

README

Fire INventory from NCAR (FINN) version 1.5

11 August 2014

Emissions files produced in June-July 2014 by Christine Wiedinmyer. Please send any feedback, comments, or questions to Christine Wiedinmyer (christin@ucar.edu).

The version of these files should be called FINN version 1.5

Updates from files in May 2011 (FINNv1.5 updates):

- Updated emission factors
- Inclusion of specific generic vegetation code for temperate evergreen forest
- Fixed bug with cropland fires. Fuel loadings for crops set to 1200 g/m² (Akagi et al. 2011)
- When LCT is bare/snow- used GLC class if possible

The files available for download are gzipped, comma-delimited ASCII files.

The emissions of non-methane organic compounds (NMOC) have been speciated either to the MOZART-4 chemical mechanism (Emmons et al., 2010) and the SAPRC99 chemical mechanism (Carter et al., 2000), and the GEOS_chem mechanism as described by Wiedinmyer et al., 2011, GMD.

All files contain daily fire emission estimates for the globe for the year specified at a resolution of ~1km².

The reference for these emission estimates is:

Wiedinmyer, C., S.K. Akagi, R.J. Yokelson, L.K. Emmons, J.A. Al-Saadi, J.J. Orlando, and A.J. Soja, 2011: The Fire INventory from NCAR (FINN): a high resolution global model to estimate the emissions from open burning. *Geoscientific Model Development*, **4**, 625-641.

There are two types of files to be downloaded: files with MOZART4 (MOZ4) speciation and files with SAPRC99 speciation.

The MOZART-4 files contain the following fields:

DAY	Julian Day (day of year)
TIME	Time of satellite overpass/observation (UTC)
GENVEG	Generic Vegetation type where fire occurred
LATI	Latitude (decimal degrees)
LONGI	Longitude (decimal degrees)
AREA	Area burned (m ²) – for use with WRF-chem processor ONLY
CO2	CO2 emissions (mole CO2/day)
CO	CO emissions (mole CO/day)
H2	H2 emissions (mole H2/day)

NO	NO emissions (mole NO/day)
NO2	NO2 emissions (mole NO2/day)
SO2	SO2 emissions (mole SO2/day)
NH3	NH3 emissions (mole NH3/day)
CH4	CH4 emissions (mole CH4/day)
NMOC	Non-methane Organic Compound emissions (kg NMOC/day)
BIGALD	BIGALD emissions (mole BIGALD/day)
BIGALK	BIGALK emissions (mole BIGALK/day)
BIGENE	BIGENE emissions (mole BIGENE/day)
C10H16	C10H16 emissions (mole C10H16/day)
C2H4	C2H4 emissions (mole C2H4/day)
C2H5OH	C2H5OH emissions (mole C2H5OH/day)
C2H6	C2H6 emissions (mole C2H6/day)
C3H6	C3H6 emissions (mole C3H6/day)
C3H8	C3H8 emissions (mole C3H8/day)
CH2O	CH2O emissions (mole CH2O/day)
CH3CHO	CH3CHO emissions (mole CH3CHO/day)
CH3COCH3	CH3COCH3 emissions (mole CH3COCH3/day)
CH3COCHO	CH3COCHO emissions (mole CH3COCHO/day)
CH3COOH	CH3COOH emissions (mole CH3COOH/day)
CH3OH	CH3OH emissions (mole CH3OH/day)
CRESOL	CRESOL emissions (mole CRESOL/day)
GLYALD	GLYALD emissions (mole GLYALD/day)
HYAC	HYAC emissions (mole HYAC/day)
ISOP	ISOP emissions (mole ISOP/day)
MACR	MACR emissions (mole MACR/day)
MEK	MEK emissions (mole MEK/day)
MVK	MVK emissions (mole MVK/day)
HCN	HCN emissions (mole HCN/day)
CH3CN	CH3CN emissions (mole CH3CN/day)
TOLUENE	TOLUENE emissions (mole TOLUENE/day)
PM25	PM2.5 emissions (kg PM2.5/day)
OC	Particulate Organic Carbon emissions (kg OC/day)
BC	Particulate Black Carbon emissions (kg BC/day)
PM10	PM10 emissions (kg PM10/day)
HCOOH	HCOOH emissions (mole HCOOH/day)
C2H2	C2H2 emissions (mole C2H2/day)

The files speciated to the SAPRC-99 chemical mechanism have the following fields:

DAY Julian Day (day of year)

TIME	Time of satellite overpass/observation (UTC)
GENVEG	Generic Vegetation type where fire occurred
LATI	Latitude (decimal degrees)
LONGI	Longitude (decimal degrees)
AREA	Area burned (m ²) – for use with WRF-chem processor Only
CO ₂	CO ₂ emissions (mole CO ₂ /day)
CO	CO emissions (mole CO/day)
NO	NO emissions (mole NO/day)
NO ₂	NO ₂ emissions (mole NO ₂ /day)
SO ₂	SO ₂ emissions (mole SO ₂ /day)
NH ₃	NH ₃ emissions (mole NH ₃ /day)
CH ₄	CH ₄ emissions (mole CH ₄ /day)
NMOC	Non-methane Organic Compound emissions (kg NMOC/day)
ACET	ACET emissions (mole ACET/day)
ALK1	ALK1 emissions (mole ALK1/day)
ALK2	ALK2 emissions (mole ALK2/day)
ALK3	ALK3 emissions (mole ALK3/day)
ALK4	ALK4 emissions (mole ALK4/day)
ALK5	ALK5 emissions (mole ALK5/day)
ARO1	ARO1 emissions (mole ARO1/day)
ARO2	ARO2 emissions (mole ARO2/day)
BALD	BALD emissions (mole BALD/day)
CCHO	CCHO emissions (mole CCHO/day)
CCO_OH	CCO_OH emissions (mole CCO_OH/day)
ETHENE	ETHENE emissions (mole ETHENE/day)
HCHO	HCHO emissions (mole HCHO/day)
HCN	HCN emissions (mole HCN/day)
HCOOH	HCOOH emissions (mole HCOOH/day)
HONO	HONO emissions (mole HONO/day)
ISOPRENE	ISOPRENE emissions (mole ISOPRENE/day)
MEK	MEK emissions (mole MEK/day)
MEOH	MEOH emissions (mole MEOH/day)
METHACRO	METHACRO emissions (mole METHACRO/day)
MGLY	MGLY emissions (mole MGLY/day)
MVK	MVK emissions (mole MVK/day)
OLE1	OLE1 emissions (mole OLE1/day)
OLE2	OLE2 emissions (mole OLE2/day)
PHEN	PHEN emissions (mole PHEN/day)
PROD2	PROD2 emissions (mole PROD2/day)
RCHO	RCHO emissions (mole RCHO/day)
RNO ₃	RNO ₃ emission (mole RNO ₃ /day)
TRP1	TRP1 emissions (mole TRP1/day)

OC	Particulate OC emissions (kg OC/day)
BC	Particulate BC emissions (kg BC/day)
PM25	PM2.5 emissions (kg PM2.5/day)
PM10	PM10 emissions (kg PM10/day)

References:

Carter, W. P. L. Implementation of the SAPRC-99 chemical mechanism into the Models-3 framework; U.S. EPA: 2000.

Emmons, L. K., Walters, S., Hess, P. G., Lamarque, J.-F., Pfister, G. G., Fillmore, D., Granier, C., Guenther, A., Kinnison, D., Laepple, T., Orlando, J., Tie, X., Tyndall, G., Wiedinmyer, C., Baughcum, S. L., and Kloster, S.: Description and evaluation of the Model for Ozone and Related chemical Tracers, version 4 (MOZART-4), *Geosci. Model Dev.*, 3, 43-67, doi:10.5194/gmd-3-43-2010, 2010.