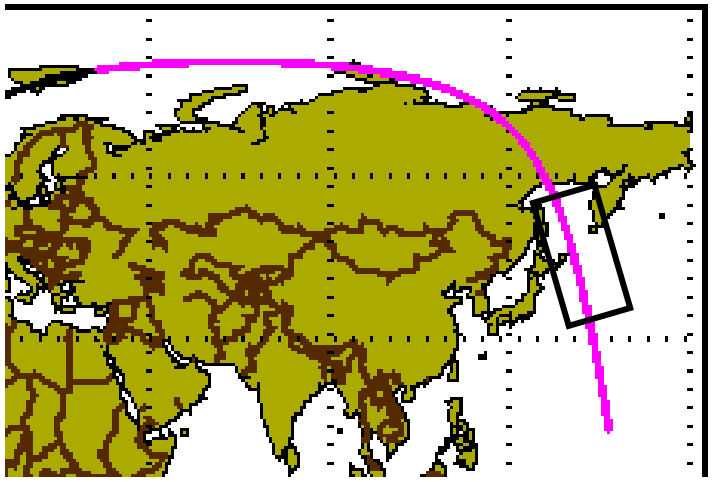
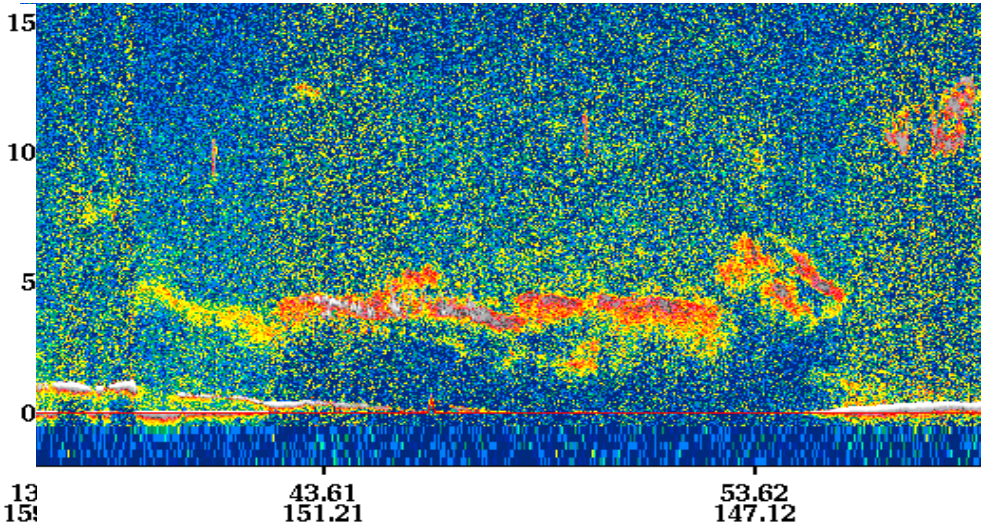


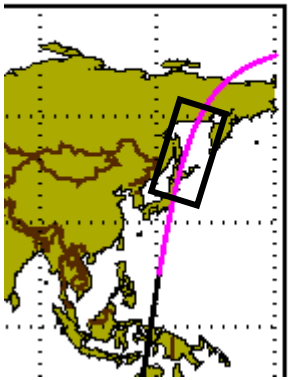


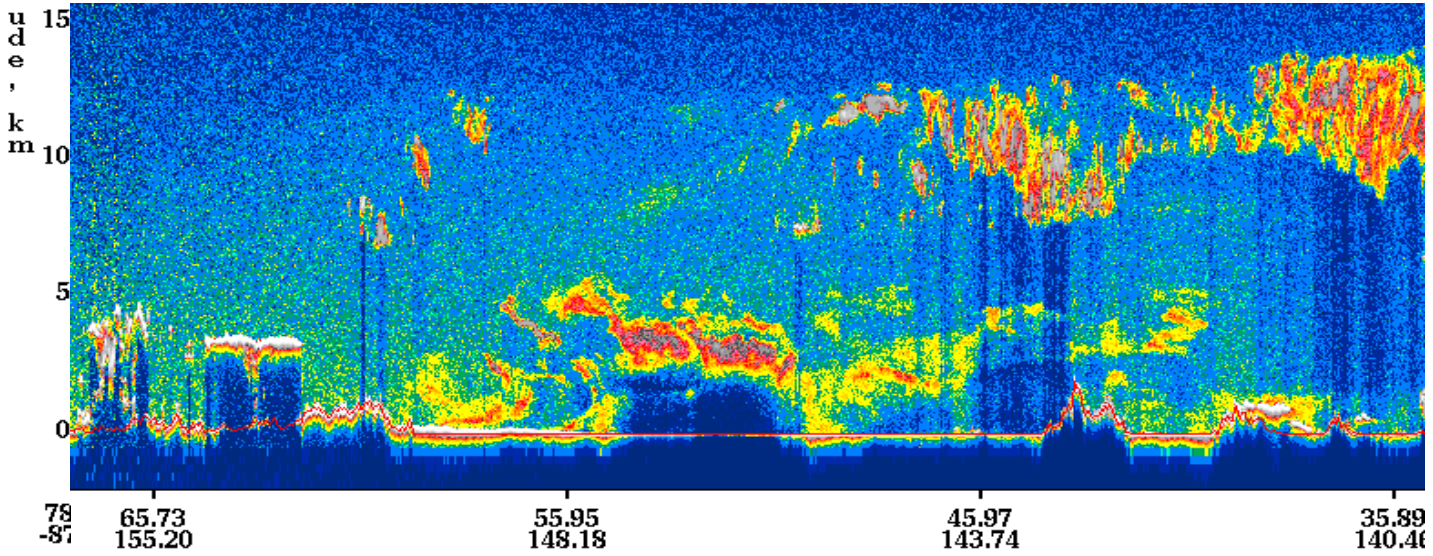
art of Hour Conditions
: Date: 07/02/2008

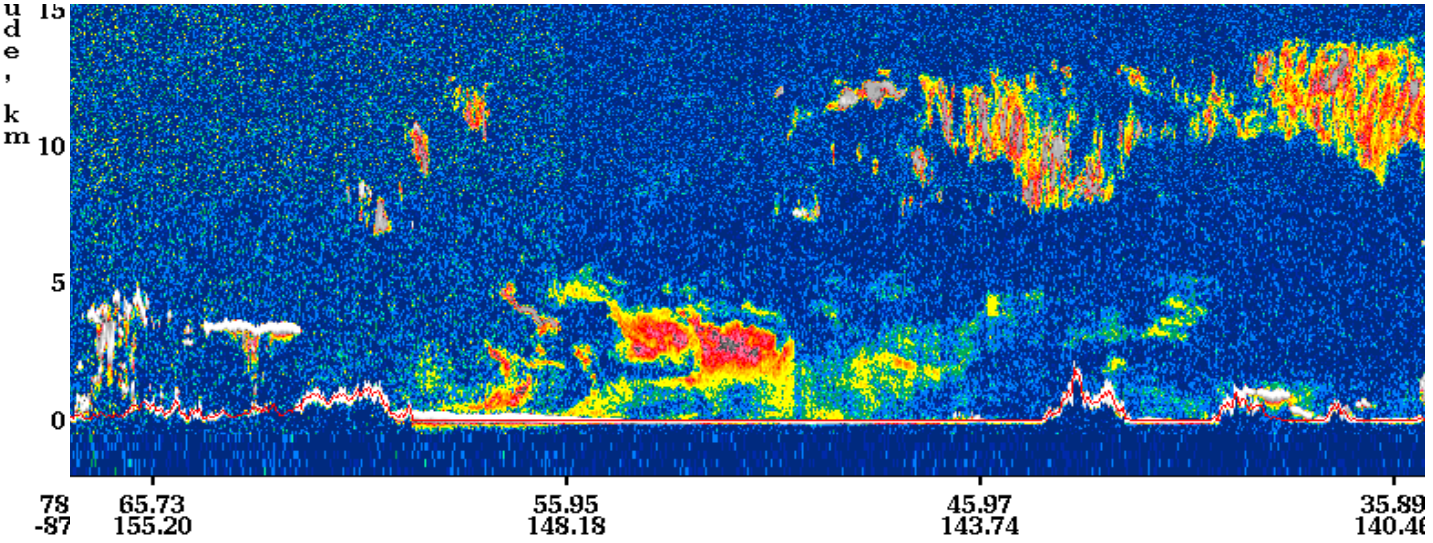




Conditions
/2008







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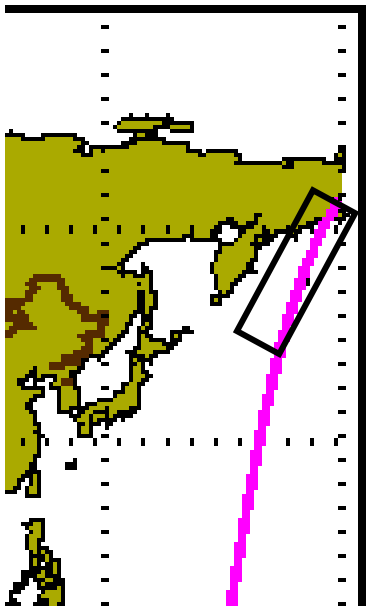
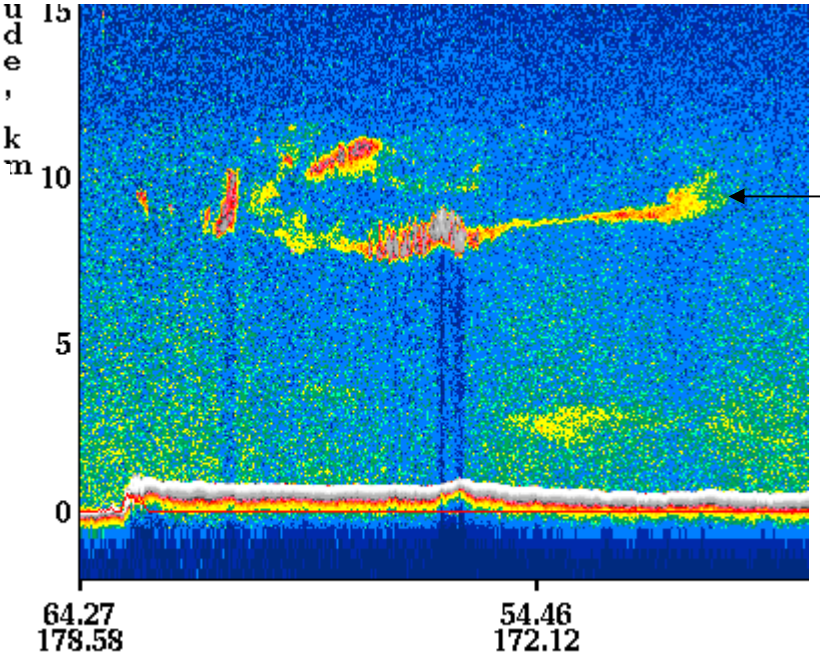
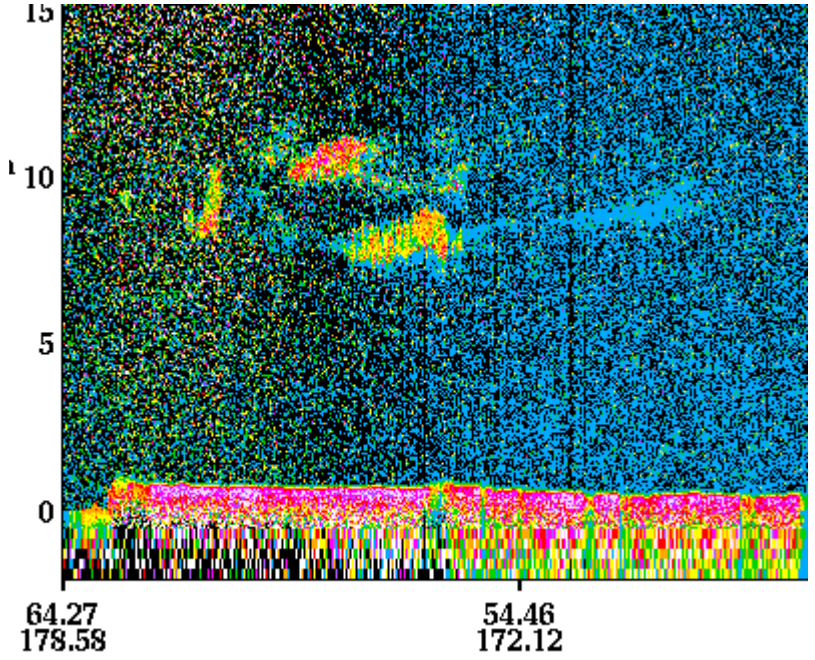




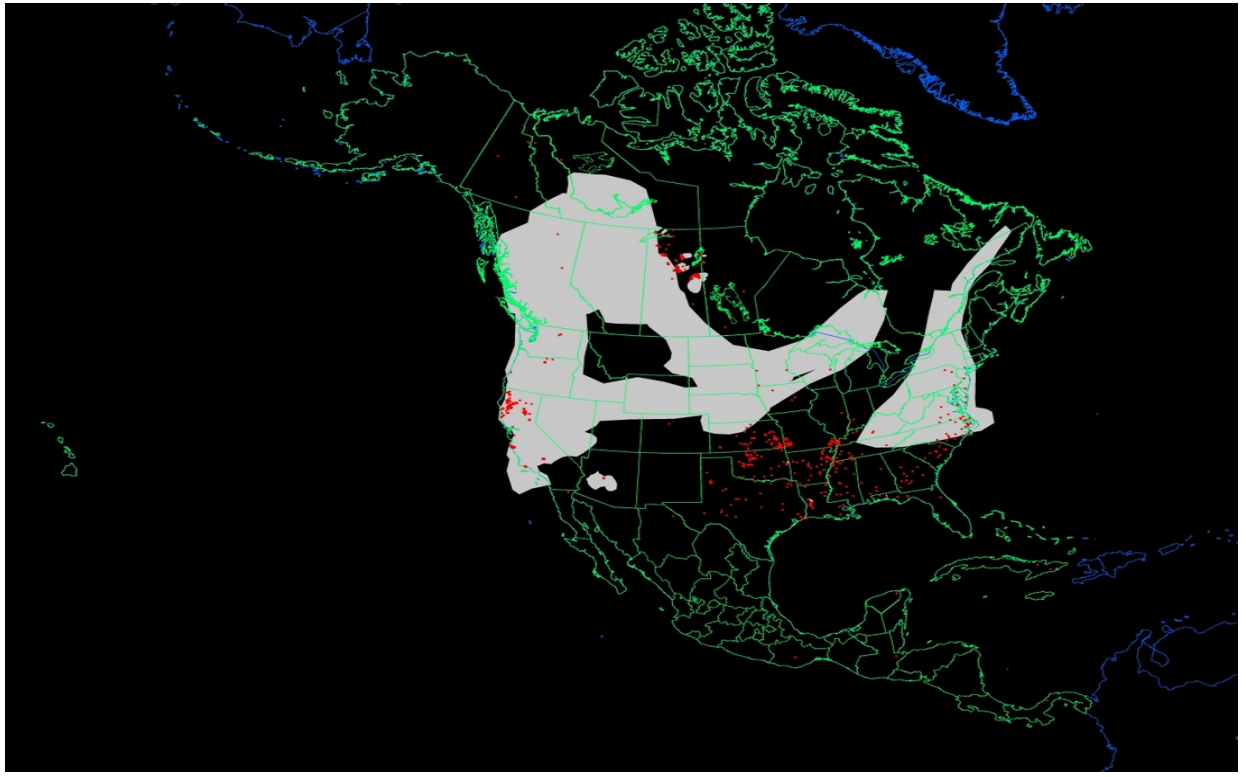
Smoke
9km



NOAA Hazard Mapping System Fire and Smoke Product

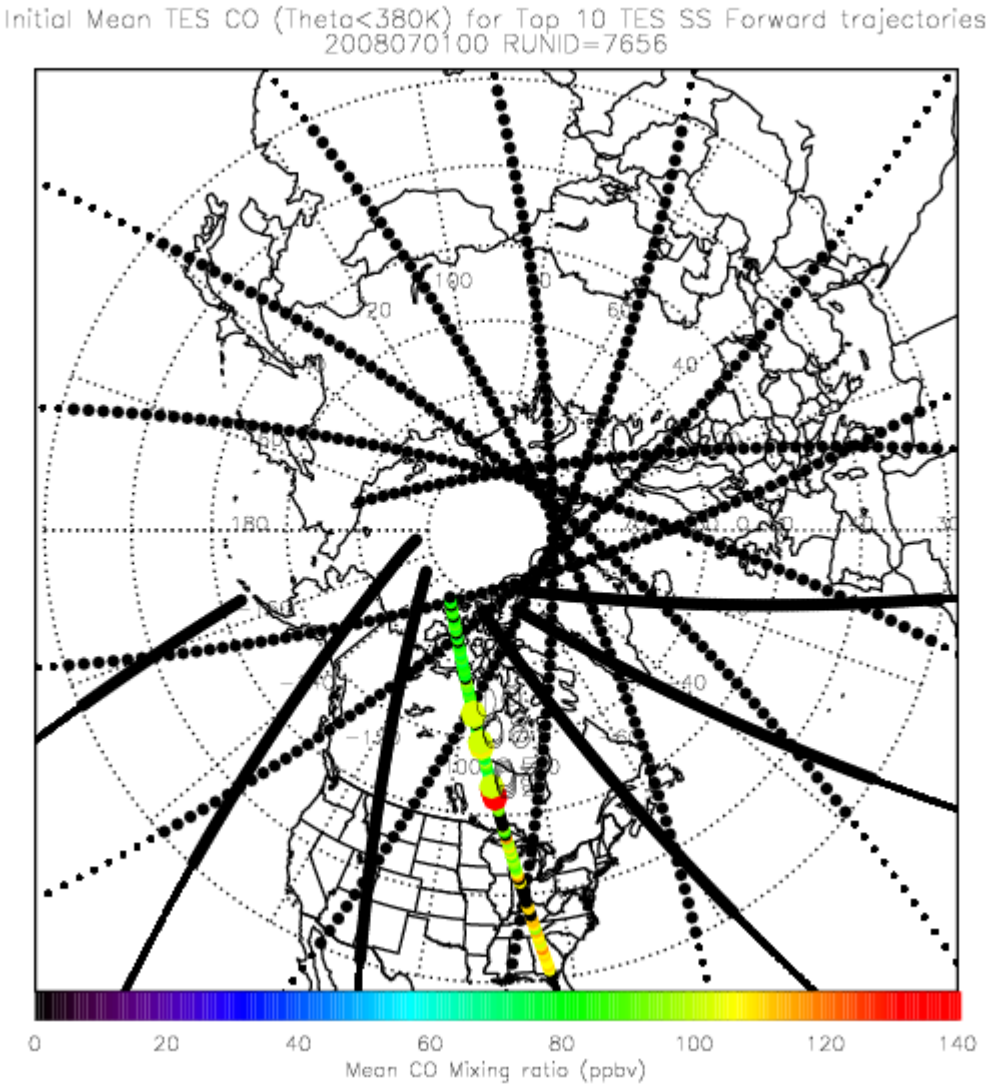
http://www.ssd.noaa.gov/PS/FIRE/hms.html

c:\program files\qualcomm\eudora\attach\MODIS_July032008.ppt



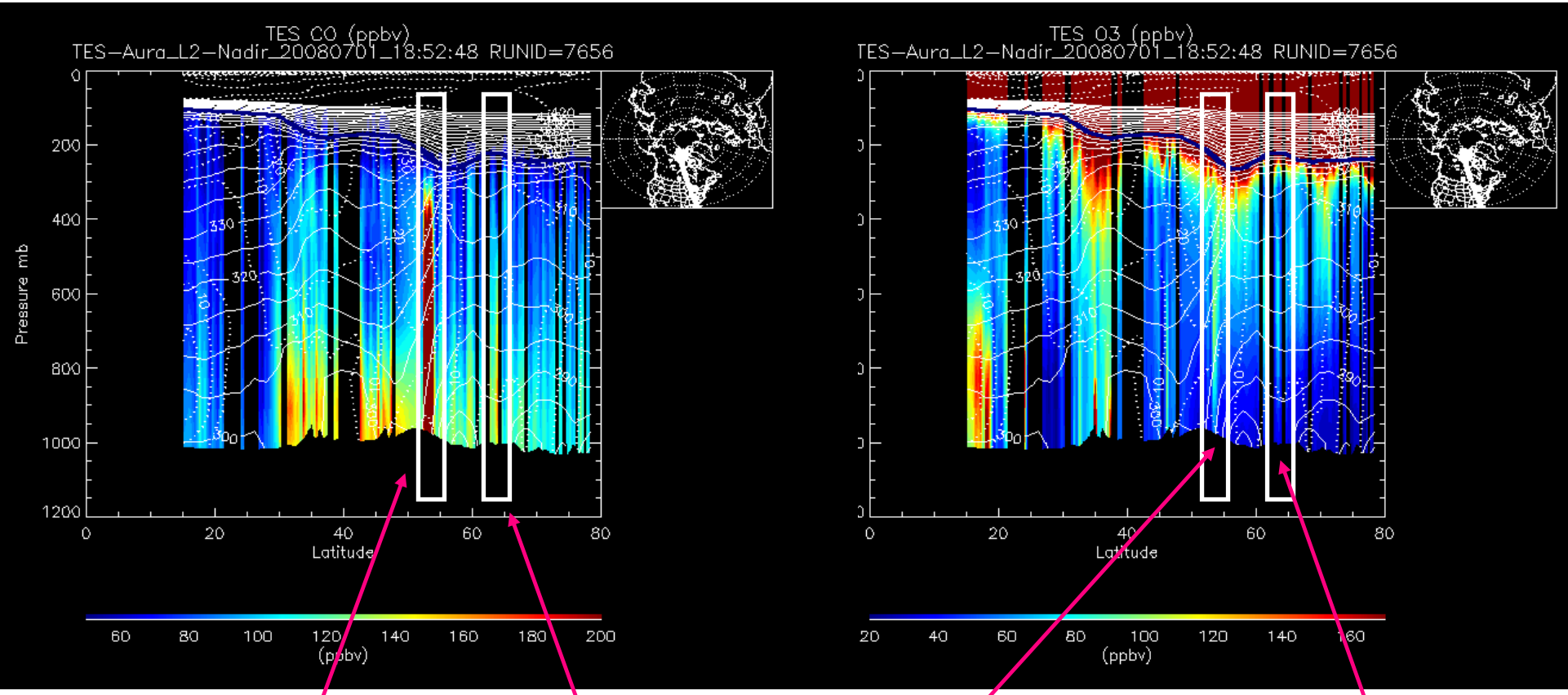
Analysis for day 7/2/2008 last updated at 7/3/2008 13:13:58 GMT

TES Step&Stare Obs 07/01 (Run ID 7656): Mean CO below 380K



TES CO (left) and O3 (right) curtains from SS orbit 7656 (07/01)

White boxes show regions of selected profiles



CO in excess of 200 ppbv

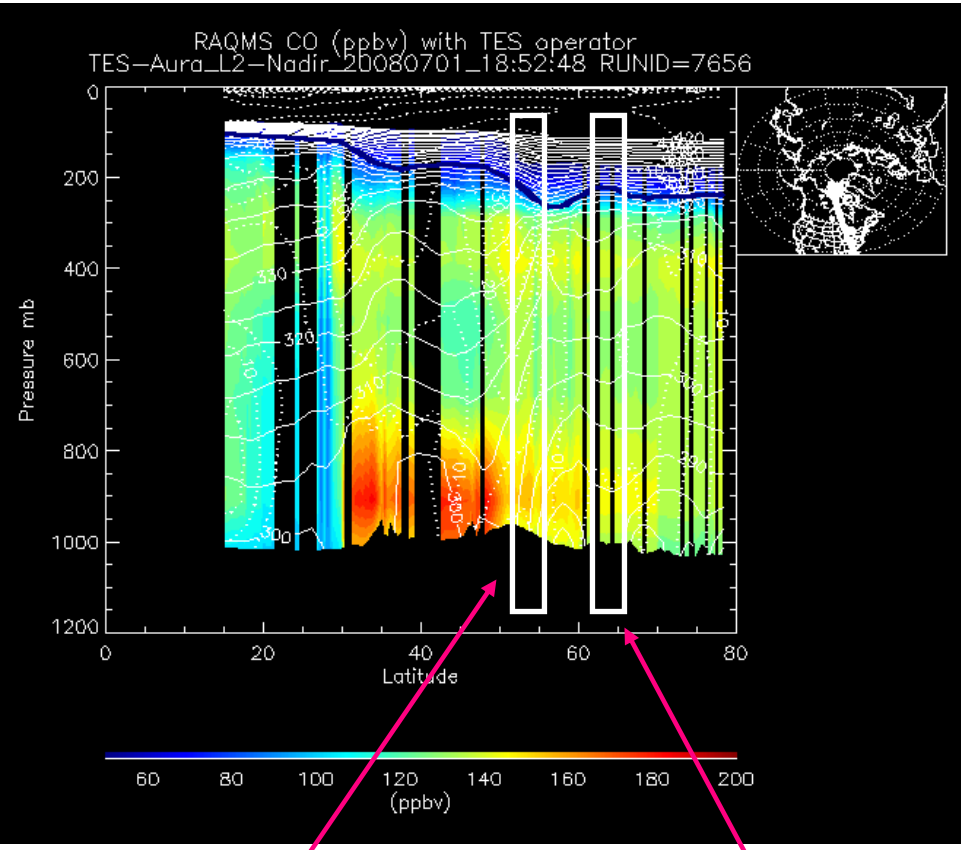
CO in excess of 150 ppbv

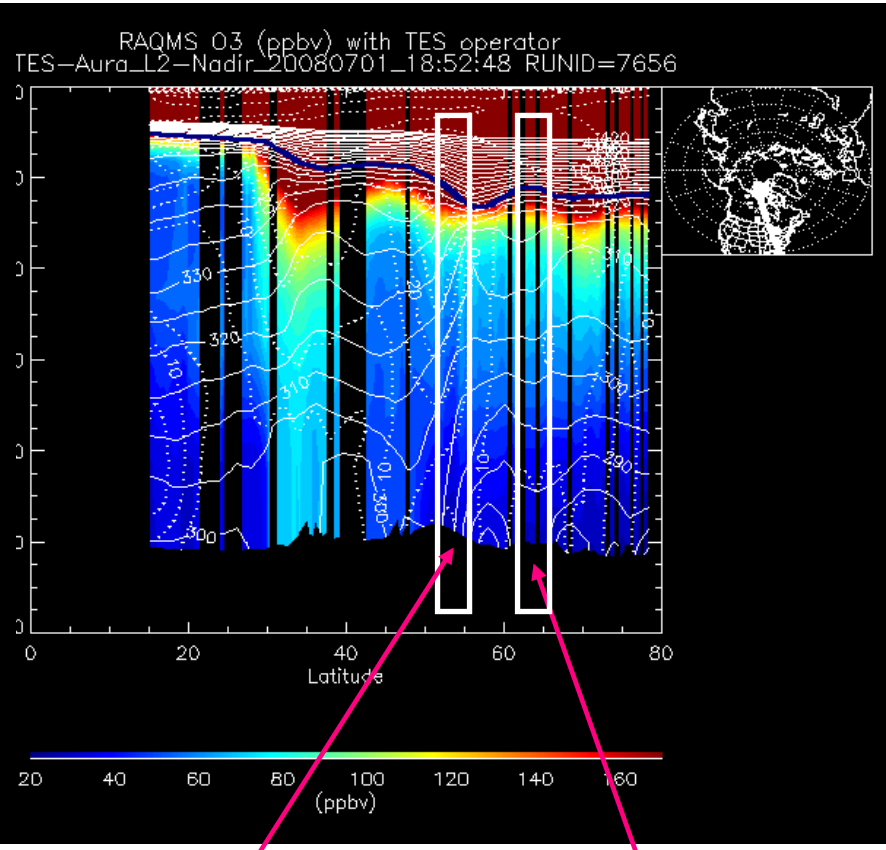
Co-located O3 enhancement

Co-located O3 enhancement in mid troposphere

$RAQMS_{TES\_sens}$ CO (left) and O3 (right) curtains, SS orbit 7656

White boxes show regions of selected profiles





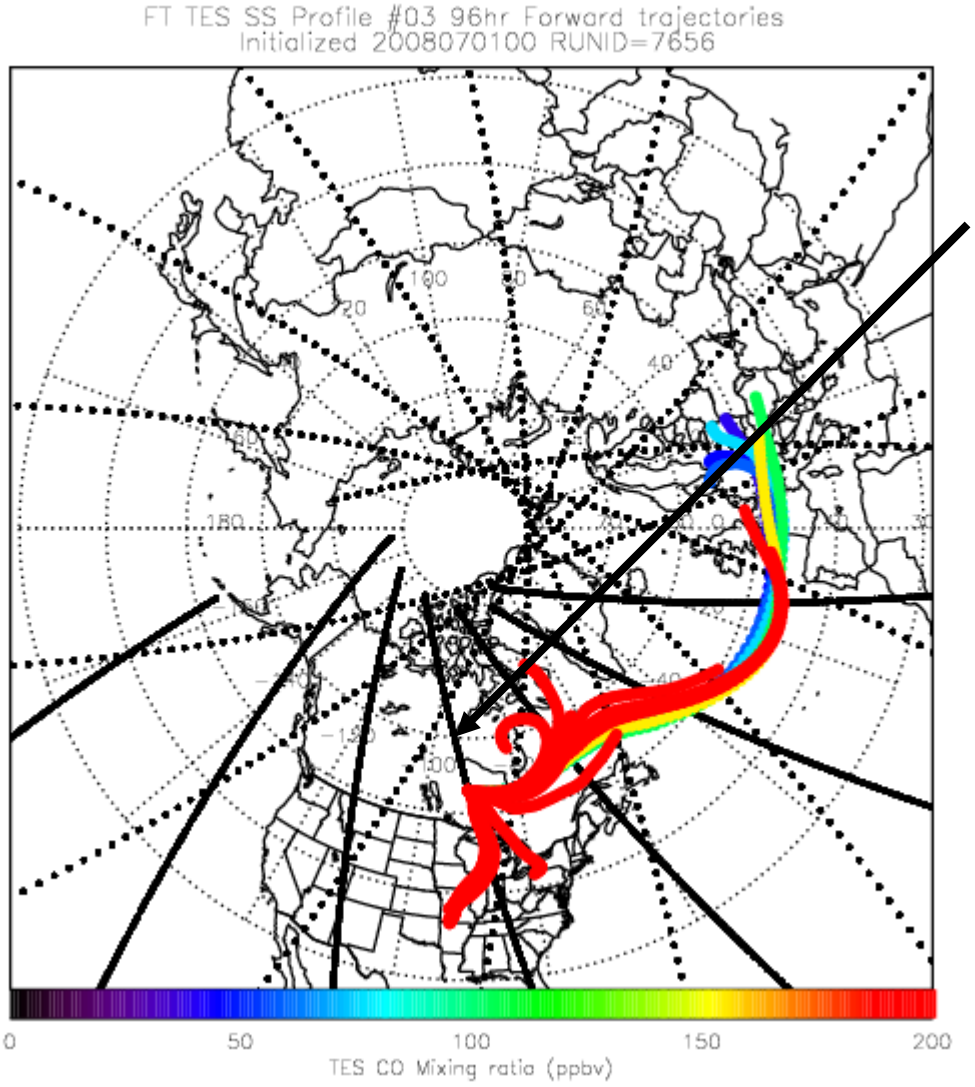
Largest model CO near surface and in upper trop; some enhancement througout free trop

CO approx. 150 ppbv

Very little O3 enhancement in model

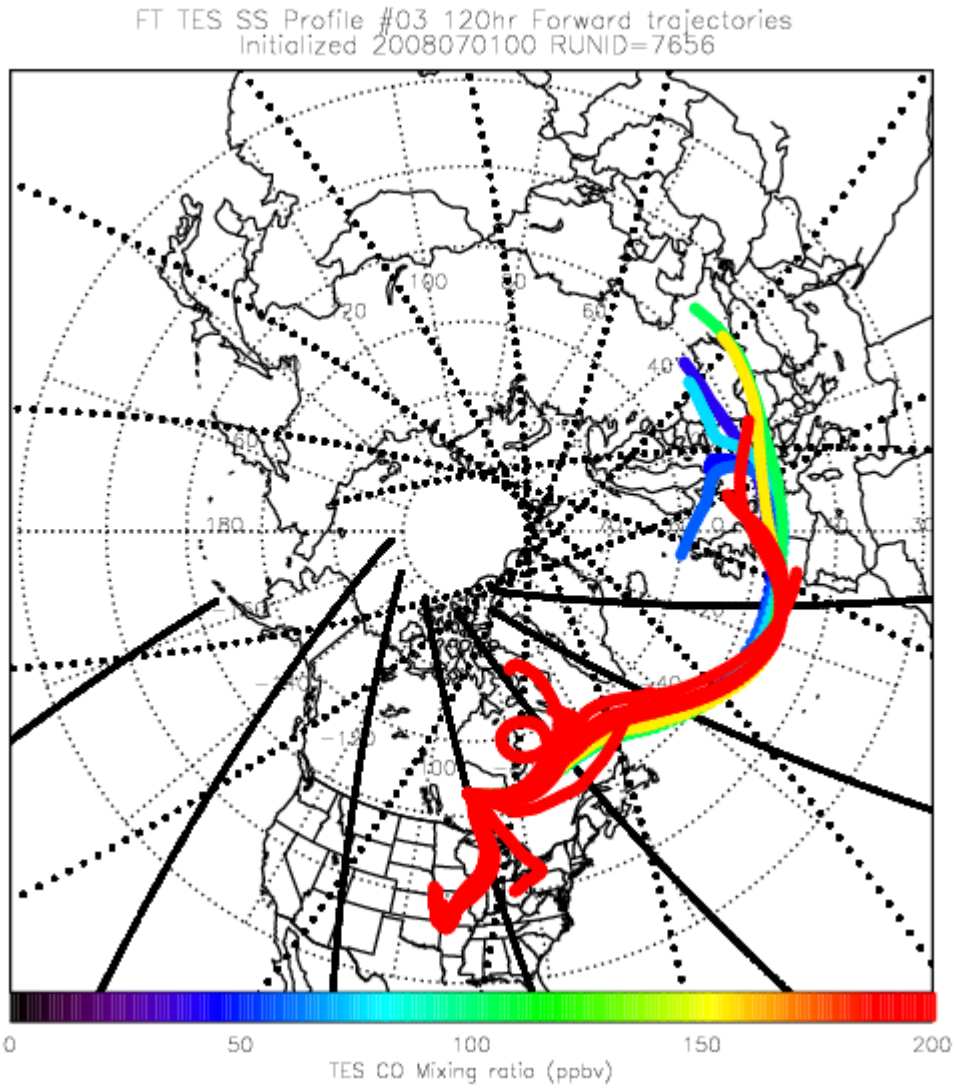
No O3 enhancement

TES SS Forward Trajectories “Profile 3” Valid 00Z 07/05
(Friday afternoon 07/04 local time)

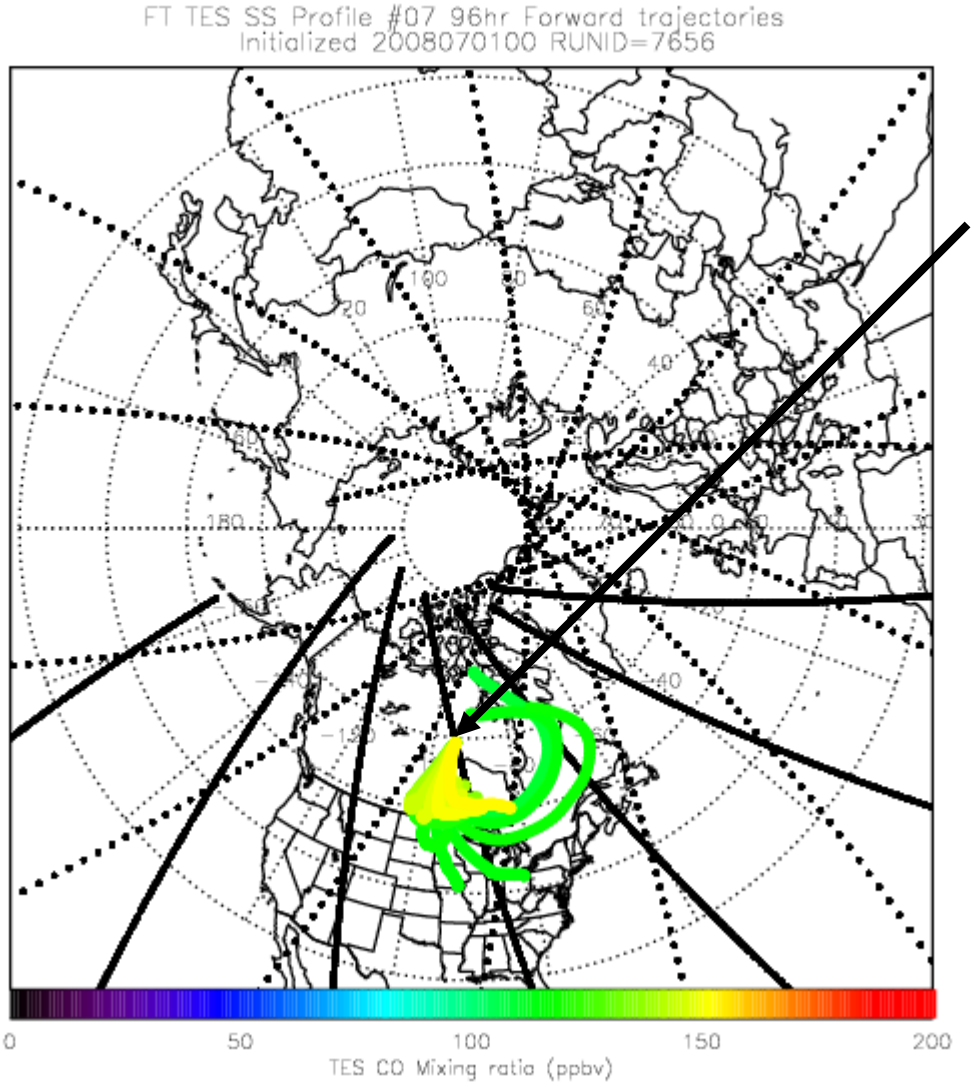


Mid-trop air with high CO transported into James Bay region

TES SS Forward Trajectories “Profile 3” Valid 00Z 07/06
(Saturday afternoon 07/05 local time)

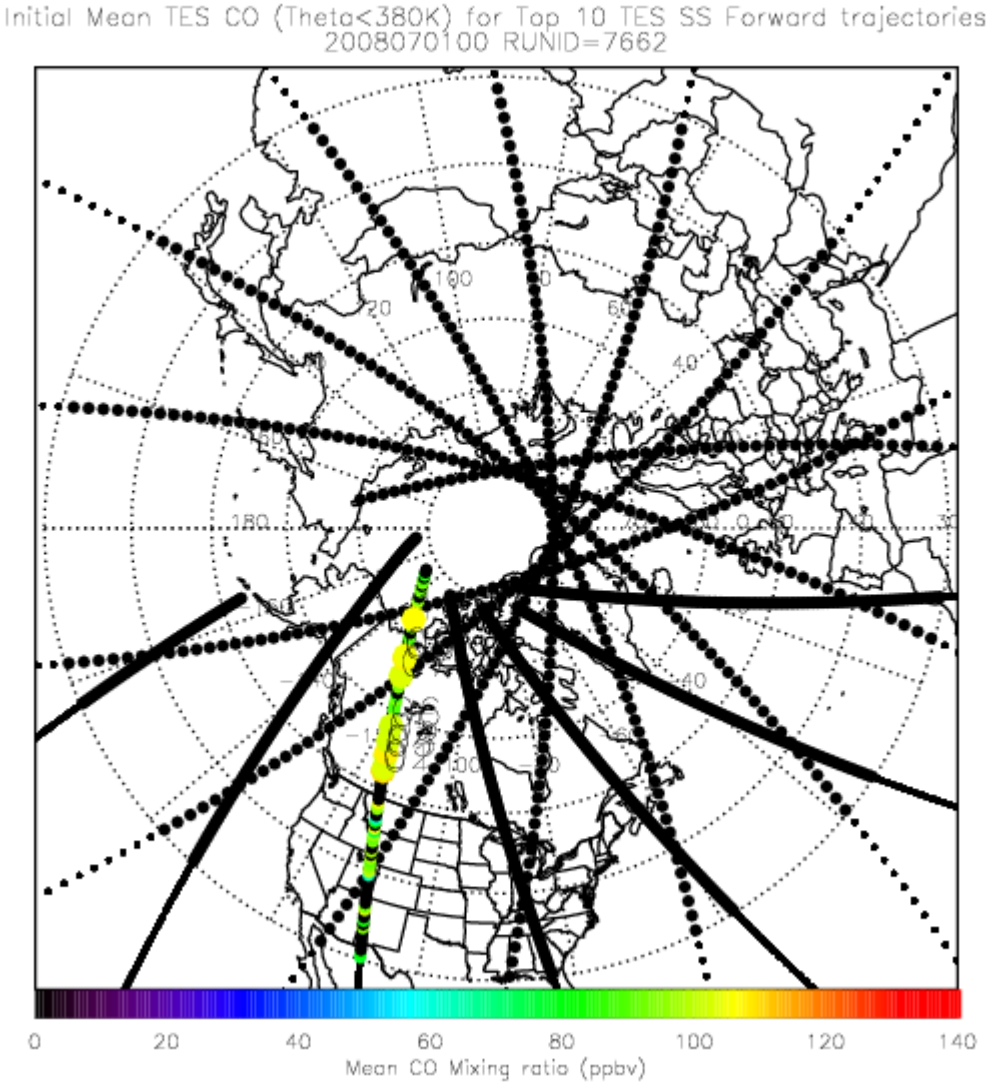


TES SS Forward Trajectories “Profile 7” Valid 00Z 07/05
(Friday afternoon 07/04 local time)

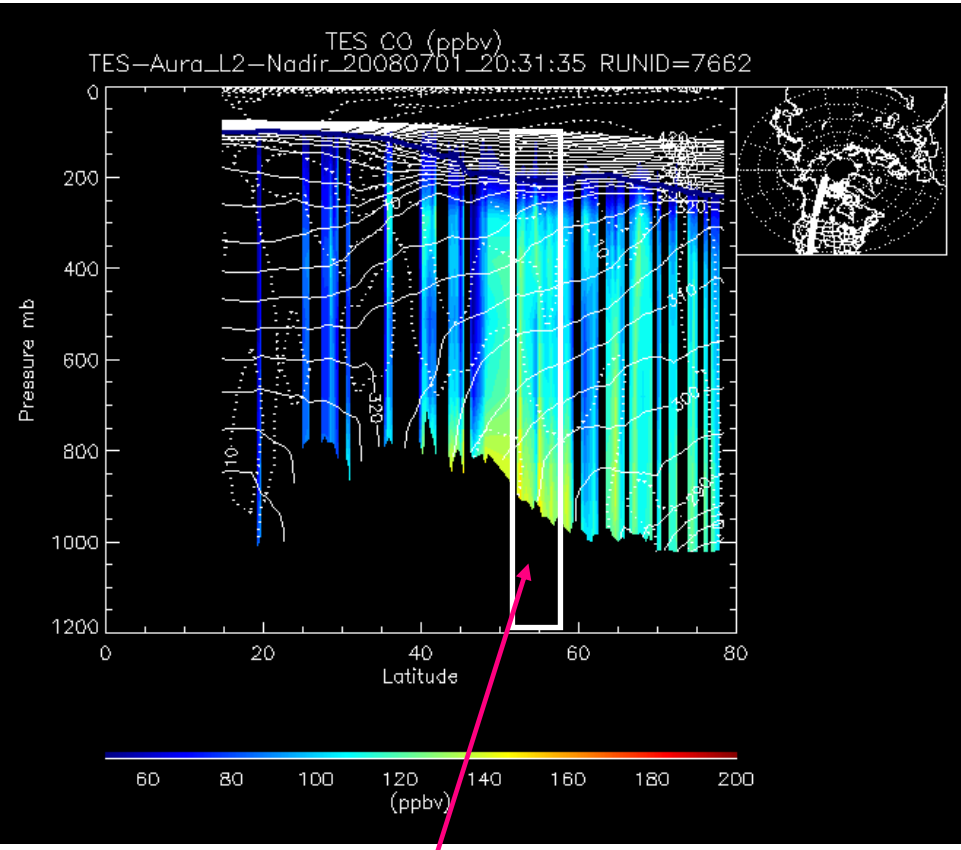


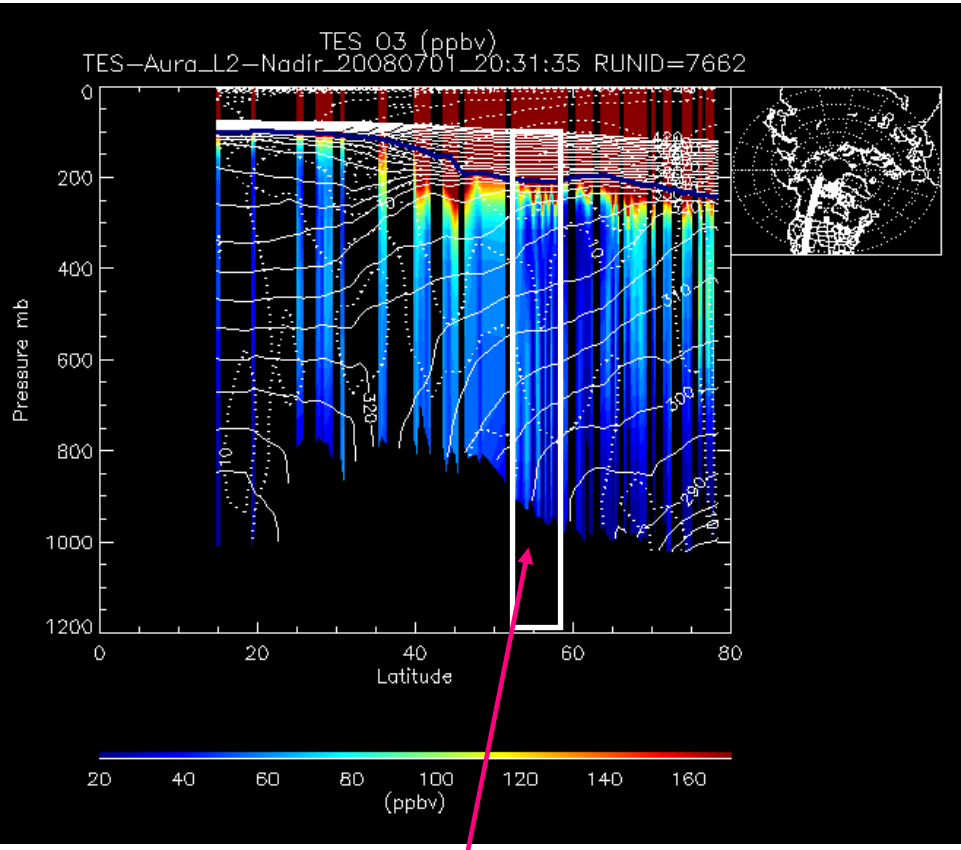
Lower trop air with high CO transported into James Bay region

TES Step&Stare Obs 07/01 (Run ID 7662): Mean CO below 380K



TES CO (left) and O3 (right) curtains from SS orbit 7662 (07/01)

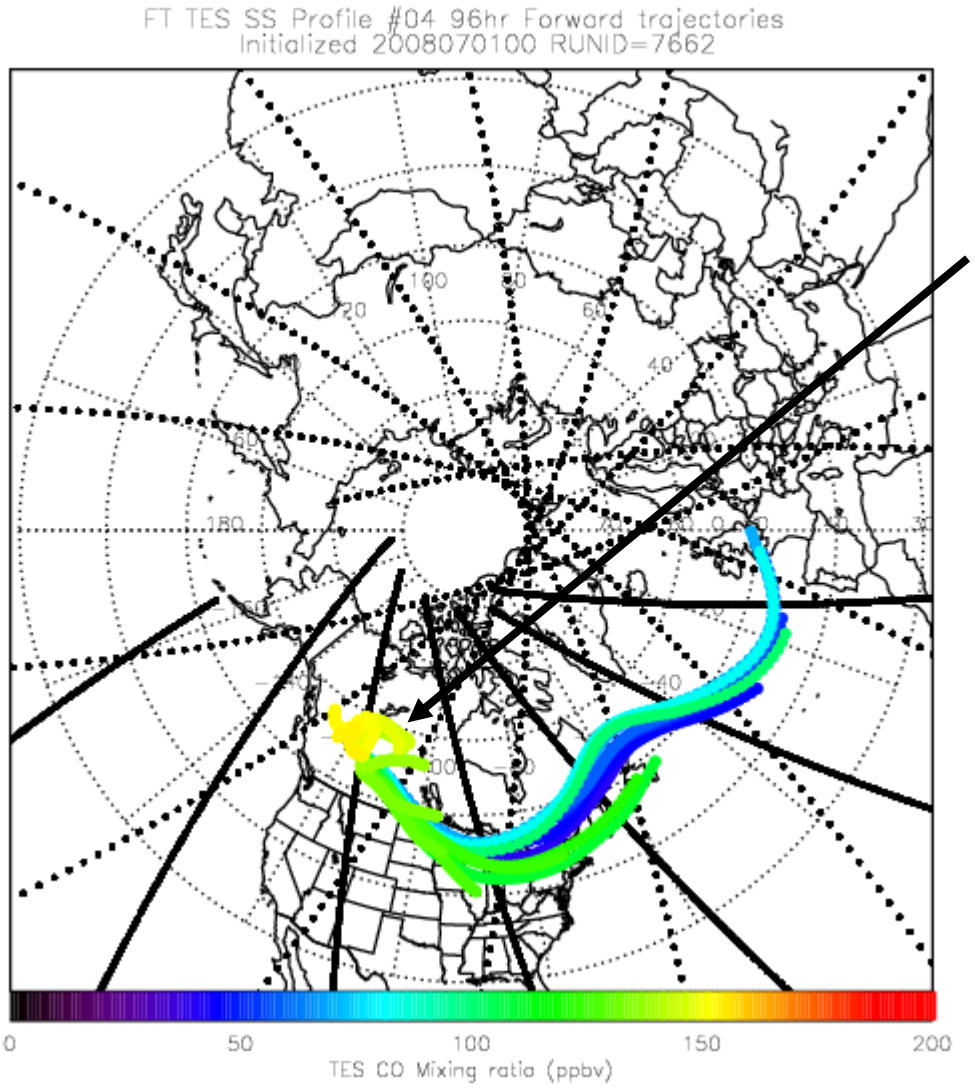




CO enhancements in both lower and upper trop

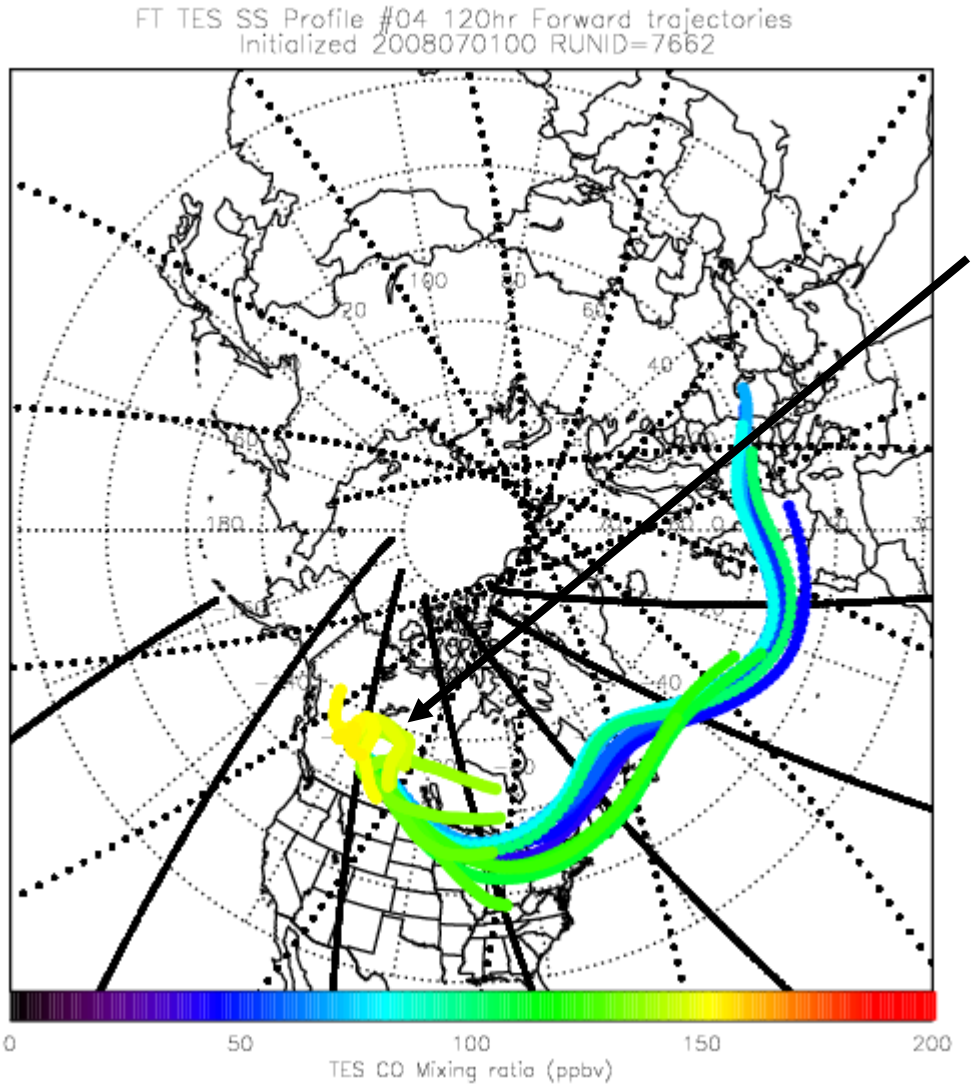
O3 enhancement in lower trop

TES SS Forward Trajectories “Profile 4” Valid 00Z 07/05
(Friday afternoon 07/04 local time)



Recirculation of local emissions into flight area

TES SS Forward Trajectories “Profile 4” Valid 00Z 07/06
(Saturday afternoon 07/05 local time)



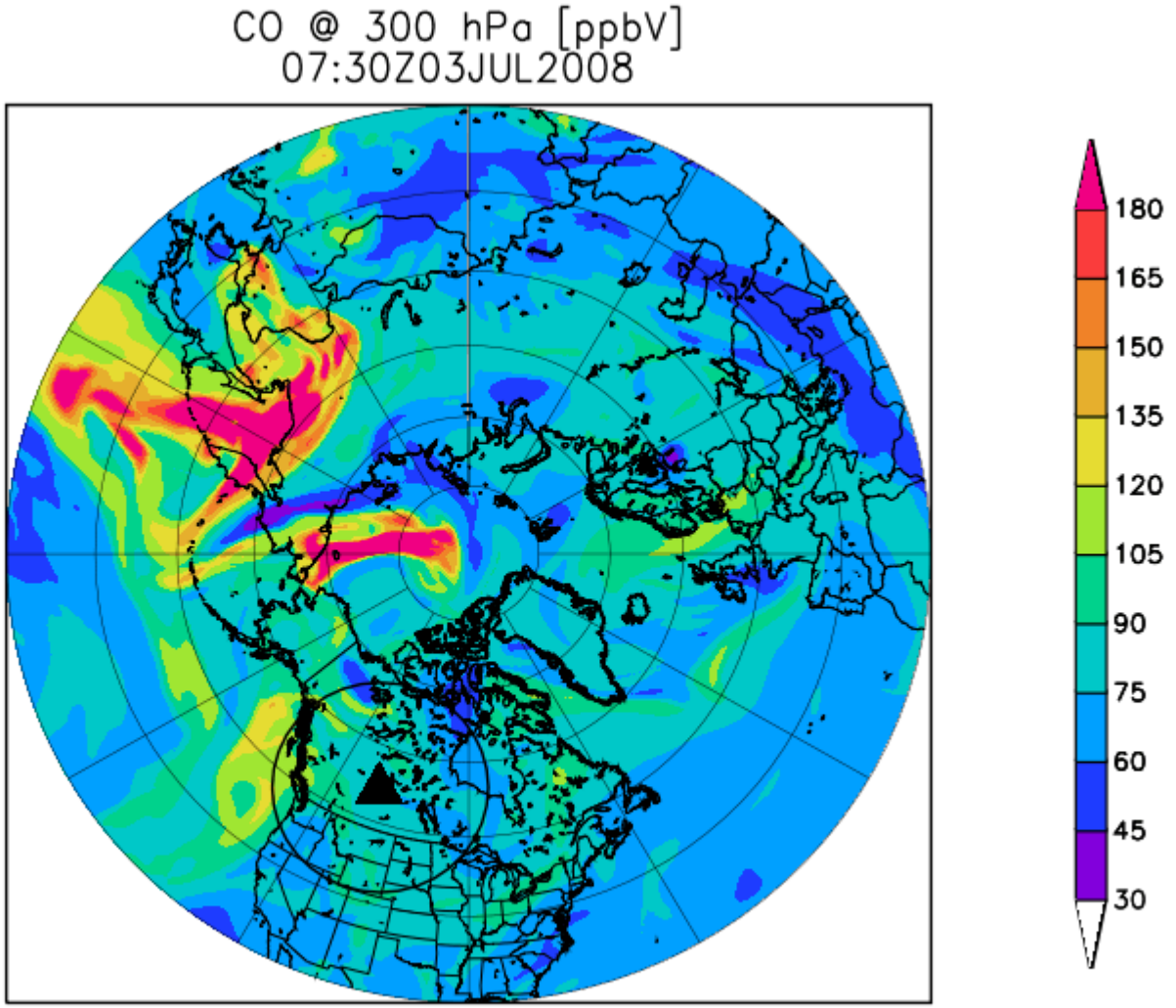
Recirculation of local emissions into local area

300 mb

5-Day Total CO Animation

Siberian plume due north to N. Pole & approaches Thule on 3rd-6th!

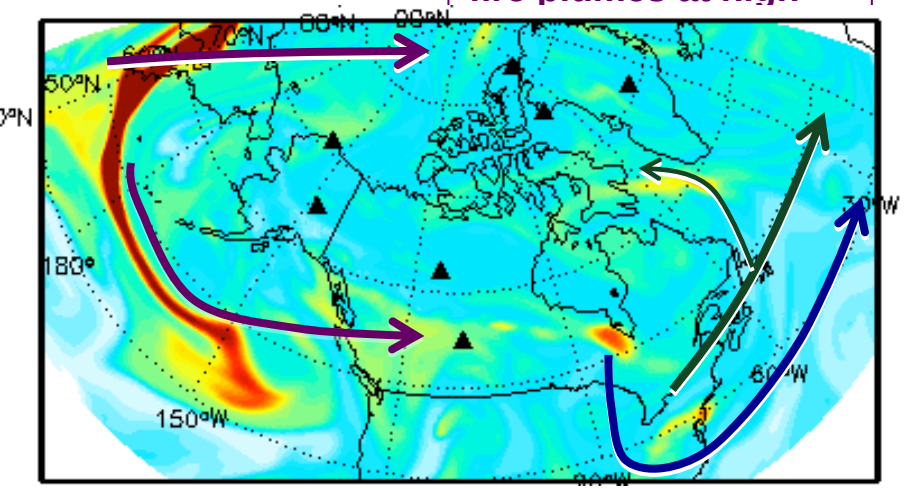
Another plume crosses Pacific Oc. & should be over Cold Lake by July 6th.



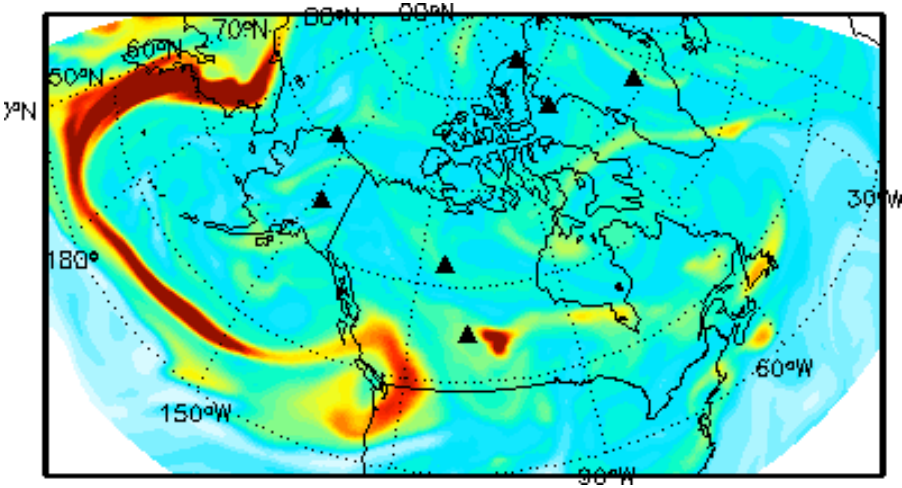
GEOS5 Outlook for next four days – Total CO @ 500 hPa

July 4

2 pulses of Siberian fire plumes at high



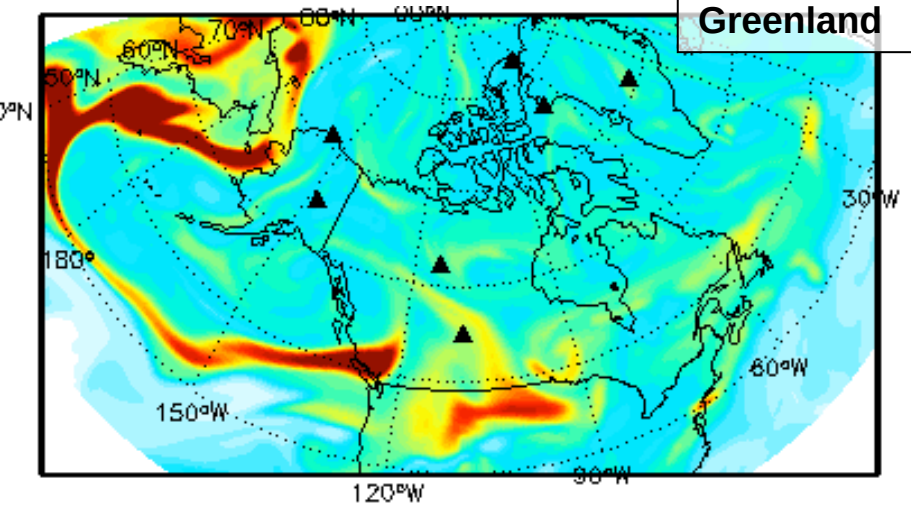
July 5



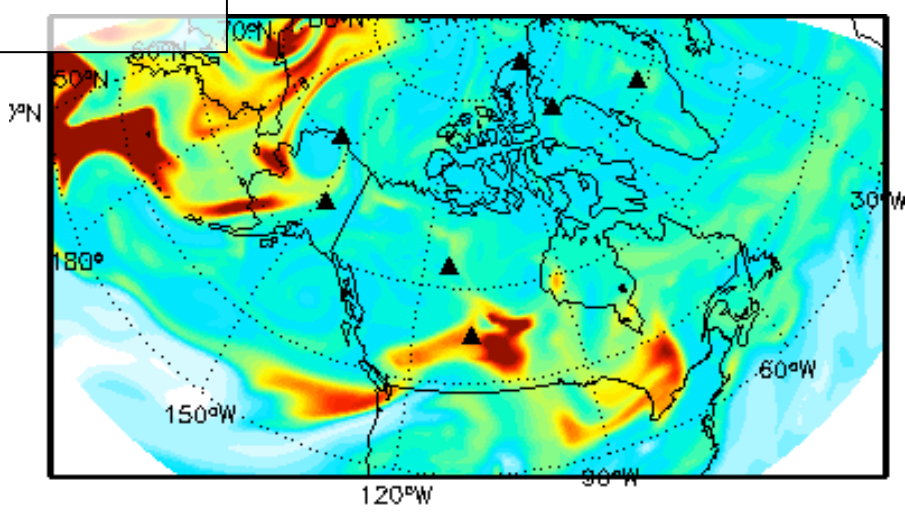
Lower alt Sib. plumes transported directly over Cold Lake!

Bulk of N. Am. pollution and Canadian plumes transported across Atlantic – minimal transport past Greenland

July 6

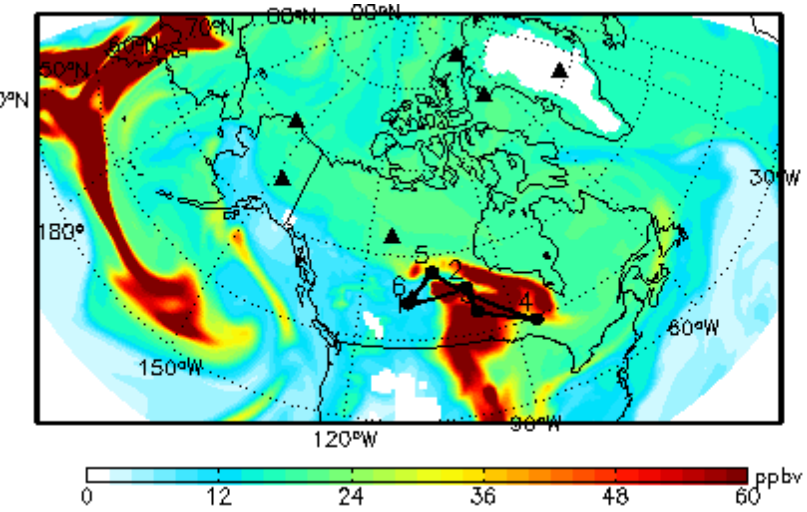


July 7

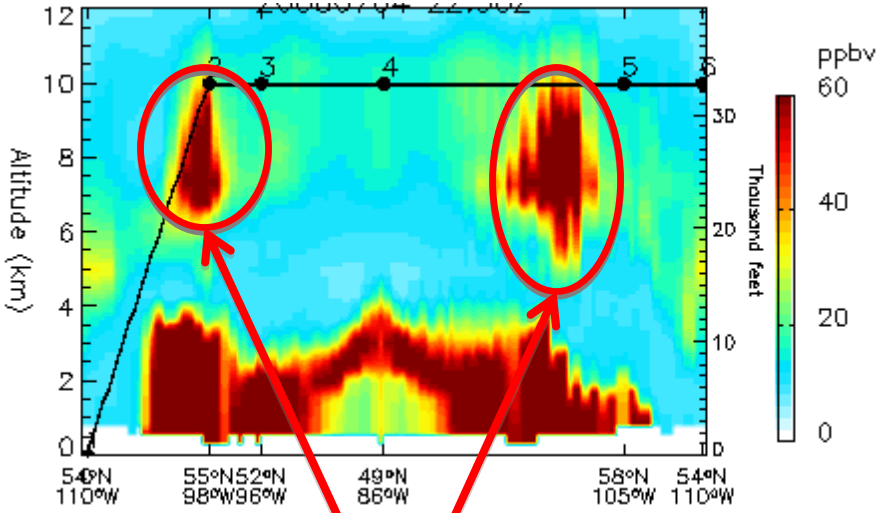


July 4 DC8 Flight Plan

Boreal BB CO: 800 hPa (2 km)

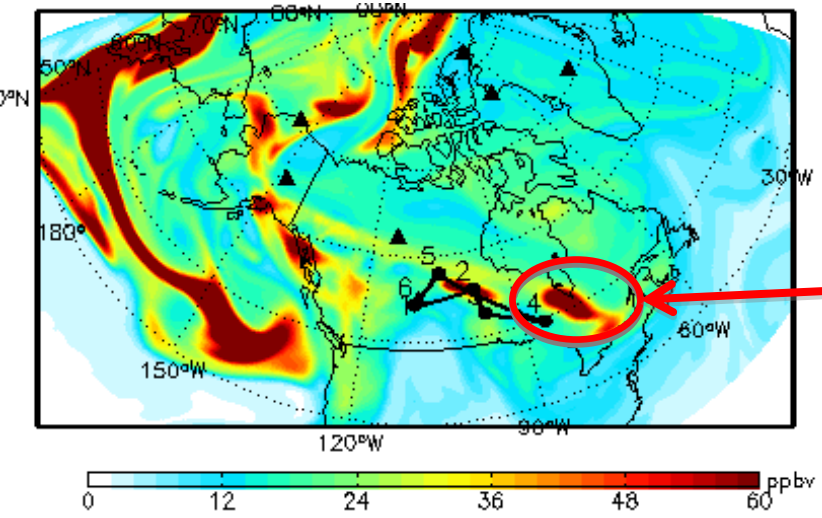


Boreal BB CO: Curtain



Lofting of Canadian B.B.

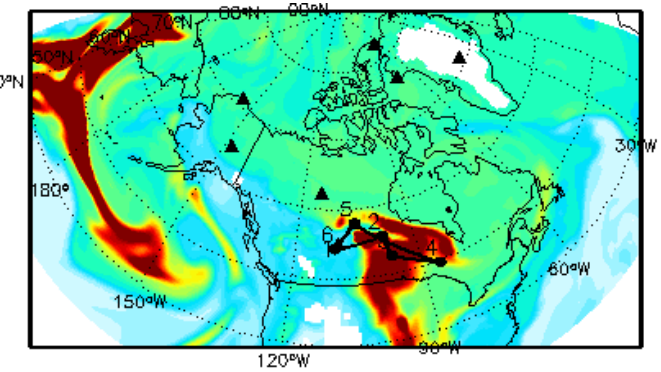
Boreal BB CO: 400 hPa (7.2



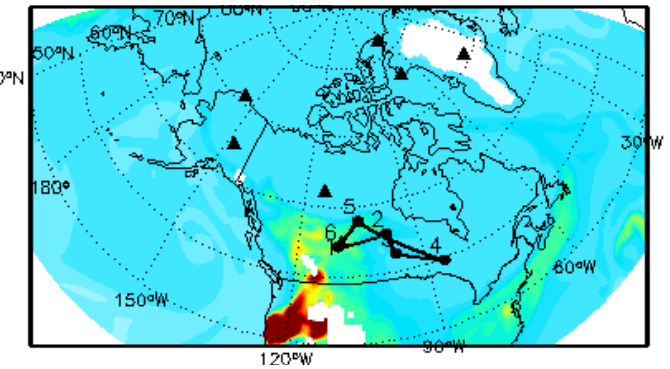
More lofting expected
Further to the east.

July 4 DC8 Flight Plan: Small Contribution from California B.B.

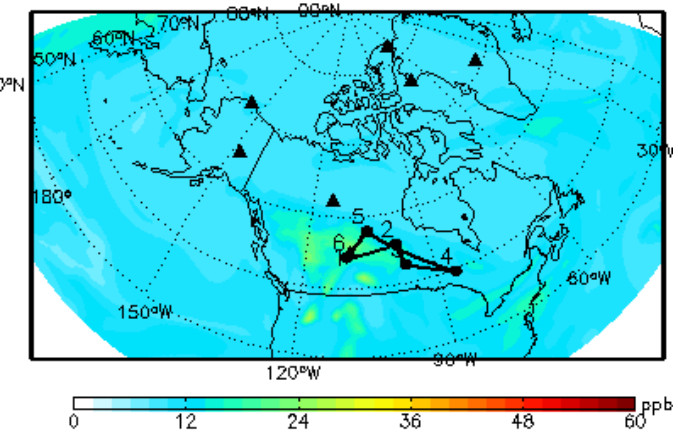
Boreal BB: 800 hPa (2 km)



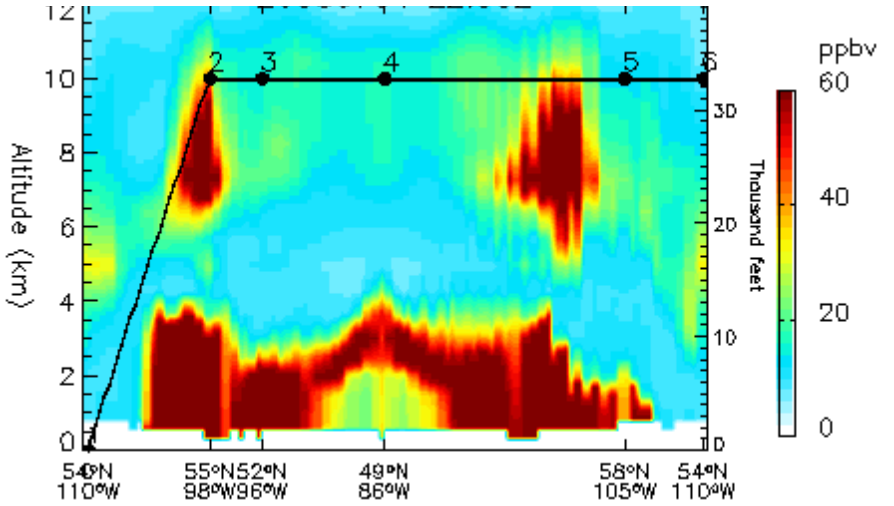
California BB: 800 hPa (2 km)



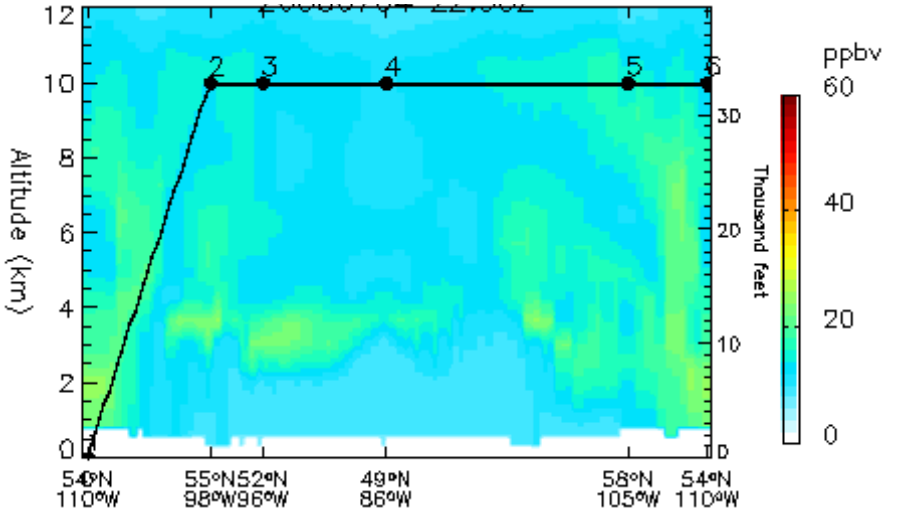
California BB: 400 hPa (7.2 km)



Boreal BB: Curtain

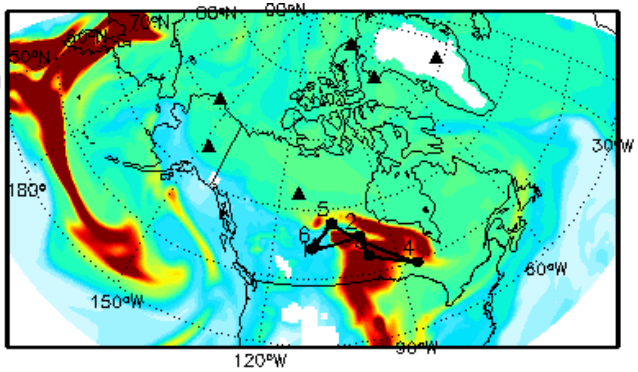


California BB: Curtain

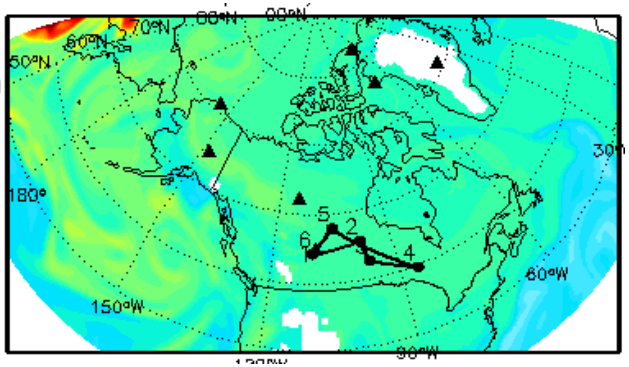


July 4 DC8 Flight Plan: Moderate Contribution from Asian Anthropogenic

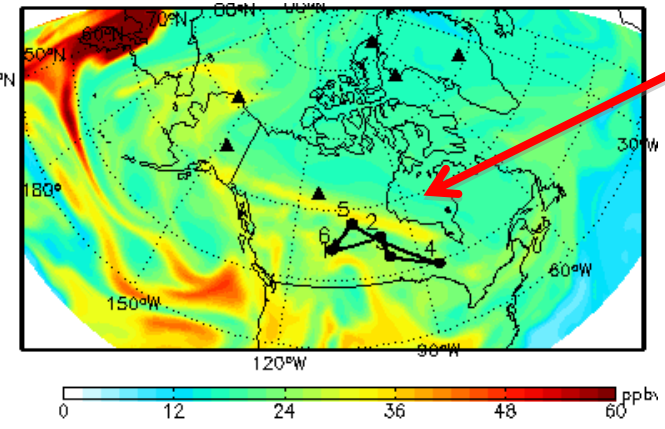
Boreal BB: 800 hPa (2 km)



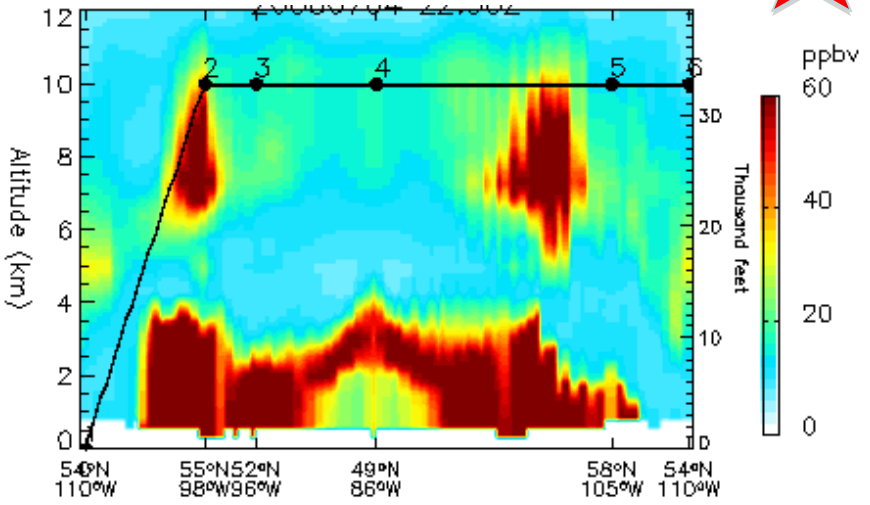
Asian Anthro: 800 hPa (2 km)



Asian Anthro: 400 hPa (7.2 km)

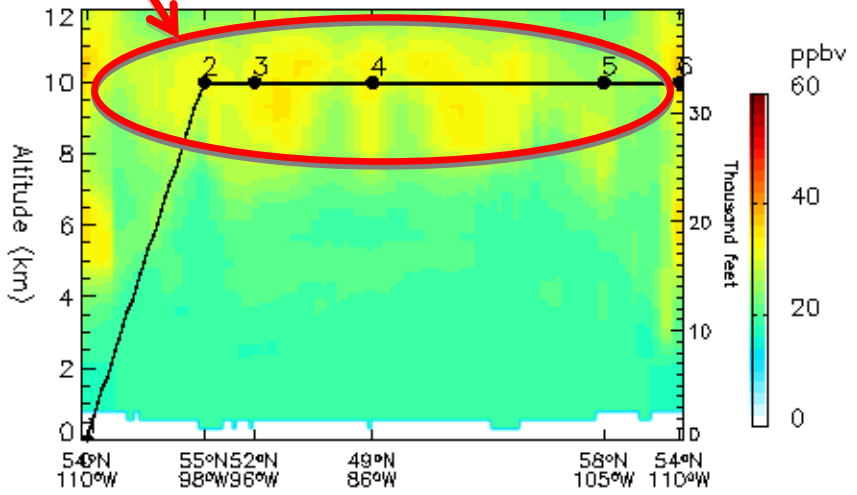


Boreal BB: Curtain



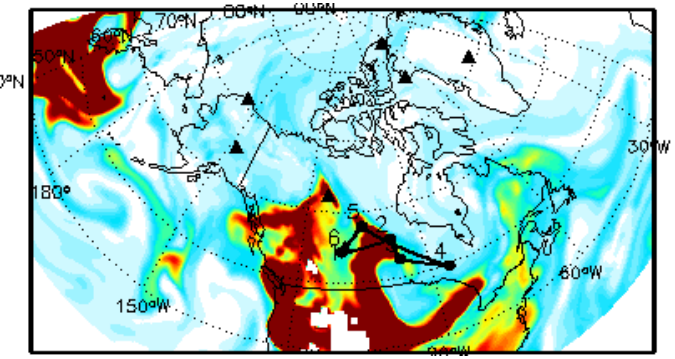
More F.F. CO from Asia at high altitudes

Asian Antrho: Curtain

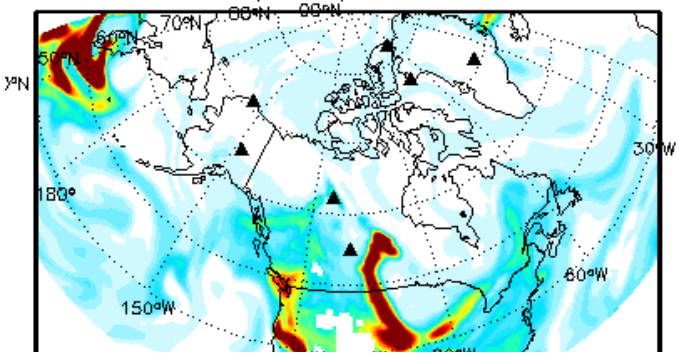


July 4 DC8 Flight Plan: Aerosol outlook

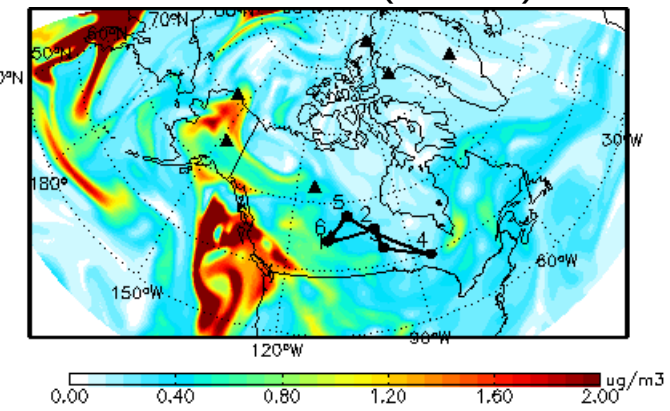
OC: 800 hPa (2 km)



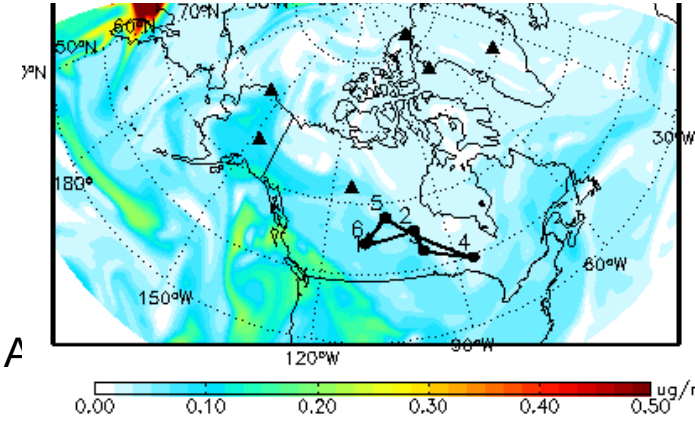
BC: 800 hPa (2km)



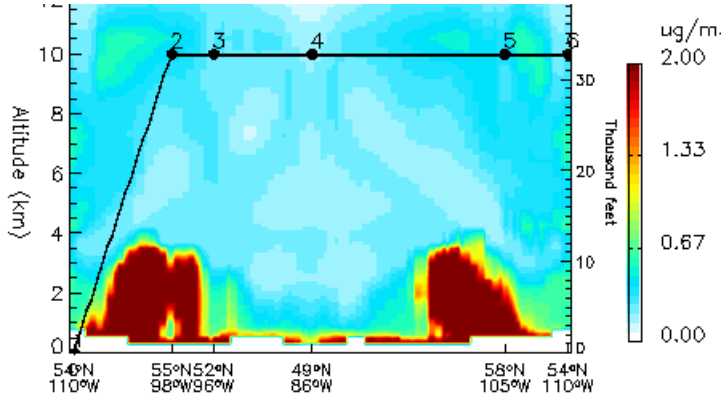
OC: 400 hPa (7.2 km)



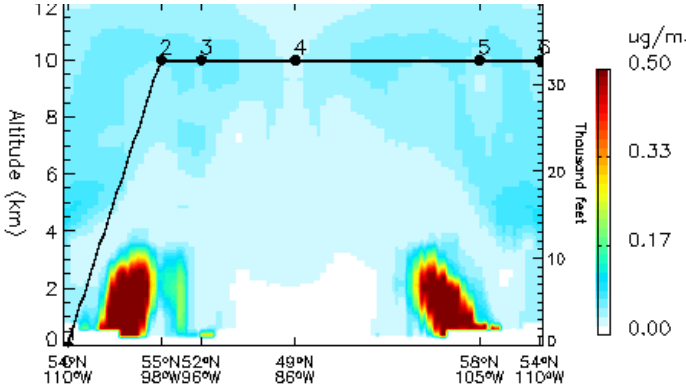
BC: 400 hPa (7.2 km)



OC: Curtain



BC: Curtain



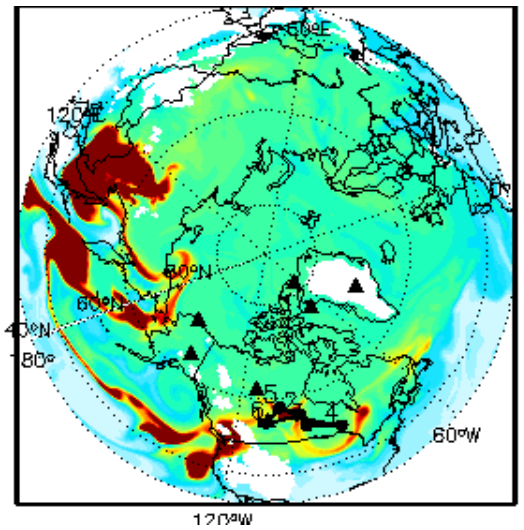
Thule Flights : Things to Keep an Eye on

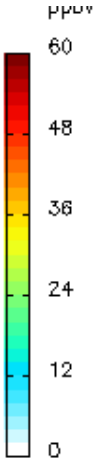
July 7th

Siberian plume enters Arctic at low, mid, & high altitudes.

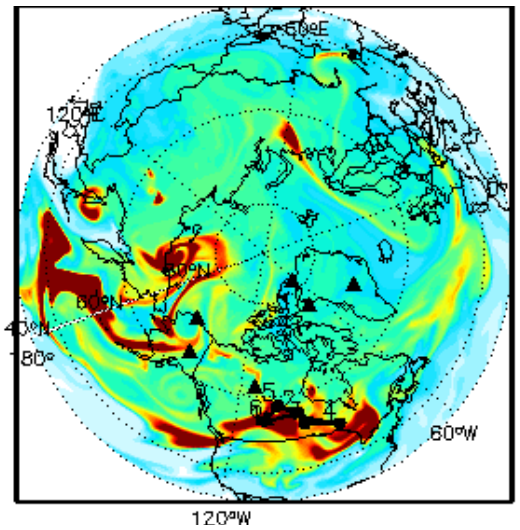
But Asian Fossil Fuels mixed in plume.

850 mb : Boreal

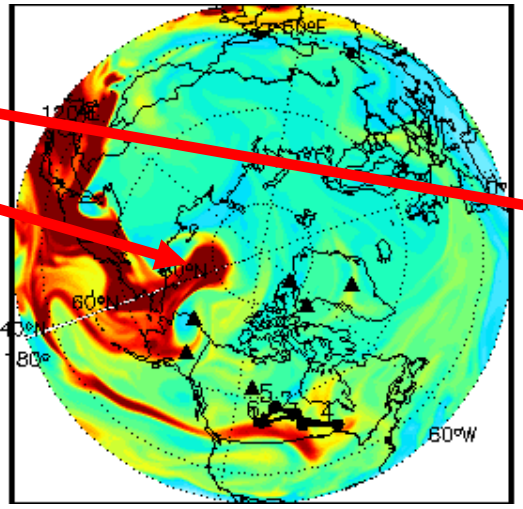


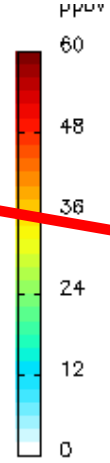


500 mb : Boreal

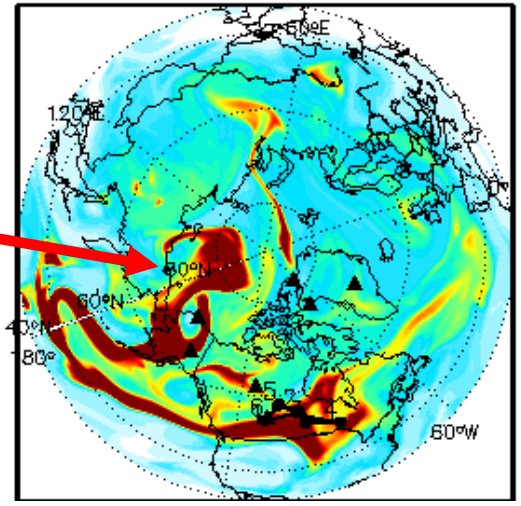


300 mb : Asian FF





300 mb : Boreal



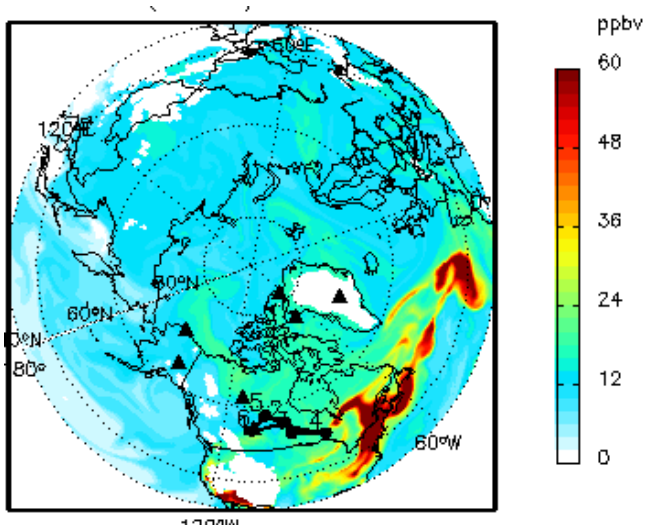
Thule Flights : Things to Keep an Eye on

July 7th

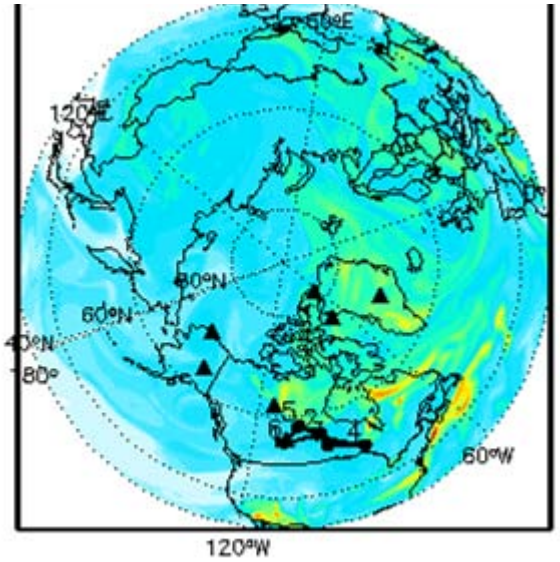
N. American Fossil Fuels seem to be heading out into Atlantic south of Greenland, Except for 300 mb.

Note: Calif. Fires in Ontario, Quebec, & US, but not Arctic.

850 mb



500 mb



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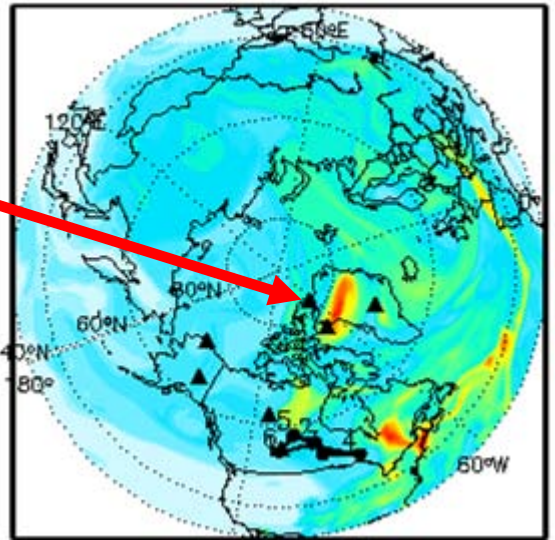
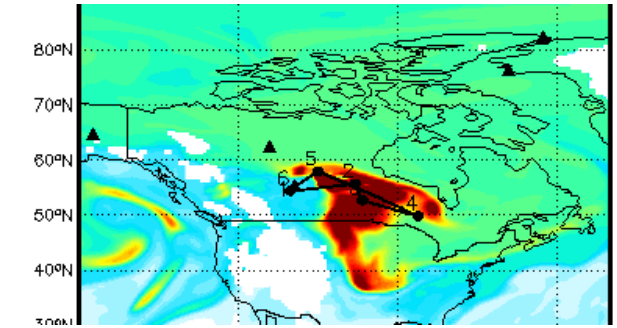
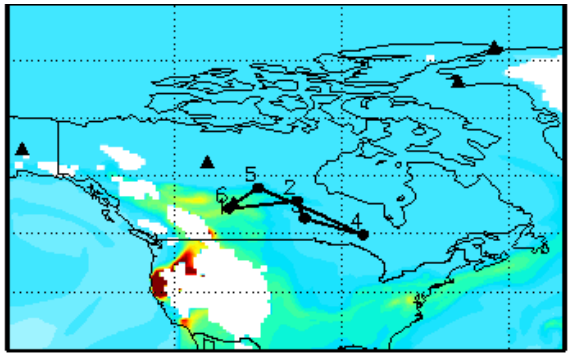


July 4th (22:30Z) : 3-levels

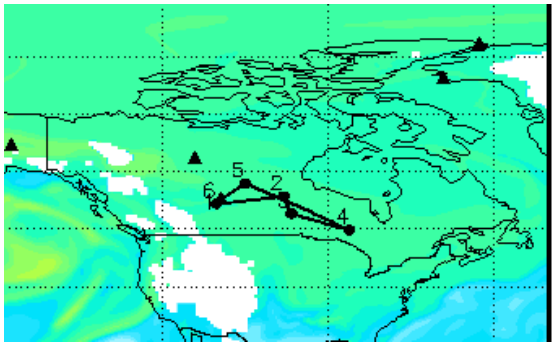
BOREAL : 850 mb



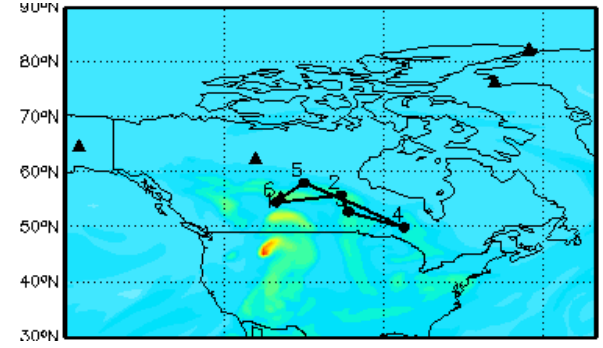
NON-BOREAL : 850 mb



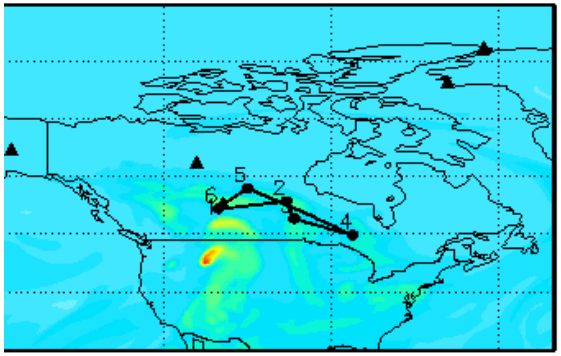
Asian FF/BF : 850 mb



500 mb



500 mb



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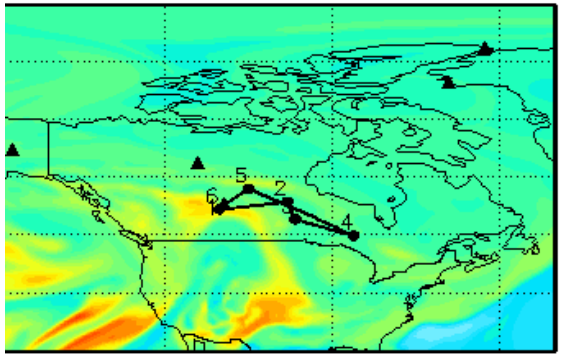
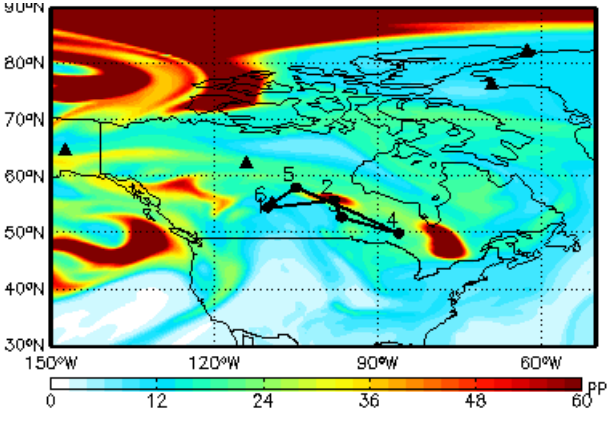


300 mb



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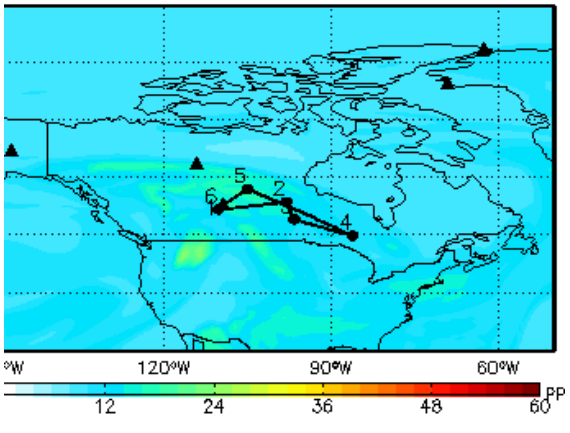

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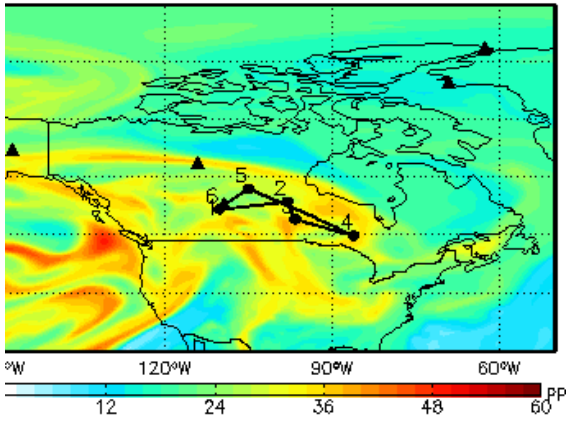
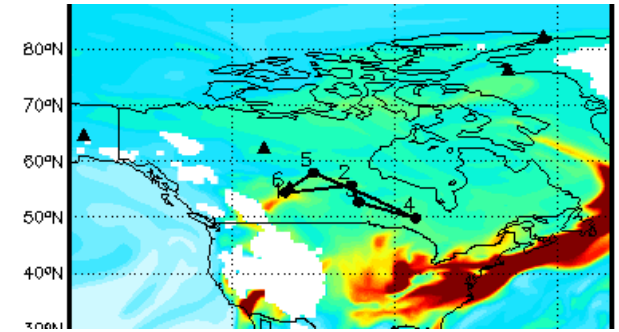


July 4th (22:30Z) : 3-levels

N. American : 850 mb



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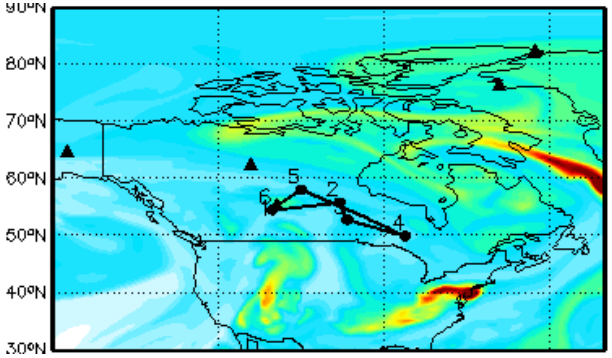

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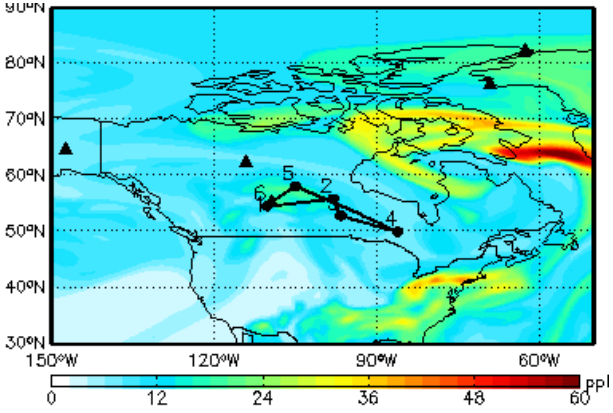
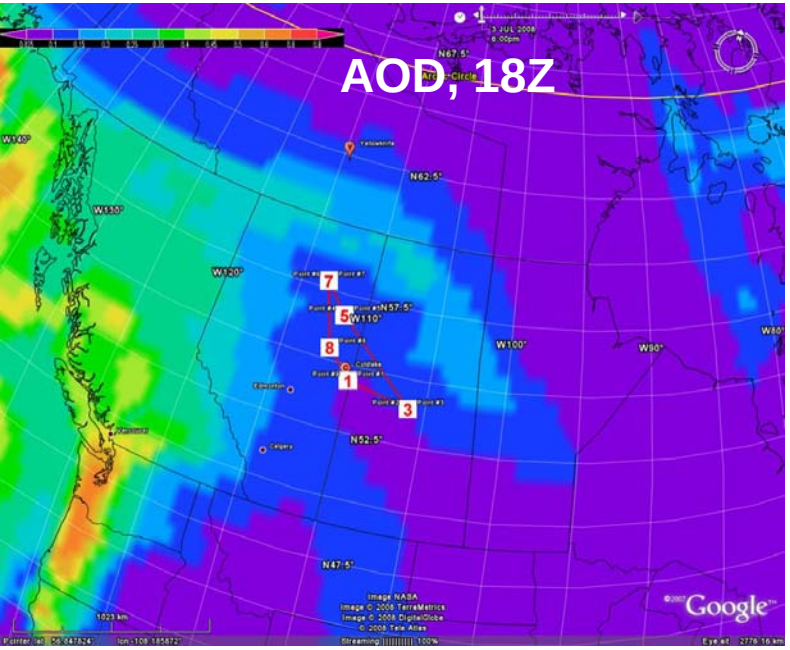
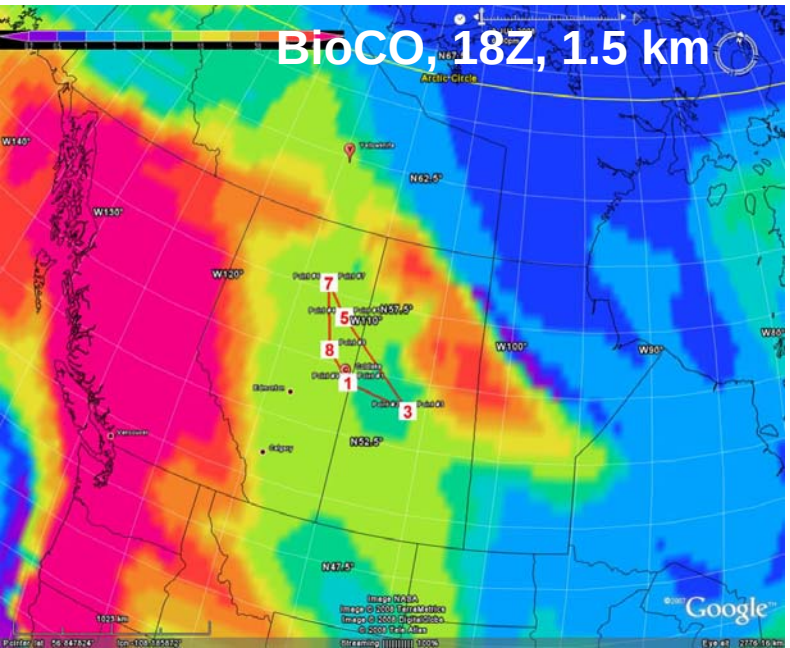
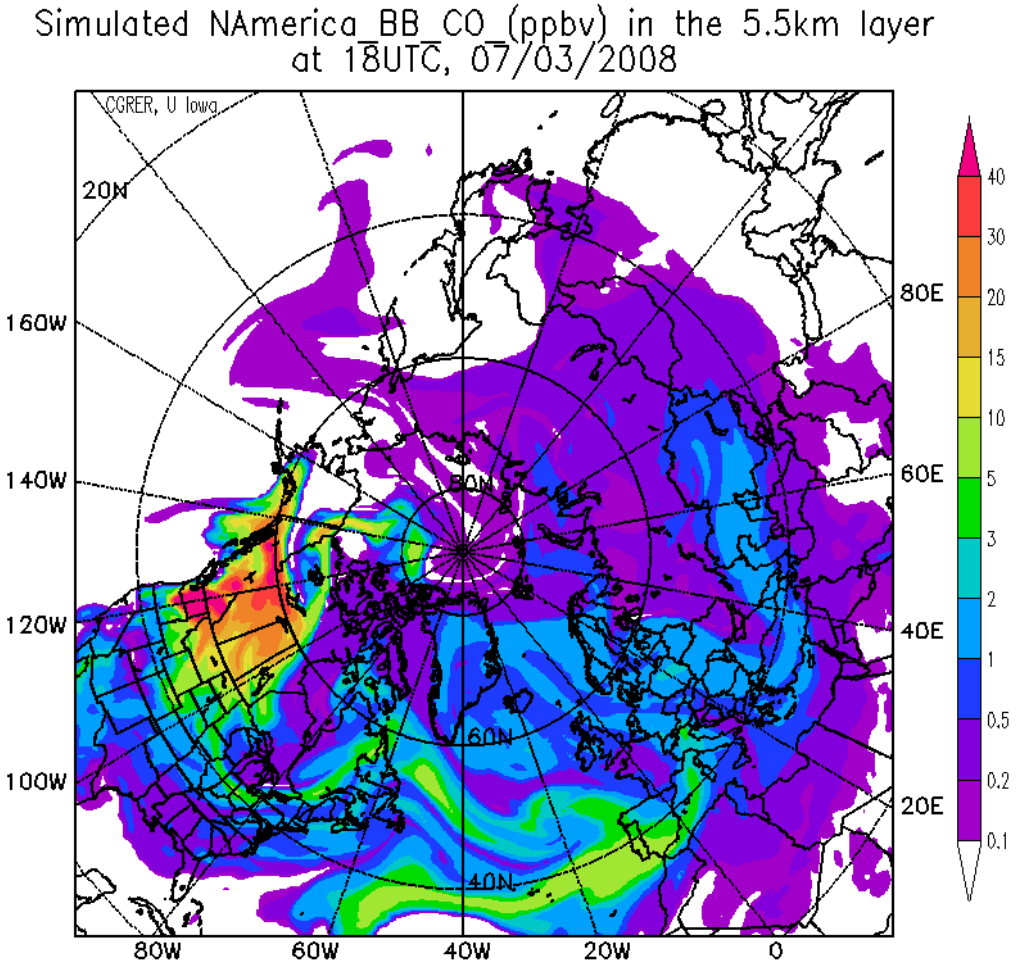
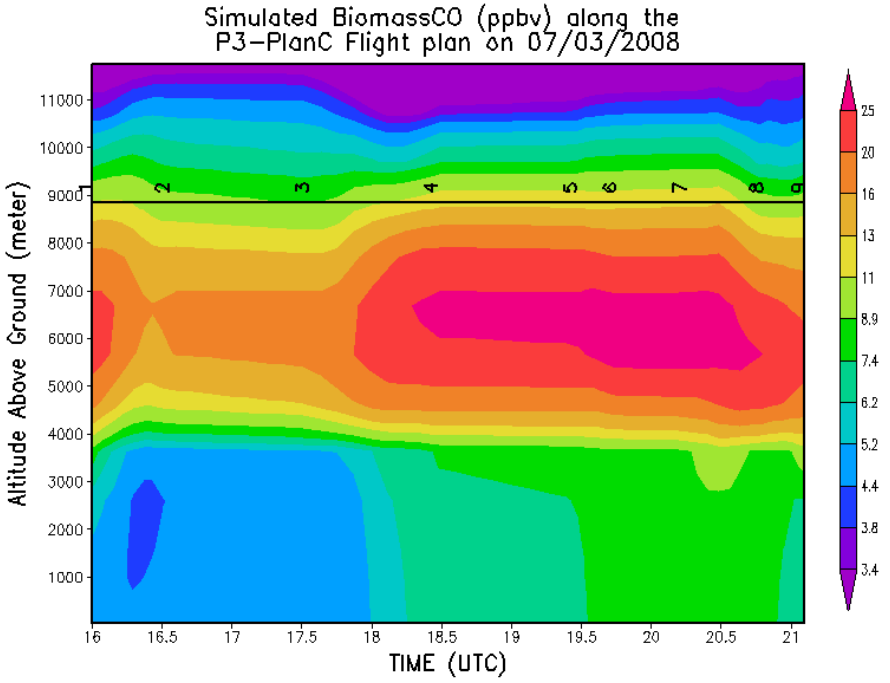


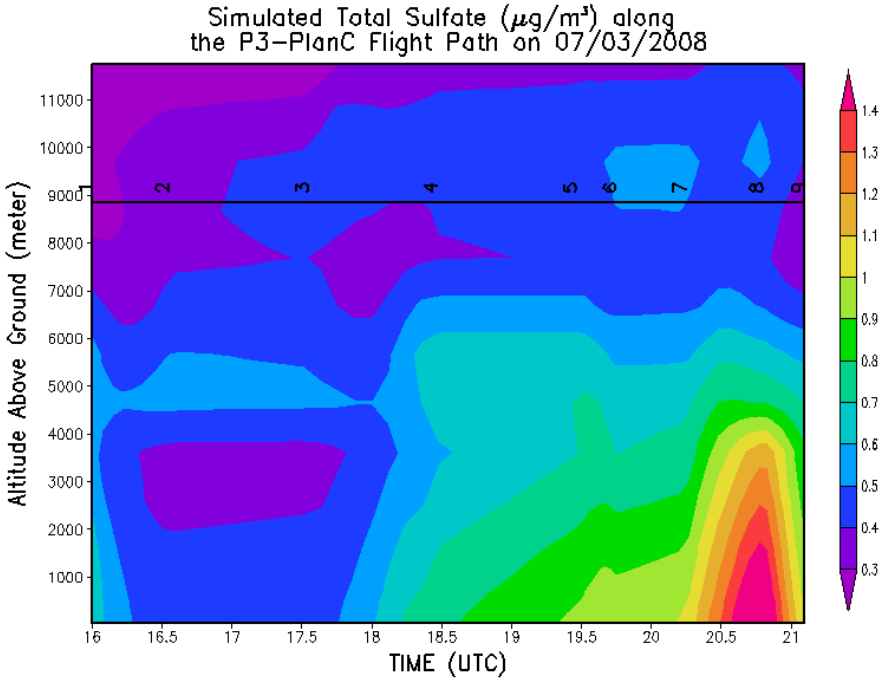
P3 Flight Today: Plan C

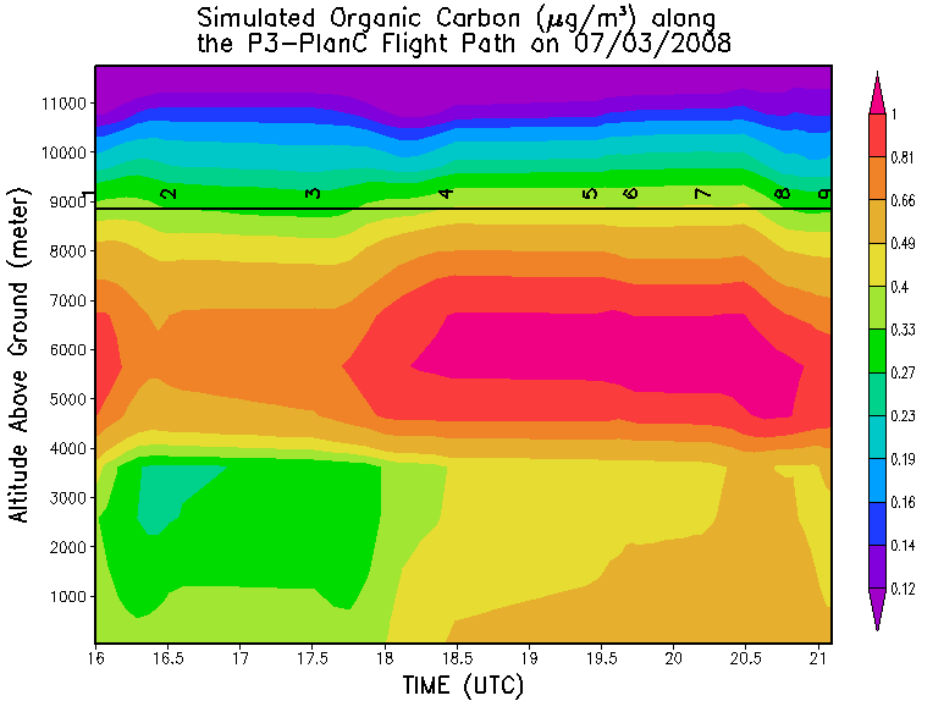


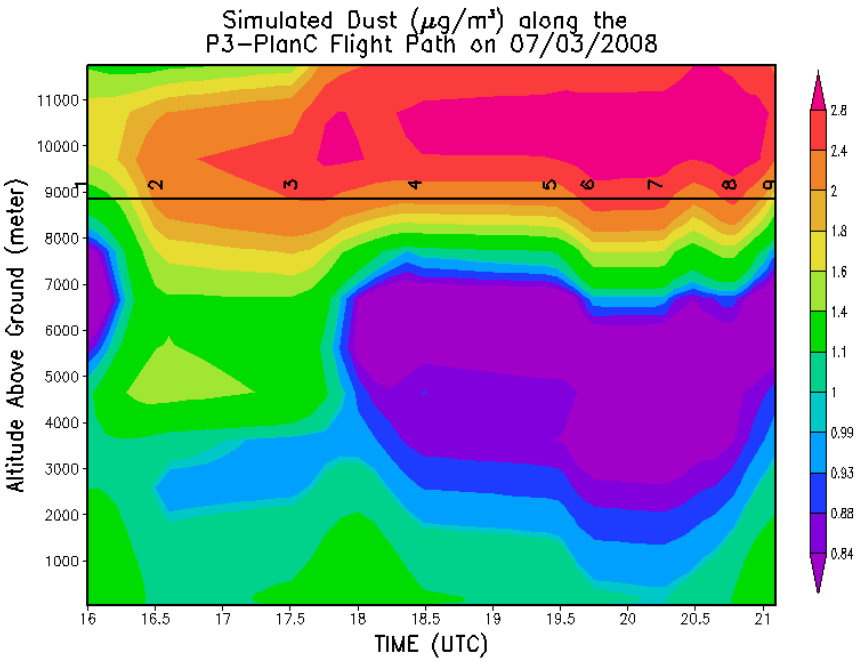


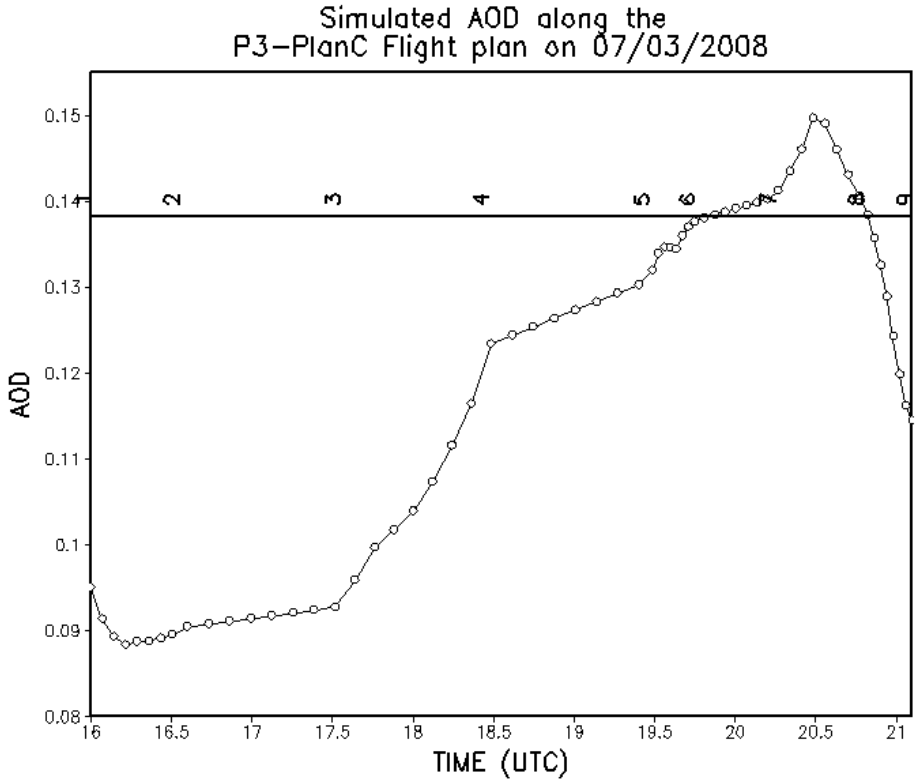


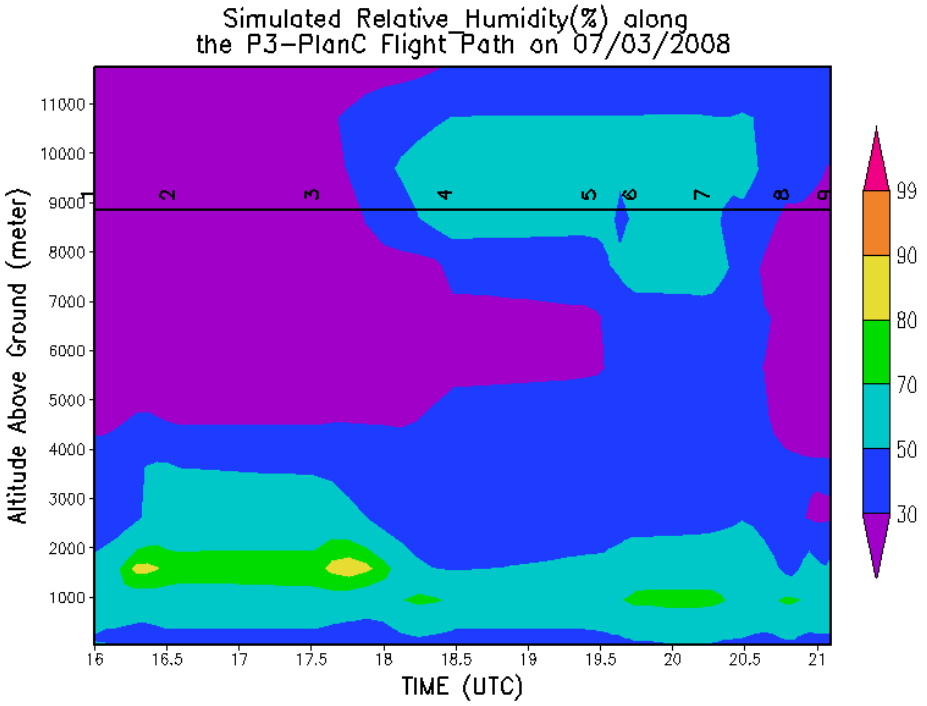

Simulated BiomassCO (ppbv) along the
P3-PlanC Flight plan on 07/03/2008
Altitude Above Ground (meter)
TIME (UTC)
25
20
16
13
11
8.9
7.4
6.2
5.2
4.4
3.8
3.4


Simulated Total Sulfate (μg/m³) along
the P3-PlanC Flight Path on 07/03/2008
Altitude Above Ground (meter)
TIME (UTC)
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3

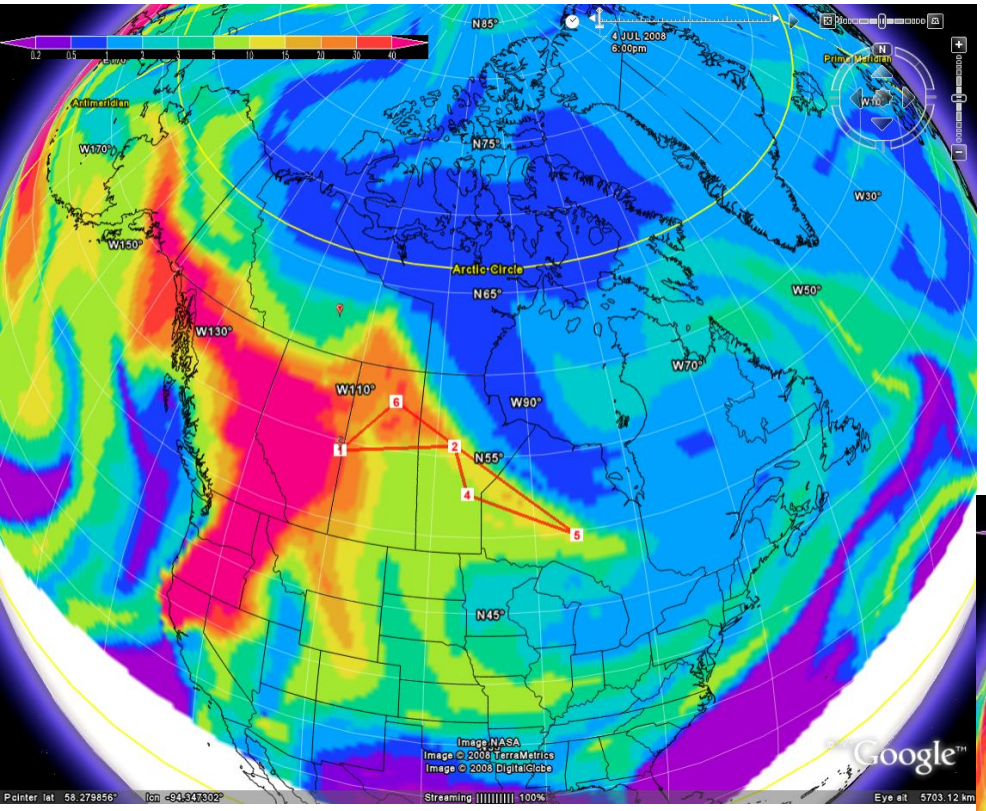

Simulated Organic Carbon (μg/m³) along
the P3-PlanC Flight Path on 07/03/2008
Altitude Above Ground (meter)
TIME (UTC)
1
0.81
0.66
0.49
0.4
0.33
0.27
0.23
0.19
0.16
0.14
0.12


Simulated Dust (μg/m³) along the
P3-PlanC Flight Path on 07/03/2008
Altitude Above Ground (meter)
TIME (UTC)
2.8
2.4
2
1.8
1.6
1.4
1.1
1
0.99
0.93
0.88
0.84


Simulated AOD along the
P3-PlanC Flight plan on 07/03/2008
AOD
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
1
2
3
4
5
6
7
8
9
16
16.5
17
17.5
18
18.5
19
19.5
20
20.5
21
TIME (UTC)

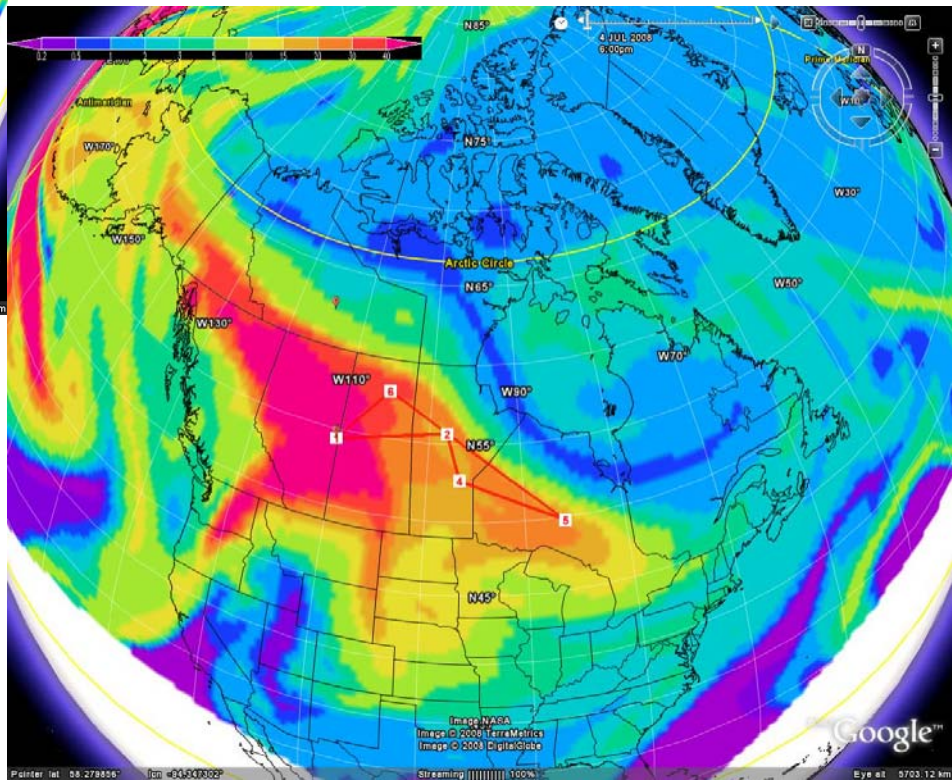

Simulated Relative Humidity(%) along
the P3-PlanC Flight Path on 07/03/2008
Altitude Above Ground (meter)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
1
2
3
4
5
6
7
8
9
16
16.5
17
17.5
18
18.5
19
19.5
20
20.5
21
TIME (UTC)
99
90
80
70
50
30

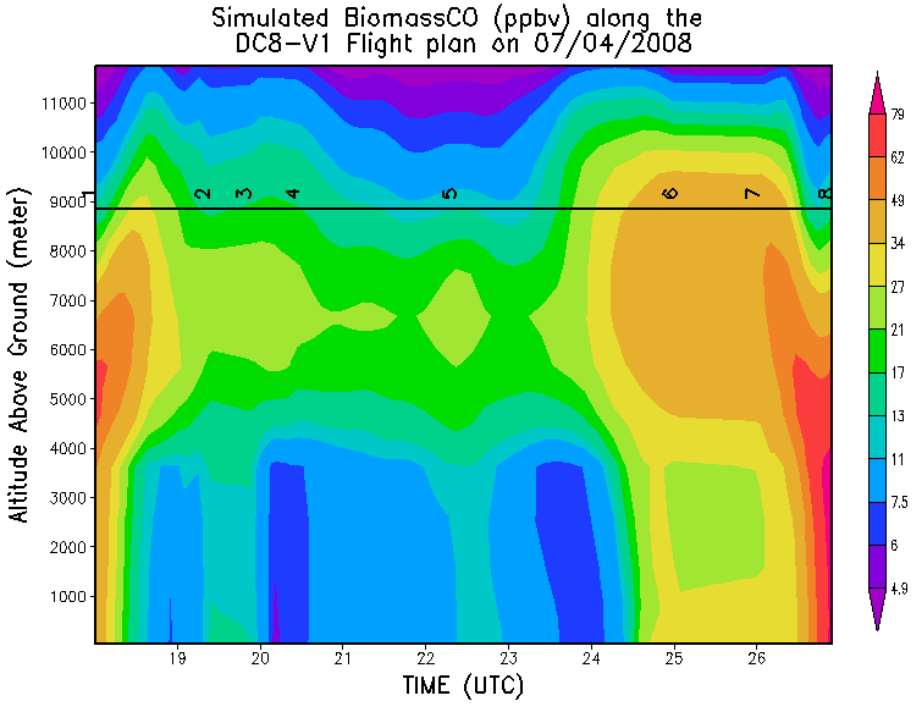
DC8 Flight 7/4

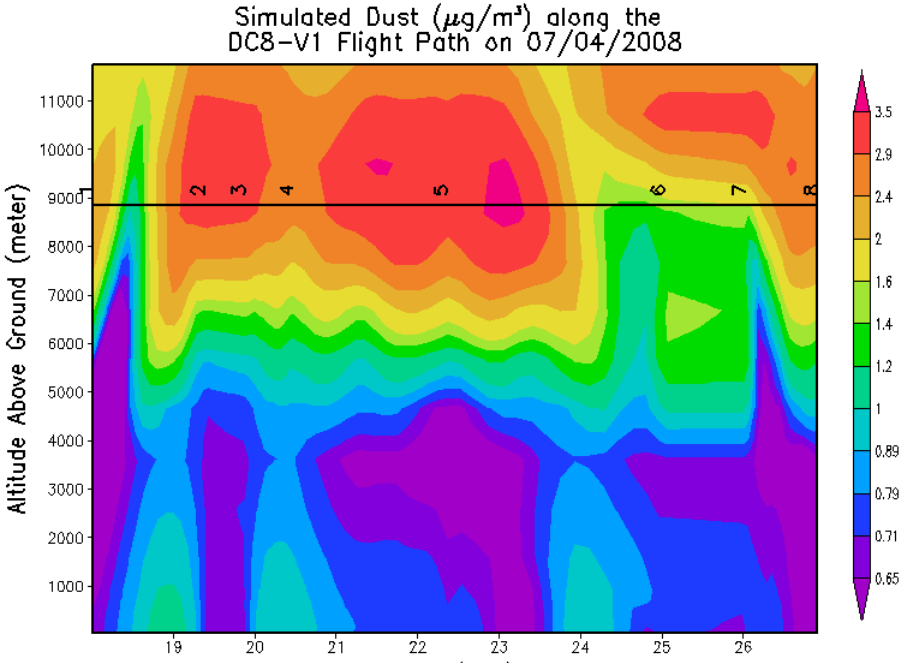


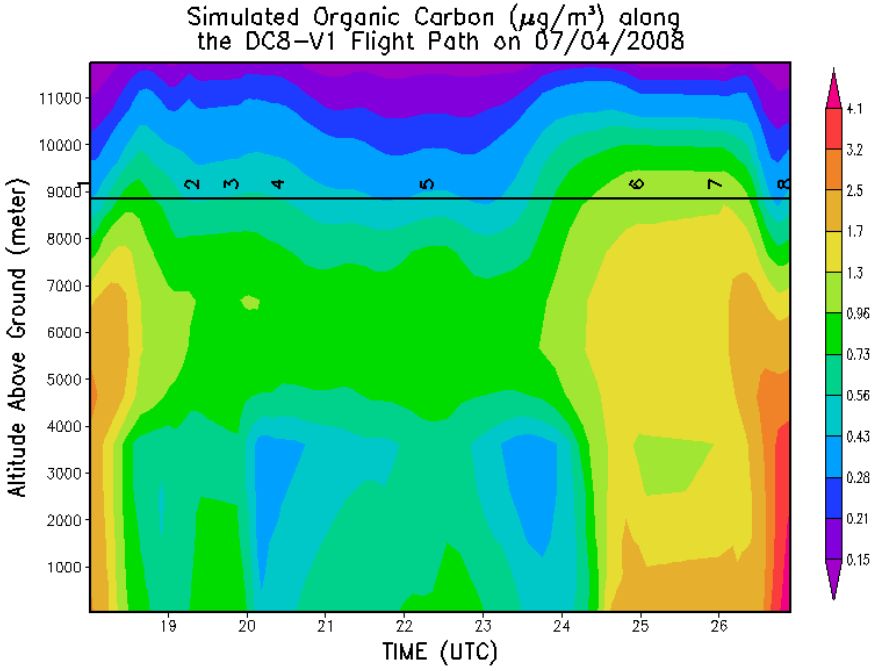
Biomass CO, 18Z, 7/4, 1.5 km

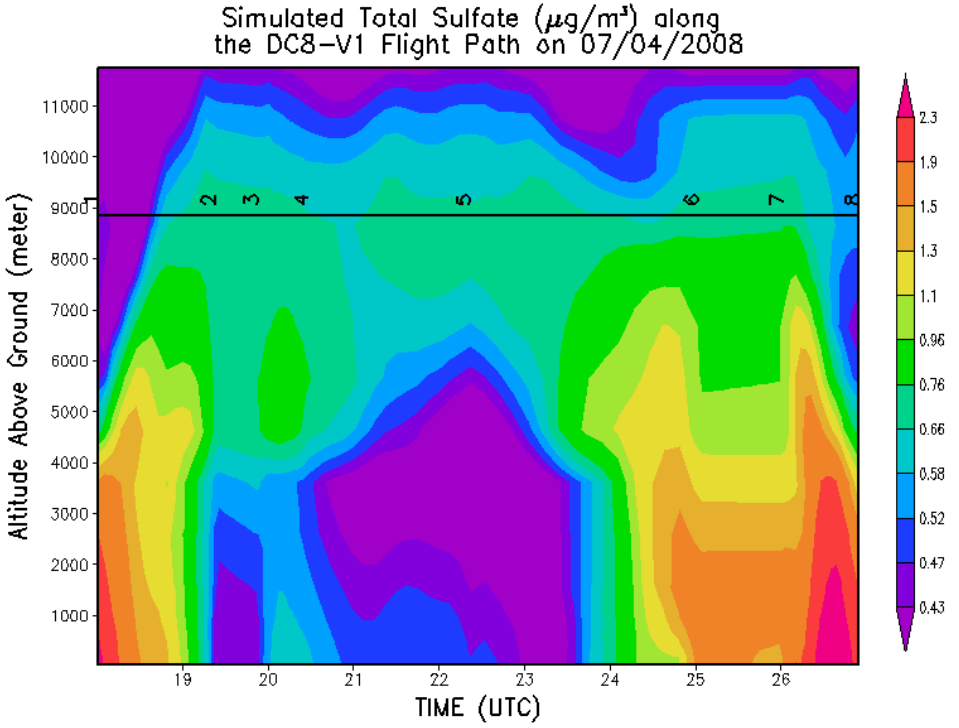
Biomass CO, 18Z, 7/4, 5.5 km



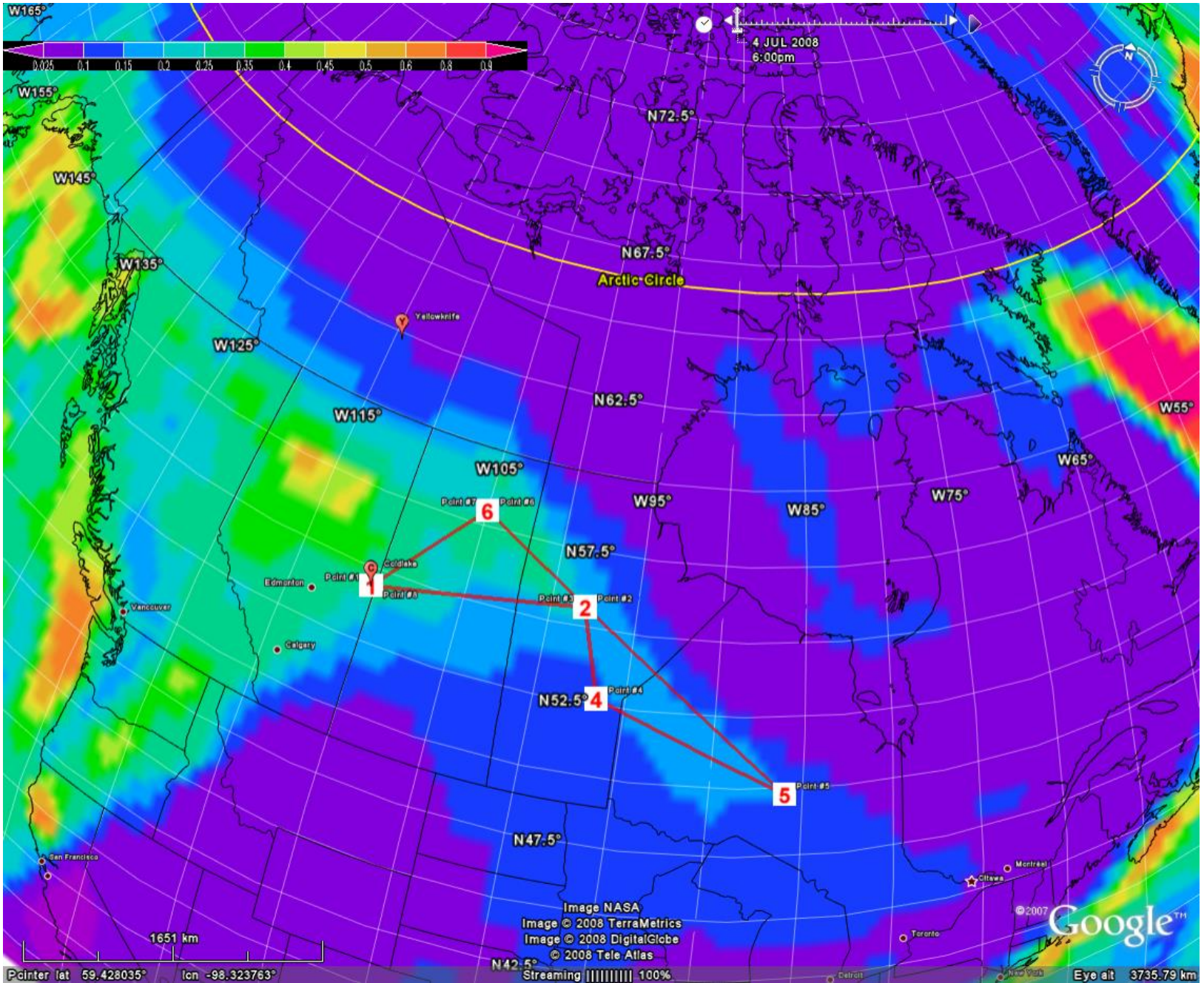

Simulated BiomassCO (ppbv) along the DC8-V1 Flight plan on 07/04/2008
Altitude Above Ground (meter)
TIME (UTC)
79
62
49
34
27
21
17
13
11
7.5
6
4.9

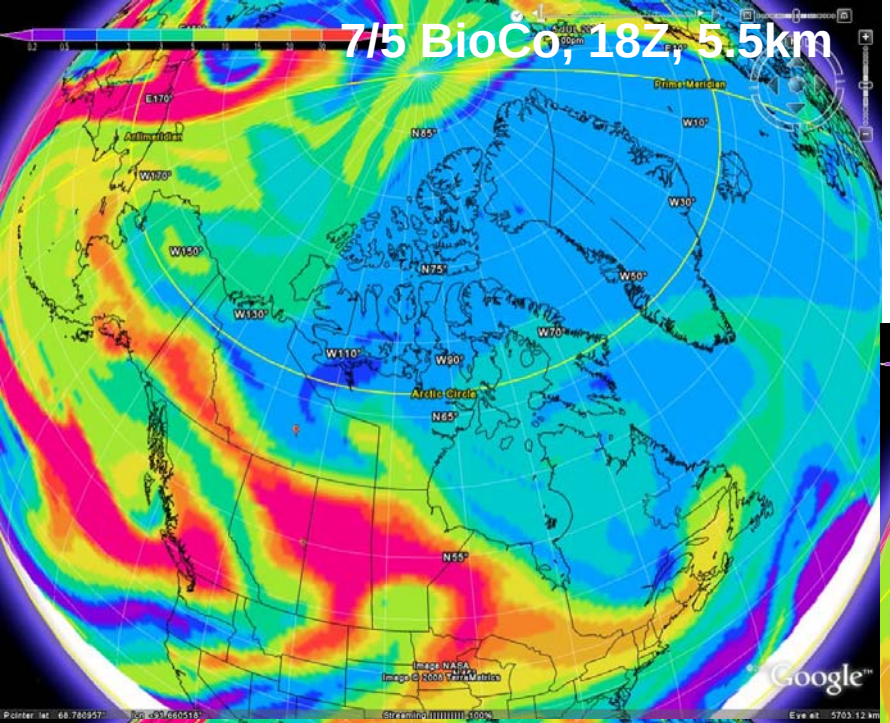

Simulated Dust (μg/m³) along the DC8-V1 Flight Path on 07/04/2008
Altitude Above Ground (meter)
3.5
2.9
2.4
2
1.6
1.4
1.2
1
0.89
0.79
0.71
0.65

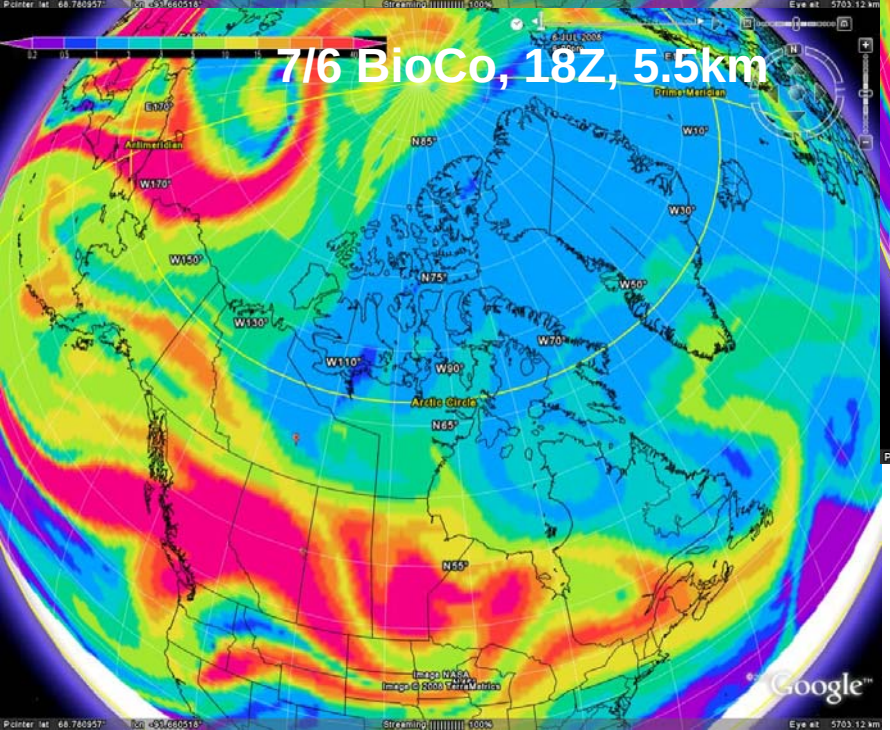

Simulated Organic Carbon (μg/m³) along the DC8-V1 Flight Path on 07/04/2008
Altitude Above Ground (meter)
TIME (UTC)
4.1
3.2
2.5
1.7
1.3
0.96
0.73
0.56
0.43
0.28
0.21
0.15

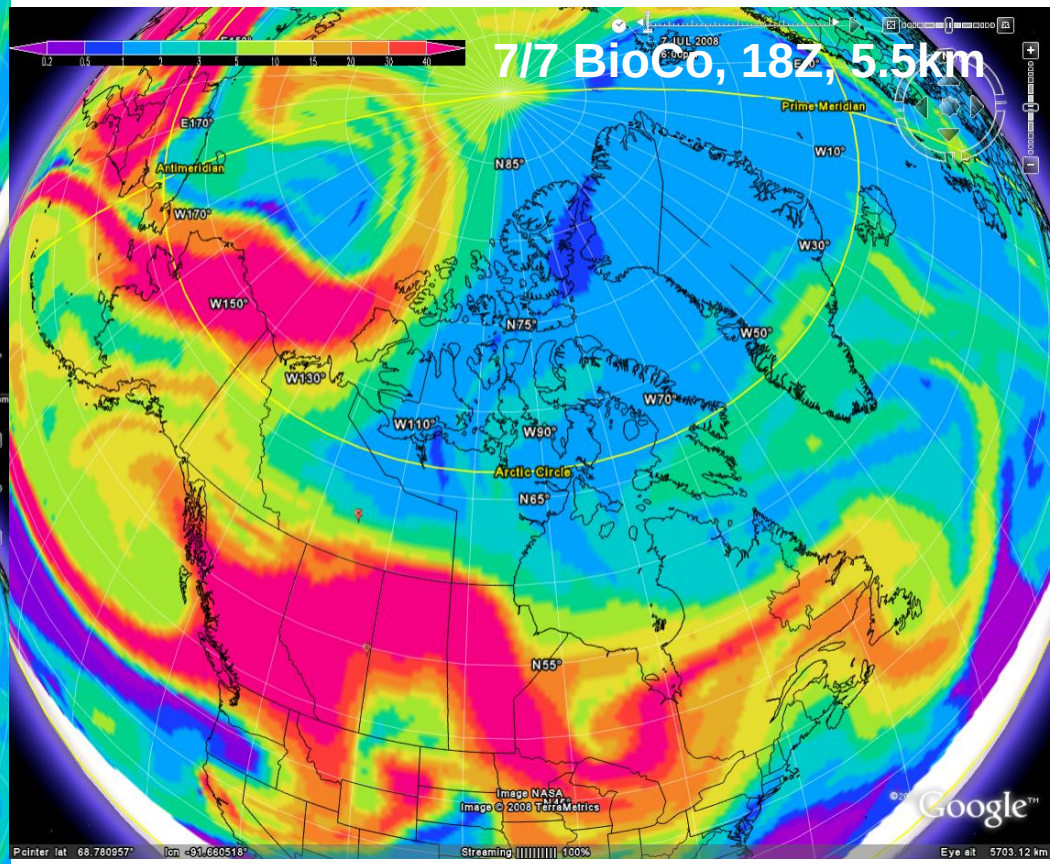

Simulated Total Sulfate (μg/m³) along the DC8-V1 Flight Path on 07/04/2008
Altitude Above Ground (meter)
TIME (UTC)
2.3
1.9
1.5
1.3
1.1
0.96
0.76
0.66
0.58
0.52
0.47
0.43

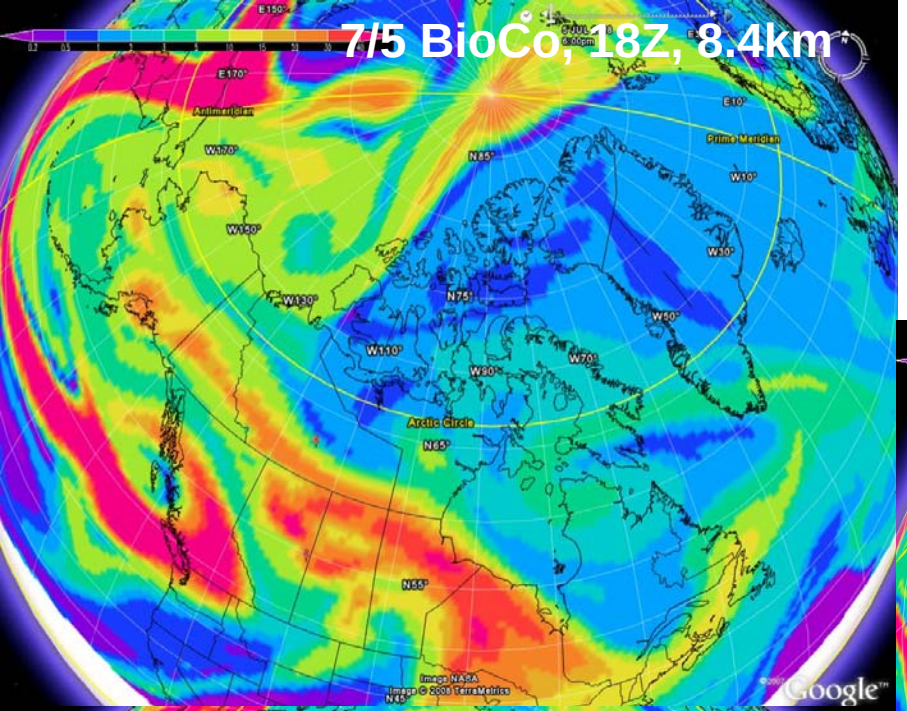
AOD 7/4 DC8 Flight 18Z

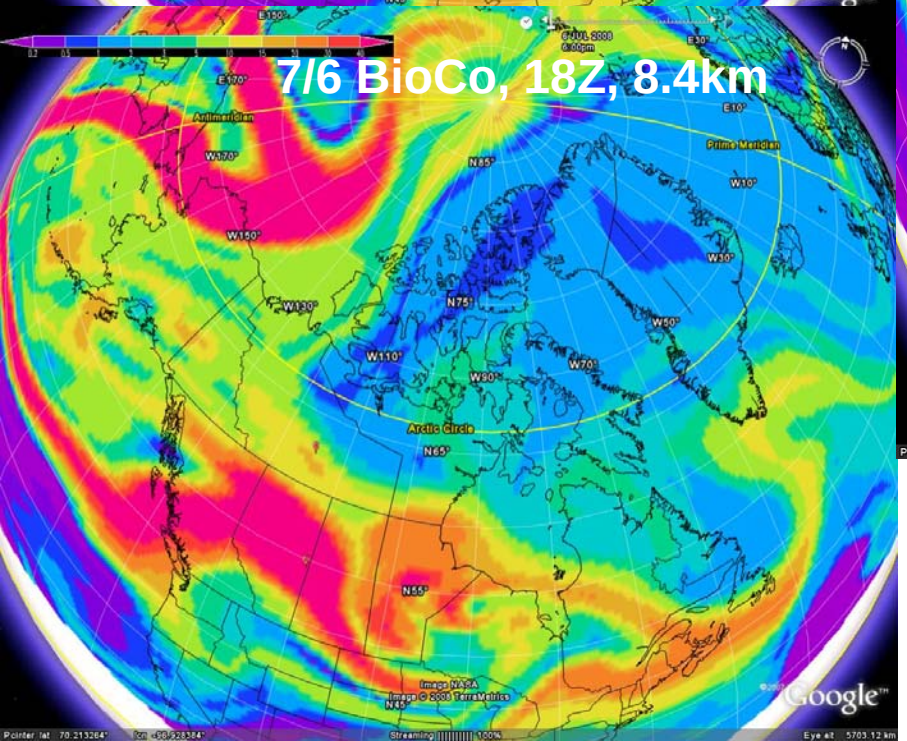


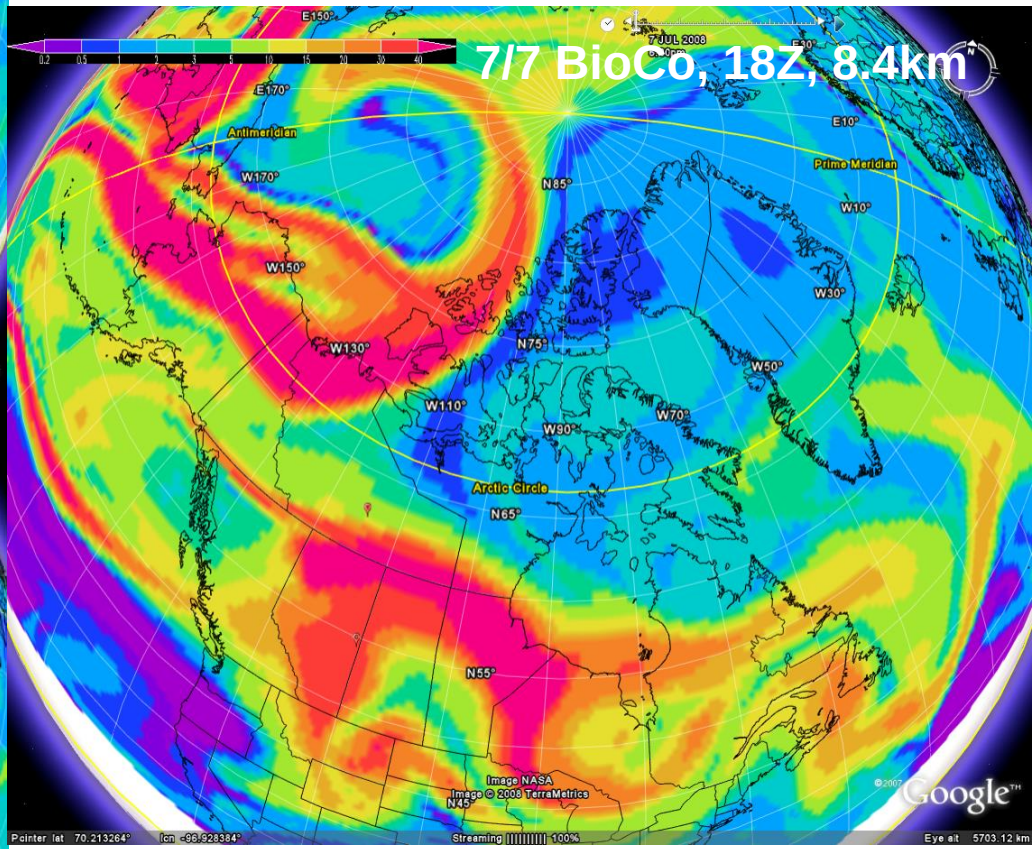

7/5 BioCo, 18Z, 5.5km
Prime Meridian
Antimeridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google

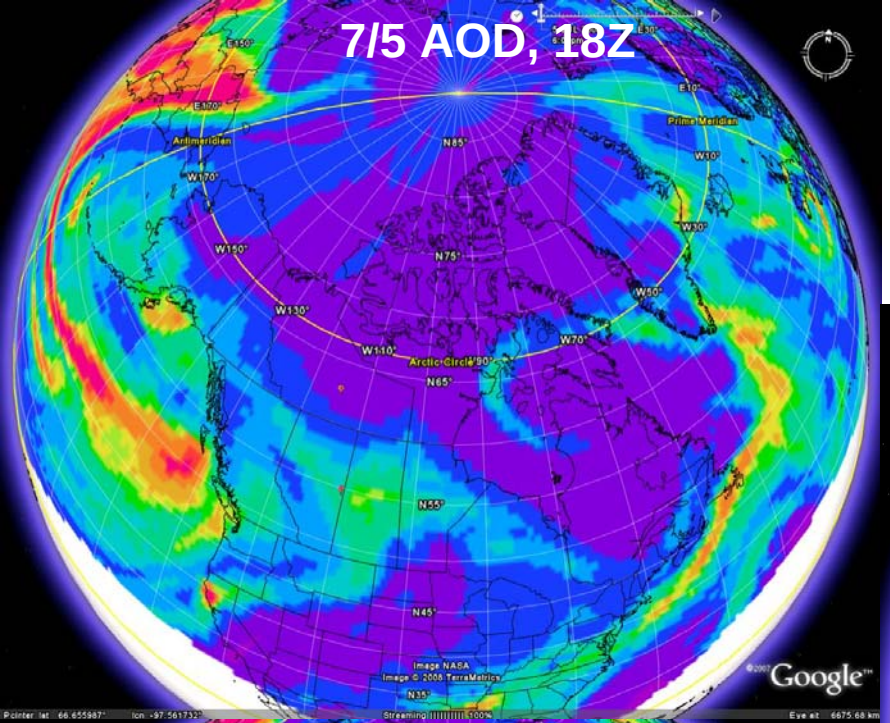

7/6 BioCo, 18Z, 5.5km
Prime Meridian
Antimeridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google

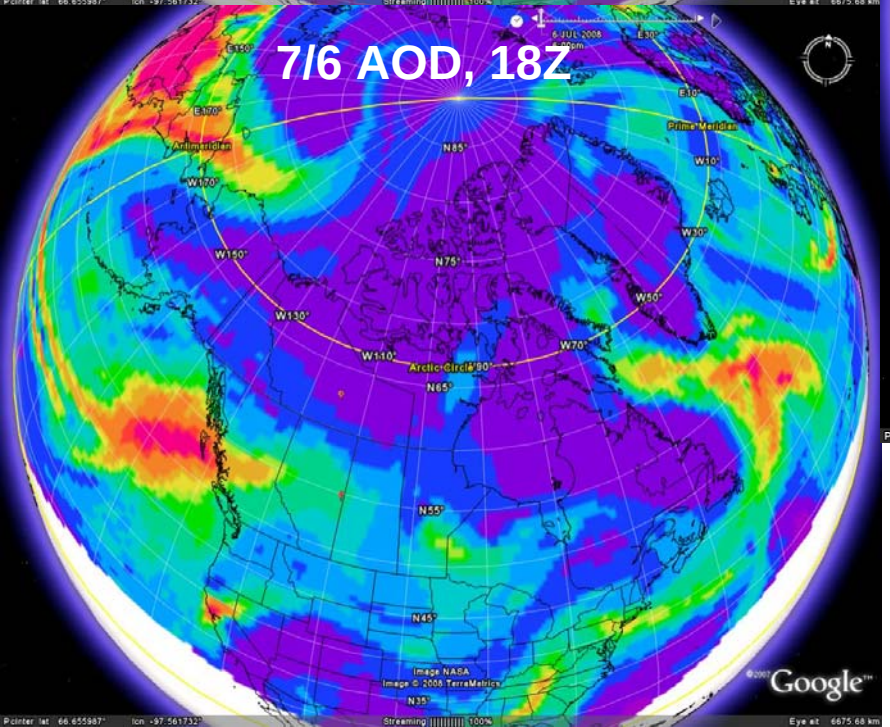

7/7 BioCo, 18Z, 5.5km
Prime Meridian
Antimeridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google

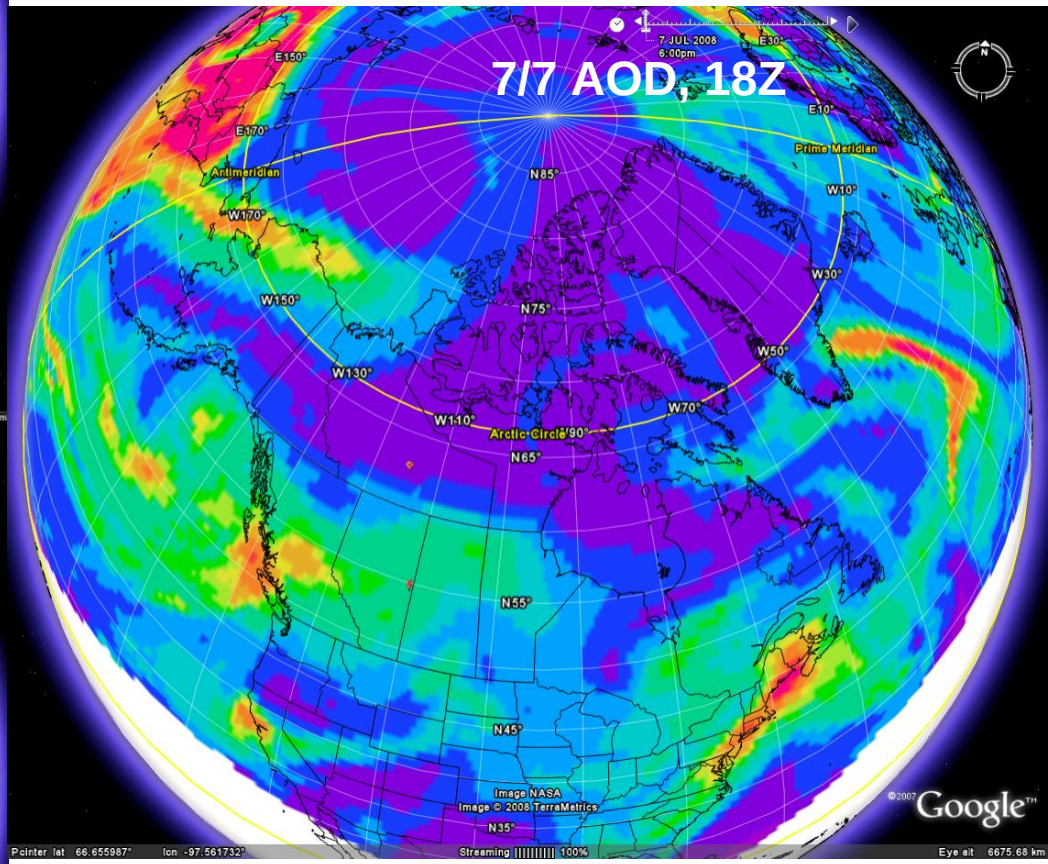

7/5 BioCo, 18Z, 8.4km
Antimeridian
Prime Meridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google


7/6 BioCo, 18Z, 8.4km
Antimeridian
Prime Meridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google


7/7 BioCo, 18Z, 8.4km
Antimeridian
Prime Meridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google


7/5 AOD, 18Z
Prime Meridian
Antimeridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google


7/6 AOD, 18Z
Prime Meridian
Antimeridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google


7/7 AOD, 18Z
7 JUL 2008
6:00pm
Prime Meridian
Antimeridian
Arctic Circle
Image NASA
Image © 2008 TerraMetrics
Google

FLEXPART Forecasts: POLARCAT – ARCTAS
Cold Lake, Alberta, 1 – 12 July 2008

Burkhart, John F.

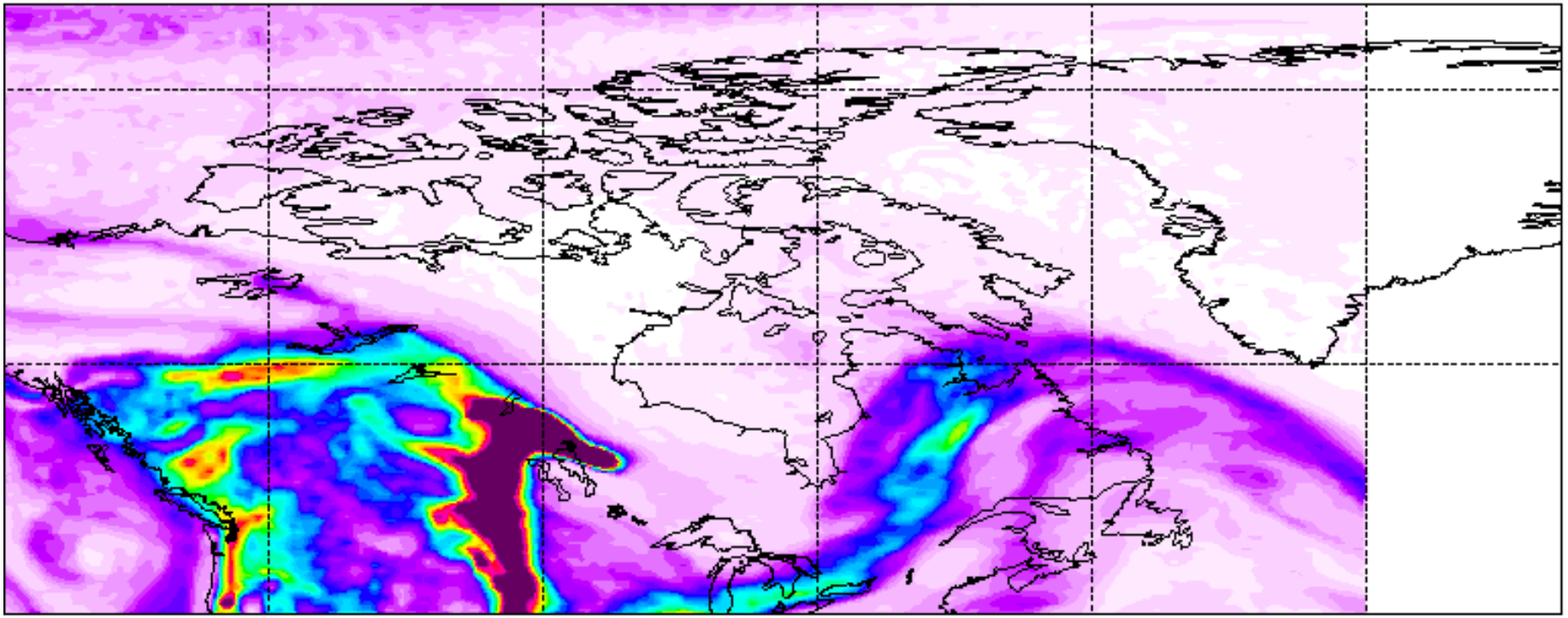
Stohl, A; Sodemann, H; Eckhardt, S; Tørseth, K
Department of Atmospheric and Climate Research, Norwegian Institute for Air Research (NILU), Norway

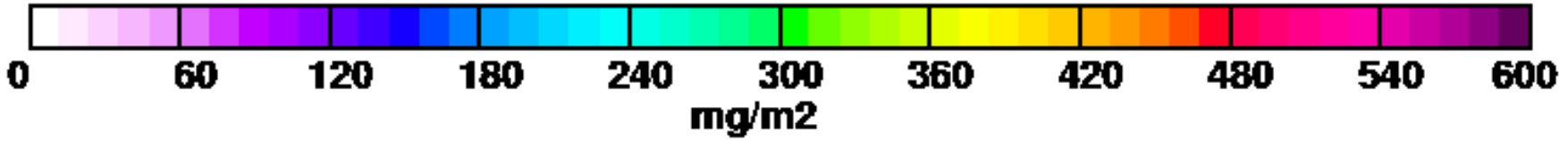
Prepared:

3 July 2008

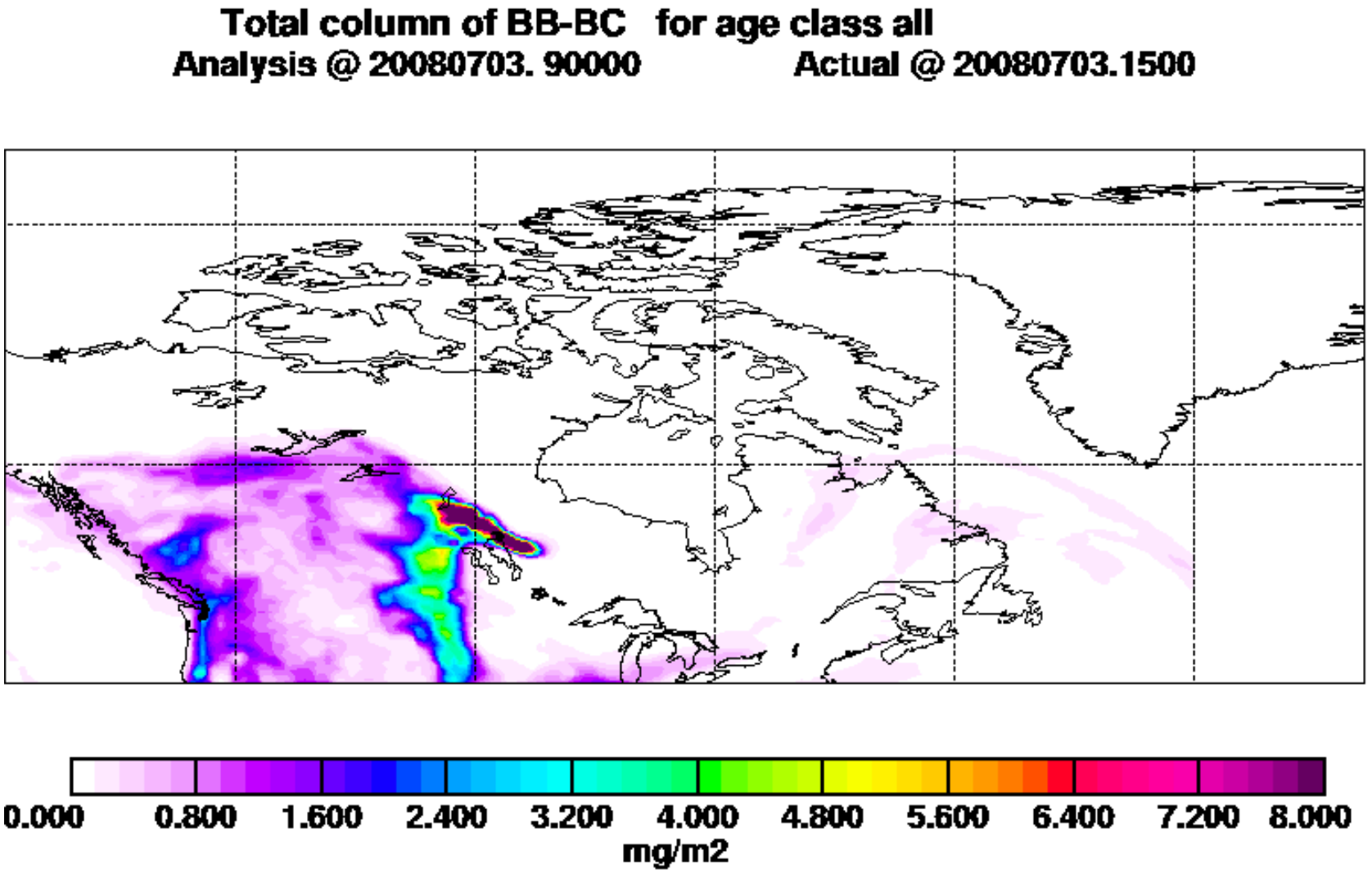
FLEXPART Forecasts – 3 July 2008

Total column of BB-CO for age class all
Analysis @ 20080703. 90000 Actual @ 20080703.1500

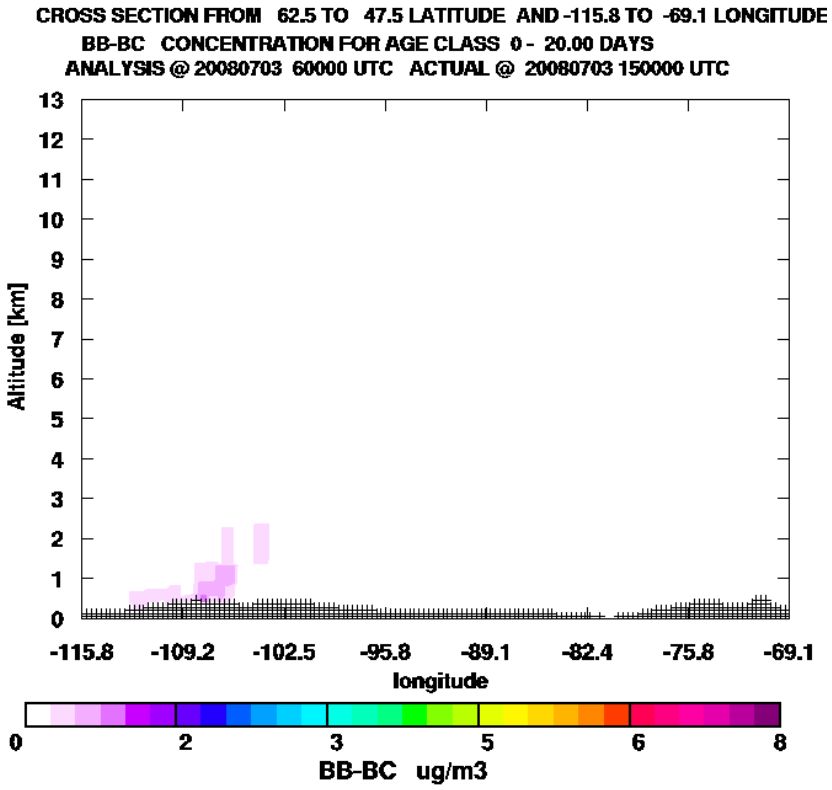


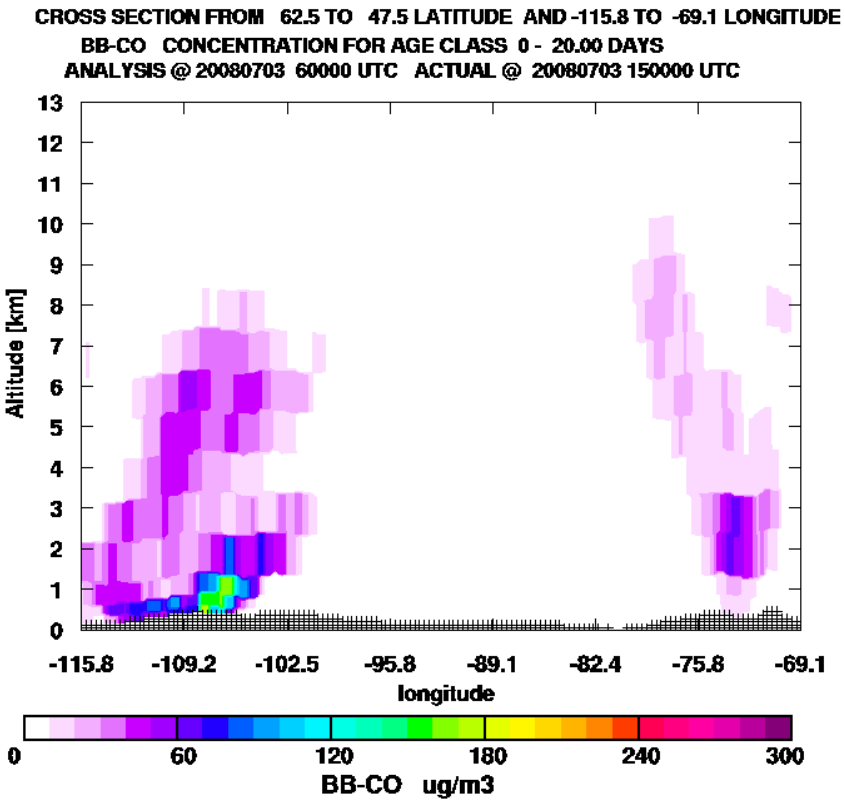


FLEXPART Forecasts – 3 July 2008

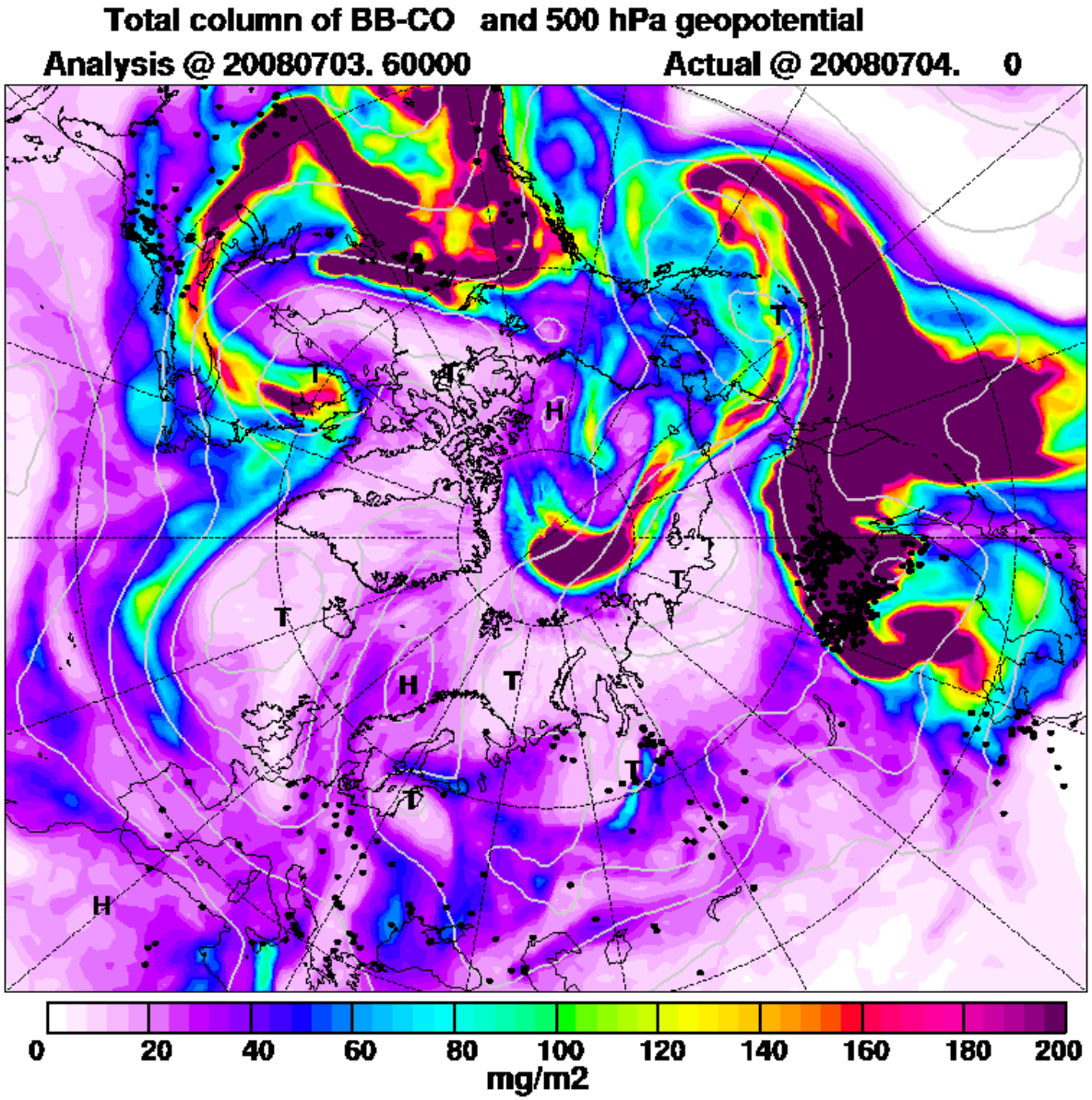


FLEXPART Forecasts – 3 July 2008

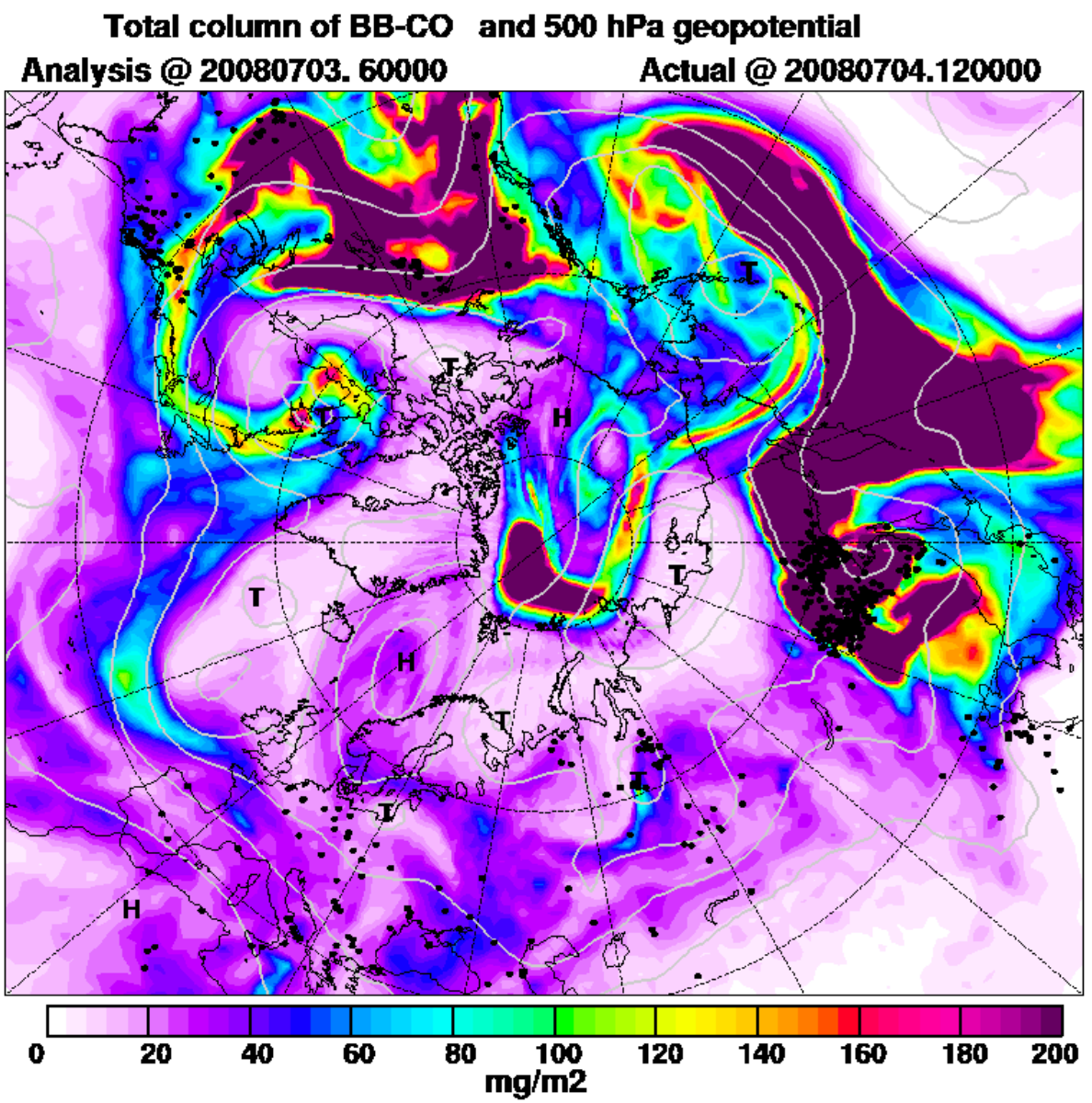




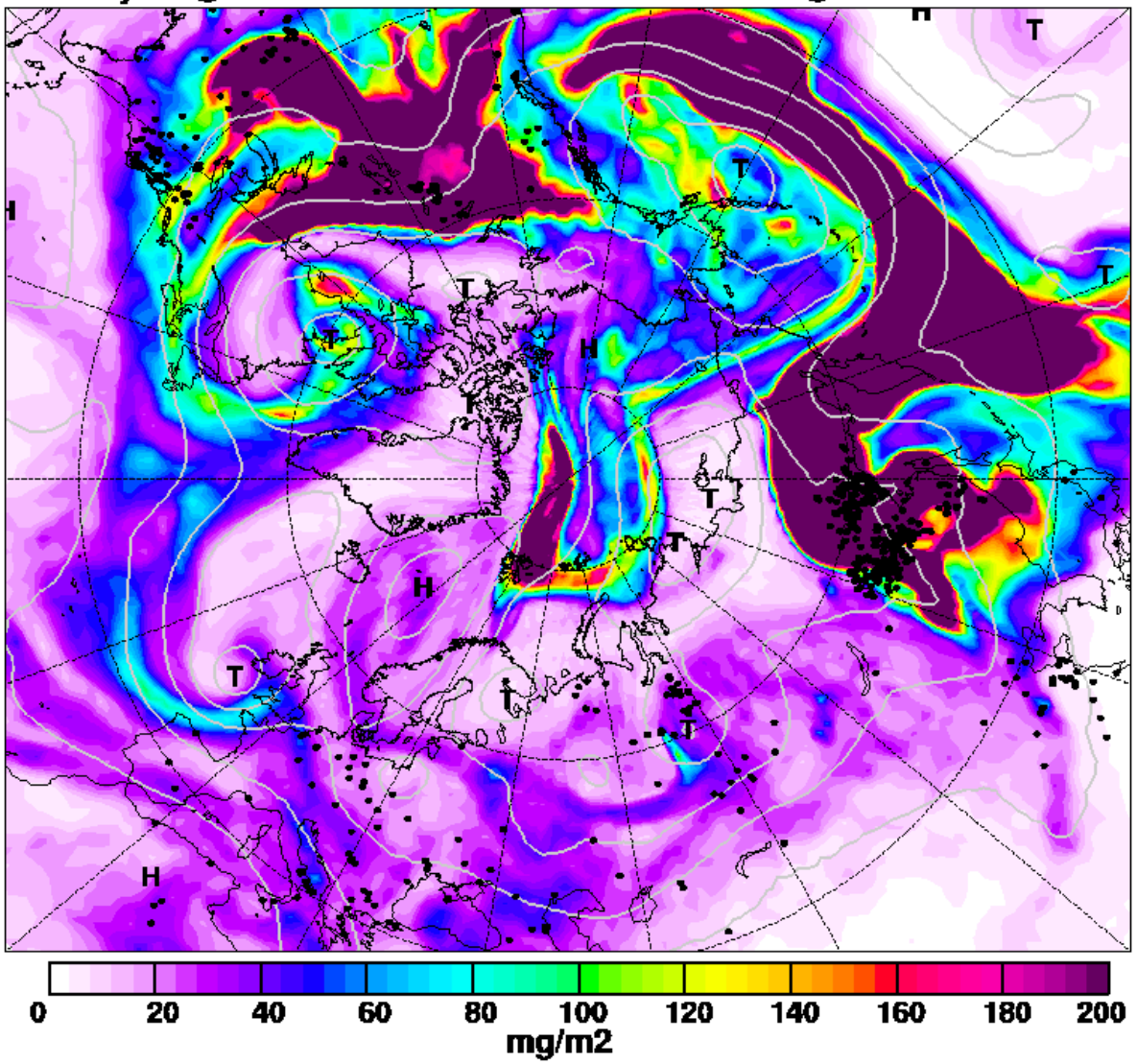
FLEXPART Forecasts – 3 July 2008



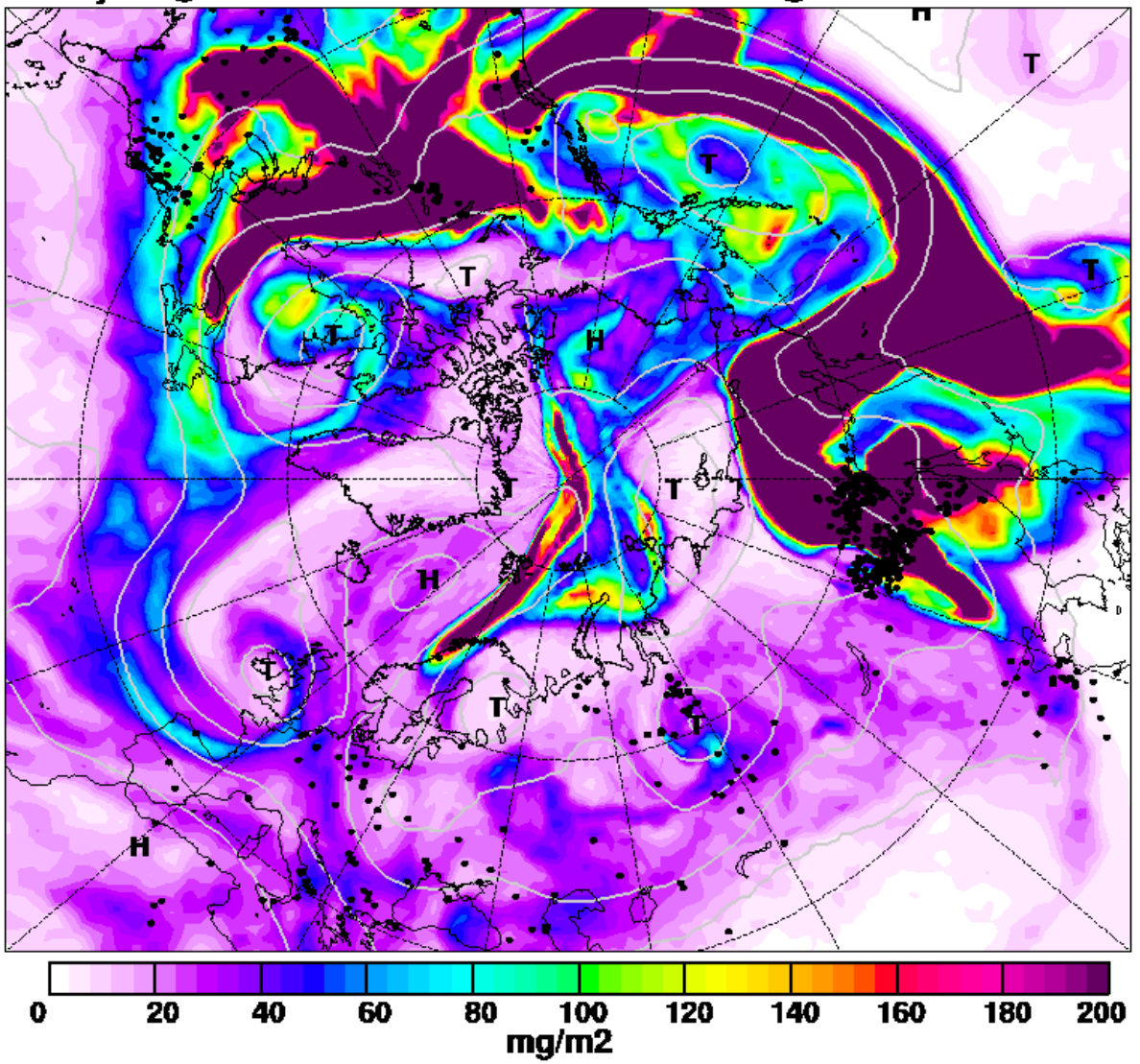
FLEXPART Forecasts – 3 July 2008



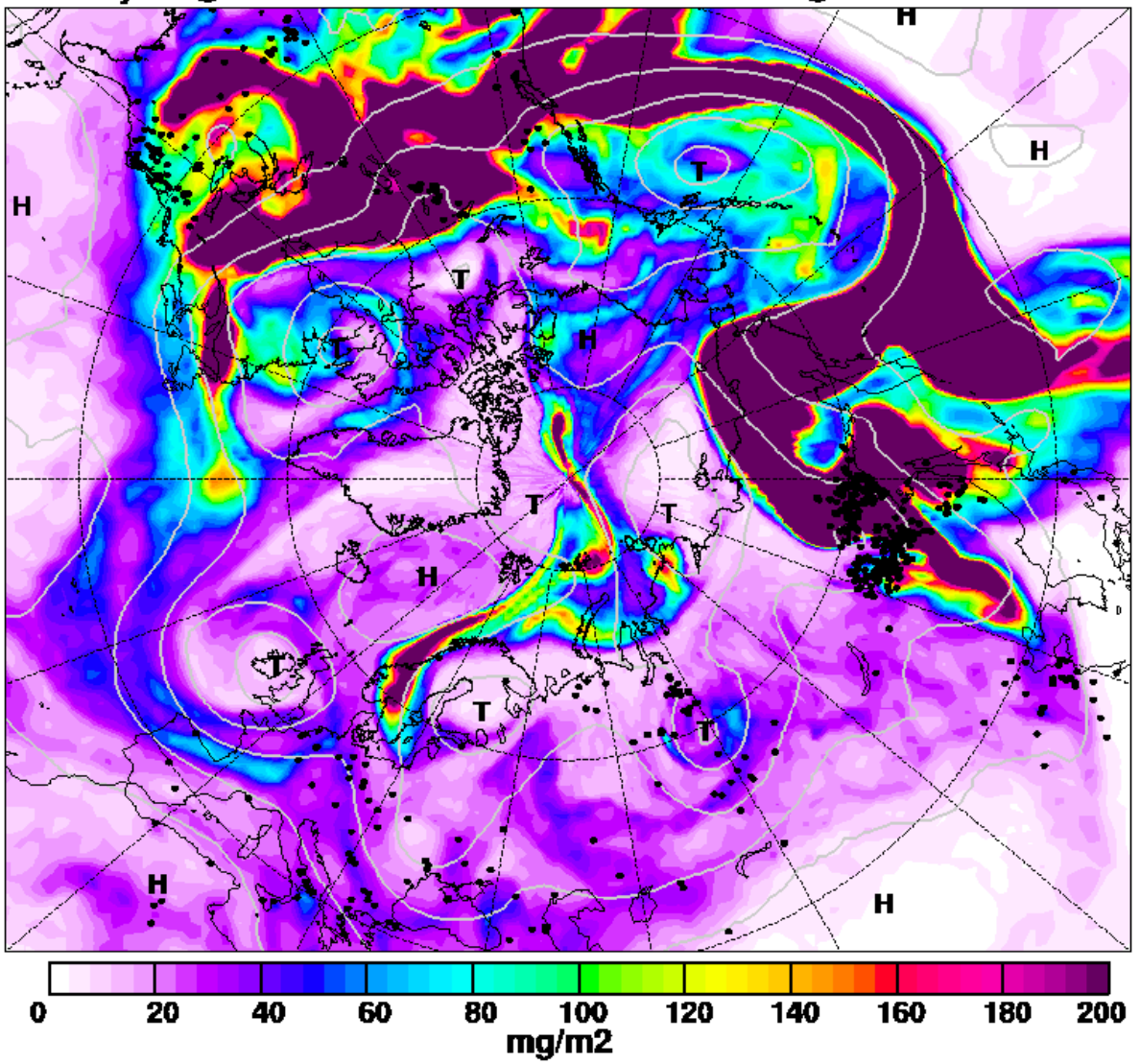
FLEXPART Forecasts – 3 July 2008



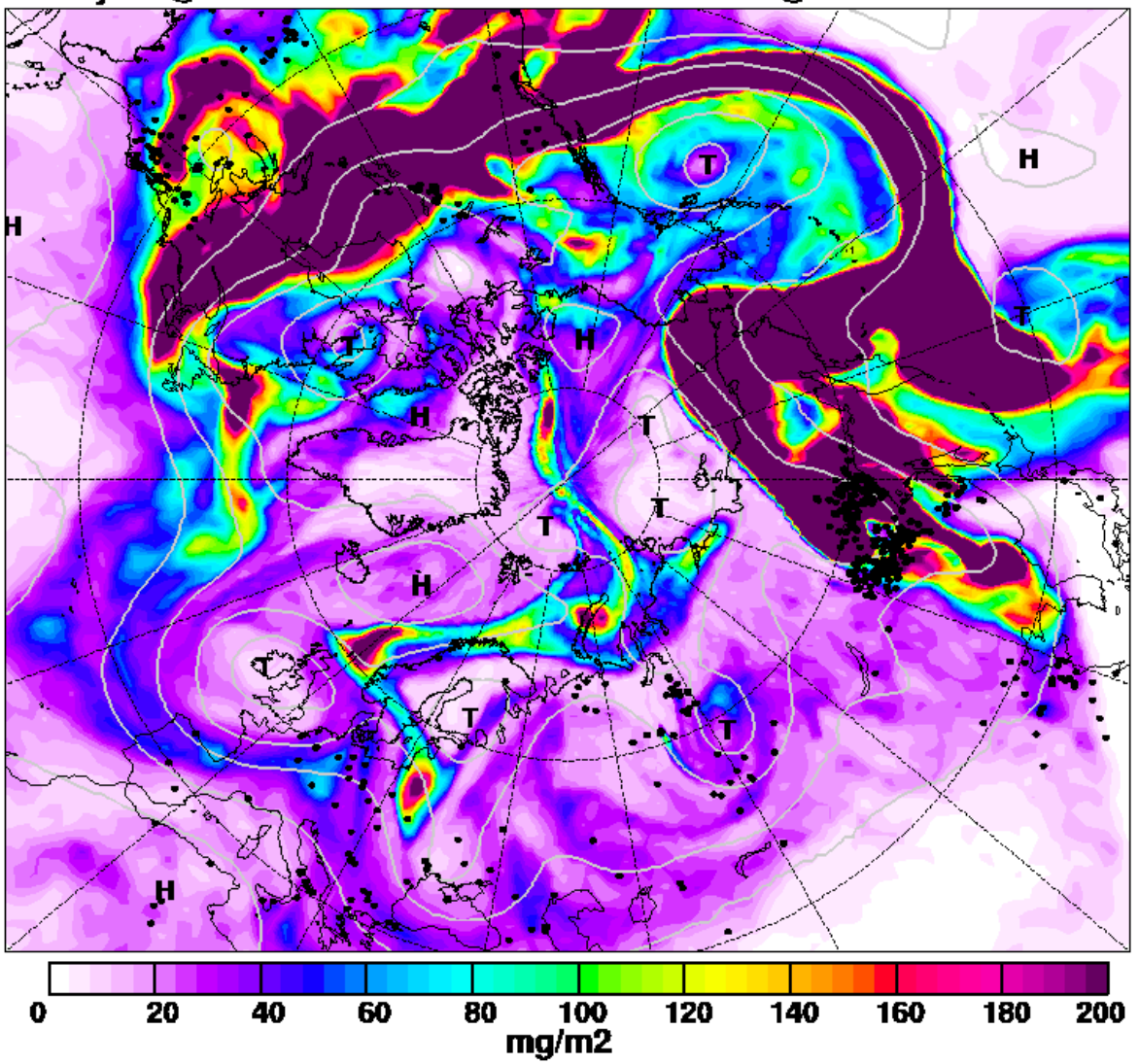
FLEXPART Forecasts – 3 July 2008



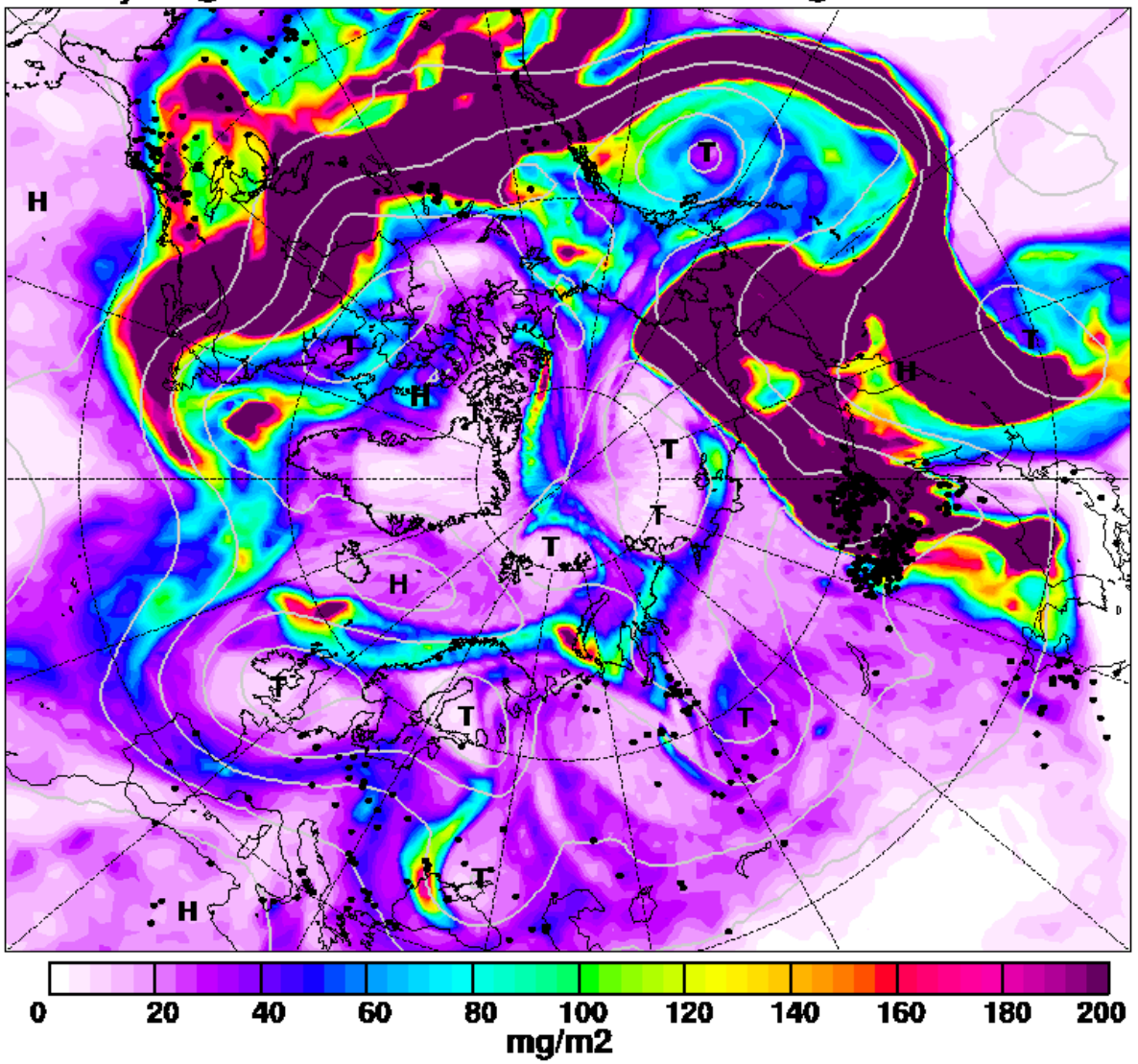
FLEXPART Forecasts – 3 July 2008



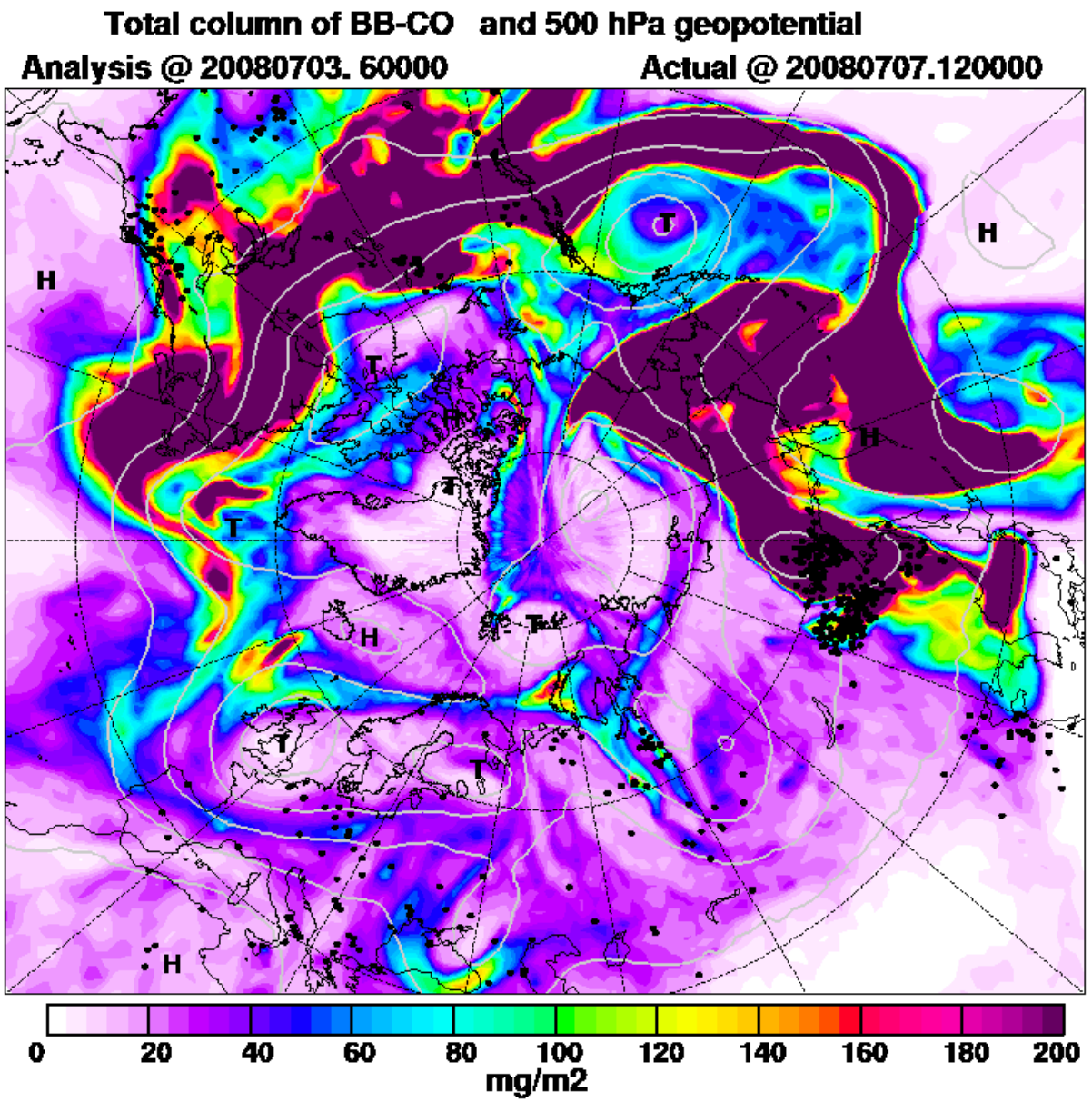
FLEXPART Forecasts – 3 July 2008



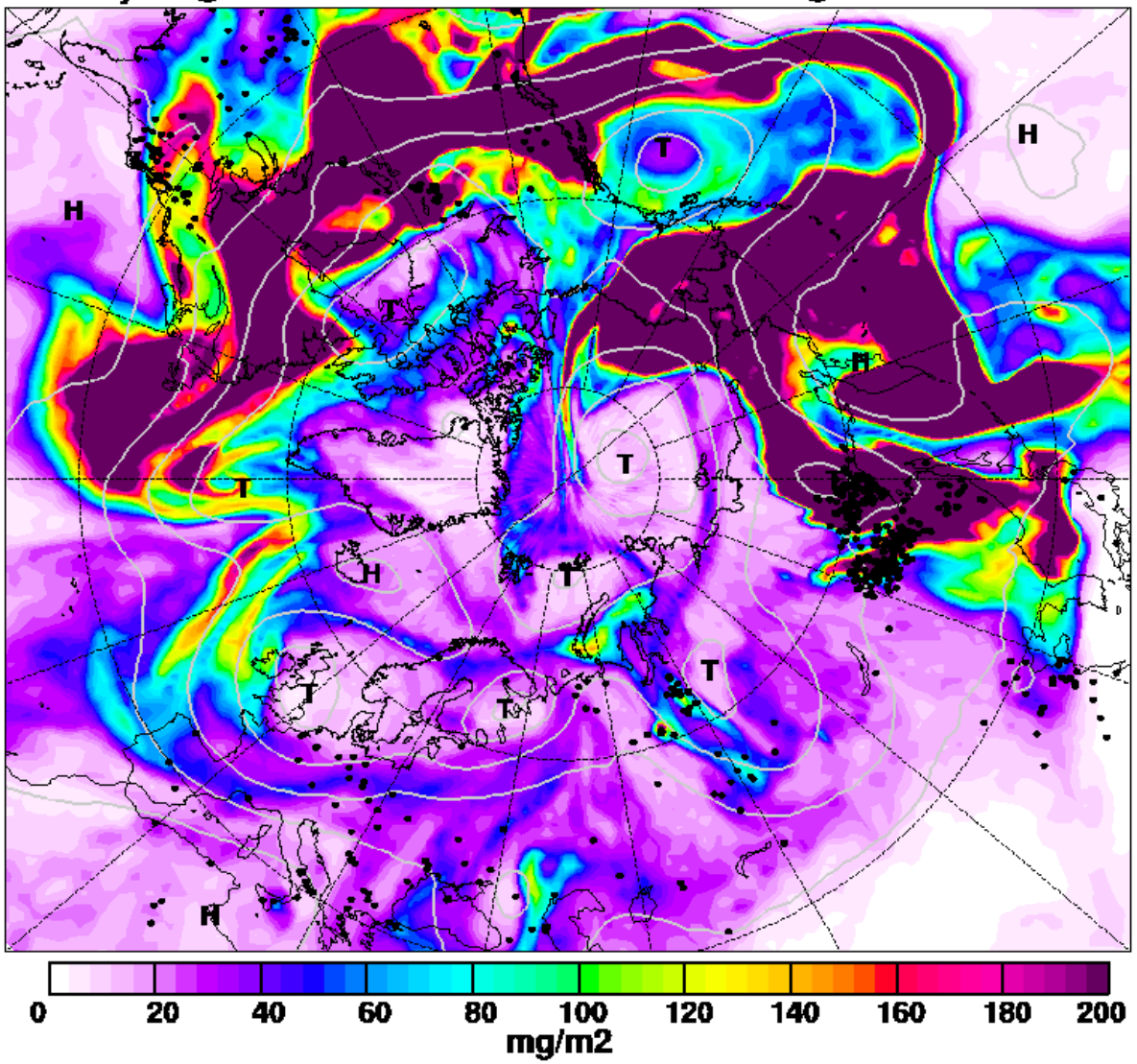
FLEXPART Forecasts – 3 July 2008



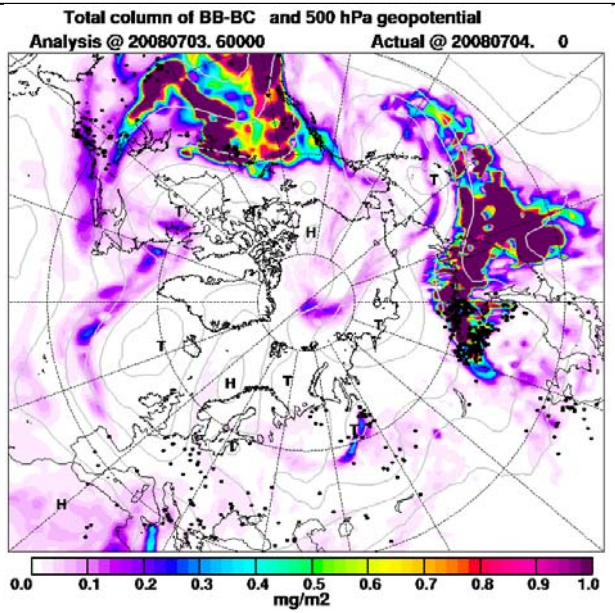
FLEXPART Forecasts – 3 July 2008

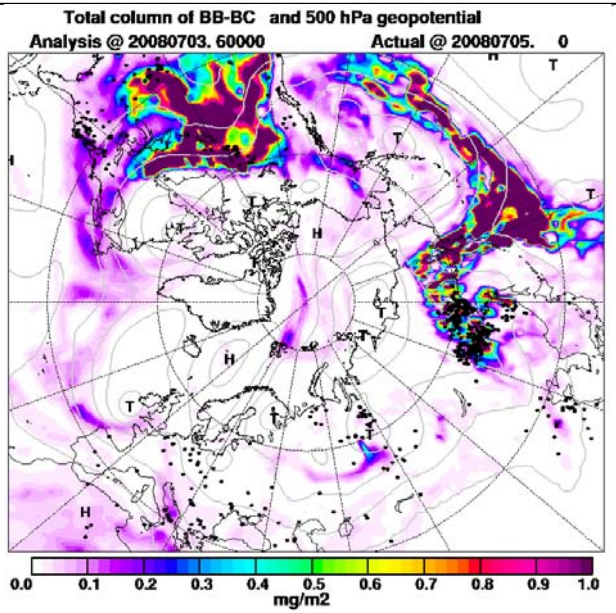


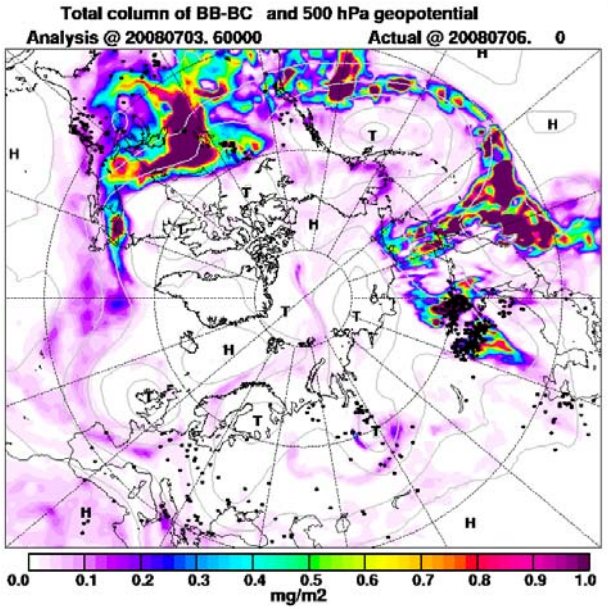
FLEXPART Forecasts – 3 July 2008

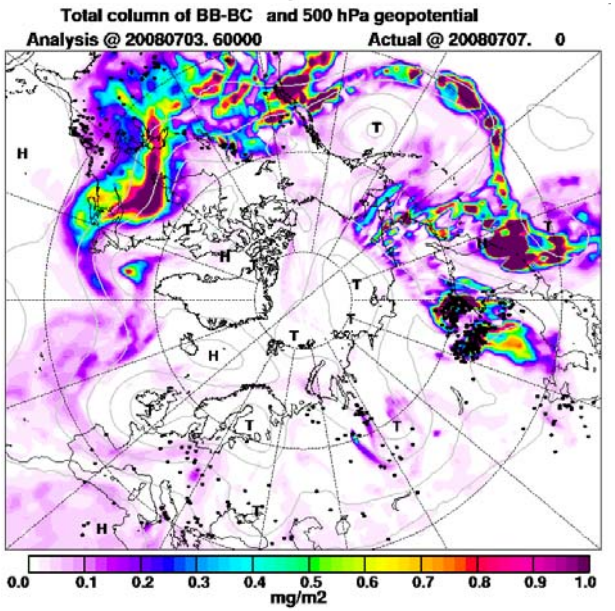


FLEXPART Forecasts – 3 July 2008









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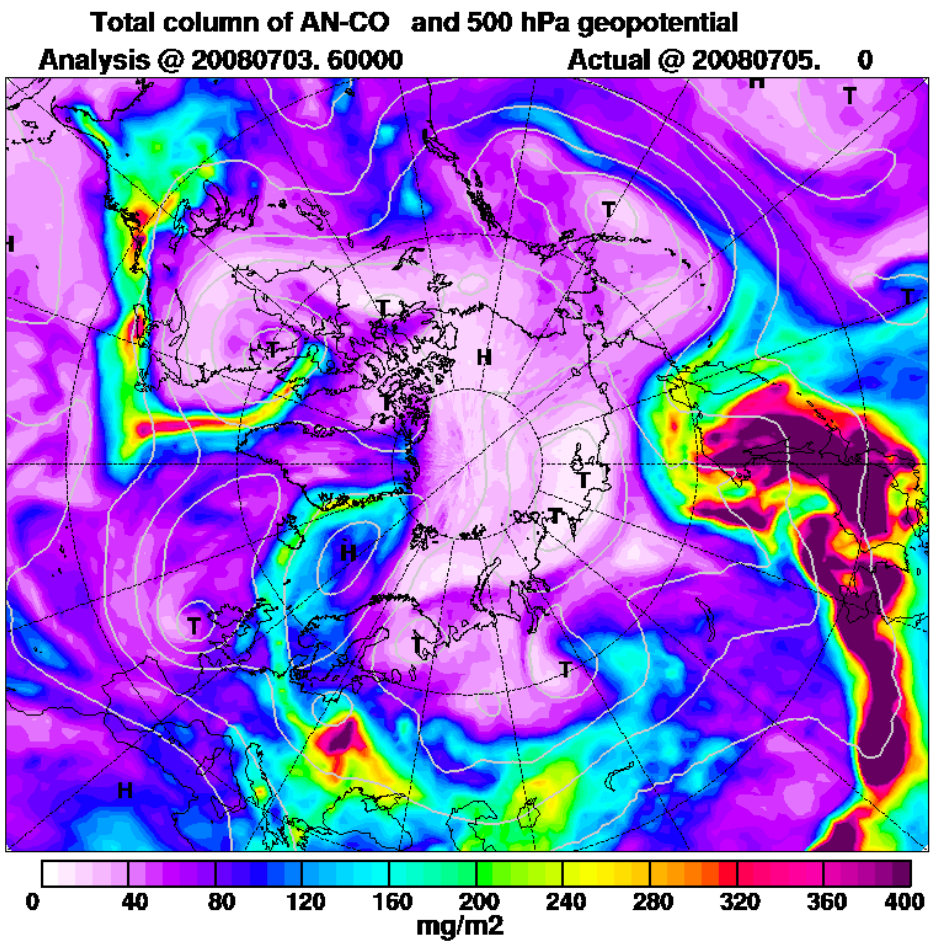
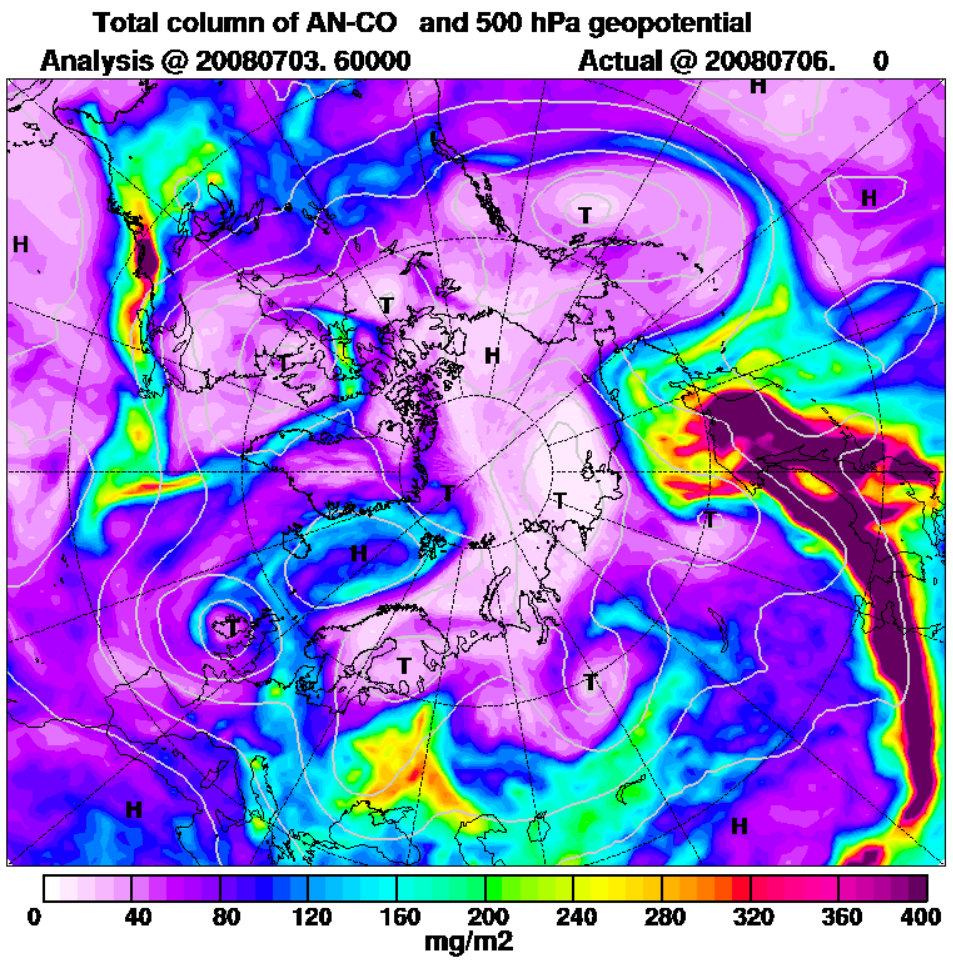
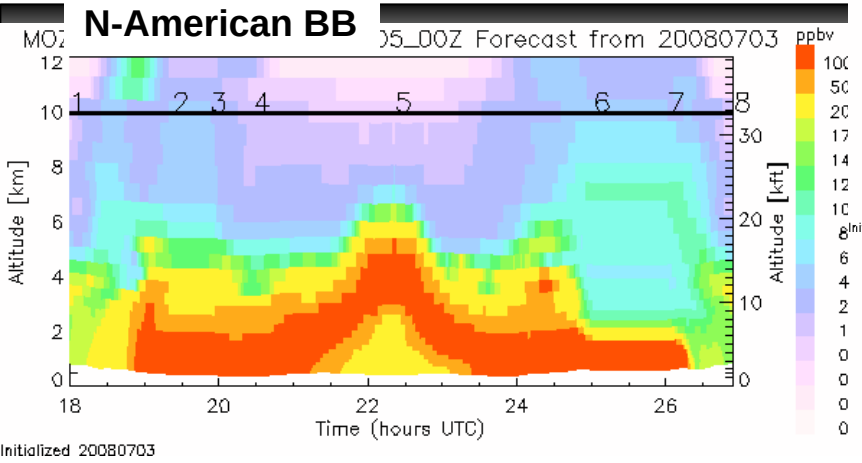
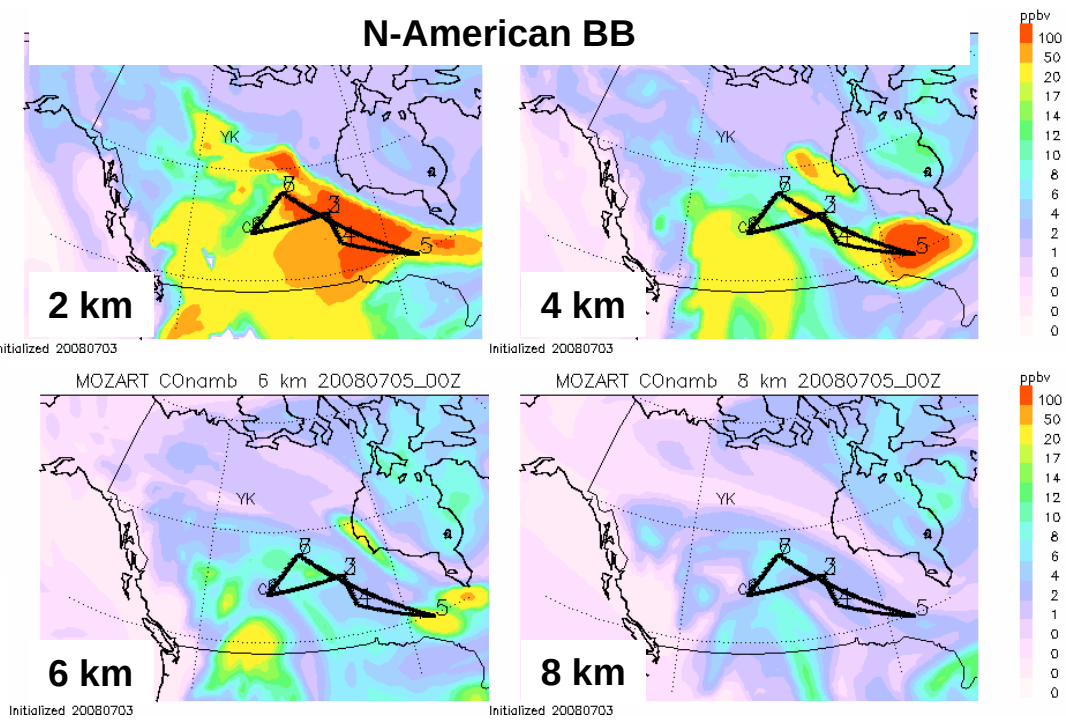




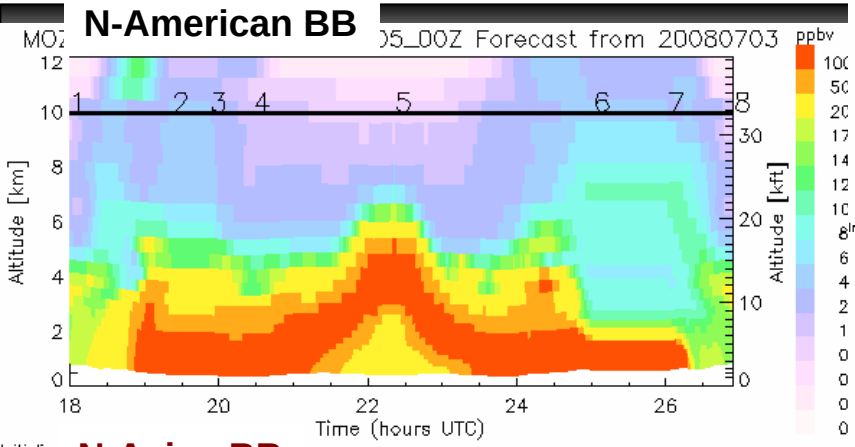
Flight July 4 – *NCAR/MOZART*



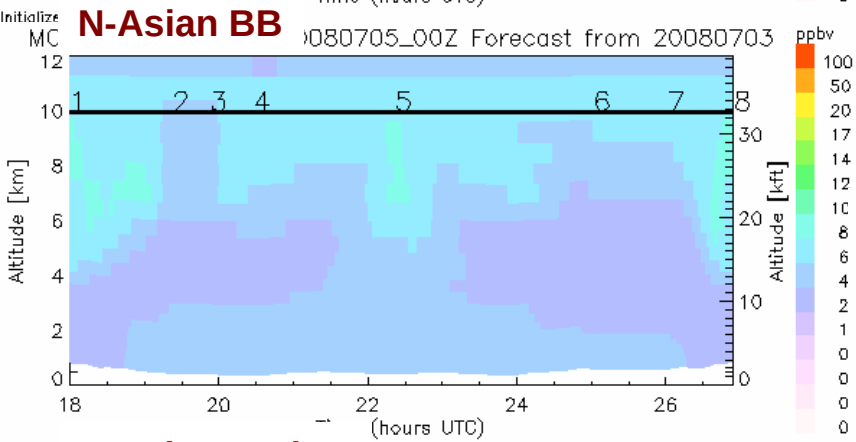


Flight July 4 – *NCAR/MOZART*

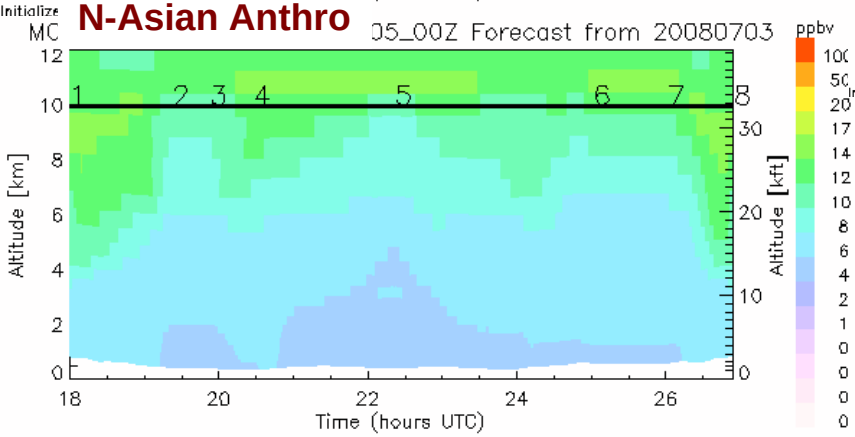
N-American BB



N-Asian BB



N-Asian Anthro



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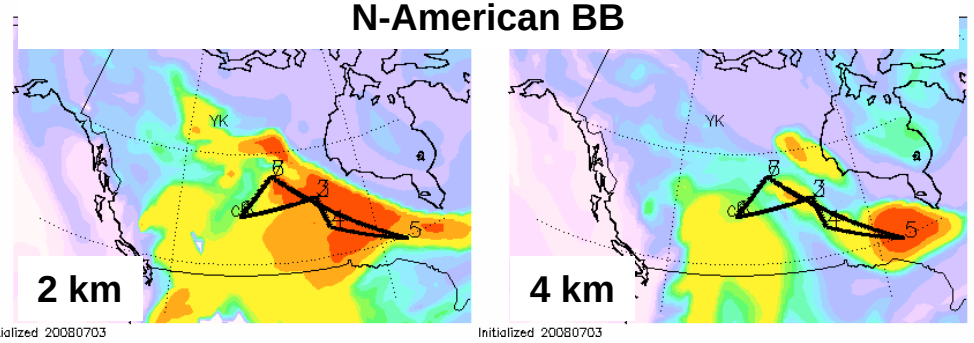
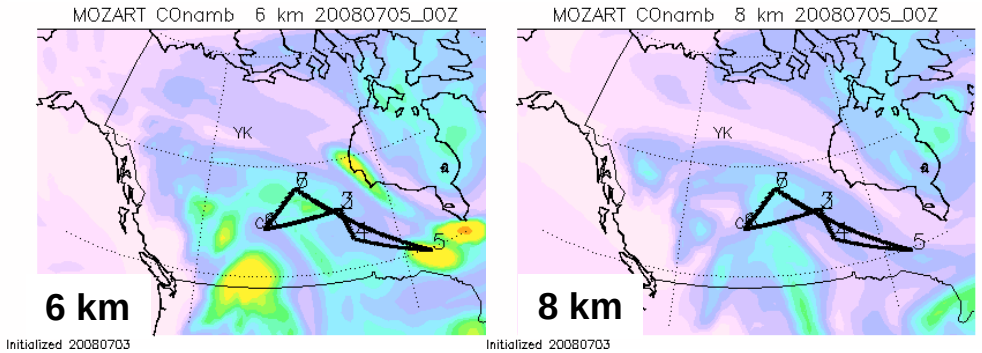
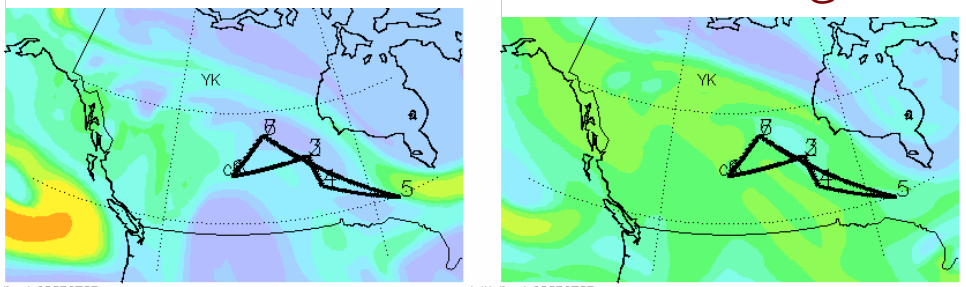


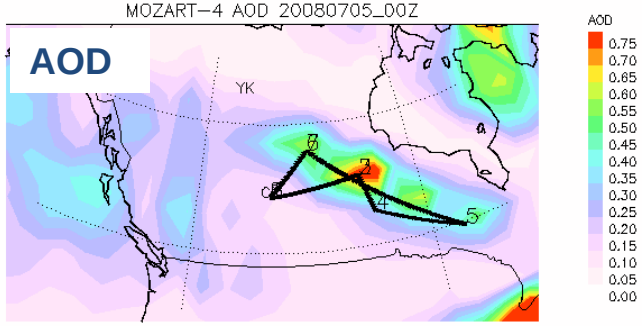


N-Asian BB @ 8 km

N-Asian Anthro @ 10 km

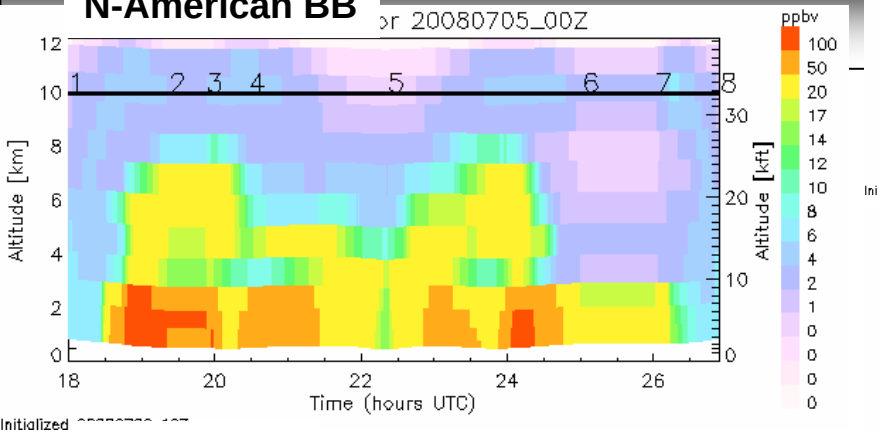


AOD

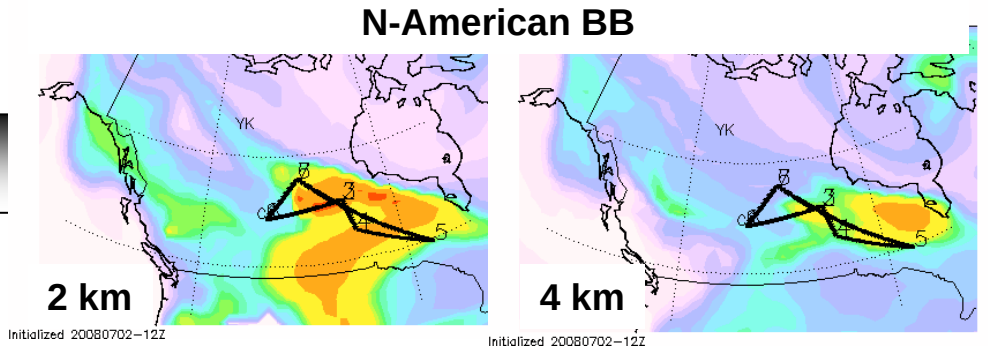


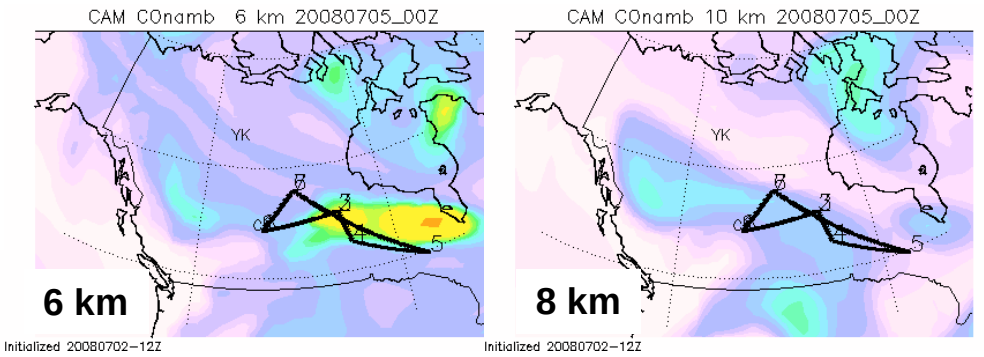
Flight July 4 – *NCAR/CAM-Chem*

N-American BB

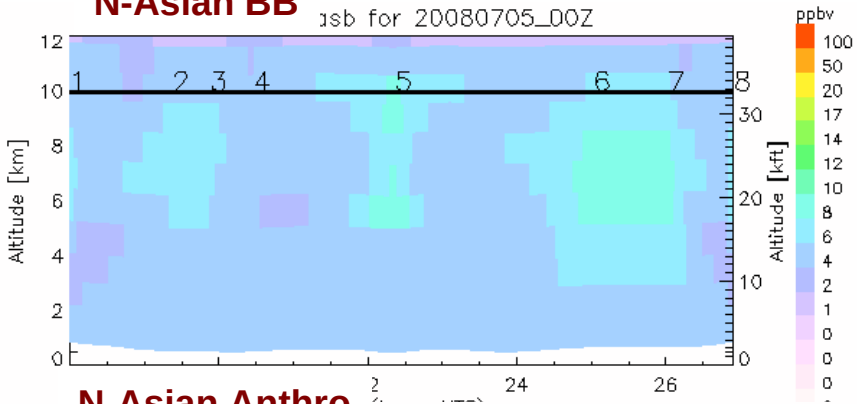


N-American BB

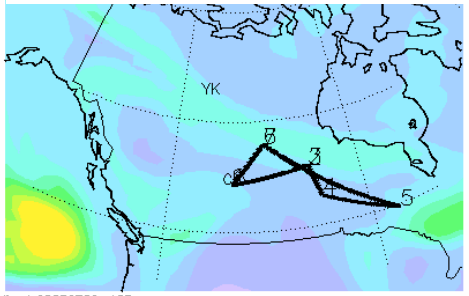




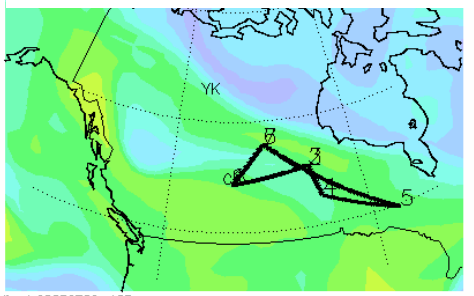
N-Asian BB



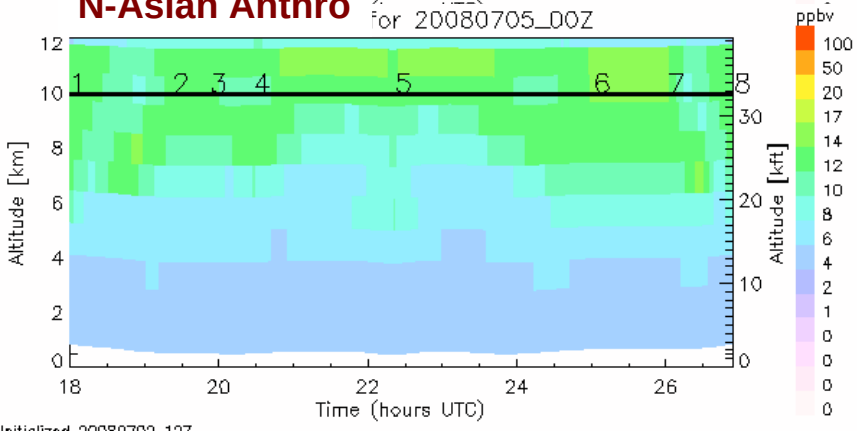
N-Asian BB @ 8 km



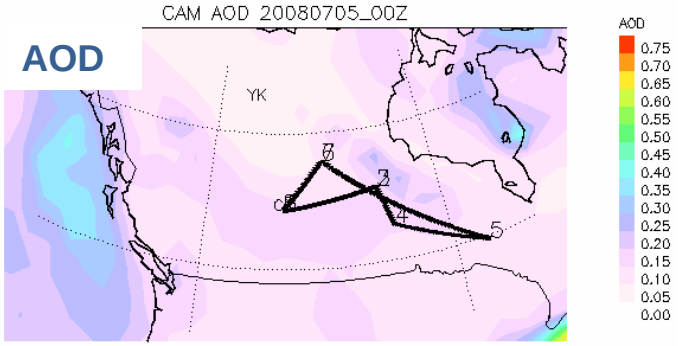
N-Asian Anthro @ 10 km



N-Asian Anthro

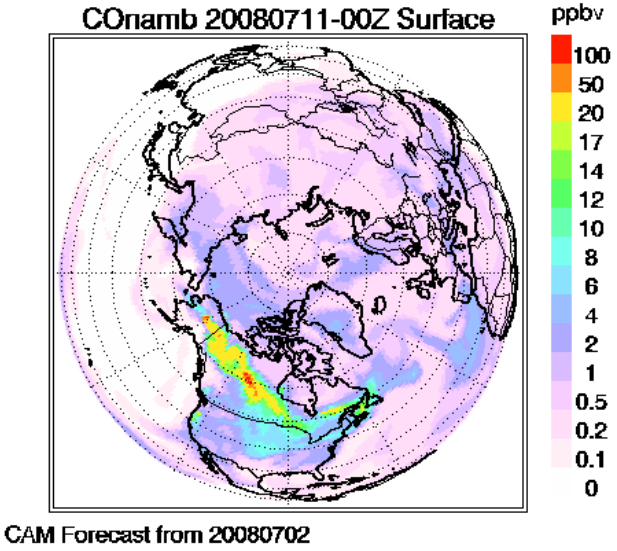


AOD

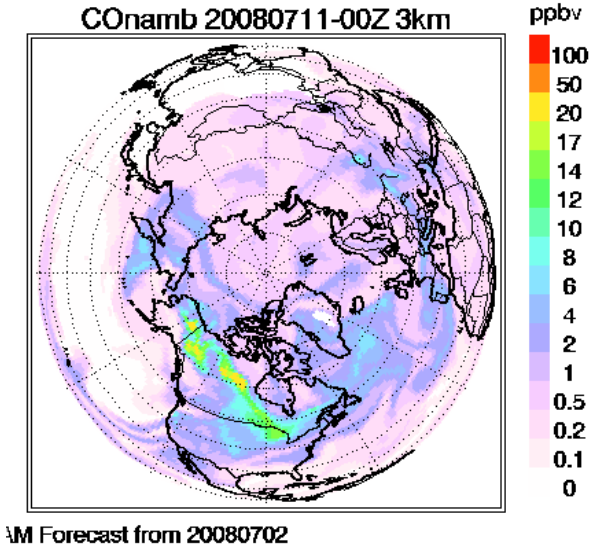


Transport of North American Fires *(NCAR/CAM-Chem)*

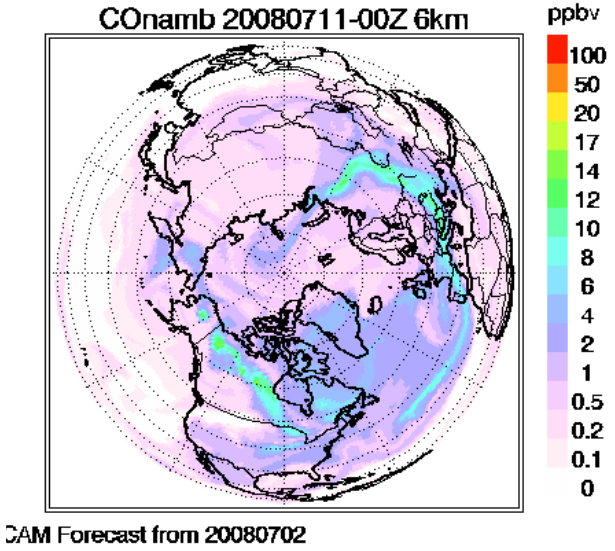
Surface



3 km



6 km

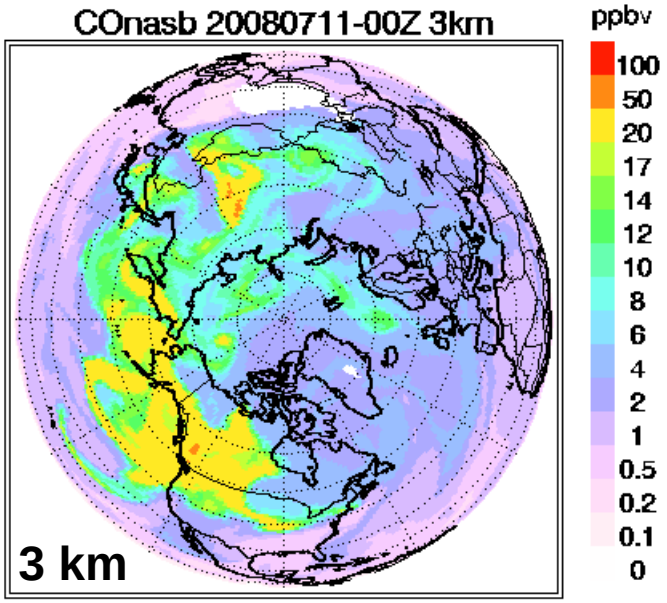


July 10

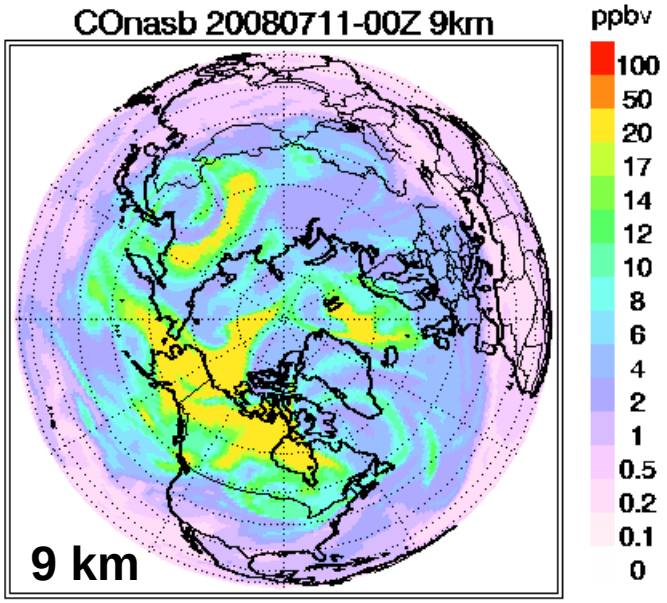
NCAR/CAM-Chem for Jul 3-7 Siberian Plumes

July 10

Fires

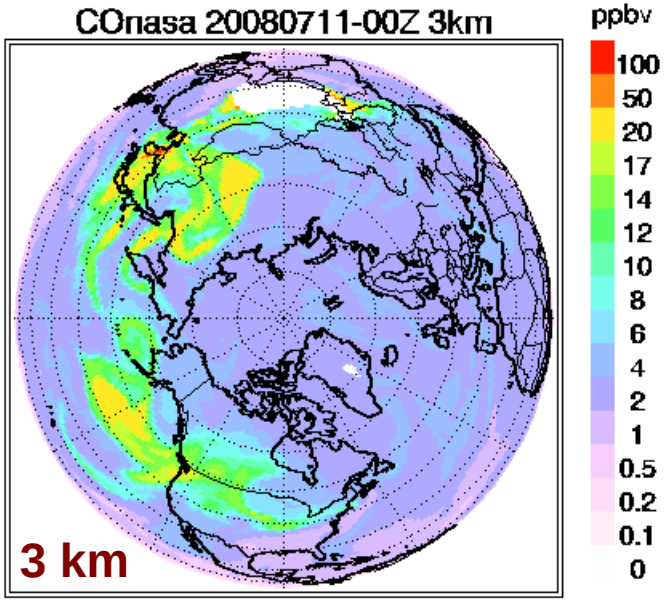


CAM Forecast from 20080701

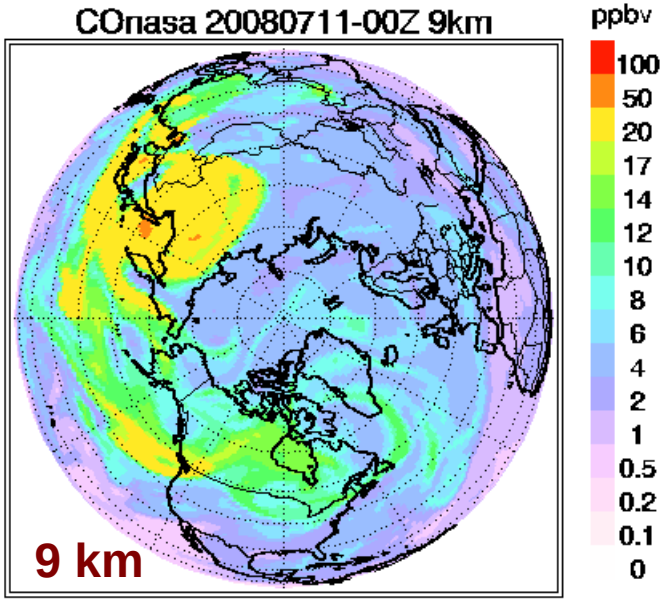


CAM Forecast from 20080701

Anthro



CAM Forecast from 20080701

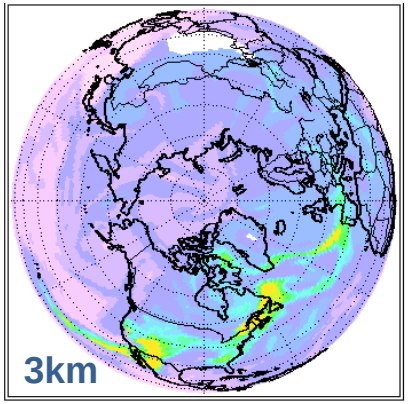


CAM Forecast from 20080701

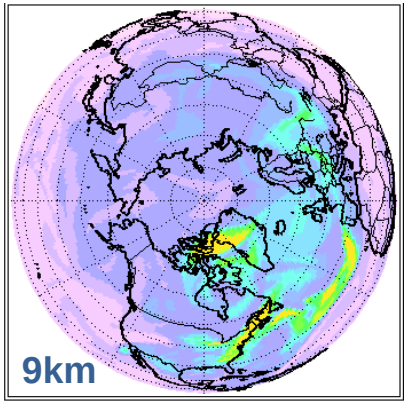
North-American and European Anthropogenic *(NCAR/Cam-Chem)*

7 July

N-American Anthro

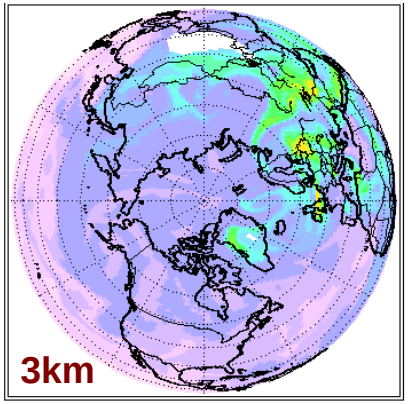


CAM Forecast from 20080702

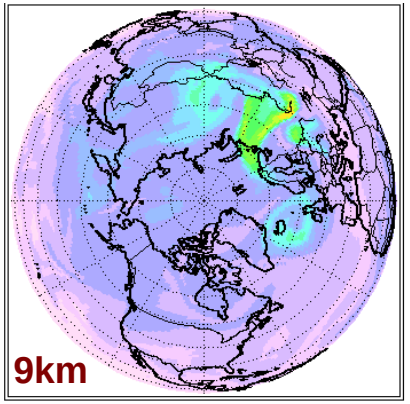


CAM Forecast from 20080702

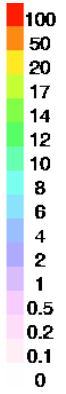
Europe Anthro



CAM Forecast from 20080702

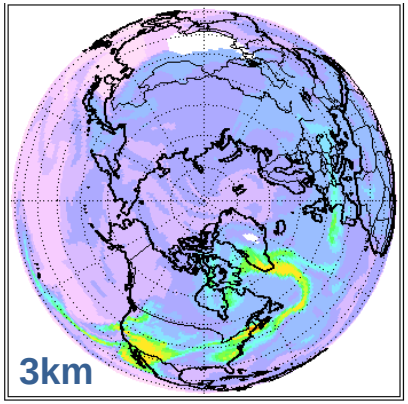


CAM Forecast from 20080702

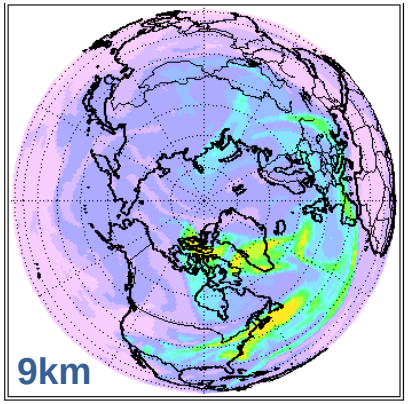


9 July

N-American Anthro

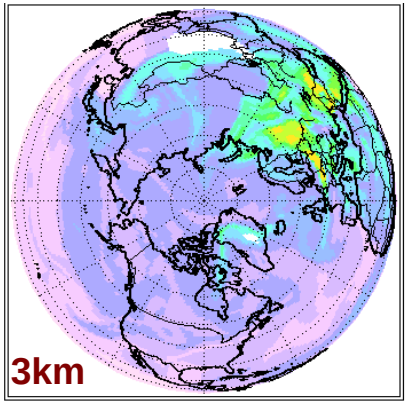


CAM Forecast from 20080702

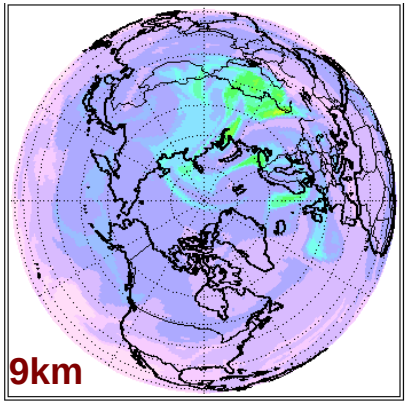
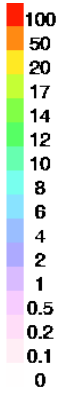


CAM Forecast from 20080702

Europe Anthro



CAM Forecast from 20080702



CAM Forecast from 20080702