

Anthropogenic and biomass burning emissions for AeroCom III

1. Anthropogenic emissions

- Source: Community Emission Data System (CEDS) for CMIP6. Available at: <https://esgf-node.llnl.gov/search/input4mips/>
- Spatial domain: Global
- Spatial resolution: 0.5° (finer resolution up to 0.1° can be generated on request)
- Temporal domain: 1750 – 2014
- Temporal resolution: Monthly
- Data format: netcdf, with 50-years per data file
- Bulk emissions (BC, OC, SO₂, NO_x, NH₃, CO, NMVOC, CO₂, CH₄):
 - 8 sectors: sector_ids = "0: Agriculture; 1: Energy; 2: Industrial; 3: Transportation; 4: Residential, Commercial, Other; 5: Solvents production and application; 6: Waste; 7: International Shipping"
 - Filename: [em_species]-em-anthro_input4MIPs_emissions_CMIP_CEDS-2017-05-18_gn_YYYY01-ZZZZ12.nc (where YYYY is the starting year contained in this file, and ZZZZ is the ending year)
- Aircraft emissions (BC, OC, SO₂, NO_x, NH₃, CO, NMVOC, CO₂, CH₄):
 - 25 vertical layers
 - Filename: [em_species]-em-AIR-anthro_input4MIPs_emissions_CMIP_CEDS-2017-05-18_gn_YYYY01-ZZZZ12.nc
- Reference: Hoesly, R. M., Smith, S. J., Feng, L., Klimont, Z., Janssens-Maenhout, G., Pitkanen, T., Seibert, J. J., Vu, L., Andres, R. J., Bolt, R. M., Bond, T. C., Dawidowski, L., Kholod, N., Kurokawa, J.-I., Li, M., Liu, L., Lu, Z., Moura, M. C. P., O'Rourke, P. R., and Zhang, Q.: Historical (1750–2014) anthropogenic emissions of reactive gases and aerosols from the Community Emissions Data System (CEDS), *Geosci. Model Dev.*, 11, 369-408, <https://doi.org/10.5194/gmd-11-369-2018>, 2018.

2. Biomass burning emissions

- Source: BB for CMIP6. Available at: <https://esgf-node.llnl.gov/search/input4mips/>
- Spatial domain: Global
- Spatial resolution: 0.25° x 0.25°
- Temporal domain: 1850 – 2015
- Temporal resolution: Monthly
- Emitted species: aerosol (BC, OC) and aerosol precursor and reactive compounds (SO₂, N₂O, NO_x, NH₃, CH₄, CO, NMVOC, H₂)
- NMVOC consists of the sum of: C₂H₆, CH₃OH, C₂H₅OH, C₃H₈, C₂H₂, C₂H₄, C₃H₆, C₅H₈, C₁₀H₁₆, C₇H₈, C₆H₆, C₈H₁₀, Toluene_lump, Higher_Alkenes, Higher_Alkanes, CH₂O, C₂H₄O, C₃H₆O, C₂H₆S, HCN, HCOOH, CH₃COOH, MEK, CH₃COCHO, HOCH₂CHO. These NMVOCs are also provided separately
- Data format: netcdf, 185001-201512 in a data file
- Filename: [em_species]-em-biomassburning_input4MIPs_emissions_CMIP_V-2017-05-18_gn_YYYY01-ZZZZ12.nc (where YYYY is the starting year contained in this file, and ZZZZ is the ending year)

- Reference: van Marle, M. J. E., Kloster, S., Magi, B. I., Marlon, J. R., Daniau, A.-L., Field, R. D., Arneth, A., Forrest, M., Hantson, S., Kehrwald, N. M., Knorr, W., Lasslop, G., Li, F., Mangeon, S., Yue, C., Kaiser, J. W., and van der Werf, G. R.: Historic global biomass burning emissions for CMIP6 (BB4CMIP) based on merging satellite observations with proxies and fire models (1750–2015), *Geosci. Model Dev.*, 10, 3329–3357, <https://doi.org/10.5194/gmd-10-3329-2017>, 2017.