



Task Force on Hemispheric Transport of Air Pollution

Update on progress in the work plan for 2024-2025

Co-Chairs Terry Keating (United States) Tim Butler (Germany)

Vice Chairs Rosa Wu (Canada) Jacek Kaminski (Poland)

EMEP/WGE Extended Bureaux meeting
Geneva, February 27 – March 1, 2024

TF HTAP 2024-25 Work Plan

Global Emissions Mosaics

Continue to explore the extension and expansion of global emissions mosaics, building on HTAPv3 (2000-2018).

HTAP3 Modelling Experiments

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Organize new global model simulations of future scenarios developed by CIAM, including examination of the role of methane, source attribution methods, link to regional scale (TFMM, MSCW), links to impacts (ICP Veg, ICP Forests?).

Mercury Trends and Source Attribution

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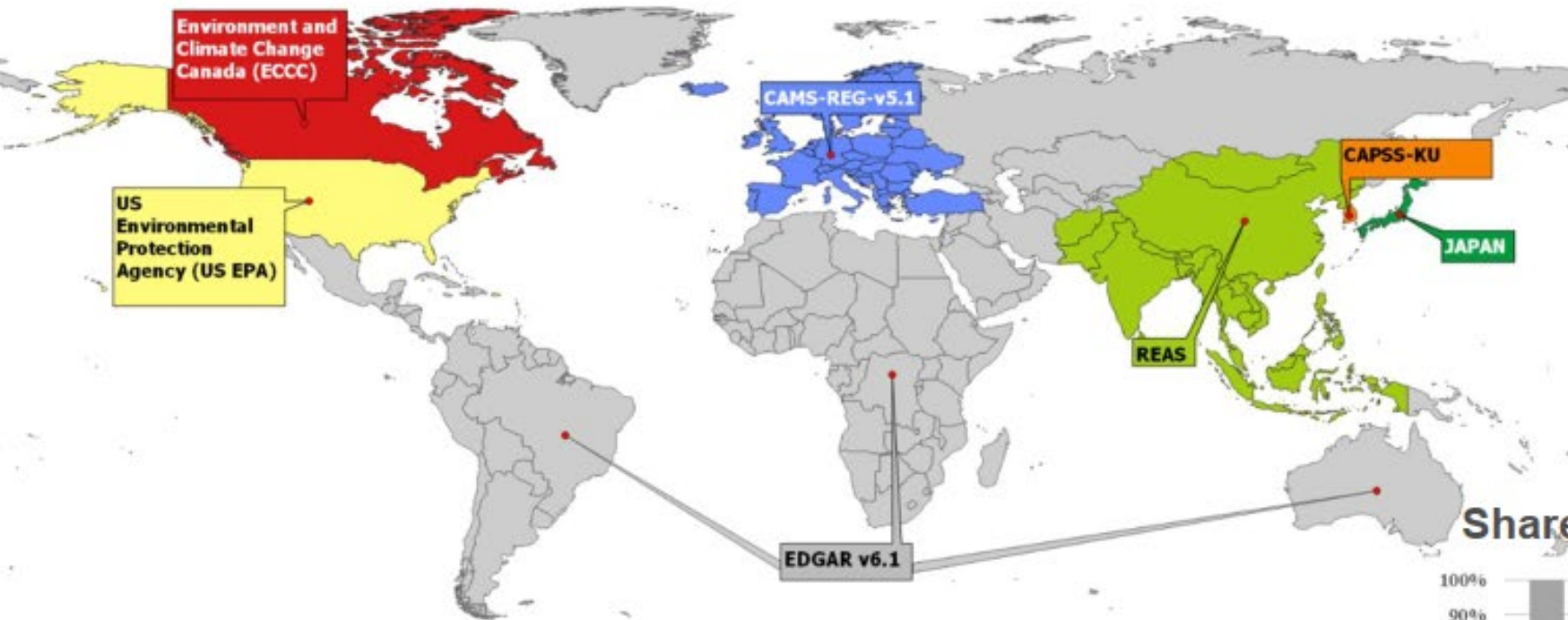
Multi-Pollutant Impacts of Fires

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Input to Decision Support Tools

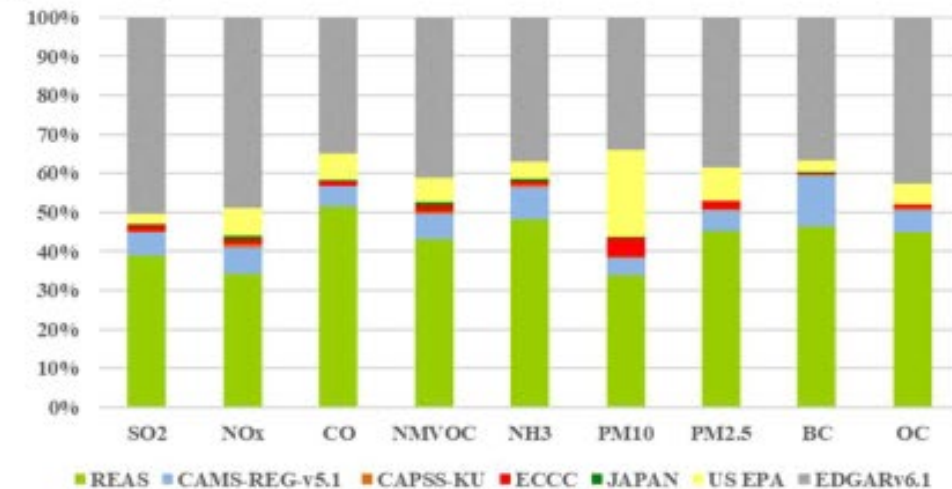
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Recent historical emissions: the HTAPv3 global emission mosaic



- Explicit spatial distribution with gap filling
- Timeseries 2000-2018
- High number of emission sectors (16)
- Dataset released April 2022
- Available at https://edgar.jrc.ec.europa.eu/dataset_htap_v3
- Published paper: <https://doi.org/10.5194/essd-15-2667-2023>

Share of the emissions by data provider



Slide from Monica Crippa, JRC

Updating the HTAPv3 global mosaic inventory

- HTAPv3.1: Scope and timeline agreed with the EDGAR team at the JRC and regional data providers
- Update of global base inventory from EDGAR 6.1 to EDGAR 8
- Extension from 2018 to 2020 (full period 2000-2020)
- Updated regional datasets
 - Europe: CAMS-REG-v6
 - 2000-2020 based on 2022 submissions
 - Fix for Black Carbon bug in HTAPv3
 - United States: US-EPA
 - Extend the time series: 2018-2020
 - Disaggregate fugitive dust for consistency with other regions
 - Canada: ECCC
 - Revised data: 2000-2020
 - Japan
 - Revised data: 2000-2020
 - Republic of Korea: CAPPS
 - Revised data: 2000-2020
 - Disaggregate fugitive dust for consistency with other regions
 - China: MEIC
 - To be included for the first time
- Data delivered by April, HTAPv3.1 release targeting September 2024

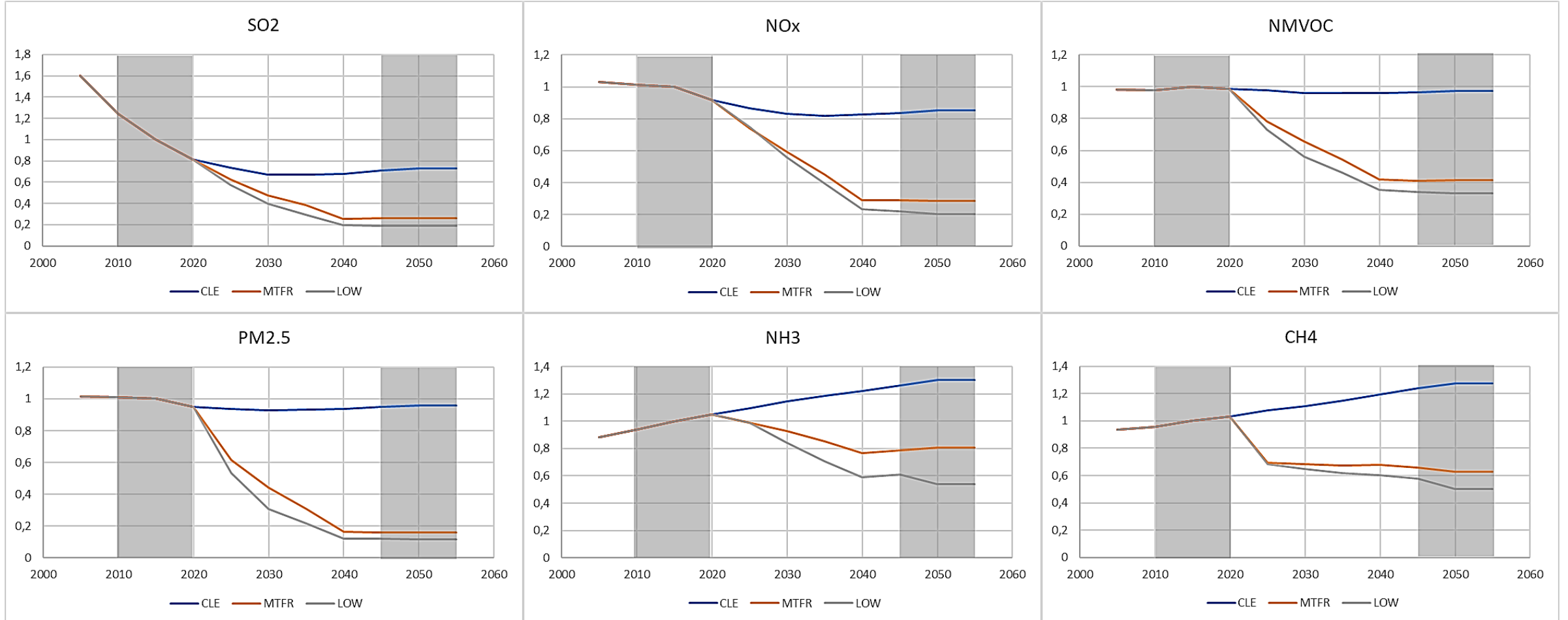


HTAP3: Three Sets of Experiments With A Common Base

1. New Global Policy Scenarios for Ozone, PM, and S/N Deposition

- Organizing new global model simulations of future emissions scenarios developed using IIASA's GAINS model
- Support for the revision of the Gothenburg Protocol
- Examining the role of methane as an ozone precursor, source attribution methods, regional-global scale linkages, and health and vegetation impacts.
- Future simulations with comprehensive global chemistry-climate models
- Present-day simulations with global chemical transport models -> emulator development
- Global to regional downscaling
- Coordinator: Tim Butler, Research Institute For Sustainability, Potsdam, Germany

GAINS LRTAP future scenarios (total global anthropogenic emissions)



Chemistry-climate simulations

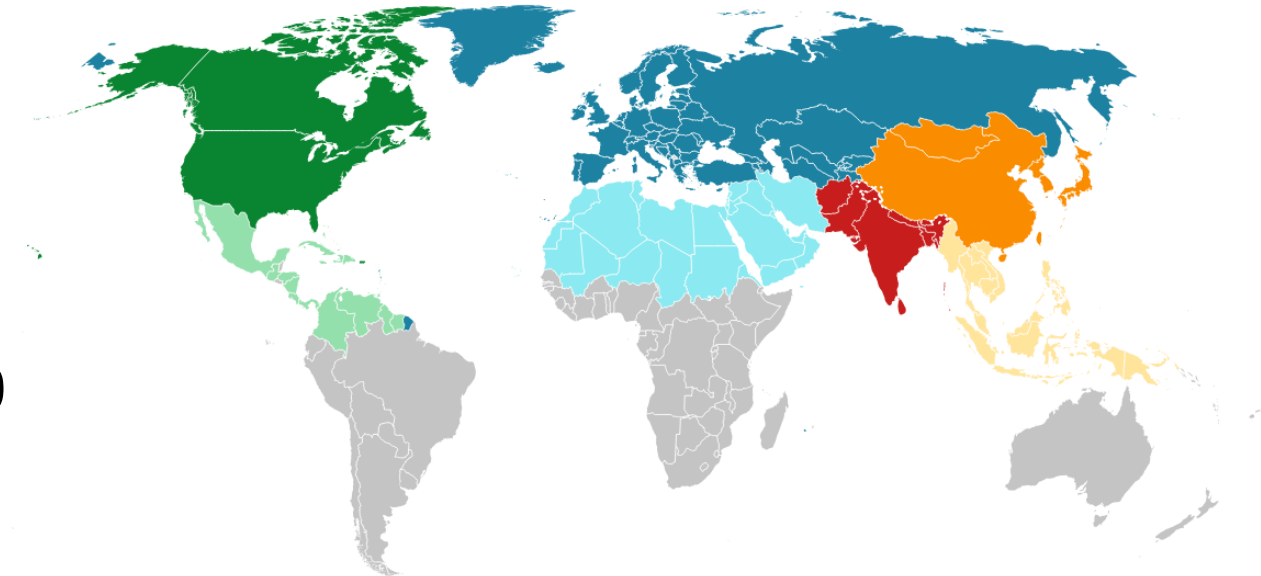
- Transient simulations (2015-2050) with an ensemble (5-10 models) of comprehensive global chemistry-climate models
 - How does air quality evolve in the future under the GAINS scenarios?
 - What is the effect of inaction on methane?
 - What is the future "climate penalty"?
 - What is the inter-model uncertainty?
 - How well does our scenario emulator work? (see next slide)
- Focus on calculation of policy-relevant impact metrics
 - Human health
 - Impacts on vegetation

Chemical transport model simulations

- Present-day (2015) simulations with an ensemble of 10-15 global CTMs
 - Set of ~25 emission perturbation runs (GAINS emissions)
 - Source-receptor relationships (with uncertainty estimates)
 - Emulator development
- Rapid assessment of the GAINS scenarios with the emulator
- Policy-relevant impact metrics
- Historical timeseries runs 2000-2020 (HTAPv3 emissions)
 - Deposition for WMO MMF-GTAD

Possible HTAP3 Source Regions

■ EAS ■ EMEP ■ MCA ■ NAM ■ ROW ■ SAS ■ SEA ■ SMD



Data access

- Model output data to be hosted on the AeroCom server
 - Data access policy
- Publications: Special Issue in *Atmospheric Chemistry and Physics* (open access)
 - Requirement to specify data availability

Timing

- Model simulations expected to begin around May 2024
- First results expected by Spring 2025
- Preliminary analysis (hopefully) by September 2025



HTAP3:

Three Sets of Experiments With A Common Base

2. Multi-Compartment Hg Modeling and Analysis Project (MCHgMAP)

- An ensemble of new global model simulations, linking atmosphere, soil, ocean, and multi-compartment models, are getting started. Initially, the results will contribute to the Minamata Convention's first effectiveness evaluation.
- Multi-journal (GMD, ACP, BG) special issue has been launched: *Mercury science to inform international policy: the Multi-Compartment Hg Modeling and Analysis Project (MCHgMAP) and other research*
- In 2024, focus will be on 2010-2020 baseline simulations. Additional sensitivity analyses to follow in 2025.
- Coordinator: Ashu Dastoor, Environment and Climate Change Canada



HTAP3:

Three Sets of Experiments With A Common Base

3. Fires Multi-Pollutant Modelling

- Comparing the impact of wildfires and agricultural burning on PM, O₃, metals, and POPs. Simulations to be conducted in 2024-2027.
- White paper open to participation
 - <https://nextcloud.gfz-potsdam.de/s/JQNn2NdZz4d66dn>
- Global Fire Emissions Workshop with IGAC/BBurned, November 7, 8, 9, 14
 - Historical emissions from the satellite record
 - Future scenarios using land-surface models
- Coordinator: Cyndi Whaley, Environment and Climate Change Canada
- Email List: https://www.listserv.dfn.de/sympa/subscribe/htap-fires?previous_action=review

Decision Support and the openFASST Concept

- HTAP1 and HTAP2 resulted in large ensembles of model simulations from complex global and regional models.
- Wild et al. (2012) and Turnock et al. (2018) demonstrated a useful non-linear parameterization of annual average ozone results.
- TM5-FASST (van Dingenen et al. 2018) and other user-friendly, web-interface driven, reduced-complexity models have proven useful as screening or decision support tools.
- openFASST: Demonstrated the potential to use multi-model results from HTAP in the FASST framework. We have explored constructing a more open, modular framework:
 - Allowing exploration of time series and future scenarios
 - Comparisons of the implications of model choice or S/R methodology
 - Allow updates to FASST as models and environmental conditions evolve

Future work on source-receptor emulator models

- Exploring incorporation of HTAP ensemble source/receptor results into other reduced-complexity models.
 - We are currently emphasizing enabling the use of HTAP results in other models or tools, as opposed to developing a dedicated “HTAP tool”
- Workshop session planned at
12th International Congress on Environmental Modelling and Software (iEMS)
23-27 June 2024, Michigan State University, East Lansing MI
- New HTAP3 model simulations coming in 2024-2027

HTAP Spring Task Force Meetings

- To be held online in the week of April 22-26
- Sessions on:
 - Updates from the Task Force
 - OPNS
 - Chemistry-climate simulations
 - Source-receptor simulations
 - Historical simulations for WMO MMF-GTAF
 - Wildfires

Email: keating.terry@epa.gov Or subscribe to email list at www.htap.org



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



About TF HTAP

Questions and Answers

Events

Useful Links



TRENDING NEWS

ion AGENDA

HTAPv3 emission

Newsletter subscripion!

Spring meetings online 18-21 April – presentations

Fire White Paper Meeting – June 29

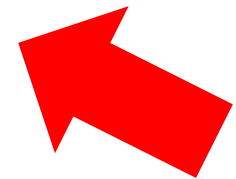
Welcome to HTAP page

The 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. TF HTAP was organized in 2005 under the auspices of the [UNECE Convention on Long-range Transboundary Air Pollution](#) (LRTAP Convention) and reports to the Convention's EMEP Steering Body. However, participation is open to all interested experts, both inside and outside the UNECE region.

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- ▶ Spring meetings online 18-21 April – presentations

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