Task Force on Hemispheric Transport of Air Pollution

Progress of the TF HTAP

Co-Chairs

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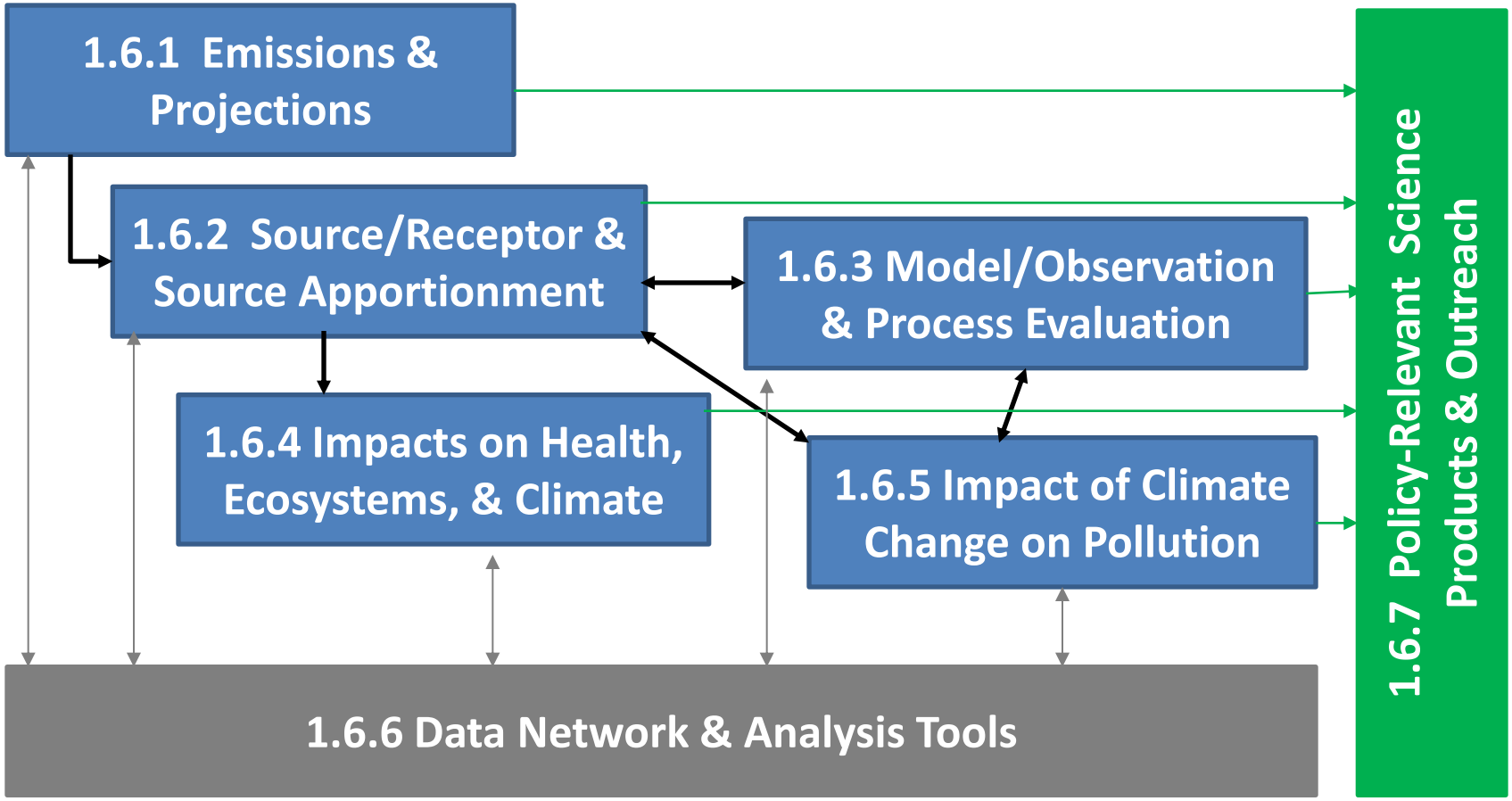
What is the TF HTAP?

Mandate from Executive Body (2010)

- Improve the understanding of the transport of air pollution across the Northern Hemisphere. Air pollution includes:
  - Ozone and its precursors, including NOx, VOC, CO, and methane
  - Particulate Matter and its components, including black carbon
  - Mercury
  - Persistent Organic Pollutants (POPs)
- Assess potential emission mitigation options available inside and outside the UNECE region
- Assess the impacts of the options on regional and global air quality, public health, ecosystems, and near-term climate change
- Work in collaboration with other groups inside and outside the Convention.

Themes of Cooperative Activities Under TF HTAP

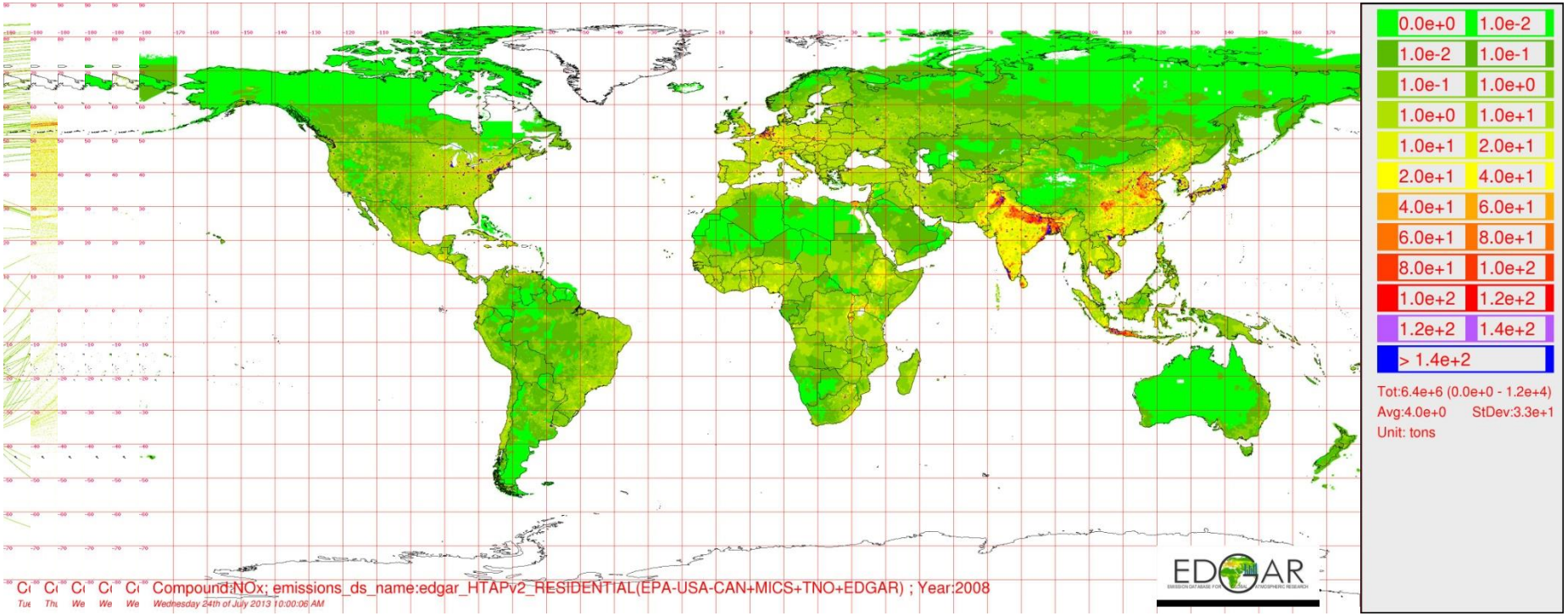
As Numbered in Convention Work Plan



> 35 Work Packages identified, each with a volunteer leader.

2008 & 2010 Global Emissions Mosaics

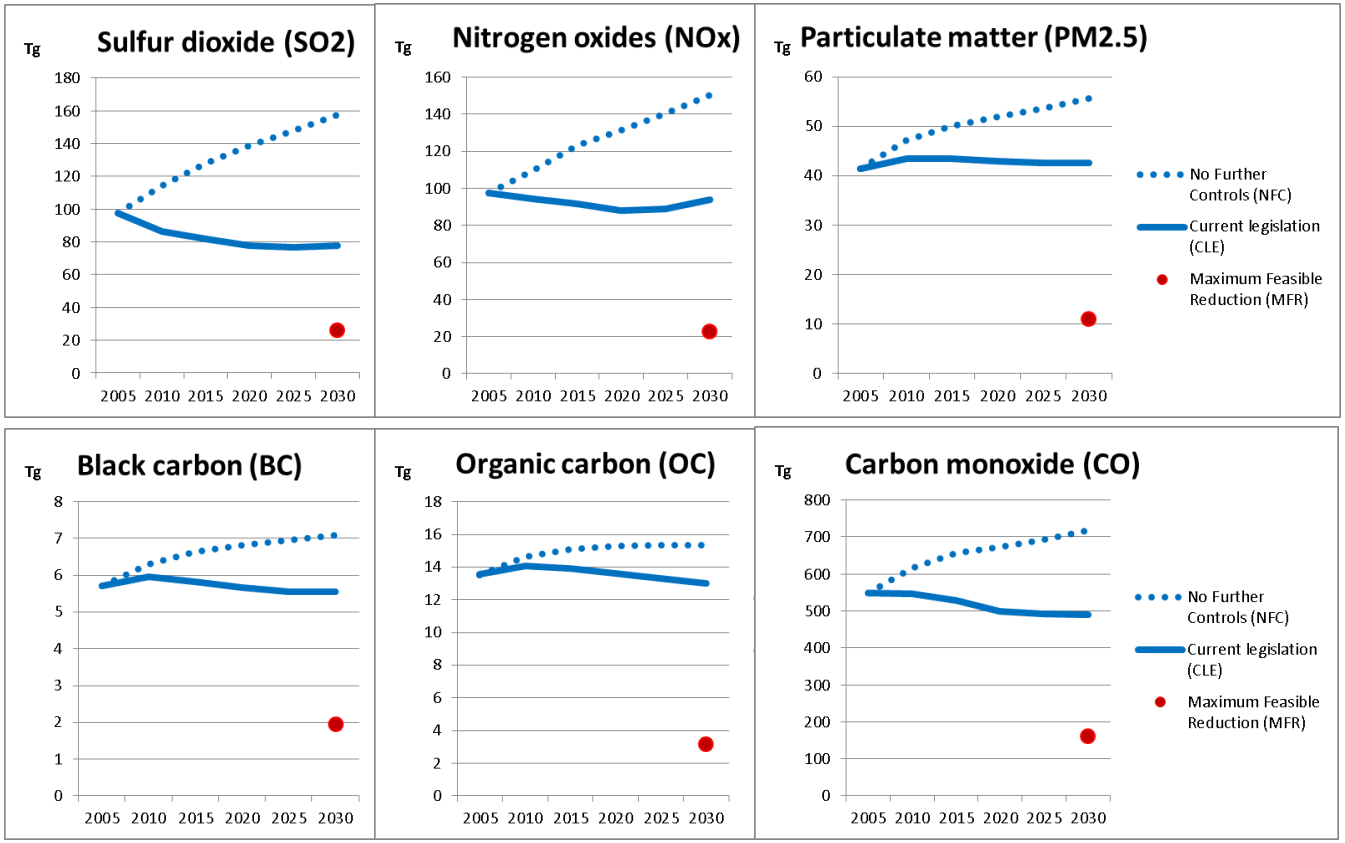
- SO_2, NO_x, NMVOC, CH_4, CO, NH_3, PM_{10}, $PM_{2.5}$, BC, OC
- 0.1°x0.1° grid, annual (monthly for some sectors)
- Aviation, Shipping, Electricity Generation, Industry, Transport, Residential, Agriculture



- 2008 Now Available, 2010 Coming Soon
- http://edgar.jrc.ec.europa.eu/htap_v2/index.php?SECURE=123

2010-2030 Emissions Scenarios

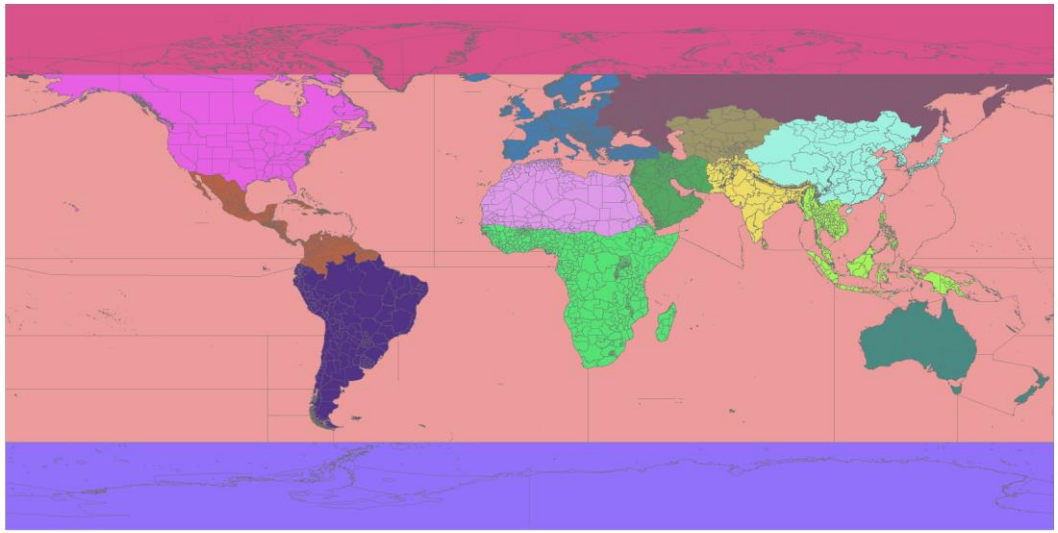
- October 2012 Workshop with TFIAM
- CIAM developing 3 “benchmark” scenarios:
  - Current Legislation, No Further Control, Maximum Feasible Reduction



- Future workshop with TFIAM on cost-effective global control strategies?

Source-Receptor Analyses

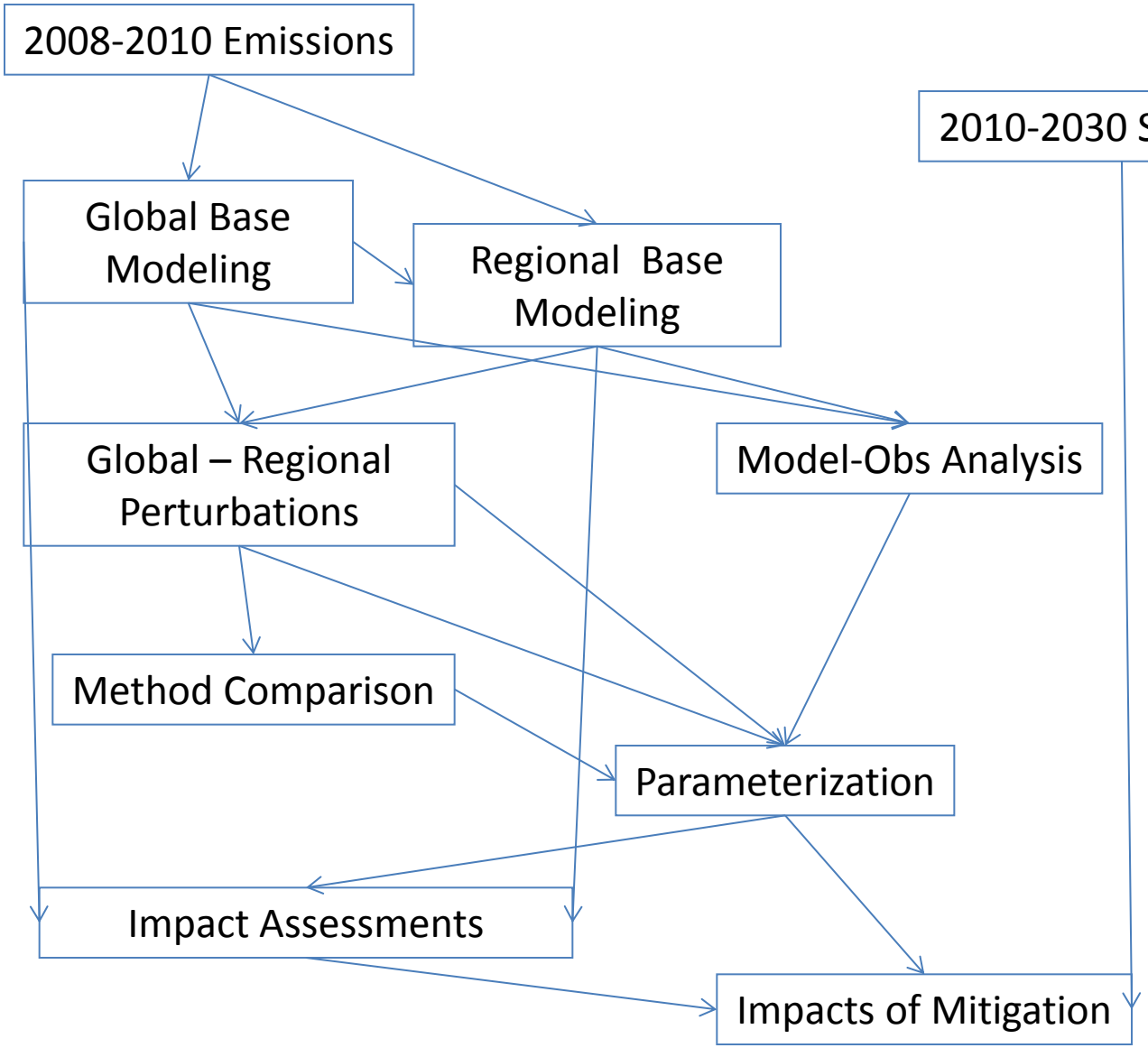
- Planned Experiments Focus on 2008-2010
- World divided into 16 regions (60 sub-regions).



7 Regions identified as priorities:
North America, Europe, East Asia, South Asia, Russia/Belarus/Ukraine, Middle East.

- Perturbation Experiments: 20% Emission Reductions By Region and Sector (or By Region and Pollutant)
- Matched Global and Regional Perturbation Simulations Working with AQMEII, EuroDelta3, and MICS-Asia
- Comparison of Perturbation and Other S/R Methods
- **Focus of Next Meeting: 5-6 December, San Francisco**

Work Flow and Timeline



Deliver Oct 1

Deliver Dec 1

Start Oct

Start Nov

Start Nov

Workshop, 5-6 Dec
San Francisco

Start Jan 2014

Start Jan 2014

Start Apr 2014

Start Jun 2014

Proposed Workshop on Impact Assessment Methods

- **Scope:**
  - Human Health (O_3, PM)
  - Ecosystem (O_3 impacts on Crops, N impacts on Biodiversity?)
  - Climate (Precipitation, Temperature, …?)
- **Outreach to link to WGE, CCAC, Malé Declaration, EANET, ABC, AMAP, GBD, …**
  - Share lessons and insights
  - Encourage involvement of relevant experts (effects community, Asia)
  - Develop a common understanding of the issues
- **Questions**
  - How do methods differ at different scales (local, regional, global) or in different regions?
  - How transferable are the methods between scales or regions? What are the limitations or challenges for transferring methods?
- **Outcomes**
  - What common analyses should TF HTAP? On global scale? On regional scale?
  - What investments are needed (in general) to improve methods, comparability, and capacity?
- **When? Where? How?**

Modeling Groups That Have Indicated Interest

Institution	Country	Model
NASA GSFC	United States	GEOS-5/GOCART, NU-WRF
Univeristy of Edinburgh	United Kingdom	STOC-HadAM3/UKCA (WRF-EMEP)
CIEMAT	Spain	CHIMERE
MIT	United States	GEOS-Chem
NIWA	New Zealand	niwa-UKCA
Norwegian Meteorological Institute	Norway	EMEP MSC-W
University of Colorado Boulder	United States	GEOS-Chem
Princeton University & NOAA GFDL	United States	GFDL AM3
Michigan Technological University	United States	GEOS-Chem
University of Wisconsin--Madison	United States	CMAQ
Lancaster University	United Kingdom	FRSGC/UCI CTM
York University	Canada	GEM-AC
University of Leeds	United Kingdom	CAM-chem
Met Office Hadley Centre	United Kingdom	HadGEM2
NCAR	United States	CAM-chem
Institute for Advanced Sustainability Studies	Germany	CAM-Chem
Indian Institute of Tropical Meteorology	India	WRF-Chem
ICIMOD	Nepal	WRF-Chem
Meteorological Synthesizing Centre - East	Russia	GLEMOS
Environment Canada	Canada	GEM-MACH

Joint Analyses and Detailed Case Studies

Coordination with:

AQMEII
MICS-Asia
EuroDelta 3
CCMI
AeroCom
POLMIP
GMOS
POPs

Analyses of:

Satellite Observations
Vertical Profiles
Ozone Deposition and Stomatal Flux
Global Ozone Observations
Regional Inflow/Outflow Budgets
(Western North America, Arctic, …)
Comparison of S/R Methods
Biomass Burning
Black Carbon
Sulfate and Nitrate Budgets
Sensitivity at Local Scales
Optical Properties of Aerosols

Data Network Status

Major focus of March 2013 meeting in conjunction with WMO/GAW.

Data Archives

FZ Juelich (HTAP1 modeling, MACC)
WU-StL ouis/DataFed (surface, satellite observations)
NILU/EBAS (surface observations)

MetNo/AeroCom (HTAP2, AeroCom modeling)
GEIA/ECCAD (emissions)
JRC/ Ensemble (AQMEII modeling)
NASA/ADAM (aircraft observations)
NOAA/CCMI (aircraft, surface observations, emissions)

SNU/ABC-Asia (surface observations)
CAS/MICS-Asia (MICS-Asia modeling)
CEOS(DLR)/ACP (satellite observations)
EPA/AirNow (surface observations)
GAW/WDCs (surface observations)

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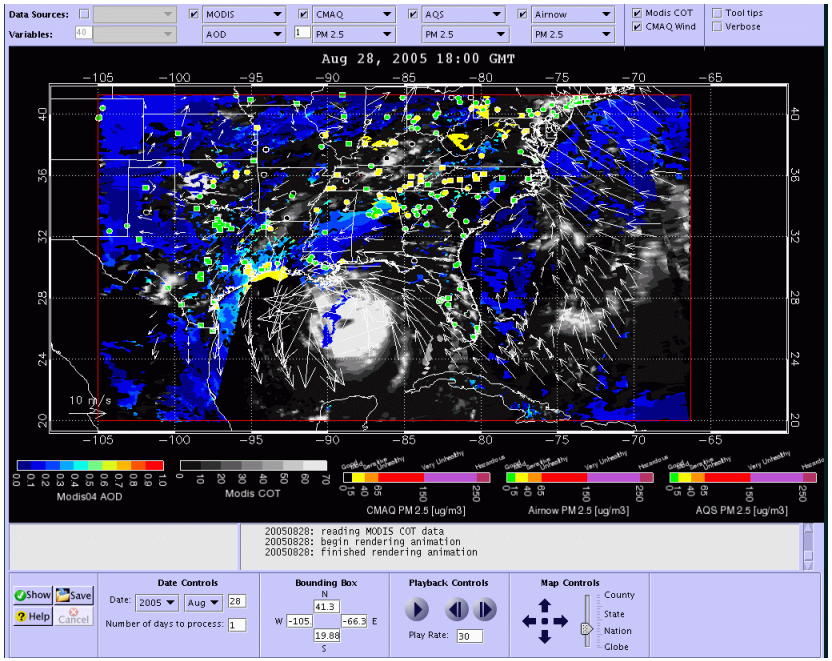
Web-Based Access and Analysis Tools

FZ Juelich JOIN http://join.iek.fz-juelich.de/htap

MetNo AeroCom Tools http://aerocom. met.no/

JRC Ensemble http://ensemble2.jrc.ec.europa.eu/

US EPA RSIG http://badger.epa.gov/rsig



RSIG: Overlay of Model AOD and PM2.5 with Satellite and Surface Observations

Our Strategy

- Annual Report – Highlighting Policy Relevant Findings
  - Pushing to have some new messages by end of 2014
- Report/Paper for Each Work Package or Thematic Area
- Joint Workshops with Other International Cooperative Efforts
- Participation in Major International Conferences
- Simple Web-Based Tools for Exploration of Policy Implications of Results