

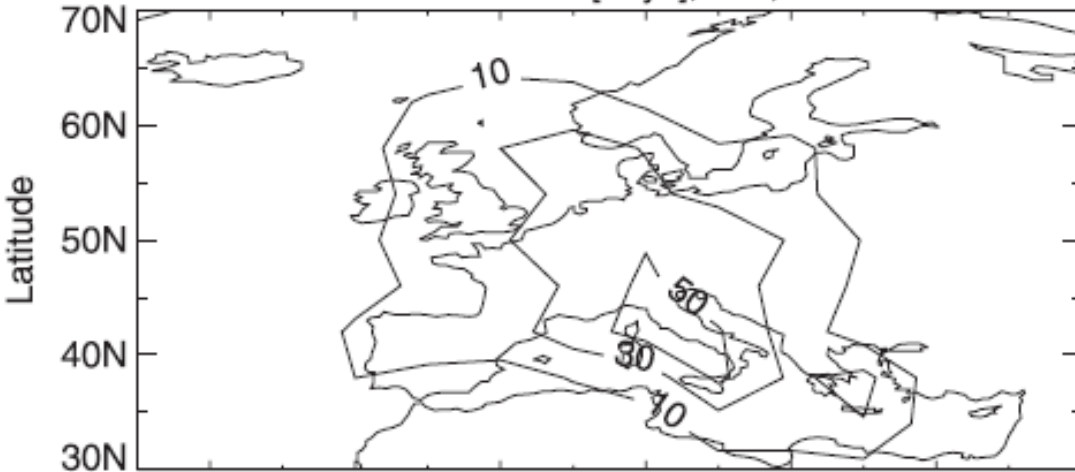
**Impacts on Air Quality Objectives:  
Initial HTAP SR Results  
and Next Steps**

Arlene M. Fiore (arlene.fiore@noaa.gov)

TF HTAP Workshop, Washington, DC, June 12, 2008

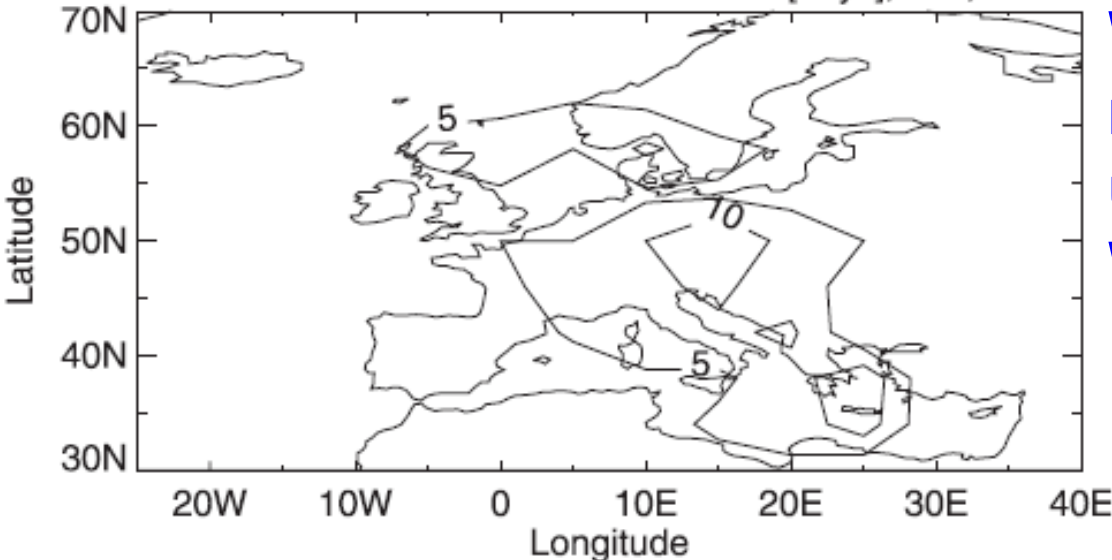
# Exceedances of EU air quality standard due to NA emissions

Total violations [days], JJA, 1997



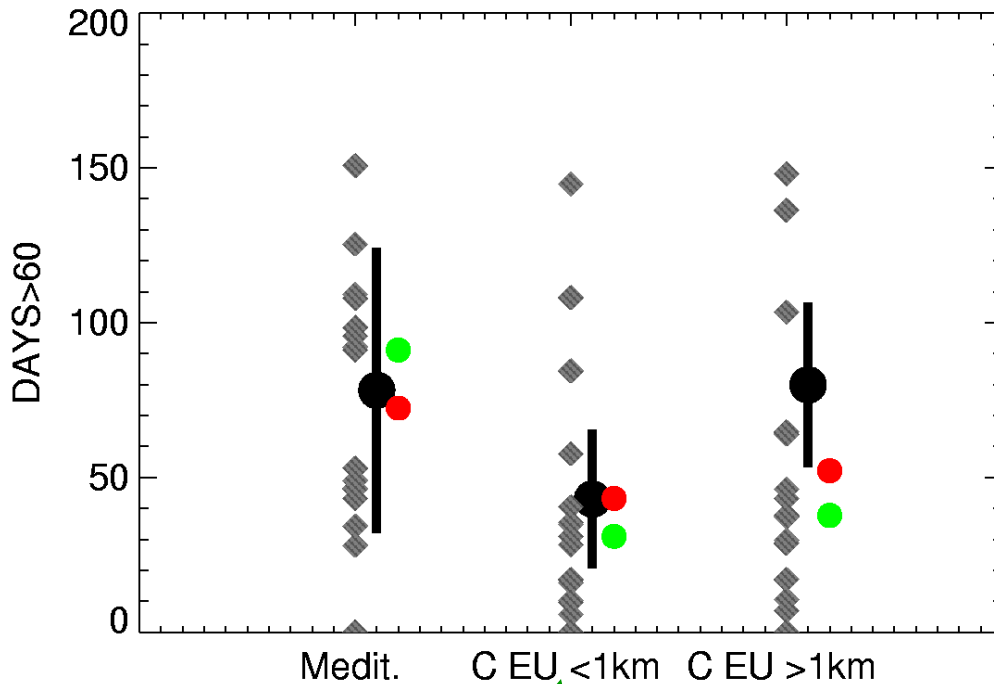
Li et al., JGR, 2002

Violations due to N. American influence [days], JJA, 1997

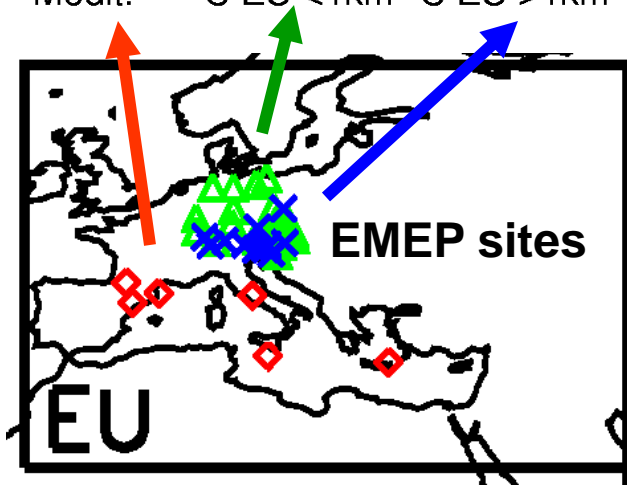


**What is the impact of 20% reductions on metrics used to gauge compliance With air quality standards?**

# Initial HTAP results: Simulated vs. observed DAYS>60 over Europe

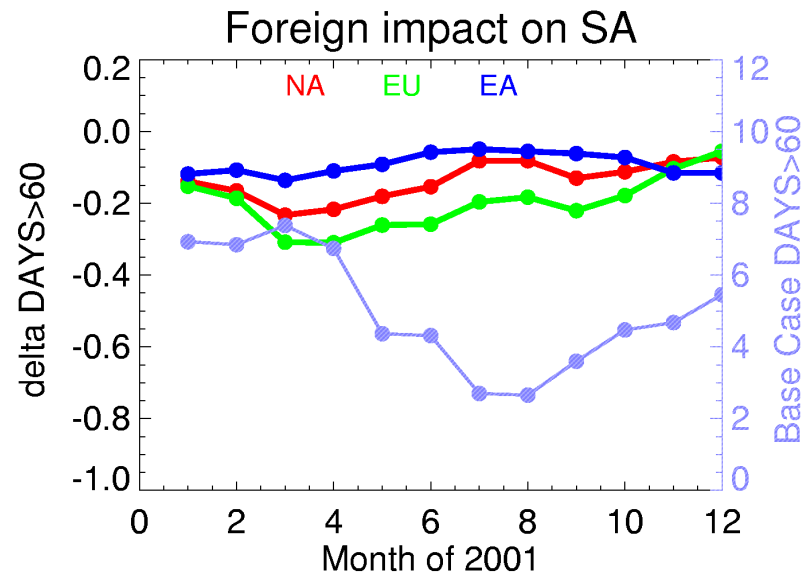
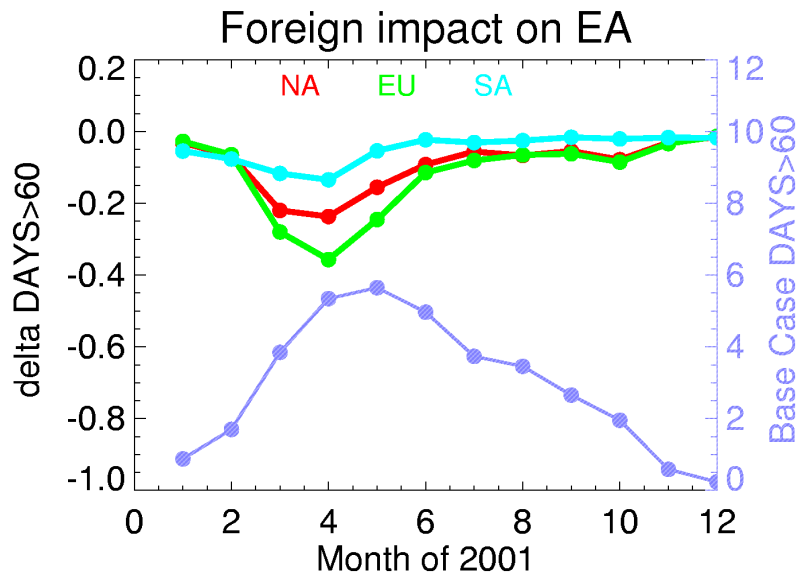
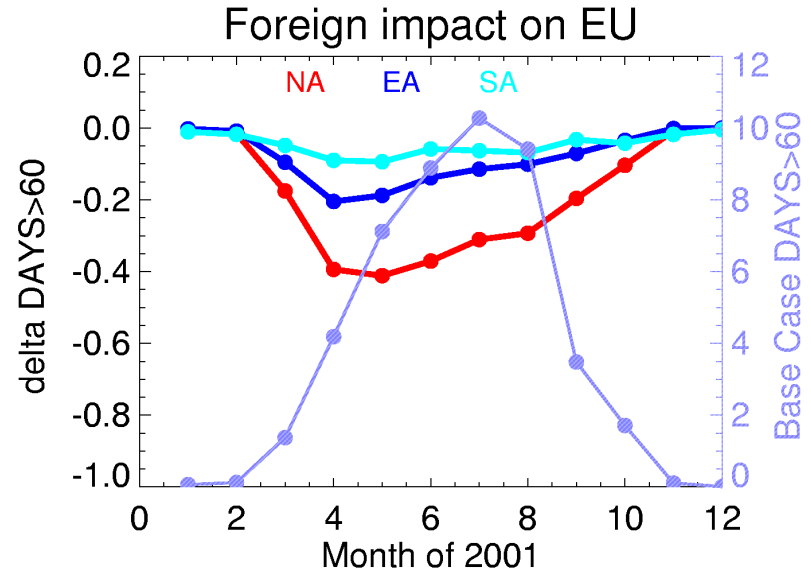
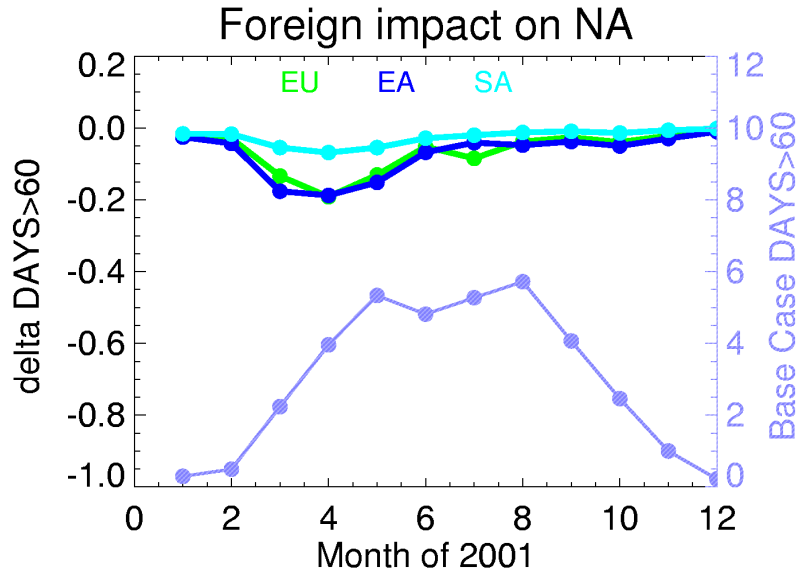


- observed mean (across sites)
- model ens. mean
- model ens. median
- ◇ individual models

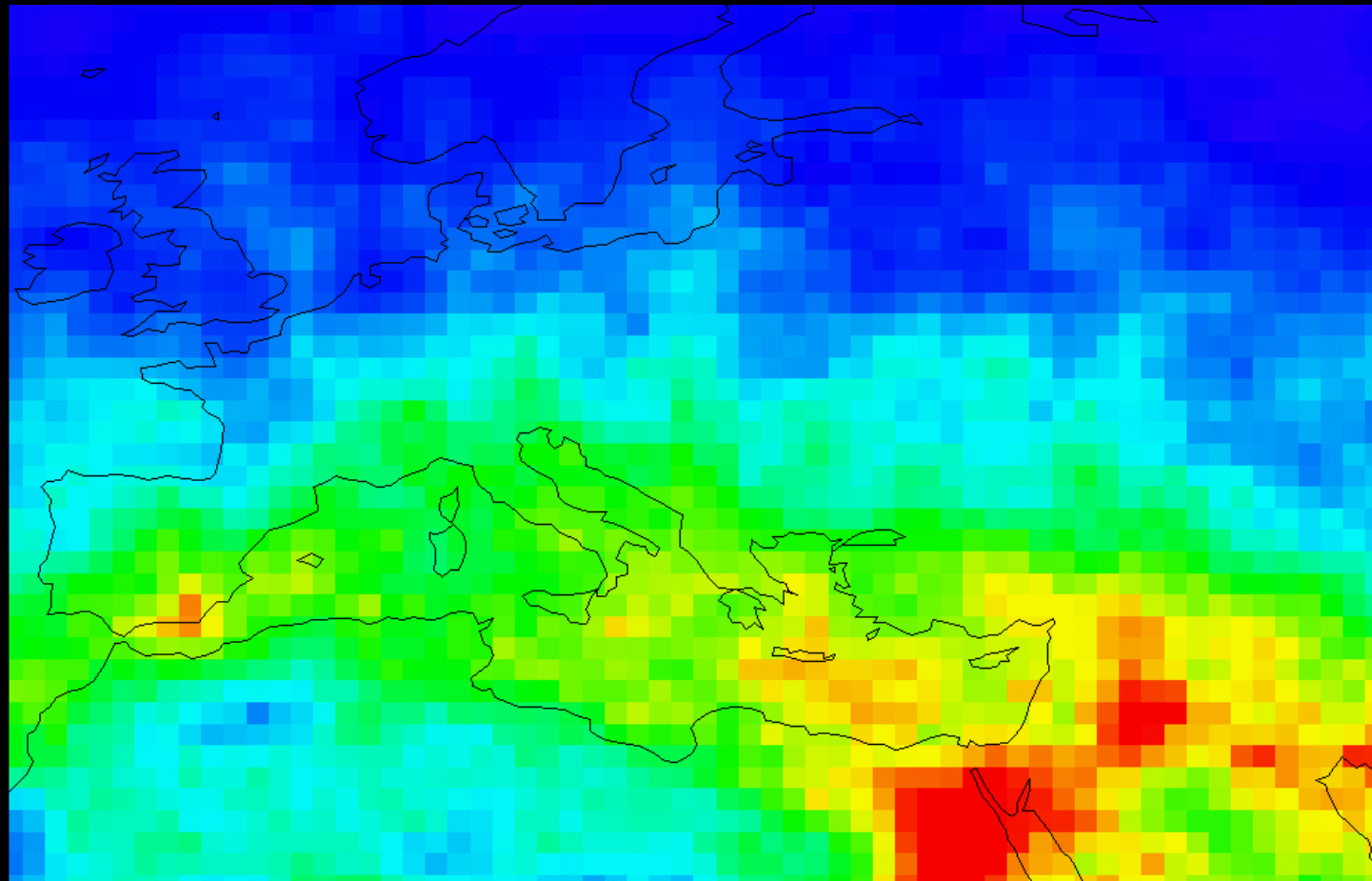


**Model ensemble mean reasonable;**  
**Low bias at high-altitude sites**  
**consistent with evaluation for monthly**  
**mean results.**

# Change in DAYS>60 when all O<sub>3</sub> precursors are reduced by 20% in foreign regions



Model ensemble mean decrease in DAYS>60 over Europe when NA O<sub>3</sub> precursor emission are decreased by 20% (SR1-SR6NA)



MAX 26.8907

0

1

2

3

4

5

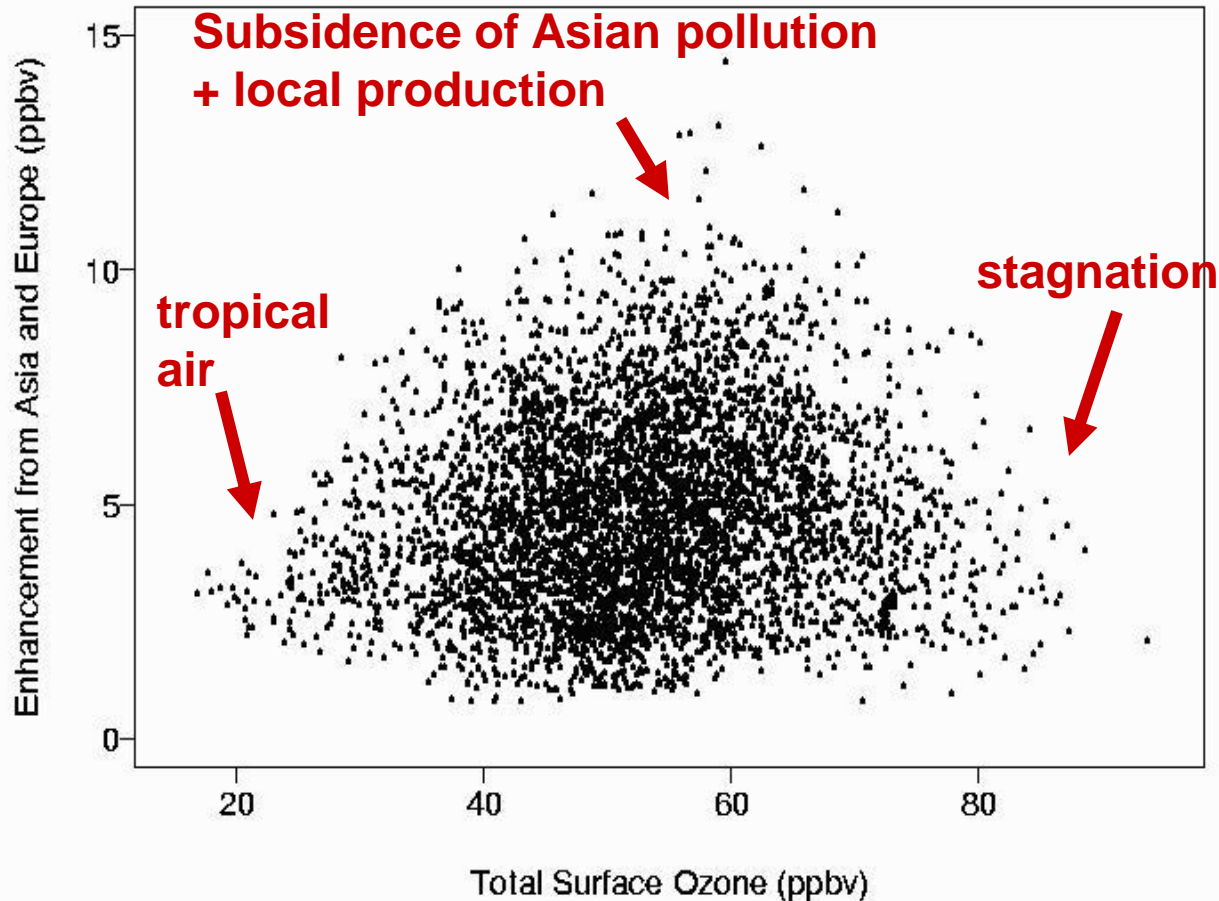
6

MIN -0.703620

→ variability within continental-scale region

# Enhancements from Asian/European pollution over the U.S. in summer

as determined from a simulation without these emissions (GEOS-Chem 4 x5 )

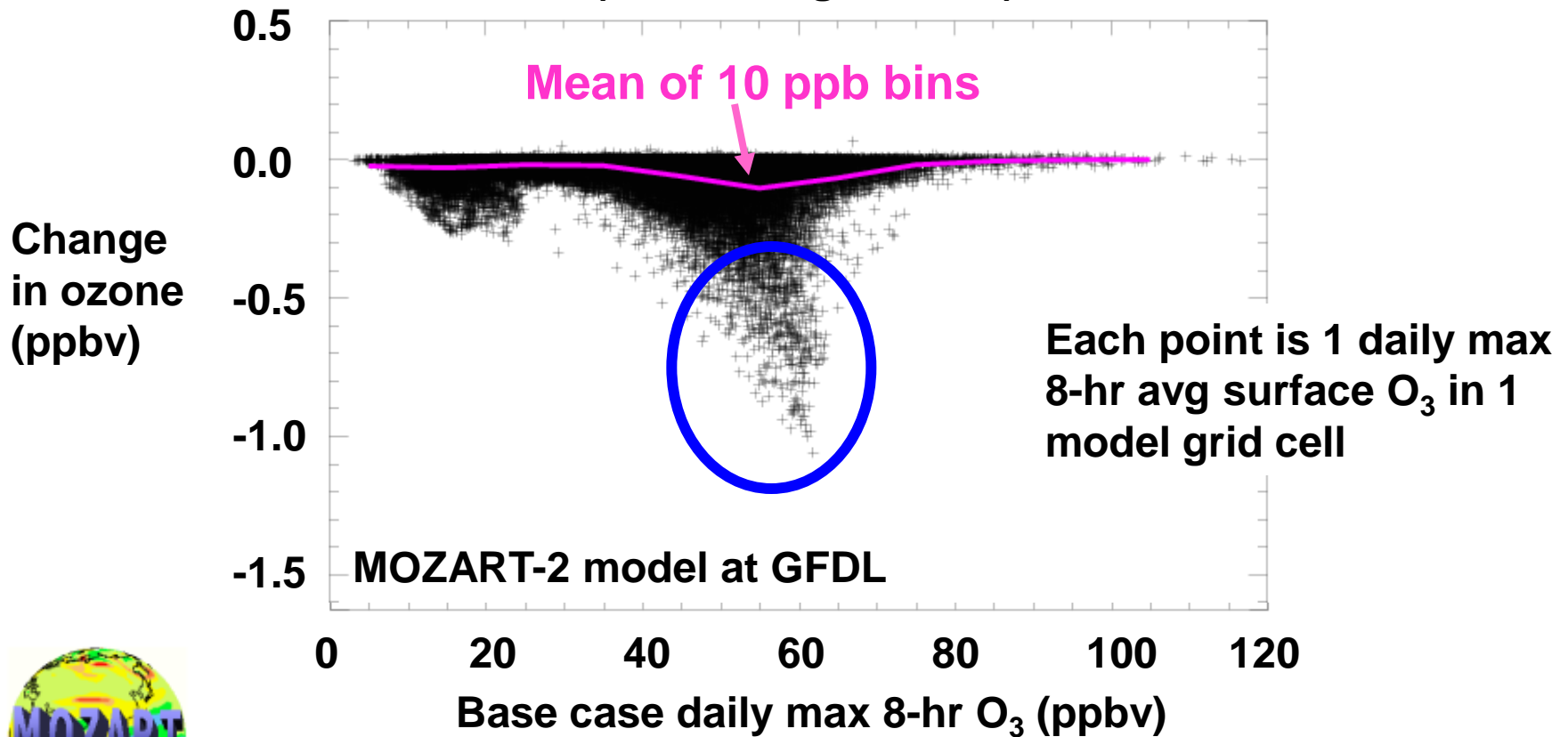


Max Asian/European pollution enhancements (up to 14 ppbv) occur at intermediate ozone levels (50-70 ppbv)

→ Major concern if national ozone standard were to decrease

# Maximum intercontinental influence occurs near the center of the overall O<sub>3</sub> distribution

Impact of a 20% decrease in NA anthrop. NO<sub>x</sub> to EA surface O<sub>3</sub>  
(Jun 1 - Aug 31 2001)

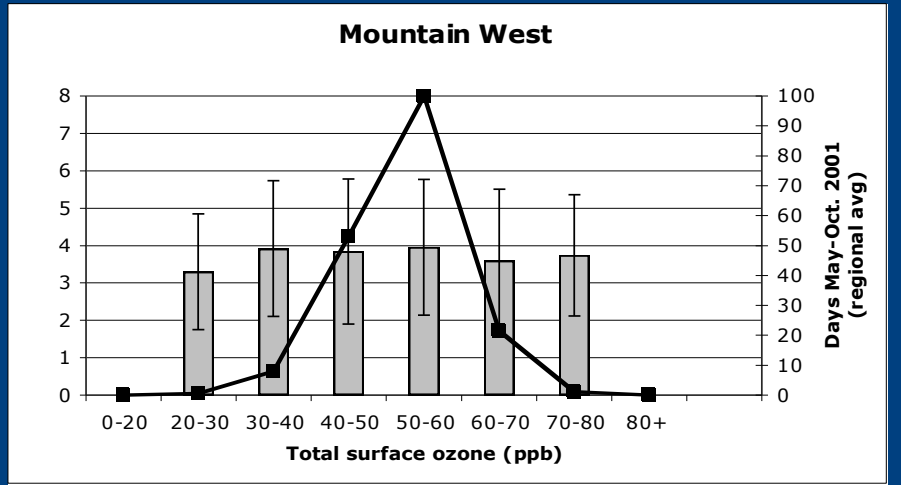
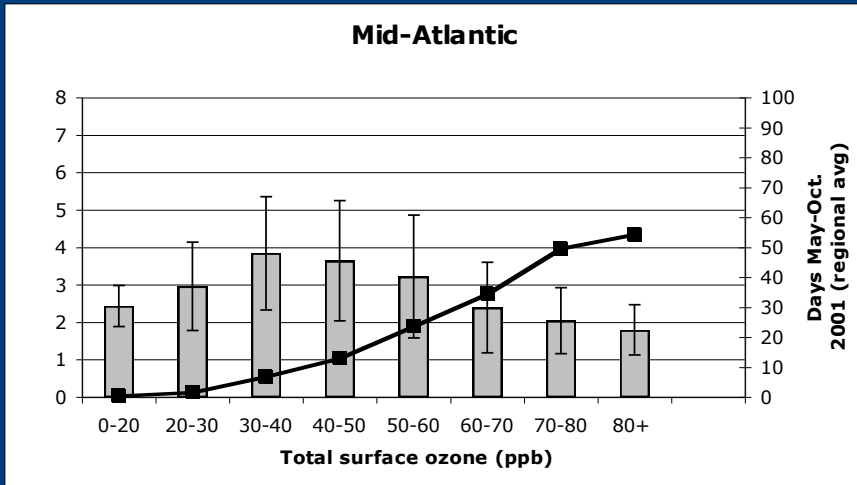
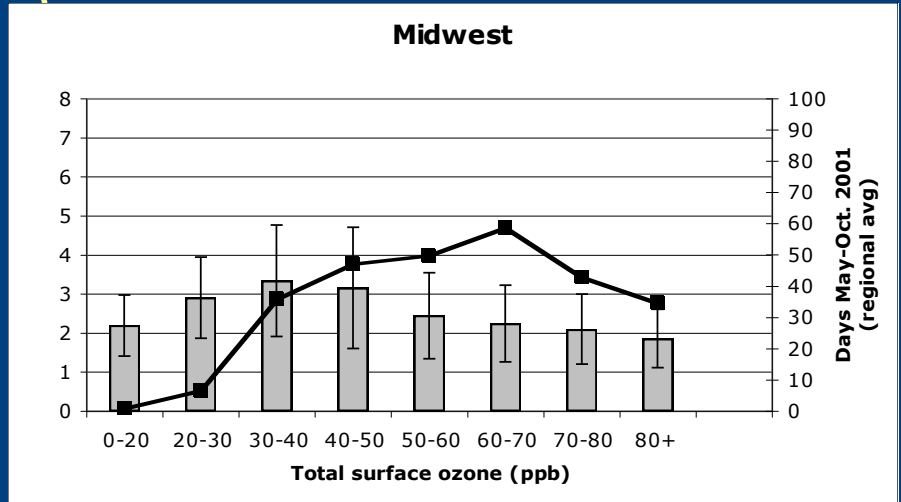
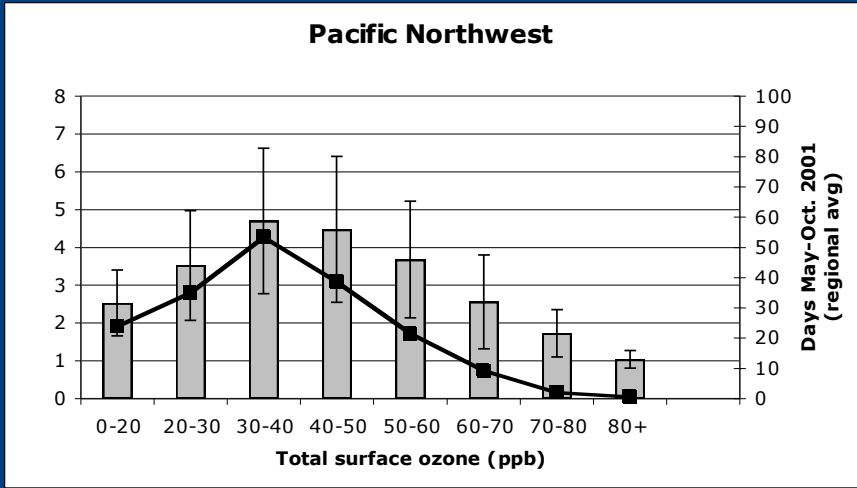


- Is this result robust across the HTAP models?
- Analysis planned for HTAP results for U.S.A.

# Variability within the U.S.:

## Asian+ European enhancement vs. total sfc.

O<sub>3</sub>



Tracey Holloway, U Wisconsin-Madison

Consistency / spread across TF HTAP models?



