MICS-Asia Phase Ⅲ (Modeling and Emission Inventories)

”Multi-scale model (Global, regional, urban)”

Draft Plan

Scales: Mega-cities, City clusters:

Japan (Tokyo and Osaka Metropolitan areas)
Increase of ozone conc. despite of NOx and VOC reduction,

China (Beijing, Pearl River Delta: Hundred-Million Yen Project, Shanghai-EXPO2010)

Thailand (VOCs emission is controlled by Environmental Standard and then photochemical ozone)

Scales: Regional and global

Source/Receptor analysis at regional scales

Increase of annual average concentration of ozone
- Decline of crops and forests (AOT40)
- Global warming

Passive sampler campaign (Workshop and observation in EANET sites)

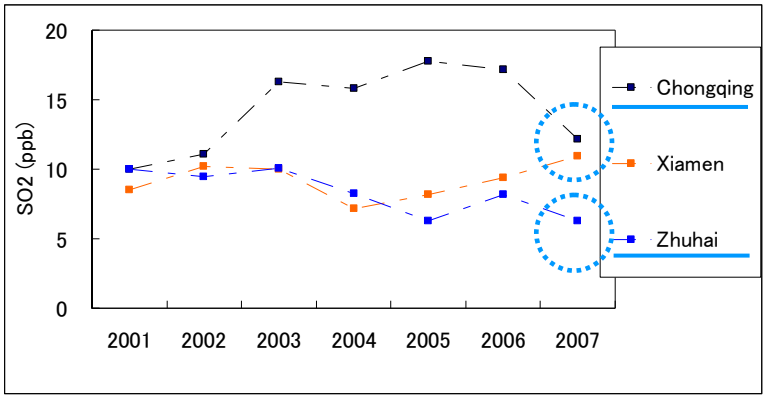
Collaborating with

EANET, HTAP, WMO GAW Urban Research Meteorology and Environment (**GURME**) Programme, IGAC and others

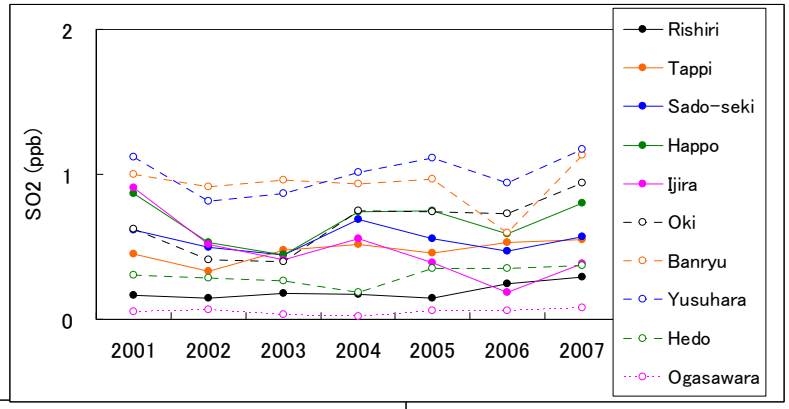
Collaborations welcomed and needed !!

Annual trend in 2001-2007 (SO_2)

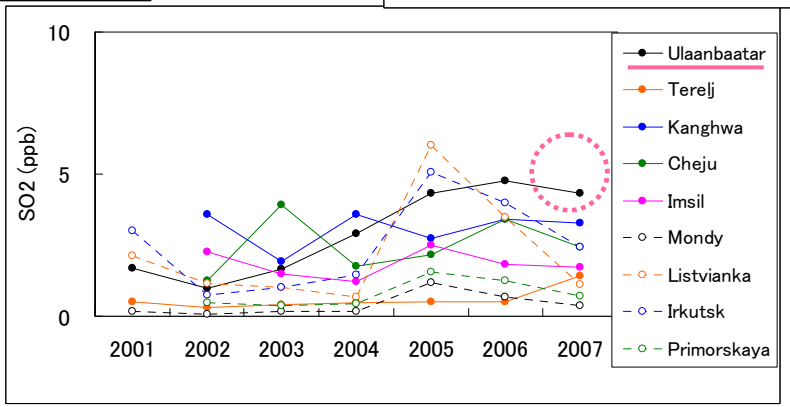
China



Japan



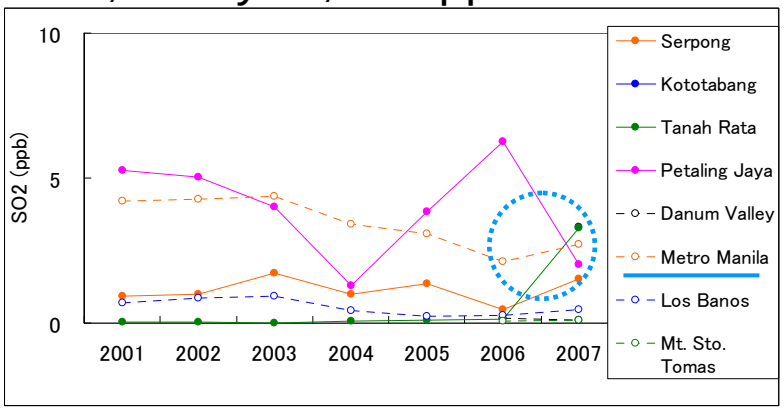
Mongolia, R.Korea, Russia



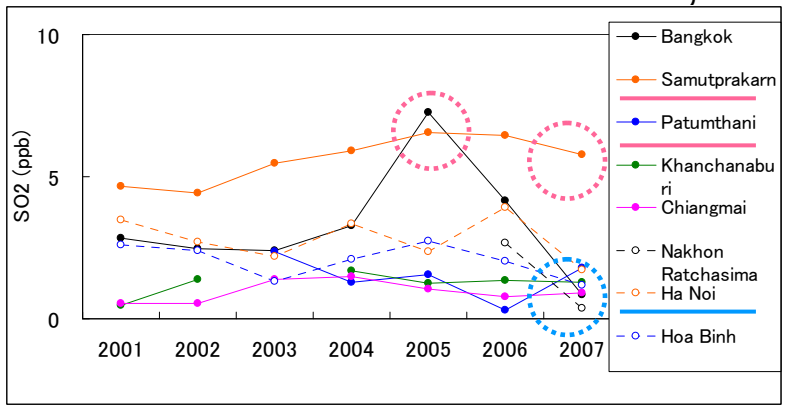
Increasing

Decreasing

Indonesia, Malaysia, Philippines

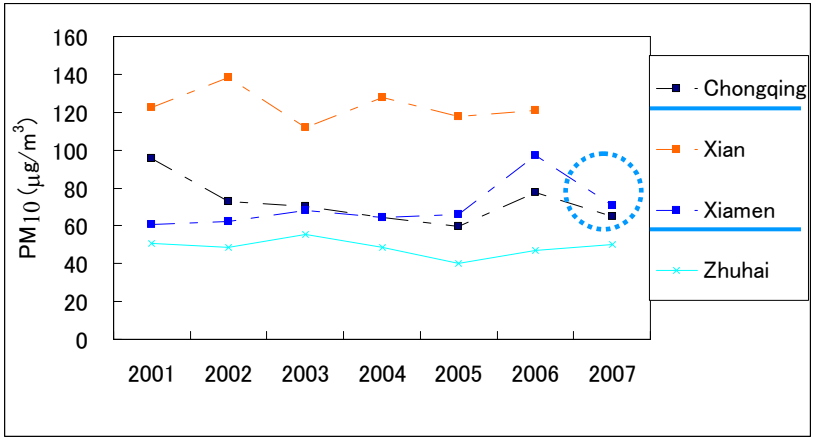


Thailand, Viet Nam

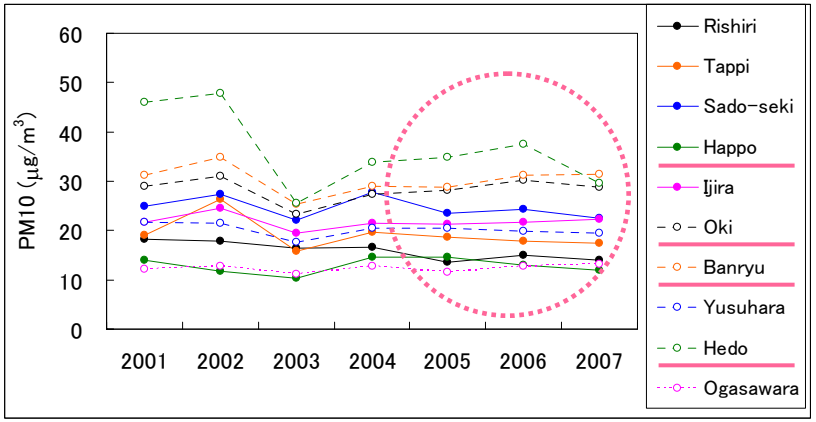


Annual trend in 2001-2007 (PM_{10})

China

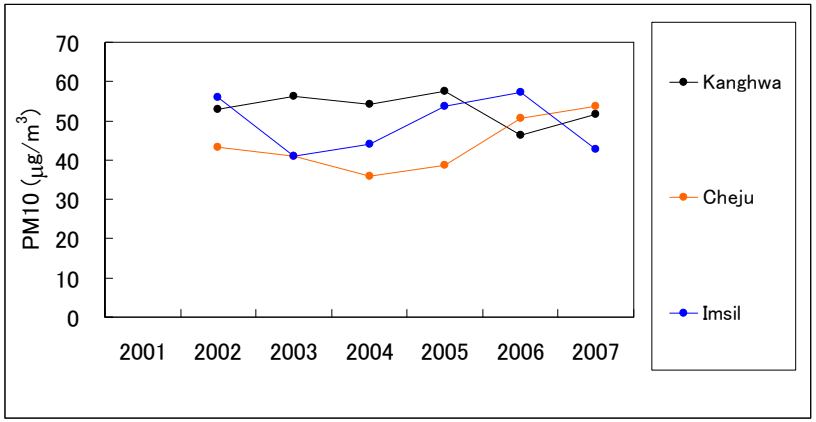


Japan



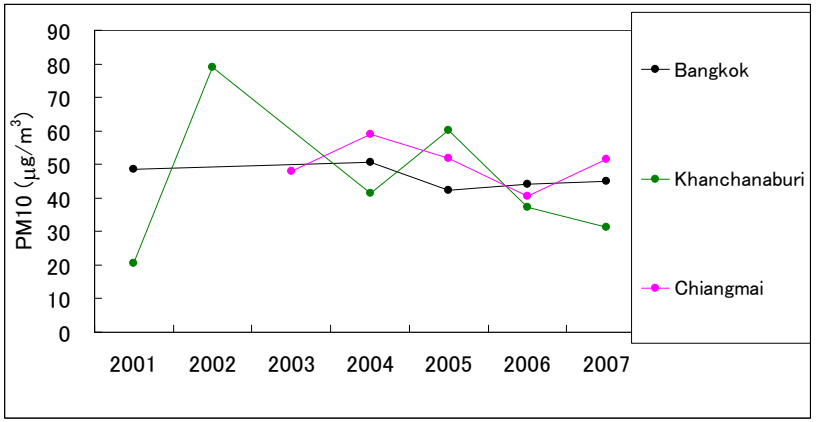
Decreasing

R.Korea

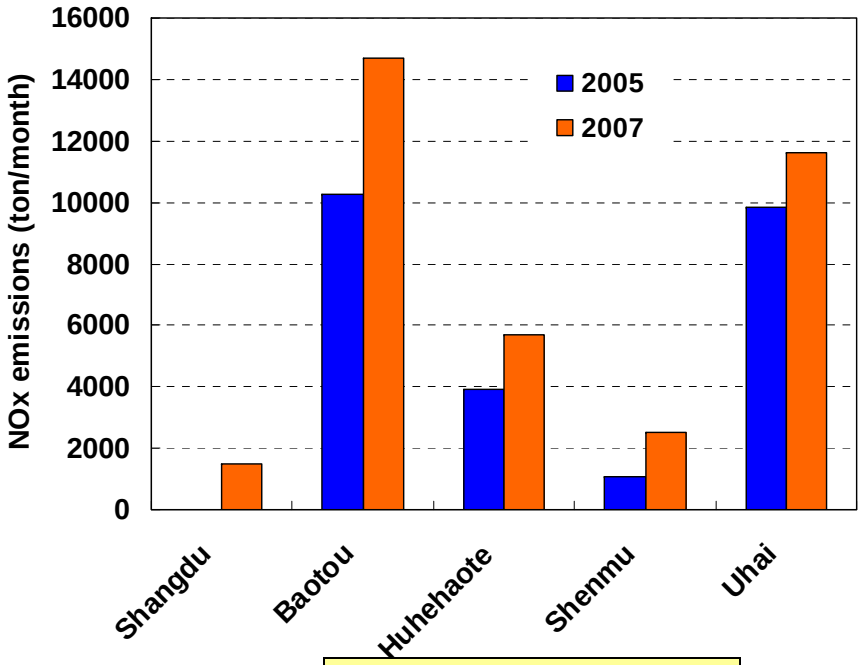


Increasing

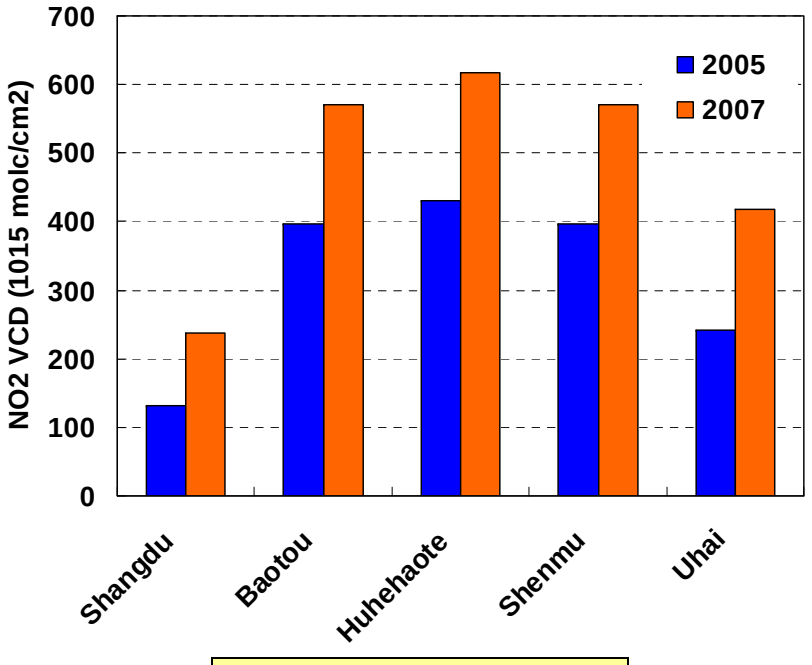
Thailand



Trends in emission inventory



NOx Emissions

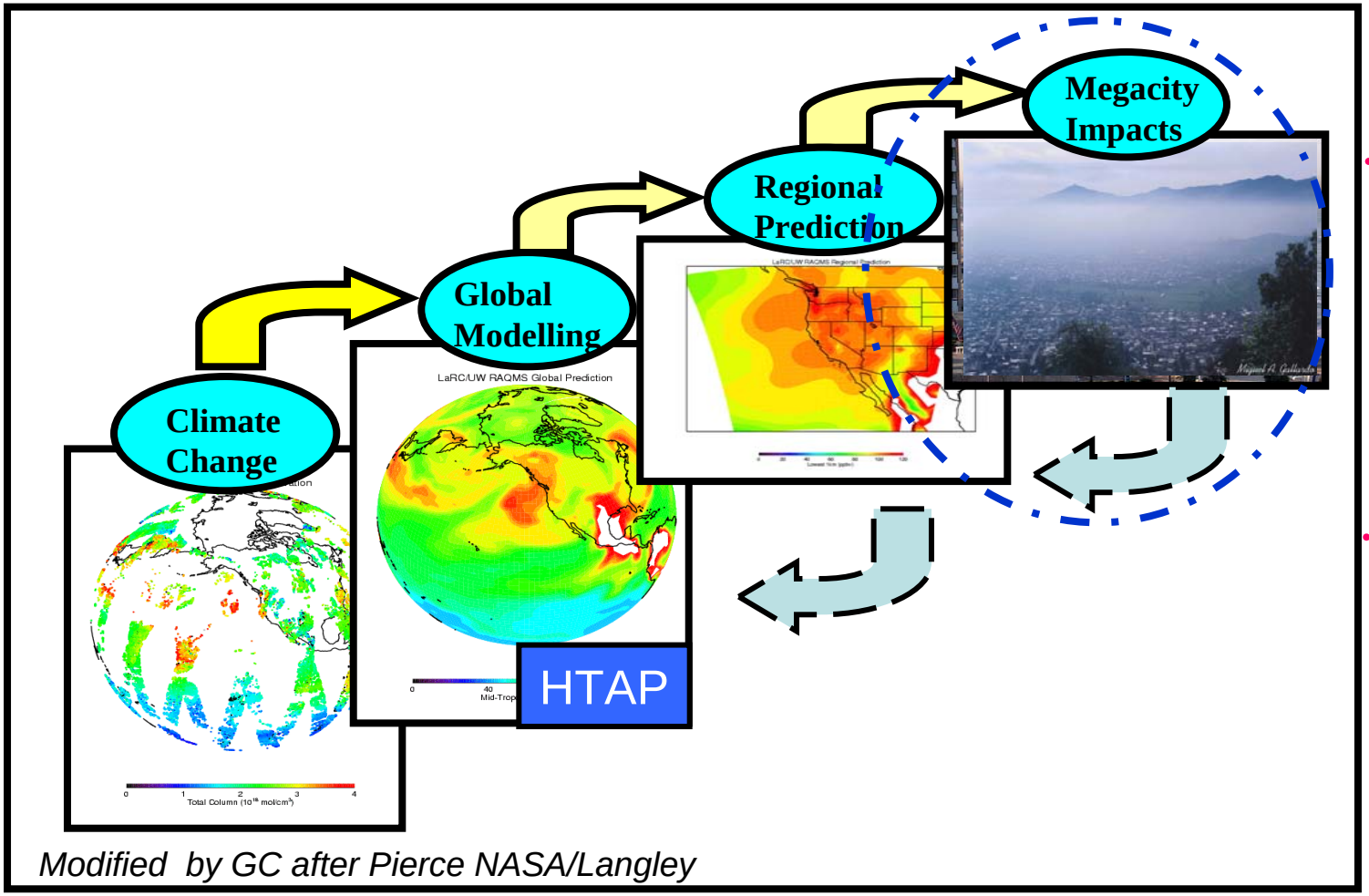


NO_2 Columns

The increase rates of NOx emissions and NO_2 columns agree very well in the two urban regions (Baotou and Huhehaote).

In the regions where emissions from power plants are dominant, NOx emissions show a larger increase rate than NO_2 columns (Shangdu and Shenmu). This is probably due to absence of dispersed NO_2 in rural areas in 2005 in the inventory.

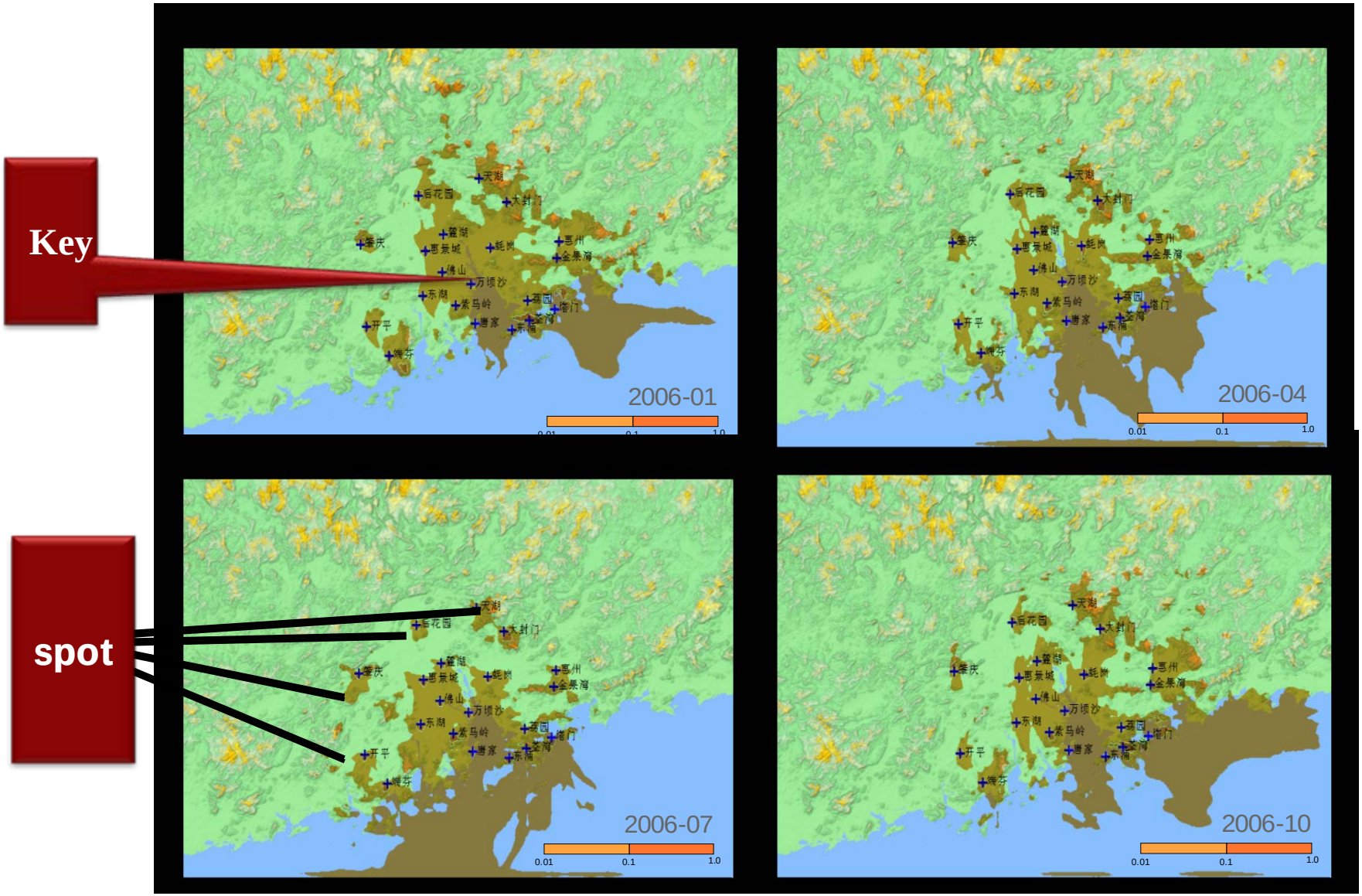
Air Quality Prediction: A Challenge of Scales and Integration

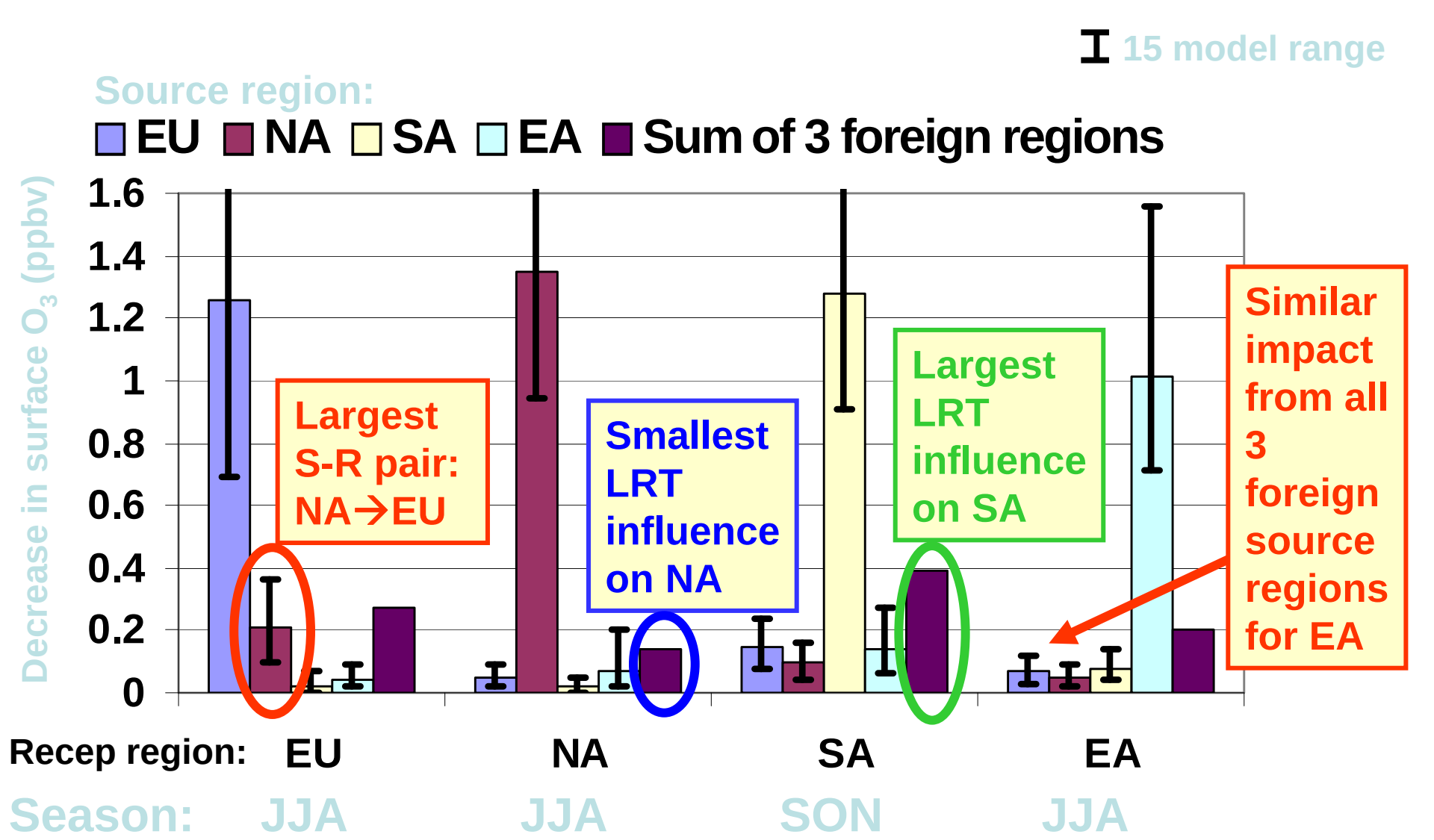


Propagation of the variability of model results

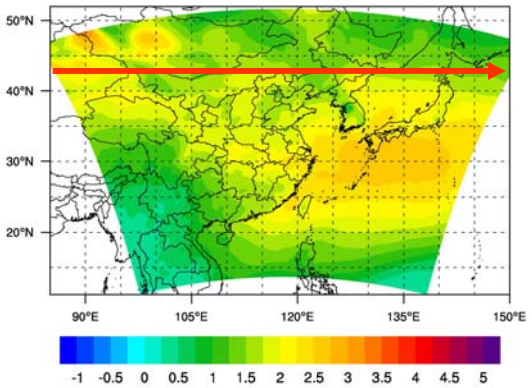
➔ Uncertainty in AQ Policy advice

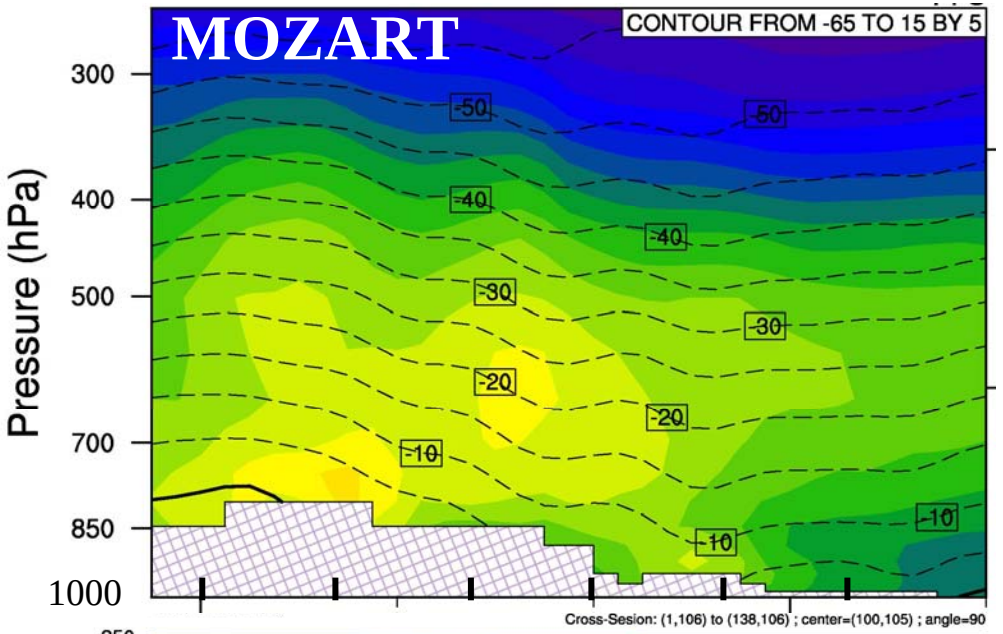
Integrated footprints of 21 sites

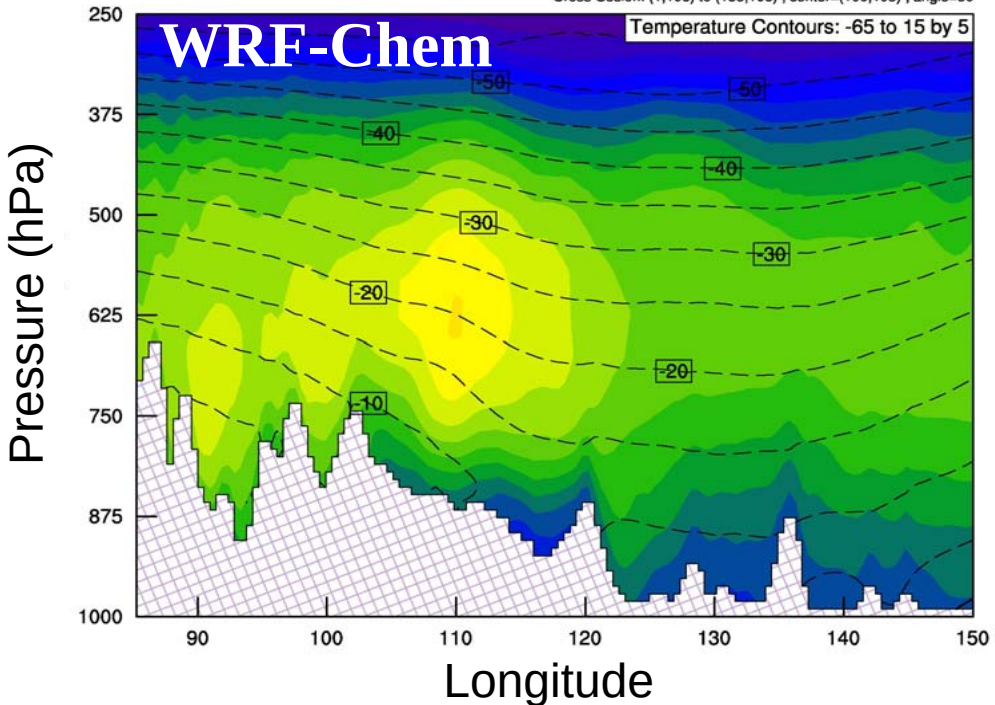



15 model range
Source region:
EU
NA
SA
EA
Sum of 3 foreign regions
Decrease in surface O_3 (ppbv)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Largest S-R pair: NA→EU
Smallest LRT influence on NA
Largest LRT influence on SA
Similar impact from all 3 foreign source regions for EA
Recep region:
EU
NA
SA
EA
Season:
JJA
JJA
SON
JJA

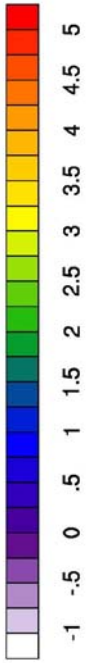
EU Enhancement (cross section at 43° N)



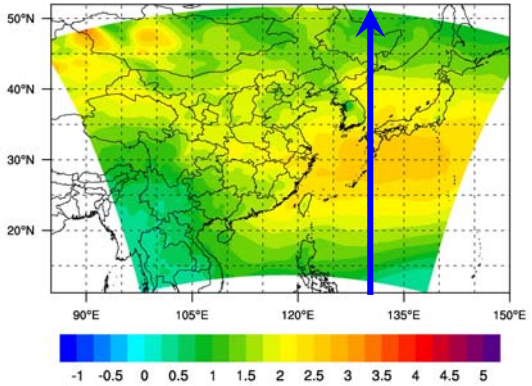


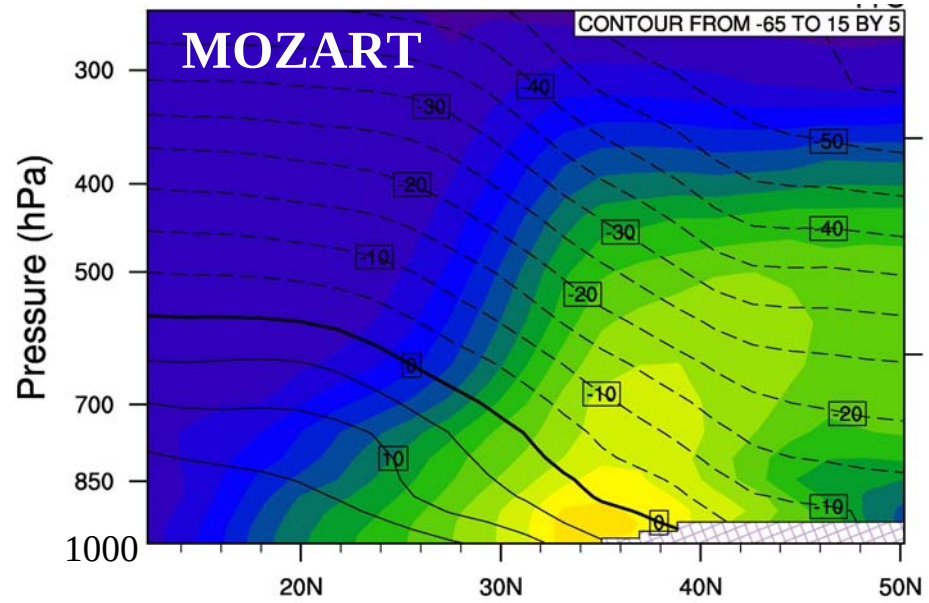


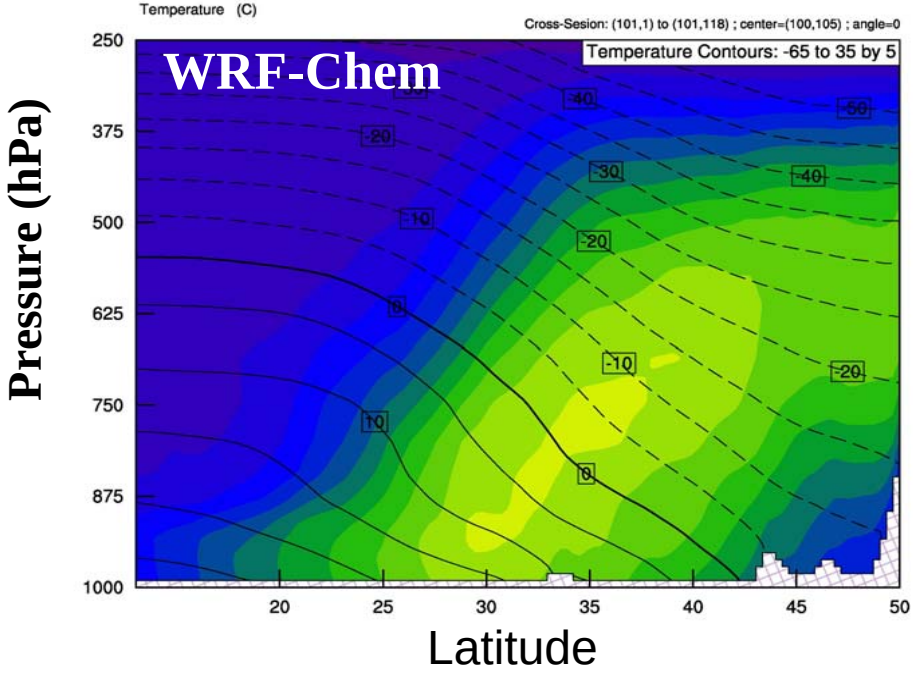
O_3 (ppb)



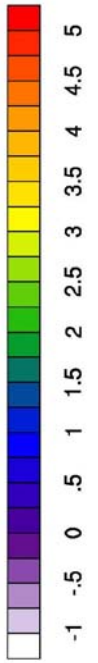
EU Enhancement (cross section at 130° E)





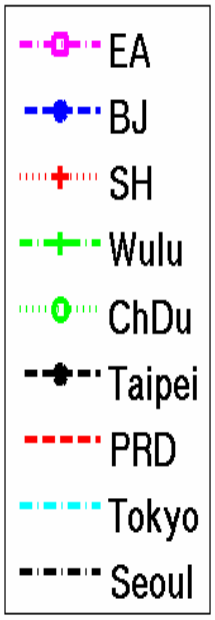


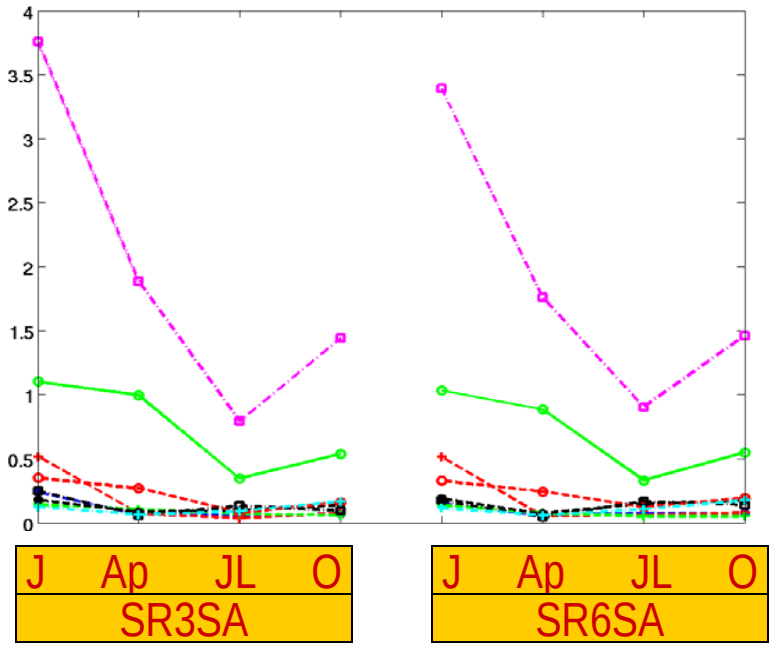
O_3 (ppb)

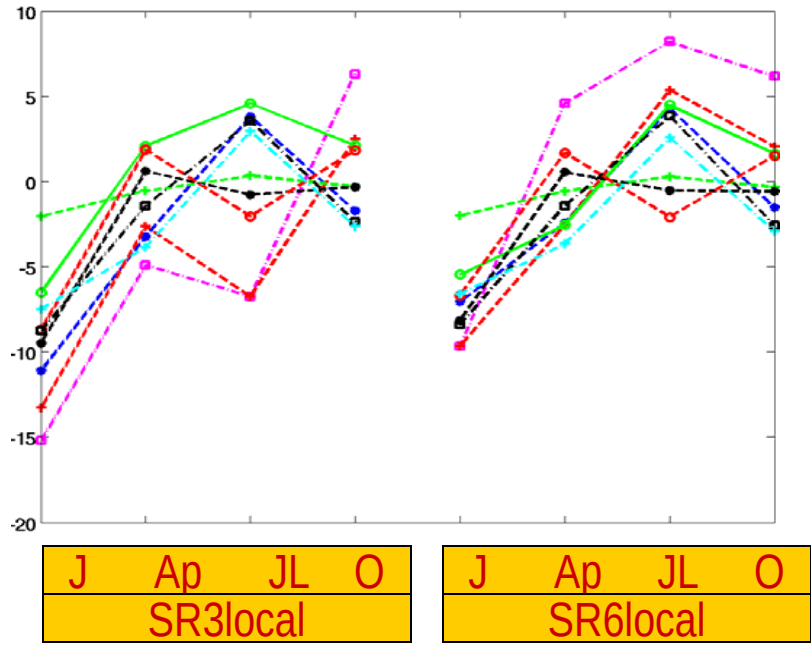


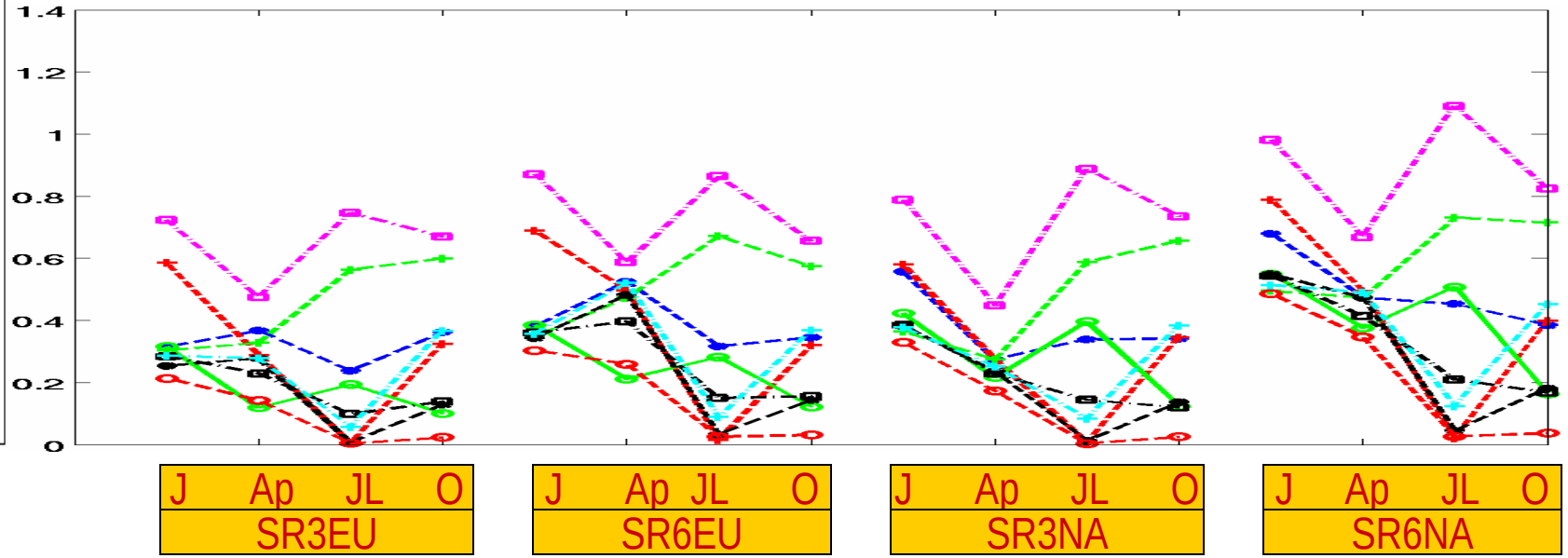
Monthly maximum Surface ozone impact on EA from other sources

Unit: ppbv

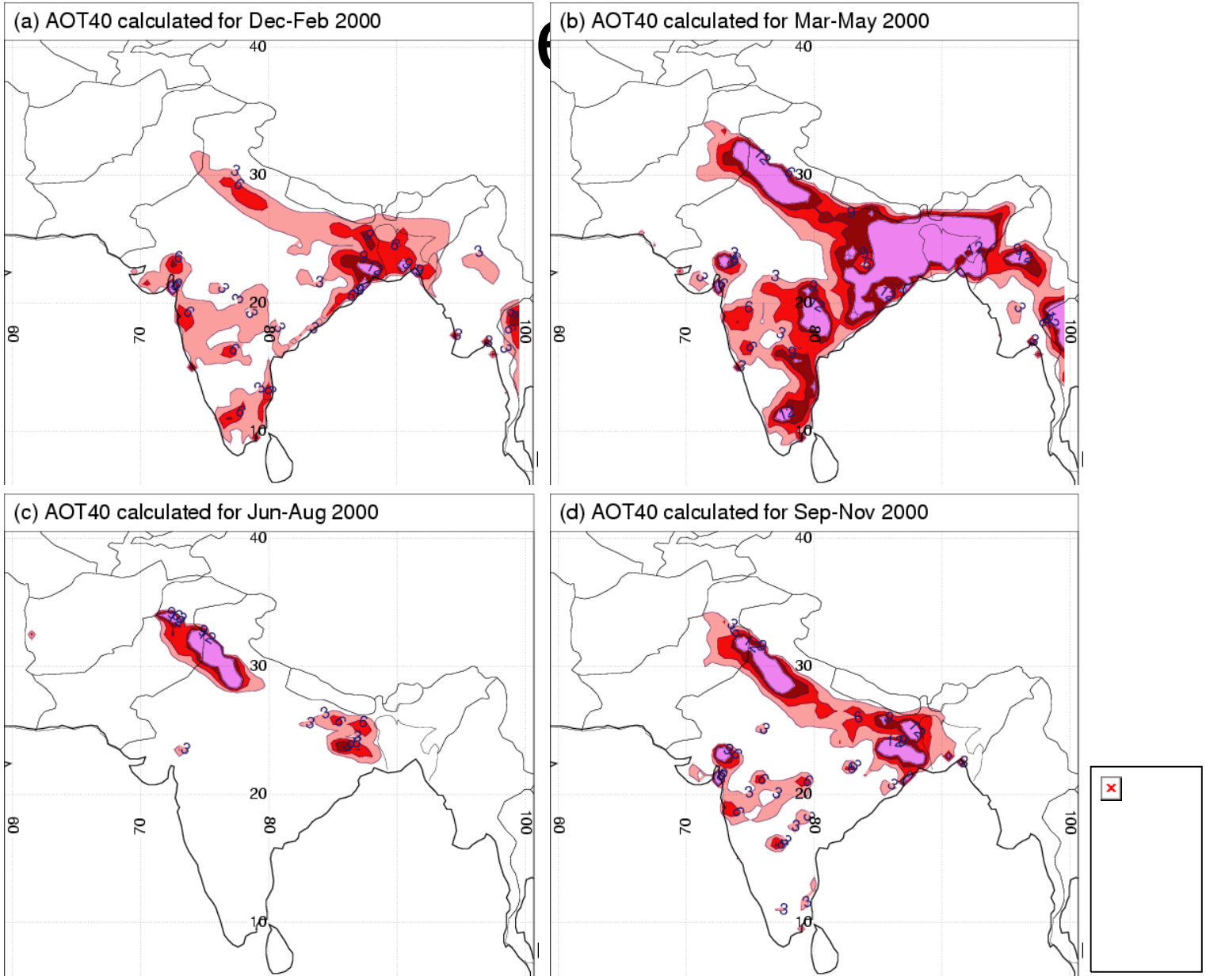




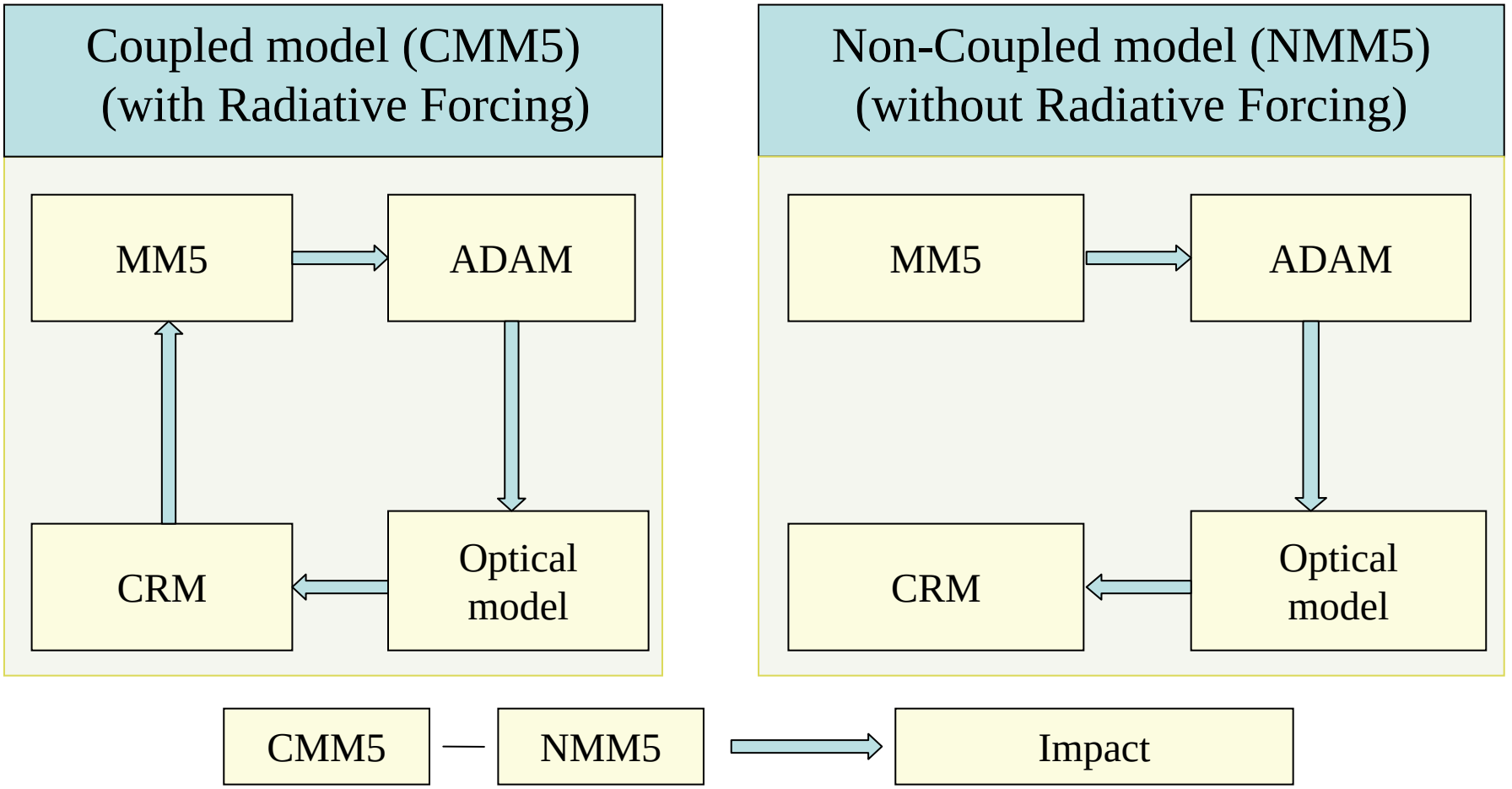




Calculated three-month AOT40



Effects of radiative forcing of Asian dust on Meteorological fields



Notes

- Intercomparison and collaboration
- ADOC/EANET
  - In support of the next assessment
  - Use of EANET data
- Contribution to HTAP *List of Authors June 2009 First Annotated Outline September 2009 Revised Annotated Outline November 2009 Internal Draft of Parts 1-3 January 2010 First Review Draft of Parts 1-4/Executive Summary February 2010 Major Review Meeting April 2010 Revised Review Draft of Parts 1-4/ES June 2010 Finalize Executive Summary, Submittal to Executive Body July 2010 Finalize Parts 1-4 August 2010 Printing*
- Relation with GAINS
- Sector analysis (also using adjoints)
- Relationships -UNEP/ABC, others..

MICS-Asia Phase Ⅲ (Modeling and Emission Inventories)

”Multi-scale model (Global, regional, urban)”

Draft Plan

Scales: Mega-cities, City clusters:

Japan (Tokyo and Osaka Metropolitan areas)
Increase of ozone conc. despite of NOx and VOC reduction,
China (Beijing, Pearl River Delta, 3C-STAR Project, Shanghai-EXPO2010)
Thailand (VOCs emission is controlled by Environmental Standard and then photochemical ozone)

Scales: Regional and global

Source/Receptor analysis at regional scales
Increase of annual average concentration of ozone
Decline of crops and forests (AOT40)
Global warming
Passive sampler campaign (Workshop and observation in EANET sites)

Collaborating with

EANET, HTAP, WMO GAW Urban Research Meteorology and Environment (**GURME**) Programme, IGAC and others

Collaborations welcomed and needed !!