

Emissions and Deposition Working Group



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Working Group Wiki

http://wiki.seas.harvard.edu/geos-chem/index.php/Emissions_and_Deposition_Working_Group

Contact Information

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| Emissions and Deposition Working Group Co-Chairs | <ul style="list-style-type: none">• Emily Fischer• Jintai Lin• Eloïse Marais• Dylan Millet |
| Emissions and Deposition Working Group email list | <code>geos-chem-emissions [at] g.harvard.edu</code> |
| To subscribe to email list | Either <ul style="list-style-type: none">• Send an email to <code>geos-chem-emissions+subscribe [at] g.harvard.edu</code> Or <ul style="list-style-type: none">• Go to the GEOS-Chem Emissions and Deposition Google Group• Click on Subscribe to this group |
| To unsubscribe from email list | Either <ul style="list-style-type: none">• Send an email to <code>geos-chem-emissions+unsubscribe [at] g.harvard.edu</code> Or <ul style="list-style-type: none">• Go to the GEOS-Chem Emissions and Deposition Google Group• Click on the My Settings button• Click on Leave this group |

--Bob Y. (talk) 18:35, 21 August 2015 (UTC)

Working Group Related Science Questions

- **Emissions**
 - **Anthropogenic & Natural**
 - **Bottom-up inventory**
 - **Top-down constraint**

- **Dry deposition**
 - **Parameterization**
 - **Top-down estimate**

On-going Projects – Please Add/Remove/Revise

Benefits:

- Enhance collaboration
- Reduce redundancy

Current Projects (please add yours!)

| User Group | Description | Contact Person | Date Added |
|---------------------------------|---|---|----------------|
| Birmingham, UK | STEAM3 ship emission inventory | Eloise Marais | October 2017 |
| Birmingham, UK/NCAR | Inefficient combustion emissions in Africa | Eloise Marais | April 2017 |
| Peking U | Agricultural ammonia emissions in China | Lin Zhang | Nov 2017 |
| University of Minnesota | VOC emissions in India | Sree Chaliyakunnel | 31 August 2017 |
| MIT | Investigating ozone dry deposition to vegetation | Sam Silva | 08 May 2017 |
| CUHK / Boston U | Linking stomatal resistance to photosynthesis calculation in dry deposition | Amos Tai Jeffrey Geddes | 08 May 2017 |
| U. Wollongong (Aus) | Top-down constraints on Isoprene emissions in Australia using OMI | Jesse Greenslade | 28 Sep 2017 |
| U. York (UK) | Improving the parameterization of oceanic dry deposition of ozone | Ryan Pound | 1 Nov 2017 |
| Colorado State University (USA) | Implementation of a newer version of the 2011 U.S. National Emission Inventory and the atmospheric implications of the light alkanes emitted from the U.S. oil and gas industry | Zitely Tzompa-Sosa | 21 Feb 2018 |

Updates in Public Release Since IGC8

| Update | Authors | Planned release |
|---|--|-----------------|
| Australian anthropogenic emissions | Jenny Fisher (Wollongong) | Update ongoing |
| NEI2011 | Zitely Tzompa-Sosa & Emily Fischer (CSU) | Update ongoing |
| CMIP6 historical BB emissions | Pengfei Liu & Lorreta Michkley (Harvard) | Update ongoing |
| Update HEMCO from v2.1.001 to v2.1.005 | Christoph Keller (NASA GMAO) | V11-02f |
| Update lightning BETA values and OTD/LIS files for consistency with latest met fields | Lee Murray (Rochester) | v11-02f |
| CEDS global anthropogenic emissions (1950-2014) | Lu Shen (Harvard) | v11-02f |
| EDGAR v4.3.1 emissions | Chi Li (Dalhousie) | v11-02f |
| Use 1x1 GEIA NH3 emissions | Eleanor Morris (York) | v11-02f |
| Historical Canadian emissions | Chi Li (Dalhousie) | v11-02f |
| Global ethane emissions | Zitely Tzompa-Sosa (CSU) | v11-02f |
| Inefficient combustion emissions in Africa (DICE-Africa inventory) | Eloise Marais (U. Birmingham), Christine Wiedinmyer (NCAR) | v11-02f |
| Trash burning emissions | Eloise Marais (U. Birmingham), Christine Wiedinmyer (NCAR) | v11-02f |
| Update GFED4 emission factors | Katie Travis (MIT) | v11-02f |
| Retire GFED3 biomass burning emissions | Katie Travis (MIT) | v11-02f |
| Ammonia emissions from Arctic seabirds | Betty Croft (Dalhousie) | v11-02f |
| Add QFED emissions for 2014-2016 | Christoph Keller (NASA GMAO) | v11-02b |
| Fix bug in dry deposition aerodynamic resistance | Brian Boys (Dalhousie) | v11-02a |

Recommended Default Emission Inventories

Recommended Default Emission Inventories

Emission inventories for standard full chemistry runs. Entries in BLACK are the recommended default emission inventories, **entries in RED are alternate options**, and **entries in GREEN are inventories slated for inclusion in GEOS-Chem in the future**. Regional inventories overwrite global inventories for particular locations (indicated in the table).

Year(s) show years for which the inventory is provided. In many cases annual scale factors are applied to extend the inventory to the past or present.

Please see our [HEMCO data directories](#) wiki page for information about how to download data files for each of the currently-available inventories.

| Region | HEMCO ExtName | Description | Resolution | Year(s) | Species | References & Notes |
|---|---------------|---|----------------------|-----------|--|---|
| Anthropogenic (Fossil, Biofuel and Process) Emission Inventories | | | | | | |
| Global | EDGAR | EDGAR v4.2 anthropogenic + biofuel | 0.1° x 0.1°, monthly | 1970-2008 | NO _x , SO ₂ , SO ₄ , CO, NH ₃ | http://edgar.jrc.ec.europa.eu/overview.php?v=42 |
| Global | BOND | BOND biofuel + anthropogenic BC + OC emissions | 1° x 1°, monthly | 2000 | BC and OC | Bond et al. (2007) |
| Global | RETRO | RETRO anthropogenic + biofuel | 0.5° x 0.5°, monthly | 2000 | NMVOCs except C ₂ H ₆ and C ₃ H ₈ | ftp://ftp.retro.enes.org/pub/emissions/agggregated/anthro/0.5x0.5/2000/ |
| Global | XIAO | Fossil fuel + biofuel C ₂ H ₆ and C ₃ H ₈ | 1° x 1°, annual | 1985 | C ₂ H ₆ and C ₃ H ₈ | Xiao et al. (2008) |
| Global | TZOMPA | Fossil fuel + biofuel C ₂ H ₆ | 2° x 2.5°, annual | 2010 | C ₂ H ₆ | Tzompa-Sosa et al. (2017) |
| Global | TRASH | Trash burning (not in other inventories) | 0.1° x 0.1°, annual | 2010 | NO _x , SO ₂ , SO ₄ , CO, NH ₃ , BC, OC, NMVOCs | Wiedinmyer et al. (2014) |
| Global | SHIP | ICoads ship emissions | 1° x 1°, monthly | 2002 | NO _x , SO ₂ , CO | Wang et al. (2008). |
| Global | AEIC | Aircraft emissions | 1° x 1°, annual | 2005 | NO _x , SO ₂ , CO, NMVOCs, BC, OC | Stettler et al. (2011) |
| Global | ParaNOx | Ship plume O ₃ and HNO ₃ formation | N.A. | N.A. | O ₃ , HNO ₃ | Vinken et al. (2011) with updates from Holmes et al. (2014) |

- **“Recommended default” does not mean “perfect”**
- **Make your own choice**

Please Add Your Top-down Results

Top-down Findings Germane to GEOS-Chem Inventories (please add yours!)

Science findings from top-down studies that have implications for inventories used in GEOS-Chem (e.g., an inferred high or low bias or other such issue) can be compiled in [this table](#). Please add any findings, either from your group or from other groups, that you feel the GEOS-Chem community should be aware of in using these inventories.

--Dbm (talk) 00:57, 1 September 2017 (UTC)

Moving Forward

- Regionally harmonized, sectorally detailed, temporally varying **high-resolution** anthropogenic emission inventory
- Vertical profiles of anthropogenic, BB and lightning emissions (ongoing)
- Integration of top-down and bottom-up (getting started)
- Deposition (parameterization updates ongoing; multiple groups)