

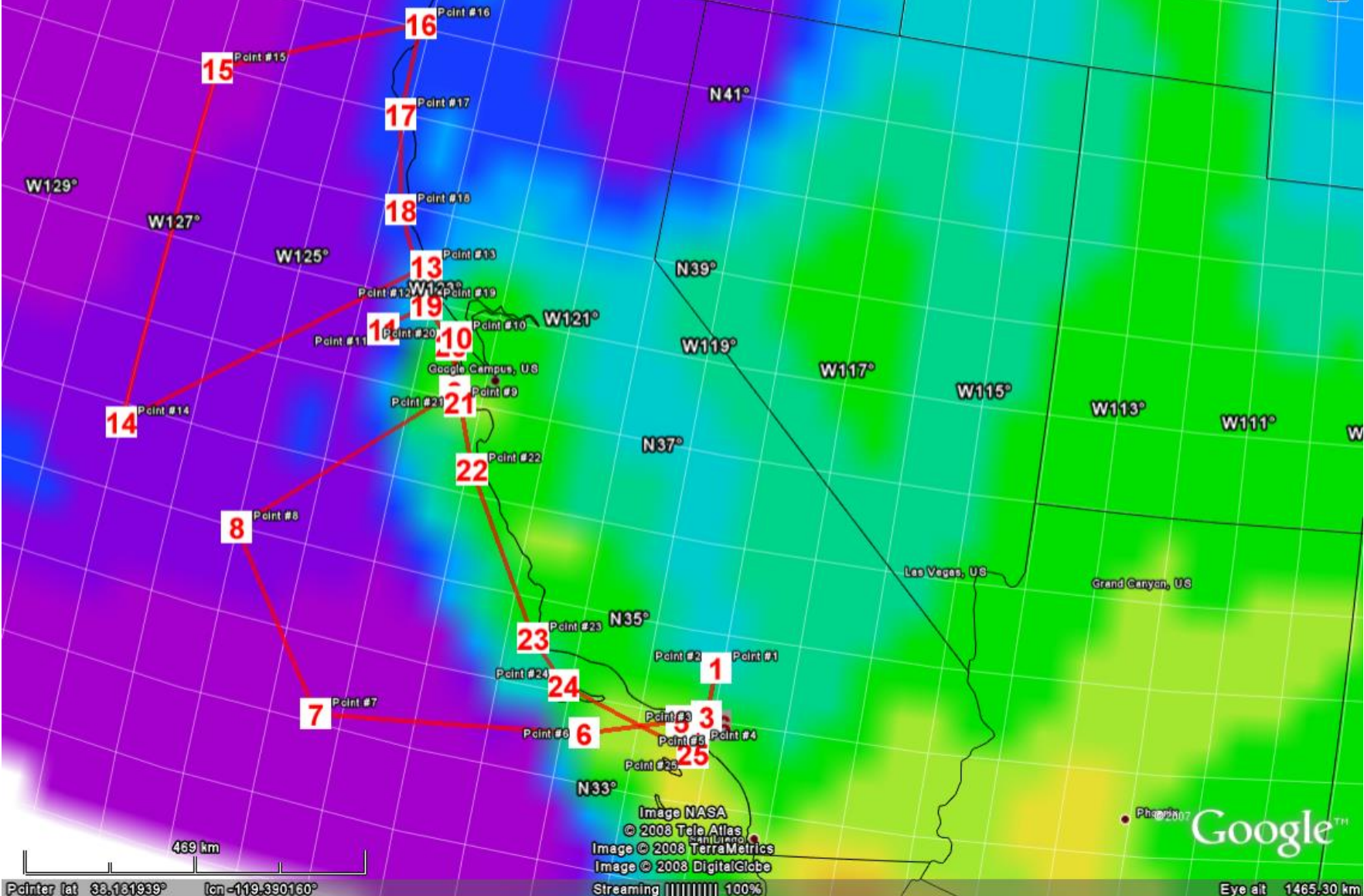
STEM Model

06-20-meeting

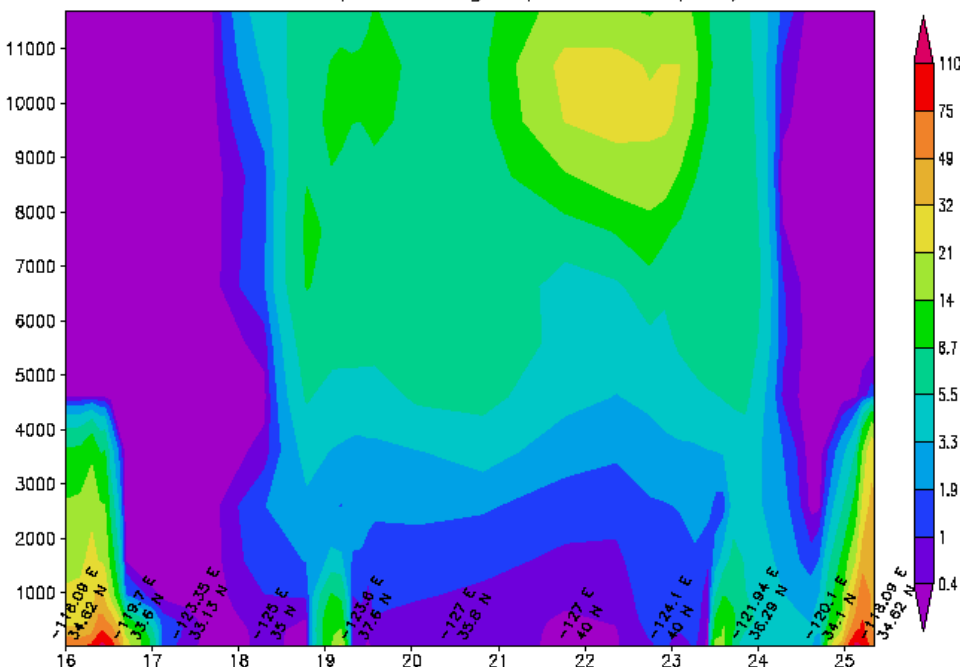


OPTION D

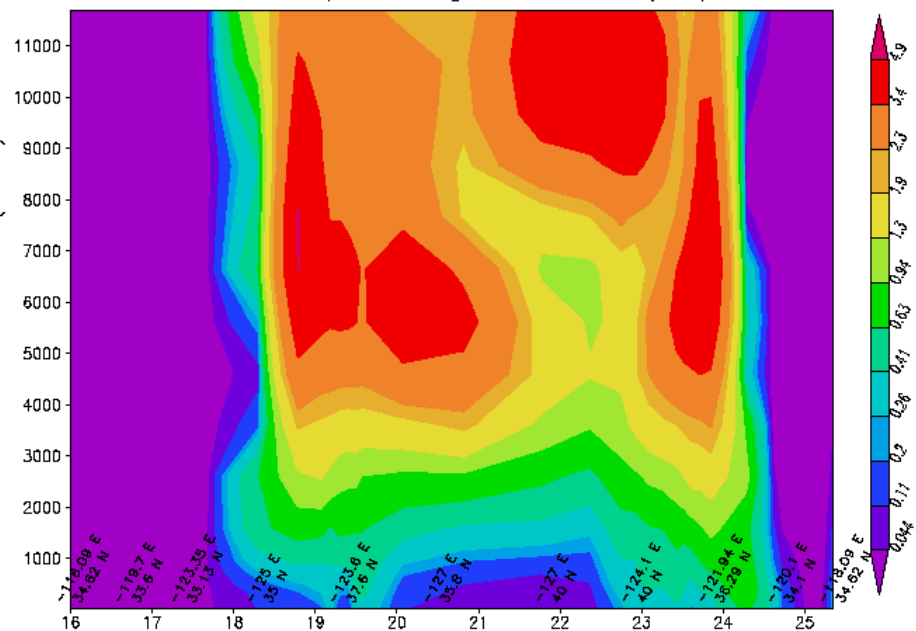
22 JUN 2008 6:00pm

A compass rose with a north arrow pointing up. Below it are navigation controls including a zoom in (+) button, a zoom out (-) button, and a reset button.

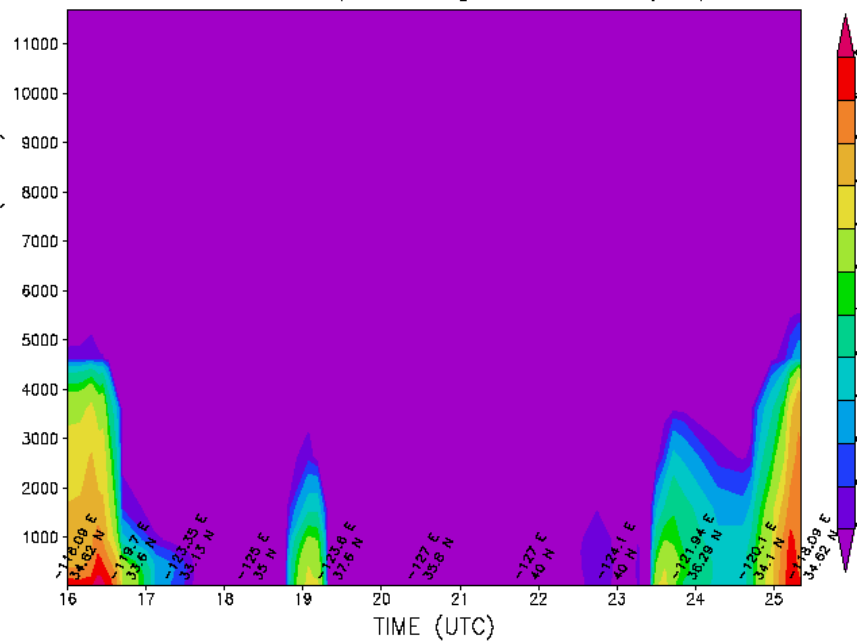
Simulated anthro CO (ppbv) along the
DC8-BouCon-OptionD Flight plan on 06/22/2008



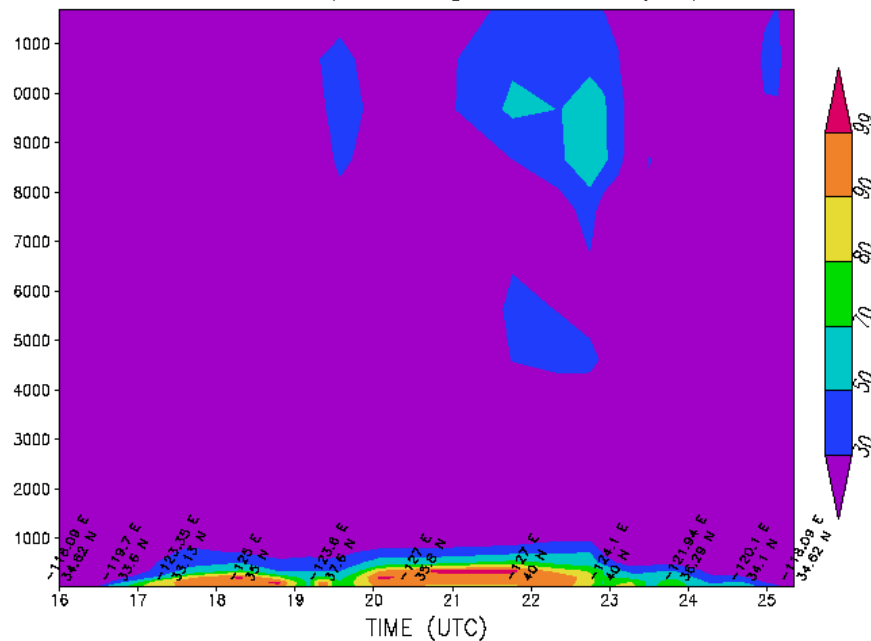
Simulated Dust ($\mu\text{g}/\text{m}^3$) along the
DC8-BouCon-OptionD Flight Path on 06/22/2008



Simulated USA CO (ppbv) along
the DC8-BouCon-OptionD Flight Path on 06/22/2008

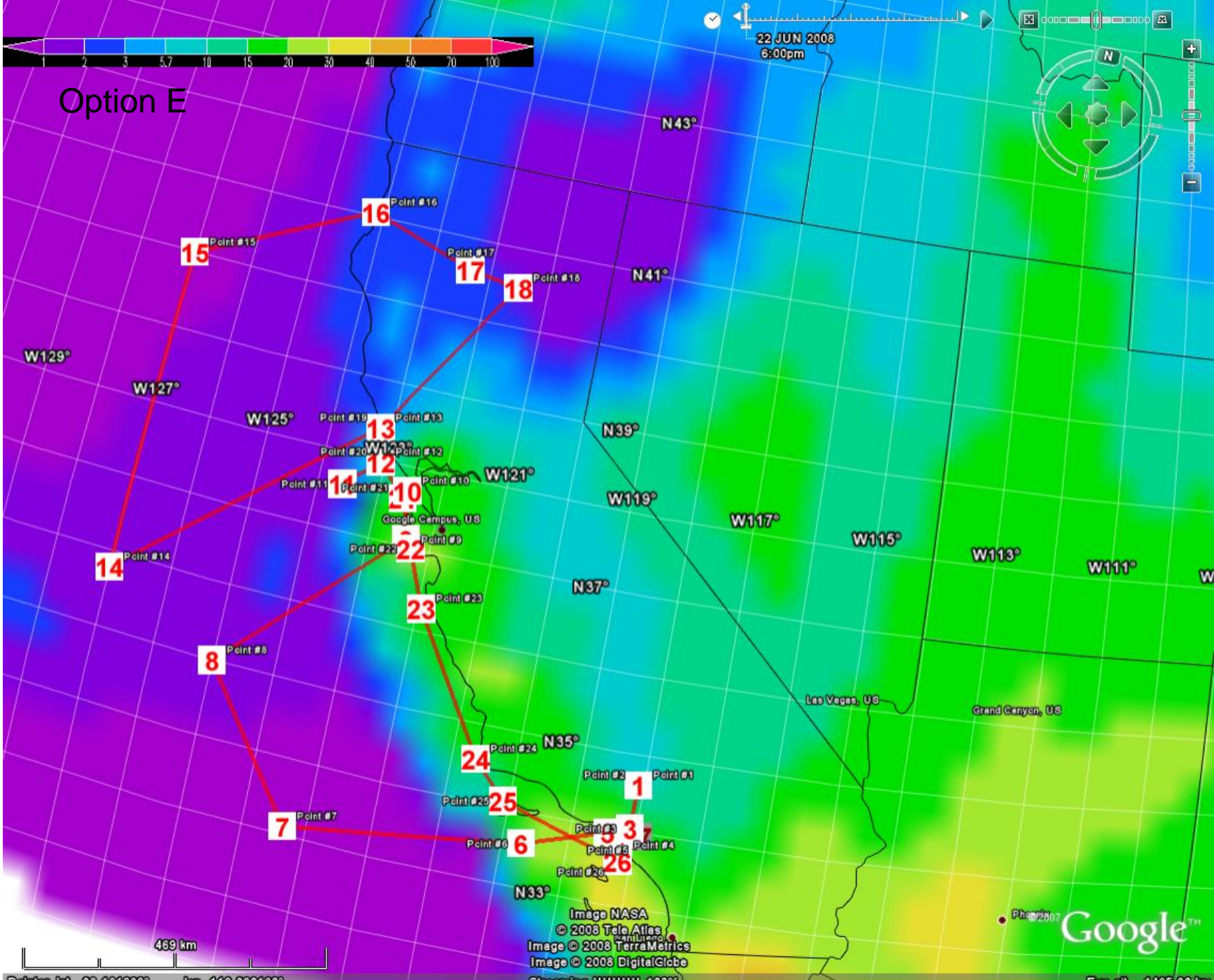


Simulated Relative Humidity(%) along
the DC8-BouCon-OptionD Flight Path on 06/22/2008

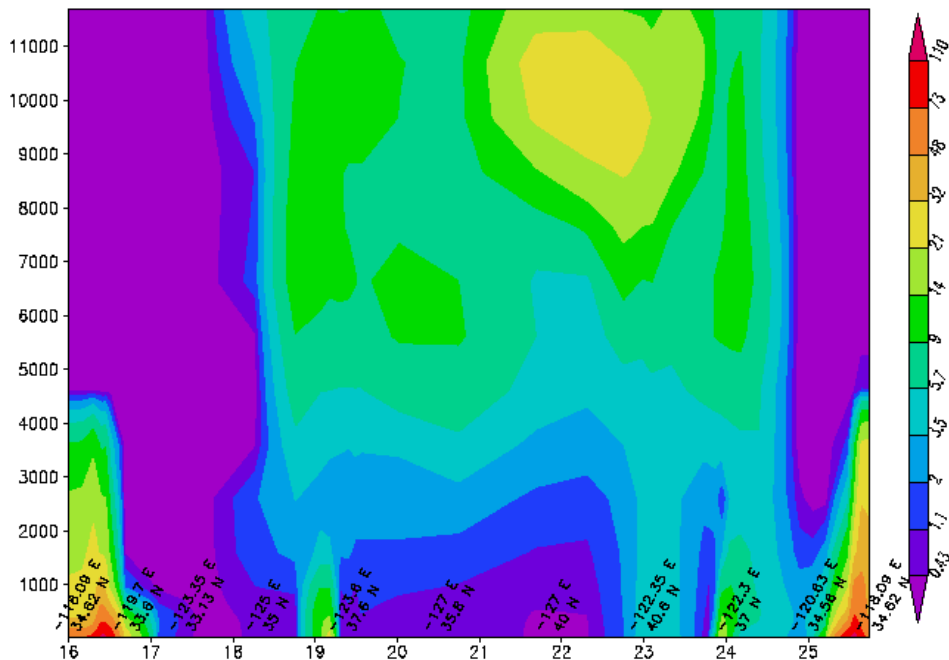




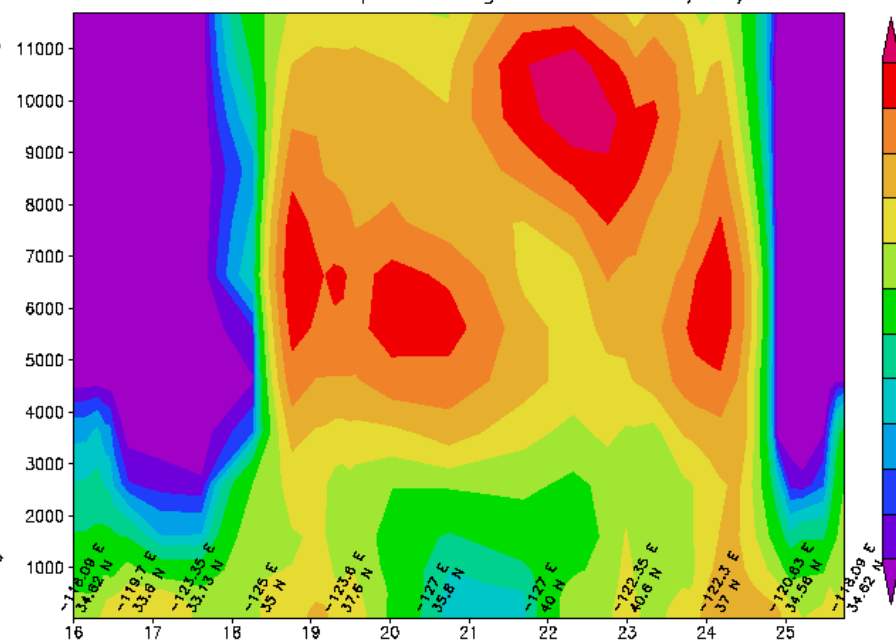
Option E



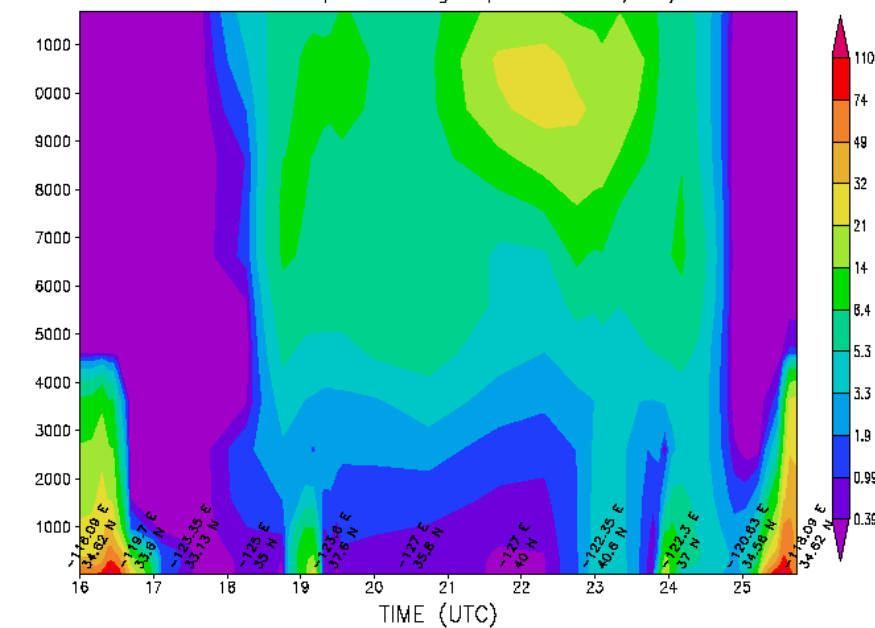
Simulated total CO (ppbv) along the
DC8-BouCon-OptionE Flight plan on 06/22/2008



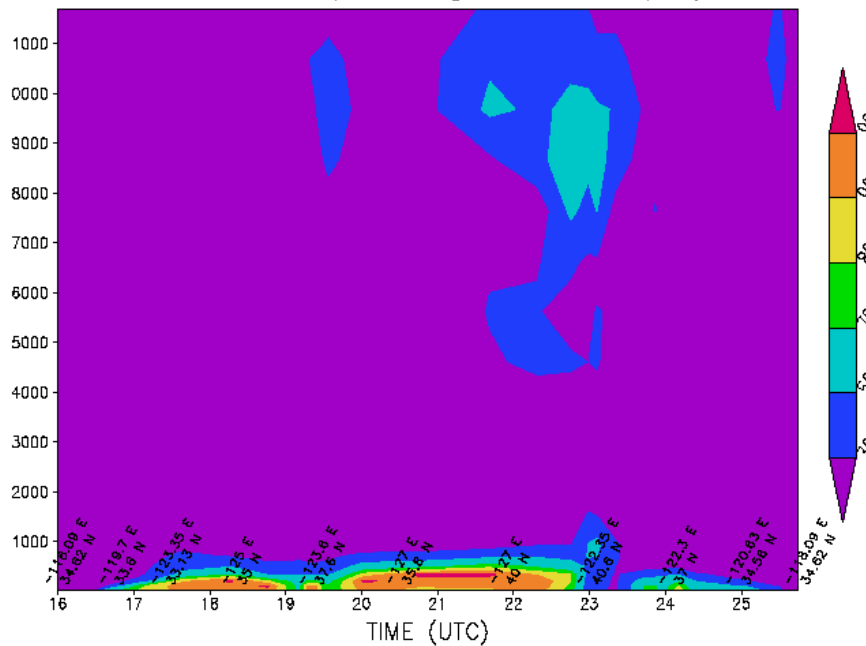
Simulated Total Sulfate ($\mu\text{g}/\text{m}^3$) along
the DC8-BouCon-OptionE Flight Path on 06/22/2008

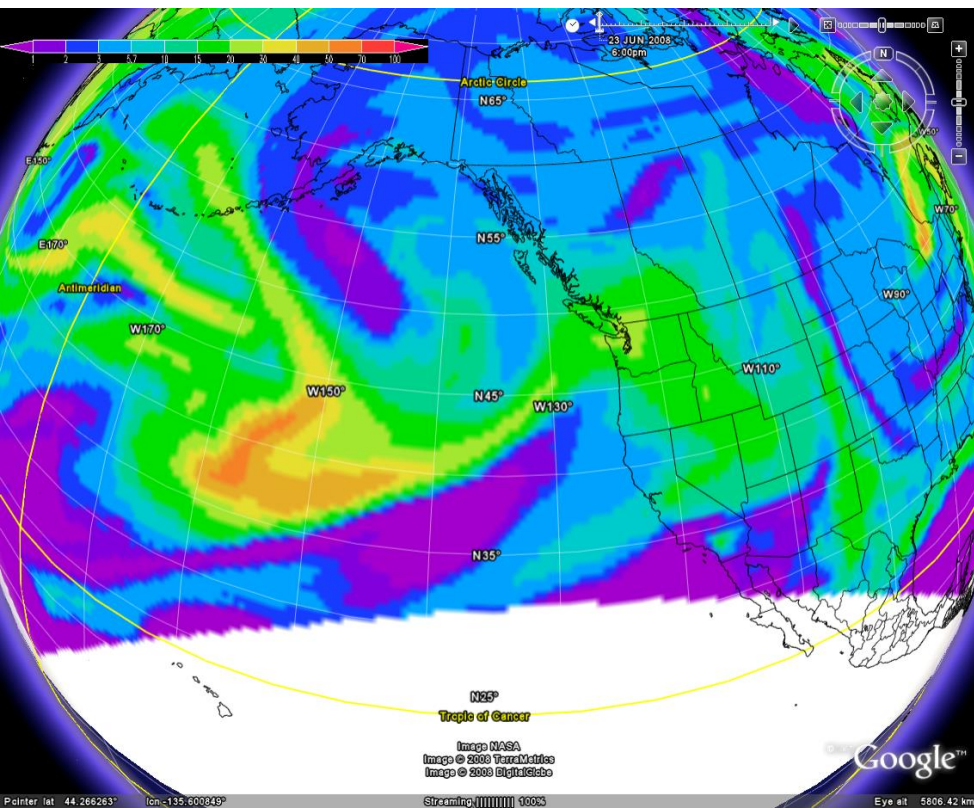


Simulated anthro CO (ppbv) along the
DC8-BouCon-OptionE Flight plan on 06/22/2008

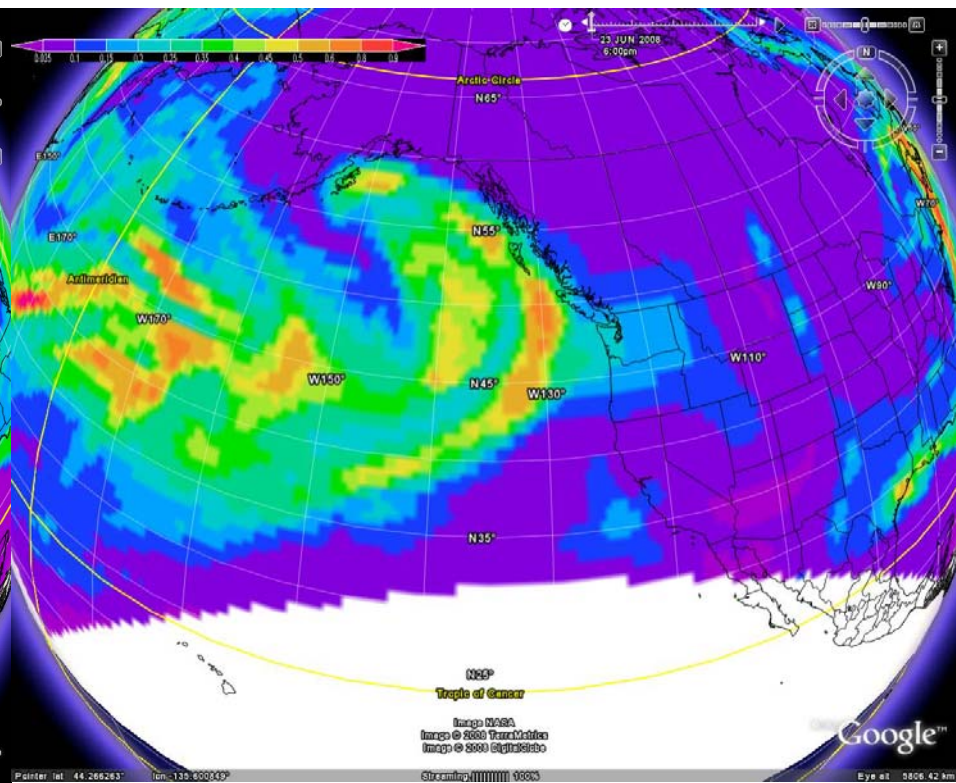


Simulated Relative Humidity(%) along
the DC8-BouCon-OptionE Flight Path on 06/22/2008

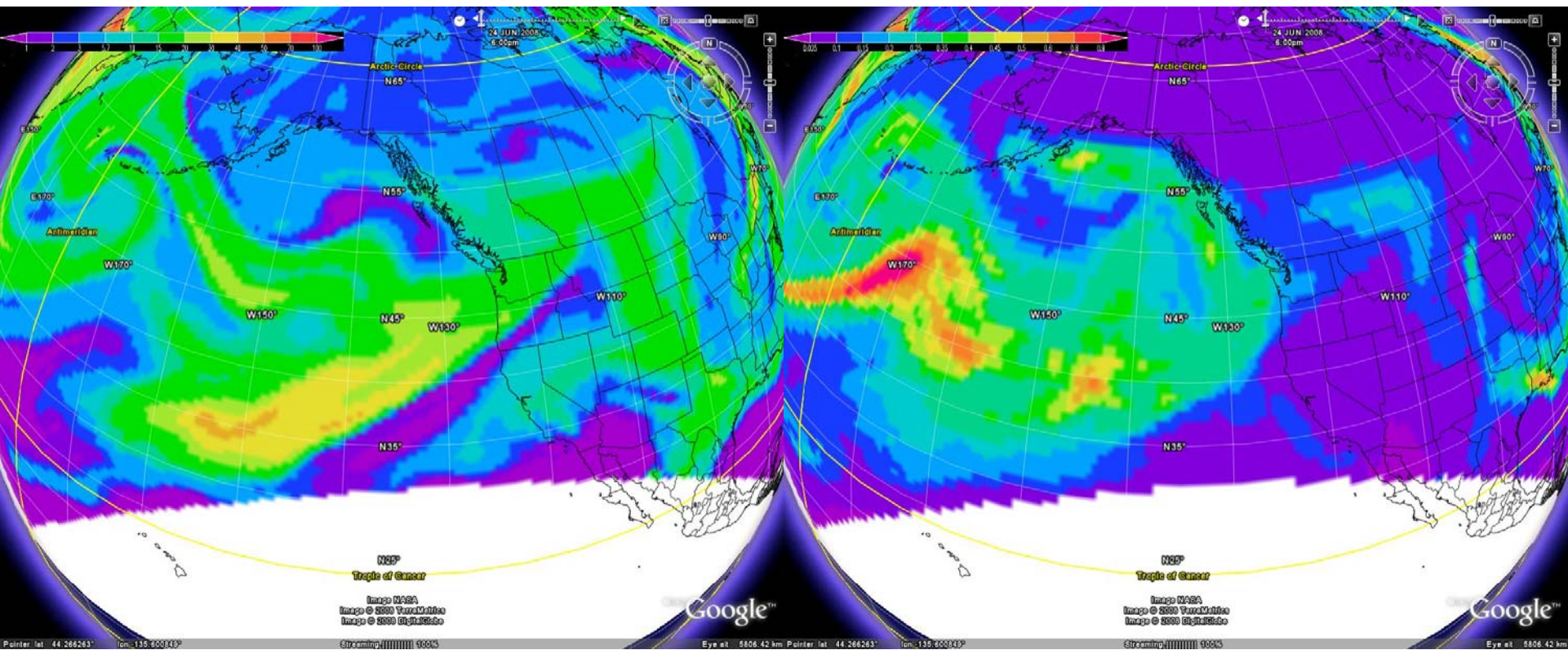




CO, 18Z, 23rd



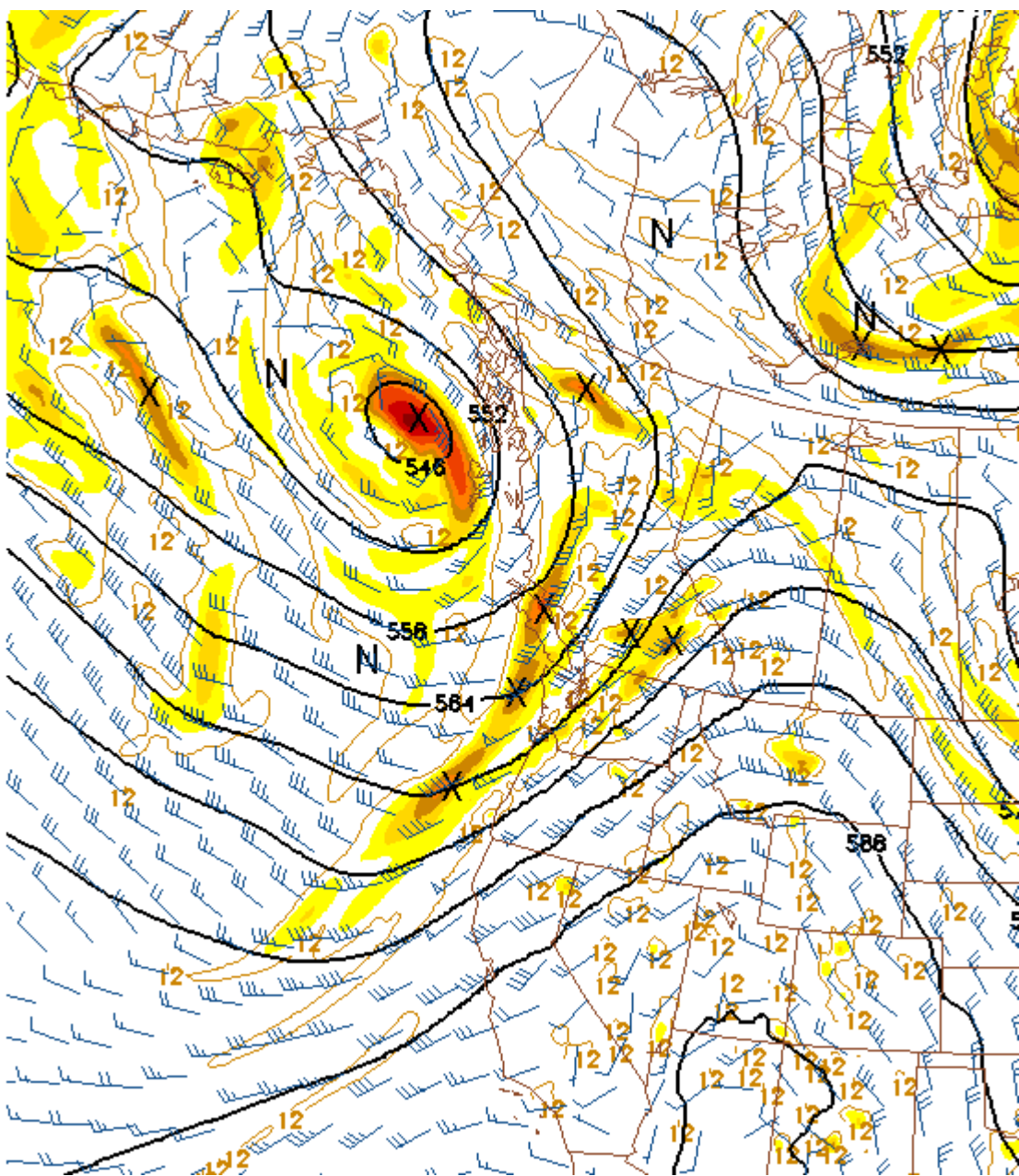
AOD 18Z, 23rd



CO, 5.5 km, 18Z, 24th June

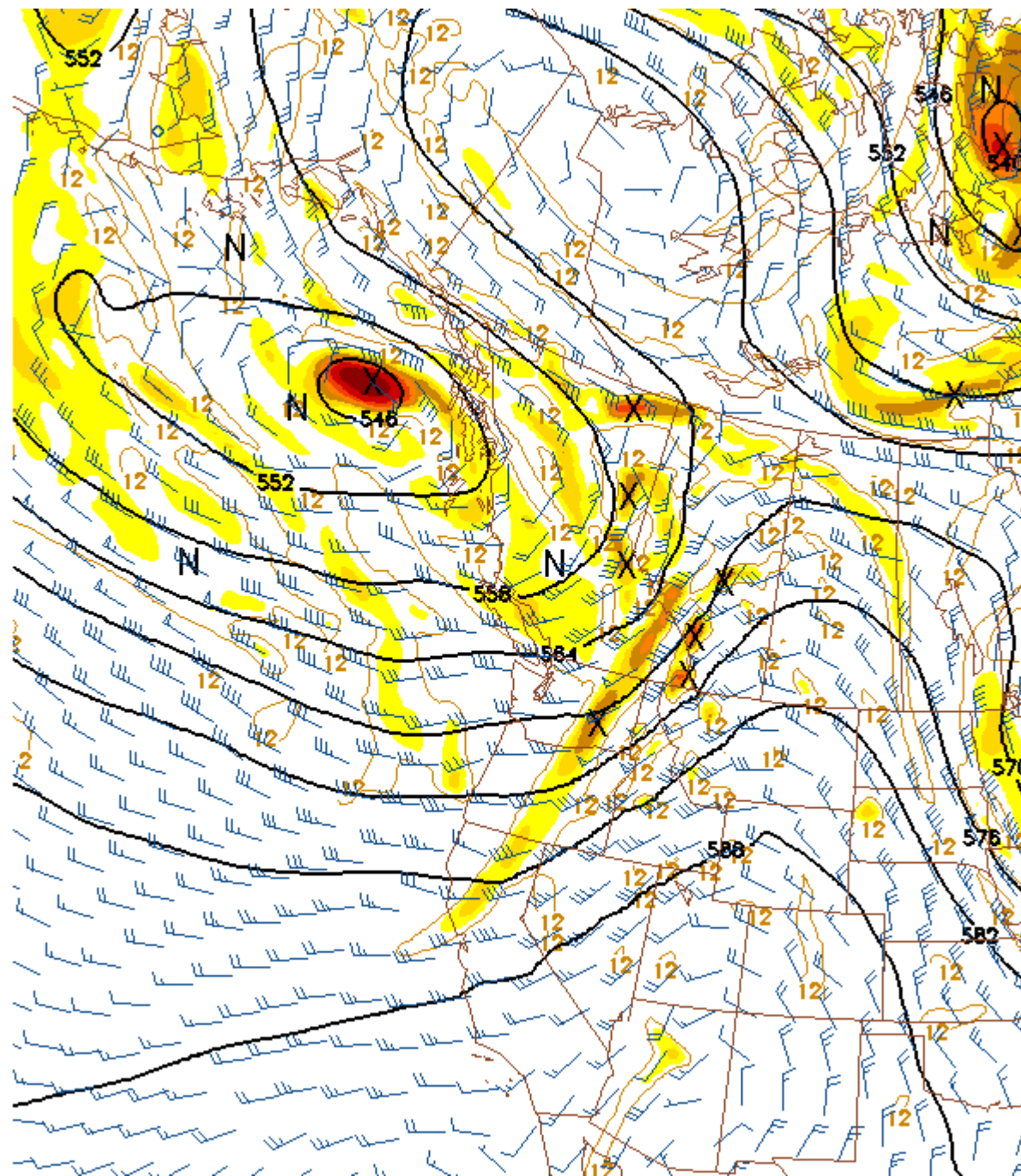
AOD, 18Z, 24th June

12Z WRF Run
Valid for 00Z Sunday
(Saturday Night)



12Z WRF

Valid for 12Z Sunday

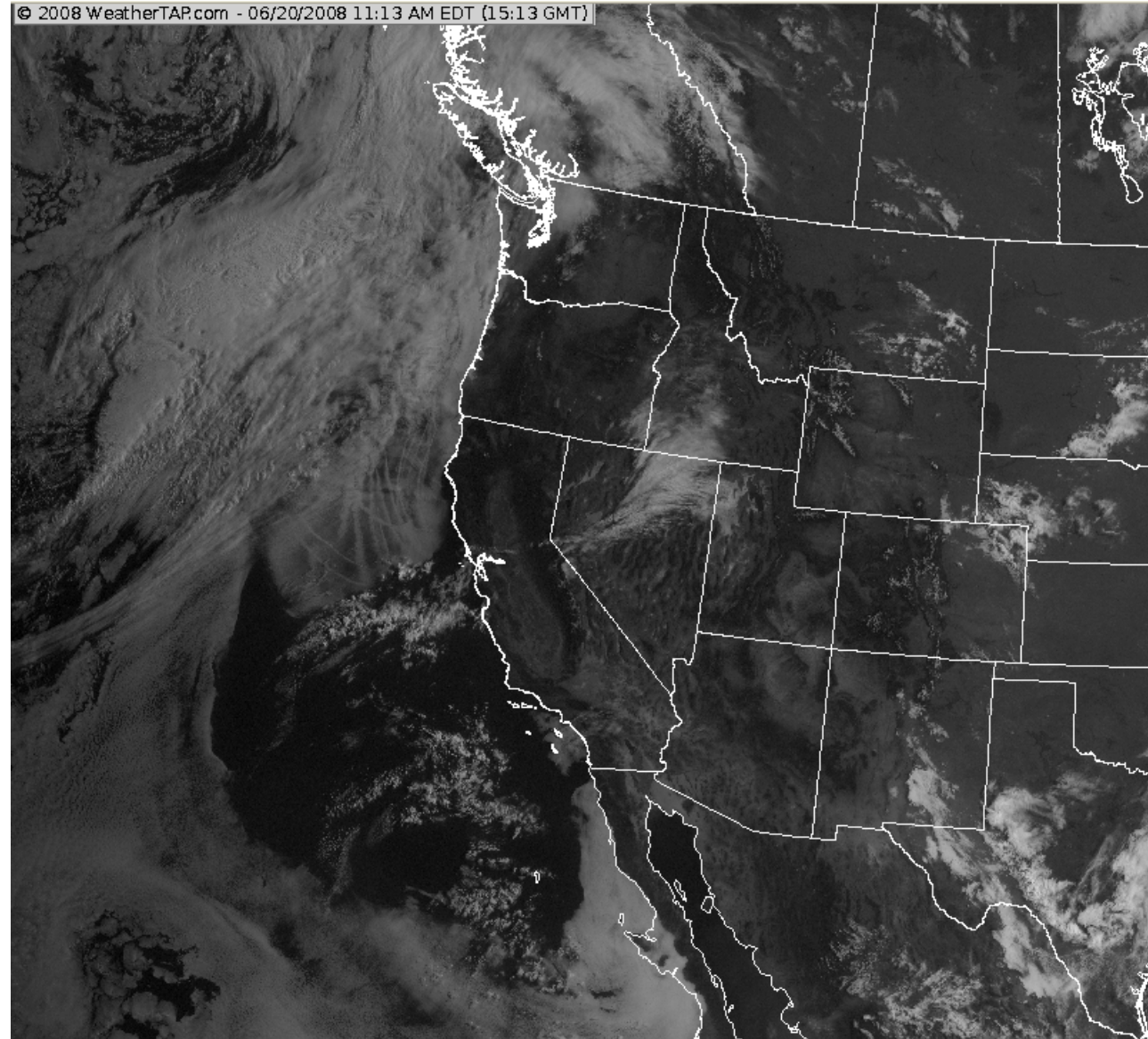


GOES Visible Satellite

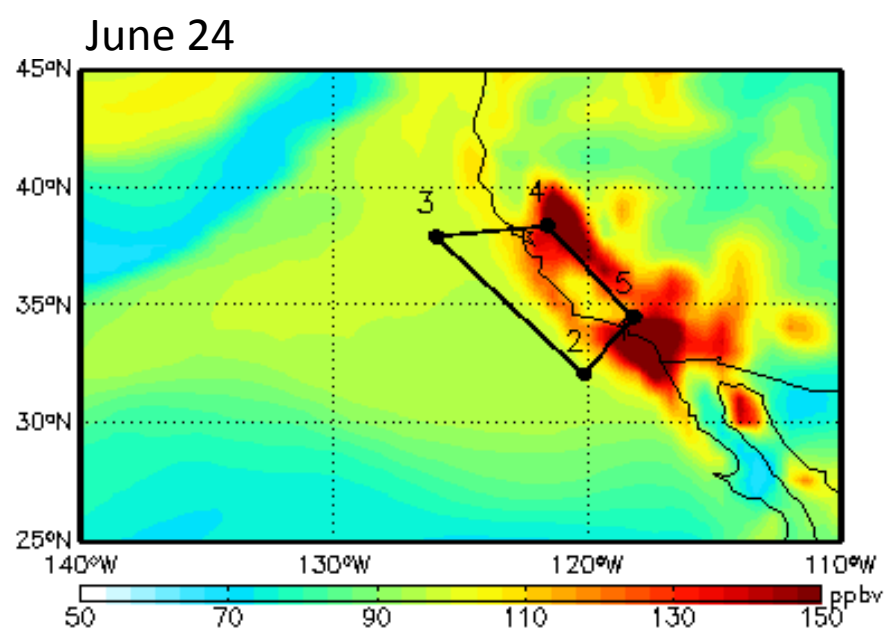
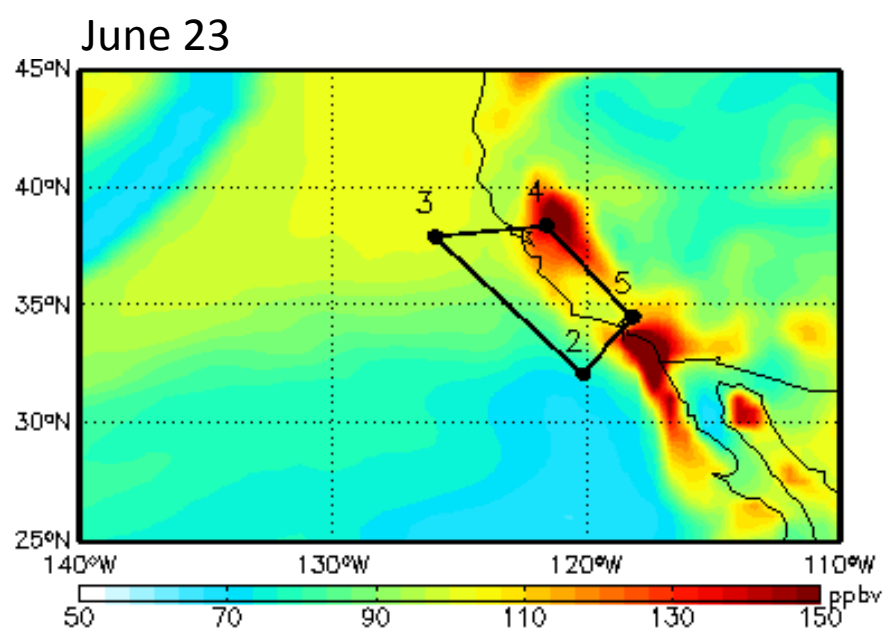
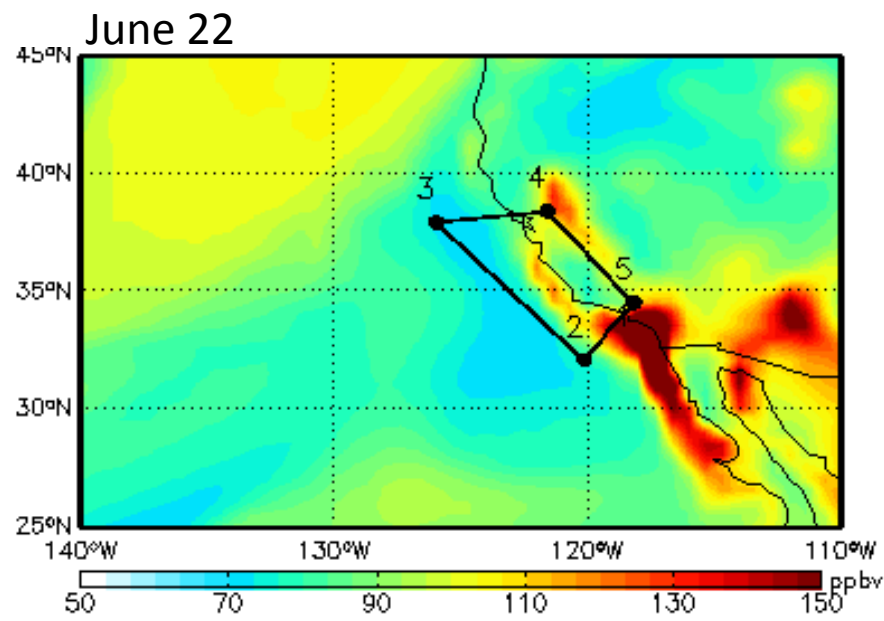
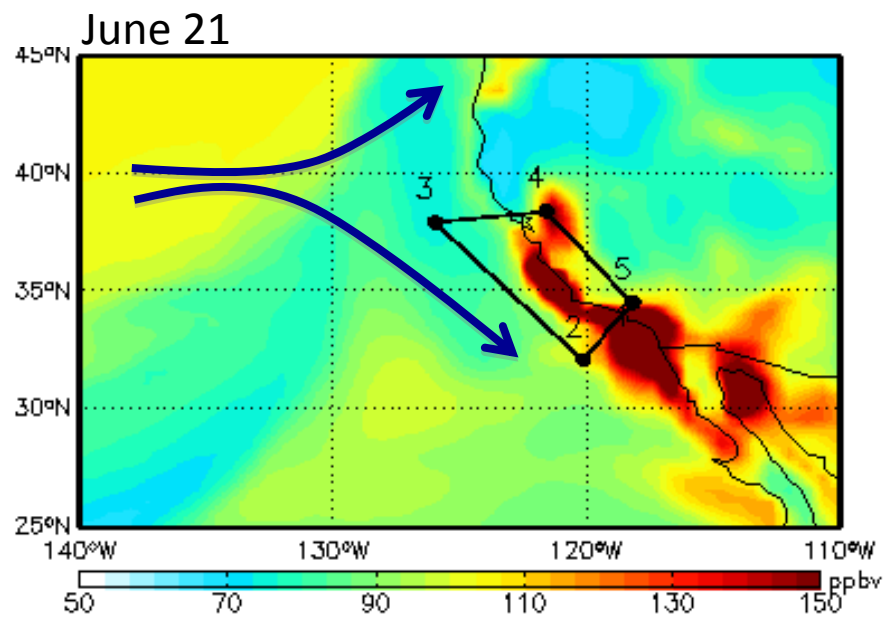
15Z this morning

Note the ship tracks off
the northern coast

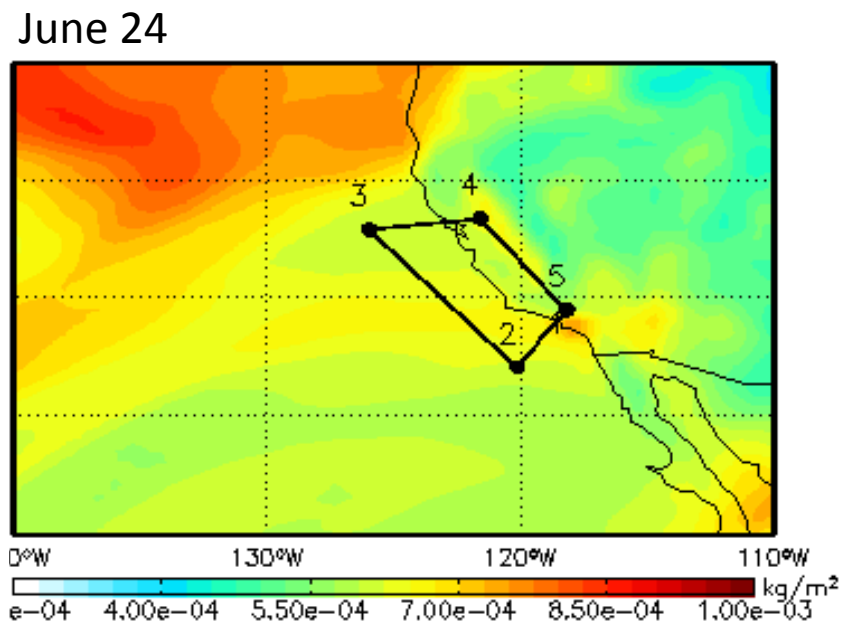
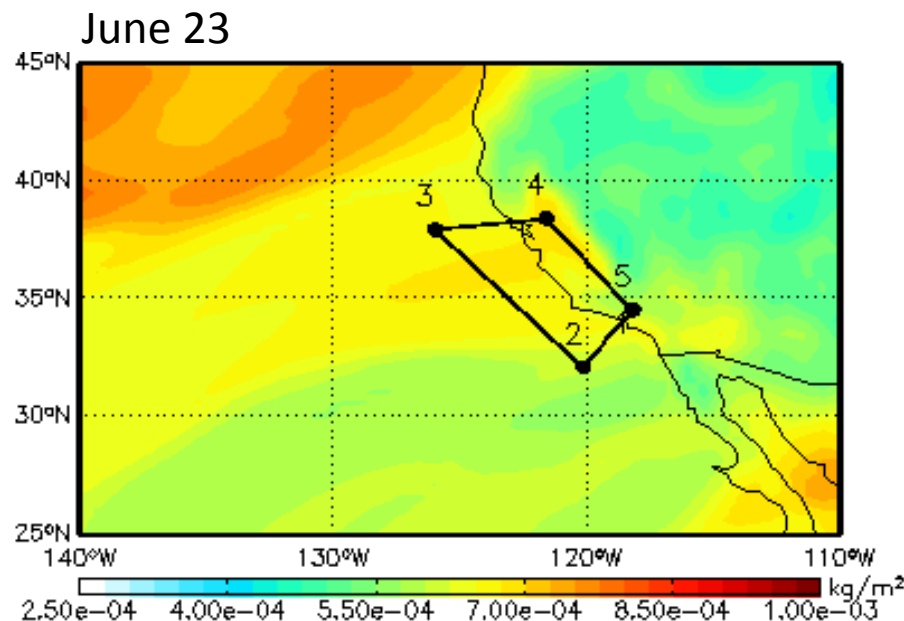
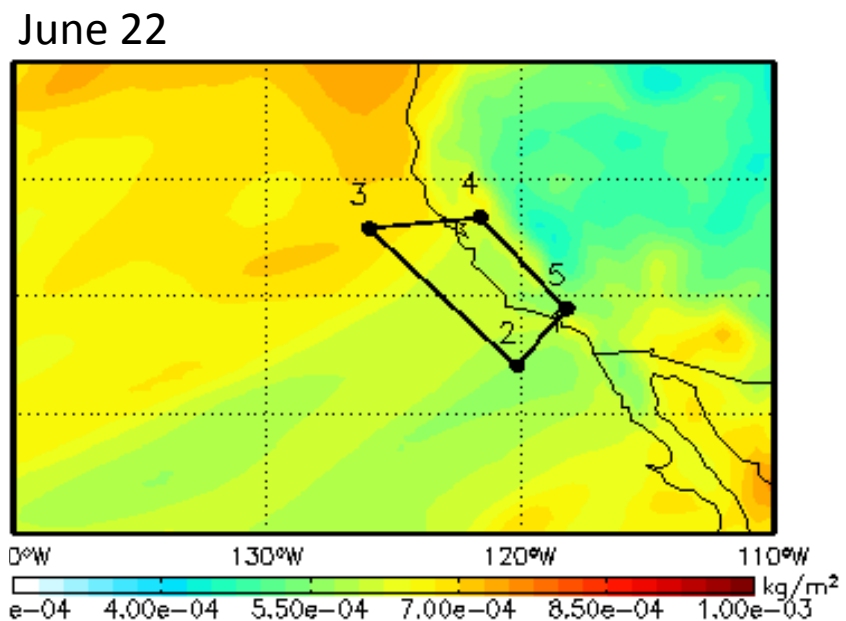
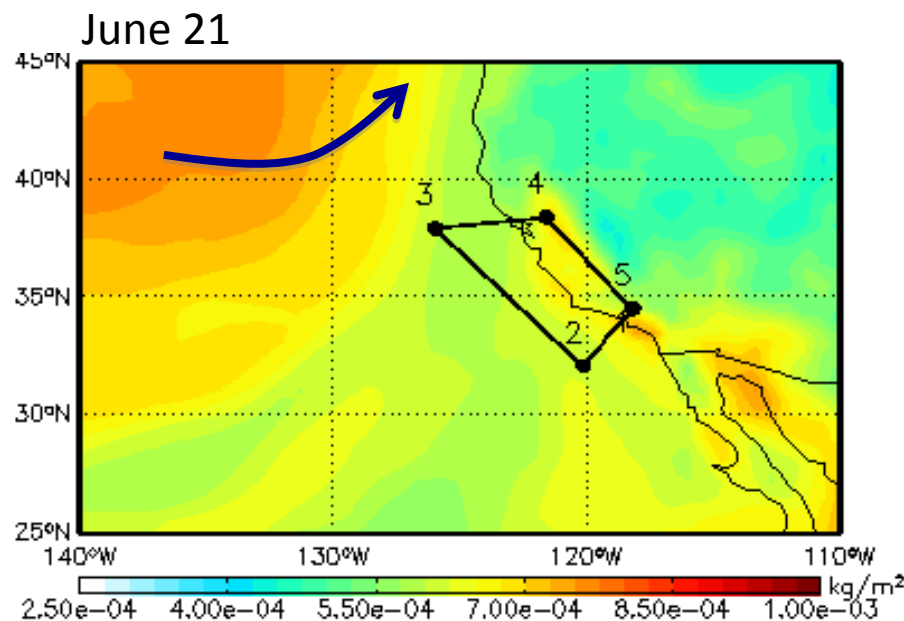
To the west of that, the
current weather system
is breaking up the stratus
behind it.



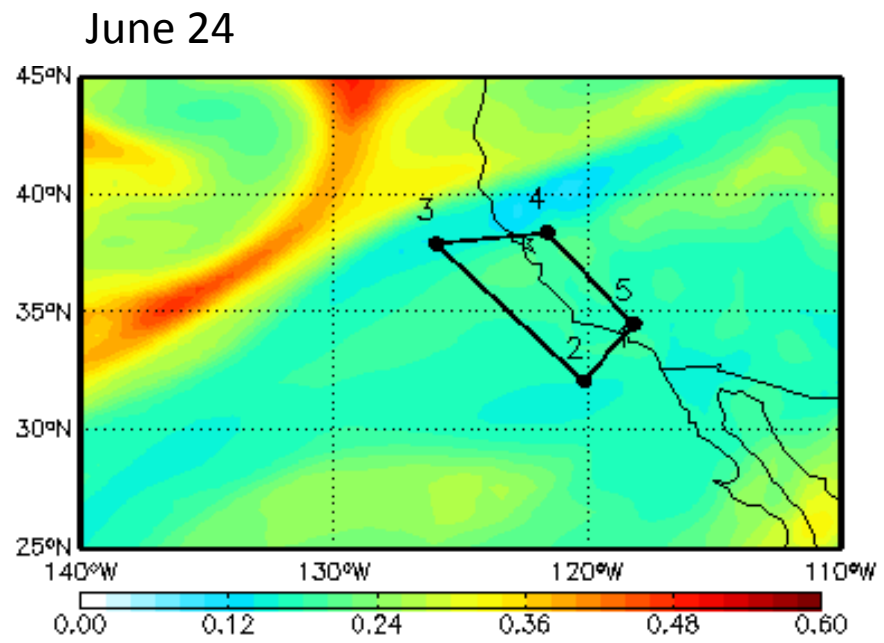
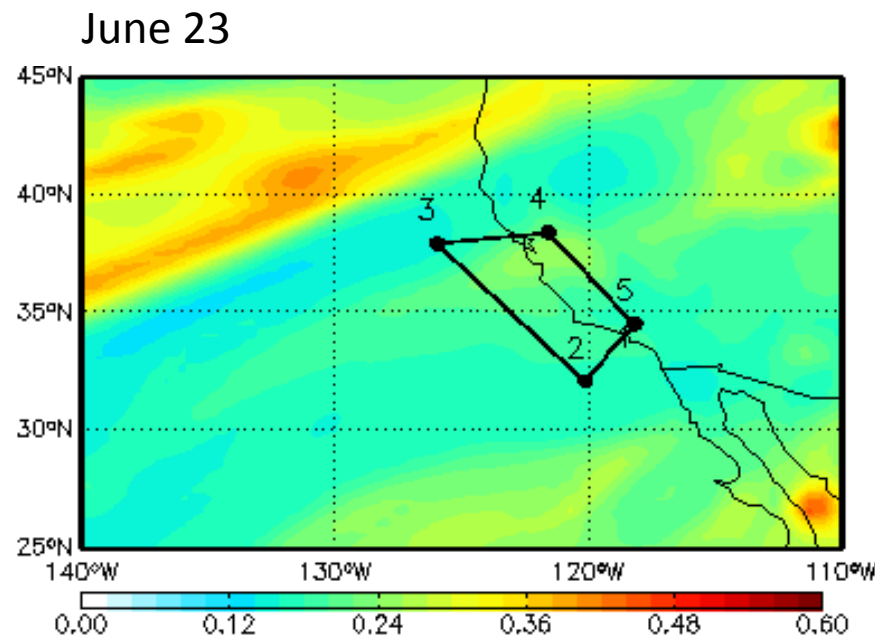
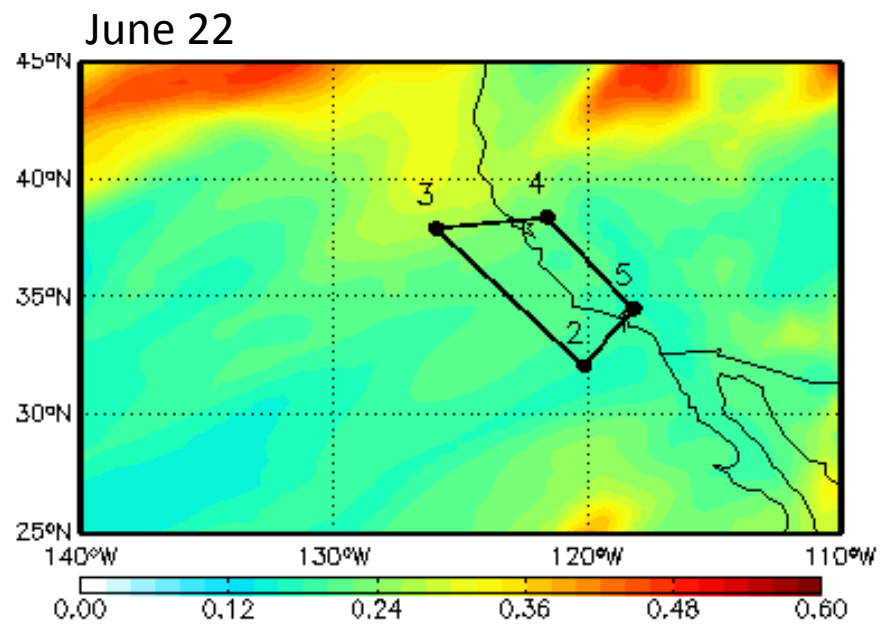
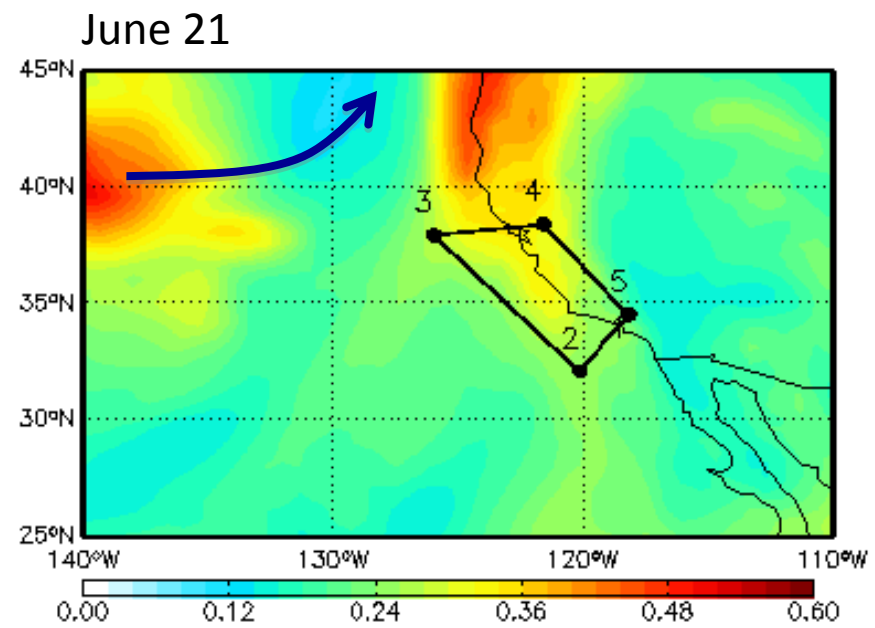
GEOS-5 Outlook: Surface CO at 19:30Z



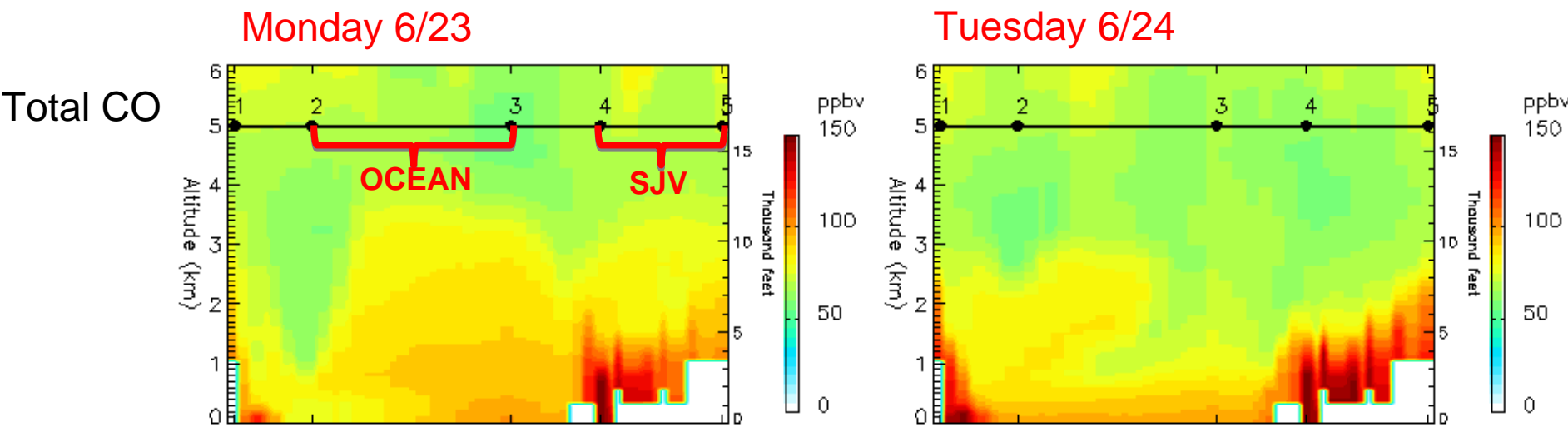
GEOS-5 Outlook: Total Column CO at 19:30Z



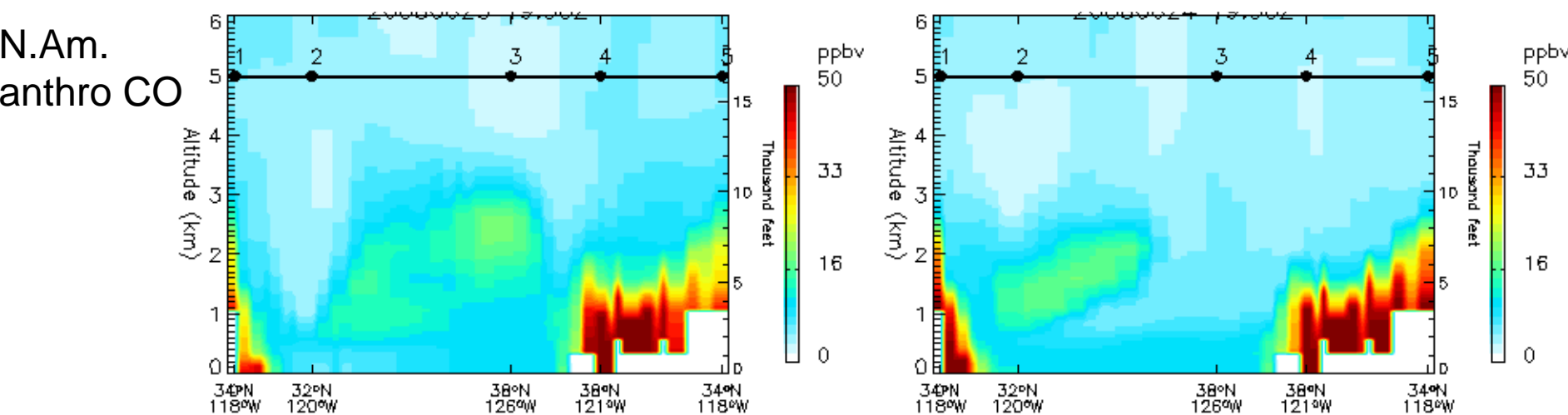
GEOS-5 Outlook: Total AOT at 19:30Z



Not much difference in CO between Monday and Tuesday



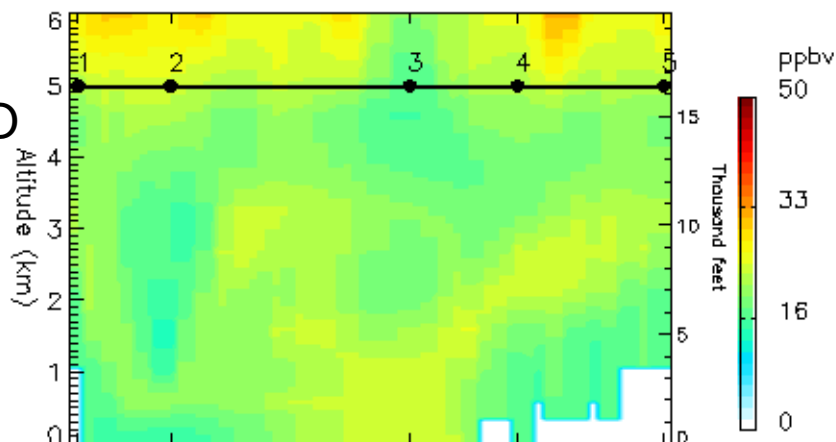
North American contribution is mostly over land on both days



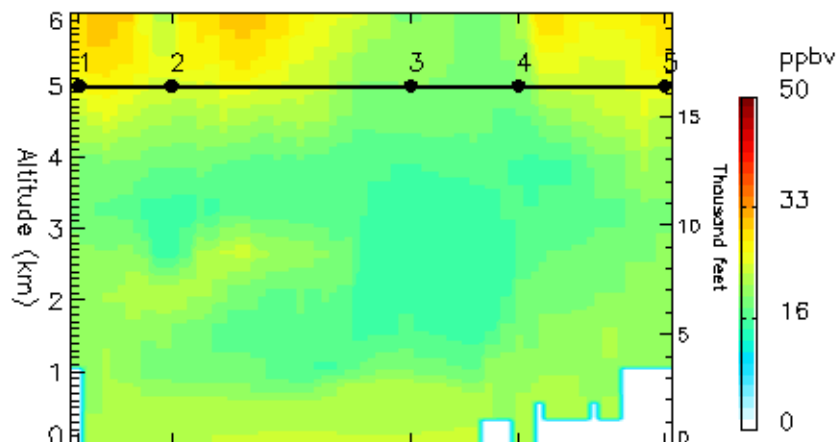
Some Asian contribution aloft (above 6 km) over entire domain

Monday 6/23

Asian
anthro CO

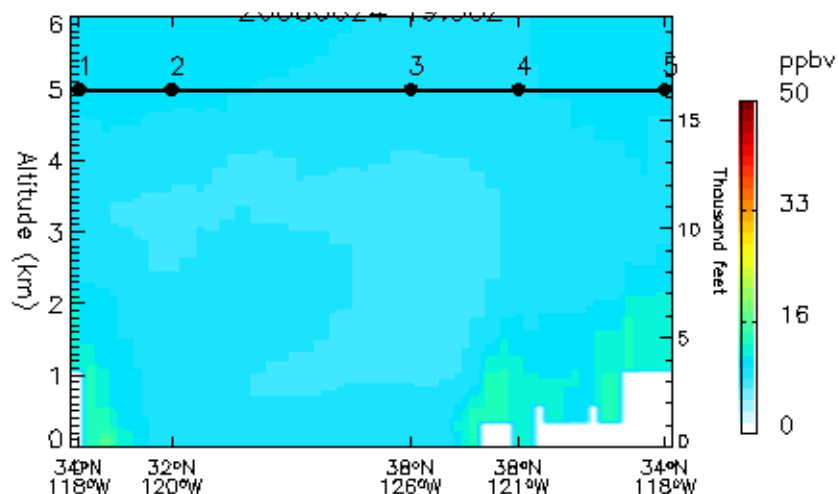
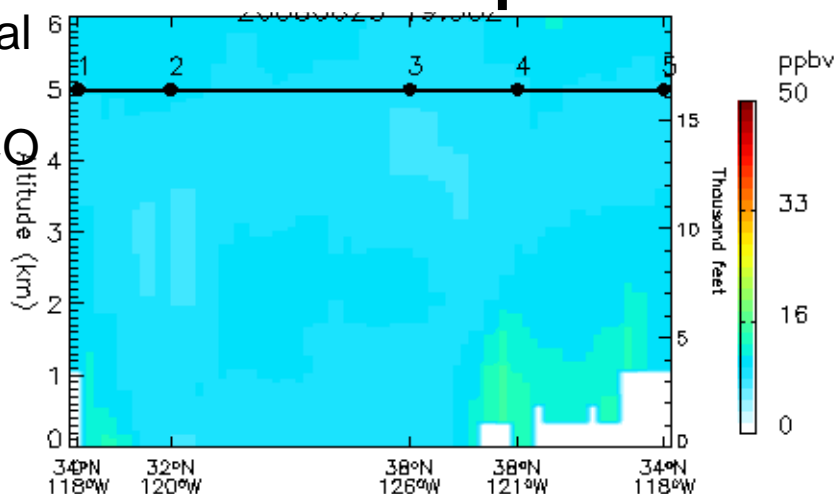


Tuesday 6/24



CO from California fires is negligible (less than 20 ppb) and collocated with N. Am. pollution

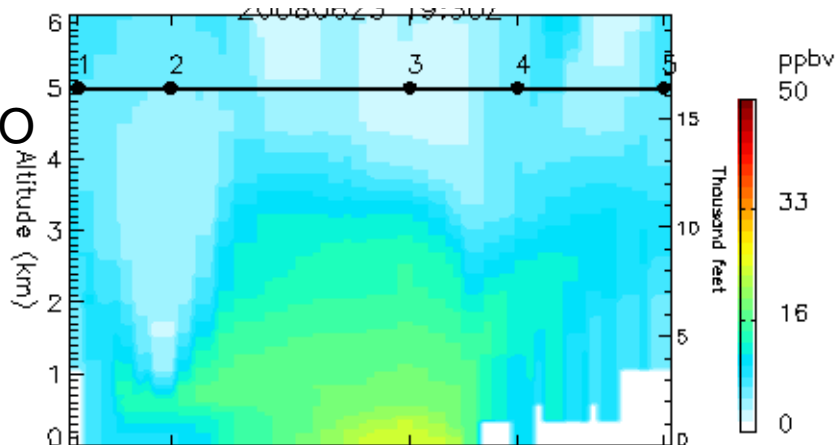
Non-boreal
biomass
burning CO



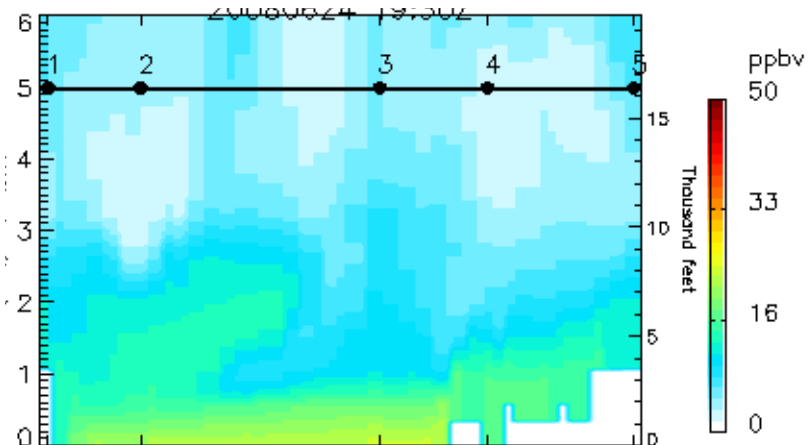
Some boreal biomass CO from fires in Siberia near surface

Monday 6/23

Boreal
Biomass CO

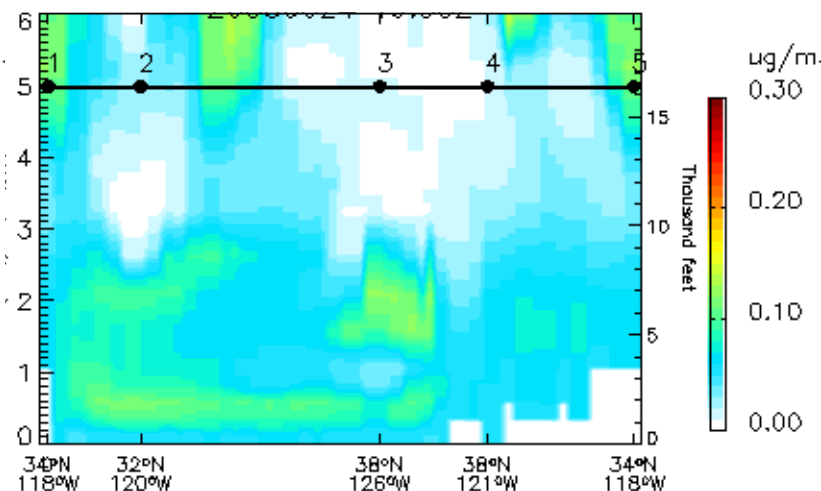
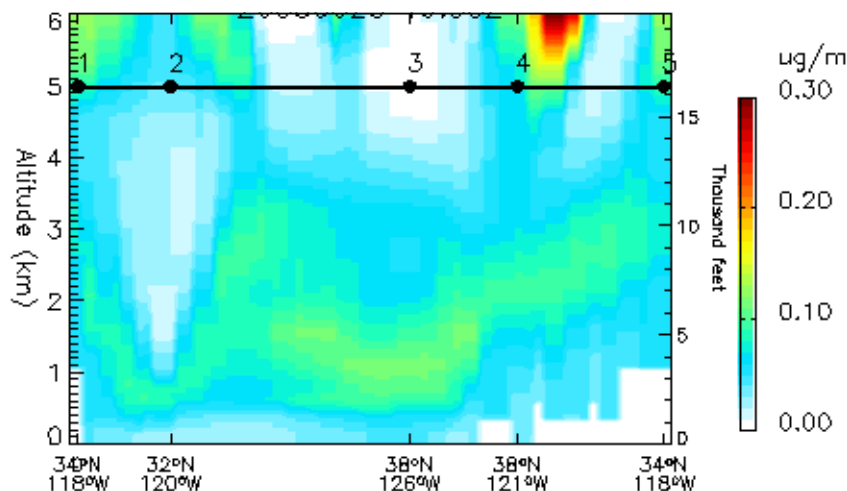


Tuesday 6/24



Some boreal biomass OC aloft

Boreal
biomass
burning
organic
carbon

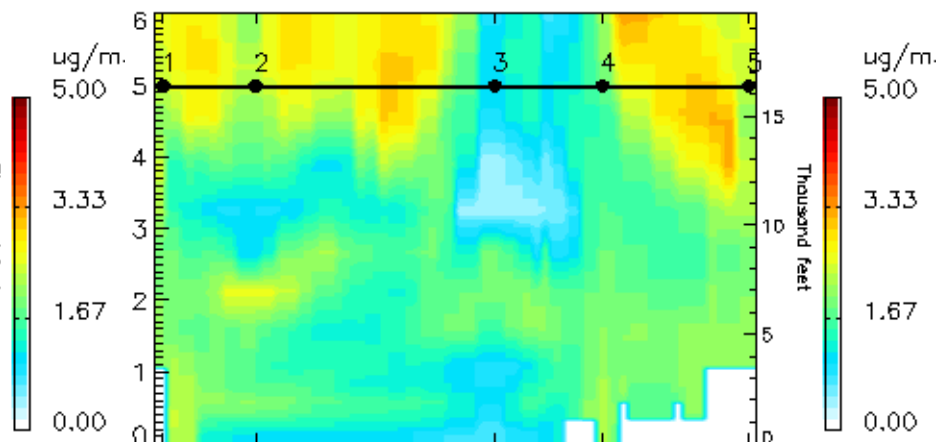
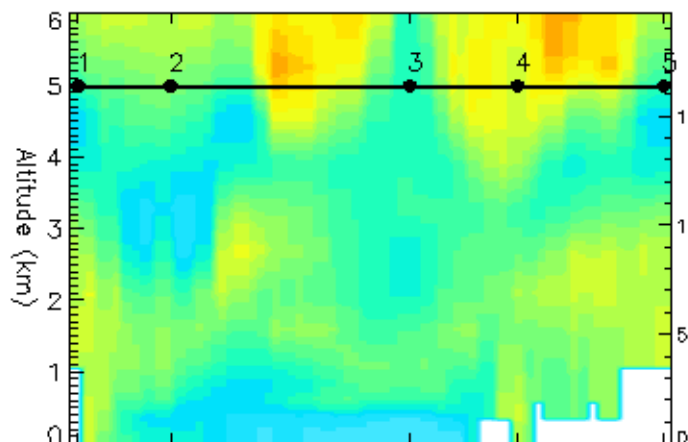


Some sulfate associated with N.Am. and Asian pollution

Monday 6/23

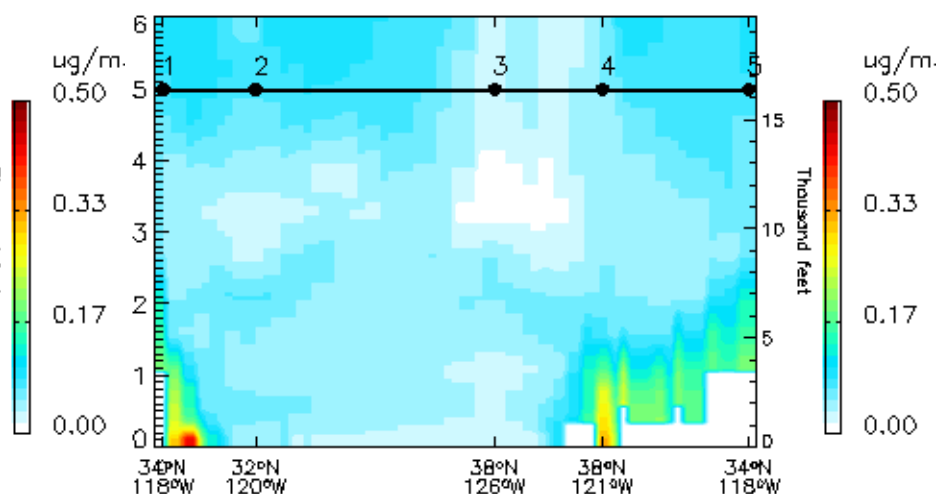
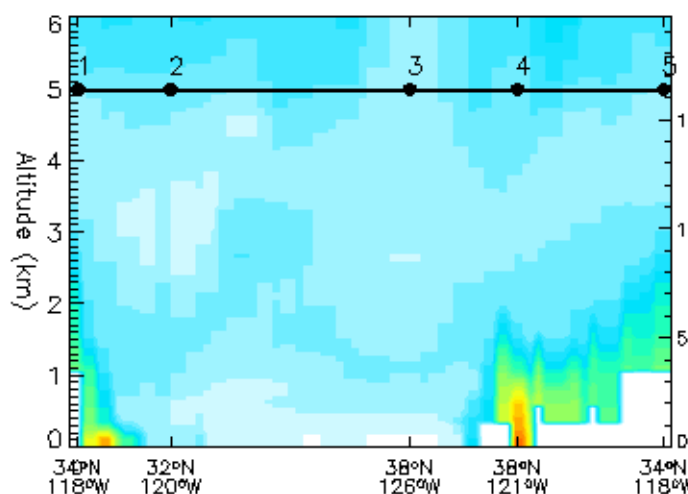
Tuesday 6/24

Sulfate
aerosol



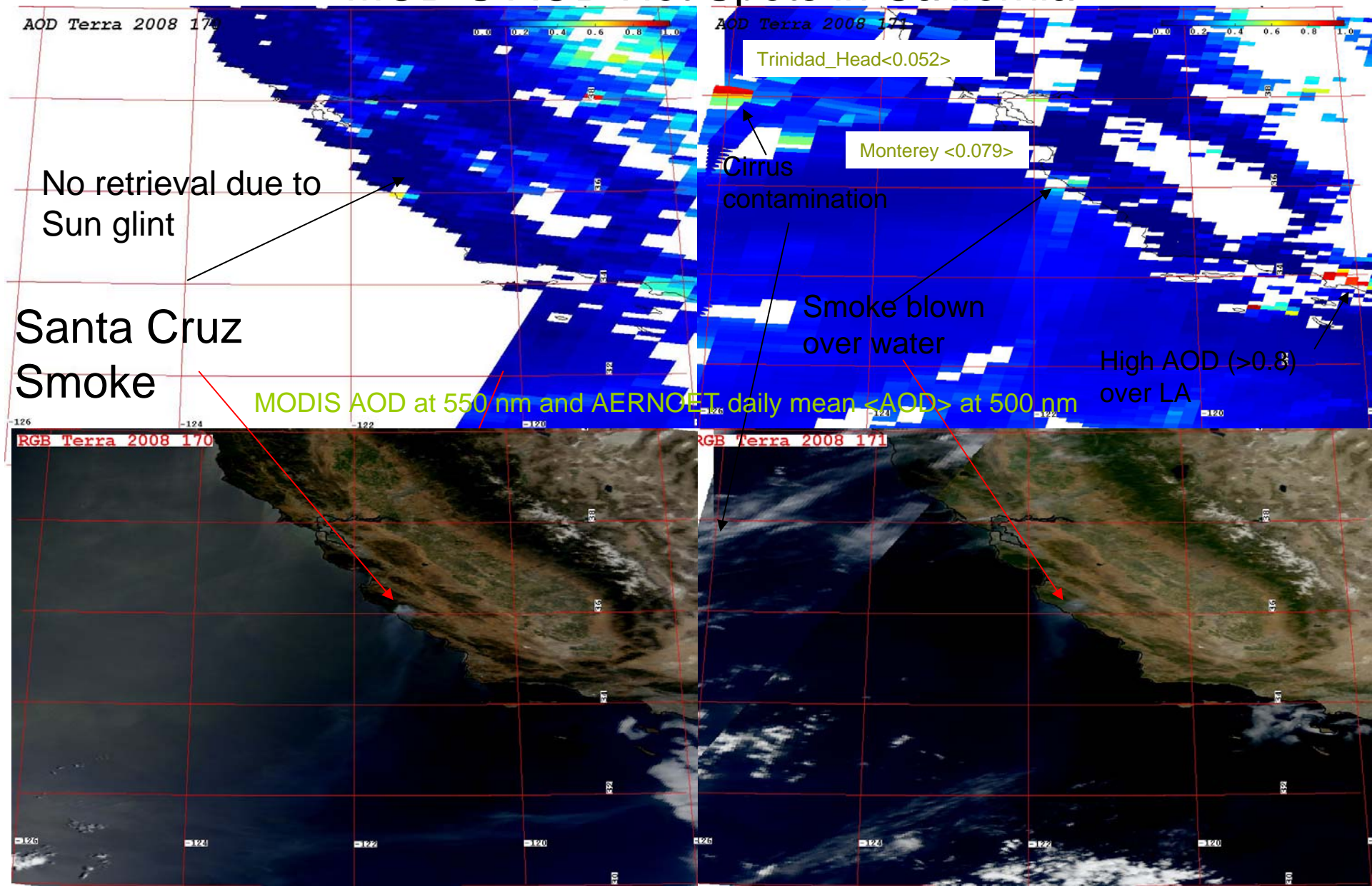
Some black carbon associated with N.Am. pollution

Black
carbon
aerosol



Day 170 & 171 (June 18 & 19) Wed. (Left) and Thu. (Right)

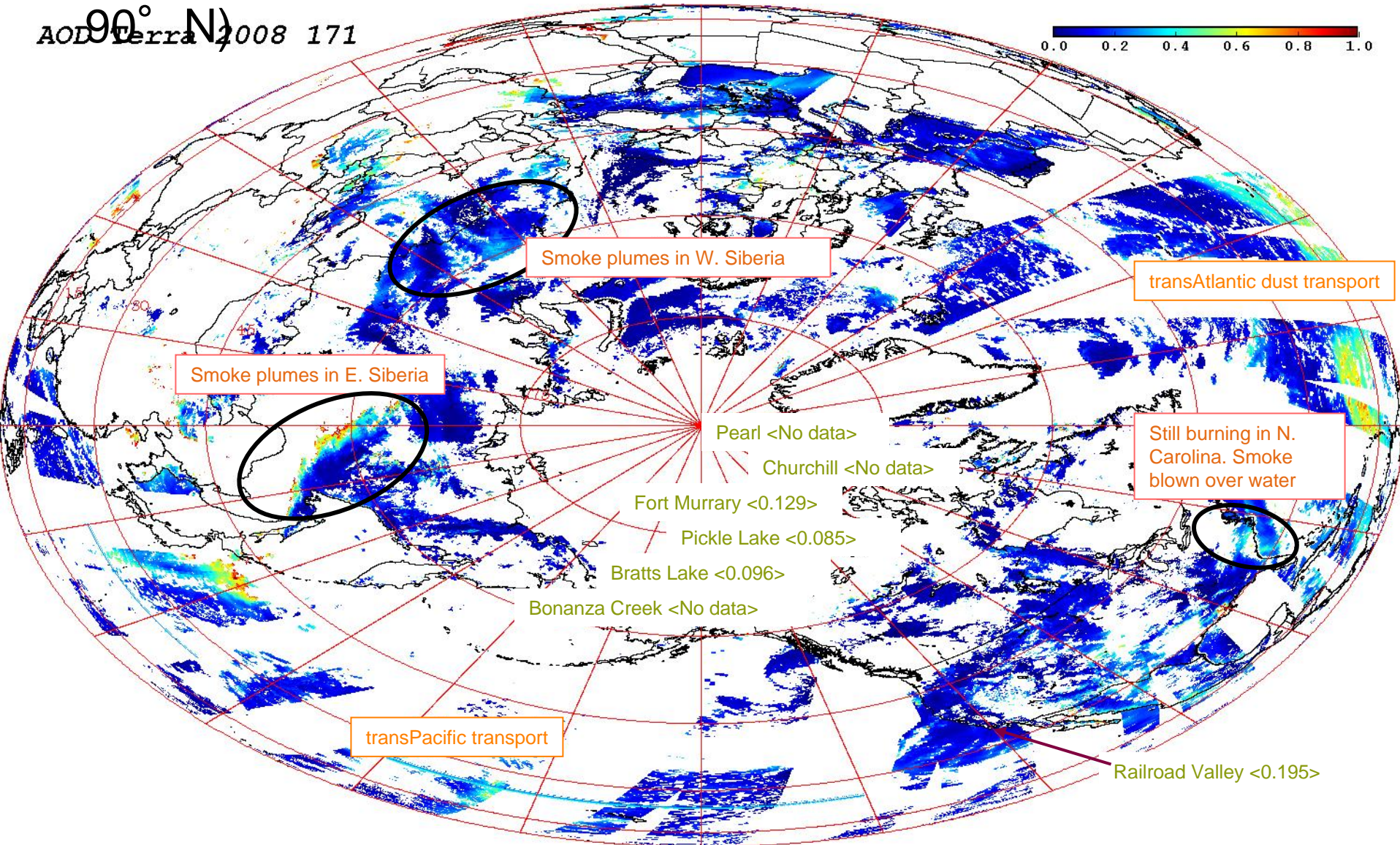
MODIS AOD Hot Spots in California



Day 171 (June 19) Thursday

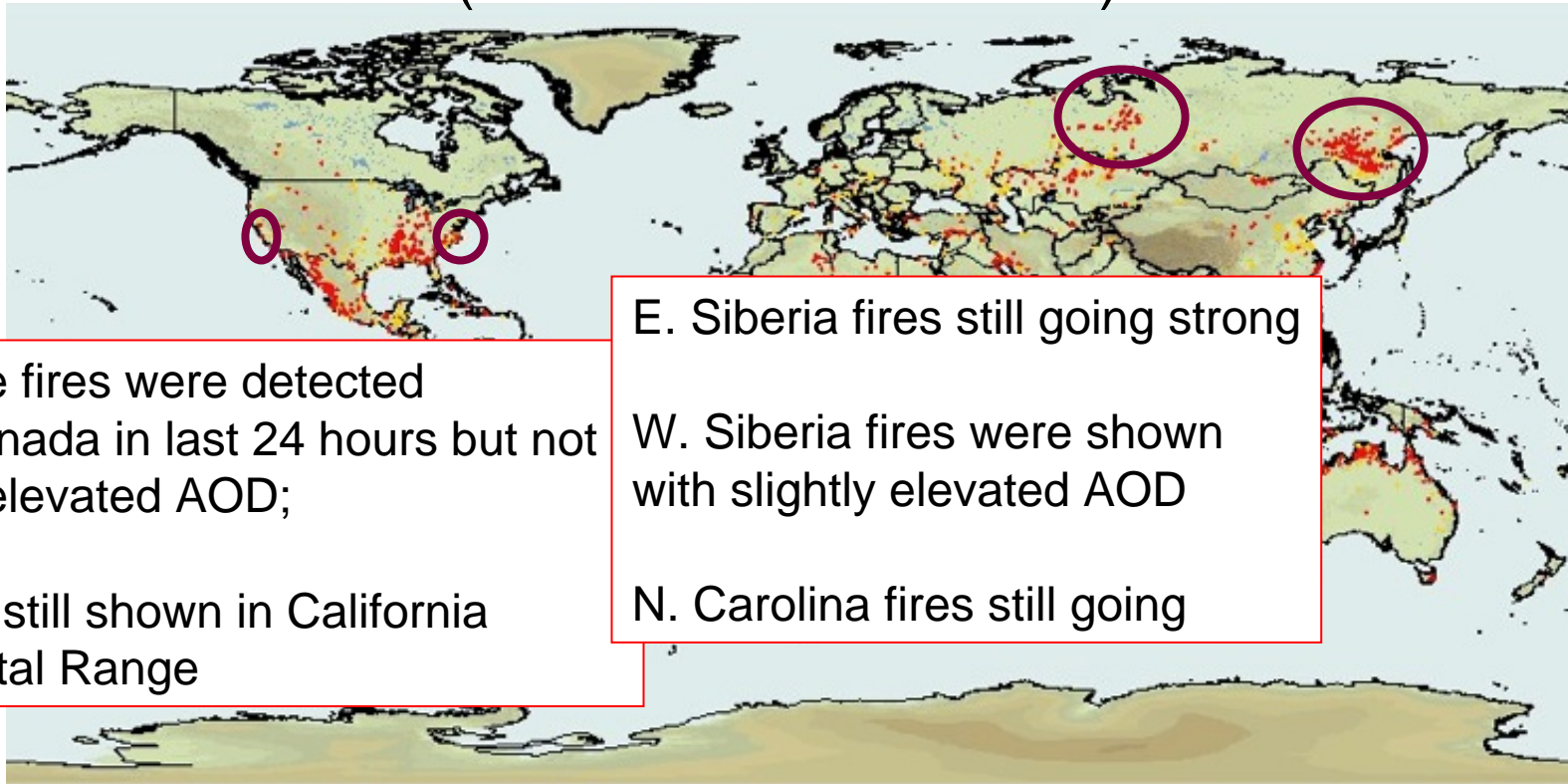
MODIS AOD Hot Spots in Northern Hemisphere (0° -

AOD Terra 2008 171



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

MODIS Global Active Fire Count Map In Last 24 hours (Red) & 7 days (Yellow) (20080618 - 20080620)



Some fires were detected in Canada in last 24 hours but not with elevated AOD;

Fires still shown in California Coastal Range

E. Siberia fires still going strong

W. Siberia fires were shown with slightly elevated AOD

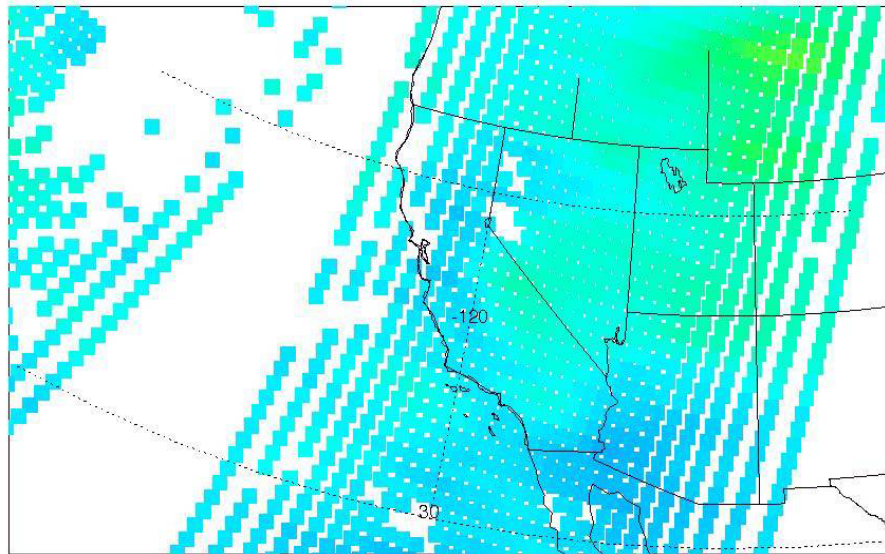
N. Carolina fires still going

<http://maps.geog.umd.edu/activefire.html>

Circles indicate fires that produced elevated AOD noted on previous slides

AIRS Support for CARB

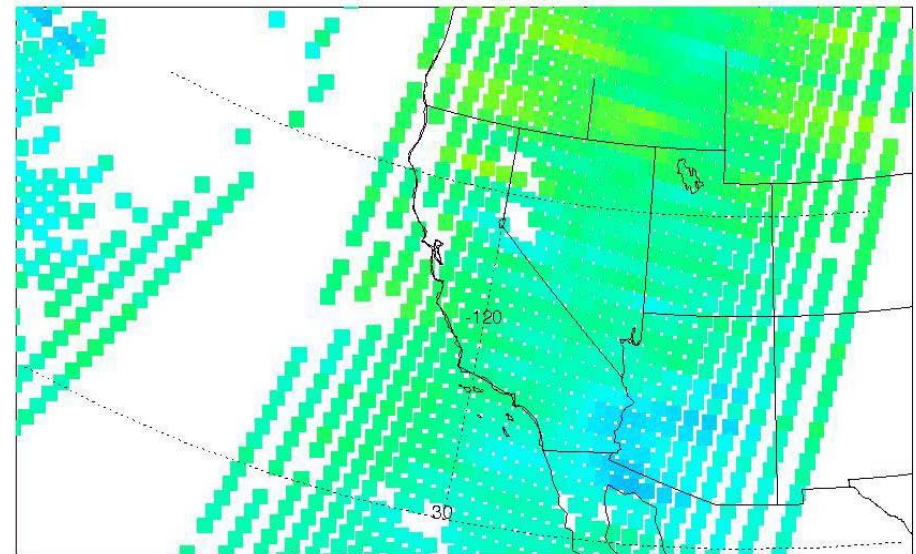
NRT AIRS CO mr 500mb June 20



0.0 27.8 55.6 83.3 111.1 138.9 166.7 194.4 222.2

ACKNOWLEDGEMENT: AIRS NRT products by NASA DAAC

NRT AIRS CH₄ mr 300mb June 20

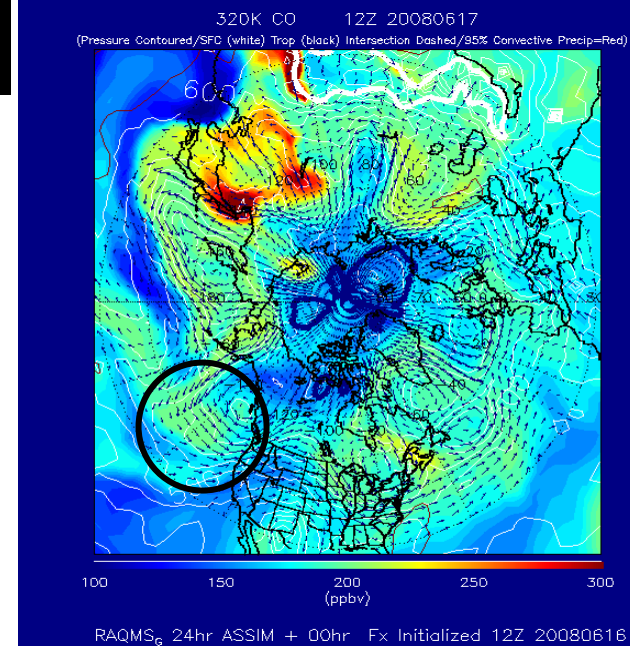
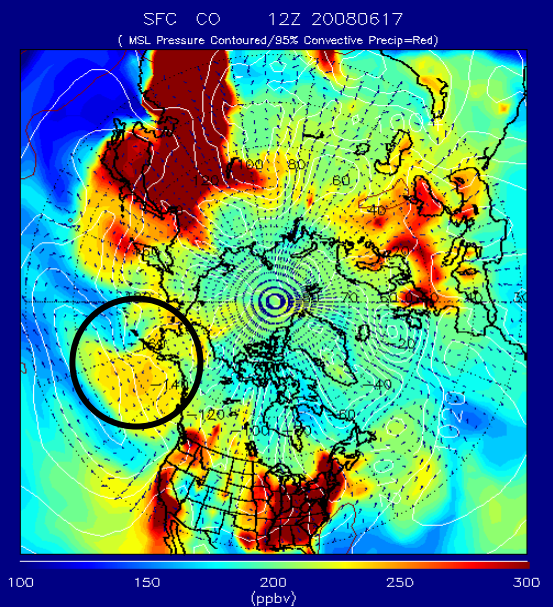
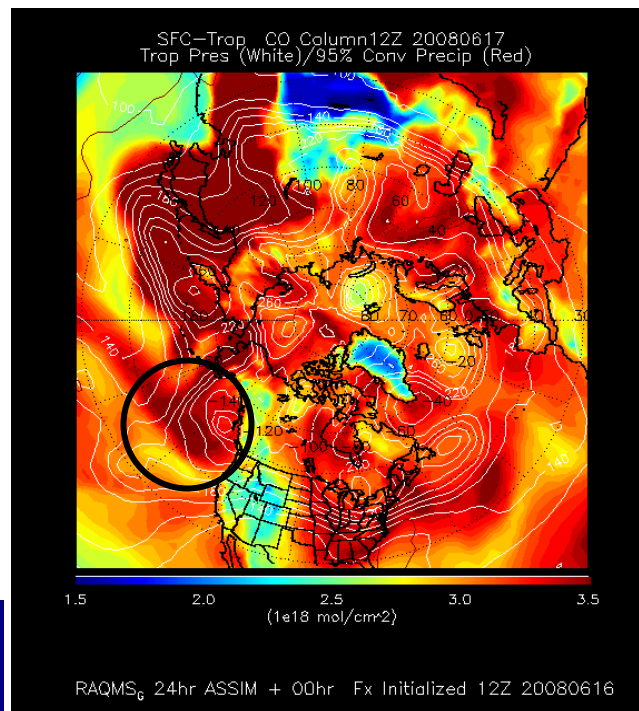


1600.0 1644.4 1688.9 1733.3 1777.8 1822.2 1866.7 1911.1 1955.6 2000.0

ACKNOWLEDGEMENT: AIRS NRT products by NASA DAAC

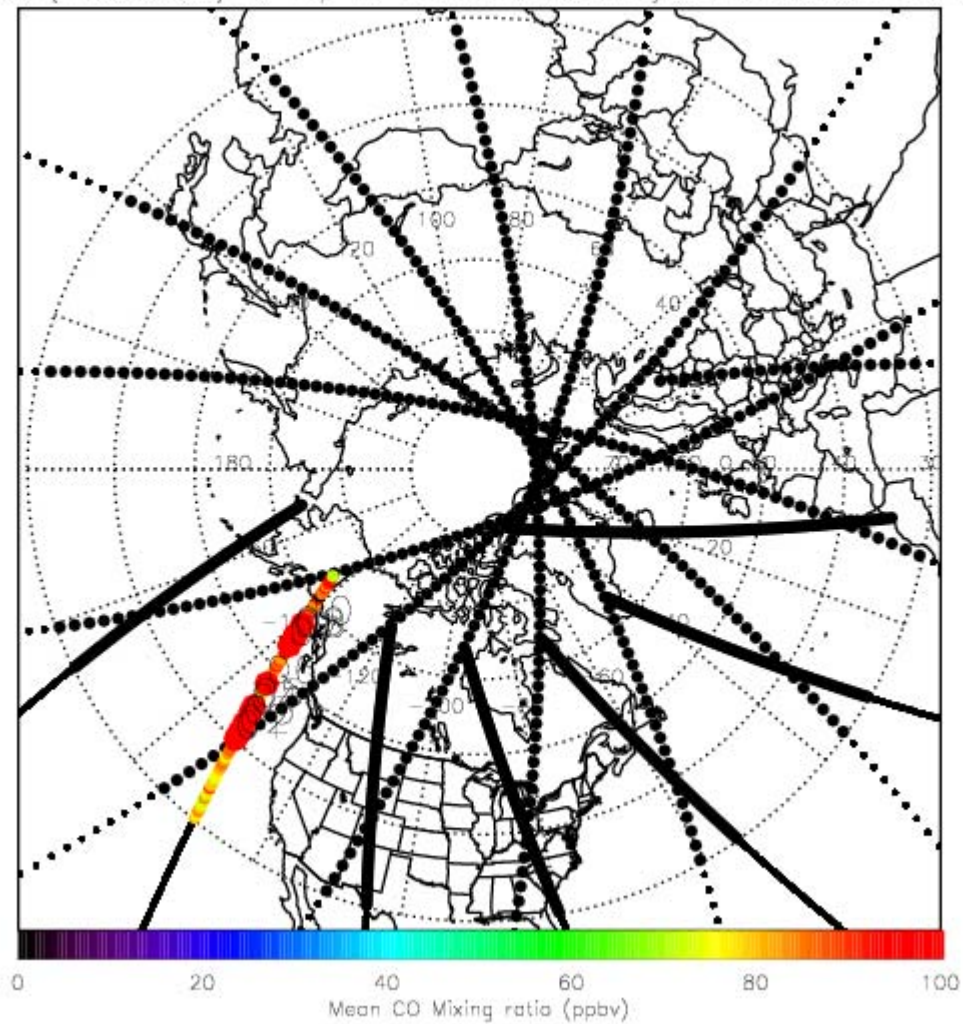
- Relatively low CO values (< ~100ppbv) over CA at 500mb, measurements taken at nighttime.
- CH₄ show north-south gradients below ~1800ppbv in average.
- Trajectories are similar as well, not shown.

RAQMS CO Analysis 06/17 : Focus on Pacific Sector

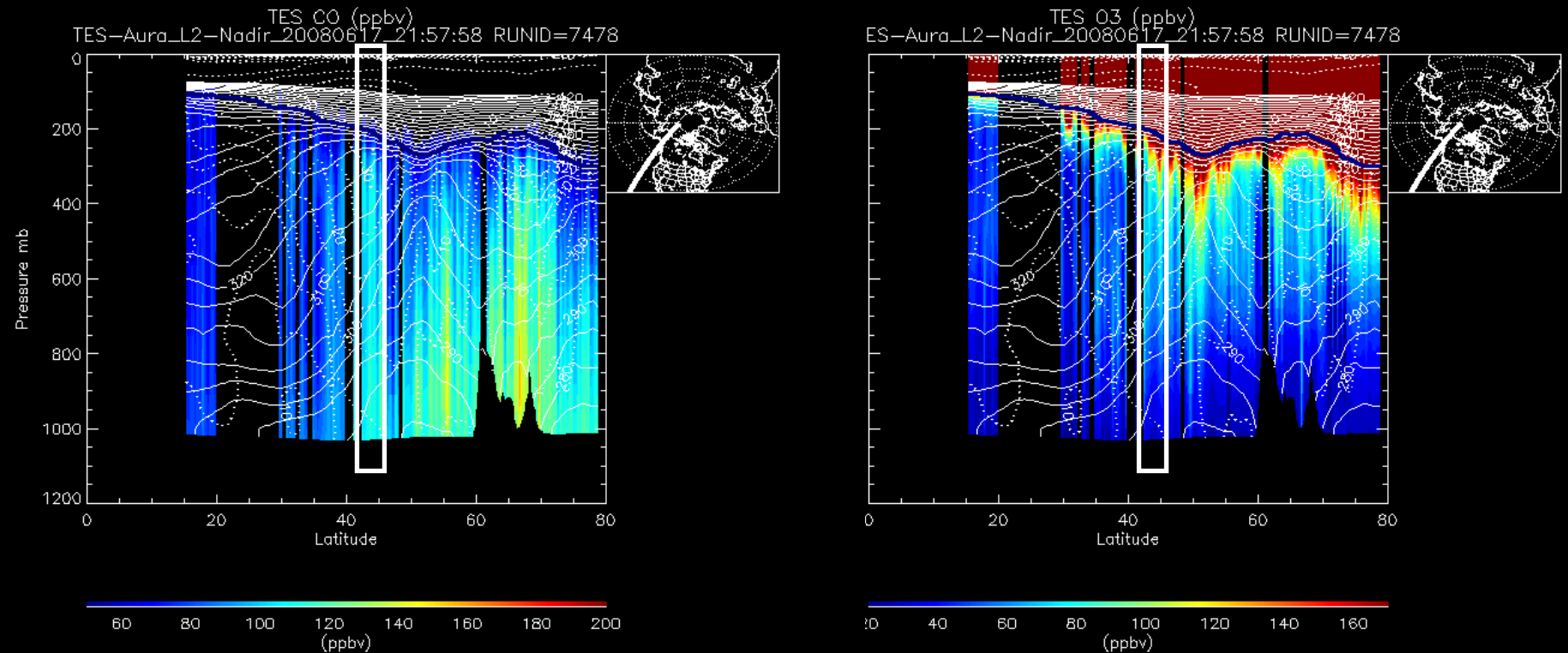


TES Step&Stare 06/17 RunID=7478

Mean CO (Theta<380K) for Top 10 TES SS Forward trajectories 2008061700 RUNID=



TES CO (left) and O3 (right) curtains from selected SS orbit

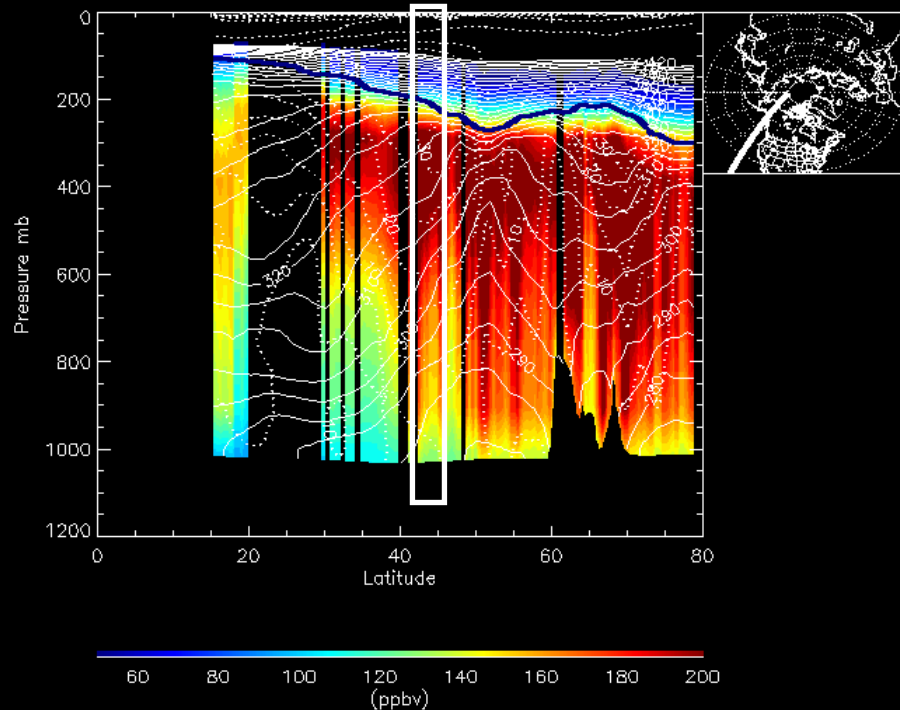


White box shows region of selected profile

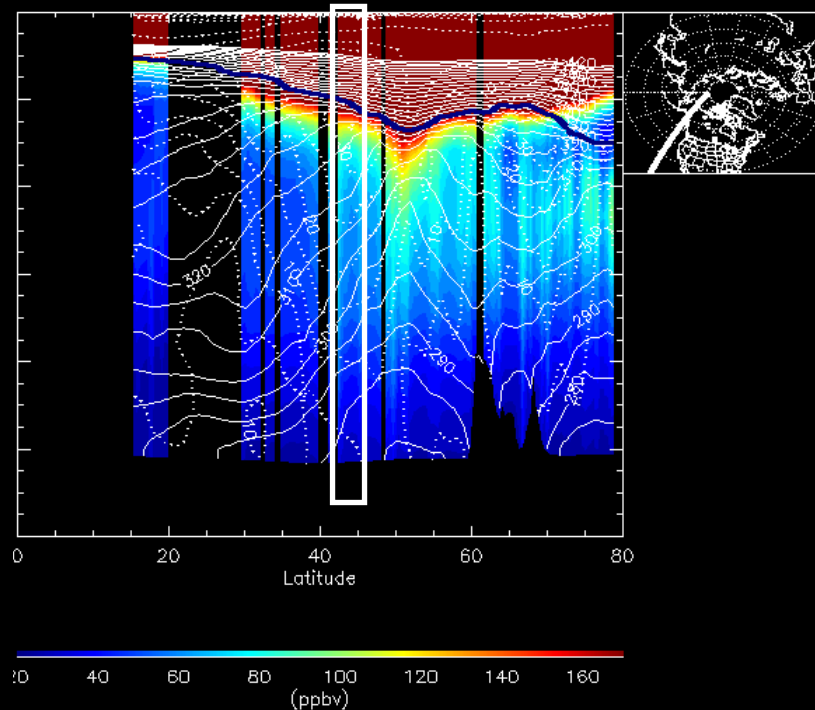
Aged plume from Asia containing moderate amounts of ozone (~65 ppbv) and CO (~120 ppbv)

RAQMS* CO (left) and O3 (right) curtains from selected SS orbit

RAQMS CO (ppbv) with TES operator
TES-Aura_L2-Nadir_20080617_21:57:58 RUNID=7478



RAQMS O3 (ppbv) with TES operator
ES-Aura_L2-Nadir_20080617_21:57:58 RUNID=7478



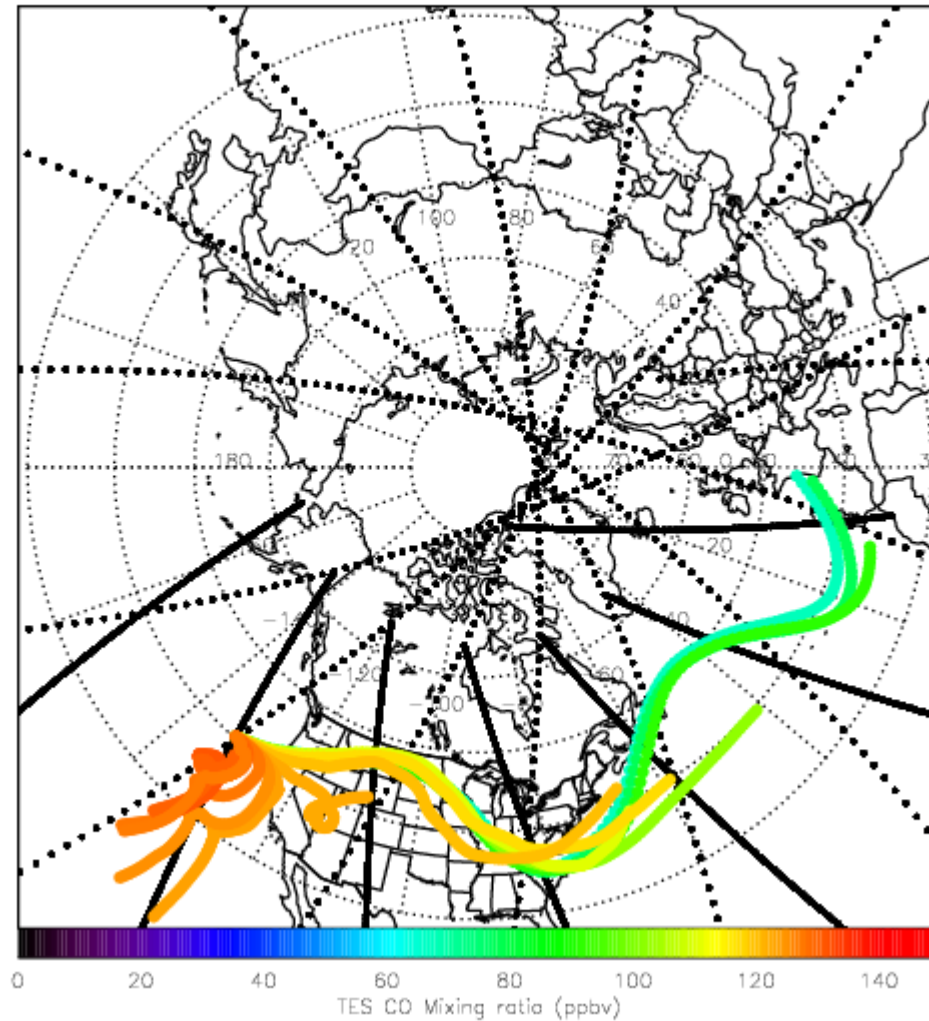
White box shows region of selected profile

RAQMS CO larger than TES but spatial patterns and
Ozone consistent

*With TES sensitivity operator applied

TES SS Forward Trajectories “Profile 1” Valid 00Z 6/23 (Sun afternoon local time)

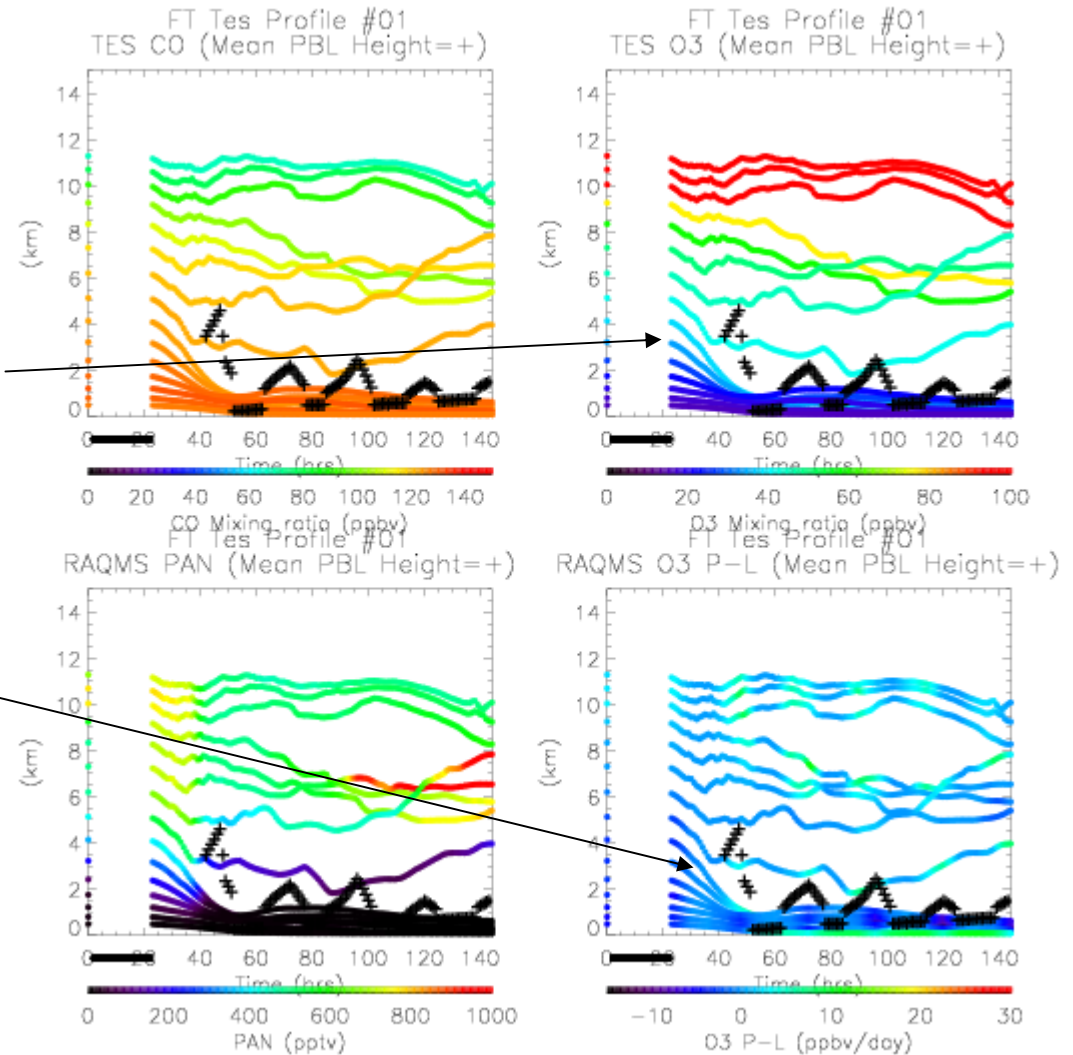
FT TES SS Profile #01 144hr Forward trajectories
Initialized 2008061700 RUNID=7478



Chemical evolution along “SS Profile 01” forward trajectories

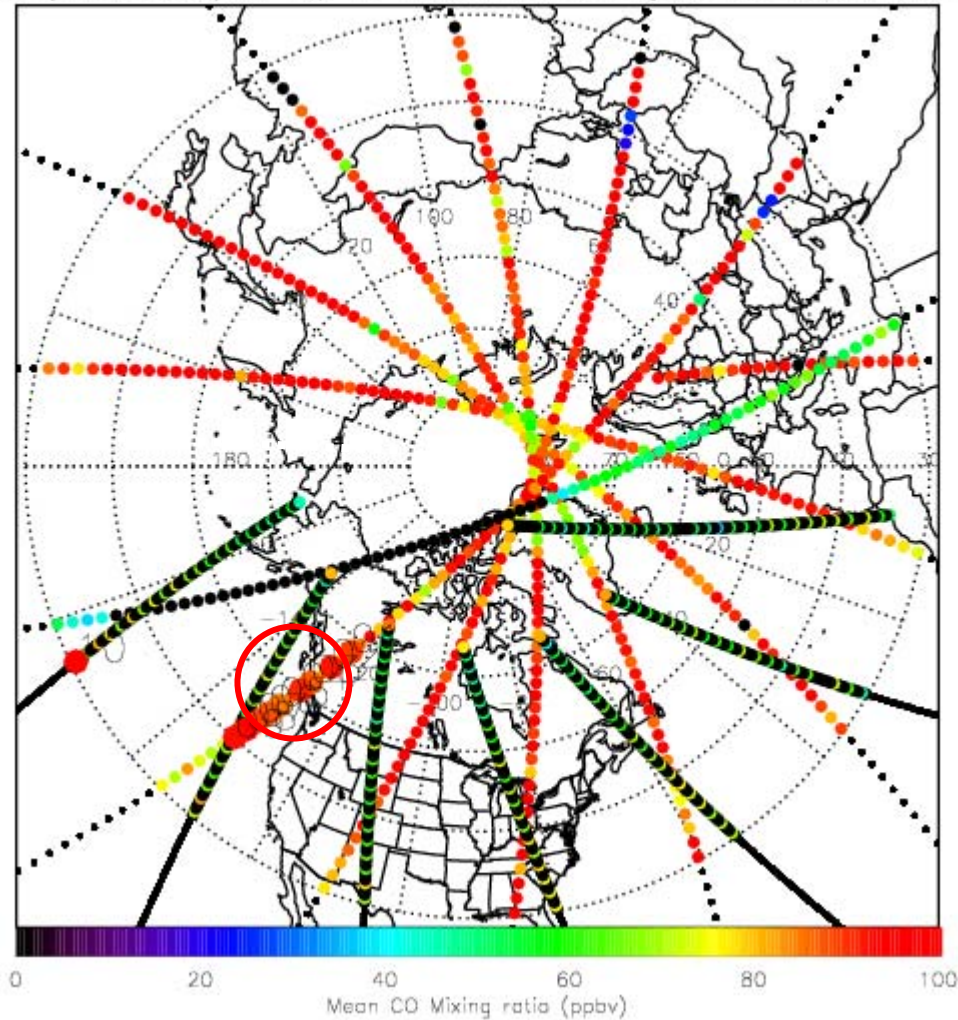
Aged air mass with
ozone of about 45 ppbv
drops into boundary
layer off of California
coast

Ozone production along
with PAN decomposition



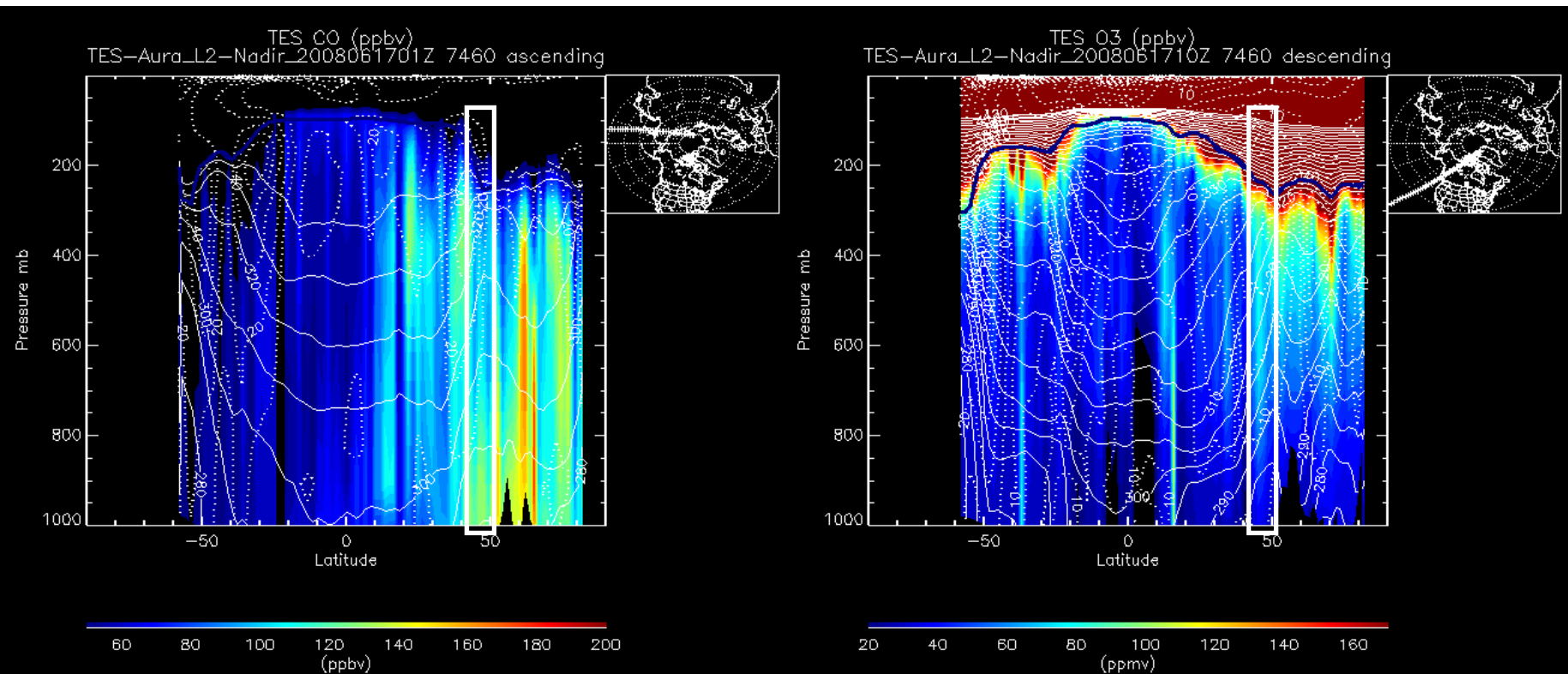
TES GS CO observations 06/17 : Focus on Pacific Sector

Mean CO (Theta<380K) for Top 10 TES GS Forward trajectories 2008061700 RUNID=



Profile selected
from TES GS
observation
"Profile 06"

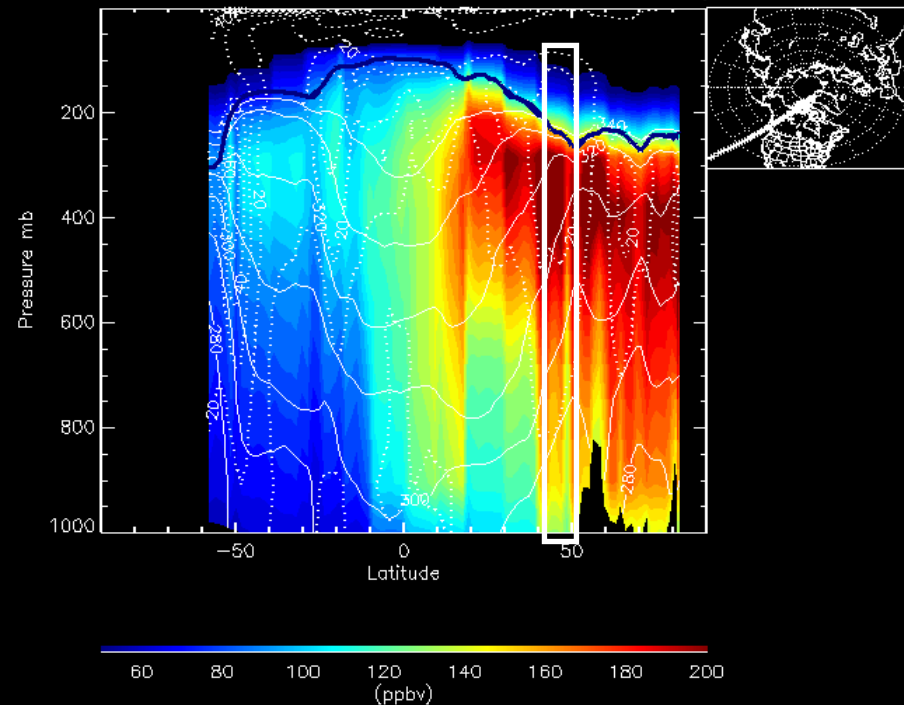
TES CO (left) and O3 (right) curtains from selected GS orbit



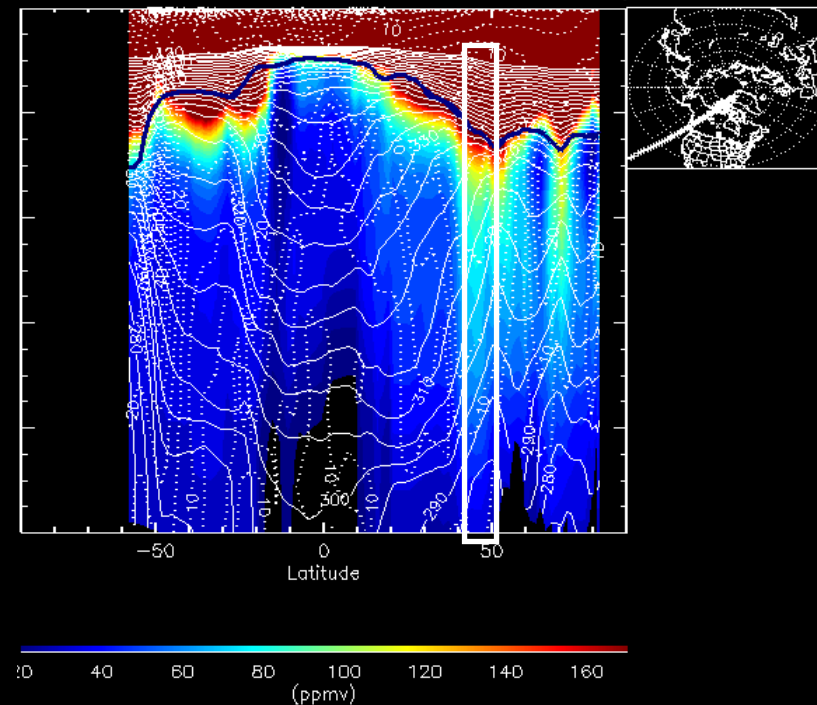
White box shows region of selected profile

RAQMS* CO (left) and O3 (right) curtains from selected GS orbit

RAQMS_{mission} CO (ppbv) with TES operator
TES-Aura_L2-Nadir_2008061710Z_7460 descending



RAQMS_{mission} O3 (ppmv) with TES operator
TES-Aura_L2-Nadir_2008061710Z_7460 descending

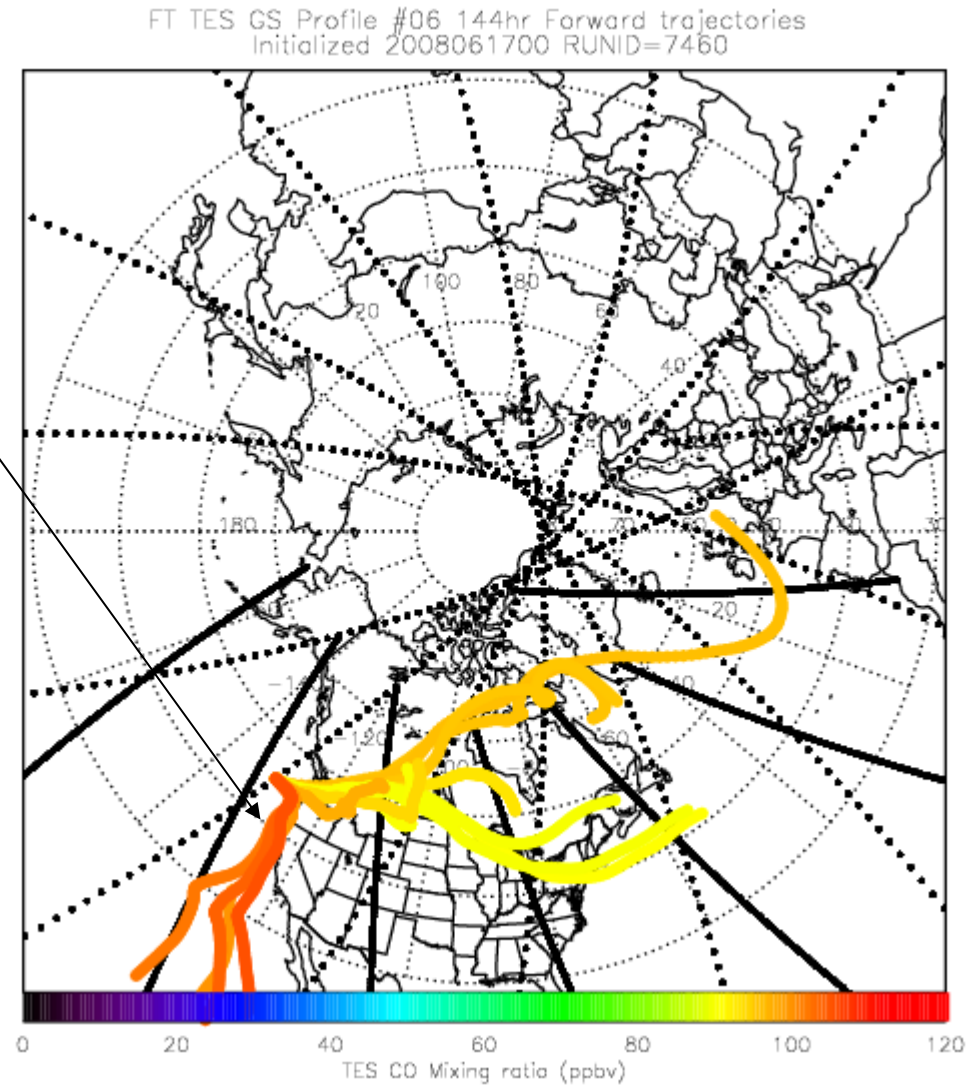


White box shows region of selected profile

*With TES sensitivity operator applied

TES GS Forward Trajectories “Profile 6” Valid 00Z 6/23 (Sun afternoon local time)

Aged polluted air expected
to head over Northern
California



Chemical evolution along “GS Profile 06” forward trajectories

Plume could increase background ozone values in boundary layer by June 23 over Northern California

