

Questions for consideration

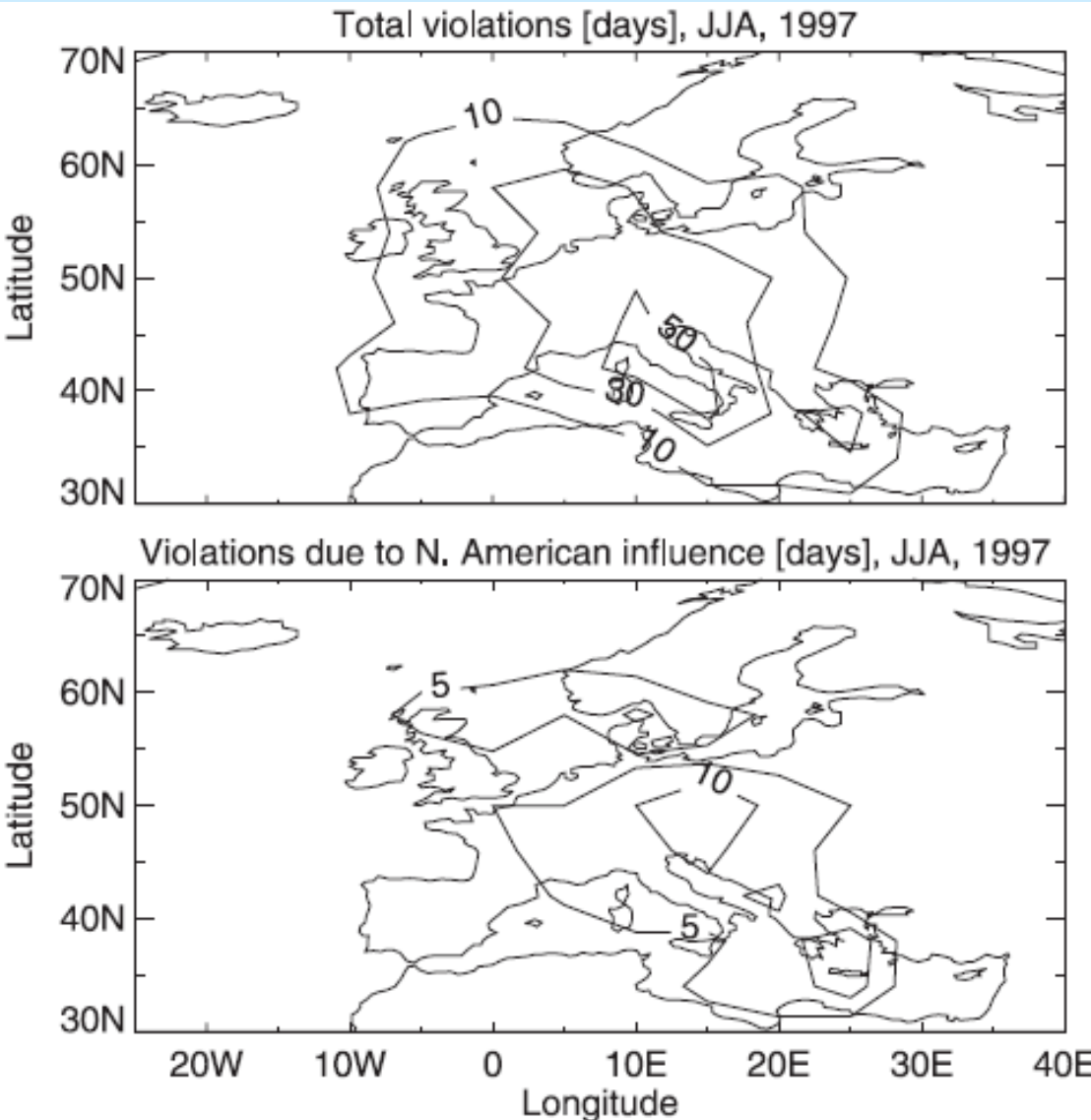
- Are sensitivity analyses enough to inform HTAP impacts on air quality goals? (or do we need total contribution?)
- How well do the global models simulate air quality? Vs. obs? Vs. regional models?
- What is spatial variation within the HTAP regions? Daily variability (peak values)? Interannual variability?
- How to quantify uncertainty?

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

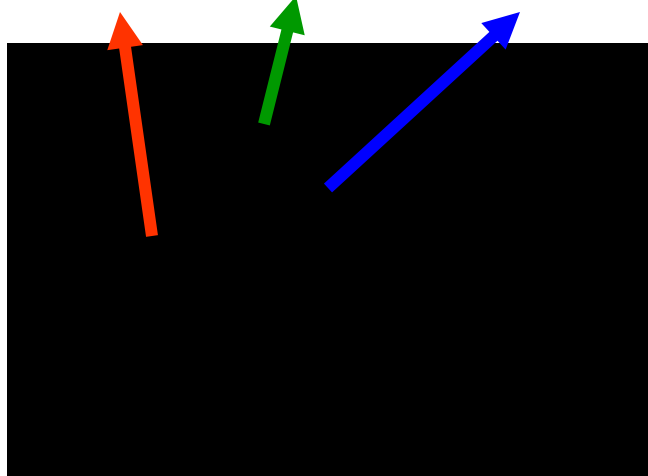
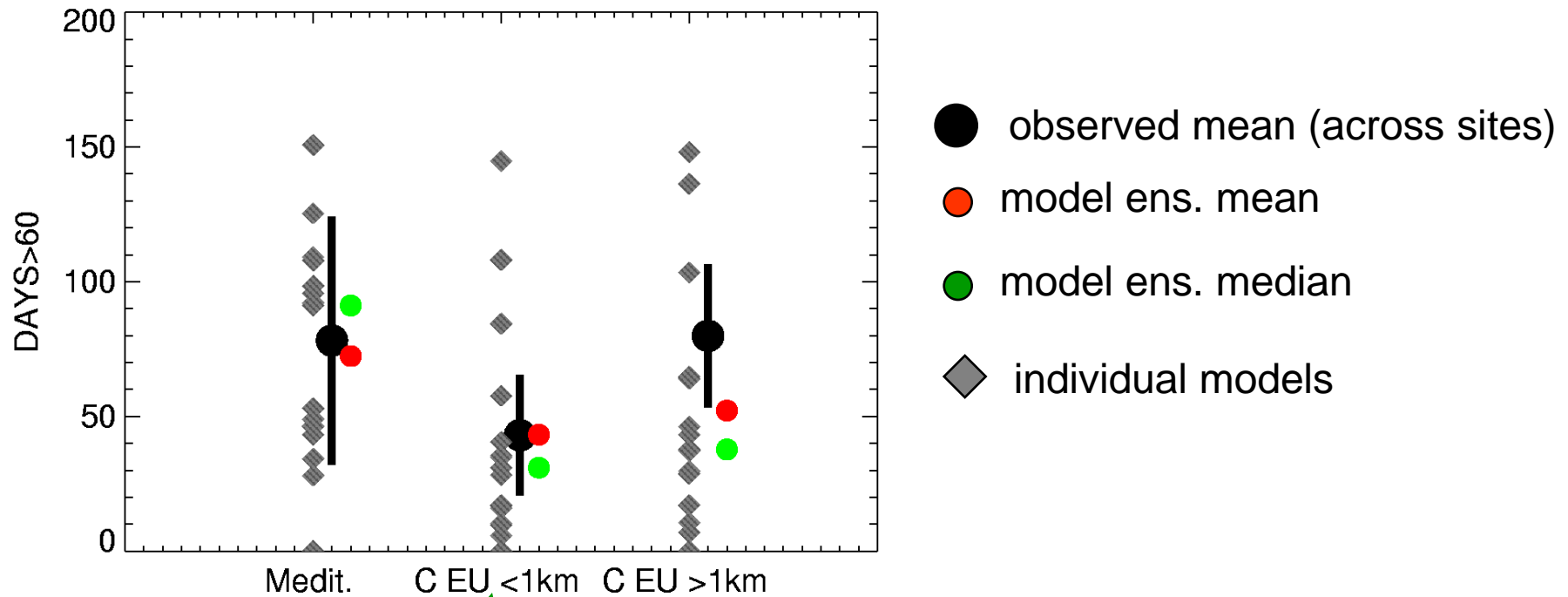
Exceedances of EU air quality standard due to NA emissions



Li et al., JGR, 2002

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

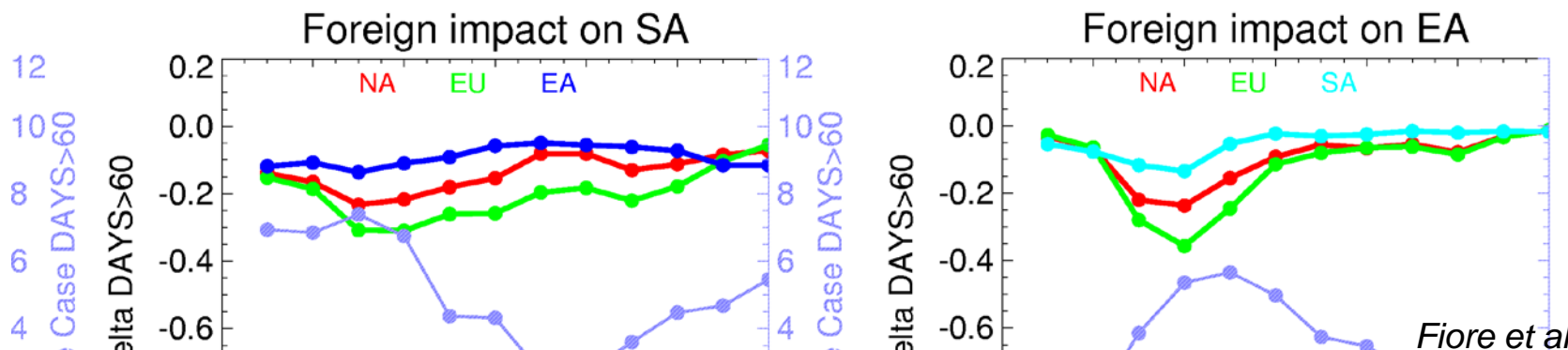
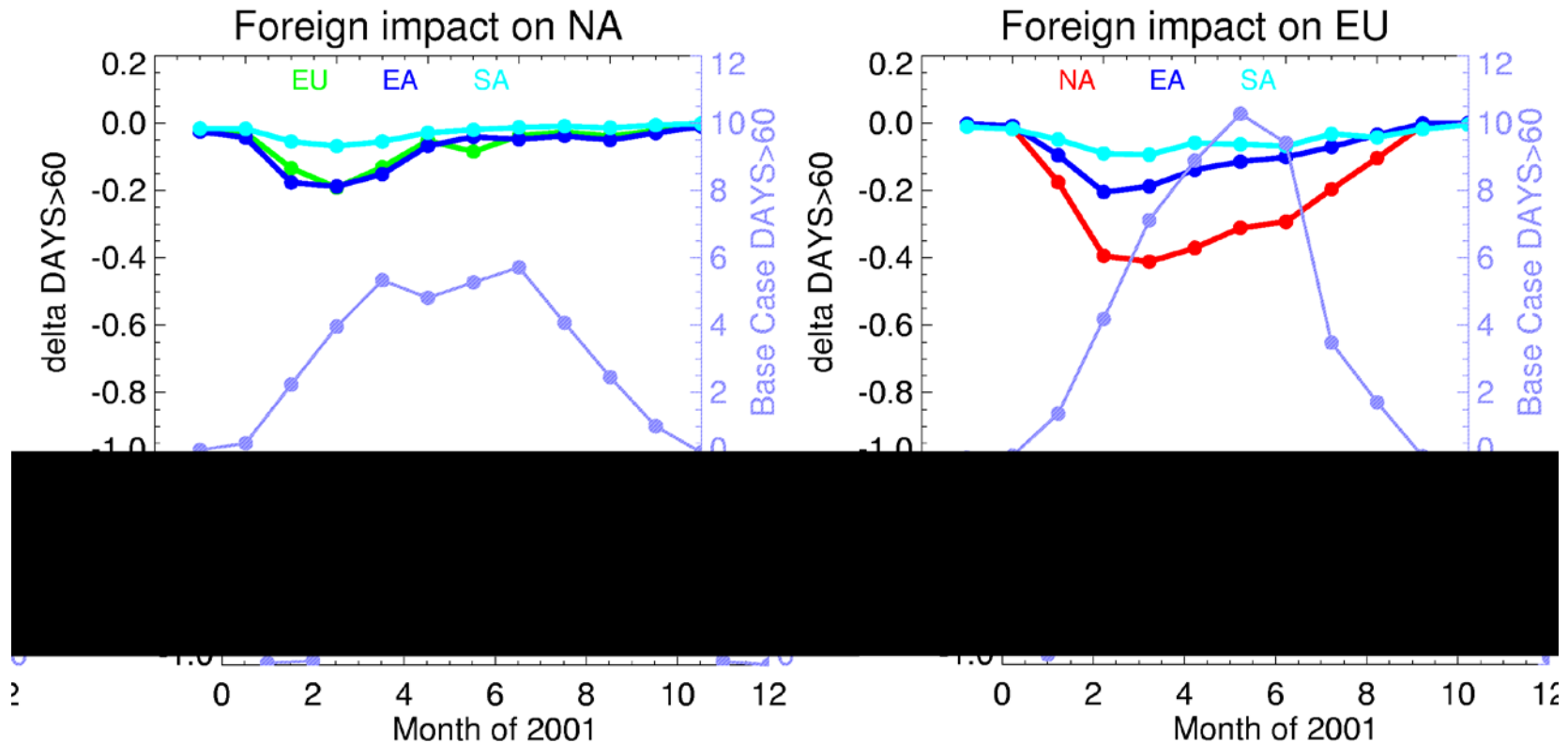
Initial HTAP results: Simulated vs. observed DAYS>60 over Europe



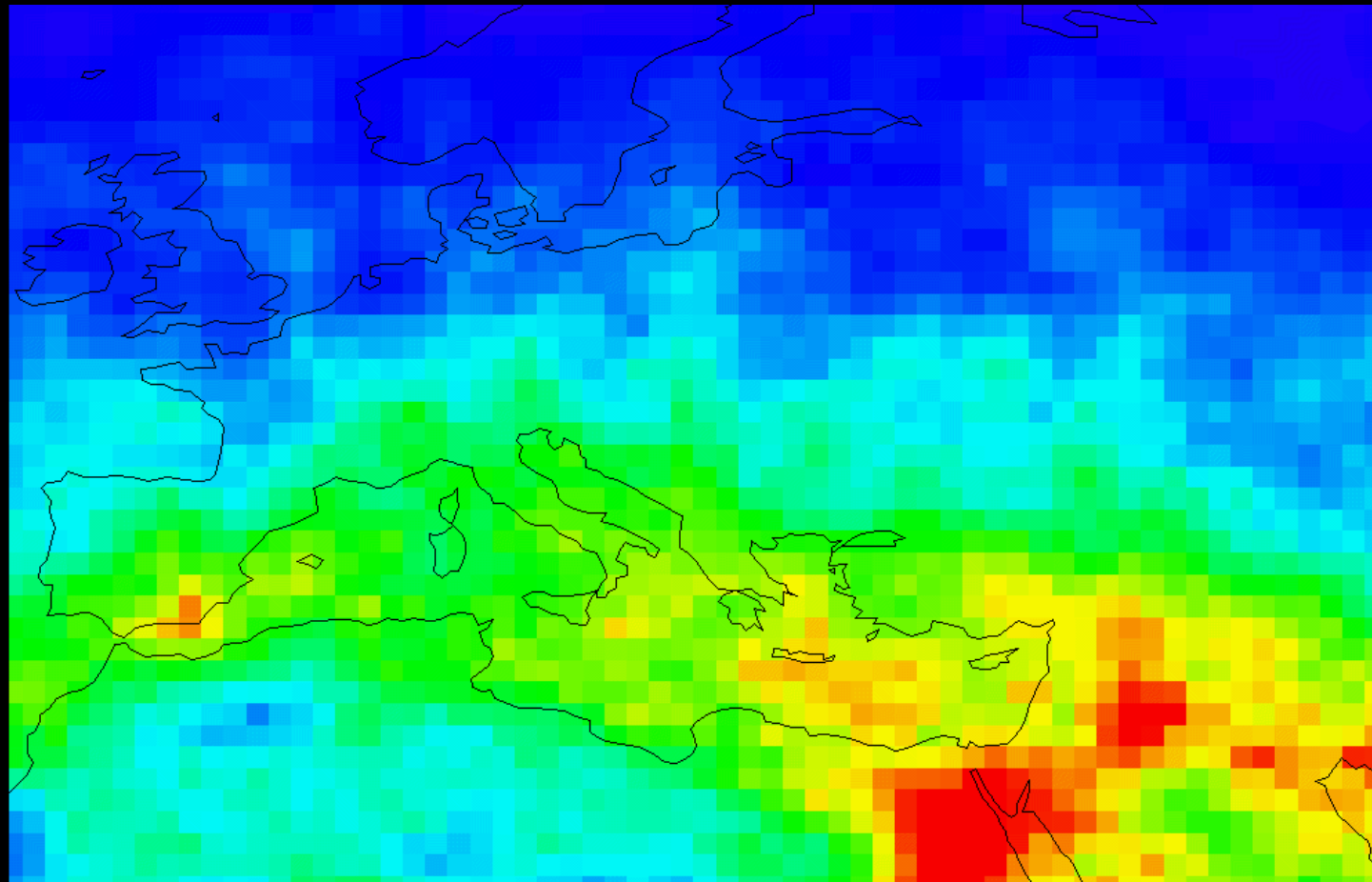
Model ensemble mean reasonable;

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

Change in DAYS>60 when all O₃ precursors are reduced by 20% in foreign regions



Model ensemble mean decrease in DAYS>60 over Europe when NA O₃ precursor emission are decreased by 20% (SR1-SR6NA)



MAX 26.8907

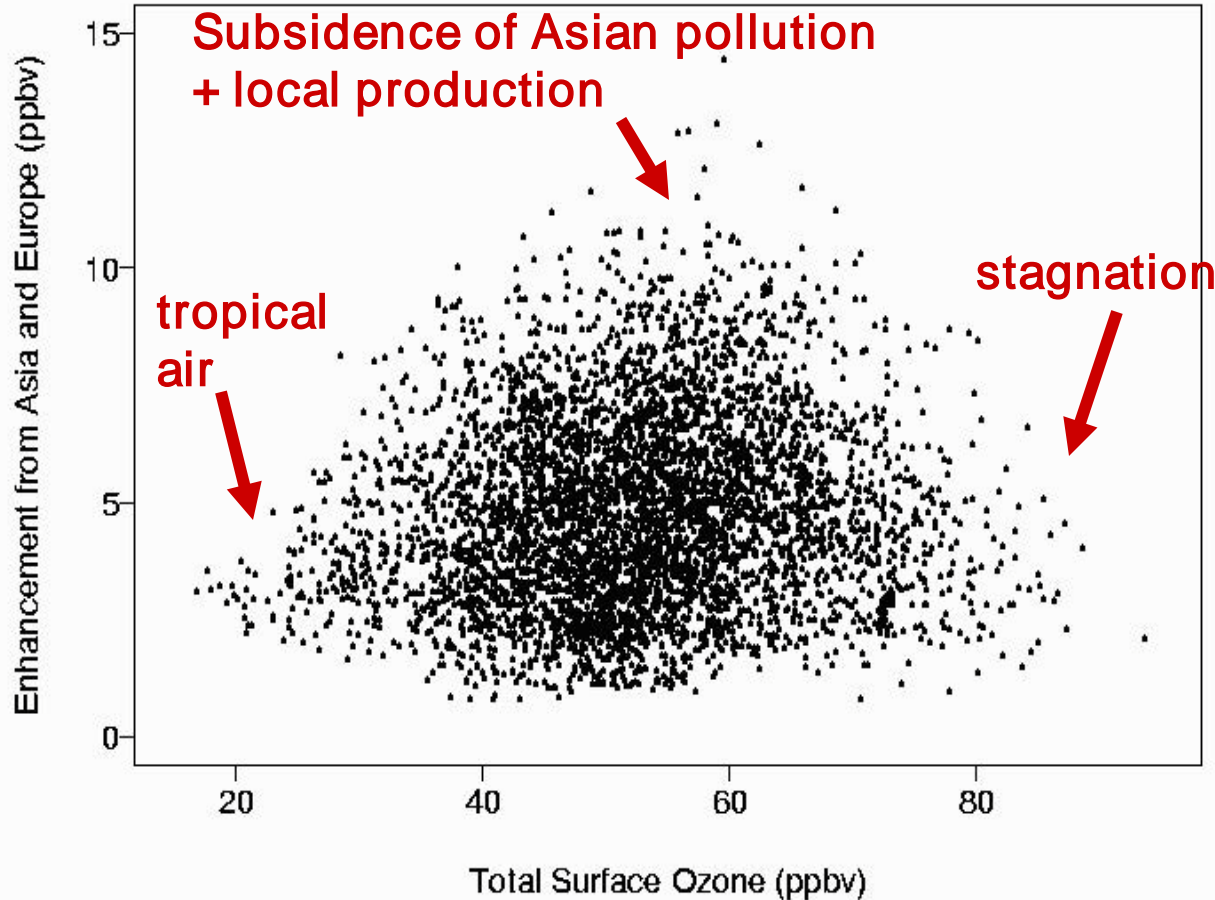
MIN -0.703620



→ 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)

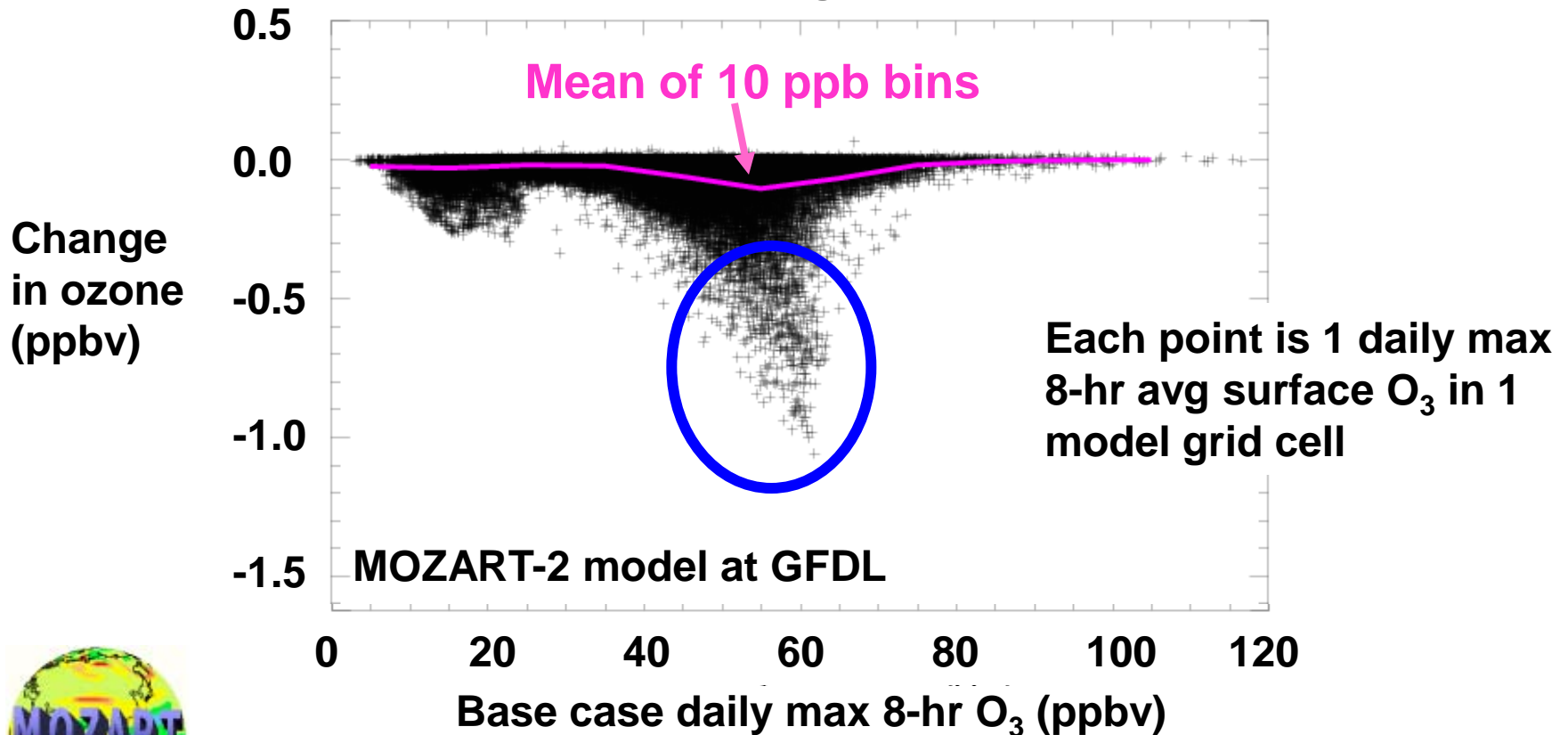


Max Asian/European pollution enhancements (up to 14 ppbv) occur at intermediate ozone levels (50-70 ppbv)

→ Major concern if national ozone standard were to decrease

Maximum intercontinental influence occurs near the center of the overall O₃ distribution

Impact of a 20% decrease in NA anthrop. NO_x to EA surface O₃
(Jun 1 - Aug 31 2001)

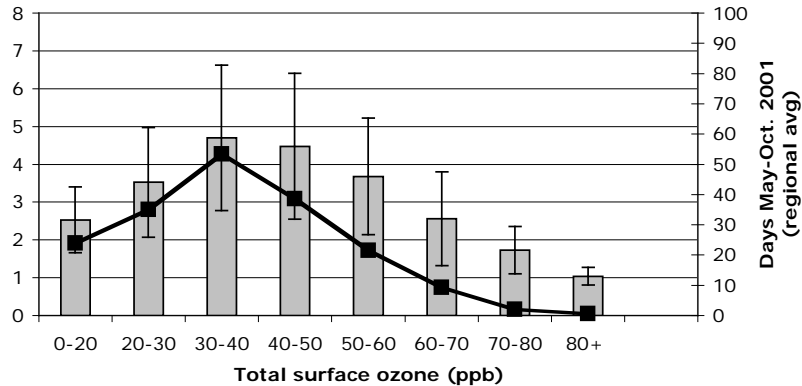


→ Is this result robust across the HTAP models?
→ Analysis planned for HTAP results for U.S.A.

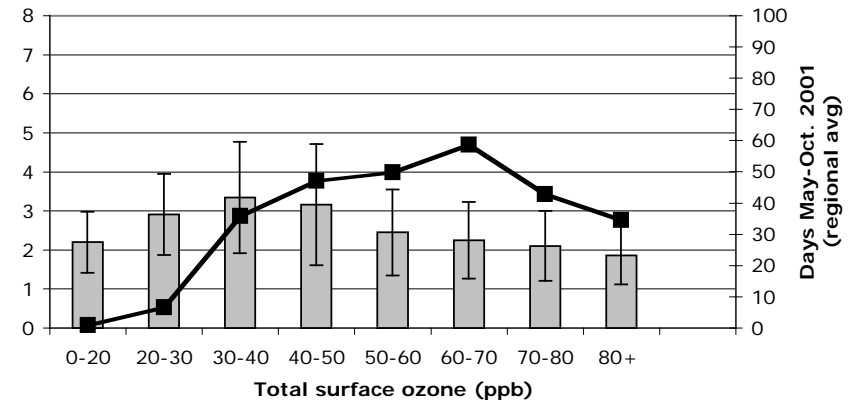
Variability within the U.S.:

Asian+ European enhancement vs. total sfc. O_3

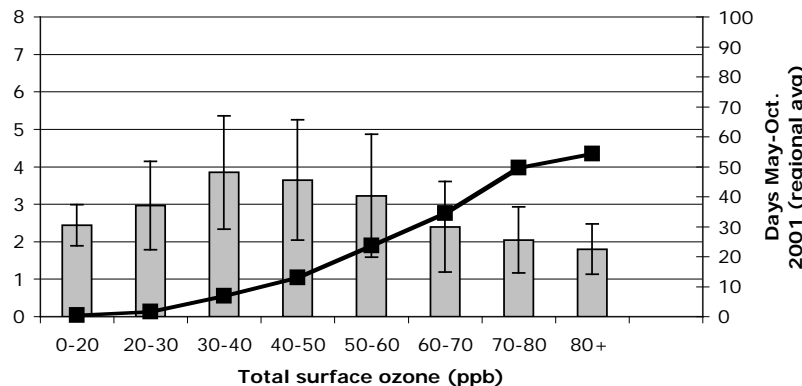
Pacific Northwest



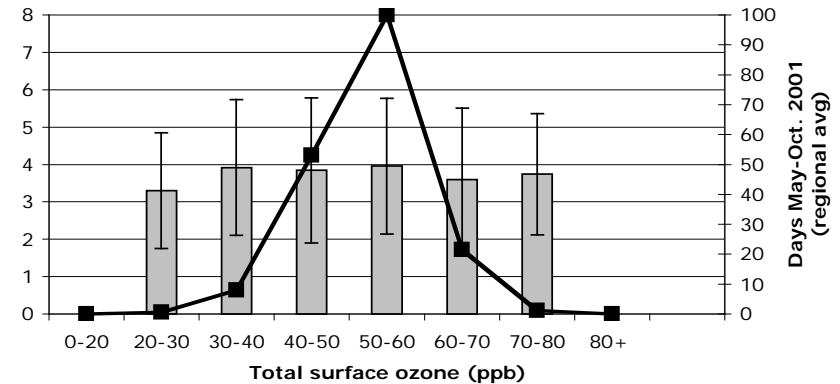
Midwest



Mid-Atlantic



Mountain West



Tracey Holloway, U Wisconsin-Madison

Consistency / spread across TF HTAP models?