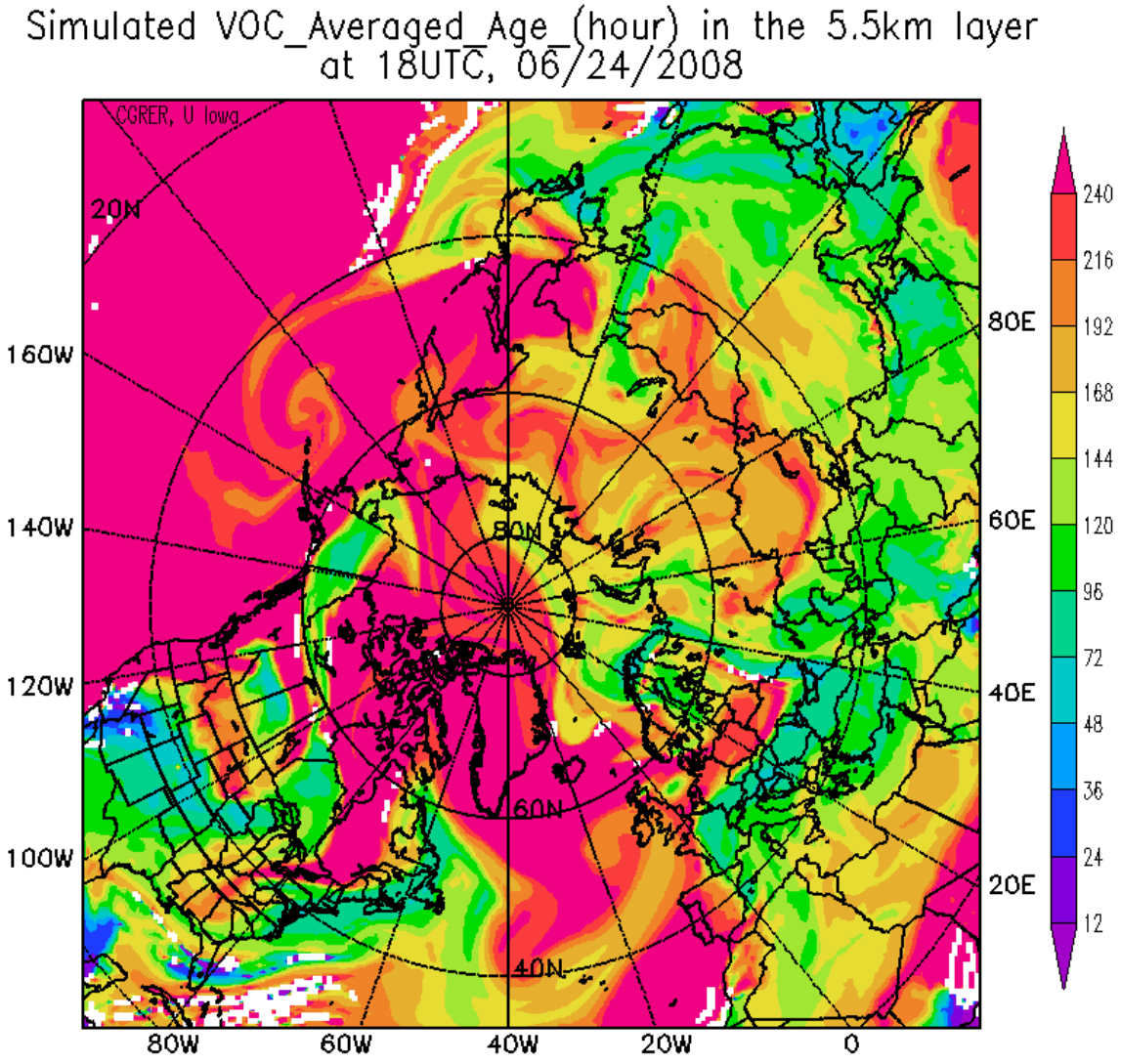
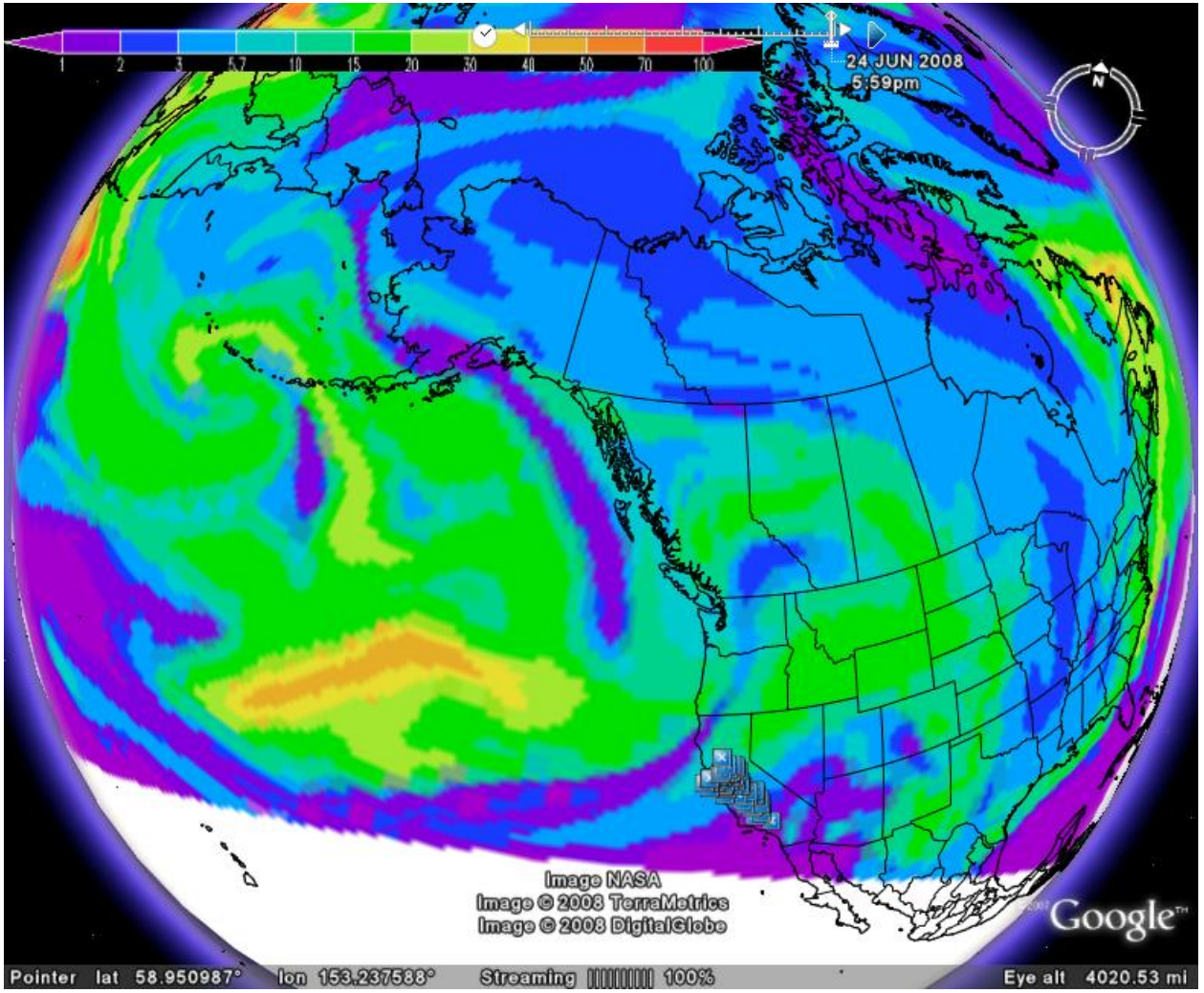
# IOWA STEM Model  forecast

06-22-2008

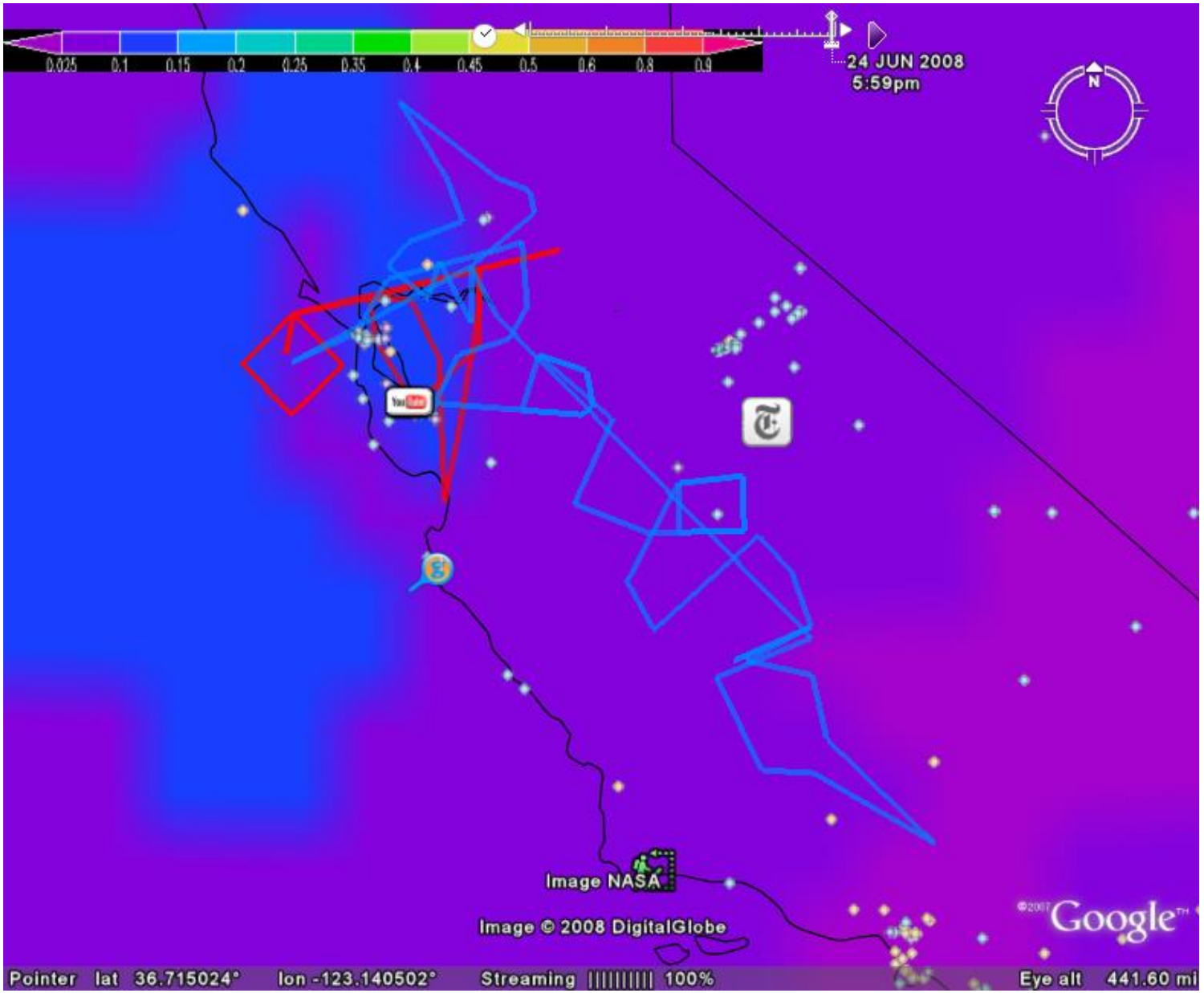
VOC age, 5.5 km, 18Z,June 24



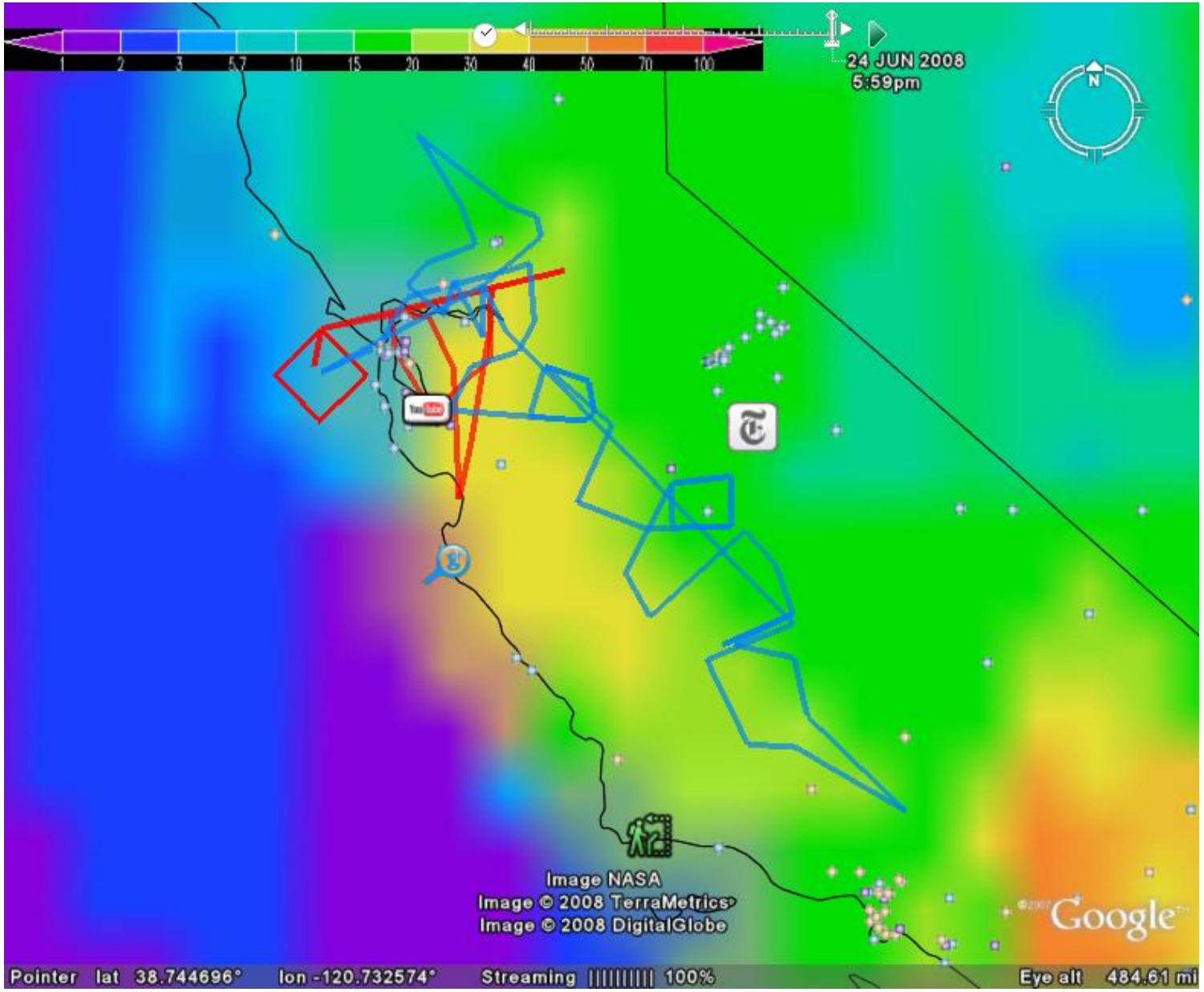
CO, 5.5 km, 18Z,June 24



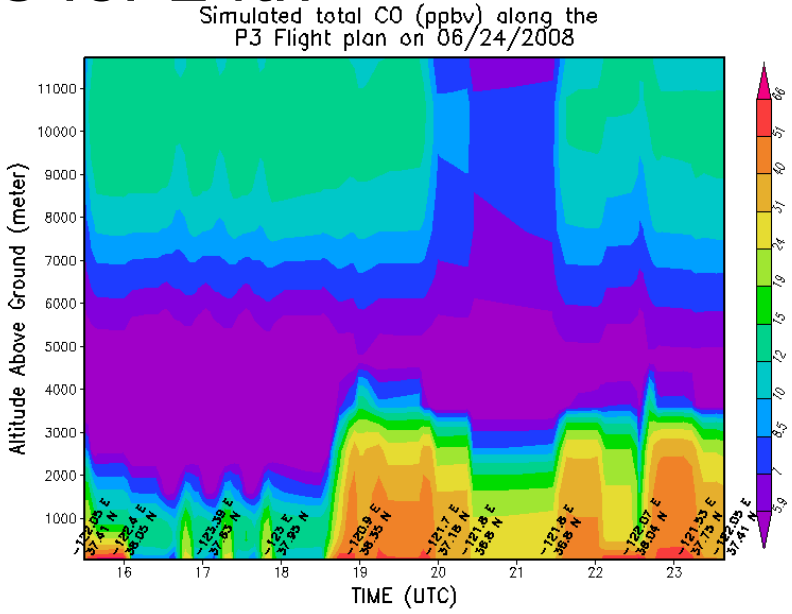
AOD, 18Z,June 24 DC8 SJV In Blue P3 in Red

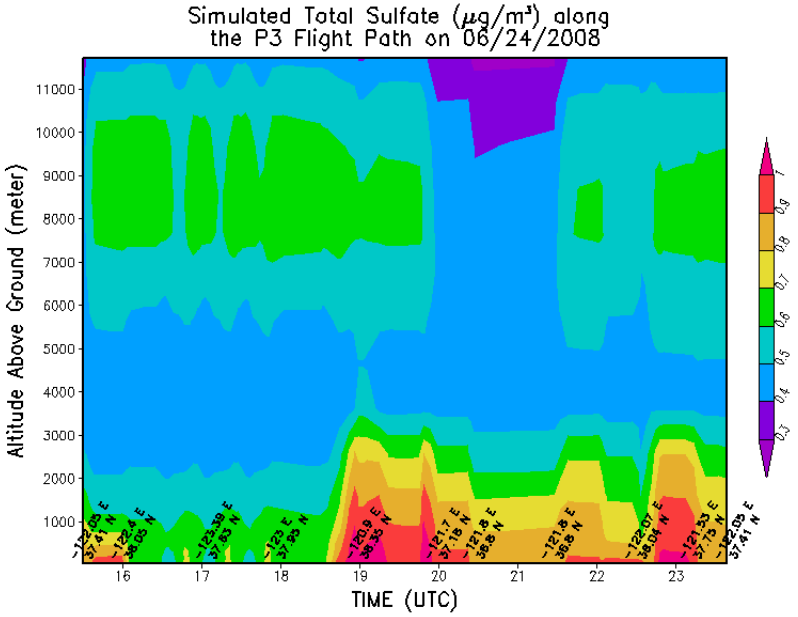


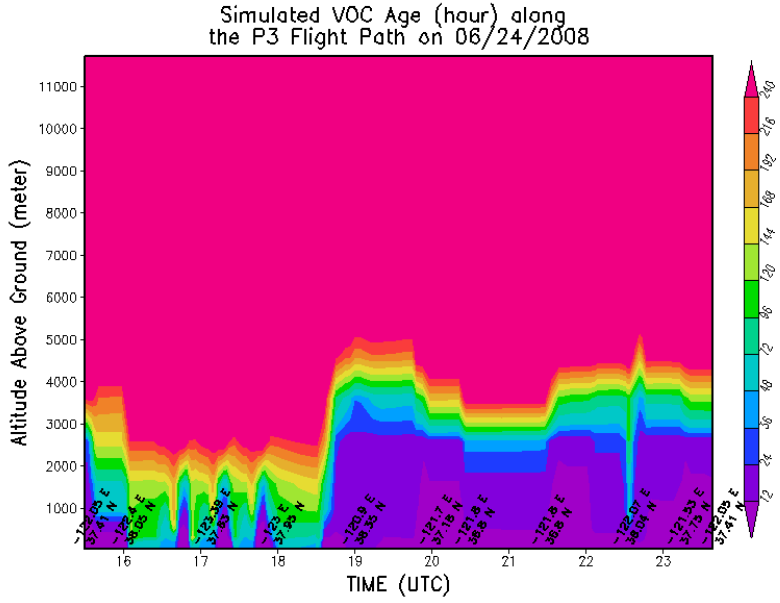
CO, 18Z, 1.5 kmJune 24 DC8 SJV In Blue P3 in Red

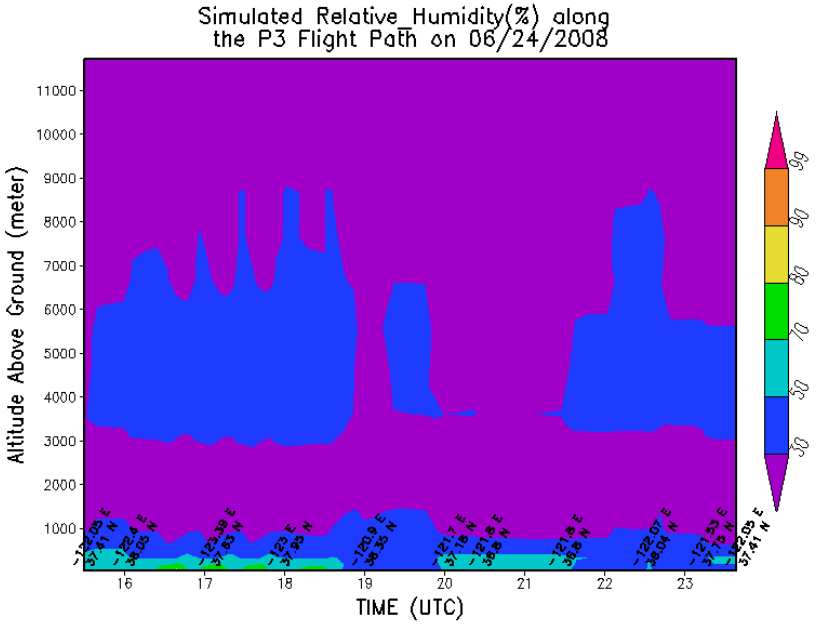


# P3 for 24th

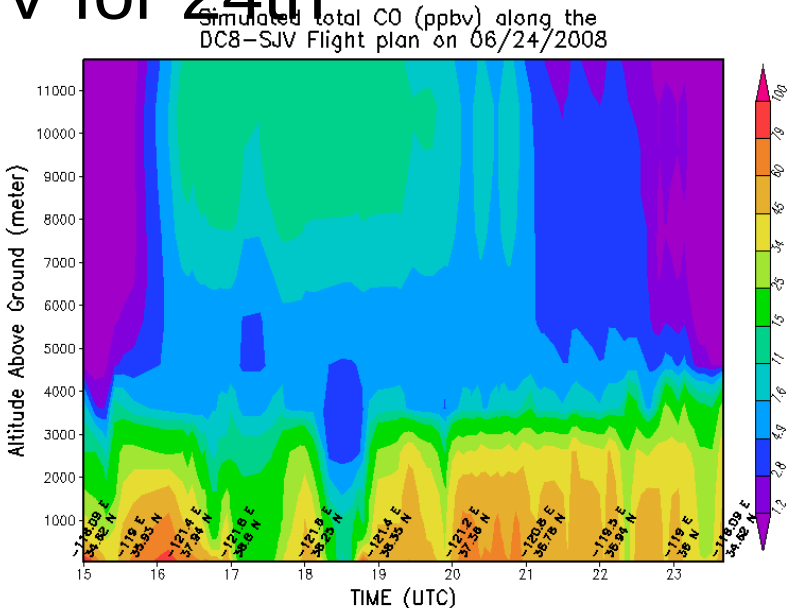

Simulated total CO (ppbv) along the
P3 Flight plan on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

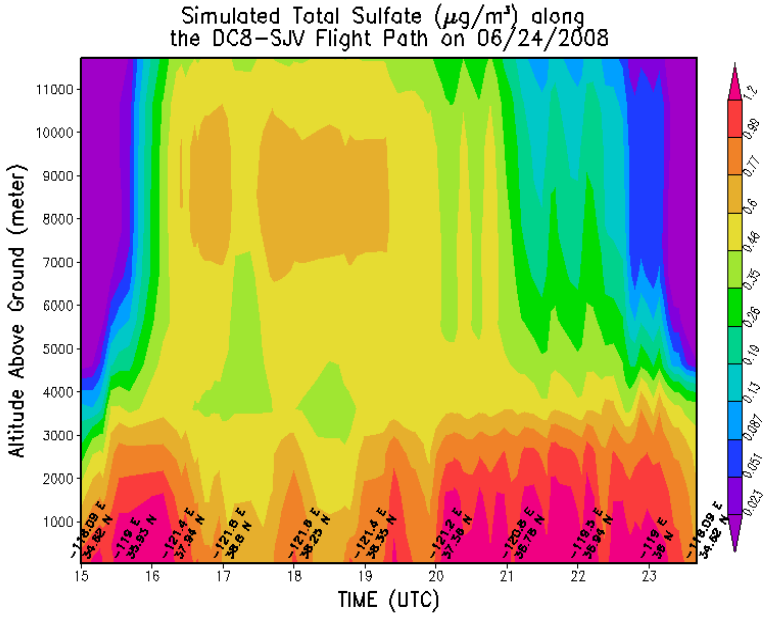

Simulated Total Sulfate (μg/m³) along
the P3 Flight Path on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

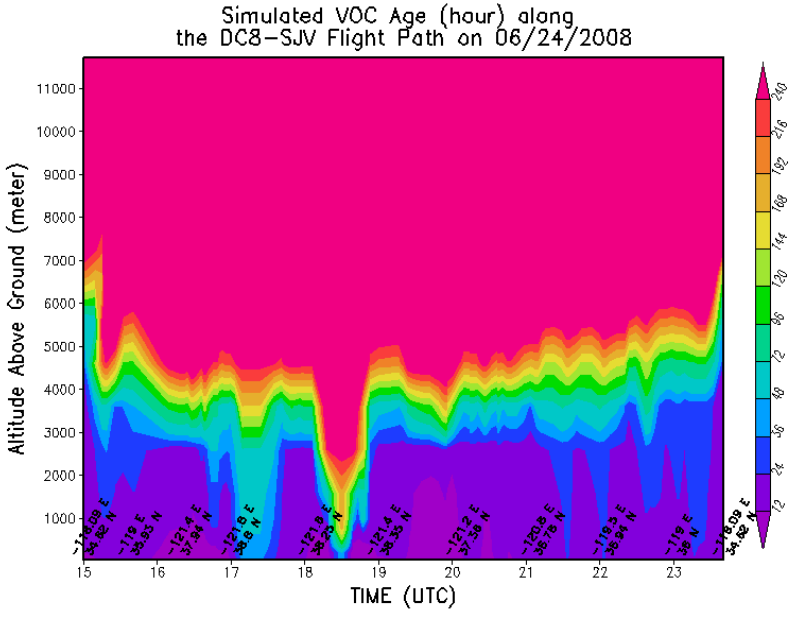

Simulated VOC Age (hour) along
the P3 Flight Path on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

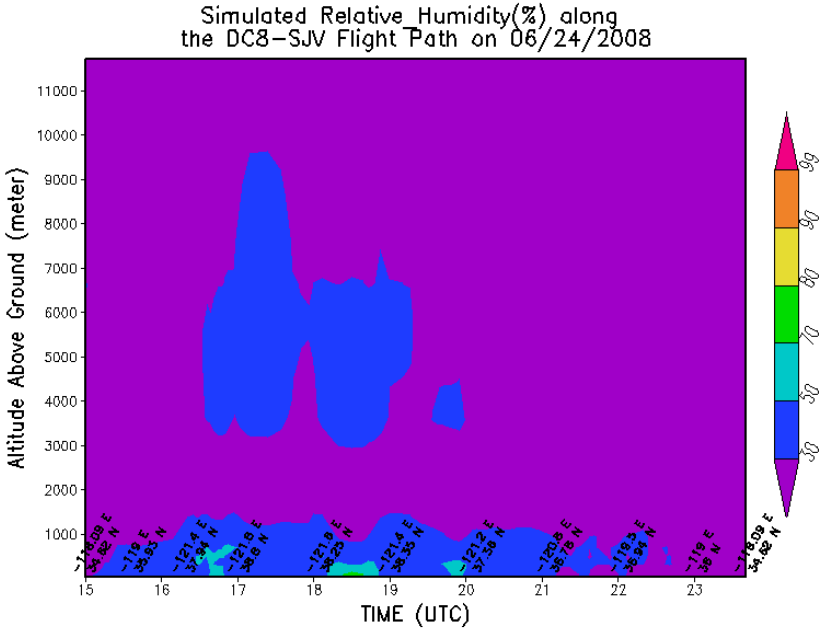

Simulated Relative Humidity(%) along
the P3 Flight Path on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

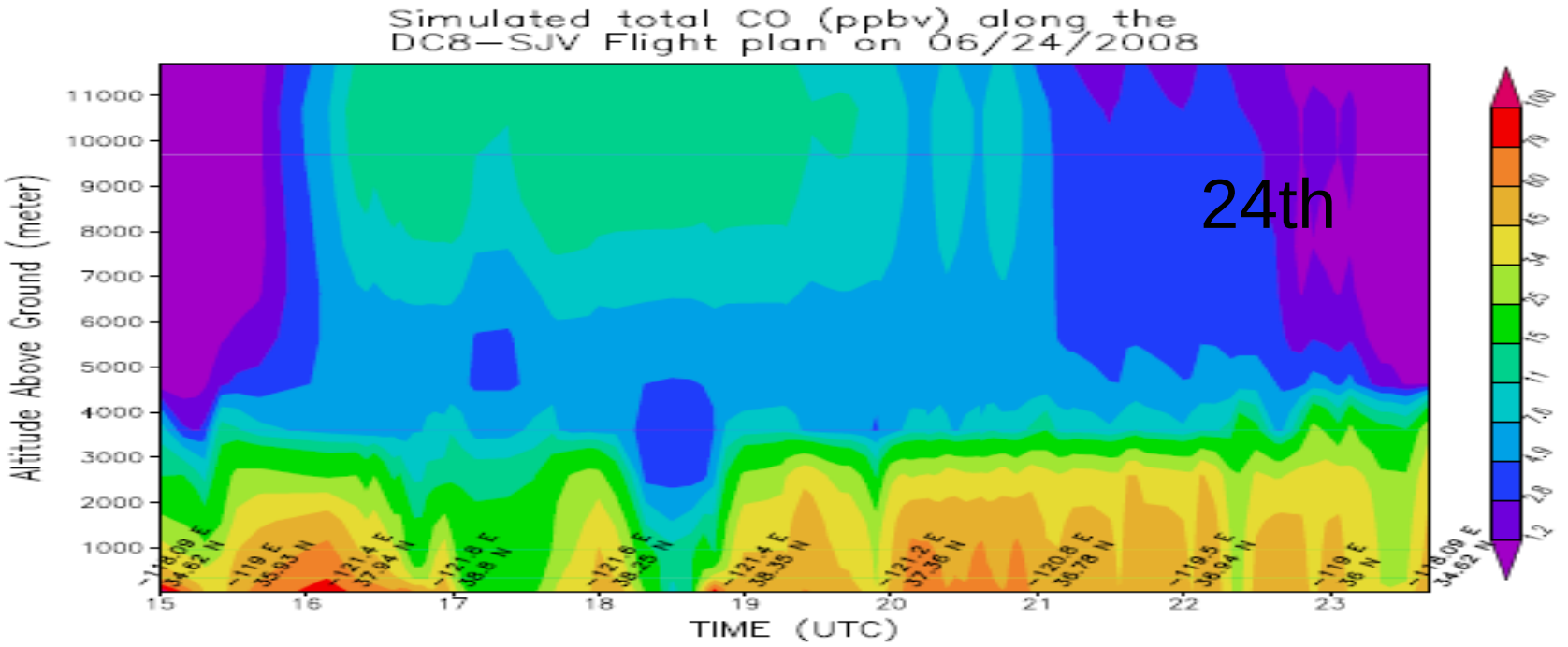
# SJV for 24th

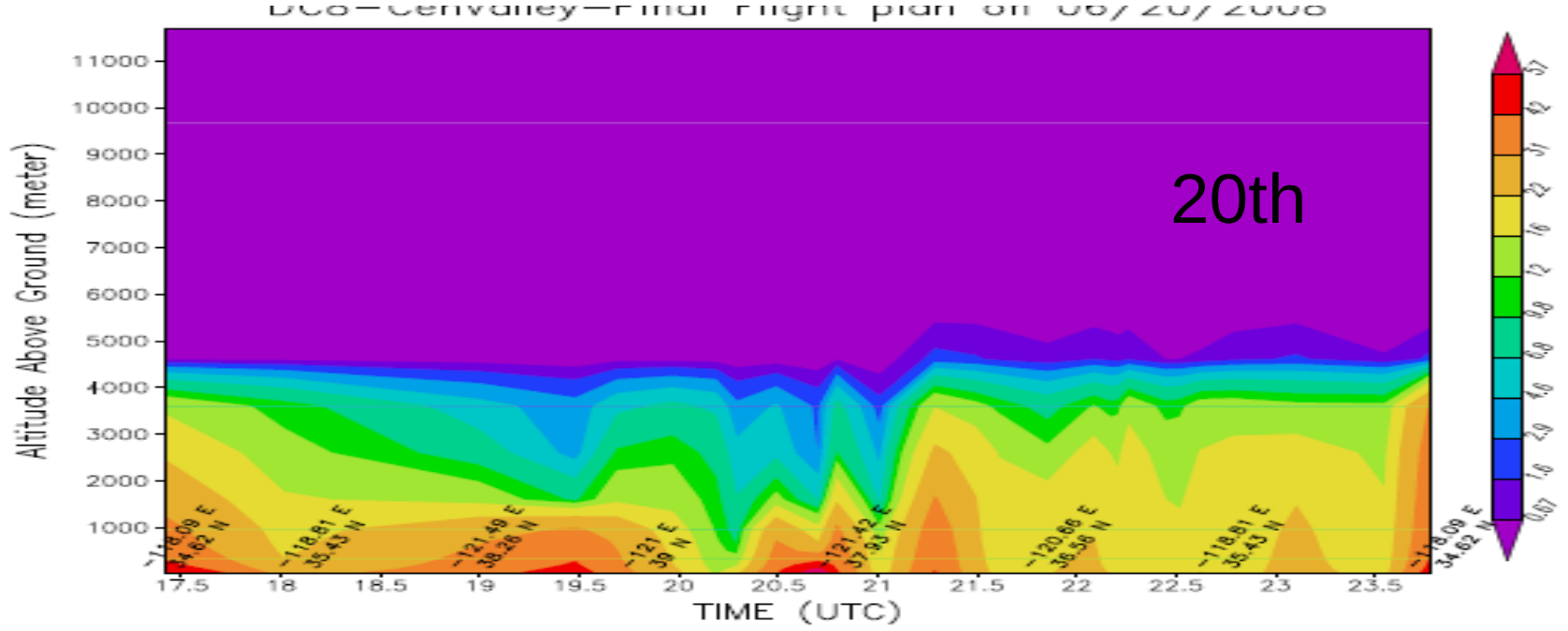

Simulated total CO (ppbv) along the
DC8-SJV Flight plan on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

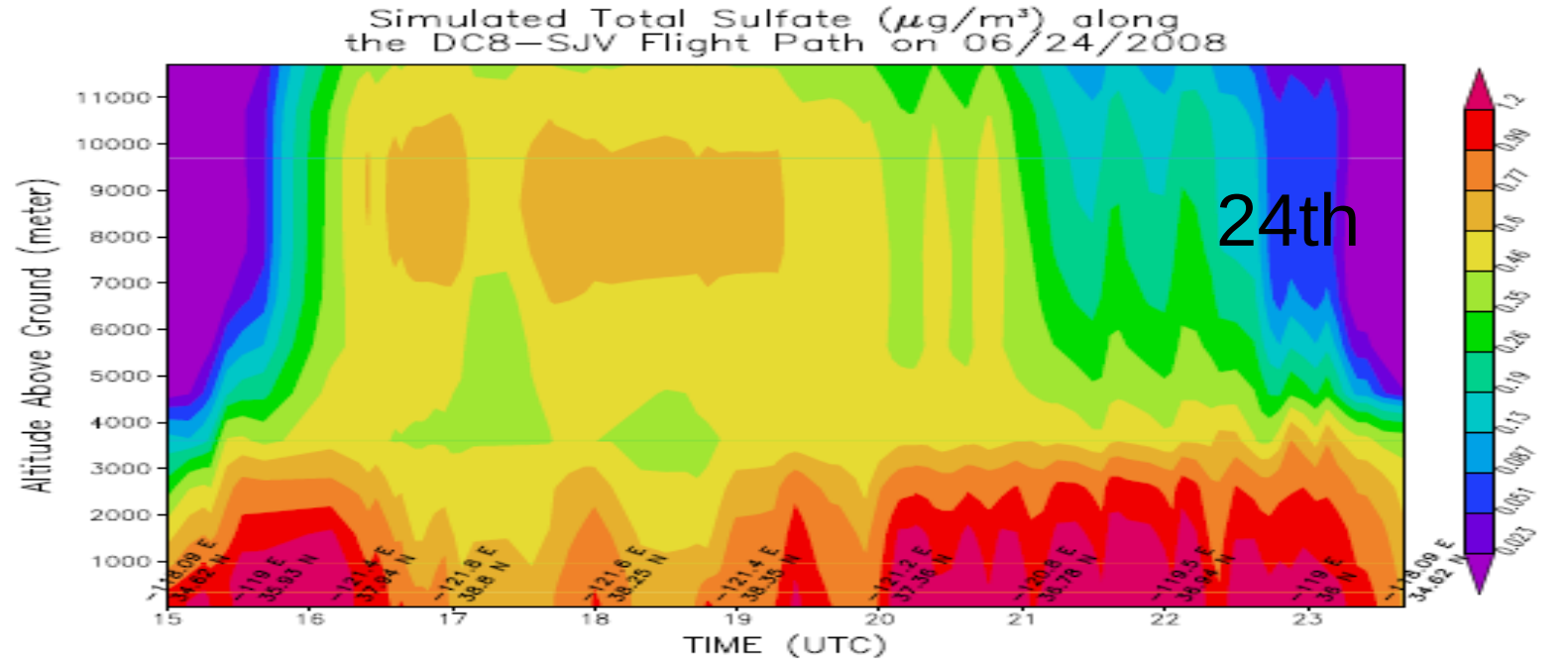

Simulated Total Sulfate (μg/m³) along
the DC8-SJV Flight Path on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

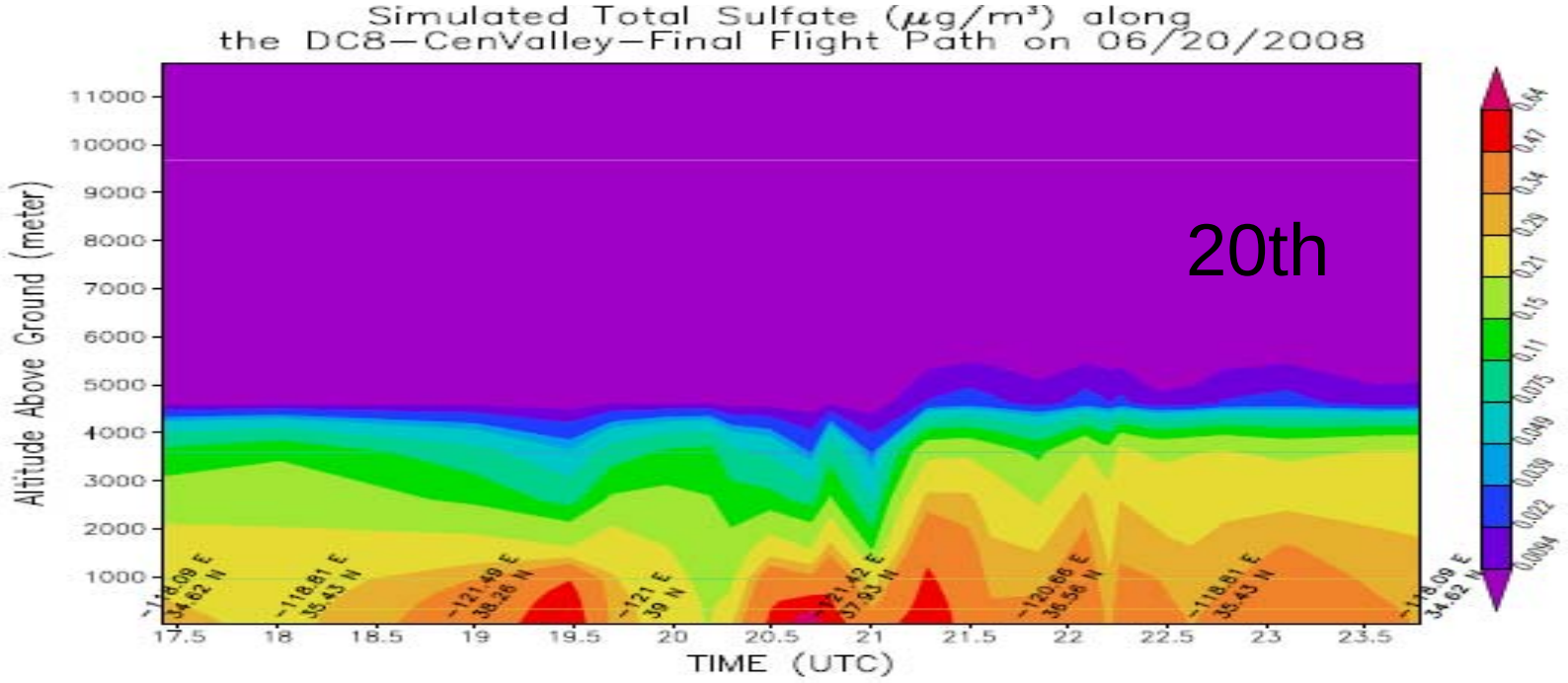

Simulated VOC Age (hour) along
the DC8-SJV Flight Path on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

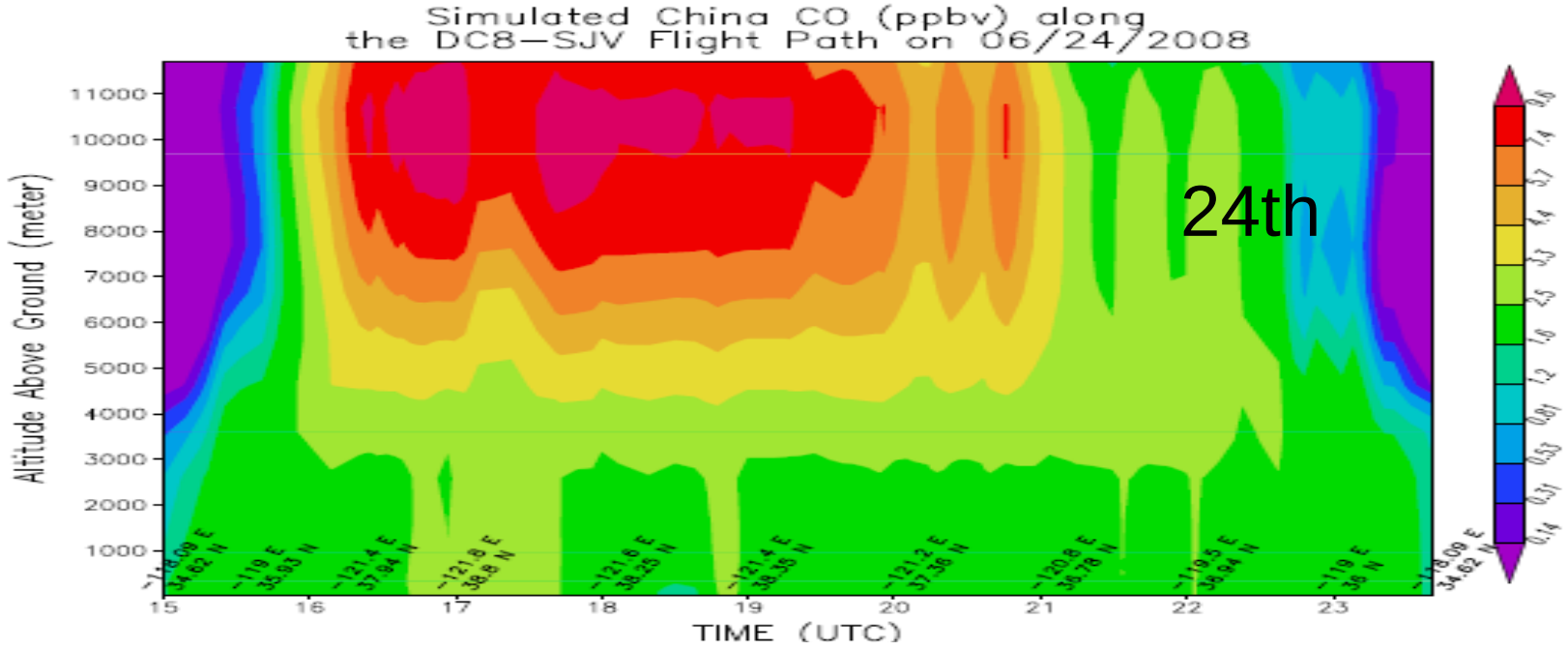

Simulated Relative Humidity(%) along
the DC8-SJV Flight Path on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)

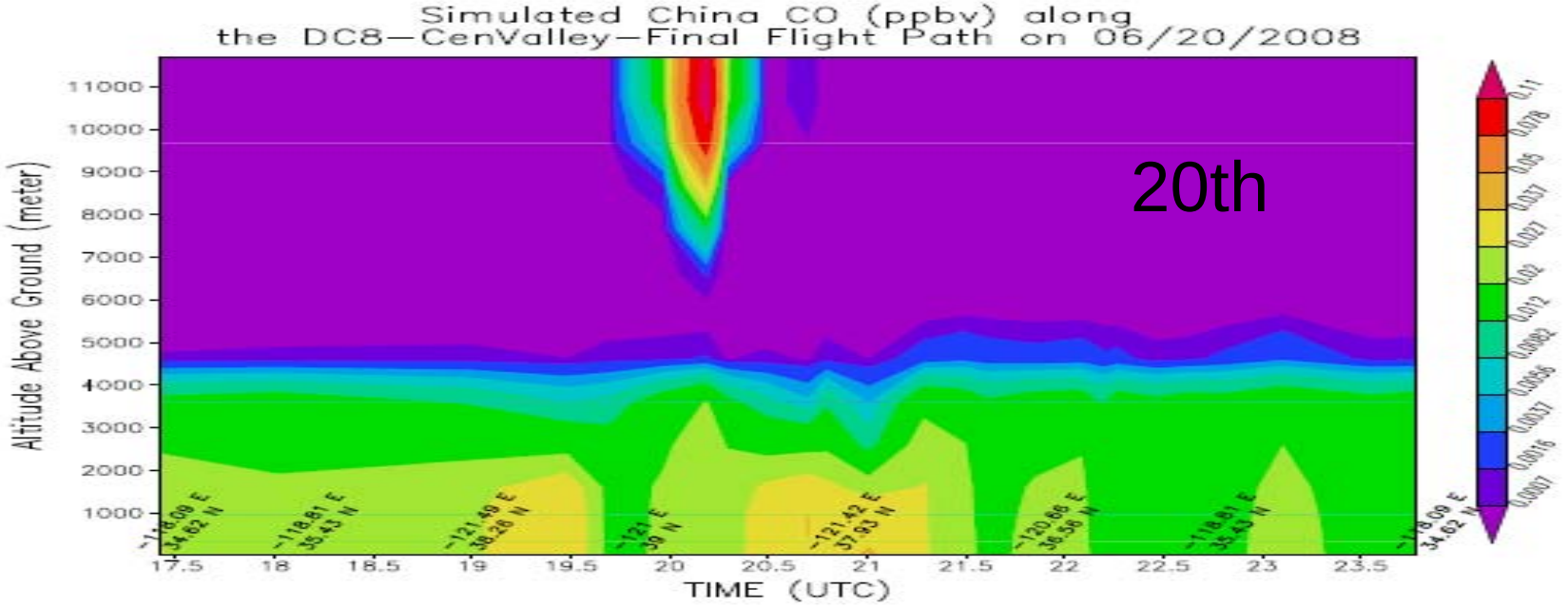

Simulated total CO (ppbv) along the
DC8—SJV Flight plan on 06/24/2008
Altitude Above Ground (meter)
TIME (UTC)
24th


Altitude Above Ground (meter)
TIME (UTC)
20th

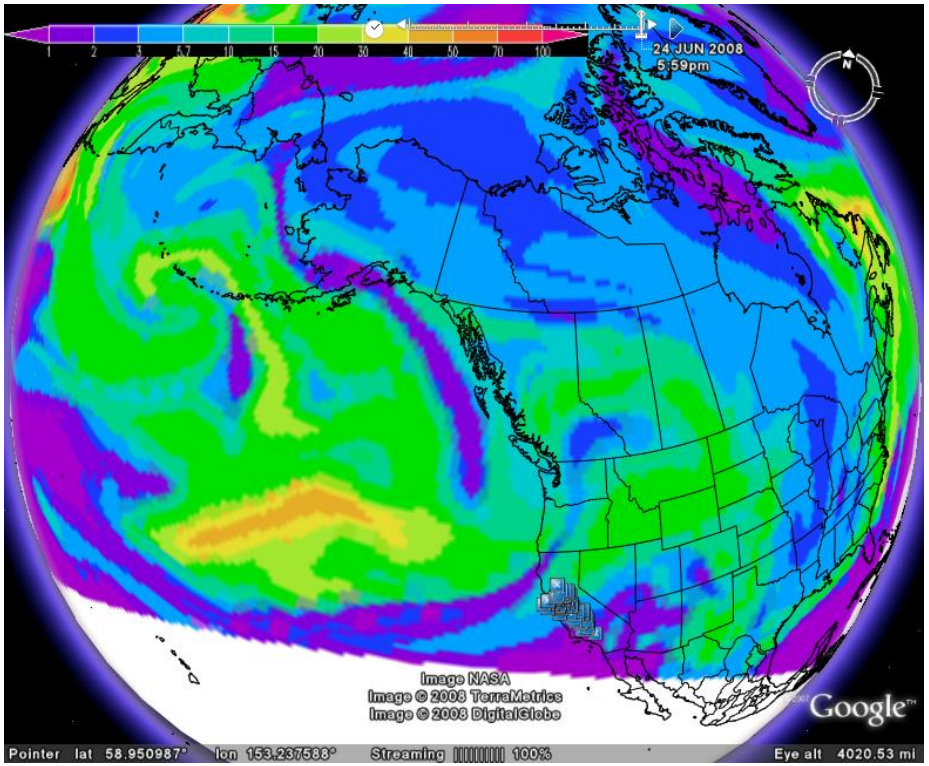

Simulated Total Sulfate (μg/m³) along
the DC8—SJV Flight Path on 06/24/2008
Altitude Above Ground (meter)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
24th
15
16
17
18
19
20
21
22
23
TIME (UTC)


Simulated Total Sulfate (μg/m³) along
the DC8—CenValley—Final Flight Path on 06/20/2008
Altitude Above Ground (meter)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
20th
17.5
18
18.5
19
19.5
20
20.5
21
21.5
22
22.5
23
23.5
TIME (UTC)

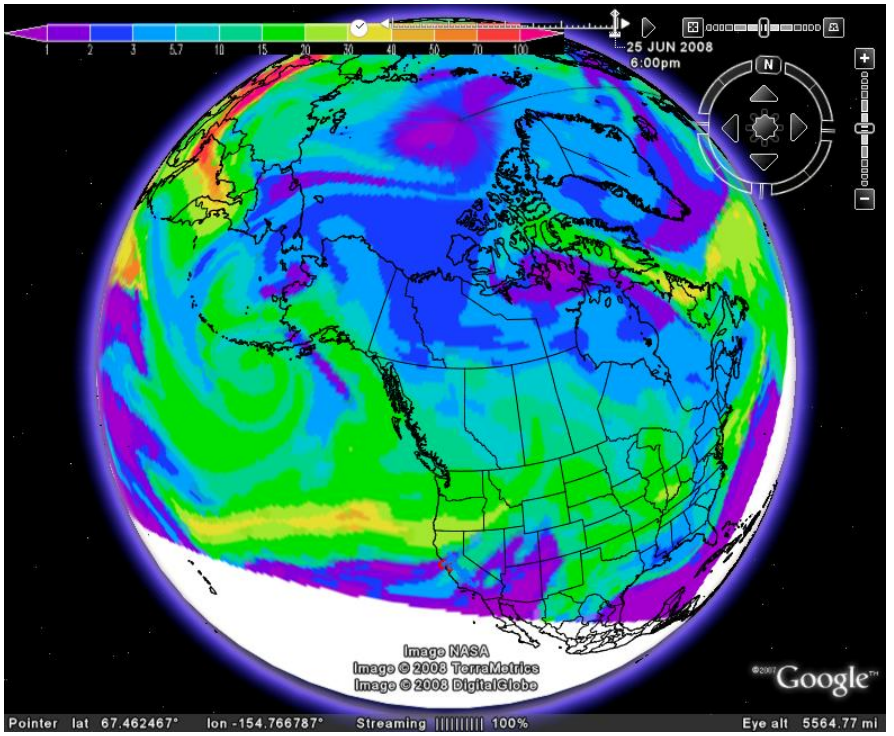

Simulated China CO (ppbv) along
the DC8—SJV Flight Path on 06/24/2008
Altitude Above Ground (meter)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
15
16
17
18
19
20
21
22
23
TIME (UTC)
24th


Simulated China CO (ppbv) along
the DC8—CenValley—Final Flight Path on 06/20/2008
Altitude Above Ground (meter)
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
17.5
18
18.5
19
19.5
20
20.5
21
21.5
22
22.5
23
23.5
TIME (UTC)
20th

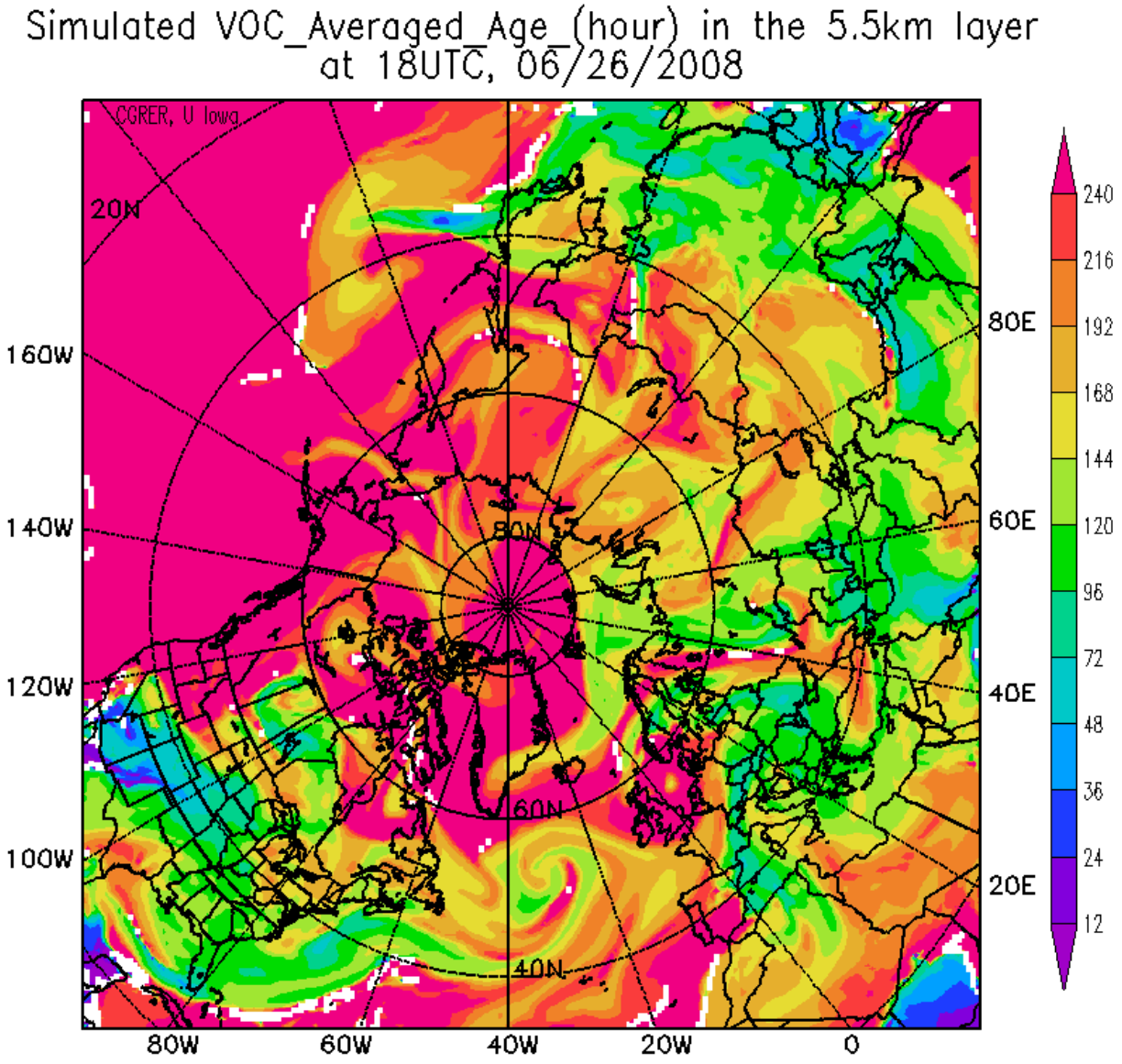
CO, 5.5 km, 18Z,June 24



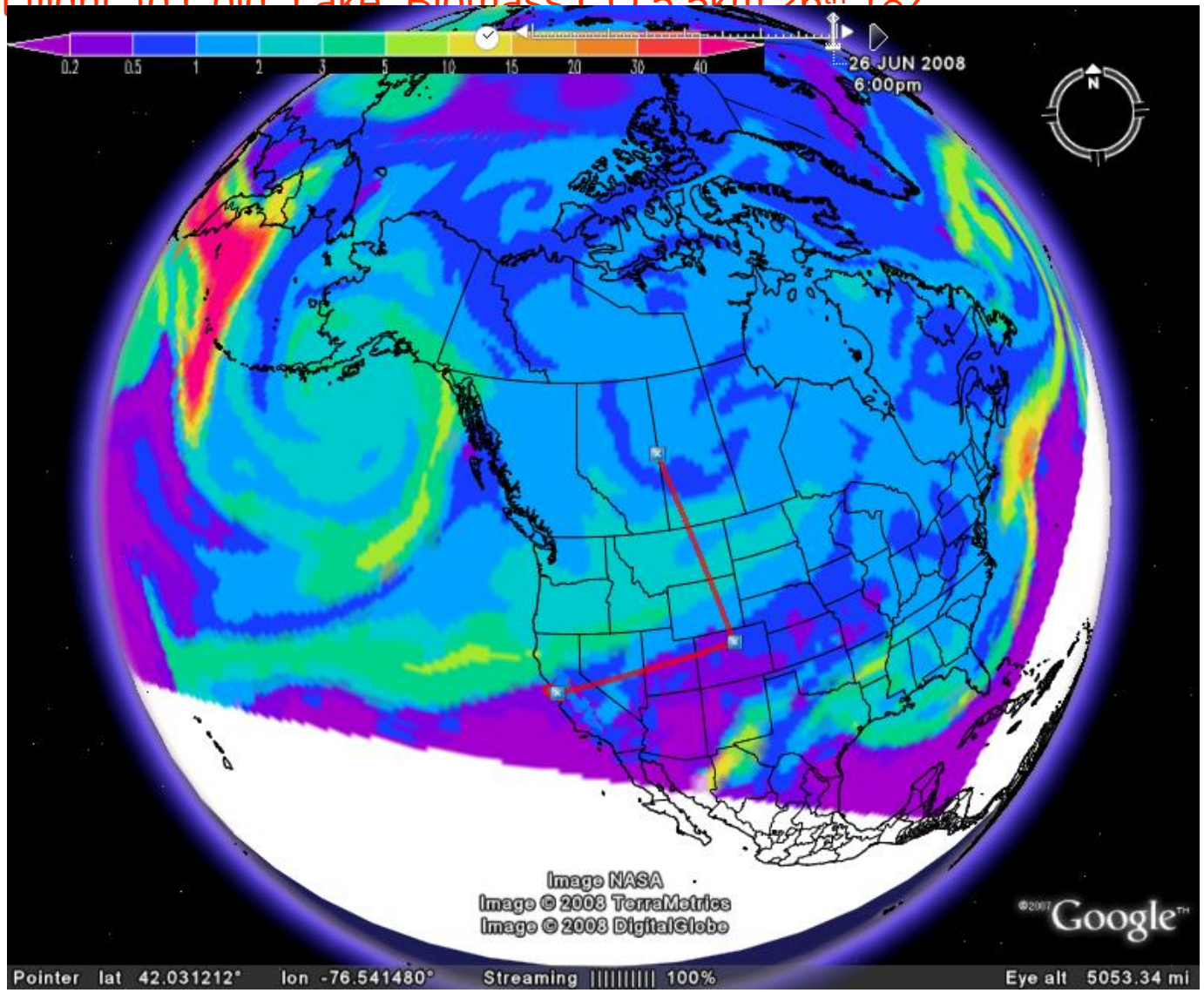

CO, 5.5 km, 18Z,June 25



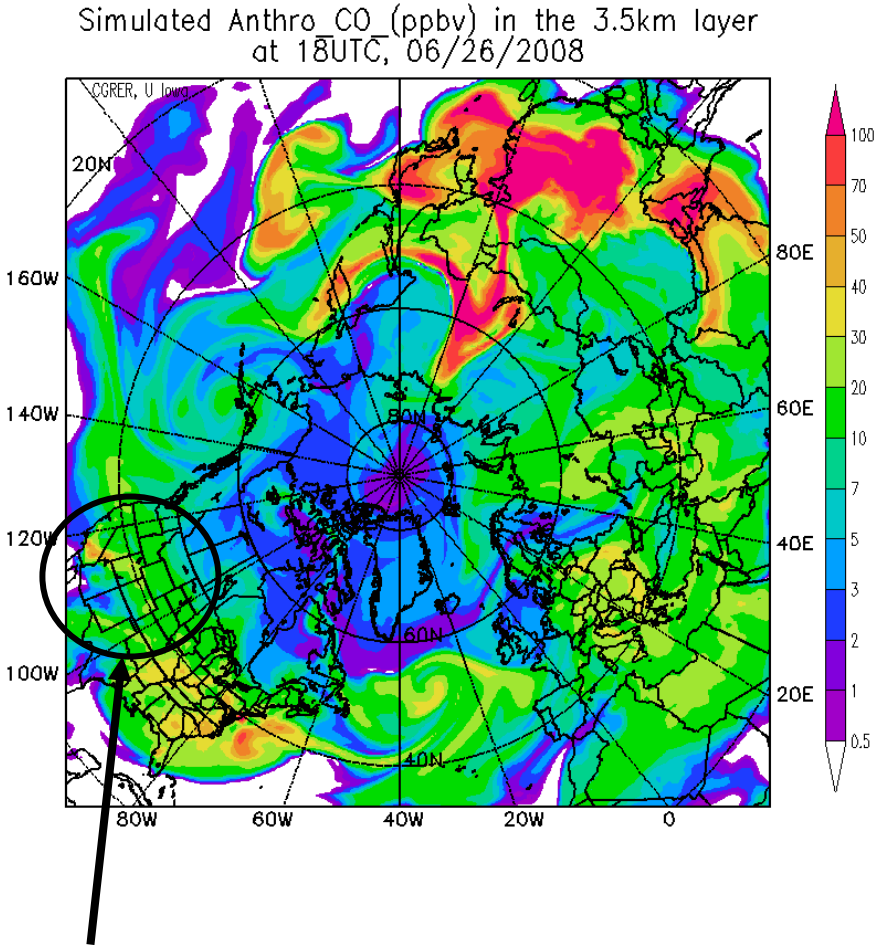
VOC age, 5.5 km, 18Z,June 26



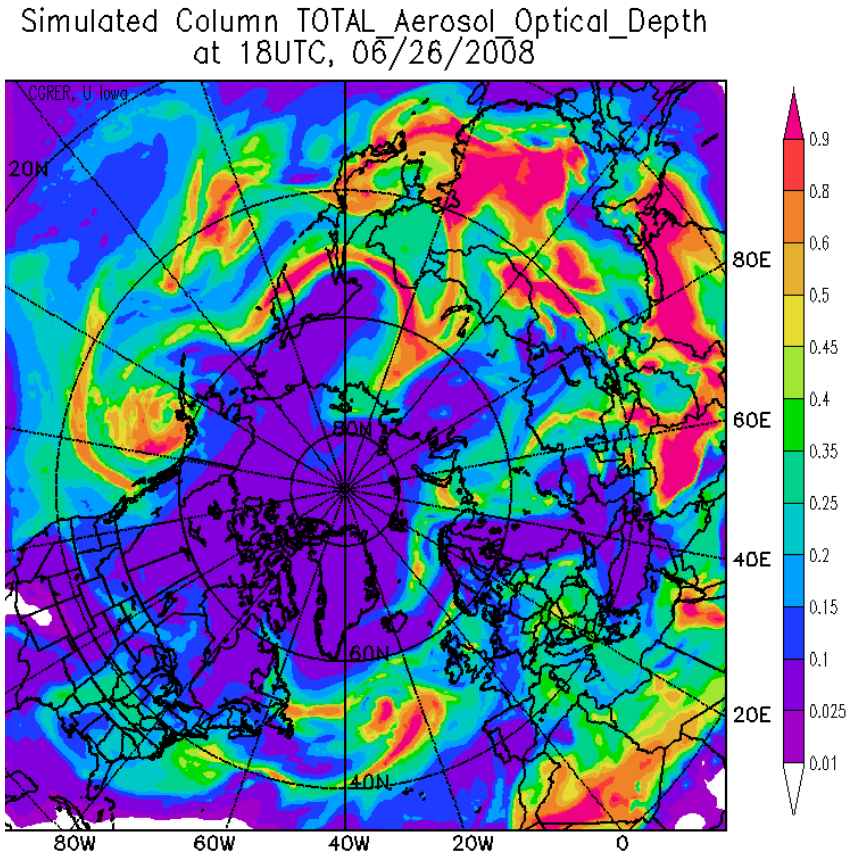
Transit flight to Cold Lake Biomass CO 5.5km 26th 187



# June 26

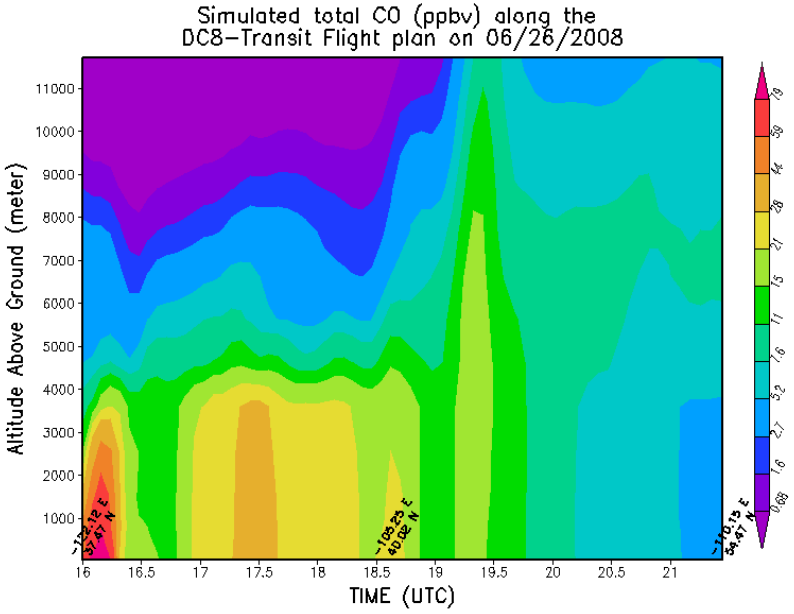


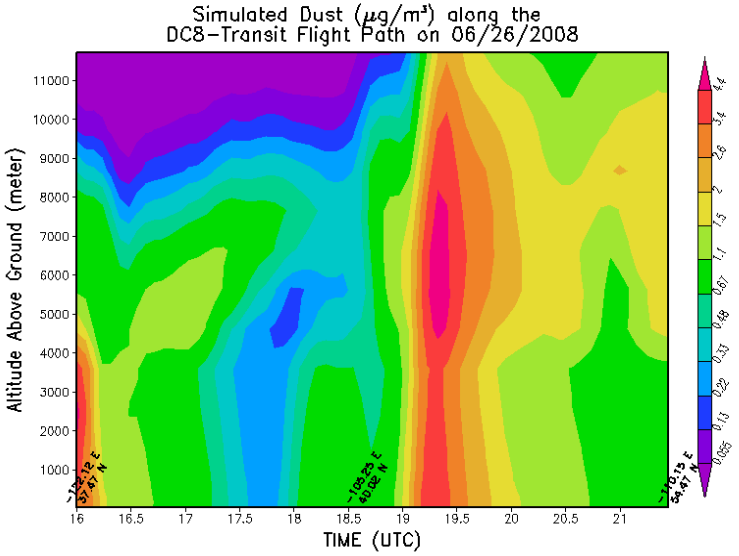

CO at 3.5 km shows S.Calf plume transport to the east

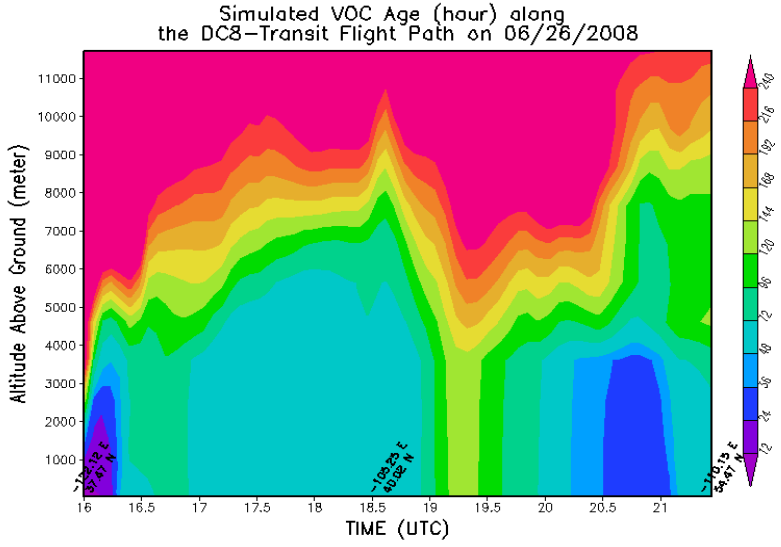


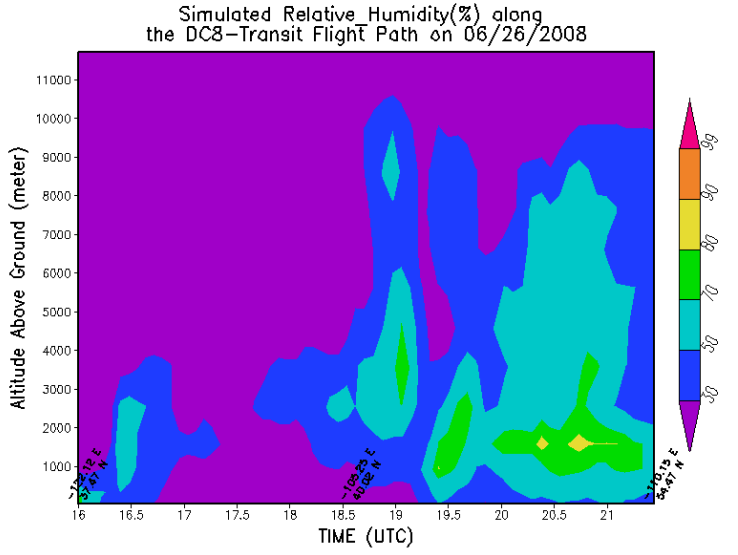

Total AOD S-N Gradients

# Transit for 26th



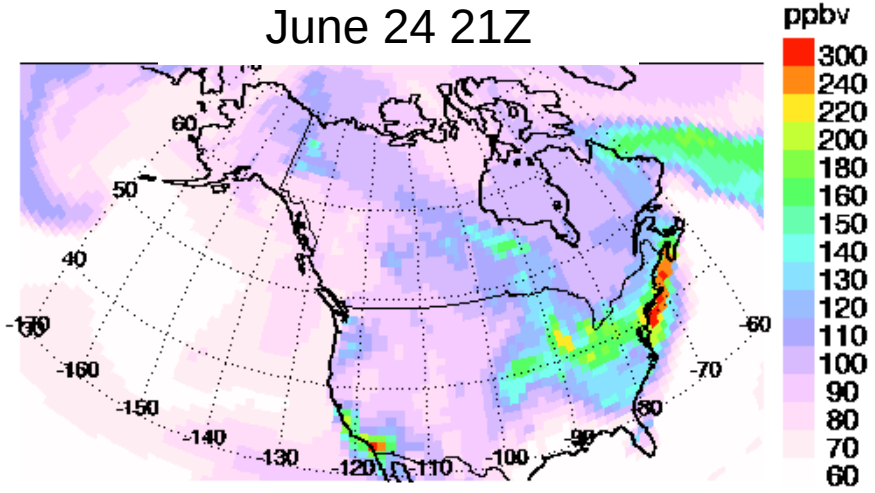



# CAM-Chem/DART June 24, 26 21Z (fx from 06-21)

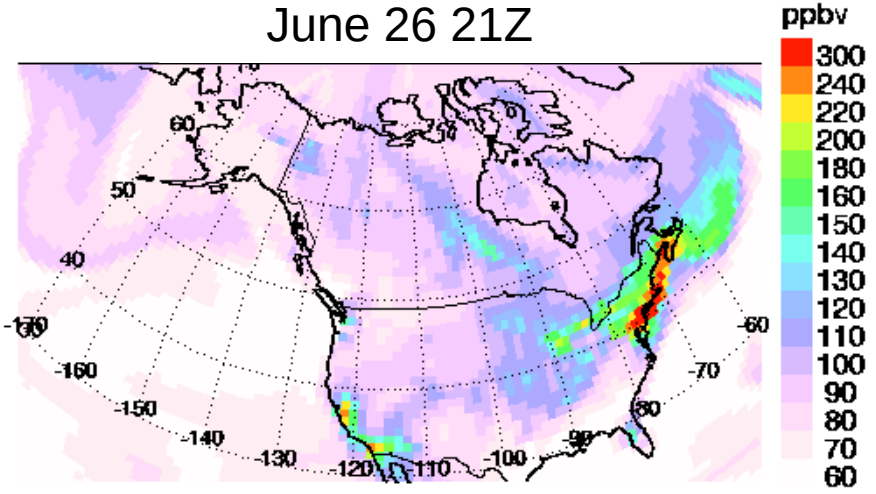
## Surface CO

June 24 21Z




CAM Forecast from 20080621

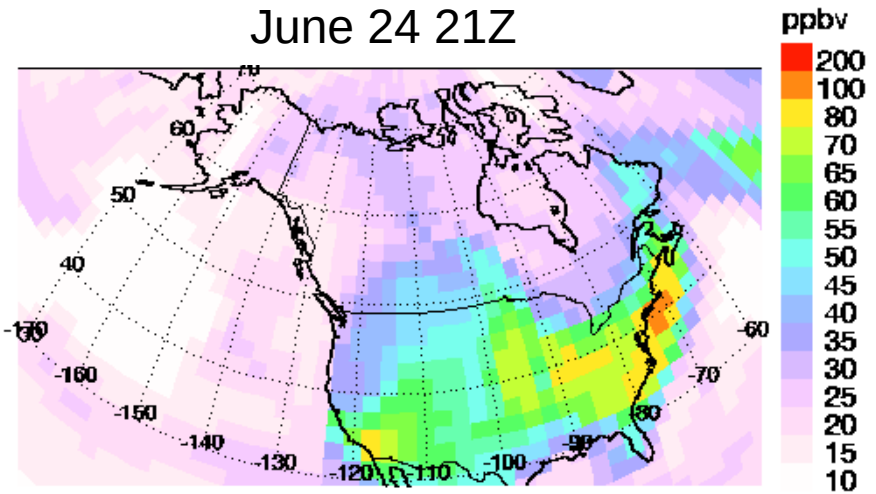
June 26 21Z




CAM Forecast from 20080621

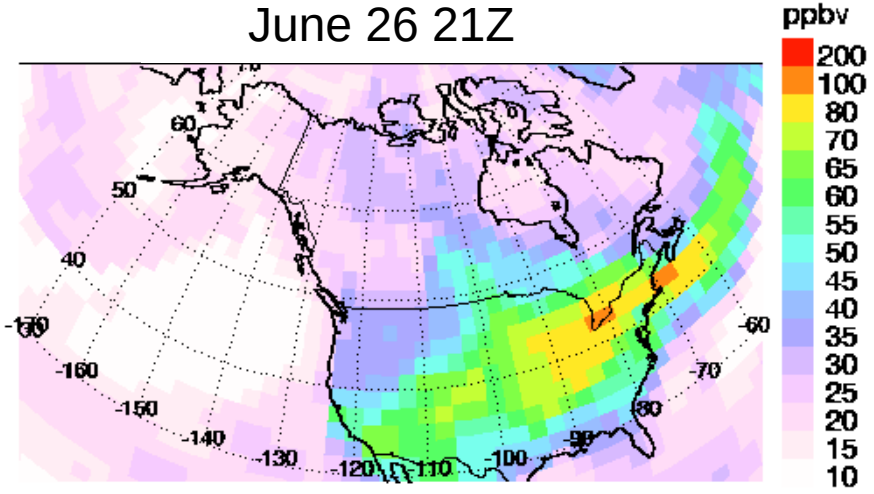
## Surface O3

June 24 21Z




CAM Forecast from 20080621

June 26 21Z

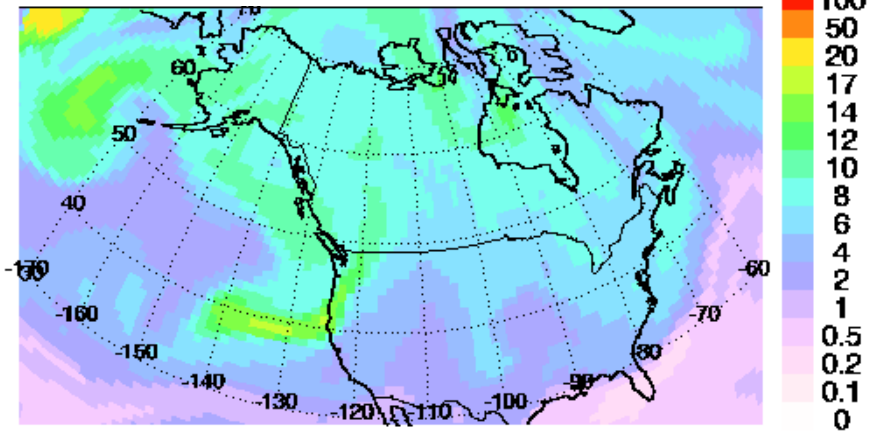



CAM Forecast from 20080621

CAM-Chem/DART

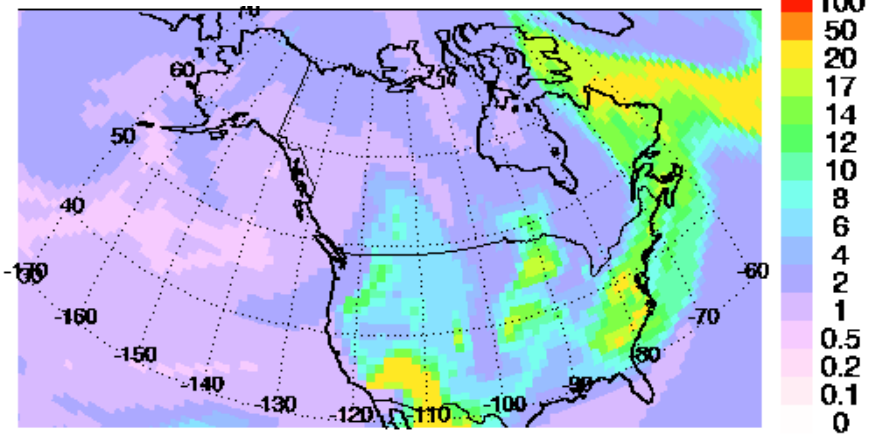
# June 24 21Z (fx from 06-21)

## N.Asia Fires 3km



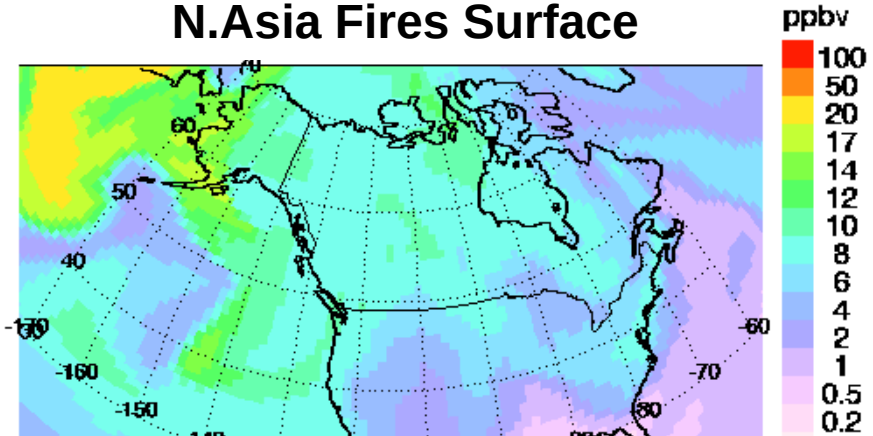

CAM Forecast from 20080621

## N.America Anthro 3km



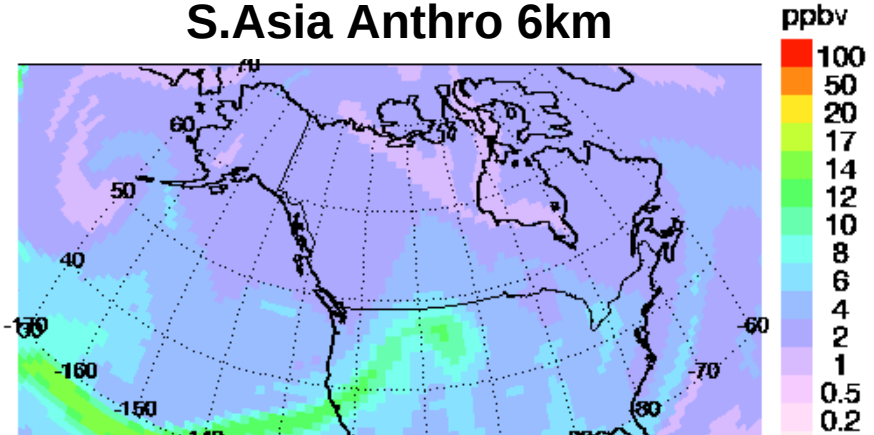

AM Forecast from 20080621

## N.Asia Fires Surface




CAM Forecast from 20080621

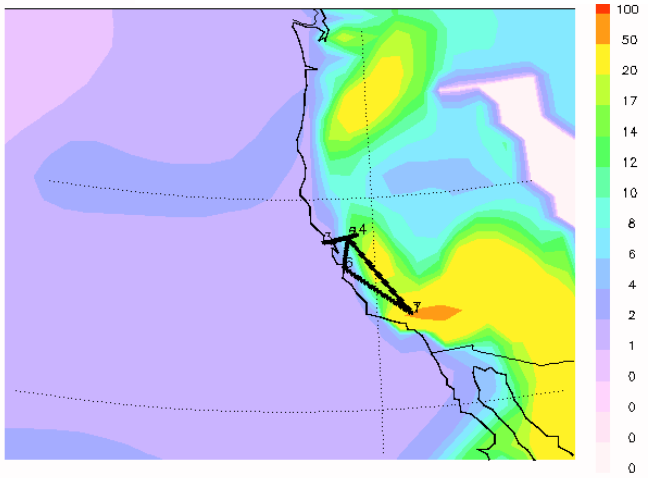
## S.Asia Anthro 6km



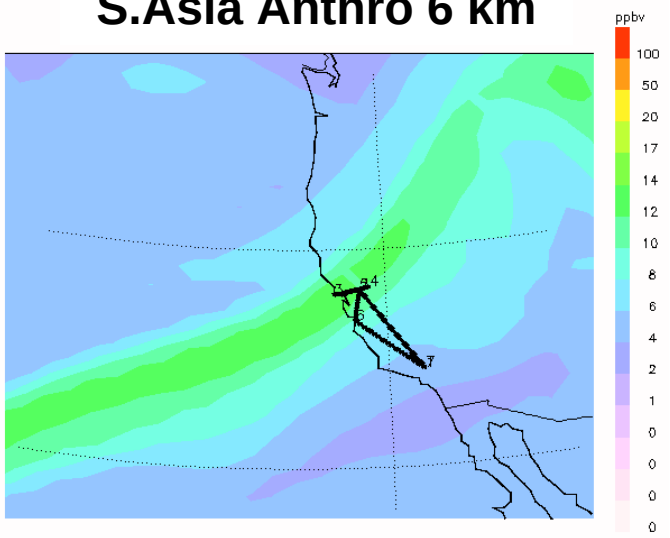

CAM Forecast from 20080621

# CAM-Chem/DART 2008-06-24 21Z (06-21 fx)

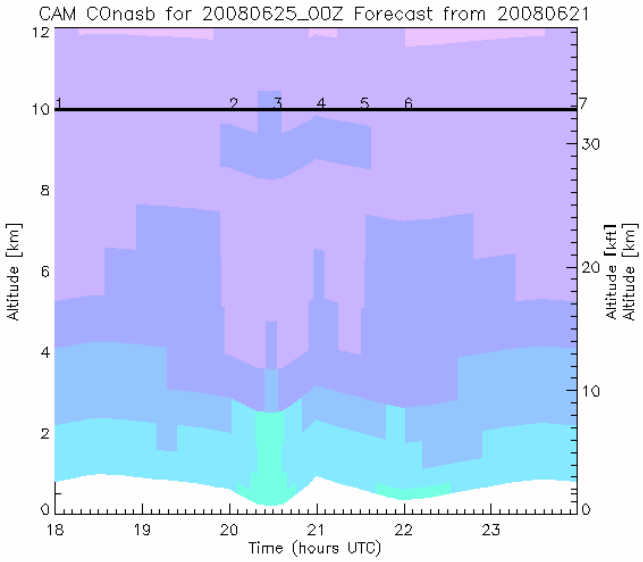
## N.America Anthro 2 km



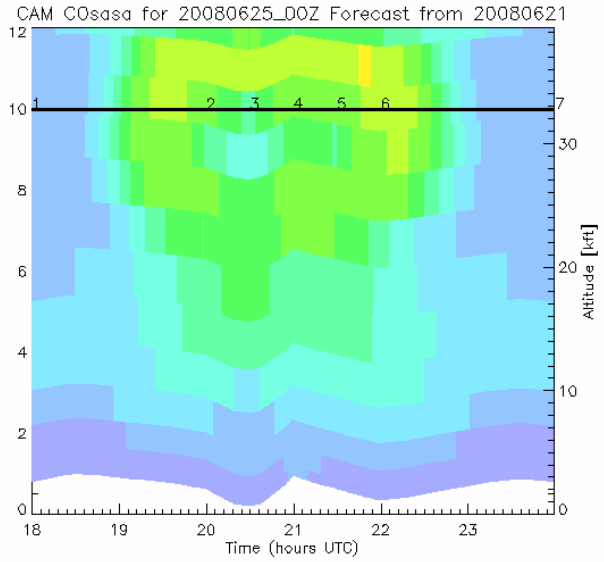

## S.Asia Anthro 6 km



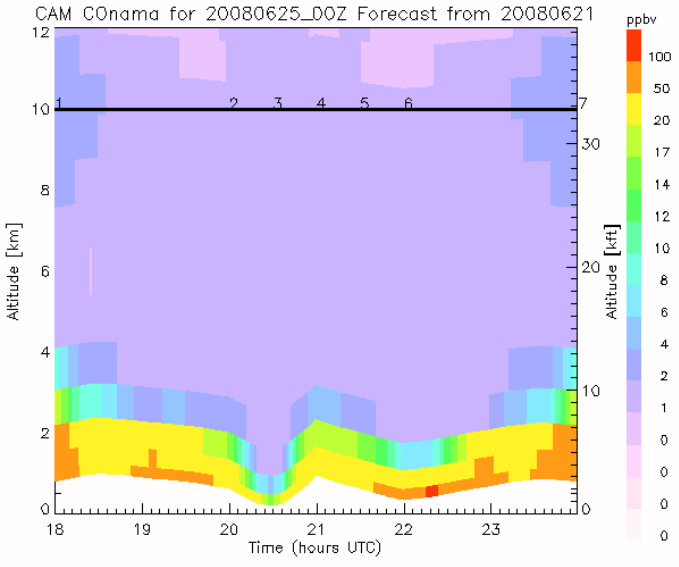

## N.Asia Fires




## S.Asia Anthro

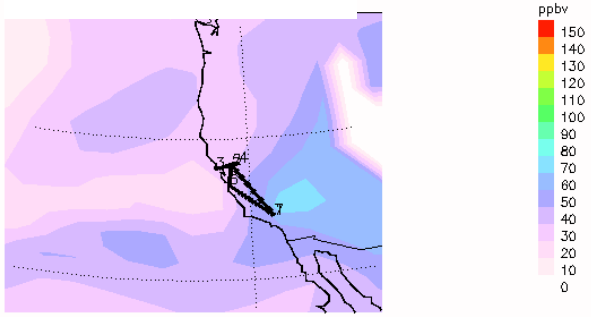



## N.America Anthro

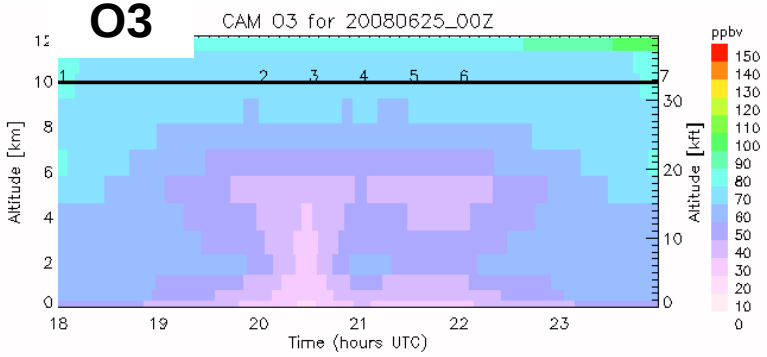


# CAM-Chem/DART 2008-06-24 21Z (06-21 fx)

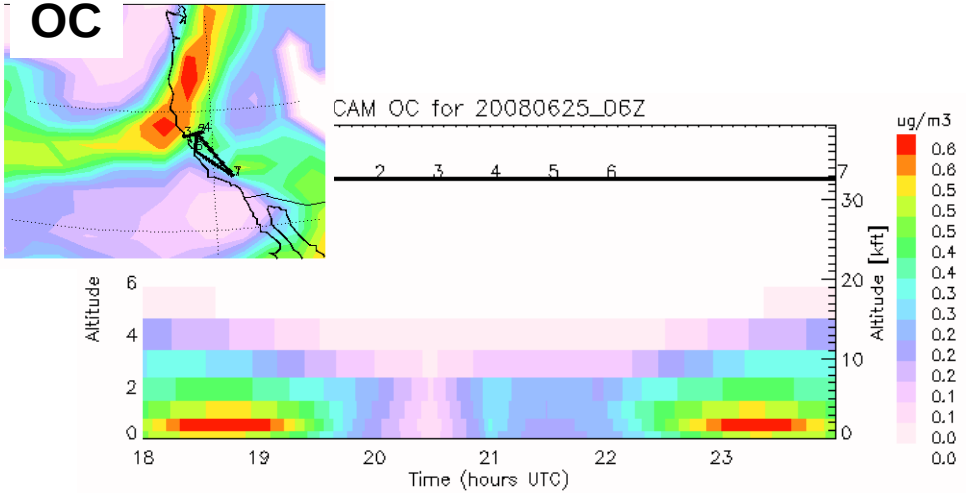
## O3 2 km



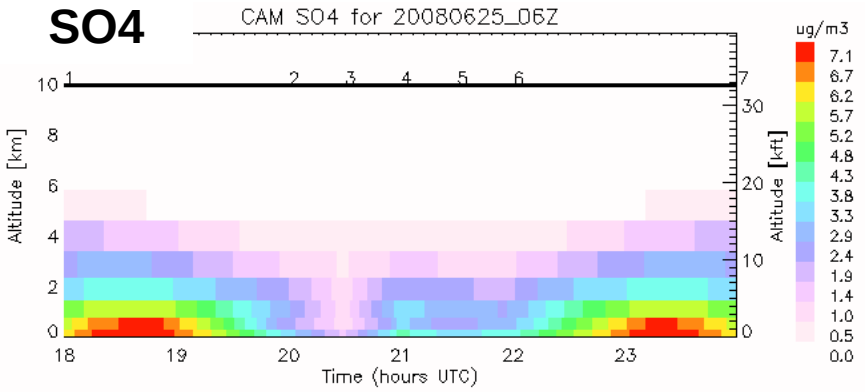

## O3



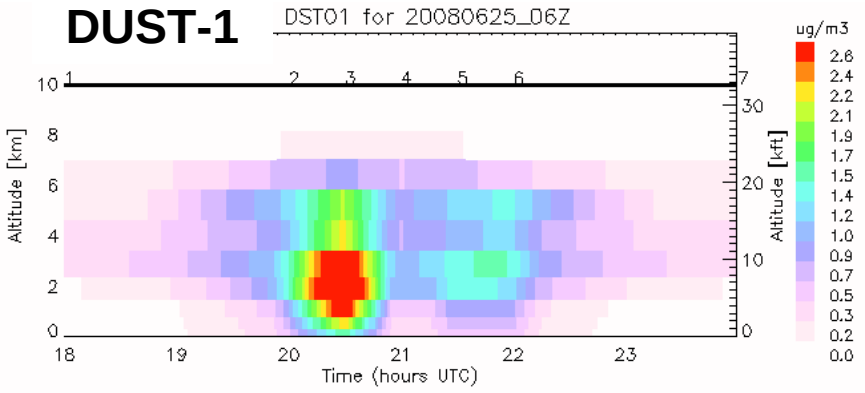

## OC



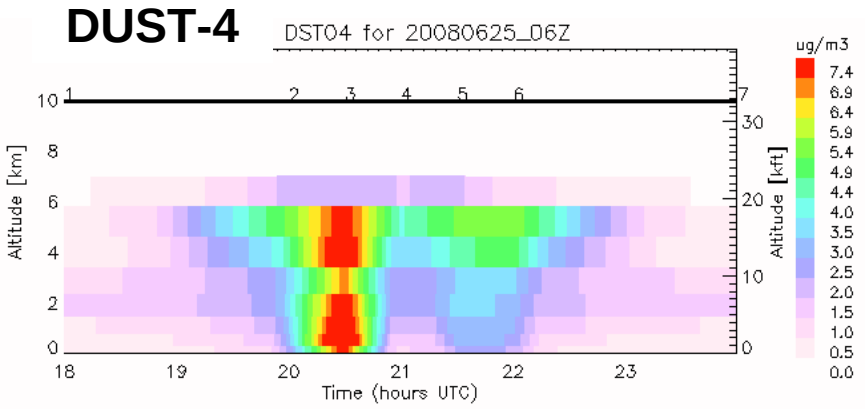

## SO4




## DUST-1

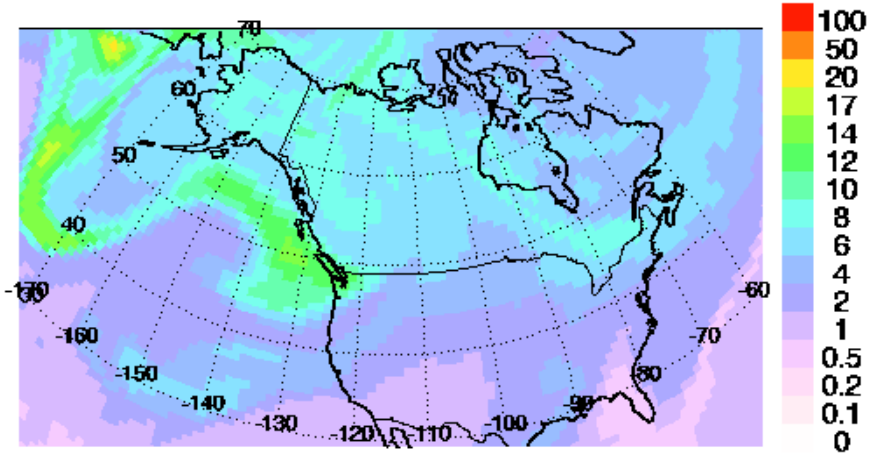



## DUST-4



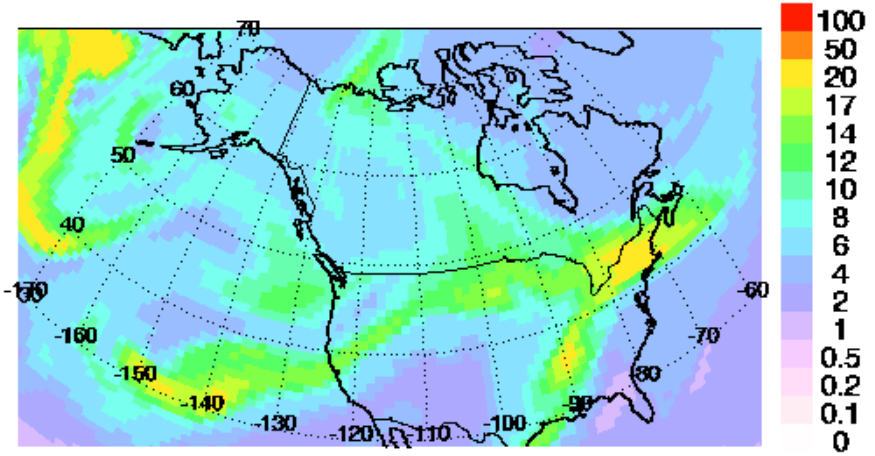
# CAM-Chem/DART Outlook for Transit 06-26

## N.Asia Fires 6 km



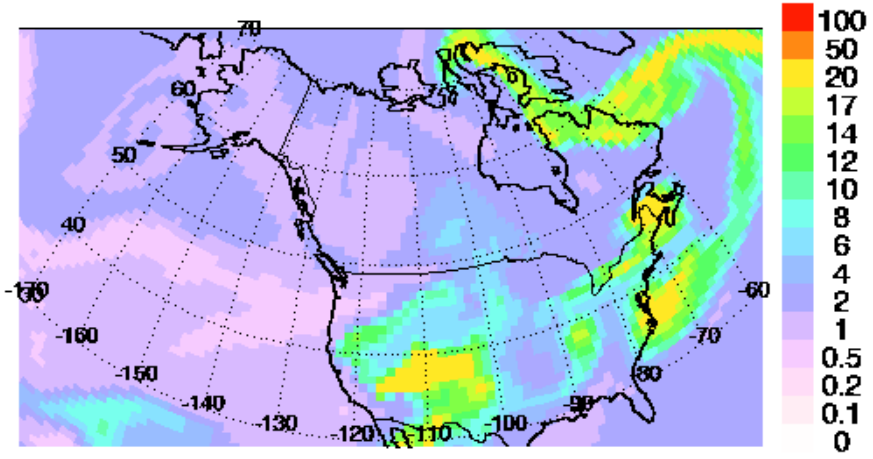

CAM Forecast from 20080621

## N.Asia Anthro 6 km



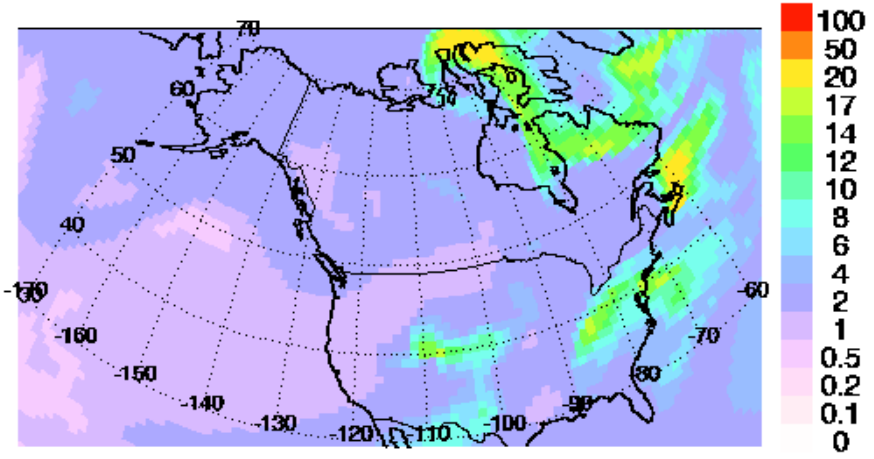

CAM Forecast from 20080621

## N.America Anthro 3 km




CAM Forecast from 20080621

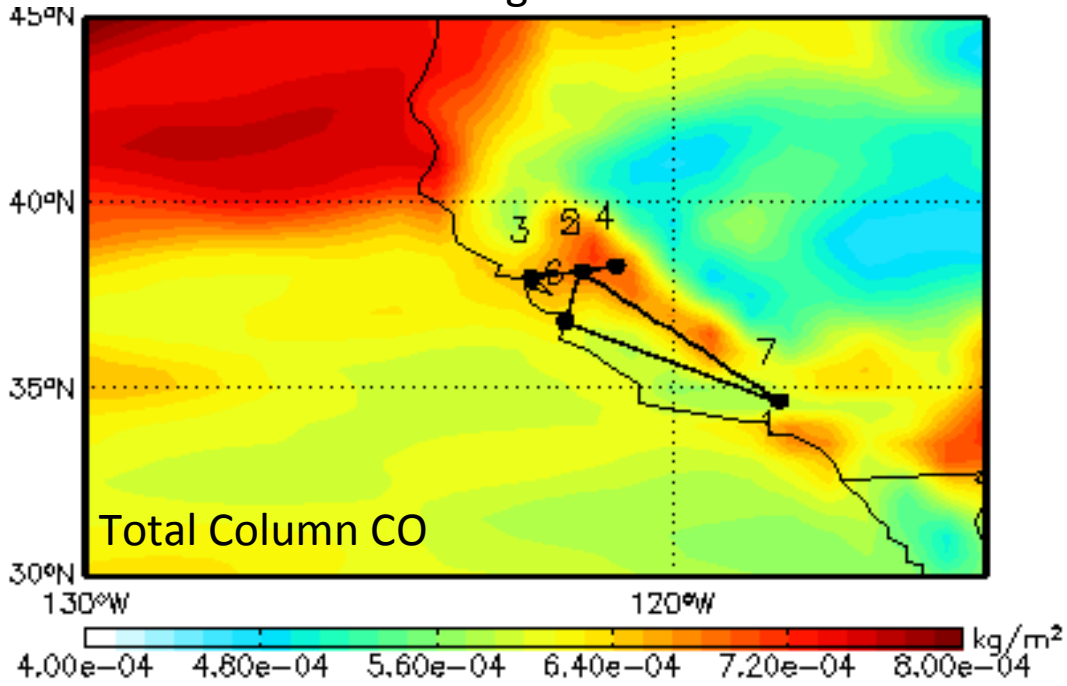
## N.America Anthro 6 km



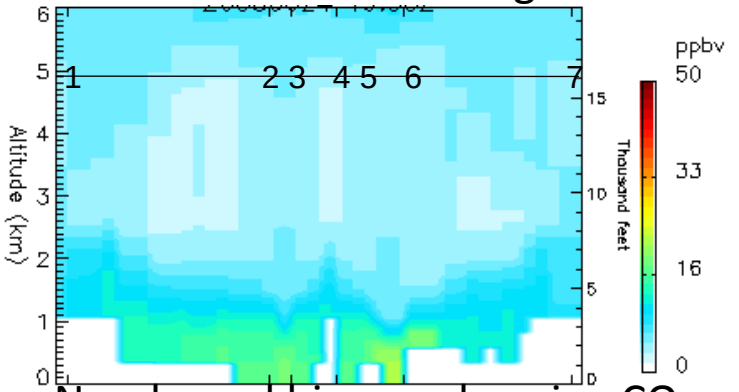

CAM Forecast from 20080621

# Updates for 6/24:

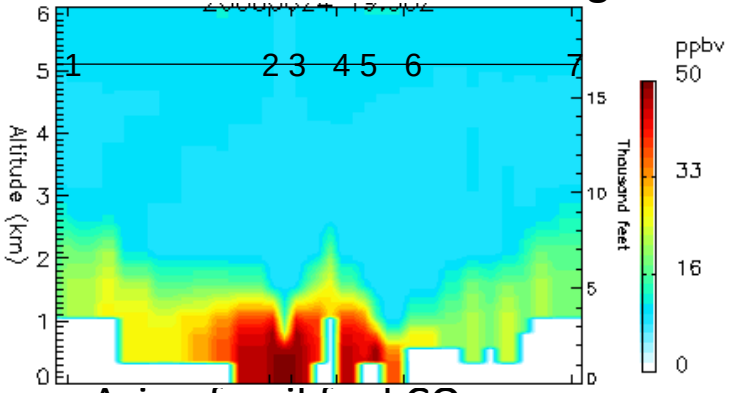
- CO & BC trapped in the BL; mostly N.Am.
- Non-boreal BB CO near Sacramento/Bay Area
- Some Asian CO at higher alt



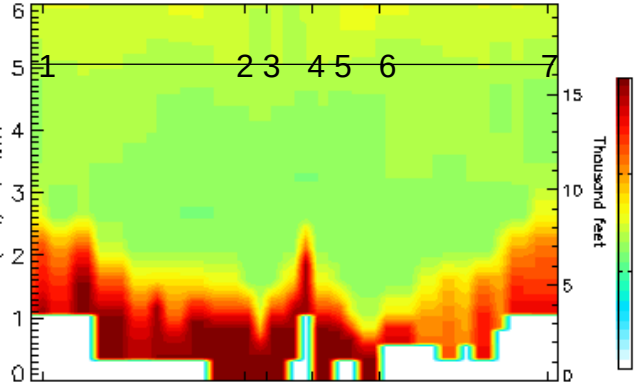

Boreal biomass burning CO



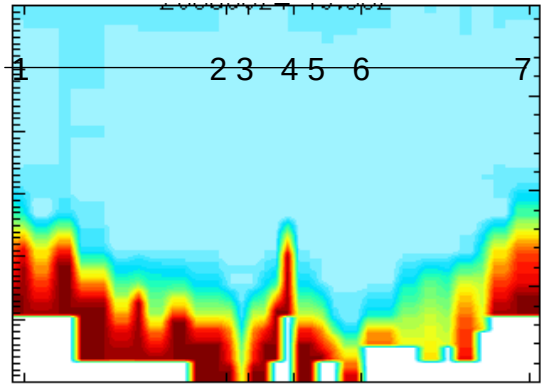

Non-boreal biomass burning CO



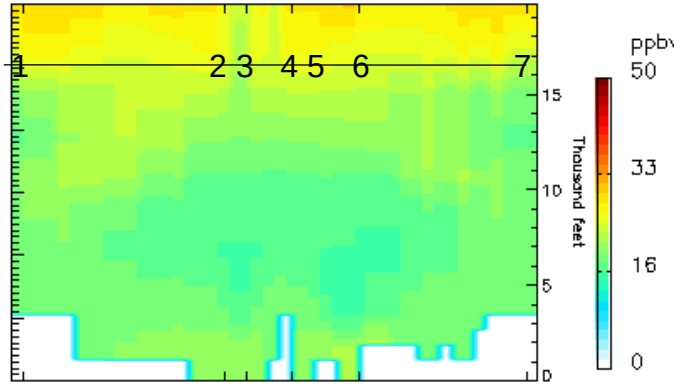

Total CO




N. American ff CO

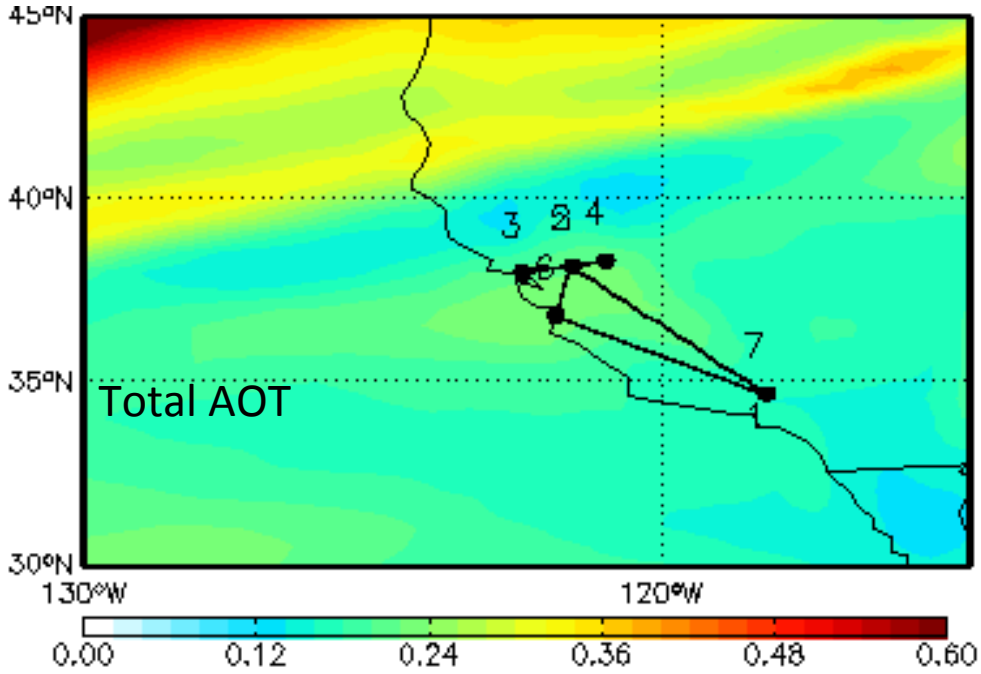



Asian fossil fuel CO

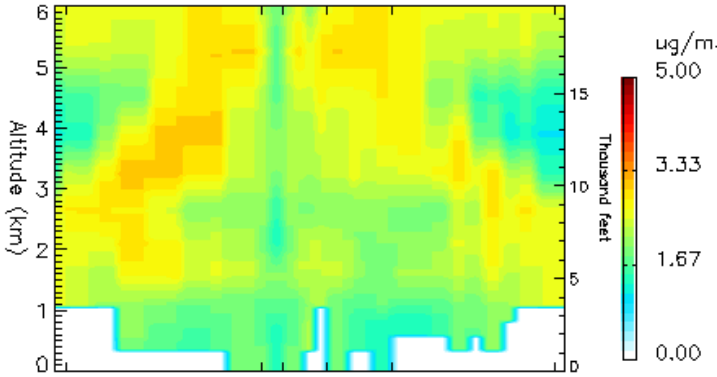


# Updates for 6/24:

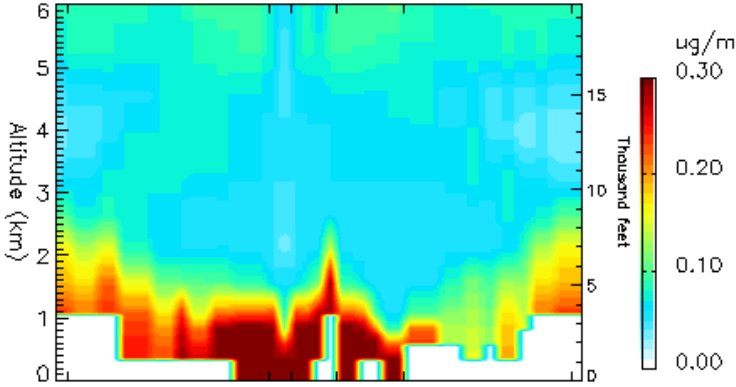
- BC aerosol associated with N.Am. CO in BL
- Sulfate and dust transported with Asian CO



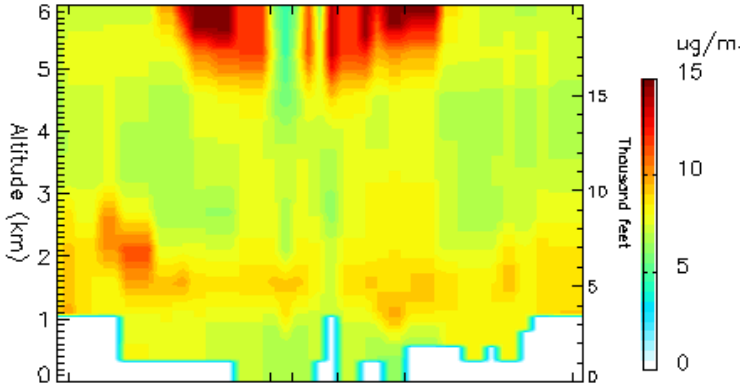

Sulfate aerosol




Black carbon aerosol

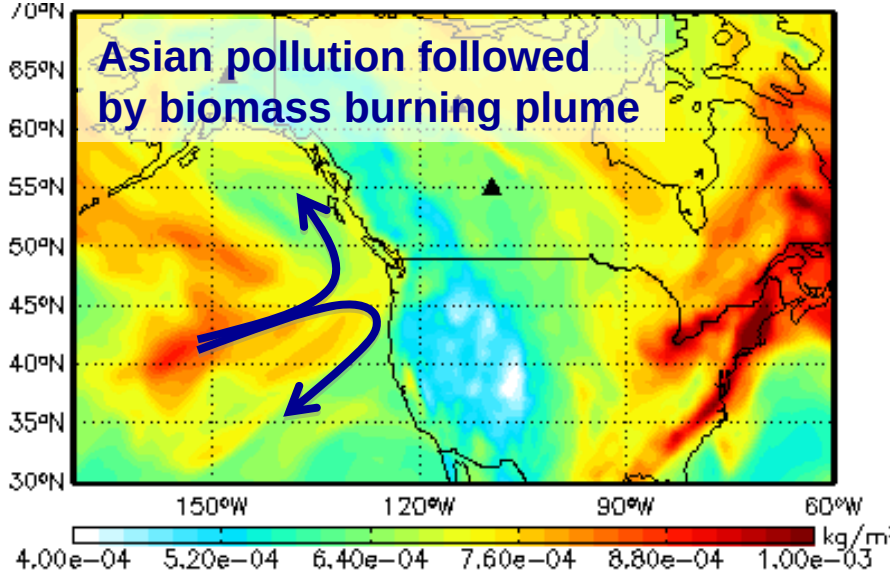



Dust

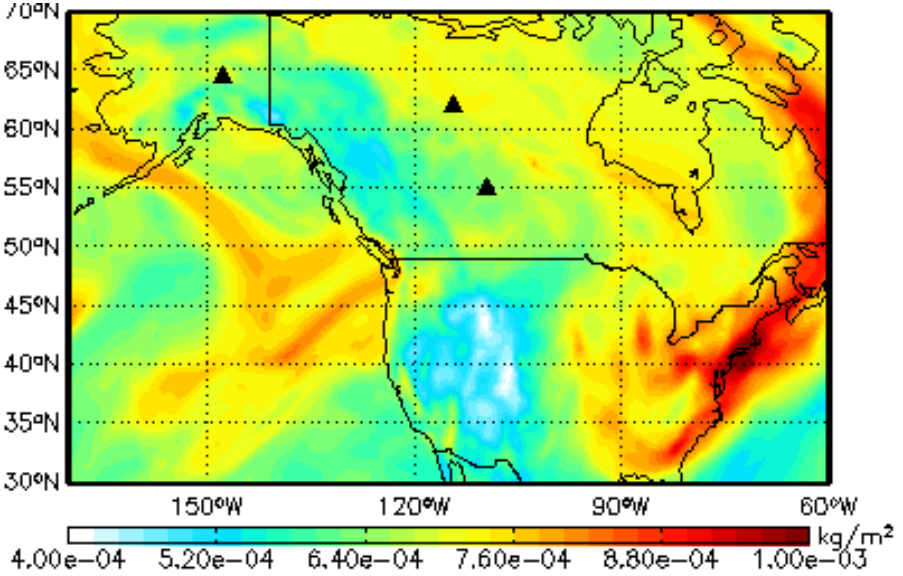


# GEOS-5 Outlook: Total Column CO at 19:30Z

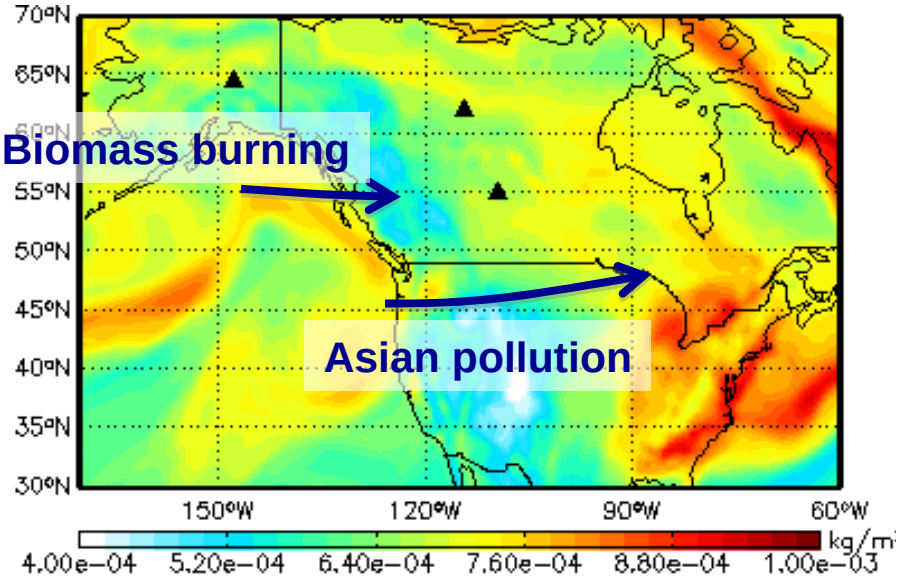
June 23



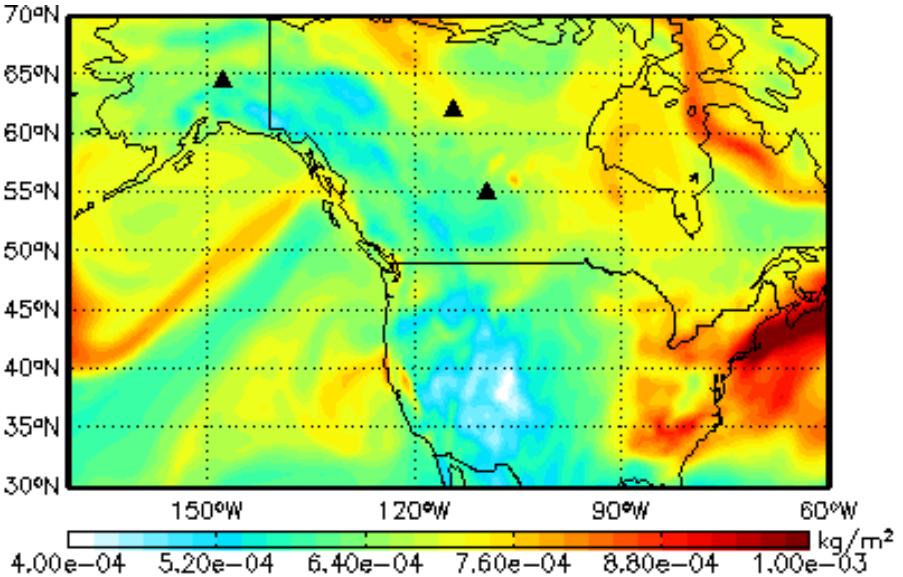

June 24




June 25

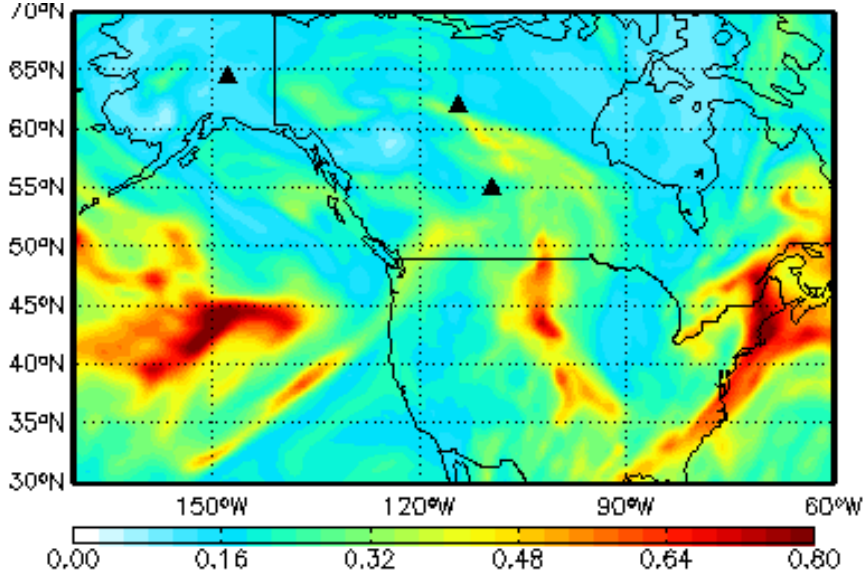



June 26

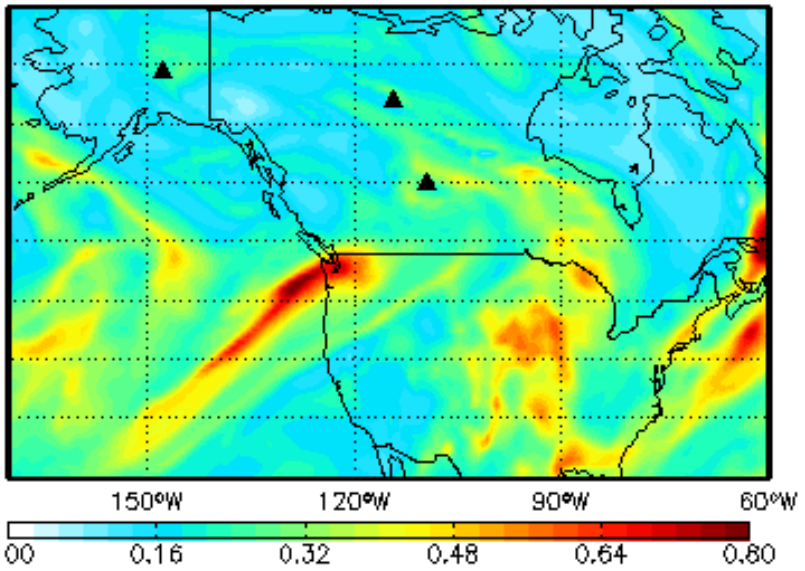


# GEOS-5 Outlook: AOT at 19:30Z

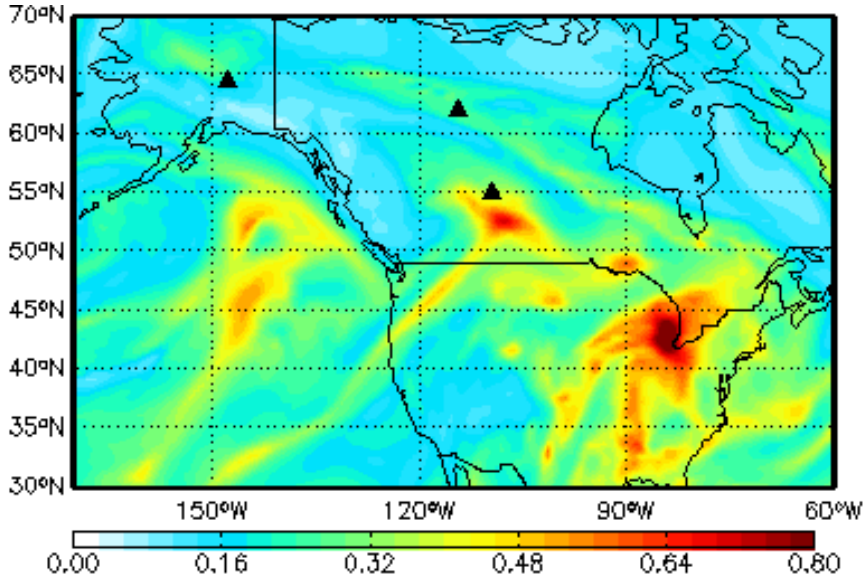
June 23



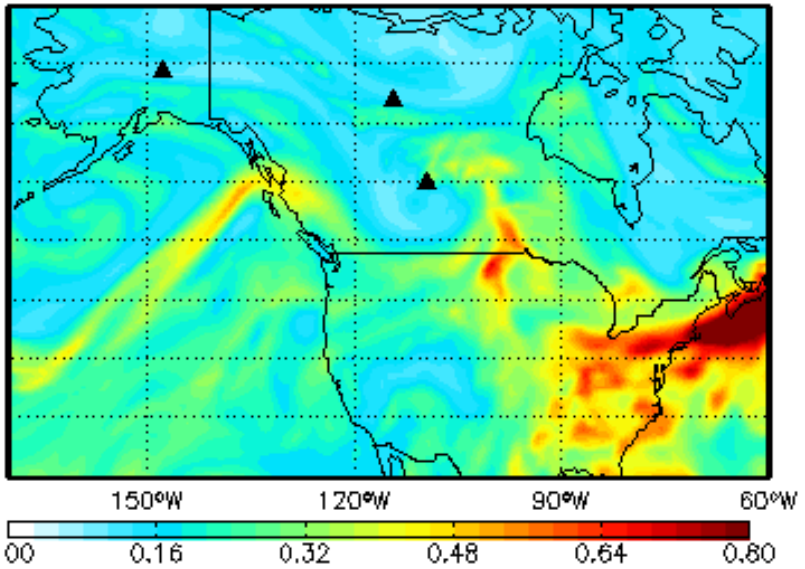

June 24




June 25

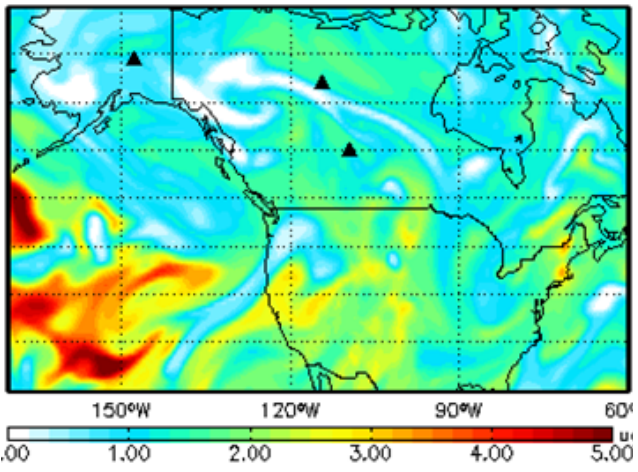



June 26

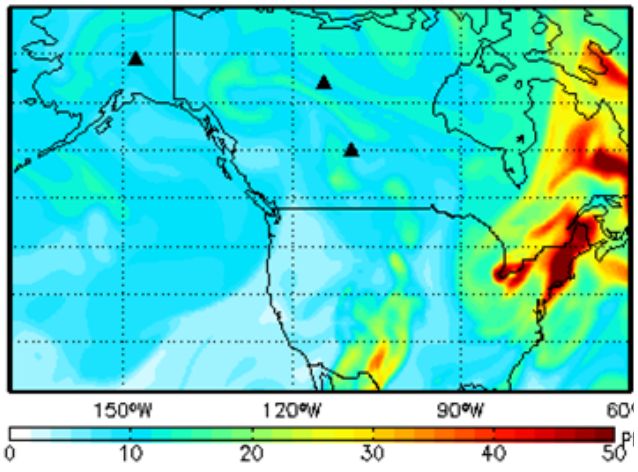


# Transit flight “second look” – 6/26 19:30Z (all at 500 hPa)

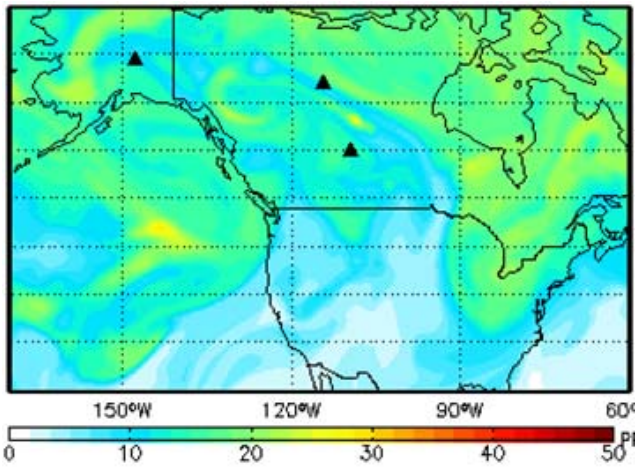
Sulfate aerosol



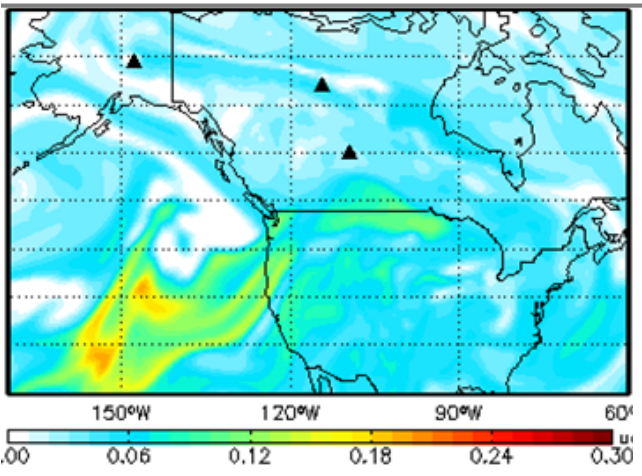

N American fossil fuel CO



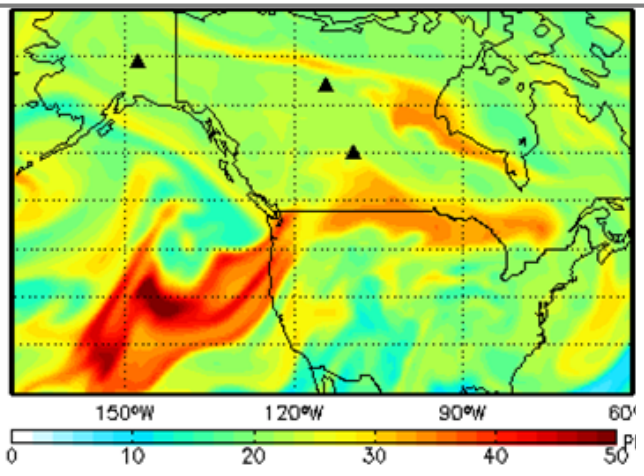

Boreal biomass burning CO



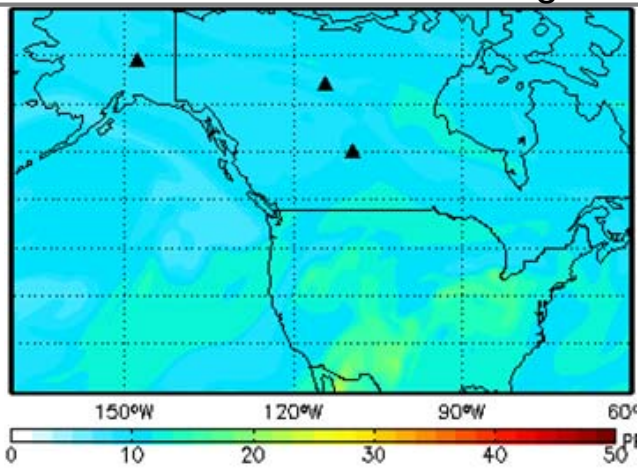

Black carbon aerosol




Asian fossil fuel CO

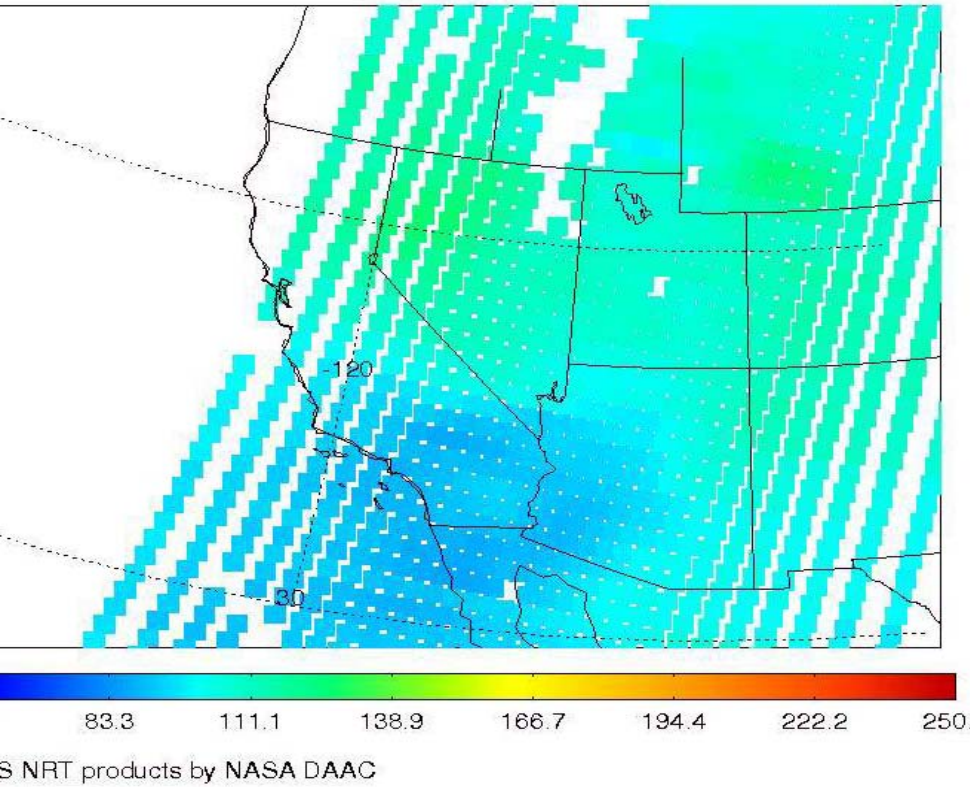



Non-boreal biomass burning CO

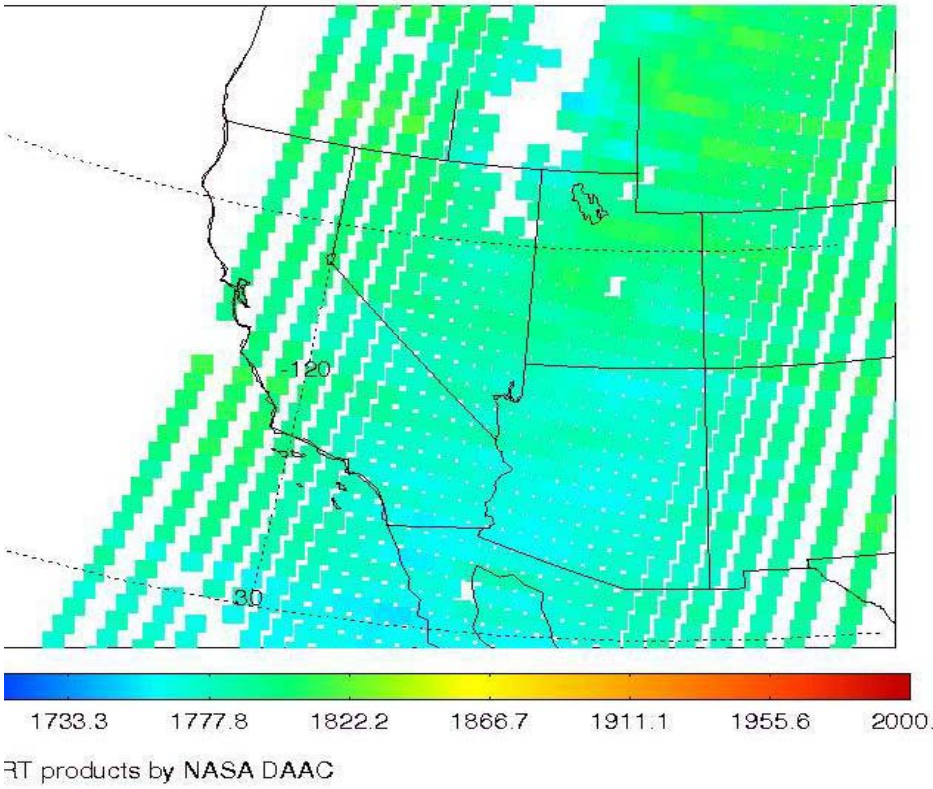


# AIRS Support for CARB

**NRT AIRS CO mr 500mb June 22**



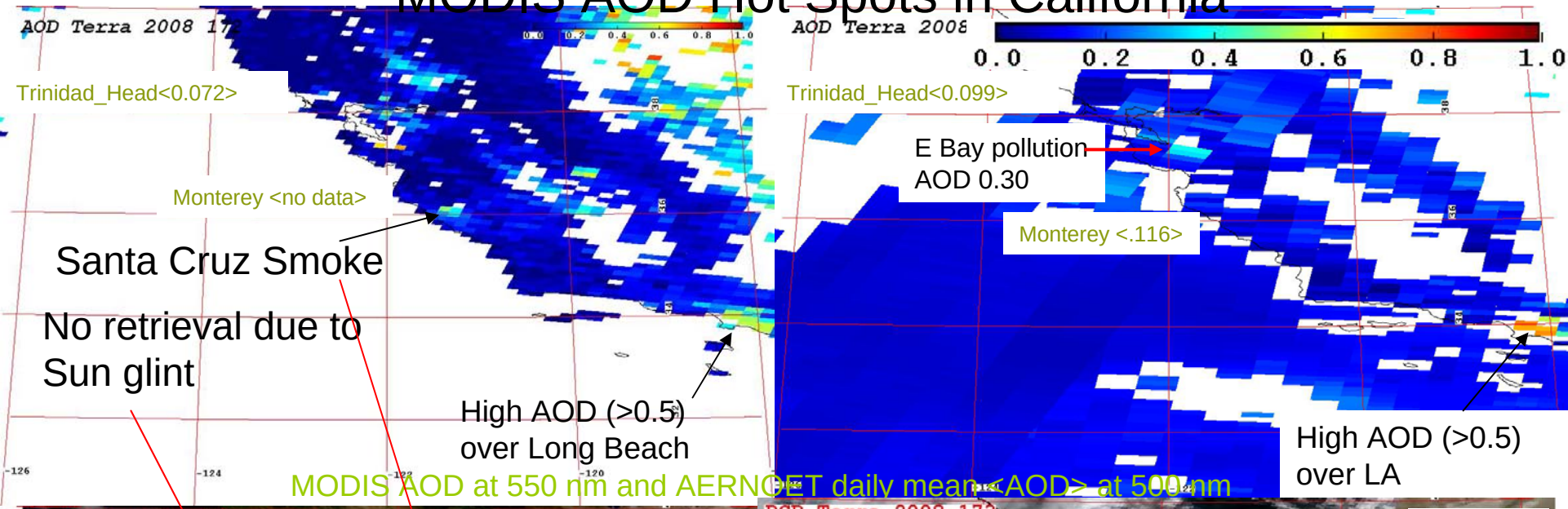

**NRT AIRS CH4 mr 300mb June 22**



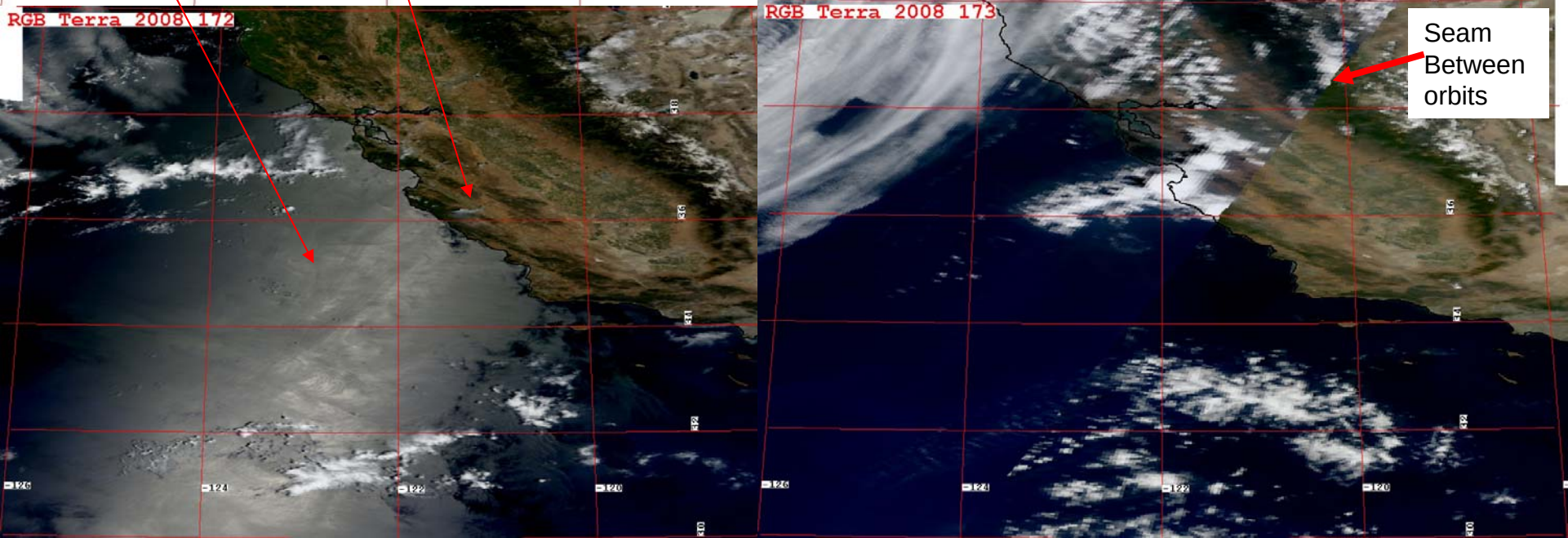

- The CO plume off the coast from yesterday now is over CA and Nevada.
- AIRS can't indicate measurements from the boundary layer, so this may not be reflected from today's DC-8 measurements.

# Day 172 & 173 (June 20 & 21) Fri. (Left) and Sat. (Right)

## MODIS AOD Hot Spots in California

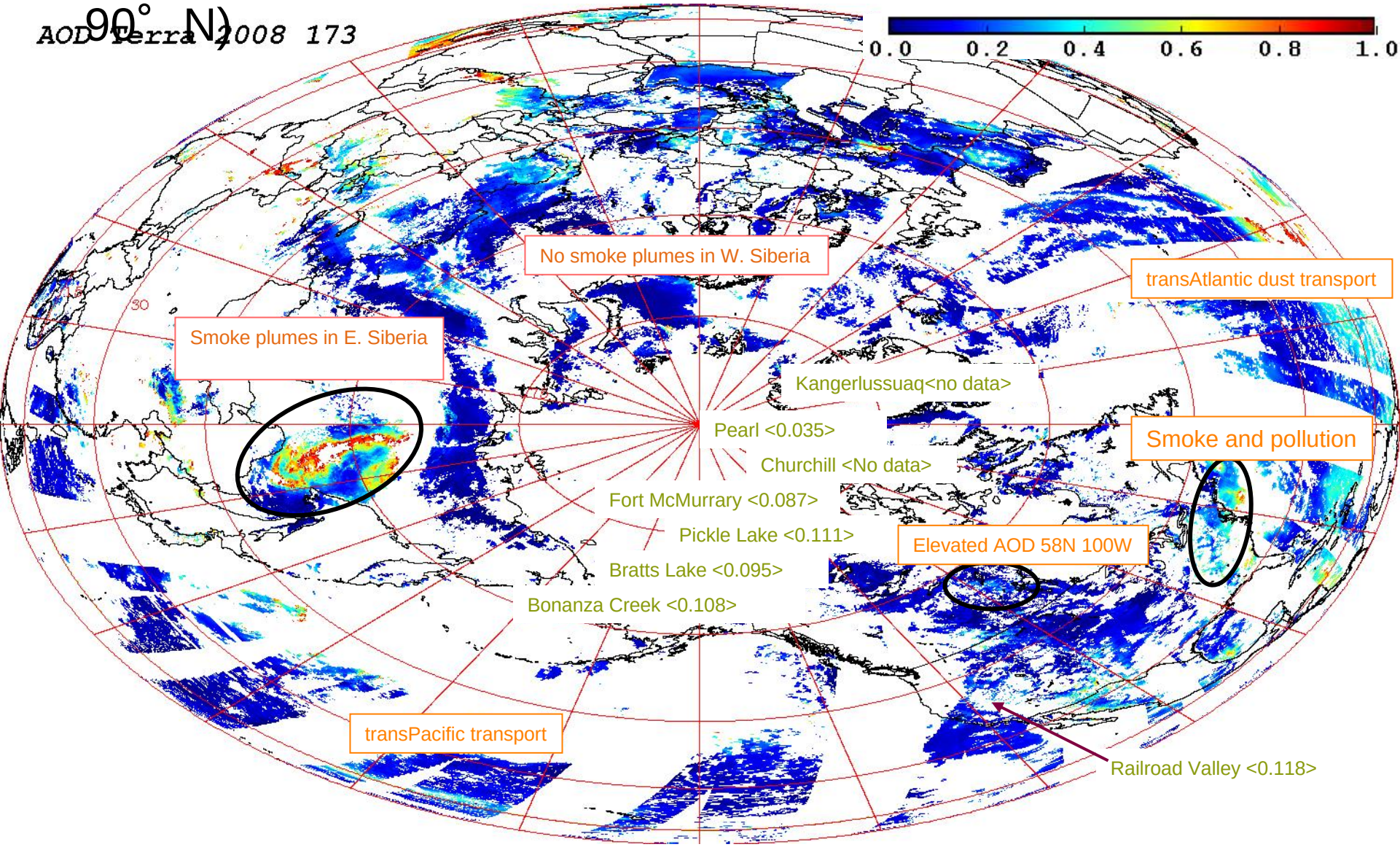



MODIS AOD at 550 nm and AERONET daily mean <AOD> at 500 nm



# Day 173 (June 21) Saturday

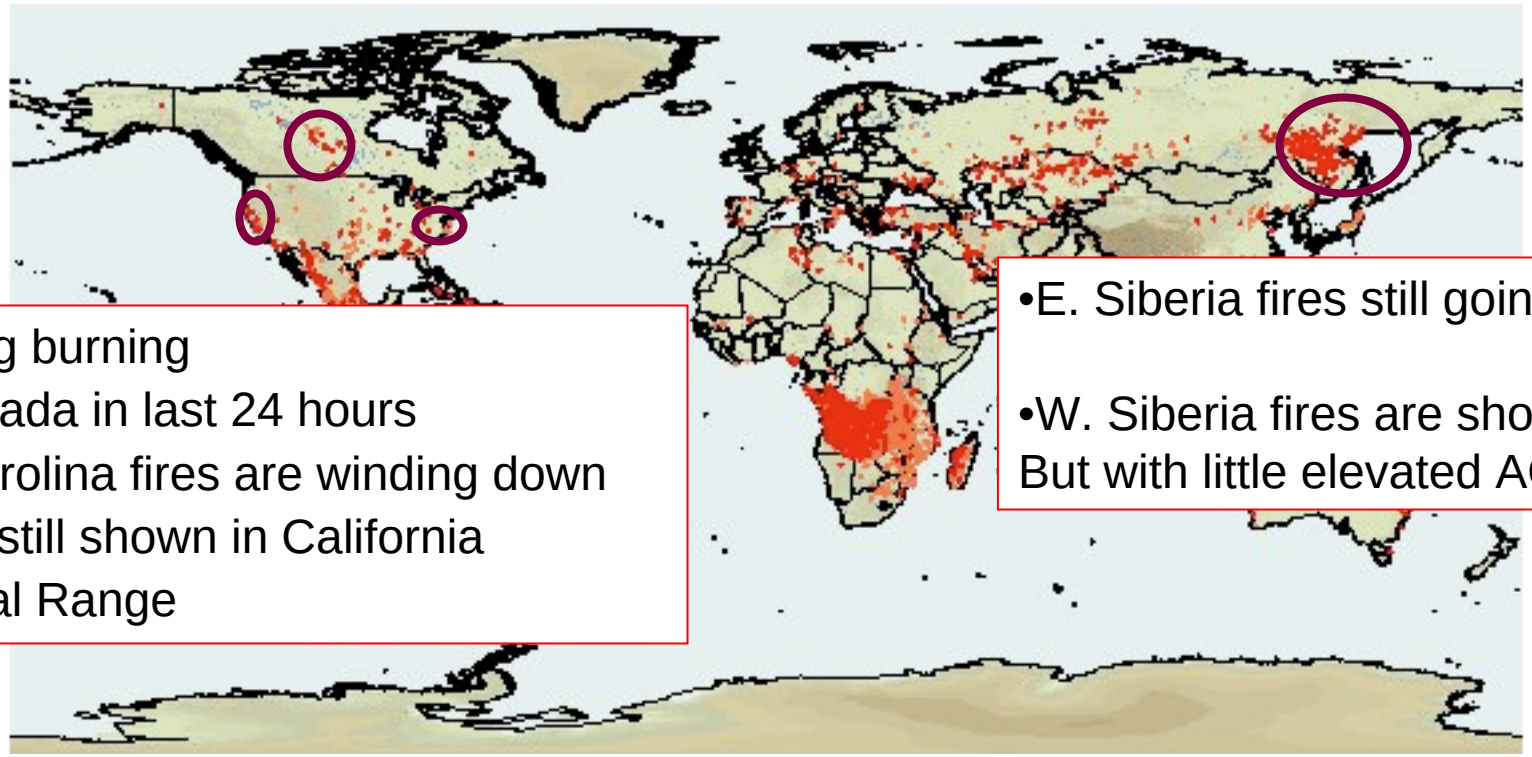
## MODIS AOD Hot Spots in Northern Hemisphere (0° - 90° N)




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

# MODIS Global Active Fire Count Map In Last 24 hours

# (20080620 - 20080622)



•Strong burning
in Canada in last 24 hours
•N. Carolina fires are winding down
•Fires still shown in California
Coastal Range

•E. Siberia fires still going strong

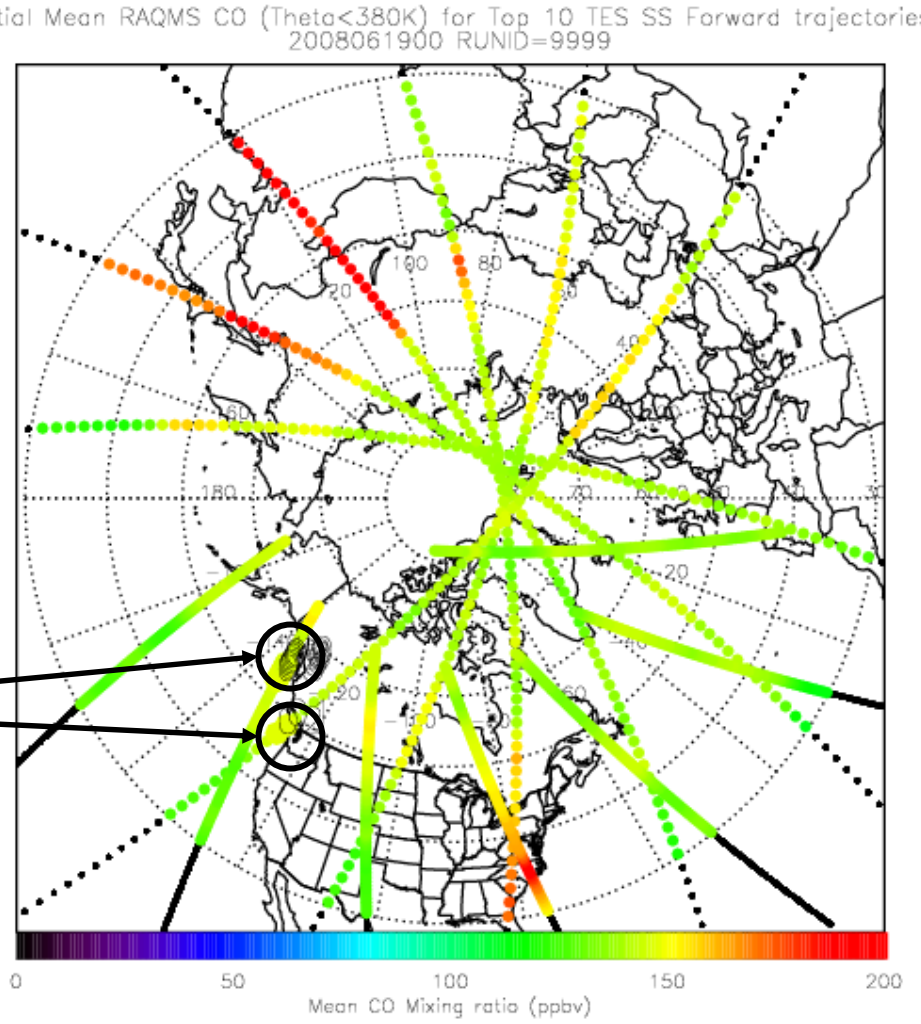
•W. Siberia fires are shown
But with little elevated AOD

http://maps.geog.umd.edu/activefire_html

Circles indicate fires that produced elevated AOD noted on previous slides

# TES Orbits (GS & SS) 06/19 with mean RAQMS CO [focus on Pacific sector]

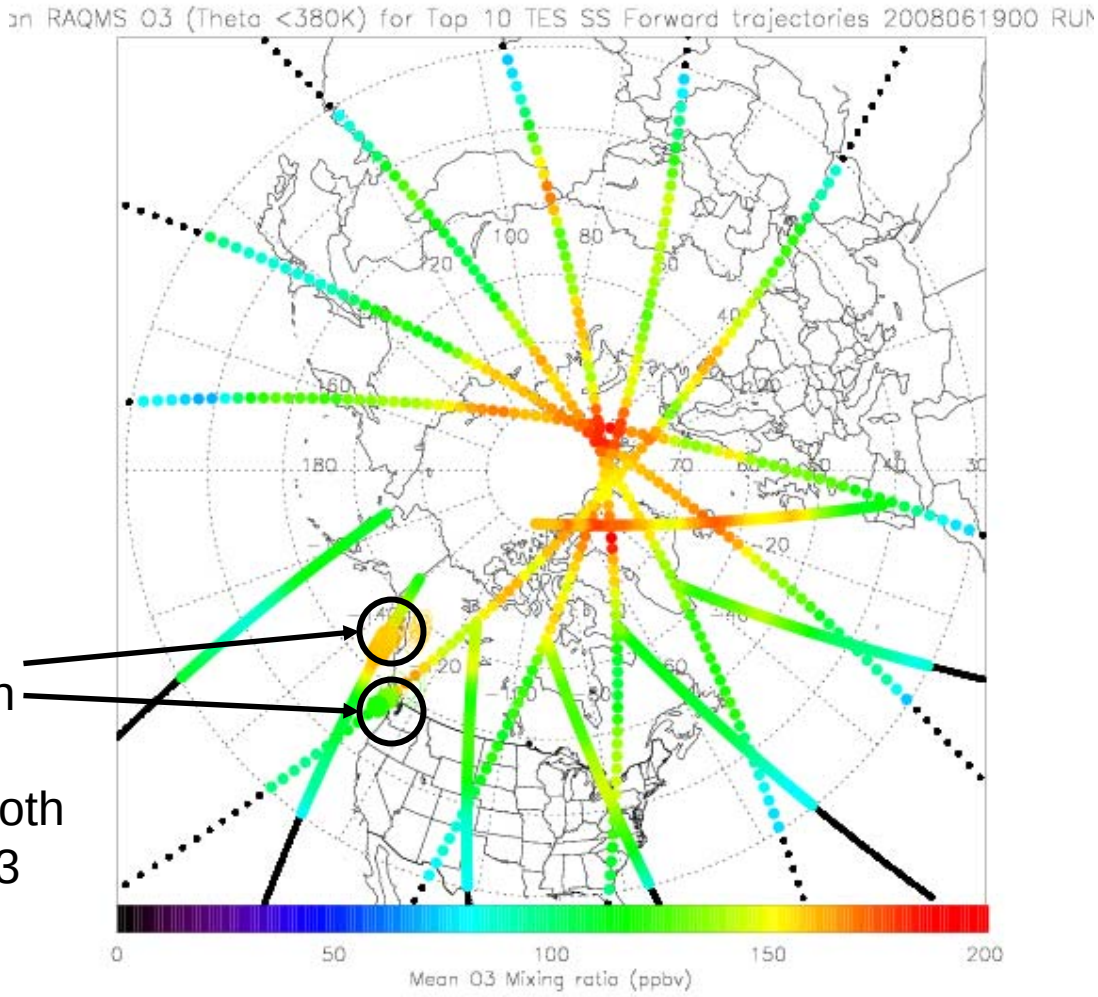
TES profiles expected to be associated with high CO



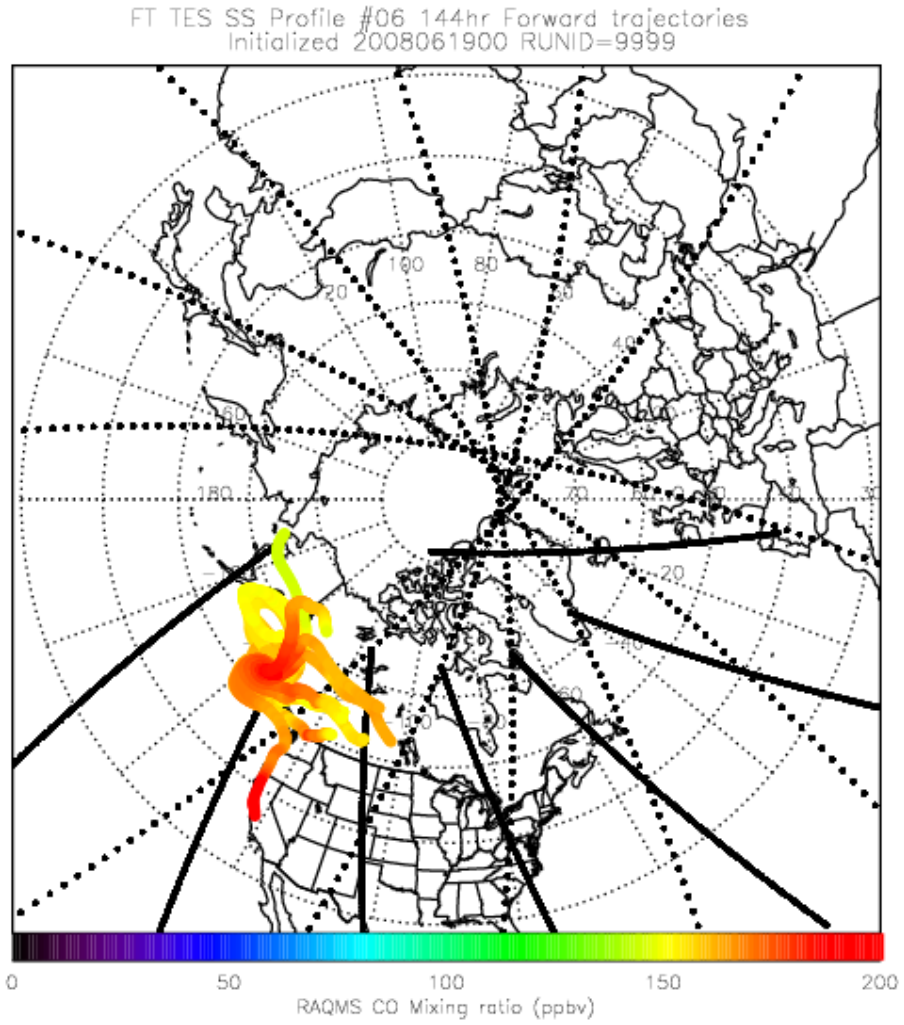

Aged Asian airmass will be near North American coast

# TES Orbits (GS & SS) 06/19 with mean RAQMS O3 [focus on Pacific sector]

Air masses with enhanced CO associated with both high and low O3

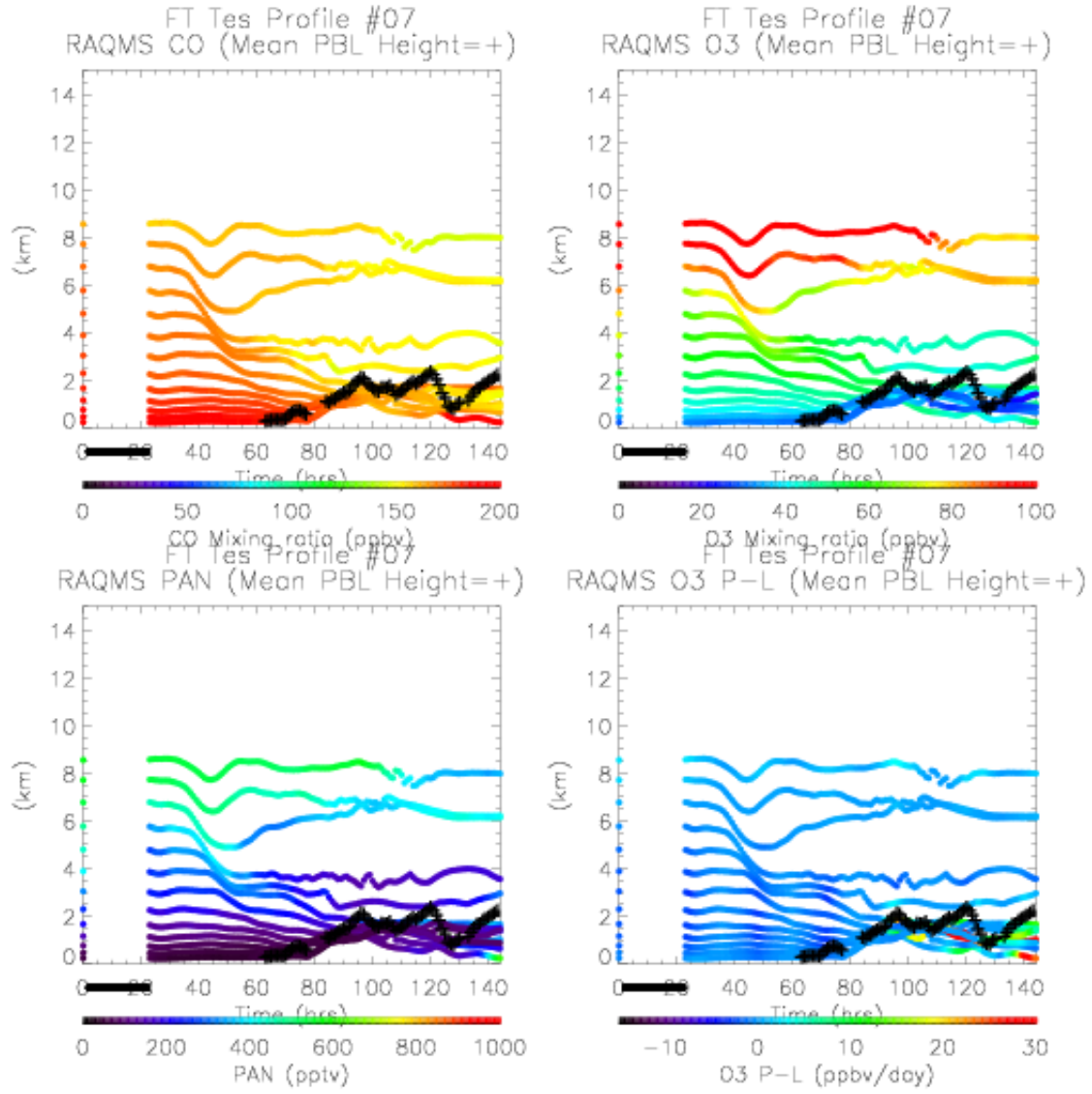


# TES SS Forward Trajectories “Profile 7” Valid 00Z 6/25
(Tuesday afternoon local time)




For the “high CO/high O3” profile:
Ongoing recirculation in aged airmass followed by wide dispersion

# Chemical evolution along “SS Profile 07” forward trajectories




Moderate enhancement in lower free trop O3, expect some entrainment into North American boundary layer (however, recall broad horizontal dispersion)

# Continued reasonable prediction of regional background O3

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.