

Global Carbon Monoxide (CO) Flux Estimates for 2001-2015

This data set contains Global carbon monoxide (CO) flux estimates for 2001-2015 partitioned into biomass burning (BB), fossil fuel (FF) and biogenic (BG) sources. The estimates were created at JPL/CalTech by Anthony Bloom using a Metropolis-Hastings Markov Chain Monte Carlo (MCMC) algorithm (Bloom et al., 2015) applied to top-down CO fluxes obtained from inverse modeling using the GEOS-Chem (with adjoint) model and data from the Terra/MOPITT satellite (Jiang et al., 2017). The spatial resolution is 4.0 x 5.0 degrees lat/lon.

Examples of the use of this data are described in Worden, J., et al., 2017 and Worden, H. et al., 2019.

References:

Bloom, A. A., J. Worden, Z. Jiang, H. Worden, T. Kurosu, C. Frankenberg, D. Schimel, (2015), Remote sensing constraints on South America fire traits by Bayesian fusion of atmospheric and surface data, *Geophysical Research Letters*, doi:10.1002/2014GL062584

Jiang, Z., J. R. Worden, H. Worden, M. Deeter, D. B. A. Jones, A. F. Arellano, and D. K. Henze (2017), A 15-year record of CO emissions constrained by MOPITT CO observations, *Atmos. Chem. Phys.*, 17(7), 4565–4583, doi:10.5194/acp-17-4565-2017.

Worden, J. R., A.A. Bloom, S. Pandey, Z. Jiang, H.M. Worden, T.W. Walker, S. Houweling, T. Röckmann, (2017), Reduced biomass burning emissions reconcile conflicting estimates of the post-2006 atmospheric methane budget, *Nature Communications*, 8:2227, doi:10.1038/s41467-017-02246-0.

Worden, H. M., Bloom, A. A., Worden, J. R., Jiang, Z., Marais, E., Stavrou, T., Gaubert, B., and Lacey, F.: New Constraints on Biogenic Emissions using Satellite-Based Estimates of Carbon Monoxide Fluxes, *Atmos. Chem. Phys. Discuss.*, doi:10.5194/acp-2019-377, in review, 2019.

Description: CO fluxes; Bayesian inference of CO fluxes, derived from joint probability of total fluxes; uncertainties represent 1 standard deviation

Dimensions:

lon = 72; degrees east

lat = 46; degrees north

time = 180; months since and including Jan 2001

Name: BiogenicEmissions

Units: g CO/m2/month

Description: primary estimate

Name: BiogenicEmissions_prior

Units: g CO/m2/month

Description: primary estimate prior and initial guess

Name: BiogenicEmissionsUNC

Units: g CO/m2/month

Description: primary estimate uncertainty

Name: BiogenicEmissionsUNC_prior

Units: g CO/m2/month

Description: primary estimate uncertainty prior

Name: BiomassBurning

Units: g CO/m2/month

Description: primary estimate

Name: BiomassBurning_prior

Units: g CO/m2/month

Description: primary estimate prior and initial guess

Name: BiomassBurningUNC

Units: g CO/m2/month

Description: primary estimate uncertainty

Name: BiomassBurningUNC_prior

Units: g CO/m2/month

Description: primary estimate prior and initial guess

Name: FossilFuels

Units: g CO/m2/month

Description: primary estimate

Name: FossilFuels_prior

Units: g CO/m2/month

Description: primary estimate prior and initial guess

Name: FossilFuelsUNC
Units: g CO/m2/month
Description: primary estimate uncertainty

Name: FossilFuelsUNC_prior
Units: g CO/m2/month
Description: primary estimate uncertainty prior
