Task Force on Hemispheric Transport of Air Pollution

Introduction to *HTAP 2010* and this Workshop

Chapel Hill, North Carolina, USA
1-2 March 2010

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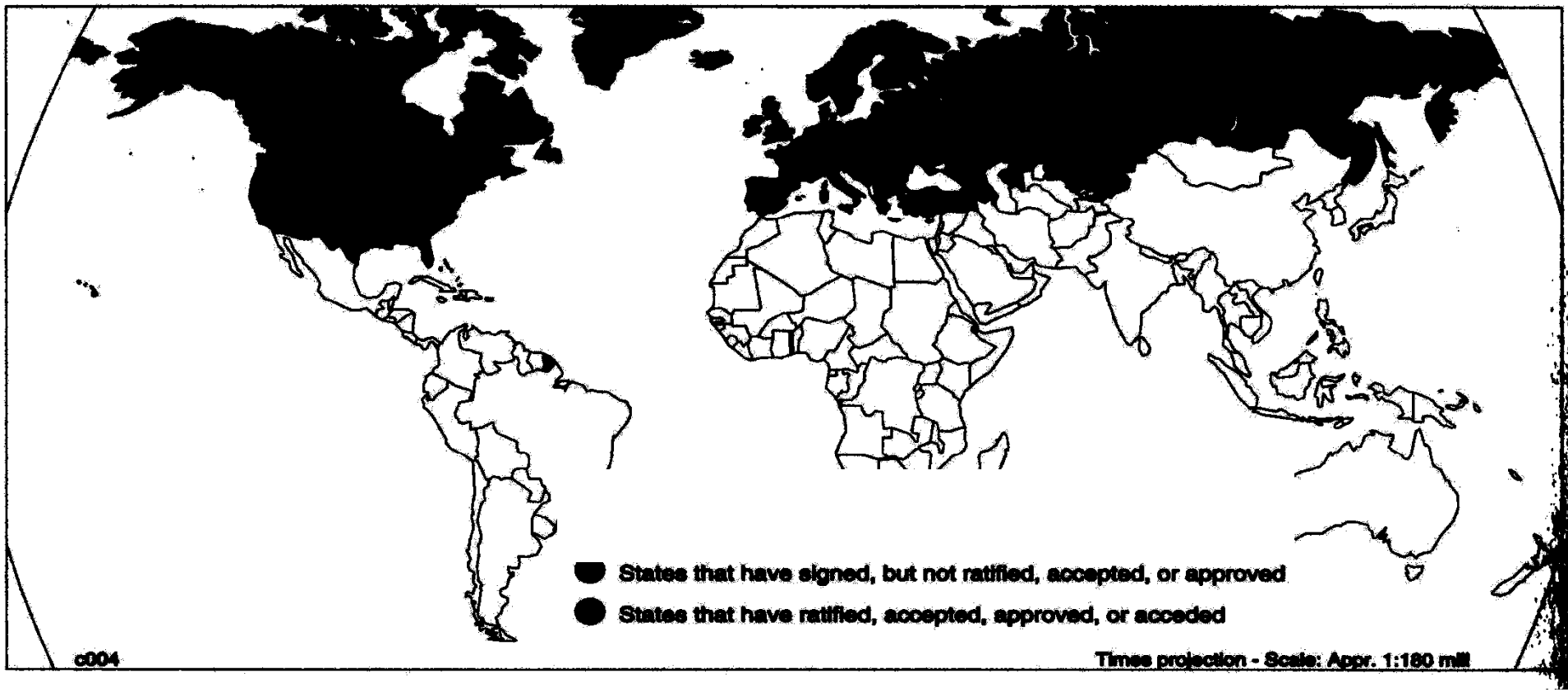
http://www.htap.org

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

51 Parties in Europe, North America and Central Asia



Protocols to the Convention

- **1984 EMEP Protocol**
  - Established permanent funding for monitoring and modeling program.
- **1985 Sulphur Protocol**
  - Reduce 1980 annual sulfur emissions by at least 30 percent
- **1988 NOx Protocol**
  - Reduce and hold NOx emissions below 1987 levels by 1993
- **1991 VOC Protocol**
  - Reduce 1984 annual VOC emissions by 30 percent by 1999
- **1994 Sulphur Protocol**
  - Reduce emissions by 50 to 80 percent by 2000/2005
- **1998 Protocol on Heavy Metals**
  - Cadmium, Lead and Mercury
- **1998 Protocol on Persistent Organic Pollutants (POPs)**
  - Pesticides, PCBs, Dioxins/Furans (16 compounds).
- **1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone**
  - NOx, VOCs, Sulphur, Ammonia

Task Force on Hemispheric Transport of Air Pollution

The Task Force was created in 2004 “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”

The chairs are encouraged to invite individuals with expertise relevant to the work of the Task Force and experts from non-Convention countries in the northern hemisphere.

Participation in the TF HTAP

- Participation is open to all interested experts
- All countries in the Northern Hemisphere have been invited to nominate “National Focal Points”
- Task Force reports are developed by consensus, but are officially reports of the Co-Chairs to the LRTAP Convention.
- Experts from 22 countries outside the UNECE have participated in at least one of the Task Force’s past meetings.

Policy-Relevant Science Questions

1. How does hemispheric transport affect air pollution?
2. How much do emissions in one country or region affect air pollution in another country or region?
3. How confident are we of the results and what is our best estimate of the uncertainties?
4. How will changes in emissions in one country or region affect air pollution in another country or region?
5. How may the source-receptor relationships change over the next 20 to 50 years due to changes in emissions?
6. How may the source-receptor relationships change due to climate change?
7. What efforts are needed to develop an integrated system of observation data and models?

Progress to Date

Where We Have Been

Dates		*Locations*	*Partners*	*Topics Discussed*
2005	June	Brussels		Science Questions
2006	Jan	Washington		Model Intercomparison
	June	Moscow		Hg, POPs, CH_4
	Oct	Beijing		Emissions and Projections
2007	Jan	Geneva	w/ WMO, GEO	Observational Evidence
	May	Reading		Climate, ***HTAP 2007* Review**
	Oct	Jülich		Model Intercomparison
2008	April	Rome	w/ UNEP Hg F&T	Hg, POPs
	June	Washington	w/ NAS, AC&C	State of Science, planning
	Oct	Hanoi	w/ EANET	Asia, Mercury
2009	April	St Petersburg	w/ TF IEP & AMAP	EECCA, Arctic
	June	Paris	w/ TF MM	Future scenarios, climate links
	Nov	Toronto		***HTAP 2010*** 1st Workshop

Progress to Date

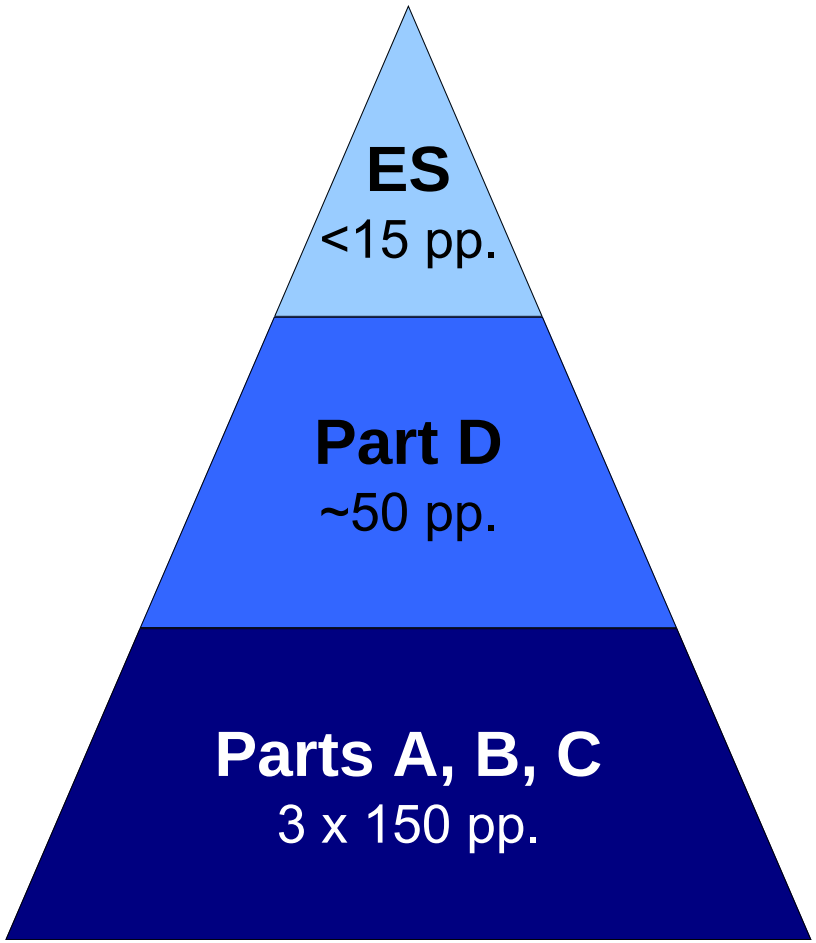
Major Work Areas

- **Emissions and Projections**
  - EDGAR-HTAP, RCP Scenarios Analysis
- **Integration of Observational Evidence**
  - EBAS-HTAP (Surface Observations)
  - GIOVANNI-HTAP (Satellite Observations)
  - Unified Aircraft Database (Aircraft Observations)
- **Multi-Model Experiments**
  - SR: Source-Receptor Sensitivity Simulations
  - TP: Passive and Artificial Tracer Simulations
  - ES: Event Simulations (focusing on ICARTT observations)
  - FE: Future Emission Scenarios
  - FC: Future Climate Scenarios
- **Data Network**

Structure of *HTAP 2010*

- **Part A: Ozone, Aerosols, Deposition**
  - eds Dentener, Akimoto, Keating and Zuber
- **Part B: Mercury**
  - eds Pironne and Keating
- **Part C: POPs**
  - eds Dutchak and Zuber
- **Part D: Synthesis**
  - “Summary for Policy Makers”
- **ES: Executive Summary**
  - Official Document to the LRTAP Convention

Audiences



- **Senior Ministry Officials, Public**
- **Ministry Technical Staff, Other Stakeholders**
- **General Scientific Audience**

The Policy Contexts

- **POPs**
  - LRTAP POPs Protocol
  - Stockholm POPs Convention
  - *Additions of chemicals? Priorities?*
- **Mercury**
  - LRTAP Heavy Metals Protocol
  - UNEP Hg Negotiations on Binding Instrument
  - *Understanding of Transboundary Flows and Source Attribution*
- **Ozone and Aerosols**
  - LRTAP Gothenburg Protocol Revision & LTS
  - Other Regional Air Pollution Agreements
  - *Need for Inter-regional or Global Cooperative Action?*

Schedule for *HTAP 2010*

• Revised Outlines/Drafts	Nov 20
• Draft Chapters Posted to Wiki	When Available
• Full Draft Chapters (with placeholders if necessary)	Jan 20
• Internal Review Draft of Parts 1-4,ES	Feb 20
• Major Review Meeting	Mar 1-2
• External Review Draft	April
• Revision Based on Comments	May
• Acceptance Meeting, Finalize ES (Brussels)	Jun 14-16
• Finalize Parts 1-4	Jul
• Printing	Aug

This Workshop

Agenda

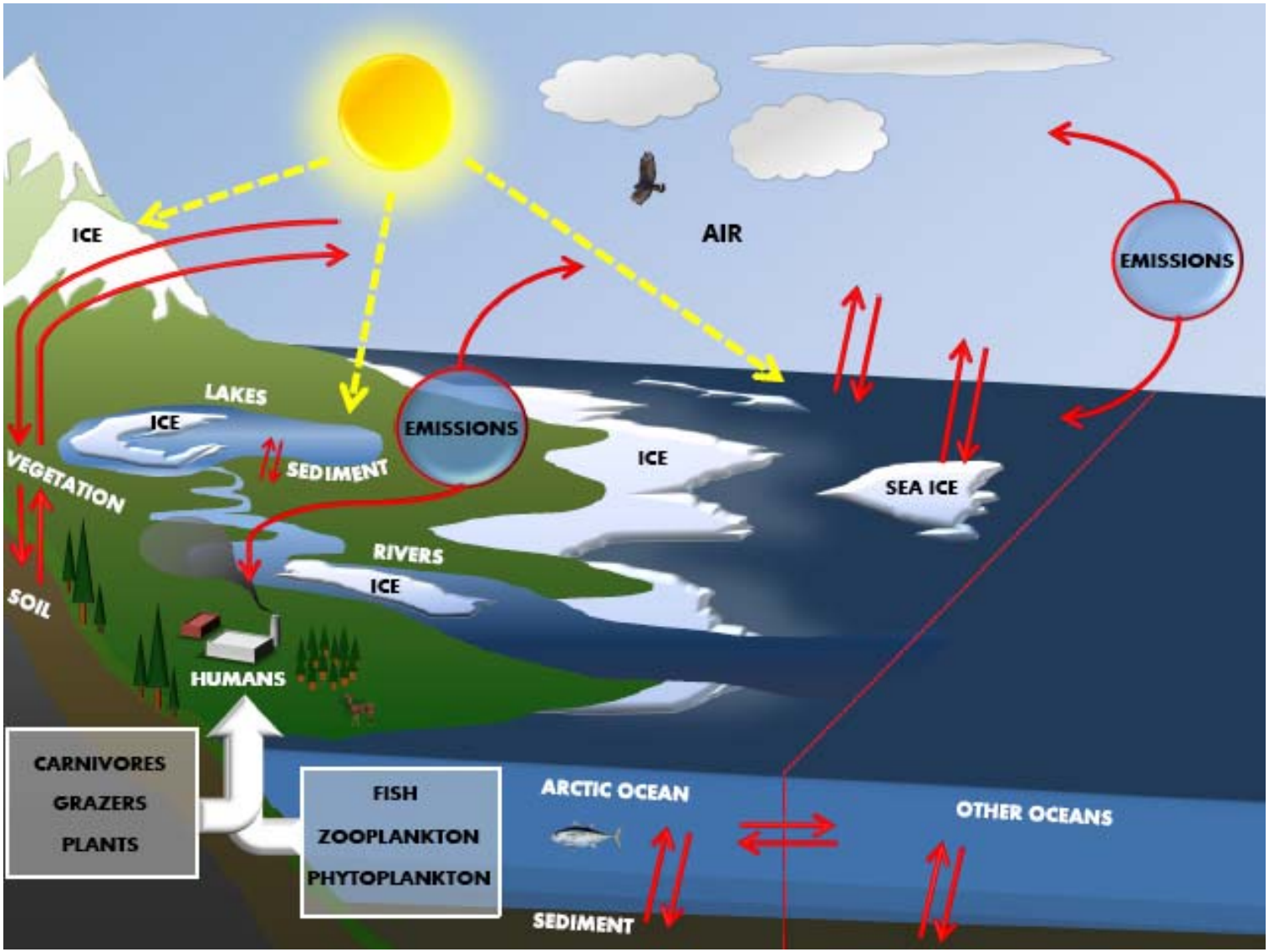
- **Monday**
  - **Introduction**
    - **Introduce Synthesis Questions and Discuss Common Terminology**
  - **Parallel Sessions by Part/Pollutant (4 hours total)**
    - **Discuss Status of Each Chapter (time for 20 min each)**
    - **Discuss Each Synthesis Question (time for 20 min each)**
      - **Identifying Findings and Recommendations to be brought forward to Chapter 6 and Part D**
      - **Please save presentations that can be posted.**
    - **Editors (with help of Chapter Leads) produce 1 slide from each Part for each Synthesis Question to carry forward to Tuesday**
    - **Identify Cross-cutting/Process Issues to be addressed**
  - **Plenary Presentations**

Agenda

- **Tuesday**
  - **Plenary Discussion of Synthesis Questions**
    - **30-60 mins per question**
  - **Plenary Discussion of Cross-Cutting Issues and Logistics**

Bringing Key Messages Forward

- **In Each Chapter**
  - Include **Findings** and **Recommendations** in text or at end of chapter
- **Add Chapter 6 in Each Part**
  - Findings and Recommendations
  - Introduced or framed by Editors, Chap 1 Authors
- **Part D: Summary/Synthesis**
  - Organized Around Themes of 7 Policy Relevant Science Questions
  - Drafted by Editors
- **Need Graphs/Tables/Illustrations**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HUMANS
CARNIVORES
GRAZERS
PLANTS
FISH
ZOOPLANKTON
PHYTOPLANKTON
ARCTIC OCEAN
OTHER OCEANS
SEDIMENT

Part D. Summary/Synthesis

- **What are the processes that affect the intercontinental or global flows of air pollutants and how well do we understand them?**
- **What is the contribution of these intercontinental or global flows of air pollutants to concentrations, deposition, and environmental impacts?**
- **How will changes in emissions in one region affect air pollution and its impacts in another region?**
- **How may the source-receptor relationships change over the next 20 to 50 years due to changes in emissions?**
- **How may the source-receptor relationships change due to climate change?**
- **What efforts are needed to develop an integrated system of observation data, emissions, and models?**

Uncertainty Terminology Following IPCC AR4

- **Qualitative:**
  - Amount and Quality of Evidence (High, Medium, Low)
  - Level of Agreement (High, Medium, Low)
- **Confidence Level** (Judgment of the correctness of data or models)
  - Very High confidence ≥ 9/10 chance
  - High confidence ≈ 8/10 chance
  - Medium confidence ≈ 5/10 chance
  - Low confidence ≈ 2/10 chance
  - Very low confidence < 1/10 chance
- **Likelihood Estimates** (Probabilistic Assessment)
  - Virtually certain > 99% probability of occurrence
  - Very likely > 90% probability
  - Likely > 66% probability
  - About as likely as not 33 to 66% probability
  - Unlikely < 33% probability
  - Very unlikely < 10% probability
  - Exceptionally unlikely < 1% probability

Terminology

- Emission Sectors
- Legacy/Secondary/Re-emission
- Background/Baseline
- Events
- Source Attribution/Source-Receptor
- Model Evaluation

Process Considerations

- Unmoderated Email Listserve for All Authors
  - no attachments possible
- Wiki Page to be Established for Each Chapter
  - Viewable and Editable by all Wiki Account Holders
  - Use as repository for exchanging drafts and elements
- Write in Word, Template Provided
- Review Drafts in “Commentable” PDFs
  - Returned to Authors in Word
- Endnote Compilation of References
- Graphics help possible if needs identified early

Editorial Process

- Chapter Lead Author Drafts (Word)
- Formatting and Bibliography Linking
- Chapter Lead Author Revisions (Word)
- Review Drafts (PDF)
- Compilation of Comments (Word)
- Chapter Lead Author Revisions (Word)
- Final Drafts (PDF, Insight)

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Relationship to Other Regional and Global Initiatives

- TF HTAP seeks to build upon the work of the EMEP centres and Task Forces
- Engage experts from other regional initiatives: AMAP, EANET, Malé Declaration, ASEAN, ABC-Asia, …
- Engage experts from the global atmospheric science community and leverage joint efforts: IGAC, Atmospheric Chemistry & Climate Initiative, IPCC
- Engage experts and leverage activities under other global forums: Stockholm Convention on POPs, UNEP Mercury Program and Associated Partnerships, GEO

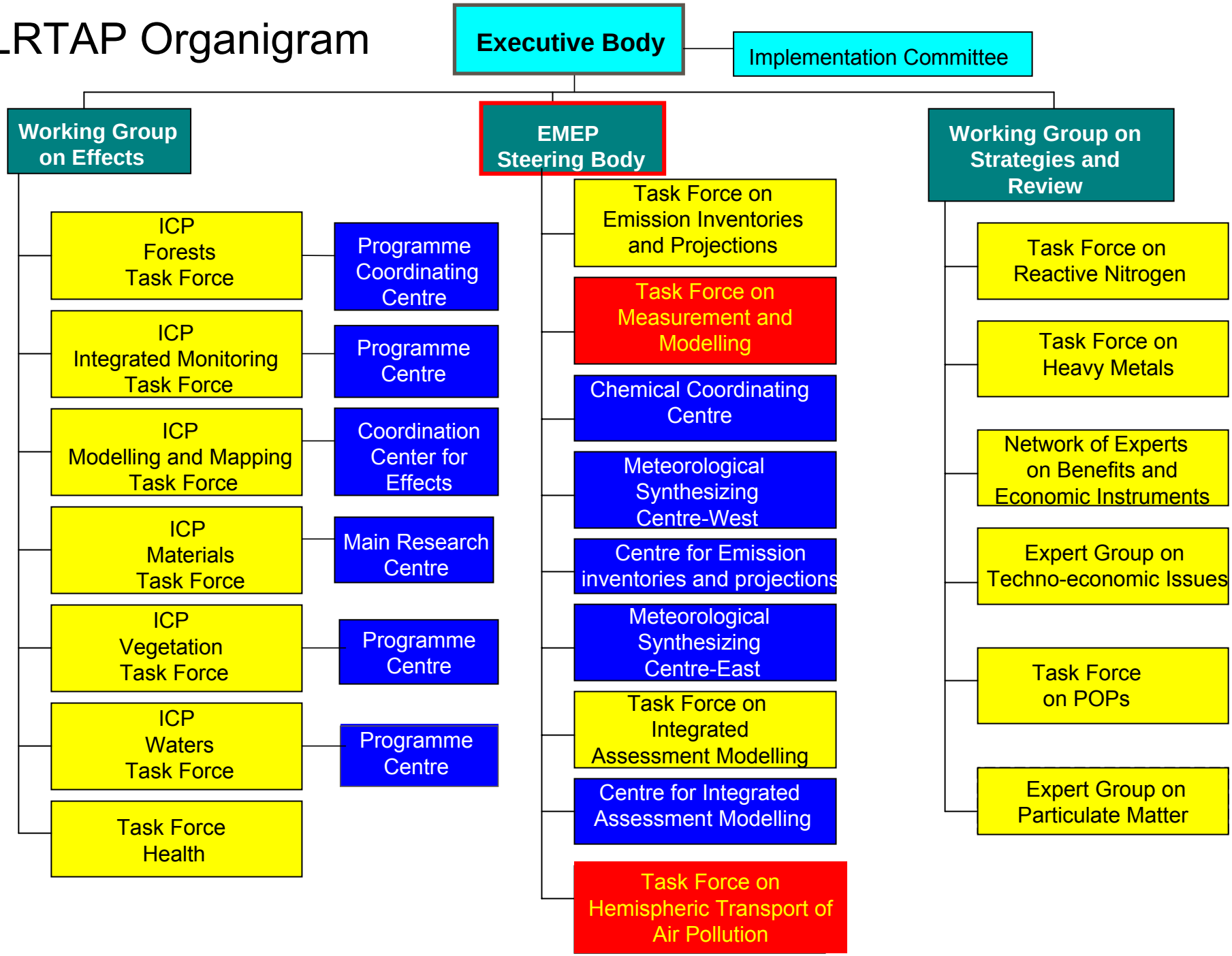
↓

- To build a common understanding of intercontinental transport of air pollution in the Northern Hemisphere

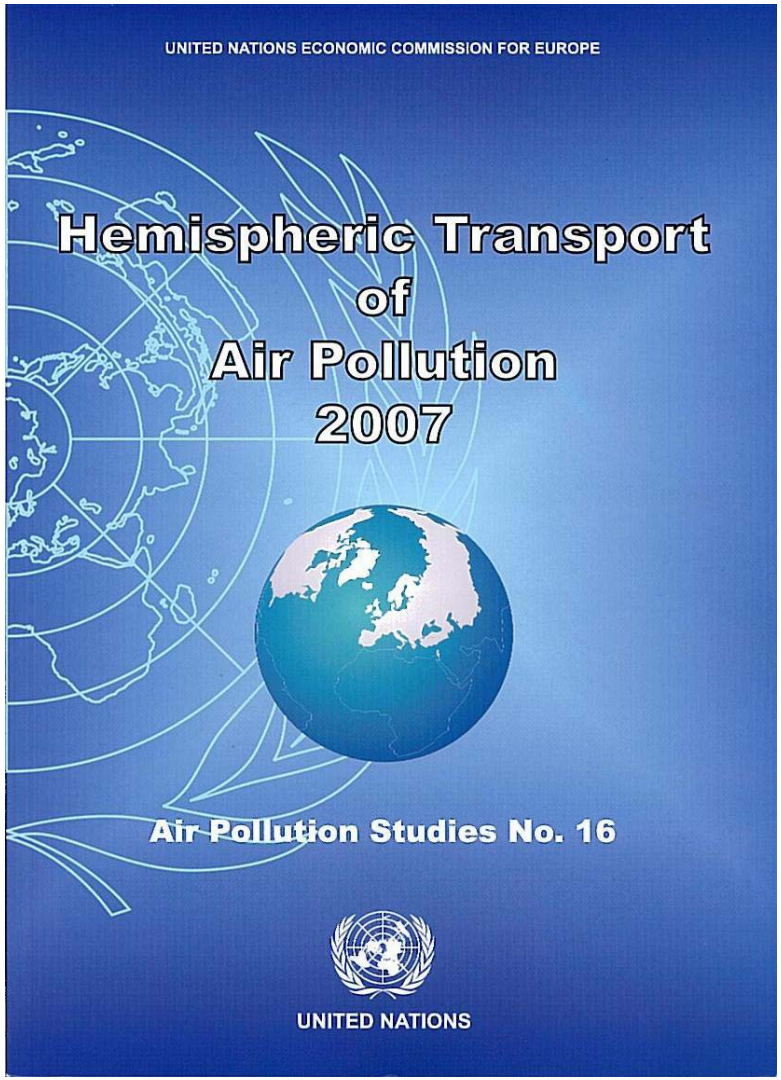
Writing Roles

- "Part" Editors
  - Identifying Authors, Overall Organization, Consistency of Content and Style
- Chapter Lead Authors
  - Outlining Chapter, Recruiting and Assigning Authors, Integrating and Editing Text, Responding to Comments, Assinging Credit for Authorship
- Contributing Authors
  - Volunteered or Recruited

CLRTAP Organigram



HTAP 2007: An Interim Report



- **Presented to EB December 2007 to inform the review of the Gothenburg Protocol**
- **In Print as of April 2008**
- **Focused on Ozone and Aerosols**
  - **Transport Processes**
  - **Observational Evidence**
  - **Emissions Inventories & Projections**
  - **Regional & Global Modeling**
  - **Summary Answers to Policy-Relevant Science Questions**
- **> 125 Experts from > 25 Countries Participated in the Process**
- **Reports initial results of HTAP Multi-Model Experiments**

Some Points of Departure

- WHO/TF Health Assessment 2003 (POPs)
- HTAP 2007 (Ozone & Aerosols)
- ABC 2008 Assessments (Ozone & Aerosols)
- UK Royal Society (Ozone)
- UNEP F&T Partnership (Mercury)
- UNEP Chemicals Report (Mercury)
- Stockholm Convention Review (POPs)
- CLRTAP Parties Submissions on Risk (POPs)
- U.S. National Academy of Sciences (All)

- **What can *HTAP 2010* add?**
- **Can we be more specific, more quantitative, more confident?**