

Description for the MIXv2 Asian Emission Inventory

Prepared by Meng Li, 11/18/2022

Updated: 09/02/2023

Overview

MIXv2 is an anthropogenic emission inventory for Asia for the years 2010-2017. It is developed to support the Model Inter-Comparison Study for Asia Phase IV (MICS-Asia IV) project by a mosaic of up-to-date regional and national emission inventories, including REAS v3 for Asia (Asia Center for Air Pollution Research/National Institute for Environmental Studies), MEIC for China (Tsinghua University), high-resolution NH₃ and open biomass burning emission inventories for China (Peking University), an Indian power plant emission inventory (Argonne National Laboratory), national emission inventories for Japan (MOE-J and J-STREAM), CAPSS for the Republic of Korea (provided by Konkuk University), and global emissions from GFED v4 for open biomass burning and EDGAR v6 for shipping.

The domain of MIXv2 covers 23 Asian countries and regions. Emissions are aggregated into seven sectors: Power, Industry, Residential, Transportation, Agriculture, Open_biomass and Shipping. Ten chemical species are included, including both gaseous species and aerosol species: SO₂, NO_x, CO, NMVOC (non-methane volatile organic compounds), NH₃ (ammonia), PM₁₀ (particulate matter with diameter less than or equal to 10 μm), PM_{2.5} (particulate matter with diameter less than or equal to 2.5 μm), BC (black carbon), OC (organic carbon) and CO₂. Only emissions from anthropogenic and open biomass burning sources are included in MIXv2. NMVOC emissions are speciated into model-ready inputs for three chemical mechanisms: CB05, SAPRC-99 and SAPRC-07. Monthly emissions are provided by sectors at a 0.1° x 0.1° resolution.

If you have any questions, please contact: **Dr. Meng Li** (meng.li.atm@gmail.com, meng.li@noaa.gov).

Readme

- The MIX emission inventory is restricted to non-commercial purposes. Any uses of MIX by business organizations are regarded as commercial purpose which needs prior authorization.
- Users are not permitted to distribute the MIX data to any third-party.
- User must ensure the data integrity and independence when using MIX. Without explicit and prior authorization, no organization or individual is allowed to integrate any forms of the MIX data into other emission products or models.
- Papers, reports or products using the MIX data should cite the related publications of MIX.

Data version

- 12/2022: MIXv2.1 released to the community
- 08/2023: MIXv2.1 updated to v2.2, with updates of Asian NH₃ emissions
- 08/2023: MIXv2.2 updated to v2.3, with updates of CAPSS emissions for the Republic of Korea

Data download

- <https://csl.noaa.gov/groups/csl4/modeldata/>

Citation

The MIXv2 emission inventory should be cited as:

- Li, Meng et al., MIXv2: a mosaic long-term emission inventory for Asia (2010-2017), *to be submitted*.

Data description

- Gridded emissions are prepared in NetCDF format.
- Species included: BC, OC, CO, CO₂, NH₃, NMVOC, NO_x, PM₁₀, PM₂₅, SO₂, in unit of Mg/month/grid (10⁶ g/month/grid)
- Chemical mechanisms included: SAPRC99, SAPRC07, CB05, in unit of Mmol/month/grid (10⁶ mol/month/grid)
- Filename format: MIXv2.3_(species name)_xxxx(year)_monthly_0.1deg.nc.
- For each species, emissions by seven sectors are developed: Residential, Industry, Power, Transportation, Agriculture, Open_biomass, Shipping.
- Spatial resolution: 0.1 x 0.1 degree. Domain: 60.05 E – 153.95 E (center of grid, longitude), 14.95 S – 59.95 N (center of grid, latitude). Dimension of dataset: 940 (cols) x 750 (rows) x 12 (months).