NW-AIRQUEST ANNUAL MEETING 2012
6-8 June 2012, ETRL #101, WSU campus, Pullman, WA

AIRPACT4/AIRPACT3 Emissions review (10 min)

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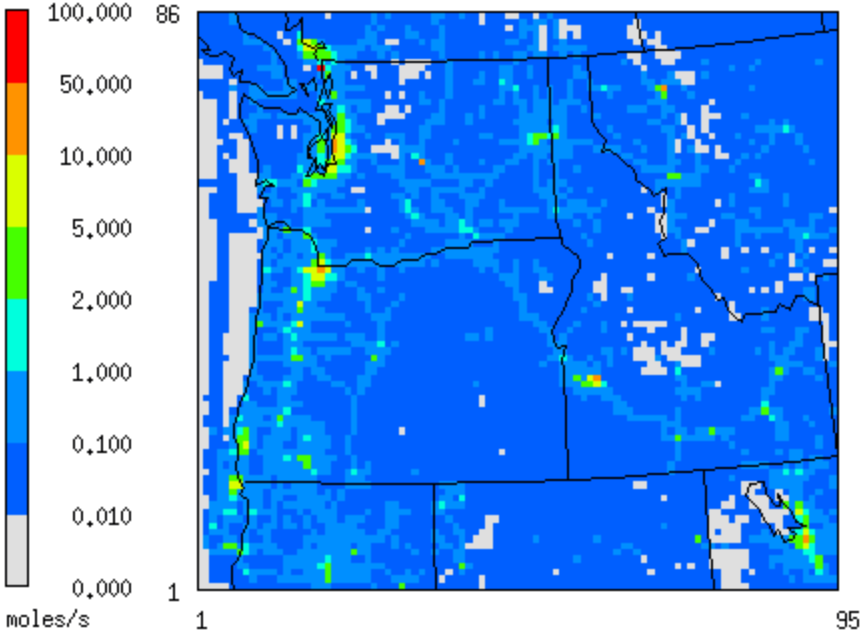
Date: June 6, 2012

Laboratory for Atmospheric Research
Washington State University
World Class. Face to Face.

	AIRPACT-3	AIRPACT-4
Grid cells	95x95 12-km grid cells	285x258 4-km grid cells
Vertical Layers	21 layers	21 layers
MCIP	v3.3 (UW MM5/WRF)	v3.6 (UW WRF)
SMOKE	v2.1 (LAYPOINT v2.4)	v2.7
CMAQ	v4.6 (denrate)	v4.7.1 updated (yamo)
Boundary Conditions	MOZART-2 (2000) monthly averages provided by Horowitz (used until Feb, 2011)	MOZART-4 forecasts with MOPITT-CO assimilation provided by Emmons (NCAR)
Anthropogenic Emissions	2005 from Ecology, IDEQ, ODEQ	2007 from Ecology, IDEQ, ODEQ
Fire Emissions	BlueSky until 10-2008	BlueSky/SmartFire In Testing Phase
Biogenic Emissions	BEIS-3	MEGAN v2.1
Storage Requirement for 24-hour Run		
Emission	1.1 GB	891 MB
MCIP	428 MB	3.6 GB
CMAQ	2 GB	27 GB

AIRPACT-4 Emissions

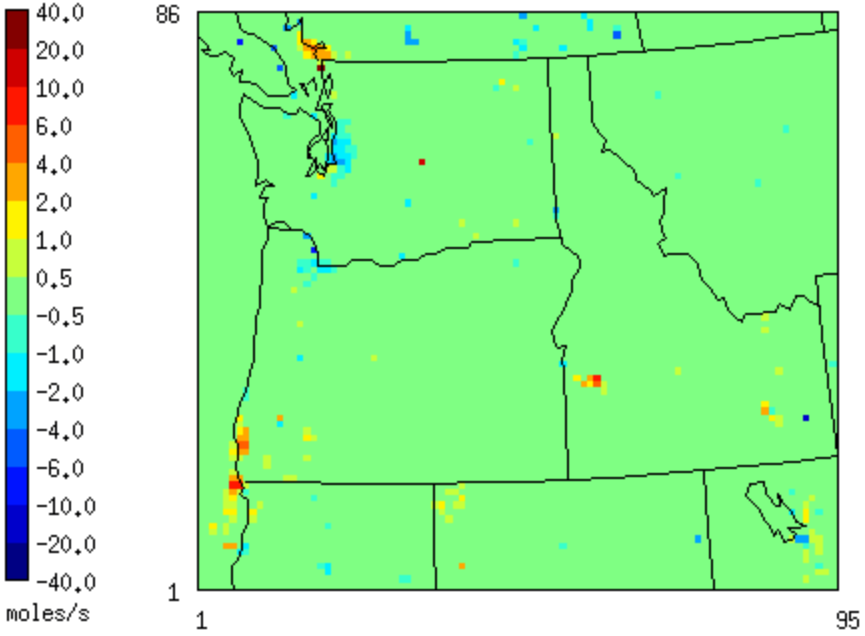
CO Grouped to 12-km grid
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min= 0.000 at (1,1), Max= 56.757 at (19,78)

Difference of CO Emissions

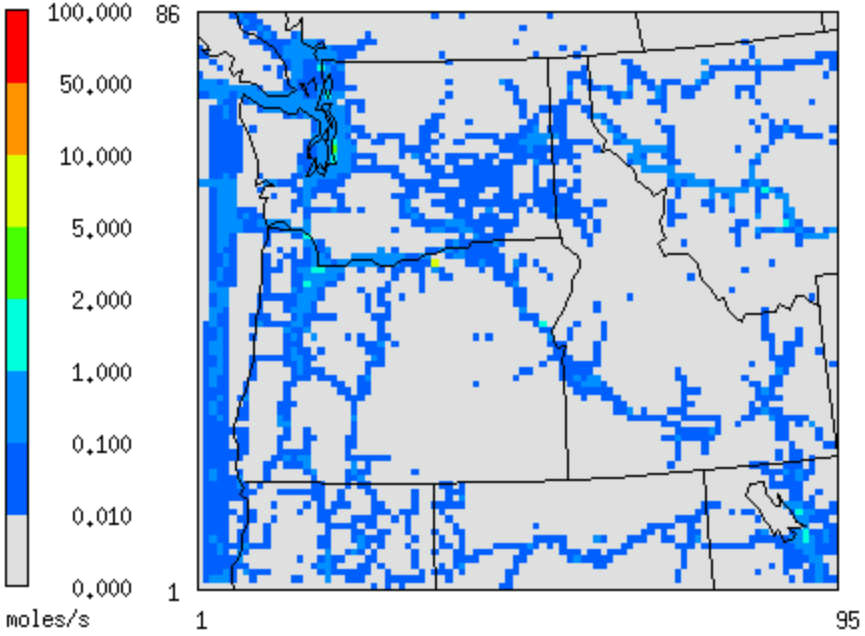
AP4 Emissions minus AP3:
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min=-12.6 at (91,26), Max=38.6 at (19,78)

AIRPACT-4 Emissions

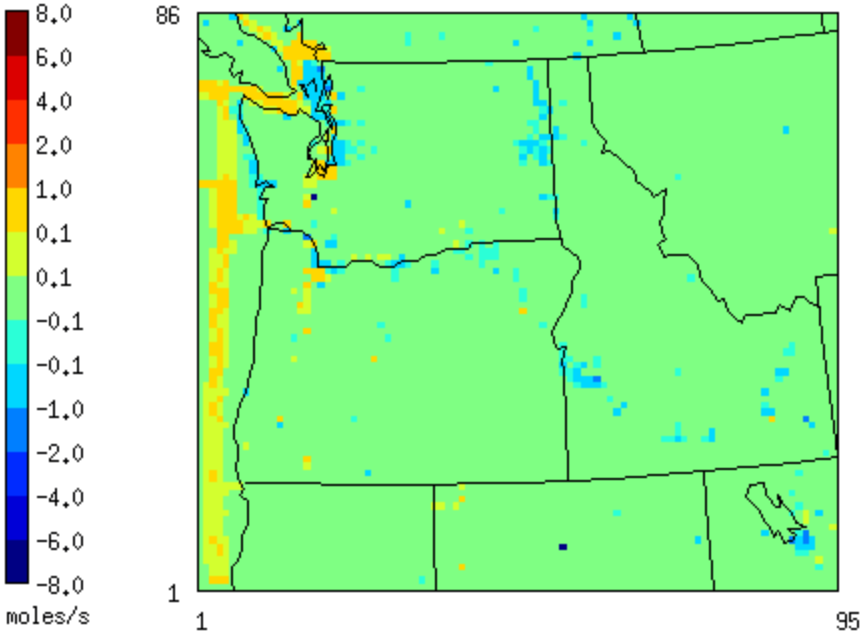
NOx Grouped to 12-km grid
Collapsed to 1 Layer



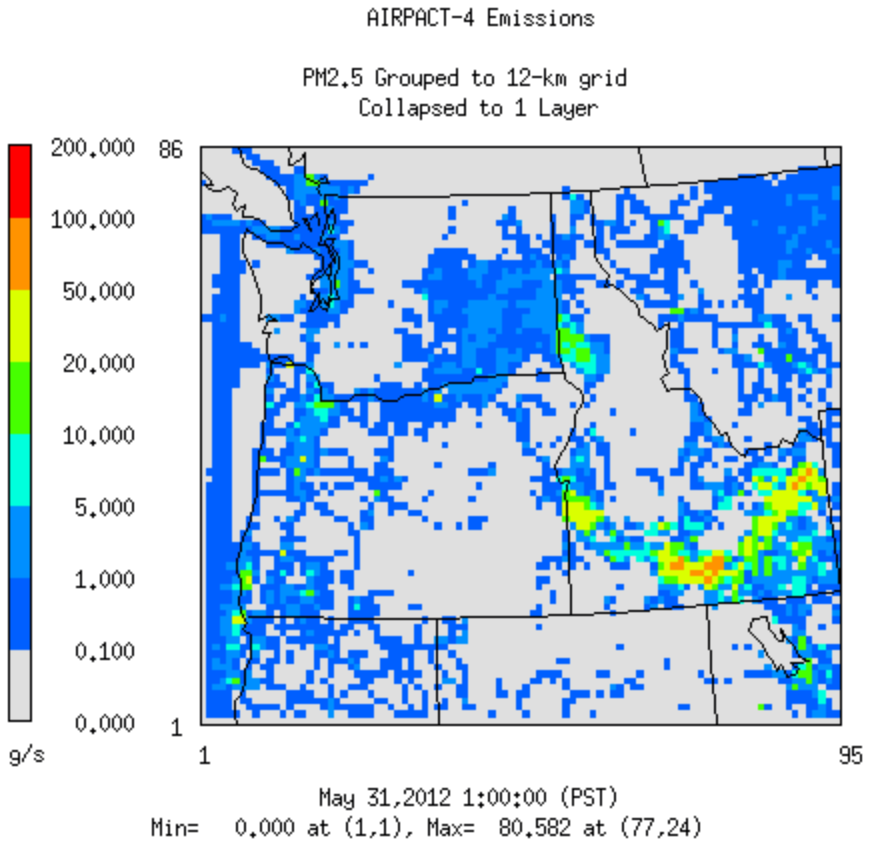
May 31,2012 1:00:00 (PST)
Min= 0.000 at (1,1), Max= 5.217 at (36,49)

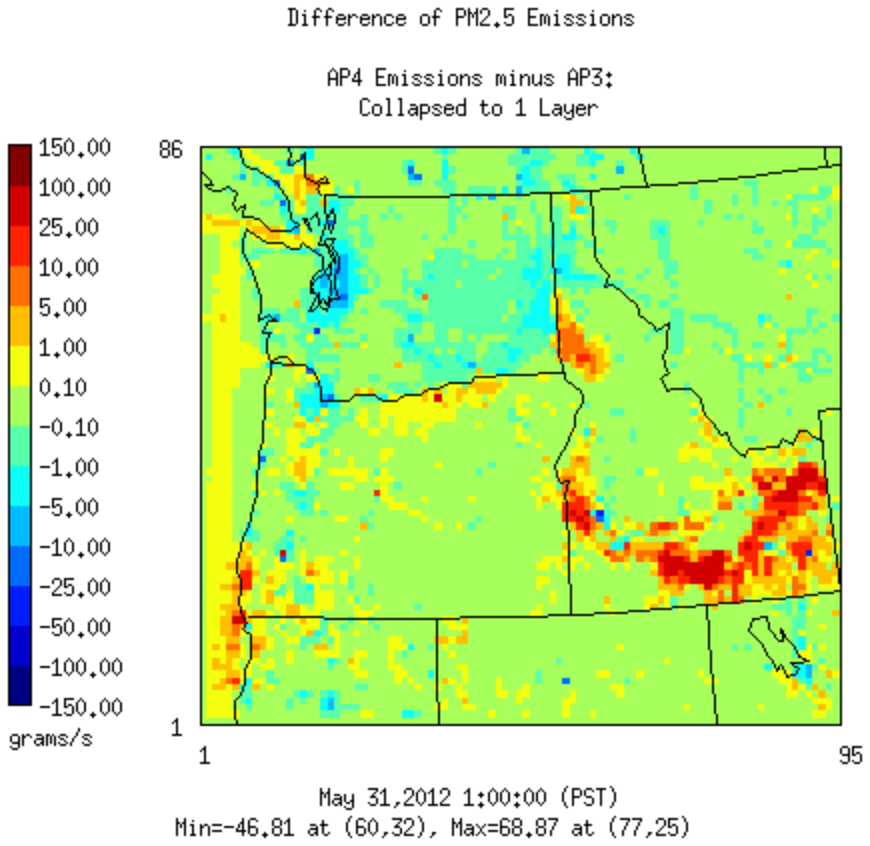
Difference of NOx Emissions

AP4 Emissions minus AP3:
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min=-9.8 at (55,7), Max=0.9 at (6,75)

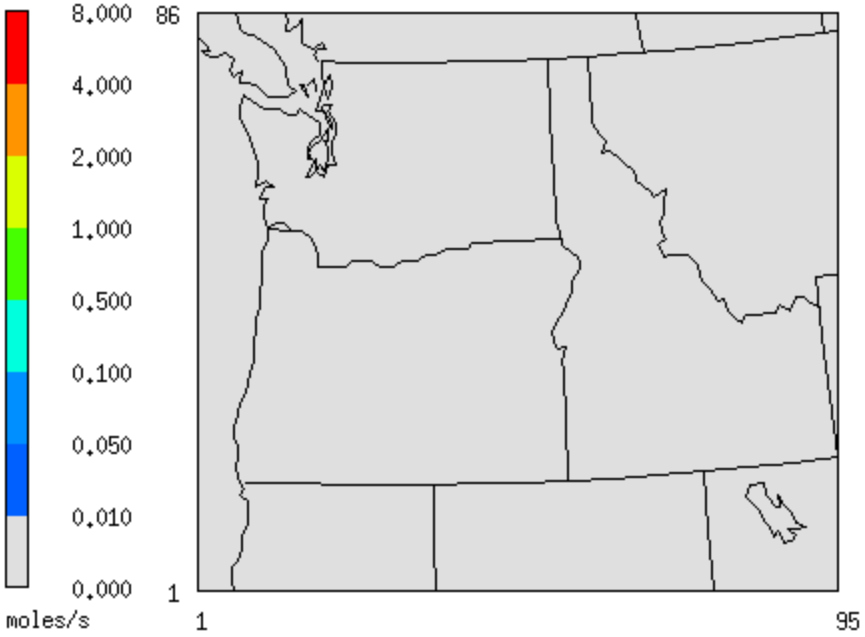




PM 2.5 = P(FINE)+P(NO3) +P(EC)+P(SO4) +POA

AIRPACT-4 Emissions

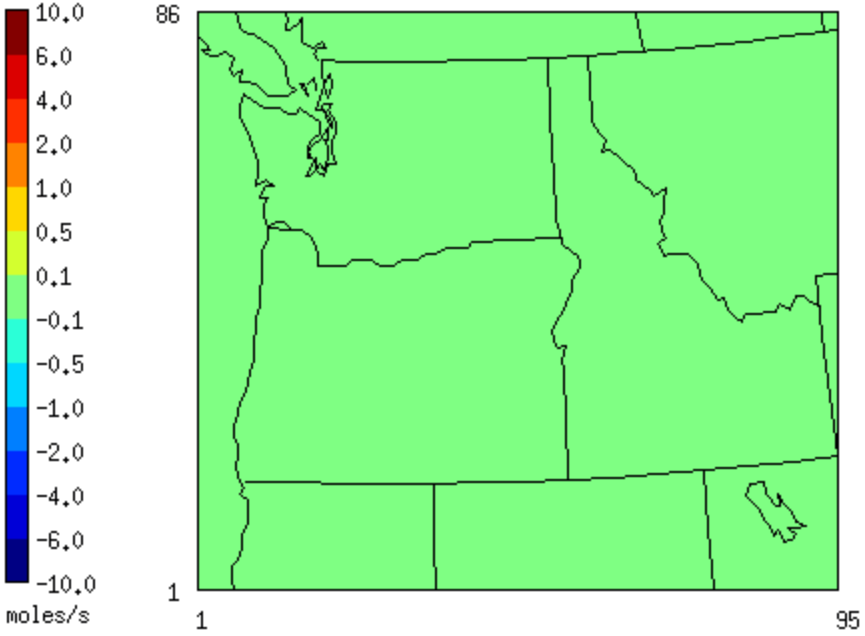
ISOPRENE Grouped to 12-km grid
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min= 0.000 at (1,1), Max= 0.003 at (18,81)

Difference of ISOPRENE Emissions

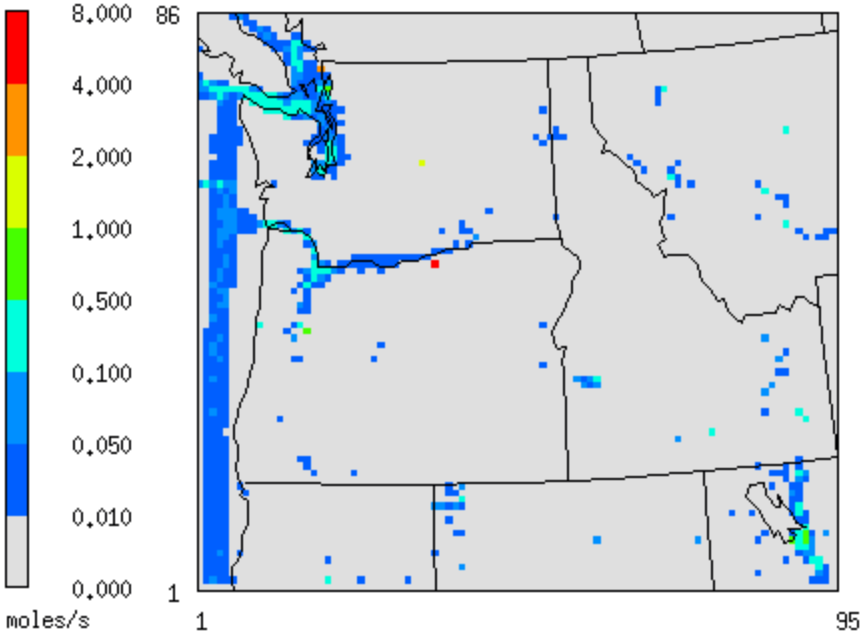
AP4 Emissions minus AP3:
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min=-0.0 at (13,25), Max=0.0 at (18,81)

AIRPACT-4 Emissions

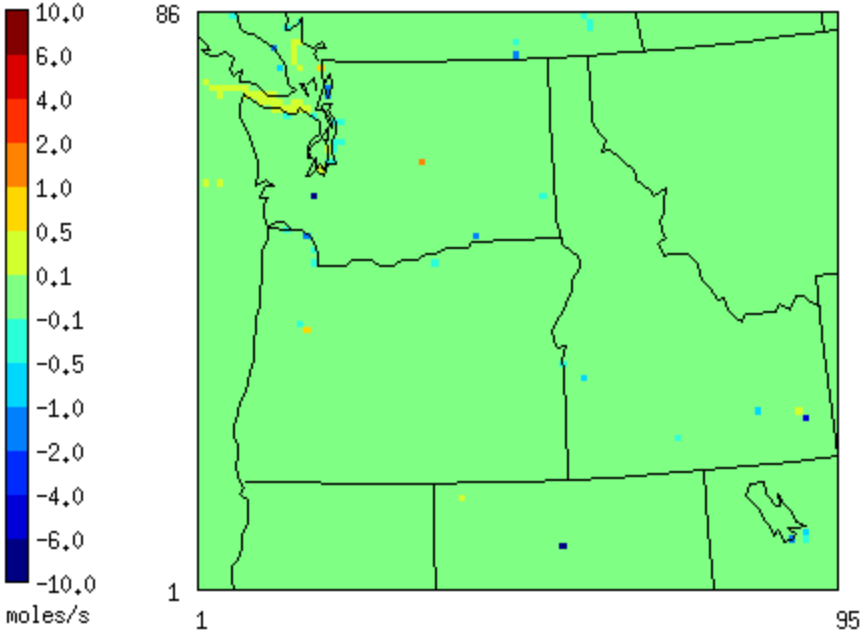
SO2 Grouped to 12-km grid
Collapsed to 1 Layer



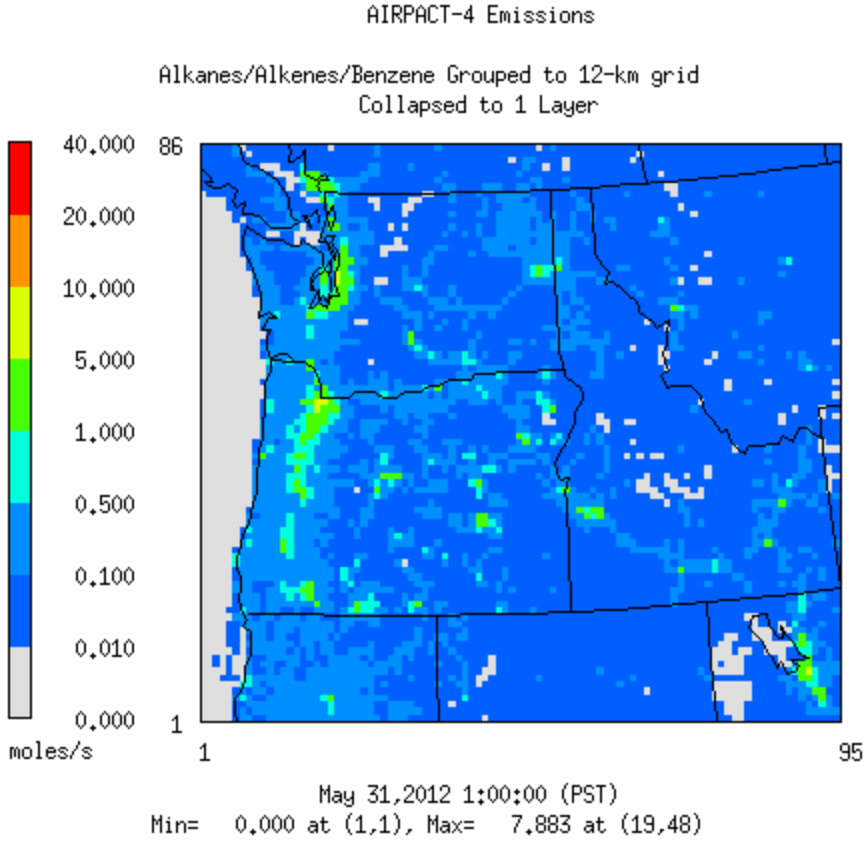
May 31,2012 1:00:00 (PST)
Min= 0.000 at (1,1), Max= 5.404 at (36,49)

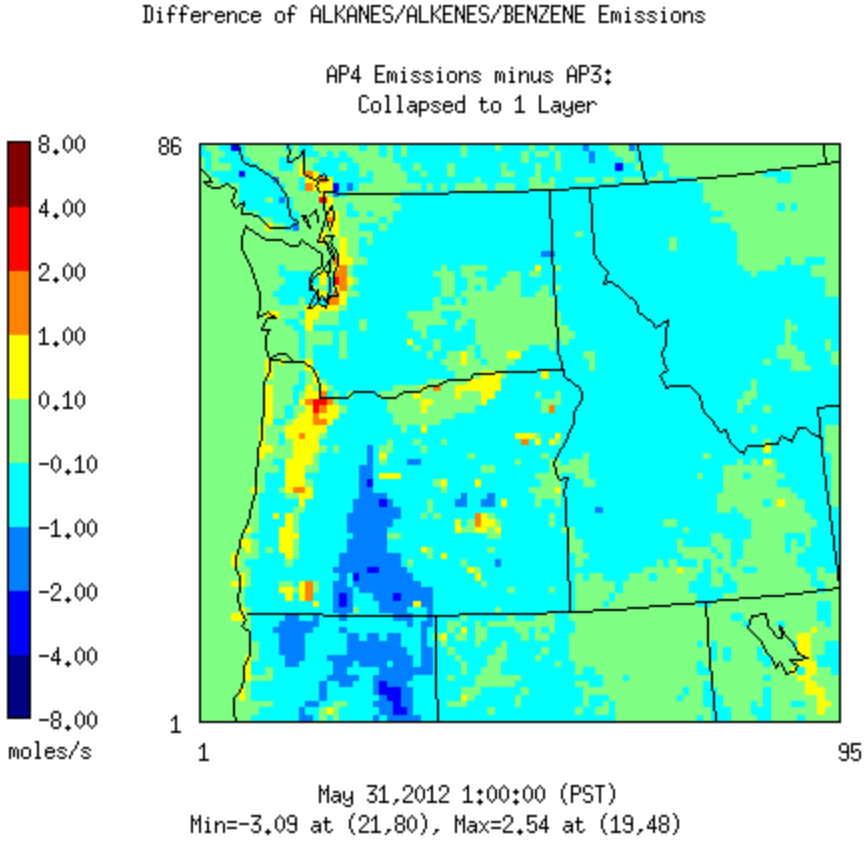
Difference of SO2 Emissions

AP4 Emissions minus AP3:
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min=-8.6 at (18,59), Max=1.6 at (34,64)

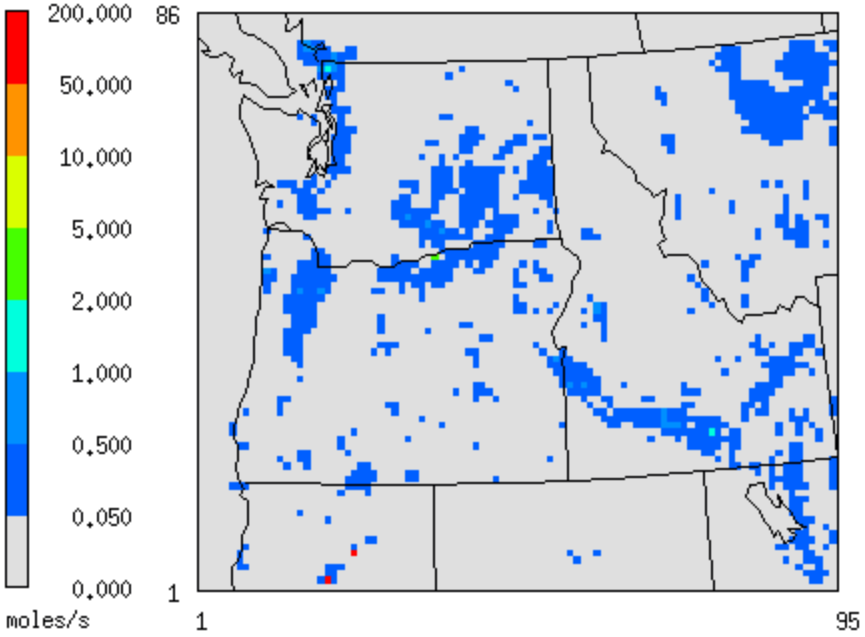




Alkanes= ALK1 x 2 + ALK2 x 3 + ALK3 x 4 + ALK4 x 5 +ALK5 x 8
ALKENES= OLE1 x 5 + OLE2 x 5
Benzene x 6

AIRPACT-4 Emissions

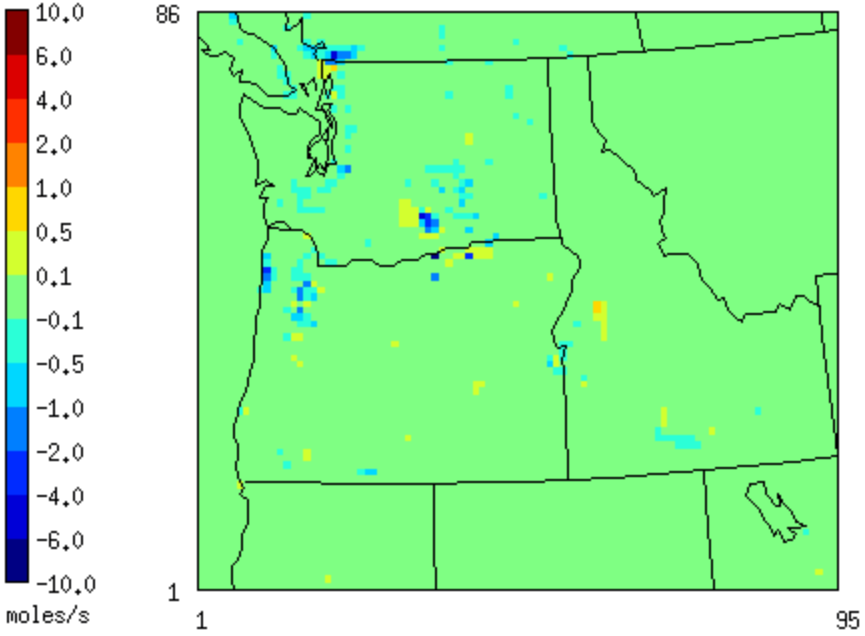
NH3 Grouped to 12-km grid
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min= 0.000 at (1,1), Max= 380.753 at (24,6)

Difference of NH3 Emissions

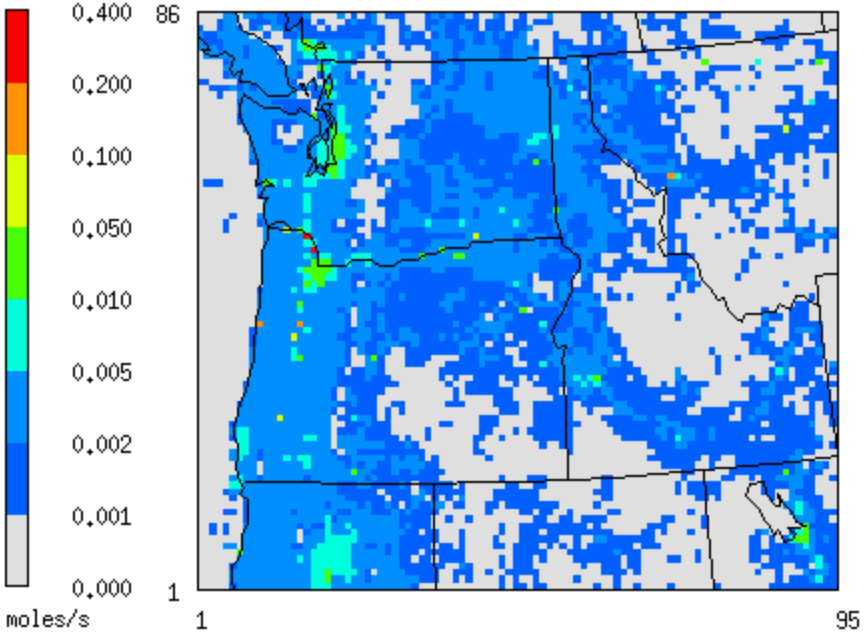
AP4 Emissions minus AP3:
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min=-10.7 at (36,50), Max=0.8 at (21,78)

AIRPACT-4 Emissions

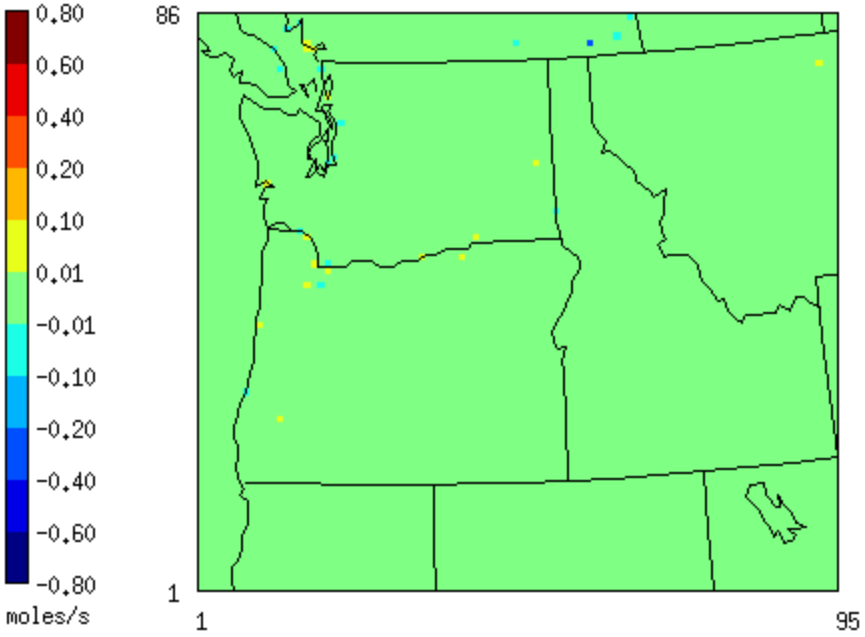
HCHO Grouped to 12-km grid
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min= 0.000 at (1,1), Max= 0.340 at (18,51)

Difference of HCHO Emissions

AP4 Emissions minus AP3:
Collapsed to 1 Layer



May 31,2012 1:00:00 (PST)
Min=-0.26 at (59,82), Max=0.09 at (17,53)

AP4 vs AP3 Emissions Summary

- AP4 shows significantly more ship channel & port emissions

- less NOx along interstates in Idaho
- more NOx in I-5 Corridor, especially major cities.

- more VOCs along I-5 corridor and other major interstates
- less VOCs in central OR / N. CA

- more pm2.5 in most of Idaho (except the north & city centers)
- less pm2.5 in nearly all of Washington.
- more pm2.5 in nearly all of Oregon

- significant isoprene differences in western Oregon and N. CA

- SO2 from Centralia is gone
- Nevada site (mine?) is gone
- many ammonia emissions sources not present in AP4 but some new ones evident as well