AEROCOM CONTRIBUTION TO THE HEMISPHERIC TRANSPORT OF AIR POLLUTION (HTAP) STUDY

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Background

- The Unite Nations' Task Force on Hemispheric Transport of Air Pollution (TF HTAP) is an international scientific cooperative effort to improve the understanding of the intercontinental transport of air pollution across the Northern Hemisphere (Task leaders: Terry Keating, US EPA; Frank Dentener, JRC)
- AeroCom made key contributions to the HTAP 2010 assessment (see HTAP 2010 report)
- In 2012, TF HTAP launched a new phase of cooperative experiments and analysis and AeroCom participation is crucial (HTAP Work Package 3.5)
- More information at http://htap.org

Objectives

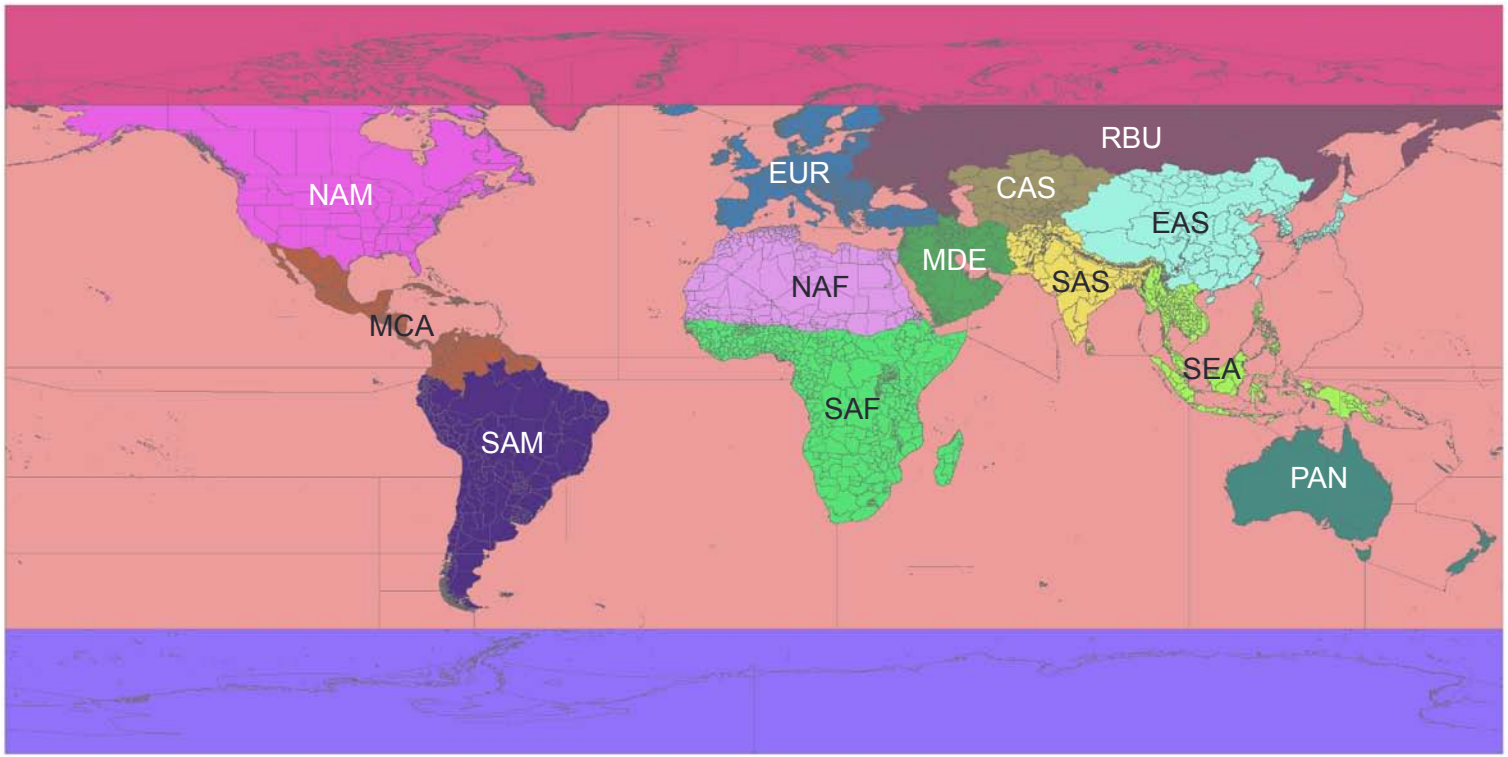
- Examine the transport of aerosols, including anthropogenic, dust, and biomass burning, from source regions to downwind regions
- Assess the emission and transport impacts on regional and global air quality, ecosystems, public health, and climate
- Provide information on potential emission mitigation options

Model experiments

- Years:
  - 2008-2010 (high priority year is 2010)
- Emission:
  - Anthropogenic (by sectors): HTAPv2 (2008 annual and monthly emission at 0.1x0.1 deg are available at http://edgar.jrc.ec.europa.eu/htap_v2/index.php?SECURE=123, 2010 emissions will be available later)
  - Biomass burning: GFEDv3 daily (in conjunction with BB experiment)
  - Natural: dust and sea salt – model calculated; volcano – Thomas Diehl (2008-2009 ready, 2010 in preparation)
- Regions:
  - Two-tiered set of regional definitions
  - Region masks are provided at http://iek8wikis.iek.fz-juelich.de/HTAPWiki/WP2.1

Tier 1 regions

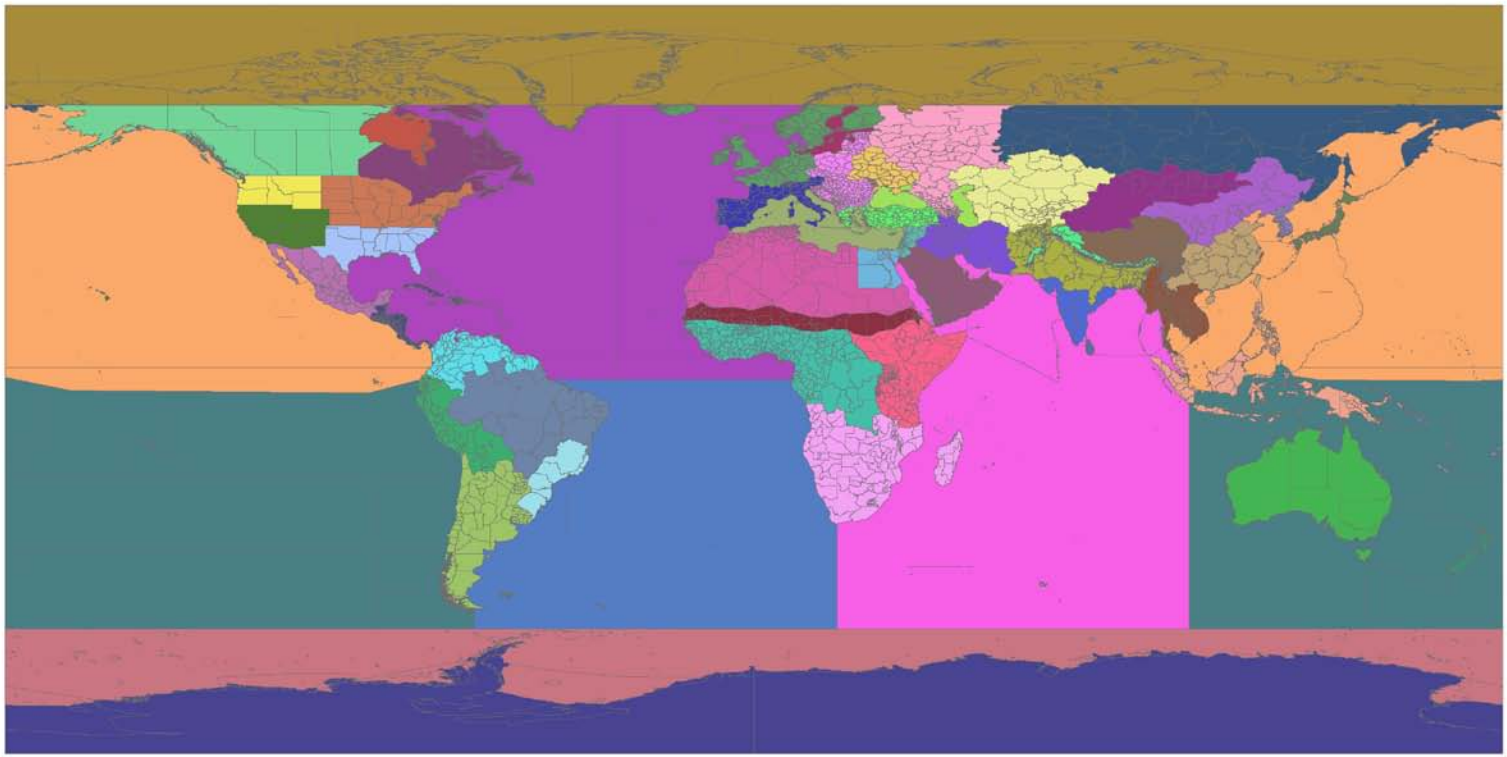
- 17 regions including the whole globe, the oceans, Arctic, Antarctic, and 13 land mass regions
- Both source and receptor regions



Region mask at: http://iek8wikis.iek.fz-juelich.de/HTAPWiki/WP2.1

Tier 2 regions

- The Tier 1 regions are divided into 60 sub-regions
- can be used individually or as groups in particular cases as source or receptor regions



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Simulation priority (Tier 1 regions)

Priorities for HTAP2 Simulations

		2008	2009	2010
Base	BASE	1		1
Increase CH4 Conc	CH4INC			1
Decrease CH4 Conc	CH4DEC			

Highest Priority 1
Next Priority
Lower Priority

		Components perturbations																		Sector perturbations																	
		All			NOX			CO			VOC			SO2			NH3			PM			TRN			PIN			RES			OTH			FIR			DST		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
Region of Emissions Perturbation																																							
Global	GLO			1			1			1															1			1			1						1			1
N America	NAM			1																																			
Europe	EUR			1																																			
East Asia	EAS			1																																			1
South Asia	SAS			1																																			
Rus, Bel, Ukr	RBU			1																																			
Middle East	MDE			1																																			1
SE Asia	SEA																																						
Central Asia	CAS																																						1
N Afr/Sahara/Sahel	NAF *																																						1
Mex/C America	MCA																																						
Southern Africa	SAF																																						
South America	SAM																																						
Aust/NZ/Pacific	PAN																																						
Oceans	OCN																																						

PM = Other Particulate Matter (BC, OC, PM10, PM2.5)
TRN = Ground Transport Sector; PIN = Power and Industry Sectors; RES = Residential Sector; OTH = Other Sectors (Ships, Aviation, Agriculture); FIR = Fire
DST = Dust * For dust, some models should divide the NAF source into separate source regions for the Sahara (091+092, in the Tier2 regions) and Sahel (093).

Timeline

- Start model simulations in October 2013
- High priority:
  - 2008, (2009,) 2010: Base simulation (global, all emissions)
  - 2010: 20% reduction by pollutant emissions in GLO, NAM, EUR, EAS, SAS, RBU, MDE
  - 2010: 20% reduction by sector emissions of TRN, PIN, and RES globally
  - 2010: 20% reduction (or zero-out) of dust emissions in EAS, CAS, MDE, NAF
  - 2010: 20% reduction (or zero-out) of fire emissions globally
- Next priority:
  - 2010: 20% reduction (or zero-out) of fire emissions in NAM, RBU, SEA, SAF, SAM
  - 2010: 20%reduction (or zero-out) of emissions separately in Sahara and Sahel (Tier-2)
  - 2010: 20% reduction by sector emissions in NAM, EUR, EAS, SAS, RBU, MDE
  - 2010: Other regions
- Analysis starts early 2014

A few more notes

- Please participate – even if you can only do a fraction of those model experiments (e.g., global 2010 run), it will be helpful for more robust statistics
- If you have any suggestions please contact Terry Keating (keating.terry@epa.gov) and Frank Dentener (frank.dentener@jrc.ec.europa.eu)
- December 5-6 meeting in San Francisco (just before the AGU), EPA regional office (registration at http://www.htap.org/meetings/2013/2013_12/meeting.htm)
- Coordinate with other AeroCom experiments