Conclusions

- CAMS-GFAS monitors global daily fire emissions
- Largest fire emissions in Indonesia since 1997
- Peat fire contribution particularly high

!!! All preliminary !!!
Fire emission estimation with the Global Fire Assimilation System (GFAS)

MODIS FRP-based
- FRP = Fire Radiative Power
- quality controlled

FRP corrections
- partial cloud cover
- observations gaps
- use FRP=0 observations

spurious signal mask
- volcanoes
- gas flares / industry

FRP-to-combustion rate
- land cover-dependent
  - peat most uncertain, conv. fact. 5x higher than tropical forest
- regression against GFED3

GFASv1.2:
- 1 day resolution
- 0.1° (~10 km) resolution
- 2003—present (2000-3 in GFASv1.0)
- 40 species
- daily operational production before 7UTC
  - part of Copernicus Atmosphere Monitoring Service

CO emis. fact. 2x higher for peat

MACC Daily Fire Products Saturday 1 November 2014
Average of Observed Fire Radiative Power Areal Density [mW/m2]
max value = 1.94 W/m2

GFASv1.2 FRP for Nov2014-Oct2015

[Kaiser et al. BG 2012]

http://atmosphere.copernicus.eu/fire
Our man on the ground:
Martin Wooster in Kalimantan, 13 October 2015
MODIS fire observations & GFAS

GFAS-FRP: Aug-Oct 2015

Daytime observations

Night-time observations

MODIS daytime FRP in Jul-Oct 2015 [W/m²]

MODIS night-time FRP in Jul-Oct 2015 [W/m²]

GFASv1.2 for all fires in Sumatra

Sumatra

Borneo

FRP for all fires in Borneo
GFASv1.2 comparison to CAMS analysis, which is constrained by satellite observations

- confirmation of exceptionally high fire activity in 2015
- potential emission overestimation by 20-25%.

[Inness et al. ACP 2013, Benedetti et al. JGR 2009]
potential overestimation by ~25%

after correction:

- 250 Tg(C) consumed in peatlands + 50 Tg(C) in other areas
- twice as much as in 2006 and 2014
Qualitative consistency with GFED

GFAS  http://atmosphere.copernicus.eu/fire

GFED  http://www.globalfiredata.org/updates.html

!!! All preliminary !!!
Event predictability – Fire Weather Index

August
Global ECMWF Fire Forecast System (GEFFs)

Nominal date: 201508 ERA Interim

- Fine Fuel Moisture Content
- Drought Code
- Fire Weather Index

September
Global ECMWF Fire Forecast System (GEFFs)

Nominal date: 201509 ERA Interim

October
Global ECMWF Fire Forecast System (GEFFs)

Nominal date: 201510 ERA Interim

GEFFs description:
Di Giuseppe et al (2015): The potential predictability of fire danger provided by numerical weather prediction, JAMC-submitted-