



PROGRAMME OF THE  
EUROPEAN UNION

Copernicus  
Europe's eyes on Earth



European  
Commission



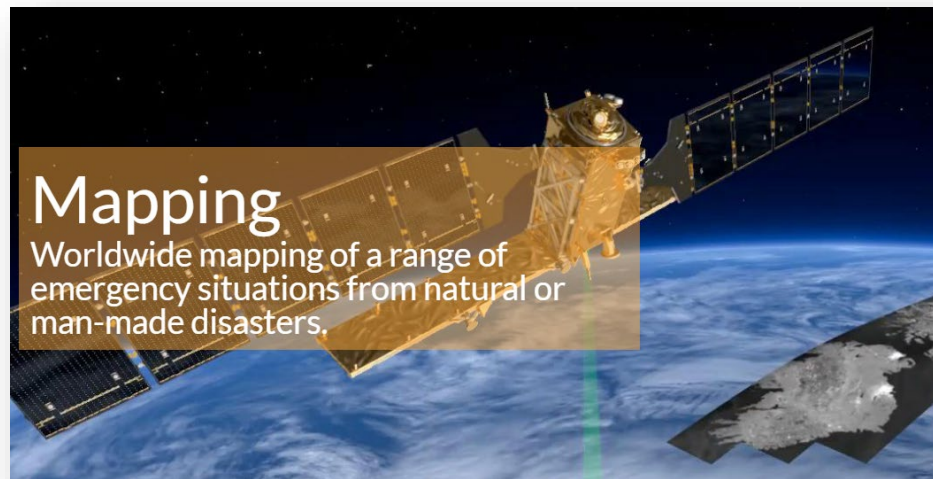
# COPERNICUS EMERGENCY MANAGEMENT SERVICE

*Andrea Toreti, European Commission, Joint  
Research Centre*



## Drought

The EMS Drought Observatory (DO) provides drought-relevant information and early-warnings.



## Mapping

Worldwide mapping of a range of emergency situations from natural or man-made disasters.



## Floods

The EMS flood component provides flood-relevant forecasting and monitoring information.



## Wildfire

The EMS fire component supports the services in charge of the protection of forests against fires.



Rapid Mapping



Risk & Recovery Mapping



Floods



Fires



Droughts



Population

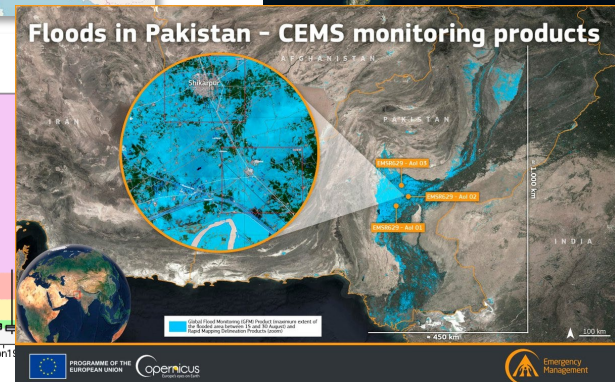
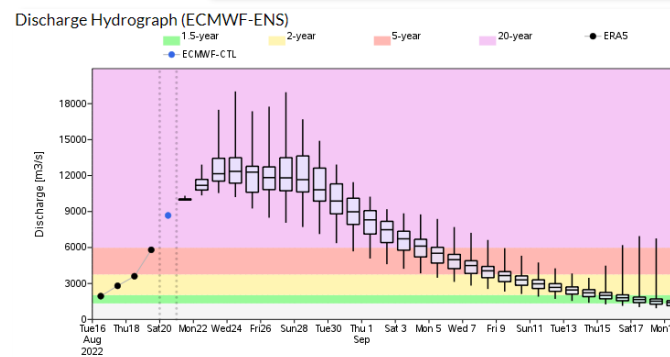
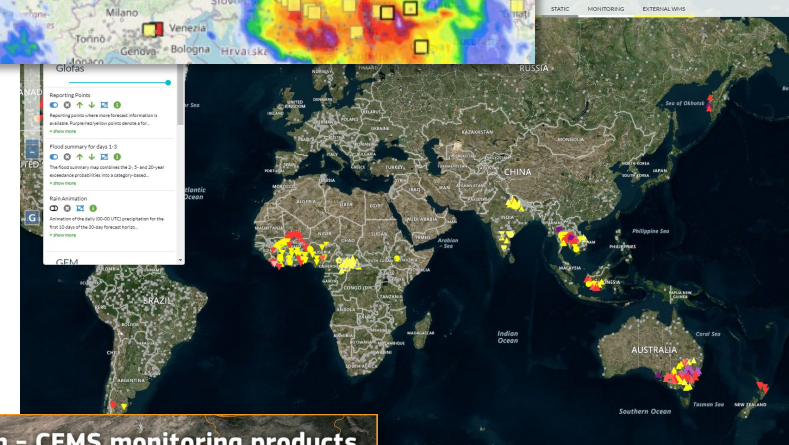
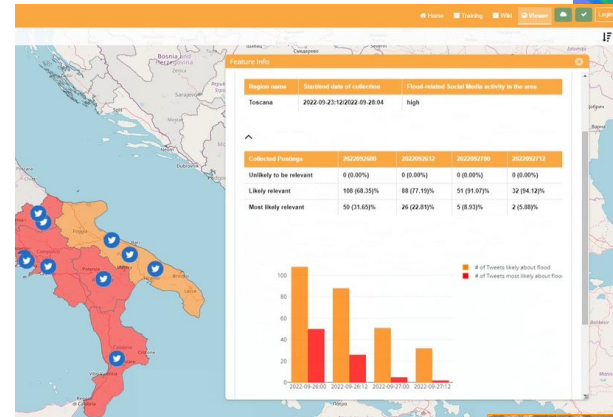
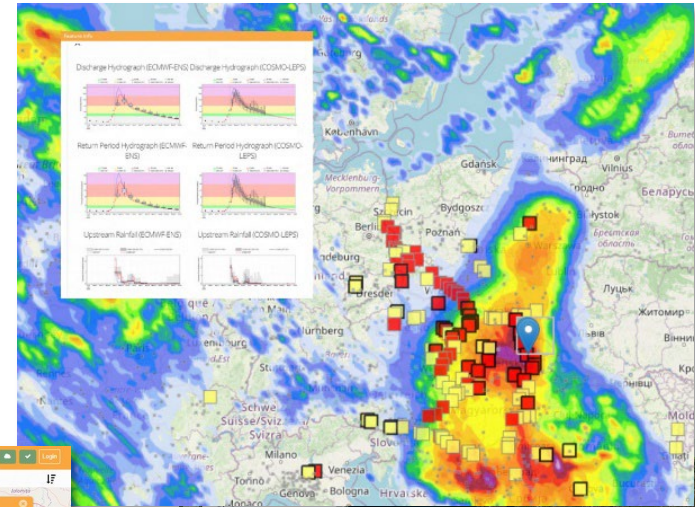


Built-up areas

# CEMS Early Warning & Monitoring – Floods

## European & Global Flood Awareness System (EFAS & GloFAS)

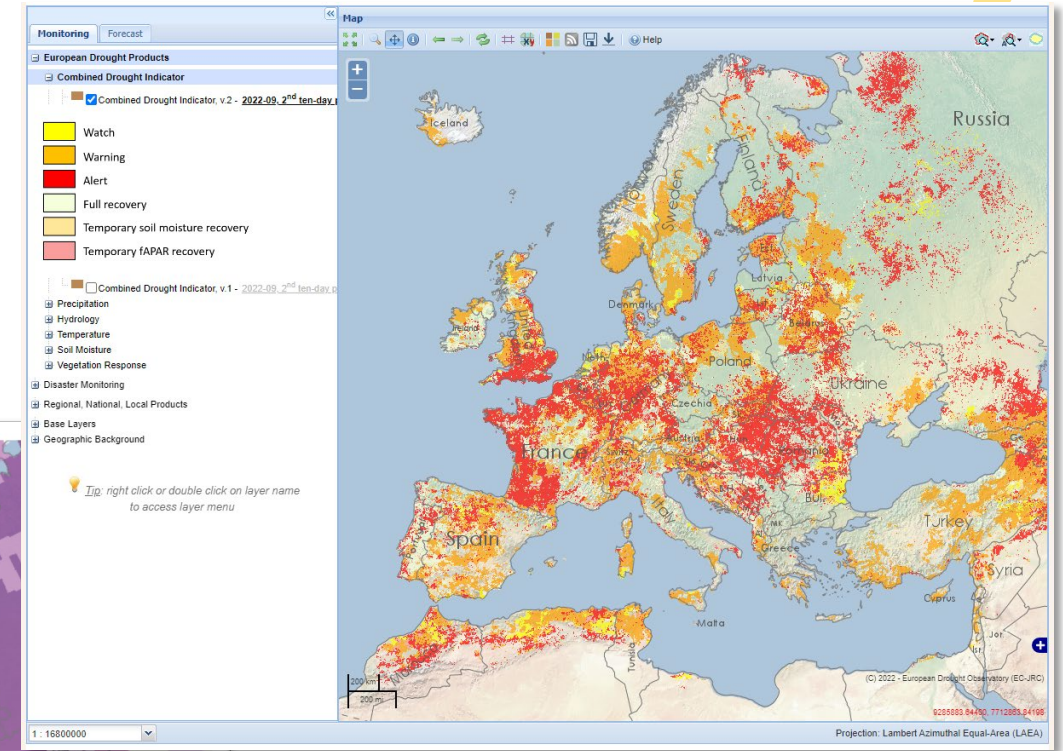
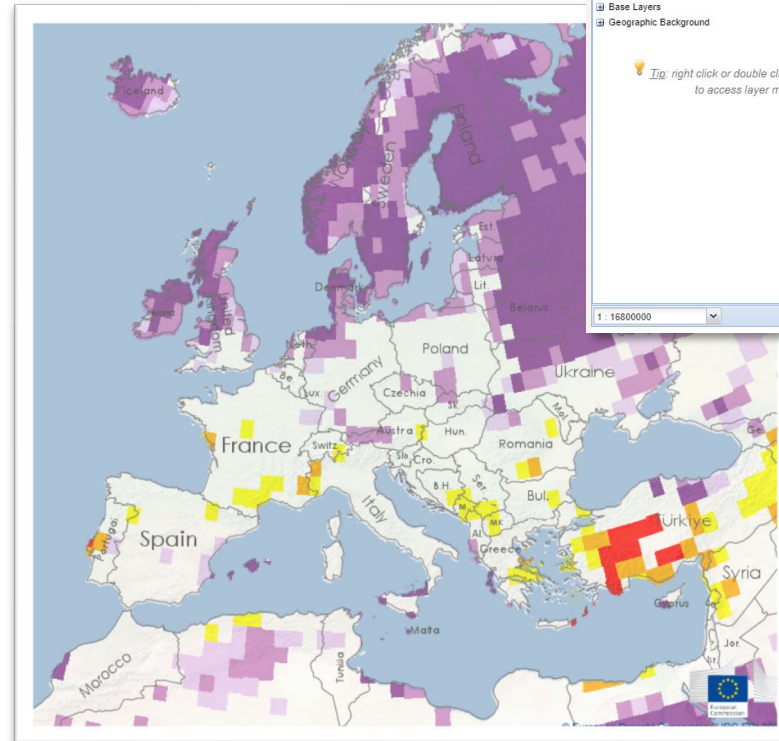
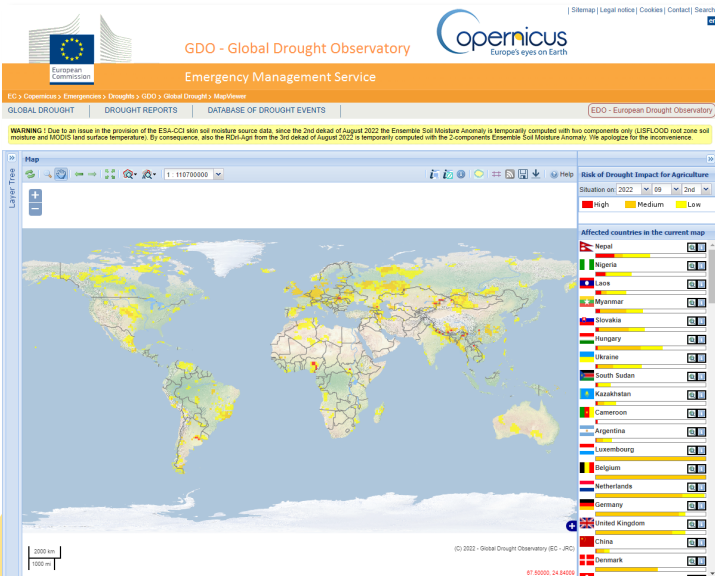
- EFAS: first operational pan-European forecasting and monitoring system. Reporting points and notifications system are only available to Partners.
- GloFAS is designed to support preparatory measures worldwide. Its reporting points are available to everyone.
- EFAS & GloFAS combine:
  - satellite information
  - hydrological modelling
  - meteorological predictions
  - in situ measurements



# CEMS Early Warning & Monitoring – Droughts

## European & Global Drought Observatories (EDO & GDO)

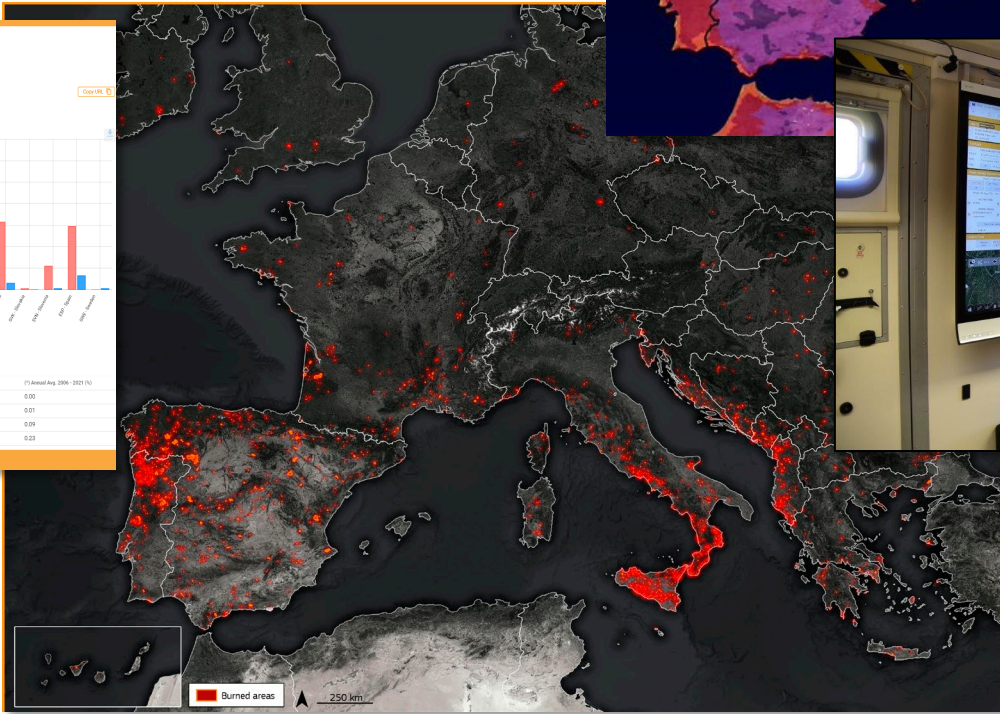
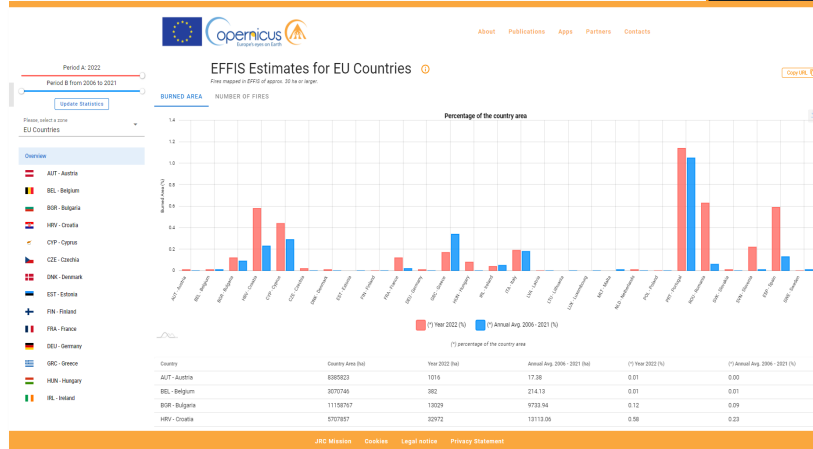
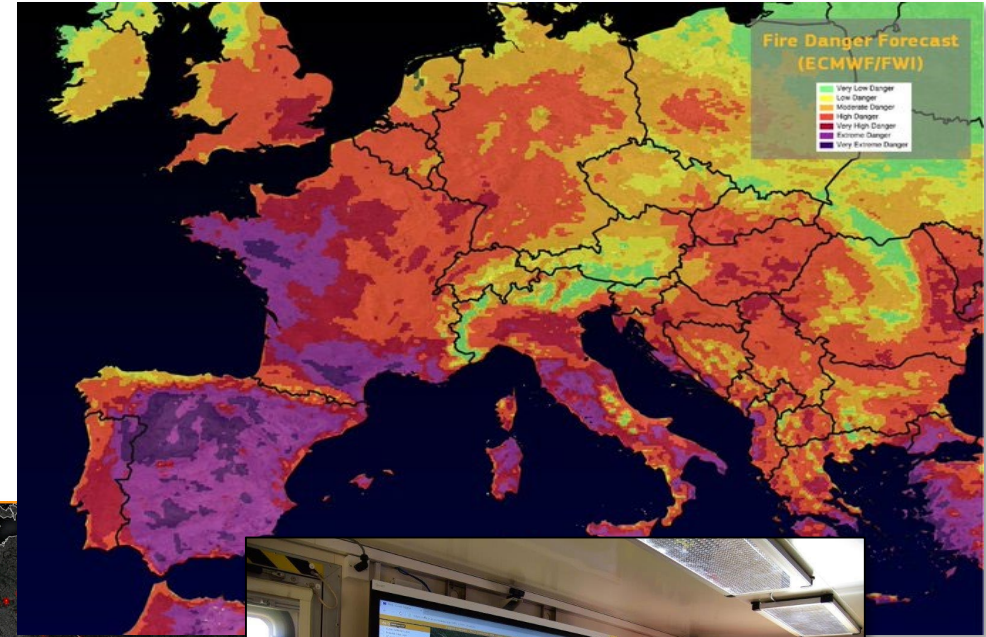
- Predicting, detecting, and monitoring drought events and heatwaves.
- Suite of indices and indicators
- Multiple sources of data: satellite, reanalysis, ground weather stations, hydrological modelling



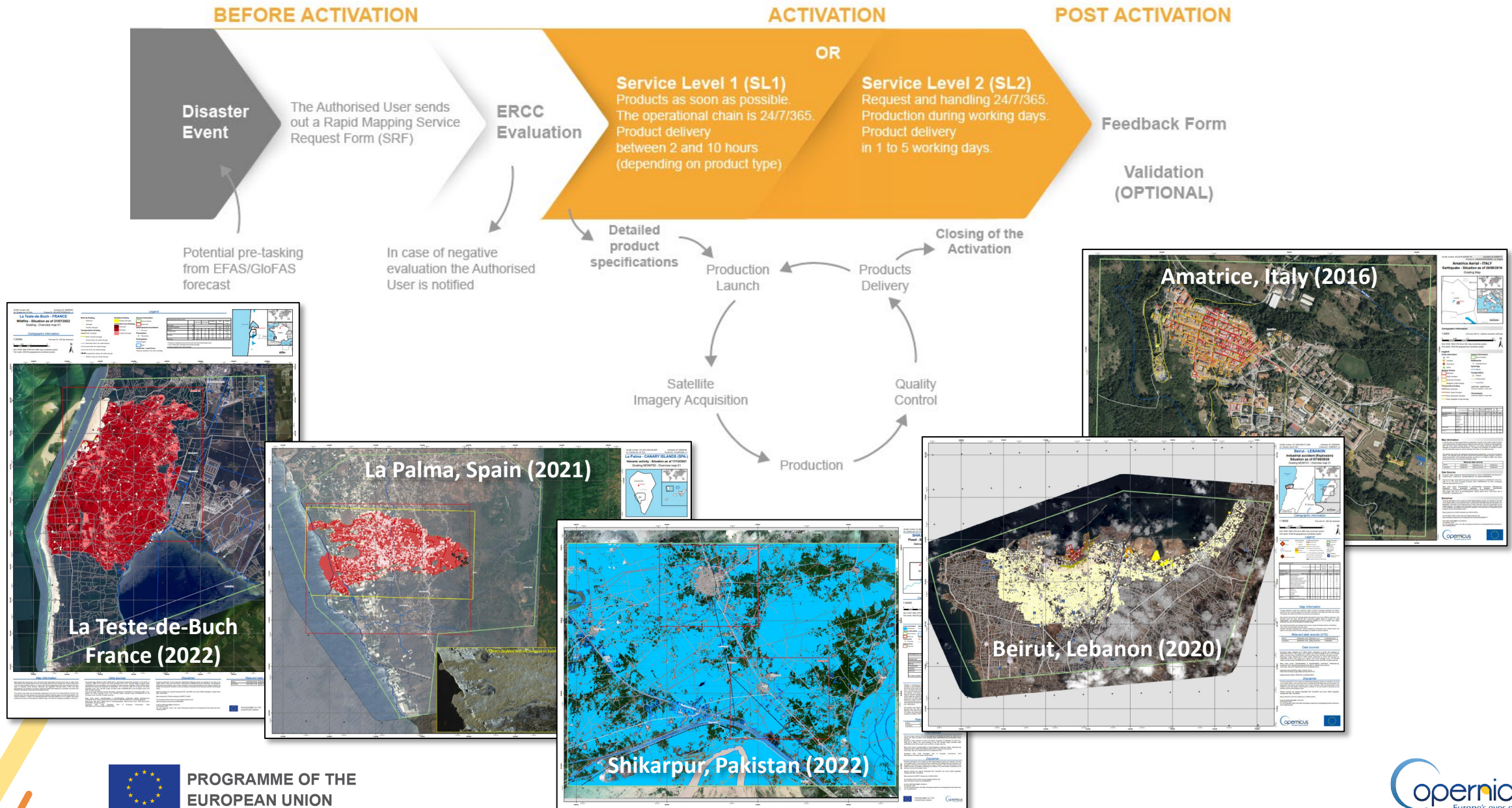
# CEMS Early Warning & Monitoring – Fires

## European Forest Fire Information System (EFFIS)

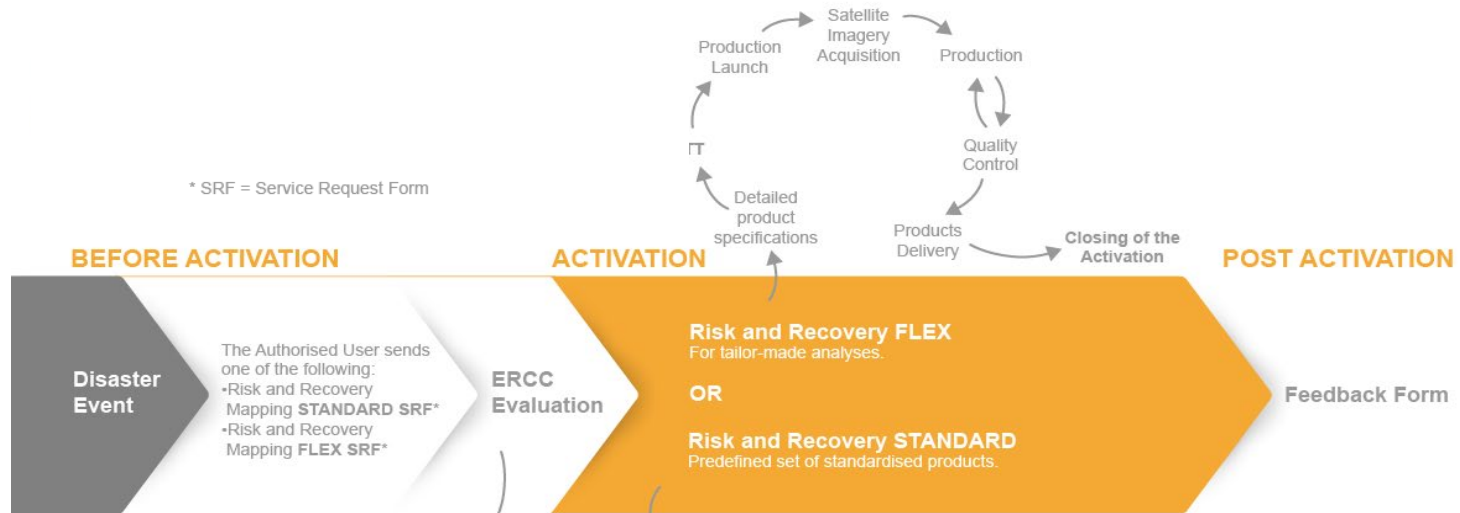
- integration and processing of **multiple data sources**
- real-time information on forest fire management, in complement to different national systems.
- **Compatibility with national systems**



# CEMS On-Demand Mapping – Rapid Mapping Workflow

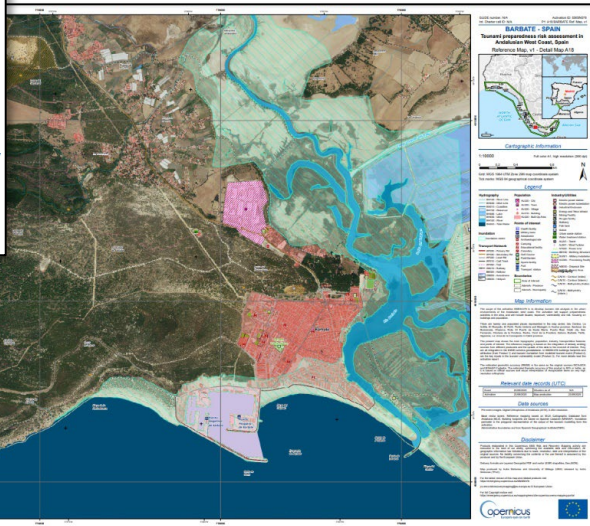


# CEMS On-Demand Mapping – Risk and Recovery Mapping

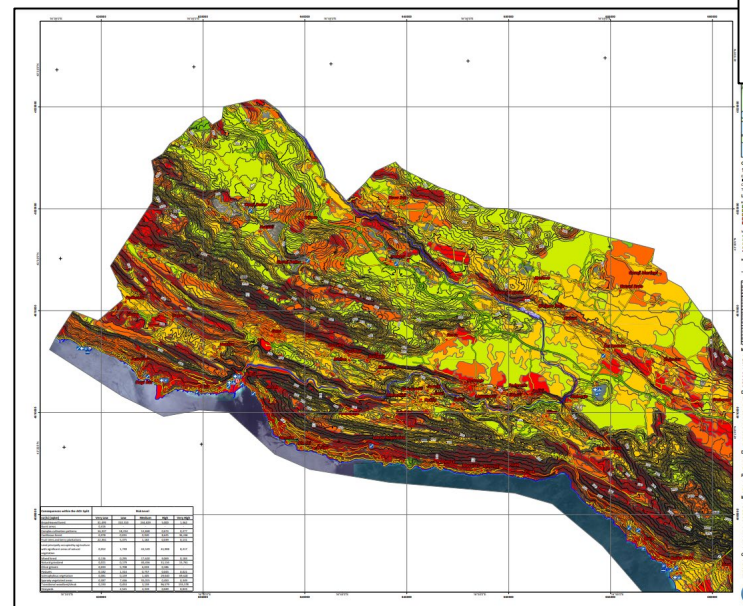


**Legend**

- Hydrography**
  - BH140 - River Line
  - BH300 - Ditch Line
  - BH410 - Coastline
  - BH330 - Reservoir
  - BH800 - Lake
  - BH200 - Canal
  - BH140 - River
  - BH400 - Total Water
- Inundation**
  - Inundation extent
- Transport Network**
  - AP030 - Primary Rd
  - AP030 - Secondary Rd
  - AP030 - Local Rd
  - AP010 - Cart Track
  - AP050 - Trail
  - AN010 - Railway
  - BB000 - Harbour
  - BB000 - Aerodrome
  - BB010 - Heliport
- Population**
  - AL020 - City
  - AL020 - Town
  - AL020 - Village
  - AL010 - Building
  - AL020 - Built-Up Area
- Points of Interest**
  - Health facility
  - Military base
  - Aerodrome
  - Archaeological site
  - Camping
  - Educational facility
  - Cemetery
  - Golf Course
  - Park/Garden
  - Sports facility
  - Transport station
- Boundaries**
  - Area of Interest
  - Admin-A - Province
  - Admin-A - Municipality
- Industry/Utilities**
  - Electric power substation
  - Industrial Enclosure
  - Energy and Telecom tower
  - Mining facility
  - Re-gas facility
  - Railway
  - Fish farm
  - Saline
  - Urban waste station
  - Water treatment station
  - AL241 - Tower
  - AW051 - Wind Turbine
  - AT030 - Power Line
  - BB190 - Berthing Structure
  - SB001 - Military Installation
  - AC000 - Processing Facility
  - AB000 - Disposal Site
  - Physiography Area
- Physiography**
  - CA010 - Contour (Index)
  - CA010 - Contour (Intern.)
  - CA010 - Bathymetry (Index)
  - CA010 - Bathymetry (Intern.)



EMS078: Tsunami preparedness risk assessment along the Andalusian West Coast, Spain



**Legend**

- Risk Level**
  - Very Low
  - Low
  - Medium
  - High
  - Very High
- Transportation Risk Level**
  - Very Low
  - Low
  - Medium
  - High
  - Very High
- Mitigation measures**
  - Surveillance point
  - Forest roads/Wildfire defensible zones
- Points of Interest**
  - Border Crossing
  - Industrial
  - Airport
  - Heliport
  - Port
  - Marina
- Populated places**
  - Town
  - Village
- First Aid**
  - Shelters
  - Camp location
  - Field hospital
  - Helicopter landing spot
  - Gasoline tank location
  - First Aid Areas
- Physiography**
  - Spot heights
  - Primary
  - Secondary
  - Hydrography
  - River
  - Stream
  - Coastline

Consequences within the AOI:	Risk Level				
	Very Low	Low	Medium	High	Very High
<b>Spill</b>					
Population (Nr of inhabitants)	77	53	310	1942	890
Built-up areas (sqkm)	0.810	4.082	2.549	9.460	18.649
<b>Assets (Nr)</b>					
Commercial, Public & Private Services	28	37	43	183	712
Industry & Utilities	6	8	23	32	176
Place of worship	1	9	32	50	56
Transportation	-	-	-	2	6
Other	790	638	2106	7179	12615
<b>Transport Network (KM)</b>					
Railways	11.141	2.399	1.709	2.118	47.047
Highway	312.771	58.527	14.130	4.970	-
Primary	89.539	74.068	179.148	71.624	7.754
Secondary	25.078	25.672	84.569	39.349	2.793
Tertiary	64.451	73.748	254.300	82.483	11.493
Local and service	170.095	147.870	340.278	135.332	11.637
Other	303	140	91	16	2
<b>Bridges (Nr)</b>					
Tunnels (Nr)	251	70	73	27	-

# CEMS Exposure Mapping

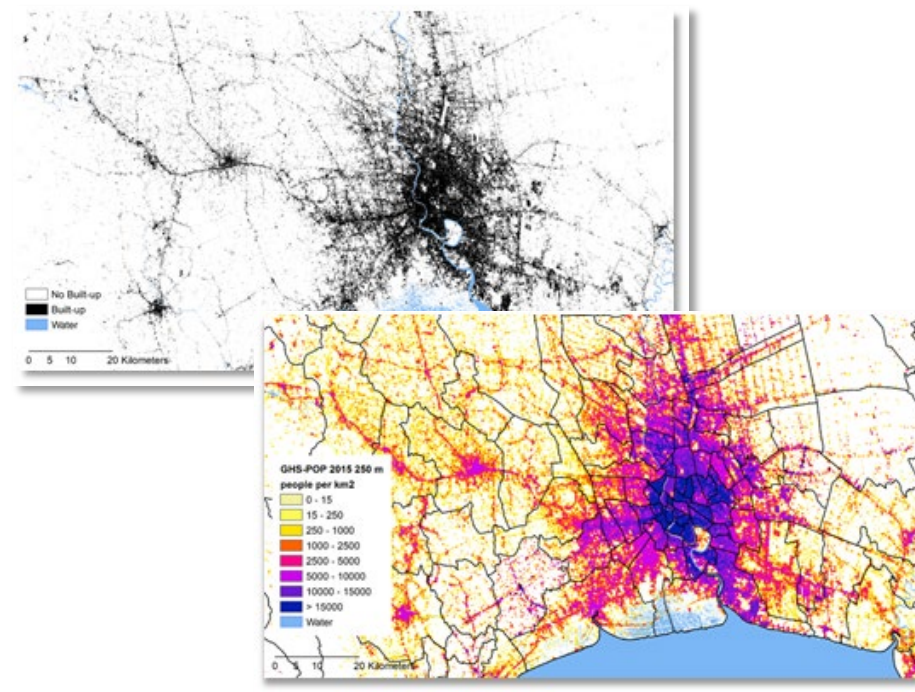
## Global Human Settlement Layer (GHSL)

The new CEMS Exposure Mapping component provides detailed information on disaster exposure, essential for:

- Properly manage crises
- Assess disaster risk

Scope: to provide highly accurate information derived from satellite and census data on **the presence of settlements and population**.

The results of this component are used in the **on-demand mapping and early warning products**.



Information on population and settlements is relevant for many other application domains, international frameworks and other Copernicus services:





# GDACS: Global Disaster Alert & Coordination System

CEMS contributes to GDACS: a cooperation framework between the United Nations, the European Commission and disaster managers worldwide to improve alerts, information exchange and coordination in the first phase after major sudden-onset disasters.



**Overall Orange alert Tropical Cyclone for ROSLYN-22**  
in Mexico

Summary Impact Meteo GTS Media Resources Covid19

**Event summary**  
Tropical Cyclone ROSLYN-22 can have a medium humanitarian impact based on the maximum sustained wind speed, exposed population and vulnerability.

GDACS ID: TC 1000940  
Name: ROSLYN-22  
From - To: 20 Oct - 20 Oct  
Exposed countries: Mexico  
Exposed population: 350 thousand in Category 1 or higher  
Maximum wind speed: 157 km/h Category 2  
Maximum storm surge: 0.5 m (23 Oct 18:00 UTC)

**GDACS Score**  
0 1 1.5 2 3  
For more info on GDACS alert score click here.

	Wind	Storm surge	Rainfall	GDACS score
GDACS	157 km/h	n.a.	n.a.	1.5
NOAA				

Maximum expected impact (wind, storm surge and rainfall) using different data sources

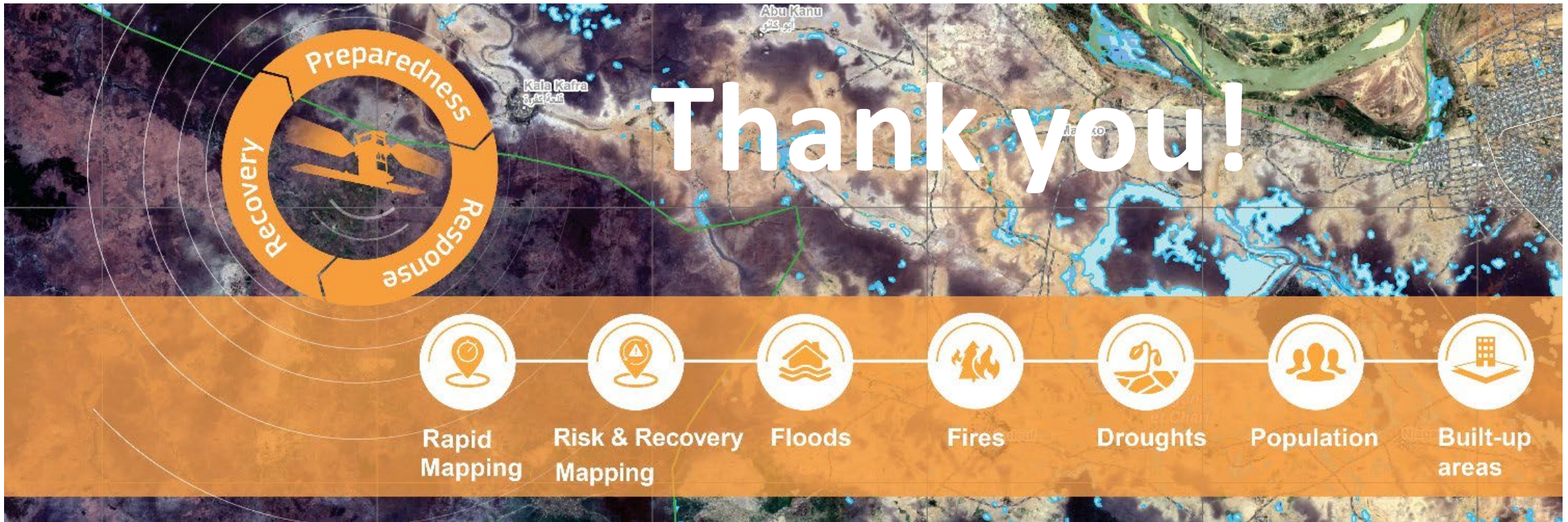
**Overall Orange alert Drought for East Africa-2022**  
in Democratic Republic of Congo, Central African Republic, Ethiopia, Kenya, Somalia, South Sudan, Uganda

Summary Impact Media Resources Covid19

**Event summary**  
The drought has lasted for 7 months. Drought indicators suggest anomalies typical of severe to extreme events.

GDACS ID: DR 1014742  
Name: East Africa-2022  
Glide number: DR-2022-000322-COD  
Countries: Democratic Republic of Congo, Central African Republic, Ethiopia, Kenya, Somalia, South Sudan, Uganda  
Start Date: End of Feb 2022

**GDACS Score**  
0 1 1.7 2 3  
For more info on GDACS alert score click here.



Website - <https://emergency.copernicus.eu/>

Mail - [support@copernicus.eu](mailto:support@copernicus.eu)

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