



Task Force on Hemispheric Transport of Air Pollution

Update from TF-HTAP

with a focus on the GP revision

Co-Chairs

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TFIAM54
IIASA, April 3-4, 2025

www.htap.org

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

O3, PM, S/N Deposition Under Future Scenarios

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

Organize new global model simulations, initially to contribute to the Minamata Convention's effectiveness evaluation.

Multi-Pollutant Impacts of Fires

Design a multi-model intercomparison of the multi-pollutant (PM, POPs, metals, O3) impacts of fires to be conducted over the next two work plans.

Input to Decision Support Tools

Continue to produce emulators for our multi-model ensembles and incorporate these into screening models and decision support tools (e.g. building on openFASST concept).

Draft workplan 2026-27

- TF-HTAP has 7 items shared with either TFIAM or CIAM
 - 5 items on scenario assessment (GP related)
 - 1.1.3.0
 - 1.1.3.1
 - 1.1.3.2
 - 1.1.3.4
 - 1.1.4.2
 - 2 items on source-receptor relationships
 - 1.1.1.5
 - 1.1.1.6

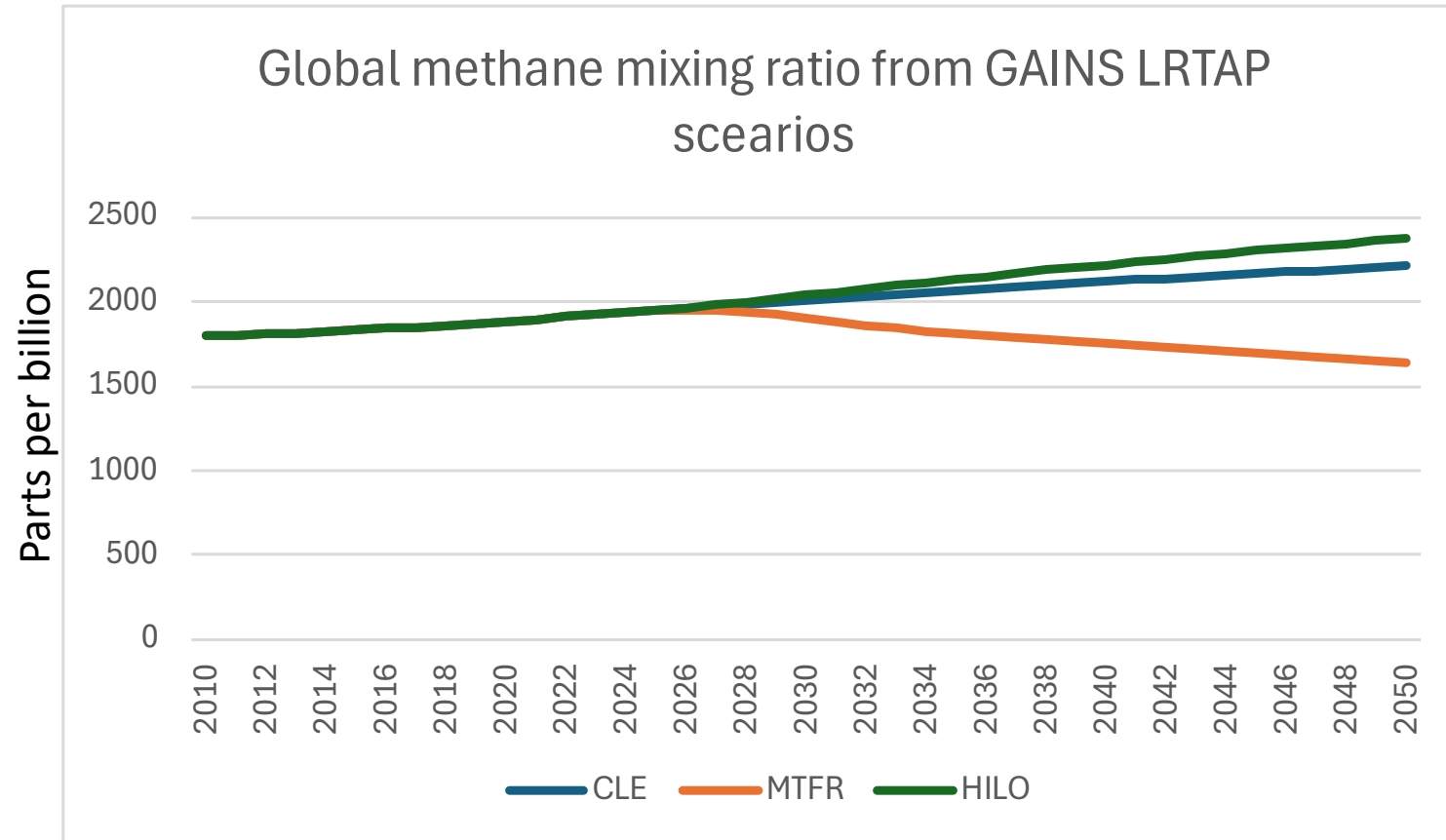


New Global Policy Scenarios for Ozone, PM, and S/N Deposition

- Model simulations using the GAINS LRTAP scenarios in support of the GP revision
 - Ensemble of chemical transport models including the EMEP model
- White paper:
<https://docs.google.com/document/d/1CYgWl2ZzrQVlbcohU9gcOSMNwCIFBmGT>
 - Methane as an ozone precursor, source attribution methods, regional-global scale linkages, health and vegetation impacts
 - Comprehensive global chemistry-climate models
 - Global chemical transport models -> source/receptor relationships -> emulator development
 - Global to regional downscaling (with MSC-W and TFMM)
- Email List: <https://www.listserv.dfn.de/sympa/subscribe/htap-opns-announce>

Which scenarios?

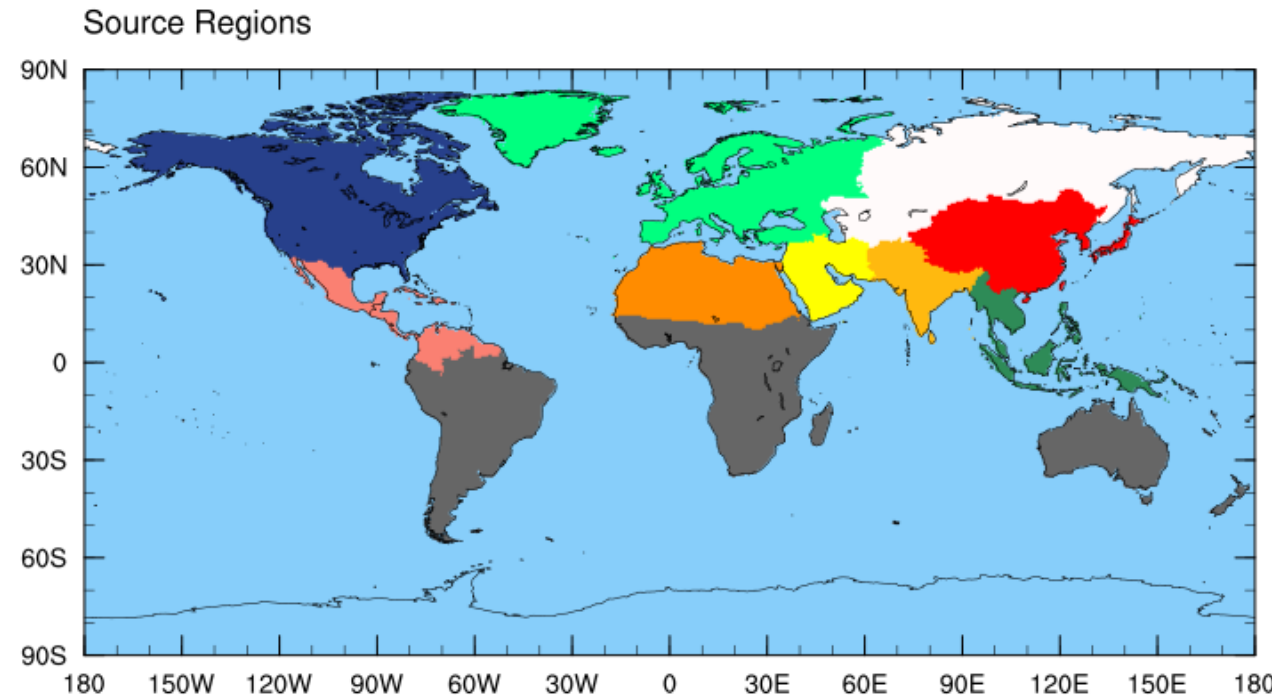
- CLE and MTFR
- Hybrid scenario “HILO”
 - Methane emissions from CLE
 - No additional action on methane
 - All other pollutants from MTFR
 - Maximum global abatement of traditional air pollutants



Results from MSC-W (W. van Caspel)

Chemical transport model simulations

- Source-receptor relationships (with uncertainty estimates)
 - Set of ~25 emission perturbation runs
 - Emulator development
 - Decision support tools (eg. OpenFASST)
 - 2040 (GAINS CLE emissions) with an ensemble of ~12 global CTMs
- Rapid assessment of new scenarios with the emulator
- Policy-relevant impact metrics
- Historical timeseries runs 2003-2020 (HTAPv3.1 emissions)
 - Deposition for WMO MMF-GTAD



Priorities for HTAP3 Simulations

Base (CLE 2040 emissions)

2015 meteorology / 2040 emissions

BASE (CLE2040) **1**

Highest Priority

1 or 2

Next Priority

n

Lower Priority

Global Perturbations

Decrease CH4 Conc

CH4DEC **1**

Decrease CH4 Conc and all anthro emissions

CH4ALL **1**

Increase H2 conc

H2INC **2**

Decrease All anthro emissions

GLOALL **1**

Decrease anthro NOX

GLONOX **1**

Decrease anthro VOC

GLOVOC **1**

Decrease anthro CO

GLOCO **1**

Global Scenario Runs

CLE 2015 emissions

CLE2015 **1**

MTR (2040)

MTR2040 **2**

HILO (2040)

HILO2040 **2**

Regional Emissions Perturbation (2015 meteorology, 2050 CLE emissions)

N America

	All	NOX	VOC	CO	SO2	NH3	PM
NAM	1	2	2	4			
EMEP Domain	1	2	2	4			
EMEP West	3	4	4	4			
EMEP East	3	4	4	4			
East Asia	1	2	2	4			
South Asia	1	2	2	4			
South and East Mediterranean	1	2	2	4			
Middle East	3	4	4	4			
North Africa	3	4	4	4			
SE Asia	3	4	4	4			
Mex/C America/Caribbean	3	4	4	4			
Rest of World (SAM+SAF+PAN)	3	4	4	4			
South America	3						
Southern Africa	3						
Aust/NZ/Pacific	3						
International Shipping	1						
Aviation (all vertical levels)	2						
Fires (all fires)	3						

NAM

EMEP Domain

EMEP

 EMEP West

EMEPW

 EMEP East

EMEPE

East Asia

EAS

South Asia

SAS

South and East Mediterranean

SMD

 Middle East

MDE

 North Africa

NAF

SE Asia

SEA

Mex/C America/Caribbean

MCA

Rest of World (SAM+SAF+PAN)

ROW

 South America

SAM

 Southern Africa

SAF

 Aust/NZ/Pacific

PAN

International Shipping

SHIP

Aviation (all vertical levels)

AVI

Fires (all fires)

FIRE

• Source-receptor relationships

- Emulator development
- Rapid scenario assessment
- HTAP workplan 1.1.4.5

• Also useful for GAINS?

- Hemispheric contribution to European background ozone
- Complementary to MSC-W
- Common workplan items:
 - 1.1.5.5
 - 1.1.5.6

Timing

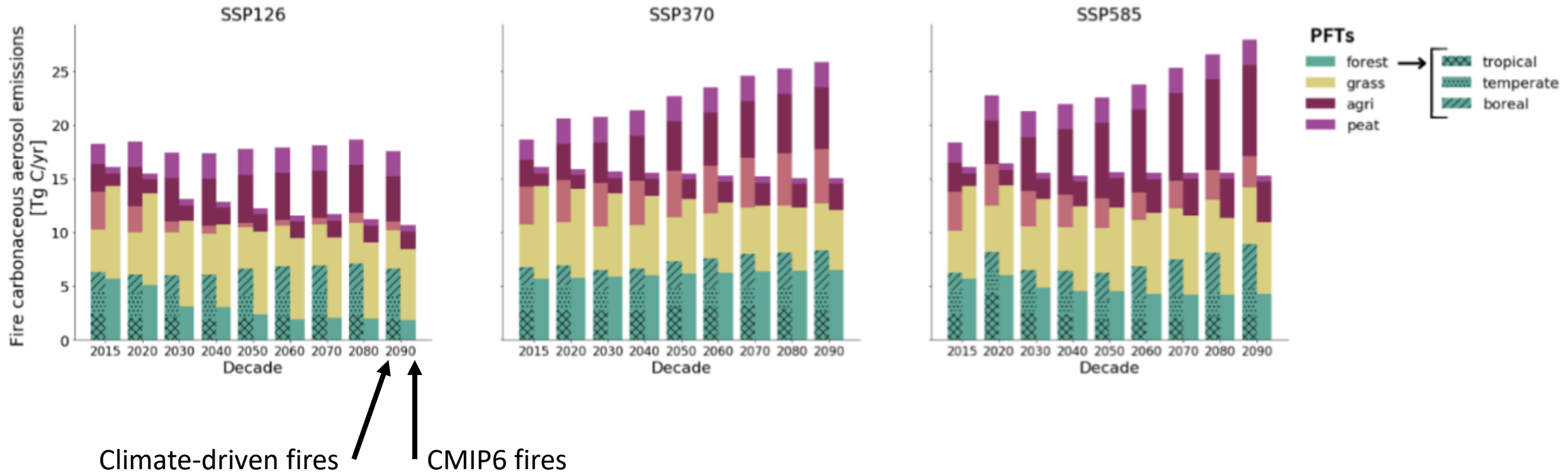
- Model simulations expected to begin SOON
- First results possible by September 2025
- Preliminary analysis (hopefully) by Spring 2026



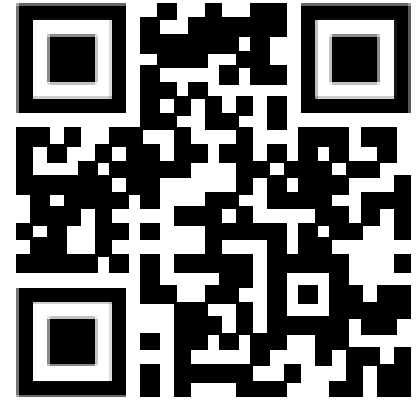
Fires Multi-Pollutant Modelling

- Comparing the impact of wildfires and agricultural burning on PM, O₃, metals, and POPs.
 - Multi—pollutant emissions with common fire activity
- Discussion paper (accepted with revisions)
 - <https://doi.org/10.5194/gmd-2024-126>
 - Contribution of regional fire emissions to air pollution
 - New emission scenario for future fire emissions
- Simulations to be conducted in 2025-2027.
- Coordinator: Cyndi Whaley, Environment and Climate Change Canada
- Email List: <https://www.listserv.dfn.de/sympa/subscribe/htap-fires>

Future fire emissions for HTAP modelling



HTAP Spring Task Force Meeting 2025



- May 7-9 in Potsdam with online participation
 - Registration: <https://eveeno.com/htap>
- Back-to-back with TFMM (May 5-7)
 - Joint session with TFMM on regional modelling of GAINS scenarios for the GP revision on May 7
- Other sessions on:
 - Global modelling of GAINS scenarios for the GP revision (HTAP3-OPNS)
 - HTAP3-Fires
 - MCHgMAP
 - Scoping for the possible future activity on PFAS