Overview of the Global Wildfire Information System

EFFIS

Jesús San-Miguel-Ayanz
& the EFFIS Team

Joint Research Centre
Outline:

1. The Global Wildfire Information System under GEO
2. The EU Copernicus program: EFFIS ➔ GWIS
3. Developments in GWIS so far
4. The Global Wildfire Information System program under GEO
5. Main potential services in GWIS
6. Next steps
7. Further discussion during the meeting
The Global Wildfire Information System under GEO – 1

- Background - 2009-2011 GEO WP Wildland Fire Warning System at Global Level (dropped)
- October 2011, GOFC Fire IT Stresa (IT) JRC proposal to develop a global wildfire information system under GOFC – wide acceptance of the group
- April 2013, GOFC Fire IT Wageningen (NL) development of beta system under EFFIS
- October 2013, Earsel (GOFC Fire IT meeting) Coventry (UK) discussion on the implementation of the GWIS by including task under GEO WP – no funding, but potential gain in support/visibility for the initiative
The Global Wildfire Information System under GEO - 2

- November 2013, proposal of a Global Wildfire Information System under GEO and GOFC Fire IT, within the GEO WP 2012-2015 (Short proposal prepared by C. Justice, J. San Miguel and F. Gaetani and info sent by email to GOFC Fire IT network for consultation)
- March 2014, adoption of the GEO WP 2015-2016, including GWIS as GI-09
- August 2016 – GWIS adopted for inclusion in the GEO WP 2017-2019
The EU Copernicus Program:

It is the European Program for the establishment of a European capacity for Earth Observation, following GMES (Global Monitoring for Environment and Security) and EU RTD program 2006-2012.

Consists of a complex set of systems which collect data from multiple sources and process them to provide users with reliable and up to date information.

Services address areas such as land, marine, atmosphere, climate change, emergency management and security.

Operation of the services is mandated and structured in the so-called Copernicus European Union Regulation (2014), covering the period up to 2020.

Several services contribute to the monitoring of wildfires...
Copernicus SErvices: Land Monitoring

In Focus

Final Report from the expert group
October 2015
Burnt Area

The Burnt Area product maps the burnt scars and gives temporal information on the fire season. The maps of Burnt Area are recognized as an Essential Climate Variable (ECV) by the Global Climate Observing System (GCOS).

BA Alerts
- Burnt Area PROBA-V reprocessed to V1.5
- Burnt Area version 1 products available

BA characteristics

<table>
<thead>
<tr>
<th>Product version</th>
<th>Access</th>
<th>Status</th>
<th>Sensor</th>
<th>Temporal coverage</th>
<th>Spatial information</th>
<th>Timeliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product Portal</td>
<td>Pre-operational</td>
<td>PROBA-V</td>
<td>Apr 2014 - present</td>
<td>Global, 10°x10° tiles, continental tiles, 1km</td>
<td>Within 3 days after end of synthesis period</td>
</tr>
<tr>
<td>1</td>
<td>Product Portal</td>
<td>Pre-operational</td>
<td>SPOT-VGT</td>
<td>Apr 1999 - March 2014</td>
<td>Global, 10°x10° tiles, continental tiles, 1km</td>
<td>Archive only</td>
</tr>
</tbody>
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For access via GEOMETCast satellite broadcast, please register for Global Land products on EUMETSAT’s EO Portal.
If you’re looking for information on older product versions, please contact us.
Copernicus Services: Atmospheric Monitoring

In Focus

Update of the Sentinel High Level Operations Plan now available

Final Report from the expert group
October 2015

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Copernicus services – Atmospheric Monitoring

Provides continuous data and information on atmospheric composition. Compiles emission inventories which serve as input to the atmospheric chemistry-transport models and estimates net fluxes of e.g. CO2 at the Earth's surface.

- Provides global fire radiative power datasets
- Provides global biomass burning dataset based on Fire Radiative Power
Copernicus services: Atmospheric Monitoring
Copernicus Services: Emergency management

In Focus

Final Report from the expert group
October 2015

CO₂
Copernicus Emergency Management Services

Support the management of natural disasters, man-made emergency situations, and humanitarian crises

Provides timely and accurate geo-spatial information derived from satellite remote sensing and available in situ or open data sources.

Made up of 3 different components:

- **Mapping services** – emergency (rapid mapping), risk and recovery (on demand) – since 2012
- **European Flood Alert System (EFAS)** – since 2012
- **European Forest Fire Information System (EFFIS)** – since 2015
Copernicus Emergency Management Services

Copernicus Emergency Management Service (Copernicus EMS) provides information for emergency response in relation to different types of disasters, including meteorological hazards, geophysical hazards, deliberate and accidental man-made disasters and other humanitarian disasters as well as prevention, preparedness, response and recovery activities. Three modules constitute the Copernicus EMS:

**Copernicus EMS - Mapping**

The Copernicus EMS - Mapping addresses, with worldwide coverage, a wide range of emergency situations resulting from natural or man-made disasters. Satellite imagery is used as the main datasource. The service covers in particular:

- **Floods**
- **Tsunamis**
- **Earthquakes**
- **Landslides**
- **Fires**
- **Severe Storms**
- **Volcanic eruptions**
- **Technological disasters**
- **Humanitarian crises**

**European Flood Awareness System**

The European Flood Awareness System (EFAS) is the first operational system that monitors and forecasts flood events across Europe. It provides its partners (national/regional authorities, as well as the European Commission’s Emergency Response Coordination Centre) with a wide range of complementary, added value flood early warning information including related risk assessments up to 10 days in advance.

**European Forest Fire Information System**

Specific applications are available in EFFIS:

- **Current Situation**
- **Latest data on the current fire season in Europe and in Mediterranean area. Today’s meteorological fire danger maps + forecast up to 6 days, daily maps of hot spots and perimeters.**

**Fire News**

News on wildland fires in Europe updated daily by the EFFIS team.
Copernicus Components: Emergency management services:
European Forest Fire Information System

<table>
<thead>
<tr>
<th>Fire Danger Forecast</th>
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<tr>
<td>Source: ECMWF (18 km resolution)</td>
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<td>Index: Fire Weather Index (FWI)</td>
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<table>
<thead>
<tr>
<th>Hot Spots</th>
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<tbody>
<tr>
<td>24 Hrs</td>
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<tr>
<td>90 Days</td>
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<table>
<thead>
<tr>
<th>Burnt Areas</th>
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<tbody>
<tr>
<td>24 Hrs</td>
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<table>
<thead>
<tr>
<th>Country Boundaries</th>
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<table>
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<tr>
<th>Burnt Area Locator</th>
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<table>
<thead>
<tr>
<th>Country</th>
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<tbody>
<tr>
<td>All</td>
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<table>
<thead>
<tr>
<th>Province</th>
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<td>All</td>
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Last update: 2015-10-13
Start Date: 2015-10-02
Area: 57 ha
Country: Spain
Province: Lleida

Last update: 2015-10-11
Start Date: 2015-10-05
Area: 116 ha
Country: Spain
Province: Lleida

Last update: 2015-10-11
Start Date: 2015-09-05
Area: 80 ha
Country: Spain
Province: Lleida

Last update: 2015-10-05
Start Date: 2015-10-05
Area: 78 ha

EFFIS Network of 40 Countries
Extension to MENA countries in collaboration with FAO
Developments of GWIS so far

Global Wildfire Information System (beta version)

EFFIS model – Extension to a Global Wildfire Information System
(beta system in partnership with the GOFC Fire IT, supported by GEO and Copernicus)
Global Wildfire Information System – Fire danger forecast
EFFIS model – Extension to a Global Wildfire Information System
(beta system in partnership with the GOFC Fire IT, supported by GEO and Copernicus)
Global Wildfire Information System – Active fires
EFFIS model – Extension to a Global Wildfire Information System
(beta system in partnership with the GOFC Fire IT, supported by GEO and Copernicus)
Global Wildfire Information System - Emissions
EFFIS model – Extension to a Global Wildfire Information System
(beta system in partnership with the GOFC Fire IT, supported by GEO and Copernicus)

CFS/USA/Australia
Fire danger forecasts
Univ. Alcala – Fueals
Fuel moisture content

JRC
Global Soil Erosion
Land degradation

Univ. Amsterdam - GFED
MACC community - GFAS

Forest events
Danger Forecast
Fire Detection

European Fire Database

Potential soil erosion estimates
Emission assessment
Land cover damage assessment

Burnt area maps

JRC/USA
Maryland
MODIS/VIIRS
/Sentinel3 fire perimeters

Space

Forestsat2016 - GWIS Meeting, 16 November 2016, Santiago de Chile

effis@jrc.ec.europa.eu
The Global Wildfire Information System program under GEO 2017-2019 (tasks-1):

1. Establish and further develop a prototype Global Wildfire Information System (GWIS) providing harmonized fire information (e.g. fire danger) – building on initial activities of the European Commission in the European Forest Fire Information System and the Global Observation of Forest Cover-Global Observation of Land Dynamics Fire Implementation Team (GOFC-GOLD Fire IT).

2. Promote the networking of major national and regional fire information providers by organizing an annual workshop convening key international organizations and initiatives (e.g. GOFC-GOLD Fire IT) and national and regional providers, e.g. Australia, Canada, China, Central and South America and South Africa.

3. Establish operational links and, if possible, arrangement with other wildfire communities dealing with wildfire aspects at global scale (e.g. burnt area assessment, emission estimation).

4. Further develop the GWIS by integrating and harmonizing as much as possible regional wildfire information data/sources.

5. Develop, implement and promote the establishment of mechanisms for interoperability and communication among national, regional and global wildfire information systems following OGC standards and guidelines, and the GEOSS Data Sharing Principles.

6. Coordinate and promote capacity building and training activities in close cooperation with the GOFC-GOLD Fire Implementation Team regional networks and the EFFIS network.
Main potential services in GWIS

• Harmonized up-to-date wildfire info at local/regional/global scale
• Country/region of interest wildfire regime profile
• Fire seasonality and impact, affected land cover
• Detailed information of single large wildfire events
• Links to regional wildfire information providers (AFIS, RedLaTIF, ...)
• Integration of existing regional/thematic fire information systems
Next steps

Foreseen steps since 2014 until now:

• Further development of GWIS as a partnership system (logos of contributing organizations) -
• Interaction with national/regional service providers for integration (as far as possible) of data and services.
• Workshop of GWIS partners – Nov. 2016

• October 2015 – Integration of EFFIS (and GWIS) under Copernicus up to 2020.
• Enhanced integration of Copernicus services with GWIS.
Further discussion during the meeting:

- Enhance cooperation to further develop GWIS
- GOFC Fire IT & GWIS liaison
- GWIS Partnership
- Cooperation with global/regional/national fire data service providers
- Cooperation with the GOFC Regional Networks – fire data users
- Next yearly meeting of GWIS partners (financed under EU Copernicus Program).
- Other areas of potential collaboration:
  - IT/data interoperability issues
  - Contribution to regional validation of products (outsourcing of some EFFIS services)

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