'NASA OMI Project'
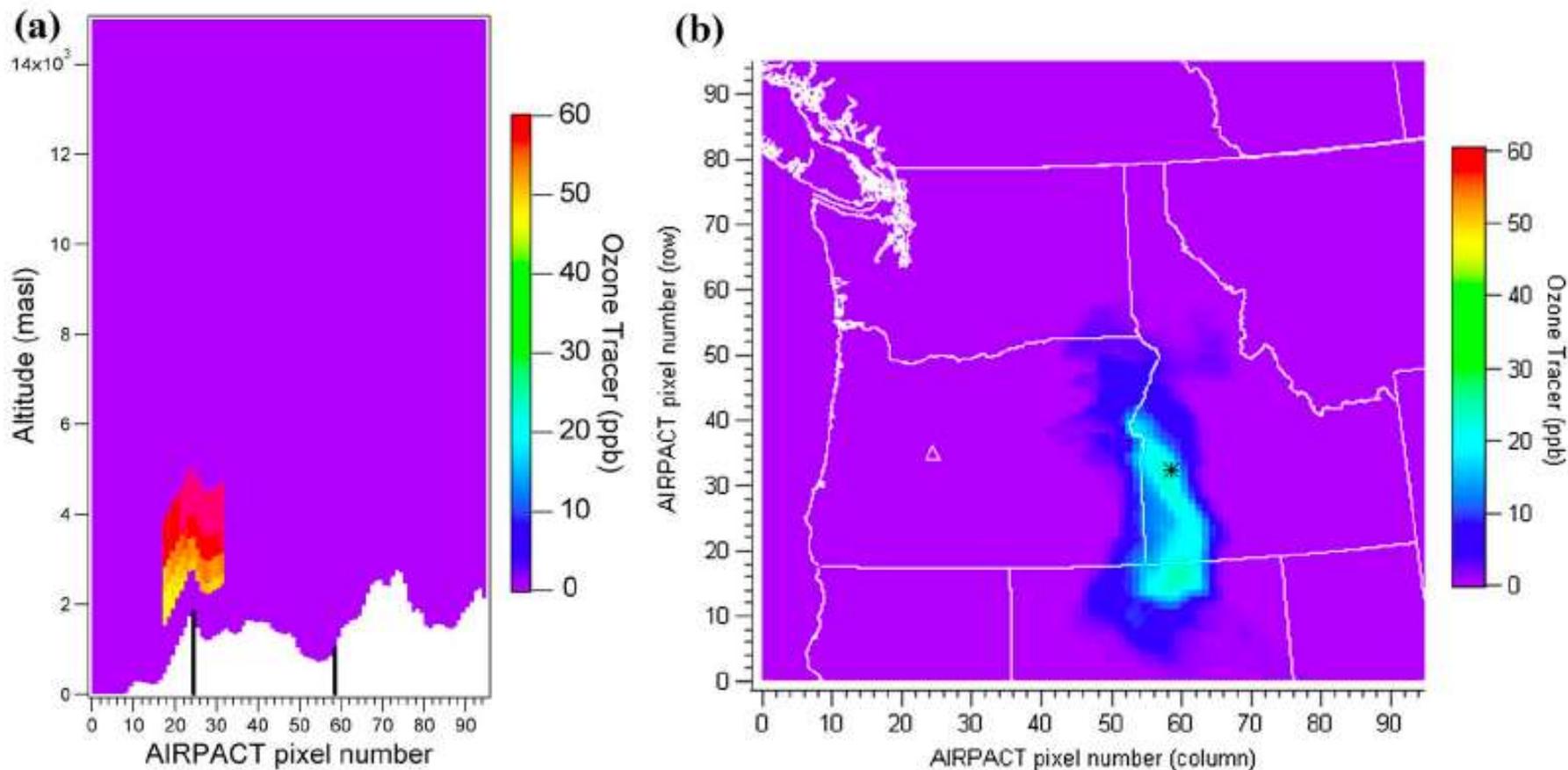# MOZART Ozone Tracer Tracking
for AIRPACT-4 CMAQ

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Figure 9. (a) Vertical cross section of AIRPACT-modeled volume of O_3 tracer above MBO on 6 April 2010 at 4:00 PST. Land elevation is shown in white, and vertical black lines indicate MBO (left) and the longitude of Boise (right) in the model. (b) AIRPACT-modeled surface mixing ratio of O_3 tracer on 6 April 2010 at 14:00 PST resulting from the volume of O_3 shown in Figure 9a. MBO is indicated with a white triangle at column 25, row 35, and Boise with a black star at column 59, row 33. An animated version of Figure 9b, showing surface O_3 mixing ratios from 4:00 to 23:00 PST is provided in the supporting information.

Introduction and Review

- Long-range-transport is an issue for the suitability of state-scale regulation in controlling ozone.

- Stratospheric-Ozone-Intrusion (SOI) and LRT are grounds for application for exceptional event designation for ozone exceedences, for ozone compliance.

- We decided to try and do a better job of using Mozart results for tracers in AIRPACT-4, resulting in posters to CMAS and AGU and an abstract for a paper to Atmos. Env. due in August.

Overview

1. Period selected Apr thru Jul 2012
2. MOZART tracers instead of by layers
3. Model configuration change
4. Results (sampled sparsely, draft and tentative)
5. Concluding comments…

Chose April-July 2012
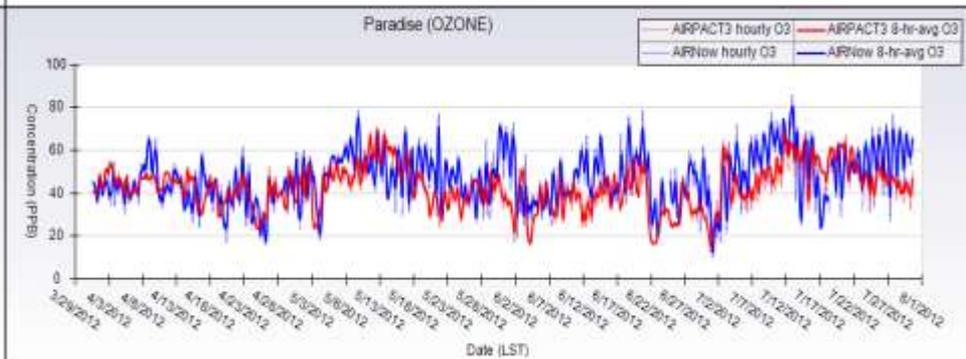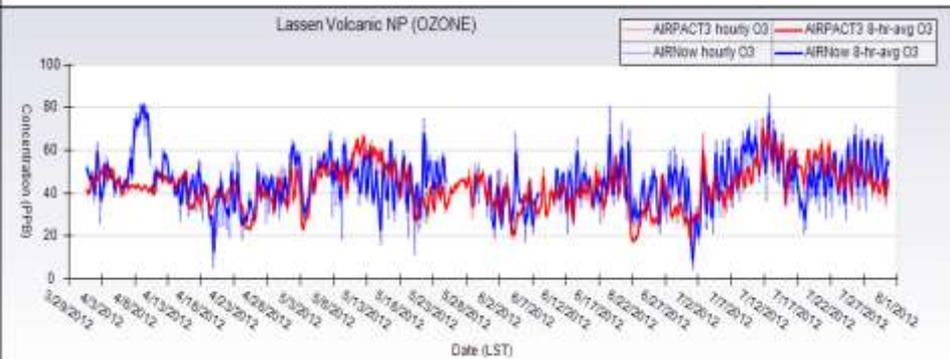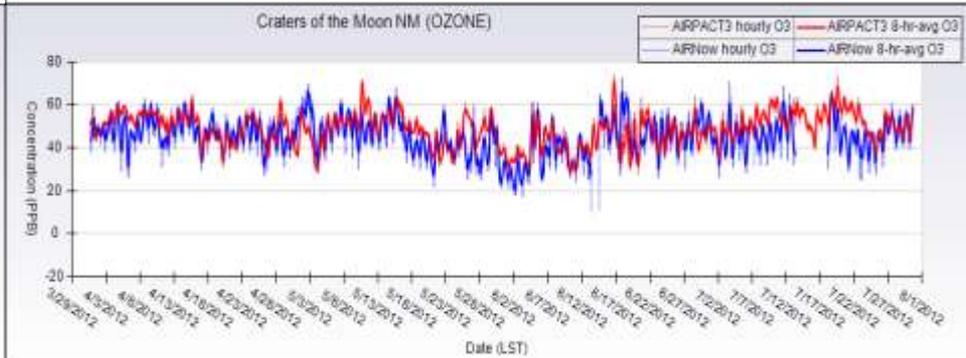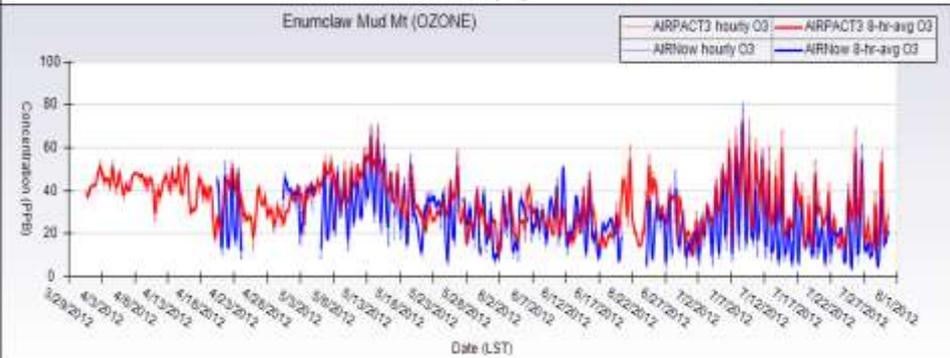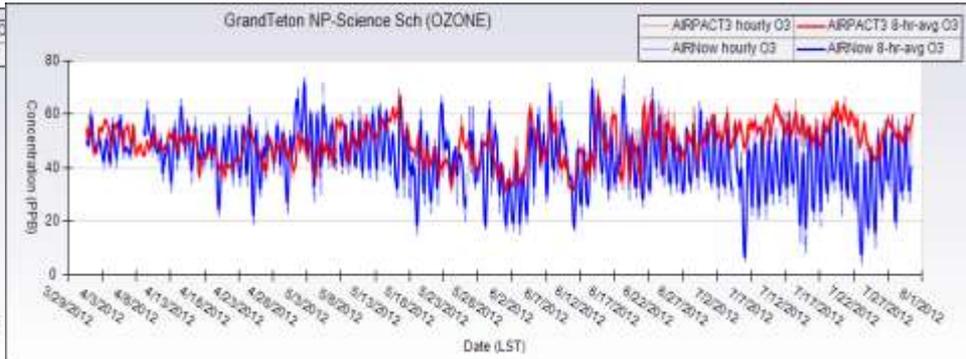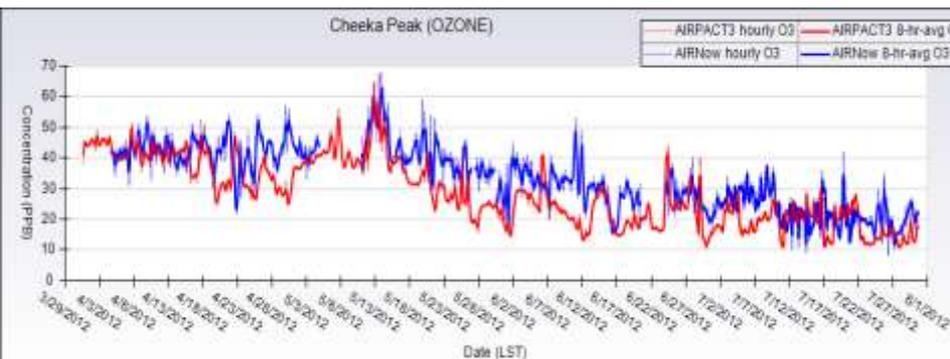
MOZART Tracers from Louisa Emmons

- O3A Ozone from Asia (Lat and Lon bounds)
- O3S Ozone from Stratosphere
- CO01 Carbon monoxide from Asia-Anthro
- CO02 Carbon monoxide from Asia-fires
- CO03 Carbon monoxide from Siberia CO (fires)

Model Configuration

- Standard CMAQ at 37 layers
  - Standard full chemistry CMAQ.
  - 37 layers of WRF meteorology.
- Tracer CMAQ
  - CMAQ 4.7.1 on AIRPACT-4 (4-km) domain.
  - Full 37 layers available from WRF 4-km.
  - Tracers defined by MOZART Tracers (5).
  - Tracers provided on all four boundaries.
  - Deposition turned on.
  - No emissions.
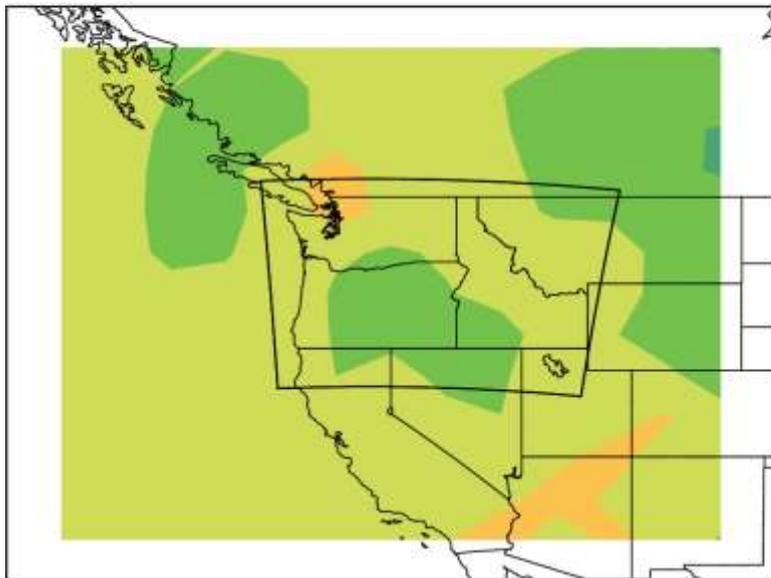
Model Layer Heights
(over ocean)

Height Above Sea Level (meters)

MOZART   AIRPACT   WRF

?
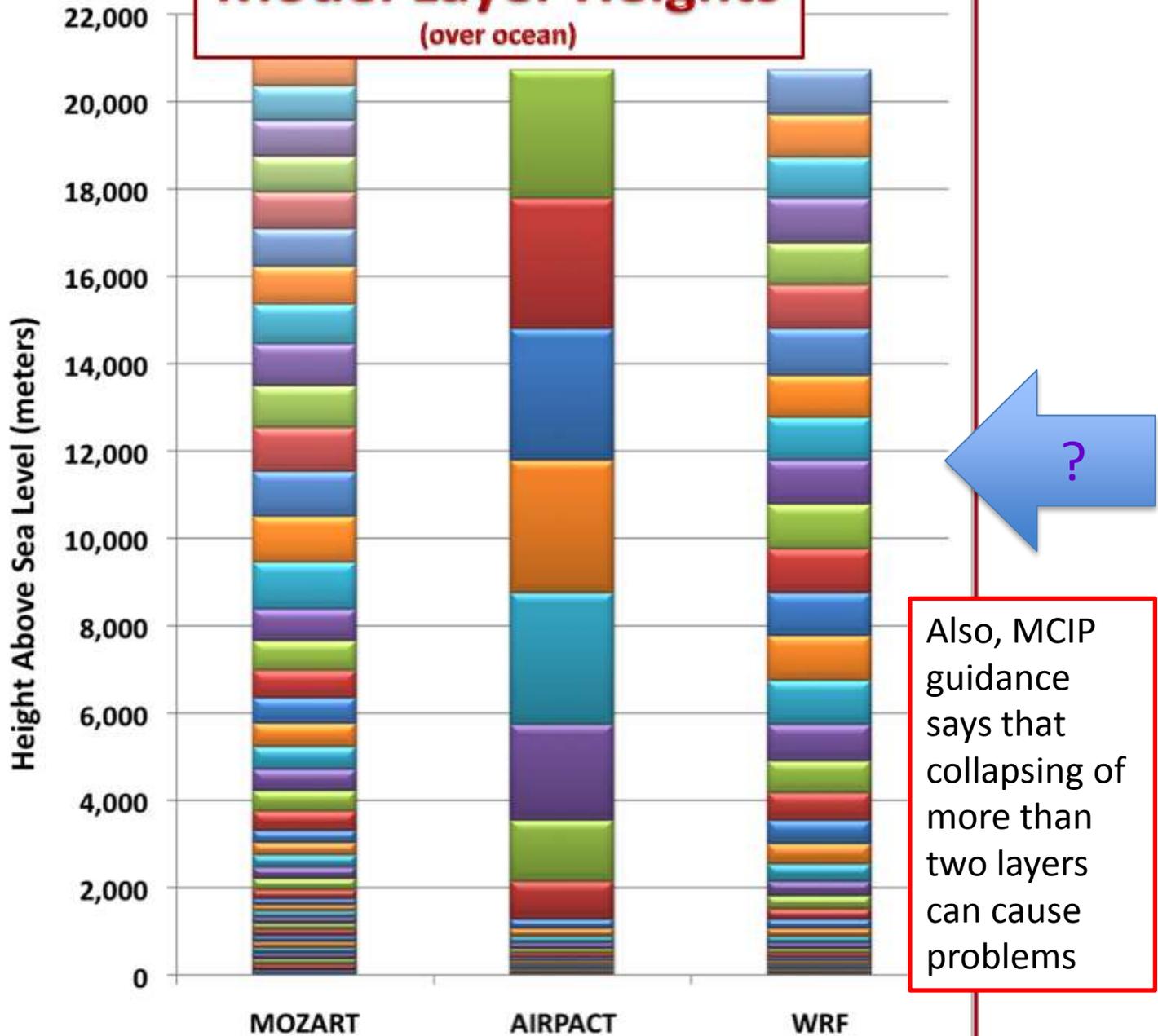
Also, MCIP guidance says that collapsing of more than two layers can cause problems
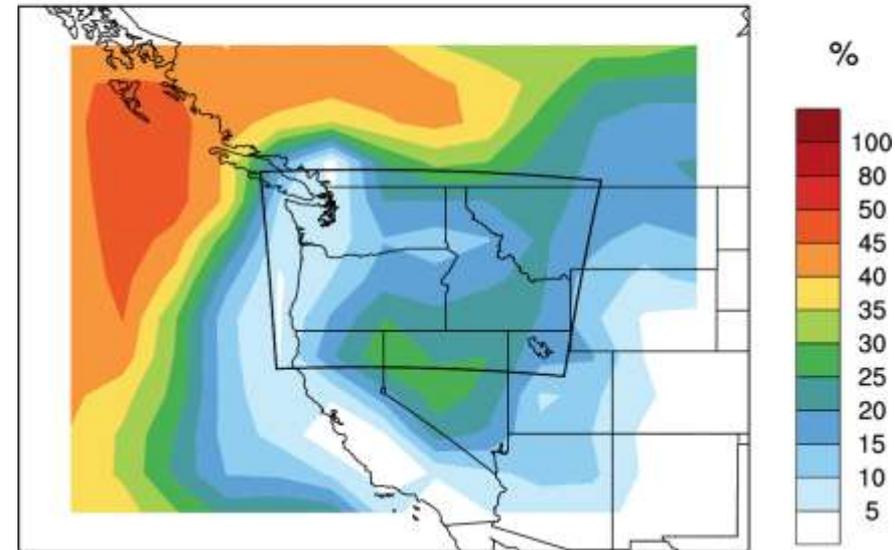
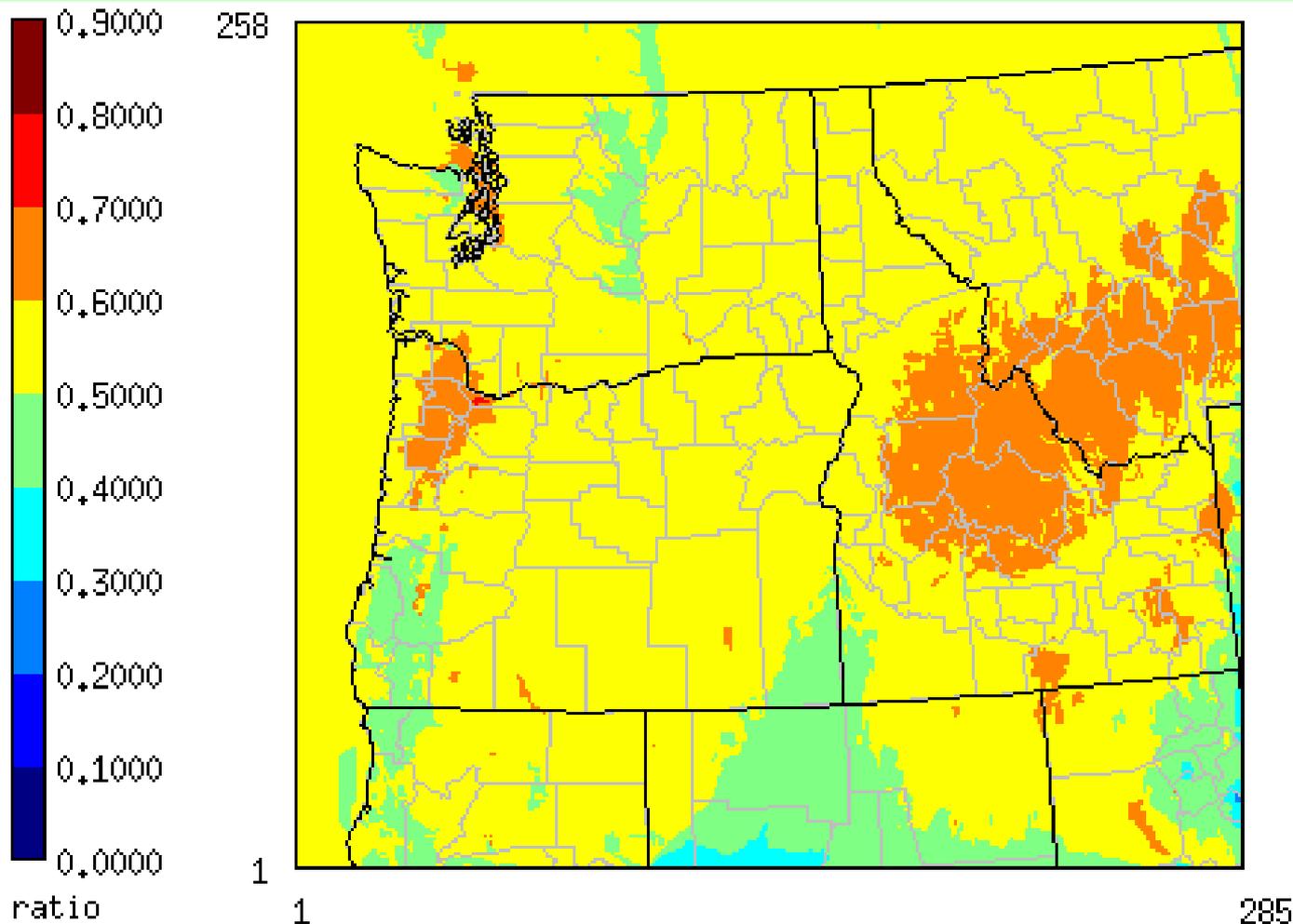# MOZART results for region for tracers 05/12/2012

MOZART results for region for tracers 05/13/2012
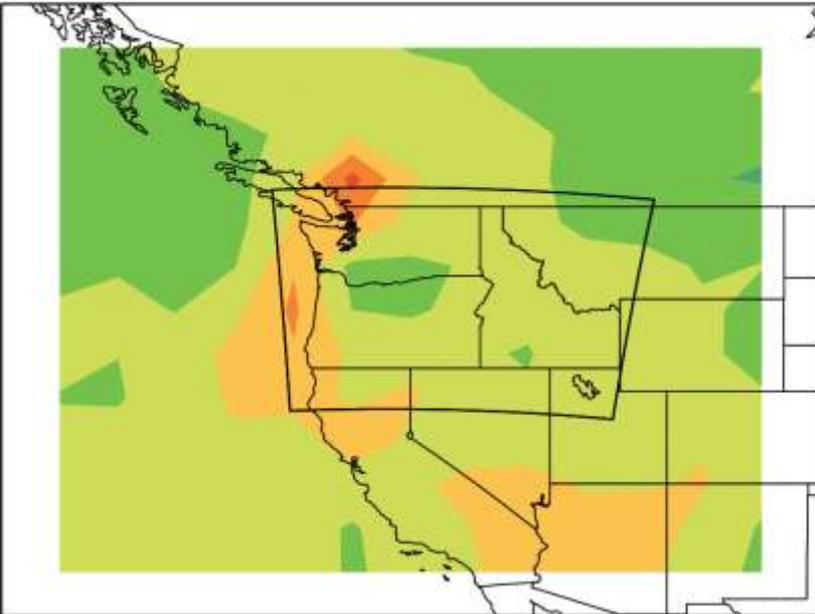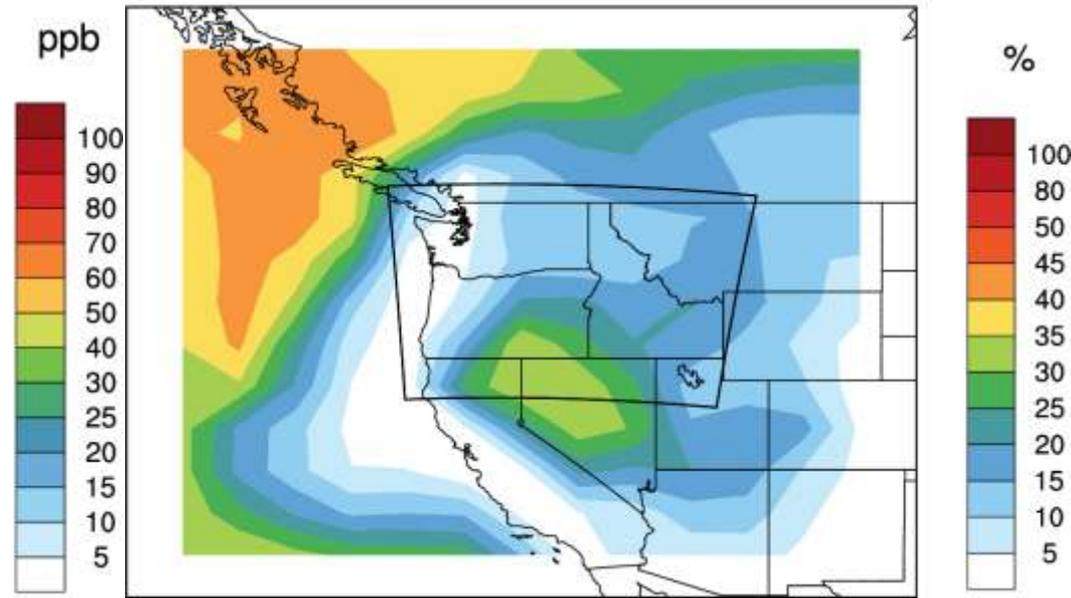
Ratios of O3S/O3 and O3A/O3

- Tracer O3S and O3A are with no removal except deposition...

- O3 values are from full AIRPACT chemistry with deposition

- Caveat is that we are now looking at Ratio of "Apples and Oranges"

Ratio of O3S to O3
(daily, for 8-hr O3 max period) April – Aug 2012

April 2,2012 17:00:00 (PST)
Min=0.2894 at (285,22), Max=0.7295 at (57,144)

Ratio of O3A to O3
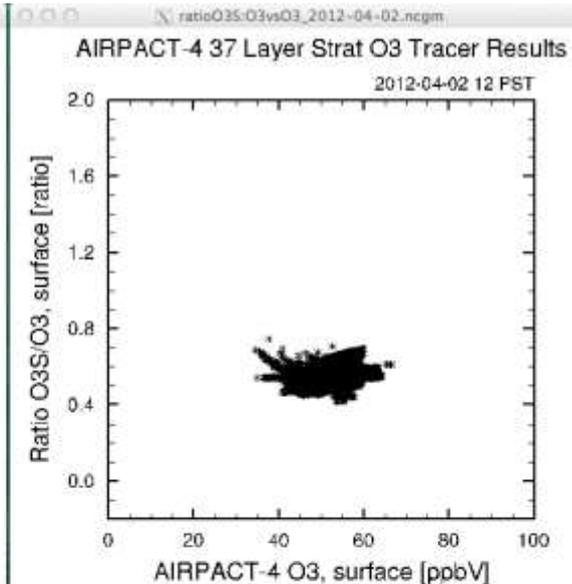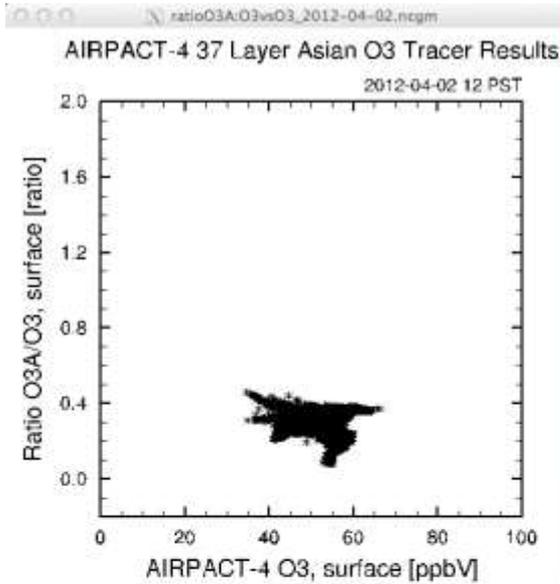## (daily, for 8-hr O3 max period) April – Aug 2012
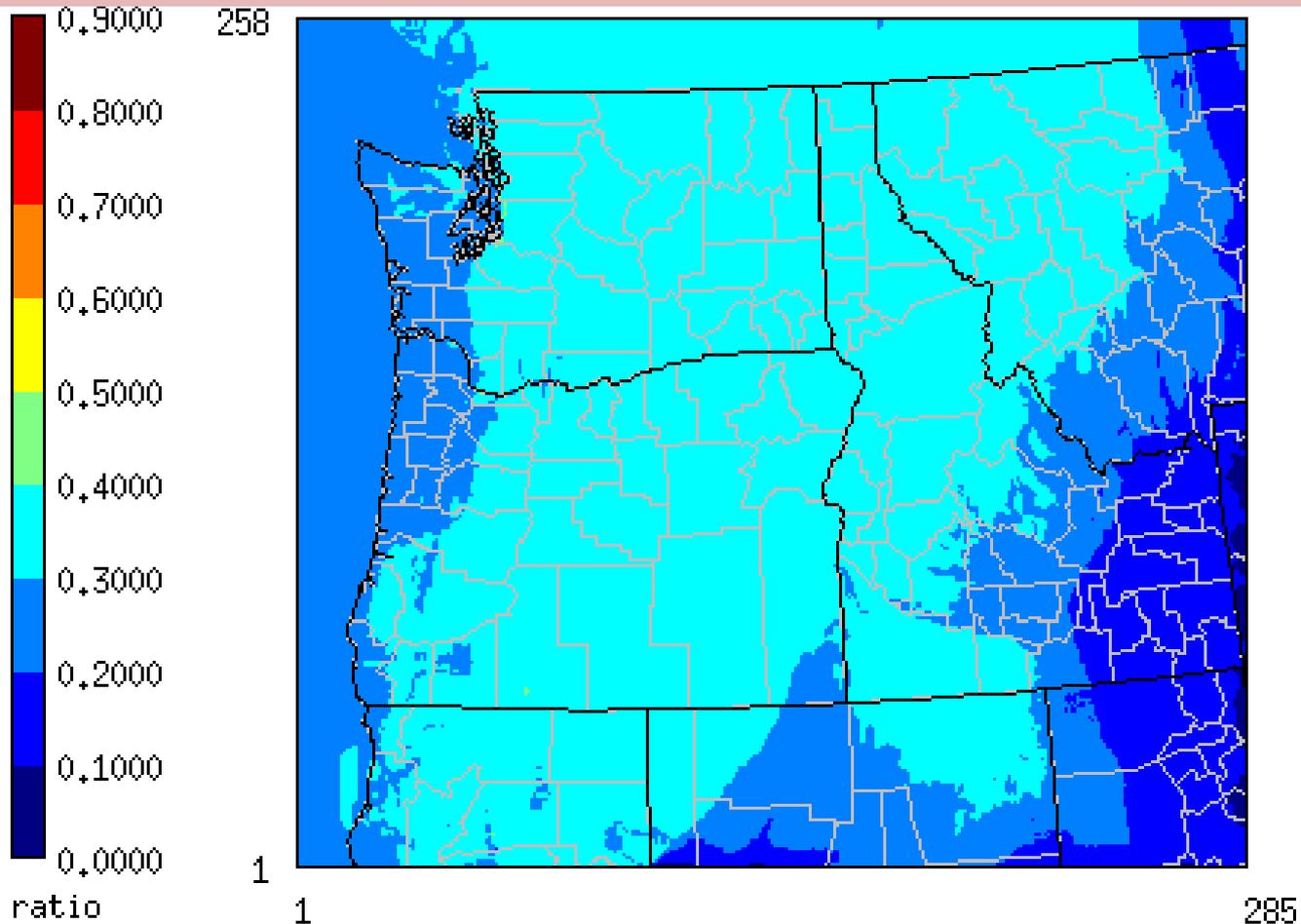
April 2,2012 17:00:00 (PST)
Min=0.0433 at (285,78), Max=0.4201 at (62,191)

All at 12 PST Noon-8 PM

O3A tracer

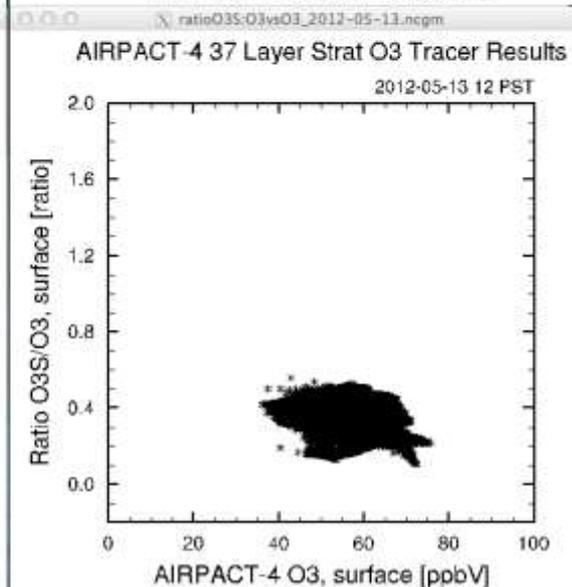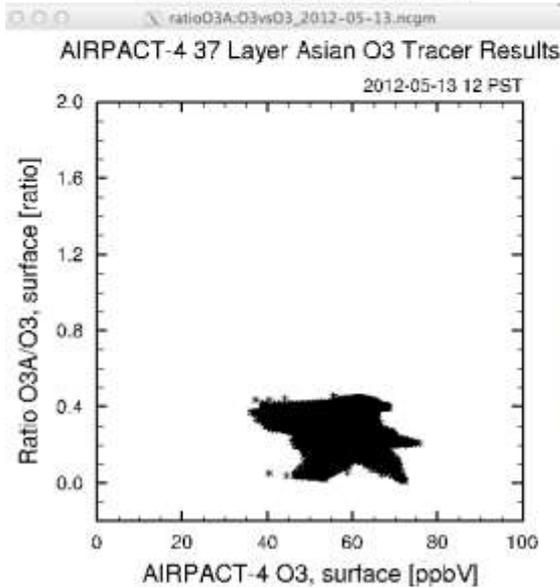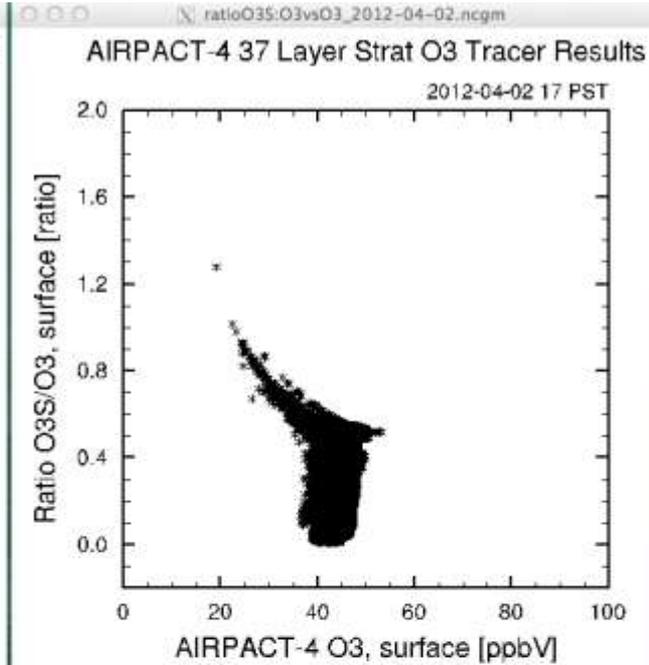**O3S tracer**
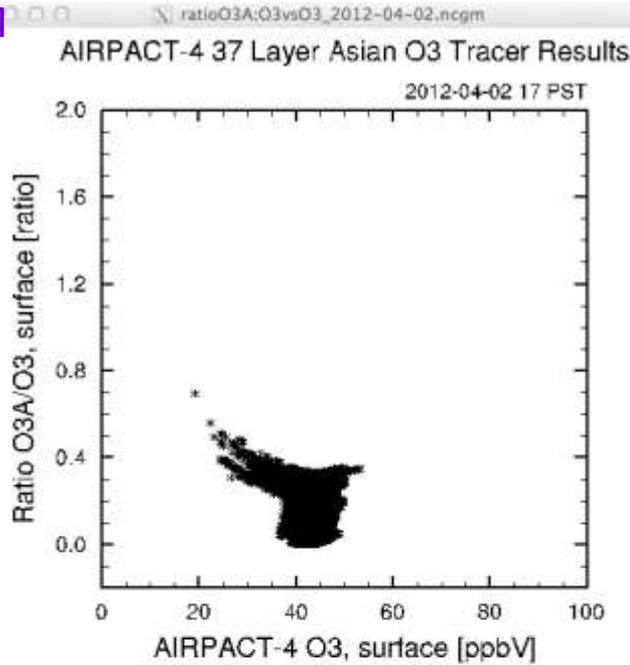
April 2, 2012
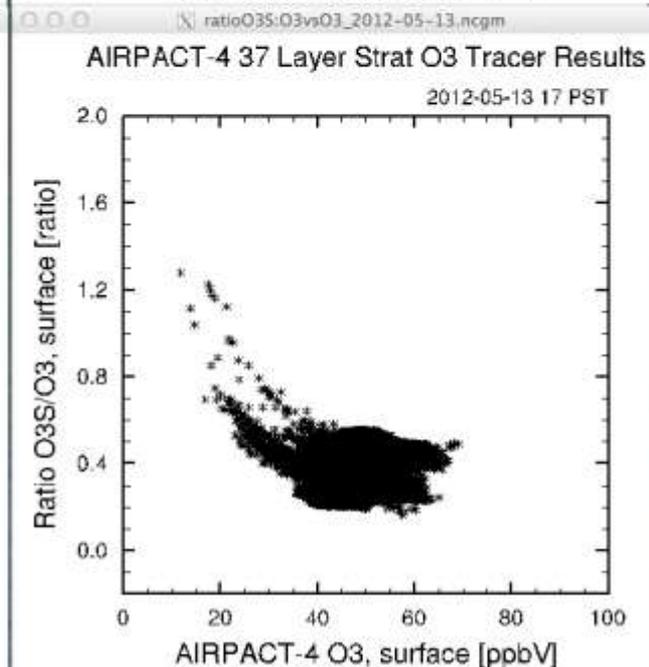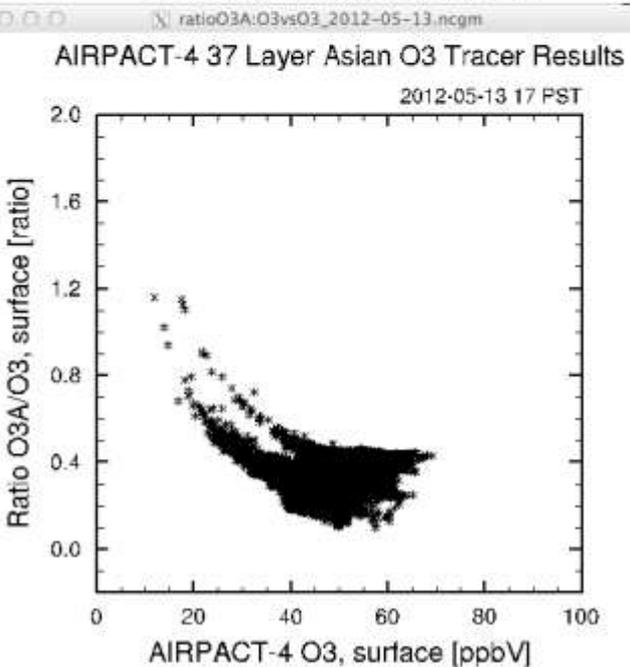
May 13, 2012

All at 17 PST
5 PM – 1 AM

O3A tracer

O3S tracer

April 2, 2012

May 13, 2012

Concluding comments

We need to do more checking and QA to be sure these result are meaningful, despite their intrinsic and acknowledged shortcomings.

We need to compare with results by others looking at LRT and SOI.

Want to produce a monthly climatology of O3S and O3A as an index of possible Asian and Stratospheric influence.

Want to analyze specific episodes of LRT and SOI.

Need to refine and redo process from MCIP forward to identify an accurate and affordable set of layers for operational AIRPACT-4 use.

Stay tuned…