

Environmental KING'S Monitoring & Modelling LONDON Research Group University of London

# Latest Updates and Research on Fire Radiative Energy Products

Presented by Martin Wooster (Kings College London, UK) Wilfrid Schroeder (Univ. of Maryland, USA)

Slide contributions from many others...

Dept. of Geography, King's College London, UK.



## FRP Products [NRT Operational]

## **Operational SEVIRI FRP\_Pixel Product**



University of London



Available via FTP/EUMETCast from the EUMETSAT Land Surface Analysis Satellite Application Facility (LSA SAF)

#### http://landsaf.meteo.pt/ - for data, ATBD, Product User Manual & Validation Report

- FRP Pixel Product (native spatial/temporal resolution) available within 30 mins
- FRP Gridded product inc. adjustments for "small fires" and "clouds" also available.

#### Two HDF files for each slot

• "List Product"- Fire Data only

• Matching "Quality Product" reports the processing status of each pixel – Fire Detected & FRP measured, cloud-covered, etc.

VALUE	MEANING
0	NOT POT FIRE
1	FRP OK
2	FRP SAT
3	CLOUDY
4	SUN GLINT
5	SUN GLINT RATIO
6	NO BCK
7	BAD BCK
8	CLOUD EDGE
254	NOT PROCESSED







# **GOES FRP Product (America's)**



University of London



- Available on request in NRT from KCL now (users ECMWF and Met Office Currently)
- End of next year should be available from LSA SAF

### **Expected Global Geostationary System**



University of London



Non-Optimum 3.9 µm channel data quality



Maybe future operational currently prototyped @ KCL

Non-Optimum 3.9 µm channel dynamic range

GOES-W: Future operational currently generated @ KCL but available to users

- + Meteosat Third Generation (2017+) will have:
- improved temporal resolution
- 2 km spatial resolution (SSP)
- $\bullet$  wide range 3.9  $\mu m$  band.



# Global Fire Assimilation System (GFAS)

## Global FRP and Atmospheric Emissions Dataset

[NRT Operational and Reanalysis]



### **FRP to Fire Emissions**



University of London



Monday 07 September 2009 00UTC ECMWF/GEMS Forecast t+006 VT: Monday 07 September 2009 06UTC 700 hPa NRT Biomass-Burning Carbon Monoxide Tracer



Operational deployment of FRP product via EUMETSAT LSA SAF: <u>http://landsaf.meteo.pt/</u>

Combined with MODIS FRP - then used to model fire chemical emissions in prototype GMES Atmospheric Core Service @ ECMWF http://www.gmes-atmosphere.eu/

#### **Observed Global FRP Areal Density**



# Global Fire Assimilation System (GFAS v1)



University of London

#### NUMBER OF MODIS OSBERVATIONS



Part of the EU FP7 Monitoring Atmospheric Chemistry and Climate (MACC) Project: Products @ www.gmes-atmosphere.eu Kaiser et al. (2011) www.biogeosciences-discuss.net/8/7339/2011/bgd-8-7339-2011.html

#### Mean Annual Fuel Consumption 2003-2009 [Spatial Patterns and Ratio]



🖉 Global Mean Ratio: 0.81

0.19 0.28 0.47 0.56

CF GFED3.1/GFAS1.0 [g kJ<sup>-1</sup>]

CF<sub>w</sub>: 0.368 g kJ<sup>-1</sup>

0.05

0.02

0.09

 $\rightarrow$  GFAS1.0 higher in NH temperate regions

272

1359

679

2038

 $\rightarrow$  GFAS1.0 greater spatial extent of areas affected by fire

## Effective fuel-type dependent CF scaled to GFED3.1

University of London



### **GFED3.1 Non-Detection Areas 2003-2009** Areas where GFAS1.0 shows Burning but GFED3.1 not



www.biogeosciences-discuss.net/8/7339/2011/bgd-8-7339-2011.html

### Next Step: SEVIRI to MODIS Merging



University of London

