Copernicus contribution to
Natural Disasters and Emergency Response
COPERNICUS

...added-value products

Sentinels

Contributing missions

CLIMATE CHANGE

MARINE MONITORING.

ATMOSPHERE MONITORING

LAND MONITORING

SECURITY

EMERGENCY MANAGEMENT

FULL, FREE AND
OPEN DATA
Emergency Management

Likelihood of Drought Impact, 16 October 2015

European & Global Flood Awareness Systems (EFAS & GloFAS)

European Forest Fire Wildfire Information Systems (EFFIS)

European & Global Drought Observatory (EDO & GDO)

24/7 on-demand and fast provision of geospatial information

On-demand GI supporting prevention, preparedness, disaster risk reduction, reconstruction, recovery

On demand mapping

Rapid Mapping

Risk and Recovery Mapping

Early warning and monitoring

Floods

Fires

Droughts

Copernicus Emergency Management Service: Benefit areas and products examples
EMERGENCY MANAGEMENT

**EFAS = European Flood Awareness System**

**GloFAS = Global Flood Awareness System**

- **Increase preparedness** for riverine flood across Europe and support the decision making
- **At country level:** to provide complementary forecasts (e.g. up to 10 days, river basin wide, comparing to local forecasts, additional products)
- **At the EU level:** to provide a harmonized picture on a larger scale (Europe or global)

**Users:**
- ERCC, national/regional hydrological and civil protection services
- Development agencies, international aid organizations, private sector

**Main outputs**
- River-basin wide, probabilistic, 10 (EFAS)/30 (GloFAS) day flood forecasts
- Specific additional forecast products: flash floods, seasonal outlook, impact forecasts

[www.efas.eu](http://www.efas.eu)  [www.globalfloods.eu](http://www.globalfloods.eu)
Emergency Management

European Forest Fire Information System

Forest fire events

Danger Forecast

Vegetation Regeneration

EFFIS DB
fire monitoring cycle

Effis Network – 42 countries

Fire Detection

Burnt Area Maps

Landcover Damage Assessment

Emissions Assessment

Rapid mapping (example)

https://effis.jrc.ec.europa.eu/
Emergency Management

EDO = European Drought Observatory; GDO = Global Drought Observatory

- Monitoring (and forecasting) of drought & heat indicators (hazard, H), based on satellite, hydro-meteorological model & in-situ data
- Analysing exposure (E) and vulnerability (V) for different sectors
- Assessing the dynamic risk (R) for drought impacts in different sectors (R=H*E*V)
- Contributing to the development of a nested global drought information system (GEO) and the Integrated Drought Management Programme (WMO & GWP)

**Main outputs**

- **Drought monitoring and forecasting**
  - Continuous monitoring of drought hazard at different scales
  - Medium to seasonal forecasting (under development)
- **Analysing the risk of impacts (every 10 days)**
  - Analysing the number of people and area affected
  - Warning for likely impacts in different sectors


**Combined Drought Indicator**

Risk of Drought Impact
Climate Change Service: From Climate Data to Actionable Information

Climate data for sectoral policies and businesses:

Water management, Energy, Insurance, Tourism, Agriculture, Health, Coastal Areas, Biodiversity, etc.
Tourism Sector - Fire Weather Index Application

- Fire danger indicators based upon the Canadian Fire Weather Index System (FWI) and EFFIS classification
- To interactively explore the fire danger for historical simulations and future climate projections

Based on improved Toolbox:
- New library of Geoserver polygons
- Faster methods of applying shapes to data
- Larger cache public applications
Atmosphere Monitoring

C o p e r n i c u s  A t m o s p h e r e  M o n i t o r i n g  S e r v i c e

Solar radiation and UV index

Ozone layer

European Air Quality and products in support of policy users

Radiative forcings

Bottom-up emissions and surface fluxes of greenhouse gases

Global analyses, forecasts and reanalyses (2003-...)

Solar radiation and UV index

ECMWF
CAMS provides the means for people to check the air quality in their area:

- the charts available on the CAMS website can be used to track fires and related pollution.
- Fire activity and emissions are also included in various freely-available applications, including data visualisation app Windy.
- CAMS provides input for the active fires map, as well as four-day forecasts of surface fine particulate matter (PM2.5) and aerosol optical depth.

CAMS data on particulate matter released by the Australian wildfires, displayed on weather visualisation platform Windy on 7 January at 10:49 CET. Together, particulate matter and gas makes up wildfire smoke. (Credit: Copernicus Atmosphere Monitoring Service/ECMWF, Windy)

https://atmosphere.copernicus.eu/
Benefit areas and products examples

- Ecosystems
- Biodiversity
- Agriculture
- Forestry
- Energy
- Natural Resources
- Water
- Urban planning

**Global**

- Vegetation
- Energy
- Water

**Pan-European**

- EU Land Cover
- Specific land cover info
- Hydrographic and elevation reference maps
- % of built-up area

**Image Mosaics**
- CORINE Land Cover
- High Resolution Layers
- Reference Data
- Related Pan-European products

**Local**

- Urban Atlas
- Riparian Zones
- Natura 2000 (N2K)
European Ground Motion Service – Application areas

- Natural and man-induced geohazard risk assessment
- Geodesy
- Land management, urban and rural planning
- Climate services
- Infrastructure development and management
- Mining and other natural resources extraction

From Solari et al. “Satellite interferometric data for landslide intensity evaluation in mountainous regions”

- Dam and groundwater monitoring
- Insurance topics and litigations
- Structural and civil engineering
- Cultural heritage
- The property market
- Railway and road management

From Ciampalini et al. “Evaluation of subsidence induced by long-lasting buildings load using InSAR technique and geotechnical data: The case study of a Freight Terminal (Tuscany, Italy)”