



## **Task Force on Hemispheric Transport of Air Pollution**

# **Intercontinental Transport Modeling Intercomparison Organizational Workshop**

Washington, D.C. USA  
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Task Force Co-Chairs

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<http://www.htap.org>

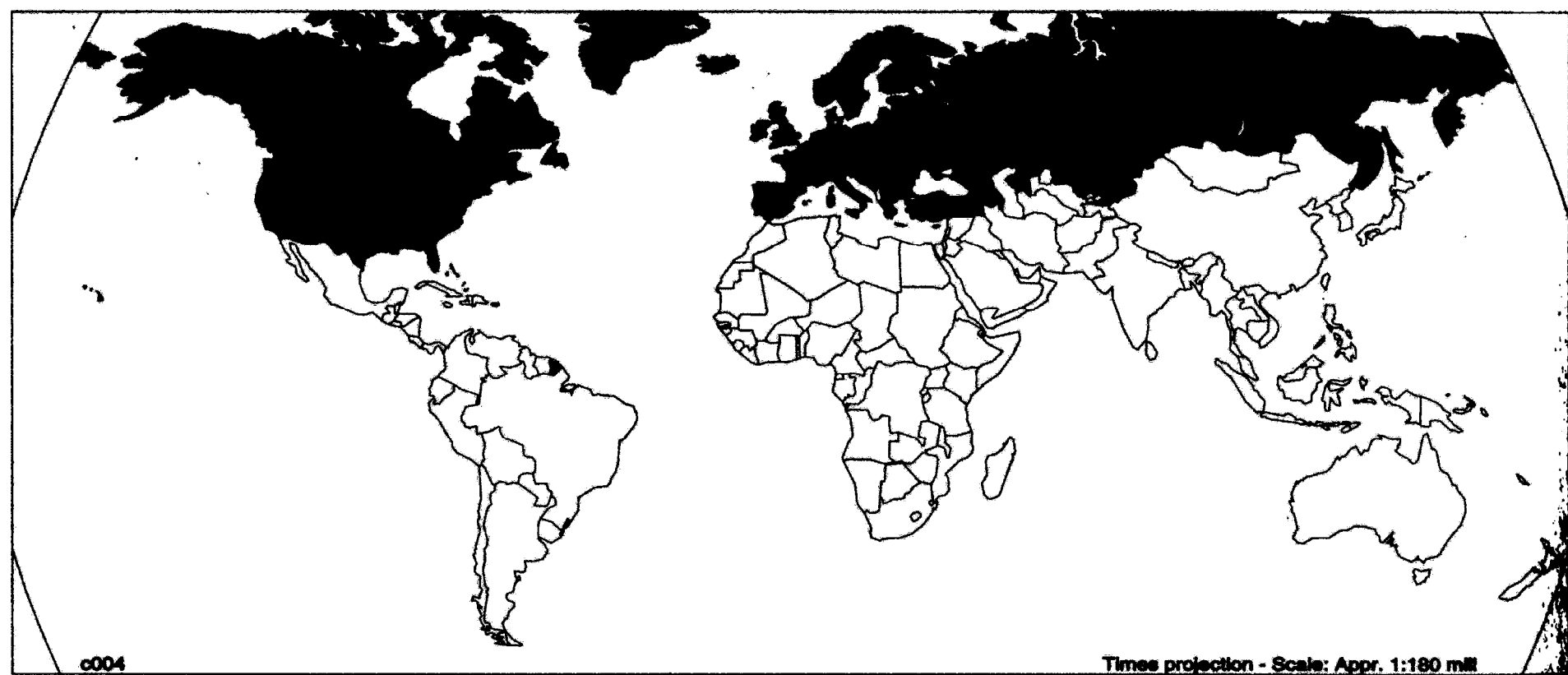
# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

- Adopted in 1979, the first multi-lateral agreement on air pollution
- Created a framework on which has been built eight Protocols, all in force as of May 2005.
- The Protocols have aimed to increase ambition levels in a stepwise manner.
- Day to day activities supported by a Secretariat at the UN Economic Commission for Europe
- <http://www.unece.org/env/lrtap/>



# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

## 49 Parties in Europe, North America and Central Asia



# CLRTAP Organigram

**Executive Body**

Implementation Committee

**Working Group on Effects**

**EMEP Steering Body**

**Working Group on Strategies and Review**

ICP Forests Task Force

Programme Coordinating Centre

ICP Integrated Monitoring Task Force

Programme Centre

ICP Modelling and Mapping Task Force

Coordination Center for Effects

ICP Materials Task Force

Main Research Centre

ICP Vegetation Task Force

Programme Centre

ICP Waters Task Force

Programme Centre

Task Force Health

Task Force on Emission Inventories and Projections

Task Force on Measurement and Modelling

Chemical Coordinating Centre

Meteorological Synthesizing Centre-West

Meteorological Synthesizing Centre-East

Task Force on Integrated Assessment Modelling

Centre for Integrated Assessment Modelling

Task Force on Hemispheric Transport of Air Pollution

Expert Group on Ammonia Abatement

Task Force on Heavy Metals

Network of Experts on Benefits and Economic Instruments

Expert Group on Techno-economic Issues

Task Force on POPs

Expert Group on Particulate Matter



## Task Force on Hemispheric Transport of Air Pollution

- The Task Force on Hemispheric Transport of Air Pollutants was created by the LRTAP Executive Body in December 2004
- The Task Force is under the leadership of the European Community and the United States.
- The Task Force is comprised of experts
  - Nominated by Parties to the Convention;
  - Representatives of intergovernmental organizations (IGOs) and accredited non-governmental organizations (NGOs);
  - Representatives of other bodies and centres under the Convention;
  - Invited by the Co-Chairs;
  - Nominated by non-Parties.
- The Task Force reports to the EMEP Steering Body through its Co-Chairs who, together with the secretariat, are responsible for preparing and presenting the report.



## Task Force on Hemispheric Transport of Air Pollution

The Task Force is charged to “plan and conduct the technical work necessary to:

- develop a fuller understanding of the hemispheric transport of air pollution ...
- estimate the hemispheric transport of specific air pollutants for the use in reviews of protocols to the Convention
- prepare technical reviews thereon for submission to the Steering Body of EMEP”

# 1<sup>st</sup> Task Force Meeting, June 2005, Brussels

- Overview of Hemispheric Transport Issues
  - O<sub>3</sub>, PM, Hg, POPs – building on CLRTAP experts
- Outreach to Activities Outside UNECE Region
  - EANET, Malé Declaration, Project ABC, & Others
- Discussion of Future Cooperative Work
  - Observations
  - Emissions & Projections
  - Regional & Global Modeling
- Long Term Goal
  - An Assessment Report by 2009 Addressing Key Questions
- 3 Initial Workshops
  - Model Evaluation & Intercomparison (Today)
  - Future Emissions Scenarios (18-20 October 2006, Beijing)
  - Use of Integrated Observations (January 2007, Geneva)

# Policy-Relevant Science Questions

Q1 How does the intercontinental or hemispheric transport of air pollutants affect air pollution concentrations or deposition levels in the northern hemisphere for ozone and its precursors, fine particles and their precursors, compounds that contribute to acidification and eutrophication, mercury and persistent organic pollutants?

Q1a What evidence do we have of transport pathways and mechanisms from intensive field studies, observations or model predictions?

Q1b How do the transport pathways differ by pollutant, source region or by season?

Q1c What processes need to be better understood to describe the relative significance of intercontinental transport?

Q1d How do processes at the intercontinental or hemispheric scale affect processes at the local or global scales? (Synoptic scale meteorological events/cycles; Hadley circulation; etc.)”

# Policy-Relevant Science Questions

Q2 More specifically for each region in the northern hemisphere, can we define source-receptor relationships and the influence of intercontinental transport on the exceedance of established standards or policy objectives for the pollutants of interest?

Q2a What observational evidence exists for attributing pollutant concentrations or deposition levels to source regions or countries?

Q2b Using predictive chemical transport models, what are possible methods for calculating source-receptor relationships? At what spatial resolution (geographic region, individual countries) can such methods be applied reasonably?

Q2c How can models with different spatial resolutions be nested within one another to provide an appropriate level of spatial resolution for the entire hemisphere or globe?

Q2d What improvements are needed to global and regional transport models to better simulate atmospheric processes to enhance source-receptor predictions?

# Policy-Relevant Science Questions

Q3 How confident are we of our ability to predict these source-receptor relationships? What is our best estimate of the quantitative uncertainty in our estimates of current source contributions or our predictions of the impacts of future emissions changes?

Q3a What metrics and techniques are most appropriate for evaluating global and regional model simulations with observations and for quantifying uncertainties?

Q3b Do we have a sufficient database of observed concentrations and deposition levels to evaluate the predictions of current models? How can this observational database be improved for the purposes of evaluating models? Should we develop a set of standard observational platforms and measurements to enhance data consistency globally?

Q3c Do we have sufficient observational data bases to track long term progress and change in transport and deposition patterns?

Q3d Do we have sufficient data on emissions and the trends in driving forces needed for making reasonable future projections? How can this data be improved?

Q3e What physical or chemical processes must be better understood to improve our confidence in our estimates of source-receptor relationships? What is the minimum level of certainty in our understanding of these processes that must be attained before reasonable/useful estimates can be made?

# Policy-Relevant Science Questions

Q4 For each country in the northern hemisphere, how will changes in emissions in each of the other countries of the northern hemisphere change pollutant concentrations or deposition levels and the exceedance of established standards or policy objectives for the pollutants of interest?

Q4a Is there a simple relationship between changes in emissions and changes in pollutant concentrations and deposition levels?

Q4b How is the predicted relationship affected by the spatial resolution of the model?

# Policy-Relevant Science Questions

Q5 How will these source-receptor relationships change due to expected changes in emissions over the next 20 to 50 years?

Q5a How might emission quantities and spatial distributions change over the next 20 to 50 years?

Q5b How should future emission scenarios be constructed?

# Policy-Relevant Science Questions

Q6 How will these source-receptor relationships be affected by changes in climate or climate variability?

Q6a How will meteorological changes predicted by climate modeling studies affect major transport or chemical processes?

Q6b Are there significant feedbacks between the transported air pollutants and regional climate and meteorology?

Q6c Are there significant feedbacks between transported air pollution and potential changes in land use, vegetation, or ecosystems, especially with respect to natural emission sources?

Q6d Are there predictive relationships between climate system indices that can be used to estimate the impact of changing climates on hemispheric transport of air pollutants?

# Policy-Relevant Science Questions

- Q7 What efforts need to be undertaken to develop an integrated system of observational data sources and predictive models that address the questions above and leverages the best attributes of all components?

# Objectives of This Workshop

1. Develop recommendations concerning methods and metrics, and encourage publication of new and comparable results. [Issues]
2. Identify activities or analyses that will facilitate access to data and tools that are useful for all TF HTAP participants. [Tasks]
3. Identify specific coordinated multi-model studies that will explore important differences in model formulations and results. [Studies]
4. Identify task/study leaders, mechanisms for coordination, funding needs, and a schedule for future work. [Topics]

# Agenda of This Workshop

Lessons from Past Activities

Monday Morning in Plenary

Identifying Key Issues/Tasks/Studies

Monday Afternoon in Plenary

Resolving Key Issues

Tuesday Morning, First Breakout Session

Organizing Future Tasks/Studies

Tuesday Morning, Second Breakout Session

Developing Work Plan

Tuesday Afternoon in Plenary

# A Path to a 2009 Assessment

What can we expect to accomplish by when?

			<b>Focused Workshops</b> Building Consensus	<b>TF Meetings</b> Reviewing Results, Planning
2006	Jan	New Research & Report Writing	Model Comparison	
	June			(Arctic, Hg/POPs...)
	Oct		Future Emissions	
2007	Jan		Integrated Obs	
	June			(Protocol Review...)
	Oct		?	
2008	Jan		?	
	June			(?)
	Oct		?	
2009	Jan		?	
	June	1 <sup>st</sup> Assessment Report		(?)

