

Aktivering av Copernicus kriskarteringstjänst - praktiska exempel och nyheter

Kartdagarna 2021 – Gauss 2021-04-21 kl.08:30

Susanne Ingvander

Avdelningen för Krisberedskap och Civilt Försvaret

Enheten för Geodata och det robusta samhället



Myndigheten för
samhällsskydd
och beredskap



EMERGENCY MANAGEMENT SERVICE

copernicus.eu



Copernicus Programme

Europe's eyes on Earth



Programme Manager

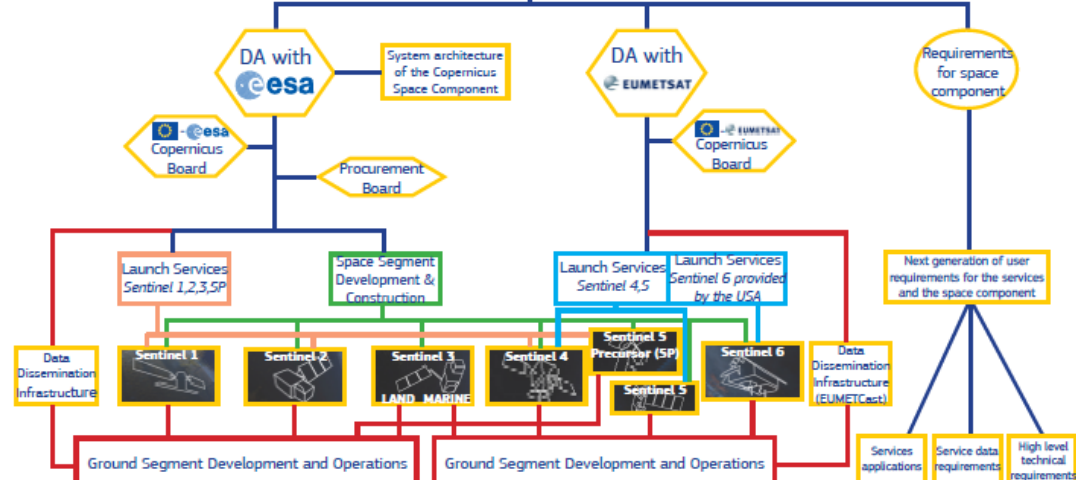
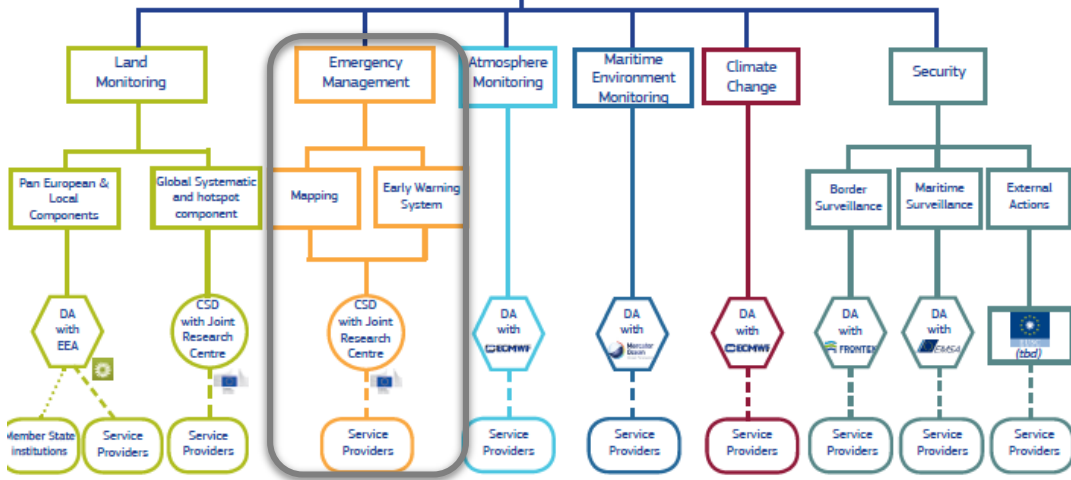
Copernicus Committee

User Forum

Copernicus Services

Copernicus Space Component

In-situ Component*

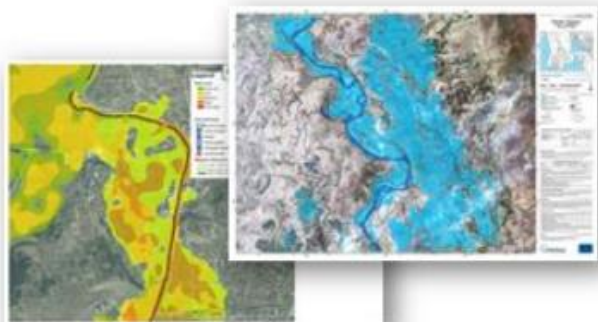


Emergency Management

ON-DEMAND MAPPING

Risk & Recovery Mapping

Rapid Mapping



RESILIENCE

RECOVERY

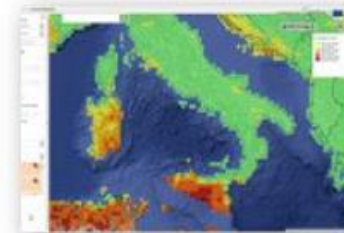
EMERGENCY RESPONSE

PREPAREDNESS

Operational
since 2012

EARLY WARNING & MONITORING SYSTEMS

European Forest
Fire Information
Systems



European &
Global **Drought**
Observatory

European &
Global **Flood**
Awareness
Systems



RAPID MAPPING

On-demand
mapping



Rapid
Mapping



Risk and Recovery
Mapping

Early warning
and monitoring



Floods



Fires



Droughts

Copernicus Emergency Management service - EMS

- Operativt sedan April 2012, GMES -> Mars 2015 Copernicus
- Sömlös karteringstjänst som aktiveras på begäran av auktoriserade användare.
- Erbjuder “efter katstrof” information inom timmar efter en händelse.
- Baseras på satellitdata tillsammans med annan geodata.
- Auktoriserade användare: nationella kontaktpunkter, tjänsteleverantör, dataleverantörer, koordination, administration och tekniskt ansvariga (JRC).

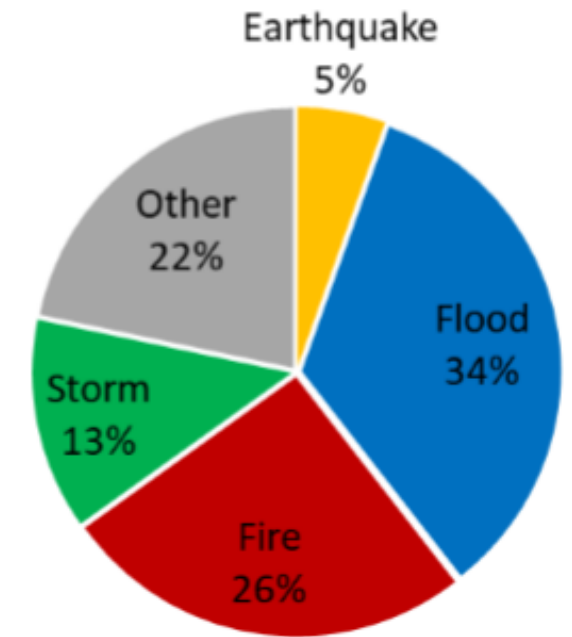
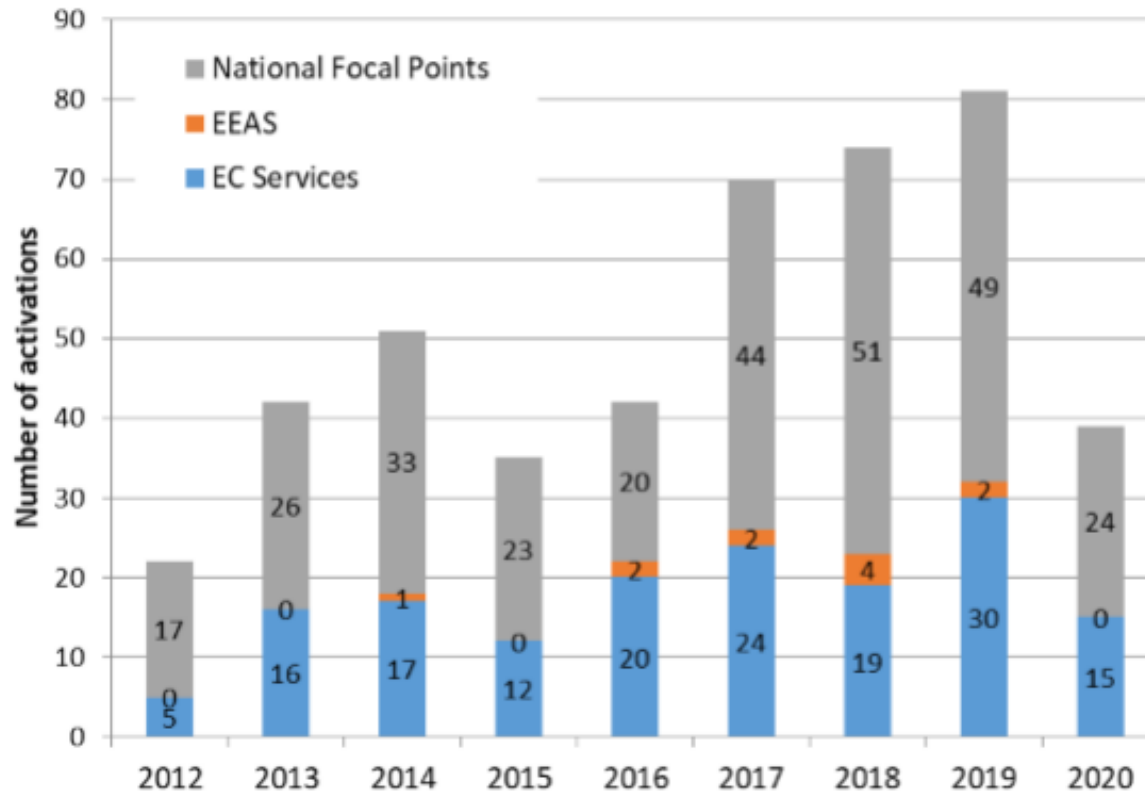


ACTIVATIONS 2012-2020



- User driven mapping of specific events, areas, scales
- Increasing number of activations
- Requested mostly by National Focal Points

<https://emergency.copernicus.eu/mapping/list-of-activations-rapid>

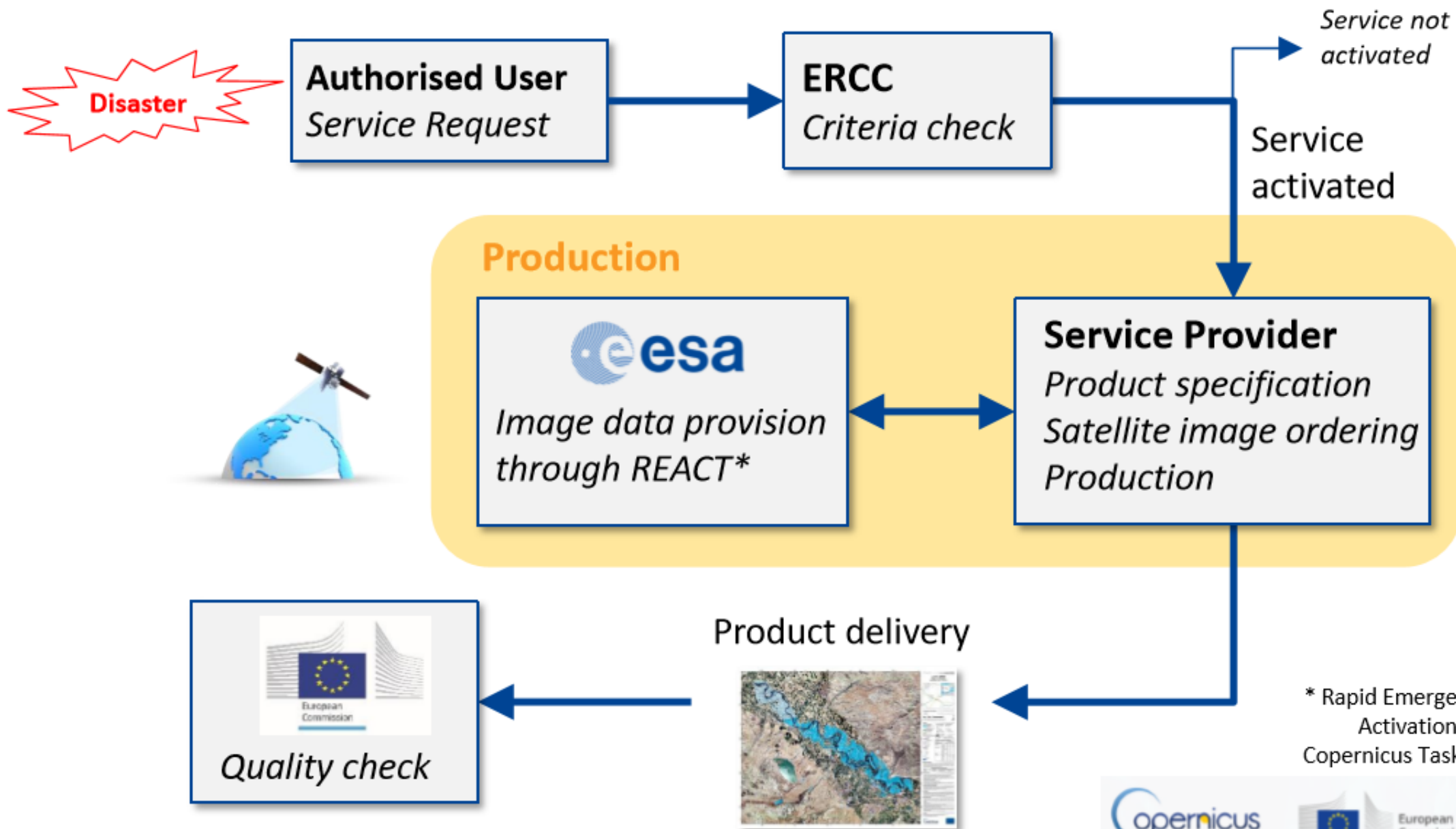


Status 24/8/2020



Emergency Management

WORKFLOW





PRODUCTS

Emergency Management

PRE-EVENT

Reference (10h*)



Pre-volcanic eruption in the Philippines, 2019 (EMSR418)

POST-EVENT

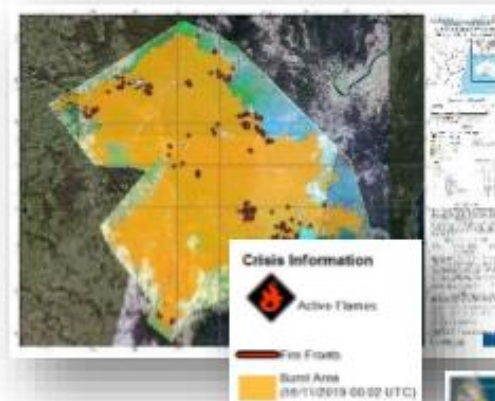
First Estimate (2h*)



Flood delineation in France, 2019 (EMSR411)

Delineation (7h*)

Delineation

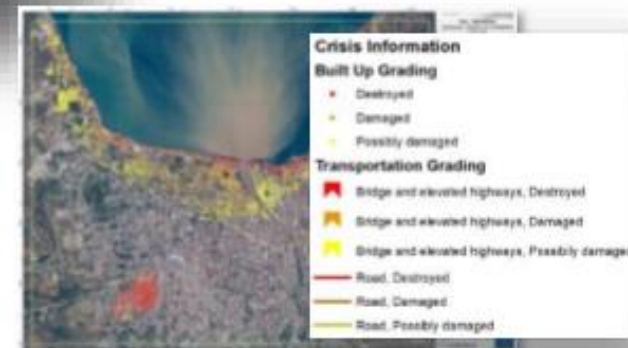


Wildfires Australia, 2019 (EMSR408)

Monitoring

Monitoring

Detailed damage assessment



Earthquake & Tsunami in Indonesia, 2018 (EMSR317)

* Production time after image reception

1° impact info delivery within 24h from user request



Tidsfaktor

Products may be requested in two service levels



Select it according to how urgently you need the information

SL1

- The fastest service, intended to provide products as soon as possible
- 24/7/365 (request, satellite tasking, production)

Target Delivery time for first product from request:
24 hours

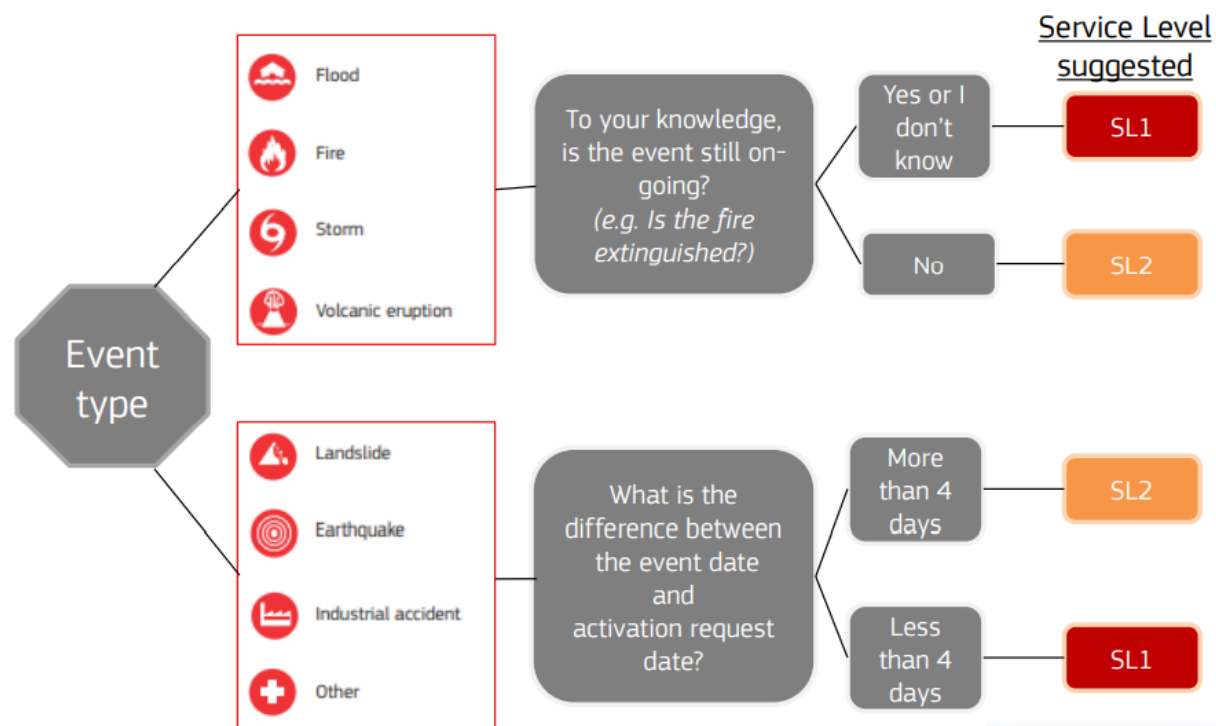
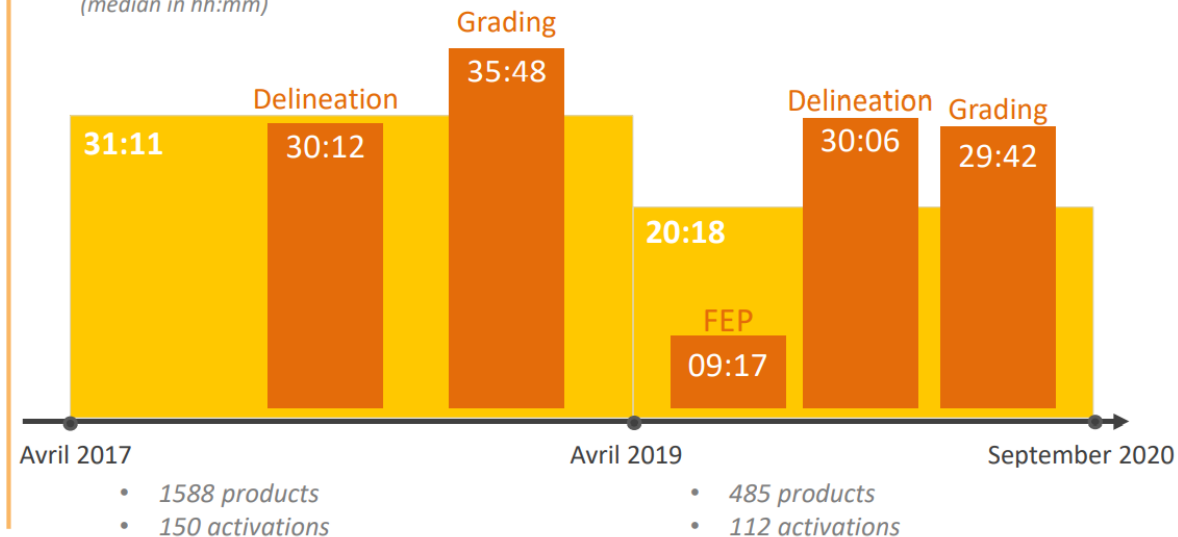
SL2

- For less urgent cases, which do not require working during the night
- Request and handling of image tasking is 24/7/365
- Production during working days and hours

Target Delivery time for first product from request: **max 5 days**

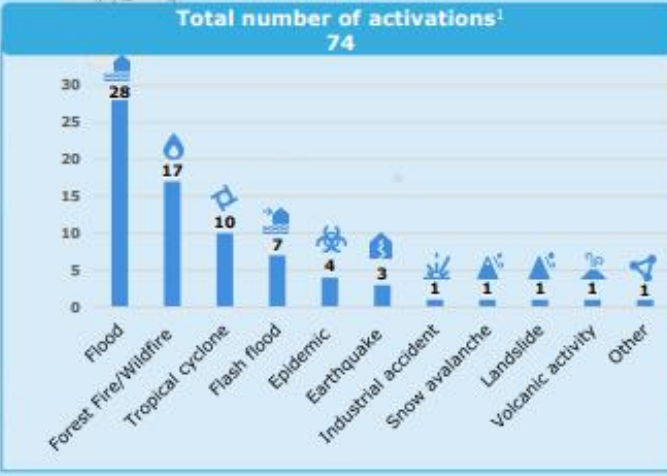
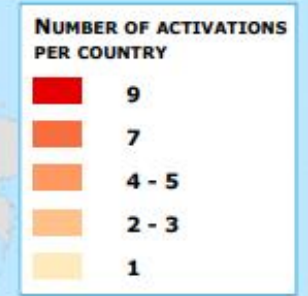
Time between activation start and delivery of the first post-event product

(median in hh:mm)



Copernicus EMS Rapid Mapping activations | 2020 Overview

	Number of Activations ¹	Number of maps
Europe	45	303
Outside Europe	29	221

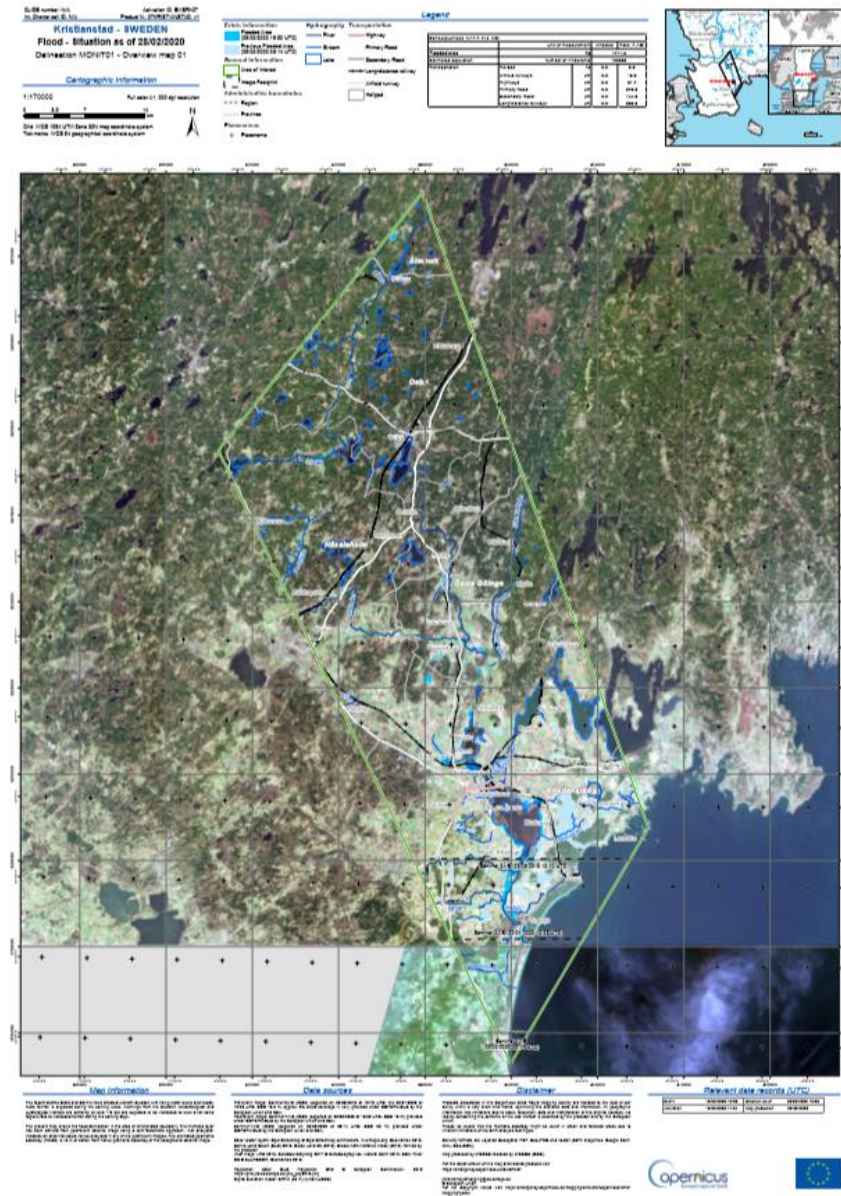
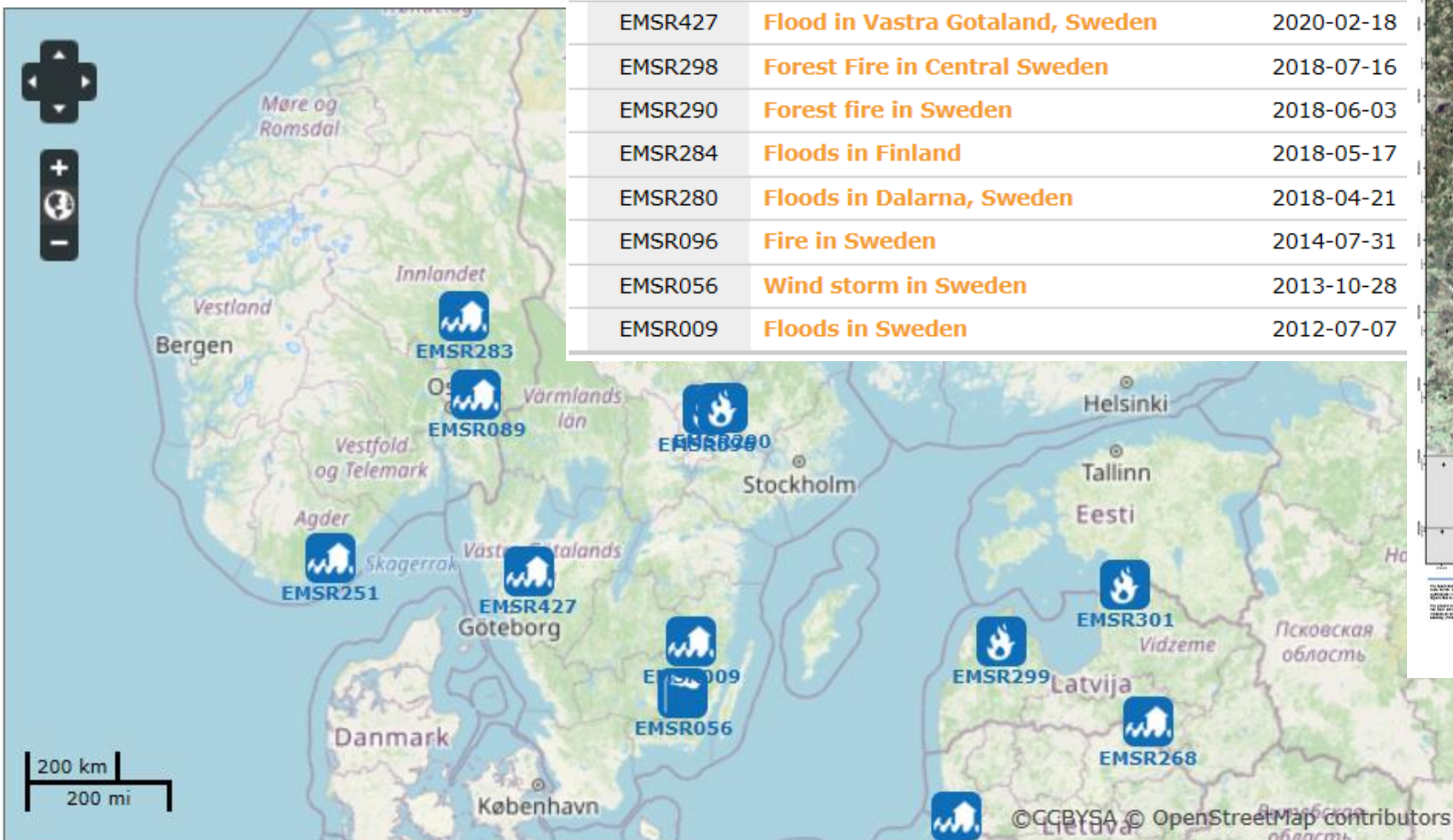


Copernicus: EU programme aimed at developing European information services based on satellite earth observation and *in situ* data. The Copernicus Rapid Mapping Service (EMSR) is part of the Copernicus Emergency Management Service (EMS), which is providing maps and analyses based on satellite imagery (before, during or after a crisis) as well as early warning services.

¹Sensitive activations are not represented in the map.
 *This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.
 © European Union, 2021. Map produced by the JRC. The boundaries and the names shown on this map do not imply official endorsement or acceptance by the European Union.

Svenska aktiveringar

Act. Code	Title	Event Date
EMSR427	Flood in Vastra Gotaland, Sweden	2020-02-18
EMSR298	Forest Fire in Central Sweden	2018-07-16
EMSR290	Forest fire in Sweden	2018-06-03
EMSR284	Floods in Finland	2018-05-17
EMSR280	Floods in Dalarna, Sweden	2018-04-21
EMSR096	Fire in Sweden	2014-07-31
EMSR056	Wind storm in Sweden	2013-10-28
EMSR009	Floods in Sweden	2012-07-07

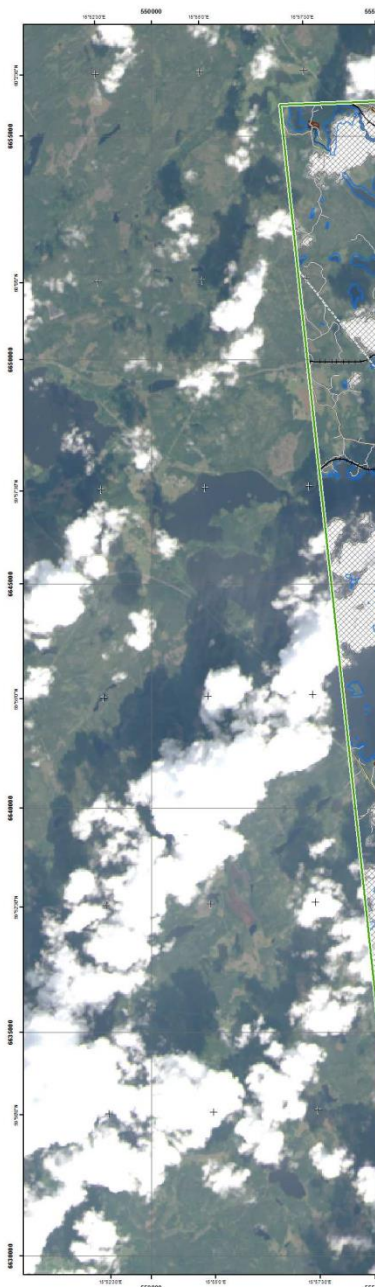


Virsbo - SWEDEN

Fire - 31/07/2014

Delineation Map - Overview - Monit01

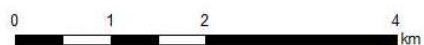
Production date: 14/10/2014



Cartographic Information

1:50000

Full color ISO A1, low resolution (100 dpi)



Grid: WGS 1984 UTM Zone 33N map coordinate system

Tick marks: WGS 84 geographical coordinate system

Legend

Crisis Information	Settlements	Transportation
Burnt Area (13/08/2014)	Populated Place	Station
Area Of Interest - AOI	Residential	Railway
Province	Industrial	Primary Road
Not analyzed	Recreational	Secondary Road
	Point of Interest	Local Road
	Educational	River
	Industrial	Stream
	Religious	Lake
		River

Consequences within the overview AOI on 13/08/2014

		Affected	Total in AOI	
Burnt area	ha	8463		
Estimated population	Inhabitants	0	5000	
Settlements	Residential	0	259	
	Industrial	0	13	
	Recreational	0	4	
Transportation	Primary roads	0	8,3	
	Secondary	1,6	65,8	
	Local roads	80,8	752,3	
	Railways	0	123,6	
	Stations	No.	0	2

Map Information

The Swedish forests between Hallstahammar and Sala are affected by forest fires that are still uncontrolled. The fire has started the 31st of July and spread more since the 3rd of August. Weather conditions may worsen the situation in the coming days with high temperatures and stronger winds. According to local authorities, the fire front extends over an area of approximately 10 x 10 km.

Data Sources

Inset maps based on: Administrative boundaries (JRC 2013, GISCO 2010, © EuroGeographics), Hydrology, Transportation (Natural Earth, 2012, CCM River DB © EU-JRC 2007), Settlements (Geonames, 2013).
Landsat-8 © U.S. Geological Survey (acquired on 13/08/2014, GSD 15 m, 30% cloud coverage), provided under E SA GSC-DA DWH License.
Base vector layers such as hydrology, settlements and transportation provided by Swedish Civil Contingencies Agency.
GSD Terrängkartan 2014, Copyright Lantmäteriet, GSD Översiktskartan 2014, Copyright Lantmäteriet Other layers such as toponyms and administrative boundaries based on GADM, Wikimapia.org and GeoNames (approx. 1:10:000, extracted on 04/08/2014), refined by SIRS.
Source information is included in vector data.
Elevation data: SRTM (90 m posting). Height in meters above mean sea level.
Population data: Landsat 2010 © UT BATTELLE, LLC.
All Data sources are complete and with no gaps.

Dissemination/Publication

Delivery formats are GeoTIFF, GeoPDF, GeoJPEG and vectors (shapefile and KML formats).


Framework

The products elaborated in the framework of current mapping in rush mode activation are realized to the best of our ability, within a very short time frame during a crisis, optimising the available data and information. All geographic information has limitations due to scale, resolution, date and interpretation of the original data sources. The products are compliant with GIO-EMS RUSH Product Portfolio specifications.

Map Production

The present map shows the fire delineation in the area of Virsbo (SWEDEN). The basic topographic features derived from public datasets are refined by means of visual interpretation of pre-event aerial orthoimagery.
The thematic layer, assessing the delineation of the event, has been derived from Landsat-8 (acquired on 13/08/2014) post-event imagery.
The satellite image has been radiometrically enhanced and orthorectified with RPC approach (using SRTM elevation data) and co-registered to the pre-event imagery.
The estimated geometric accuracy of this product is 100 m CE90 or better, from native positional accuracy of the background satellite image.
The estimated thematic accuracy of this product is 85% or better, as it is based on visual interpretation of recognizable items on high resolution optical imagery. Shaded areas are zones of lower interpretation accuracy due to the poorer image radiometry.
Only the area enclosed by the Area of Interest has been analyzed.
Map produced on 14/10/2014 by GAF AG under contract 257219 with the European Commission. All products are © of the European Commission.
Name of the release inspector (quality control): e-GEOS (ODO).
E-mail: rush@ems-gmes.eu

Map products available at <http://emergency.copernicus.eu/mapping/list-of-components/EMSR08>



Civil Protection


Response

Delineation Map - Overview

Planning

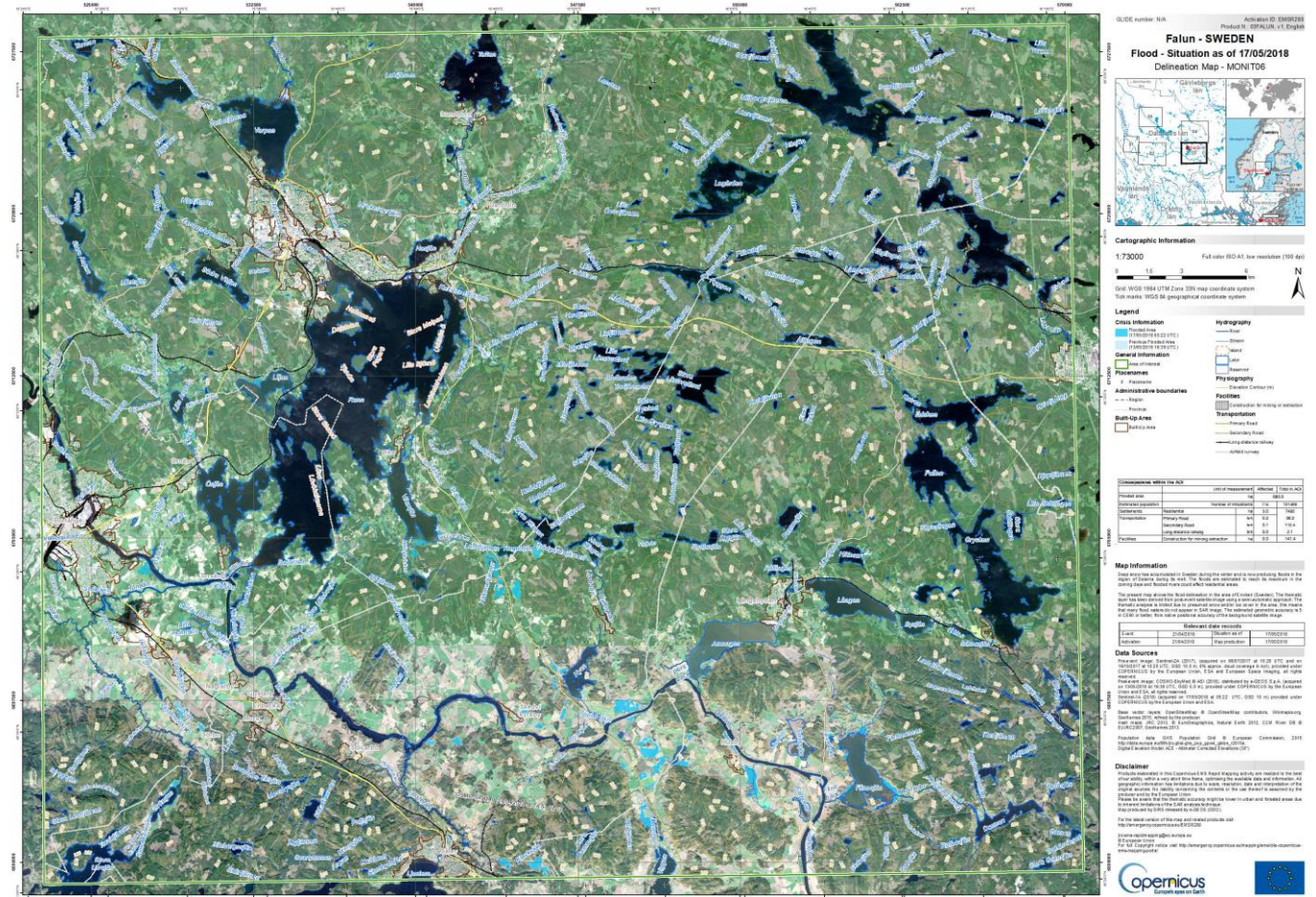
Landsat-8 © USGS

31-07-2014



Vårflod Dalarna

- **Aktiveringskod:EMSR280:** Vårflod i Dalarna 2018
- **Tid för händelse (LOC):**2018-04-21 12:00
- **Tid för aktivering:**2018-04-21 14:00
- **Typ av händelse:** Översvämning
- **Antalet referenskartor skapade:**0
- **Antalet konturkartor skapade:**35
- **Antalet graderingskartor skapade:**0
- **Aktiveringsstatus:** Avslutad
- **Drabbat område:** Dalarna, Sverige
- **Områdesbeskrivning:** Malung, Mora, Falun, Orsa, Vansbro, Enviken.
- **Auktoriserad användare:** Myndigheten för Samhällsskydd och Beredskap (MSB).
- **Orsak till aktivering:** Vinterns stora snömängder lagrade stora mängder vatten i landskapet i norra Sverige. När denna snön smälte befarades en kraftig vårflod. MSB och länsstyrelsen i Dalarna valde att aktivera Copernicus för att övervaka översvämningarna som efterföljde vårfloden.
- **Efterfrågad produkt:** Konturkartor



Skogsbrand Sverige

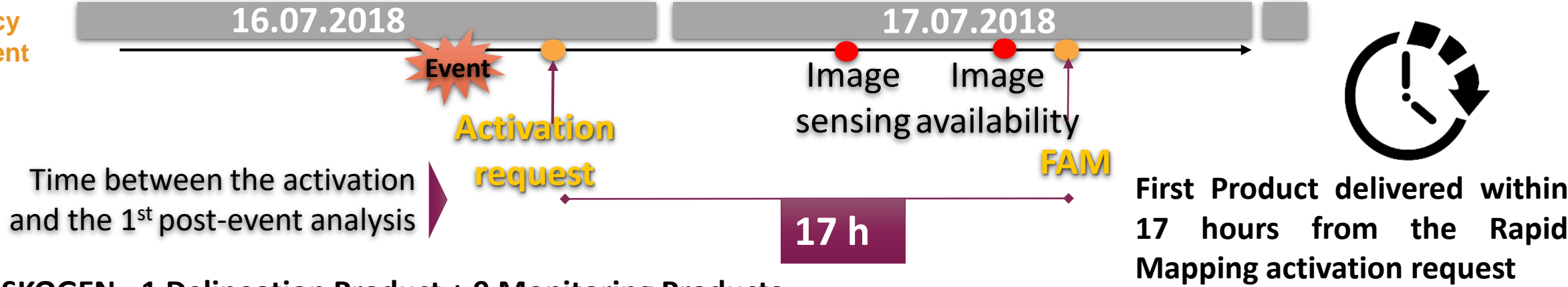
- **Aktiveringskod:**EMSR290: Skogsbrand Sverige
- **Tid för händelse (LOC):**2018-06-03 14:00:00+00:00
- **Tid för aktivering:**2018-06-06 11:00:00+02:00
- **Typ av händelse:** Skogsbrand
- **Antalet referenskartor skapade:**0
- **Antalet konturkartor skapade:** 8
- **Antalet graderingskartor skapade:** 5
- **Aktiveringsstatus:** Avslutad
- **Drabbat område:** Rörbo, Broddbo, Ulvsbo, Björneborg, Edsvalla
- **Områdesbeskrivning:** Skogarna i Värmland och Västmanland.
- **Auktoriserad användare:** Myndigheten för Samhällsskydd och Beredskap (MSB).
- **Orsak till aktivering:** På grund av det varma och torra vårvädret har det varit mycket torrt i skog och mark. Flera bränder har rasat i Västmanland och Värmland. Flera av bränderna har haft så stor omfattning att det önskades karteringshjälp from Copernicus kriskarteringstjänst.
- **Efterfrågad produkt:** Konturkartor och graderingskartor.



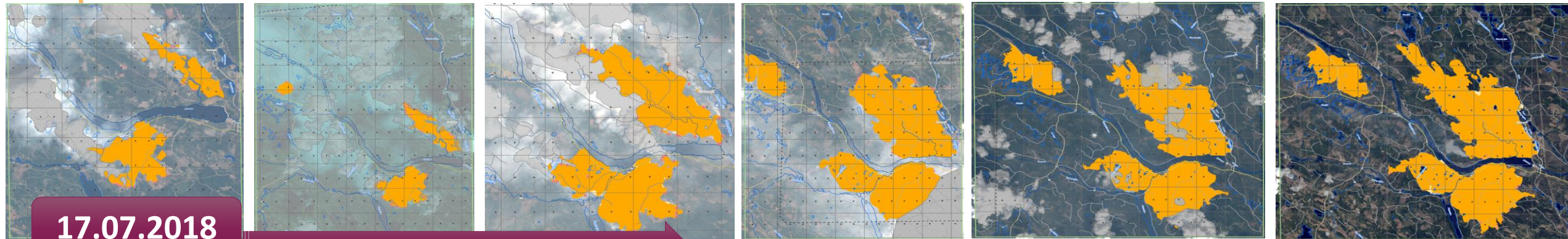


EMSR298 Timeline

Emergency Management



AOI 01 ENSKOGEN - 1 Delineation Product + 9 Monitoring Products



Legend

Crisis Information

-  Active Flames
-  Burnt Area (18/07/2018 10:03 UTC)



TASK 1: Physical definition of collected field survey photographs.

- Physically define field survey photographs.
- Classify grading CPTs according to Rapid Mapping.
- Creation of reference data.

Not burnt



Possibly
damaged

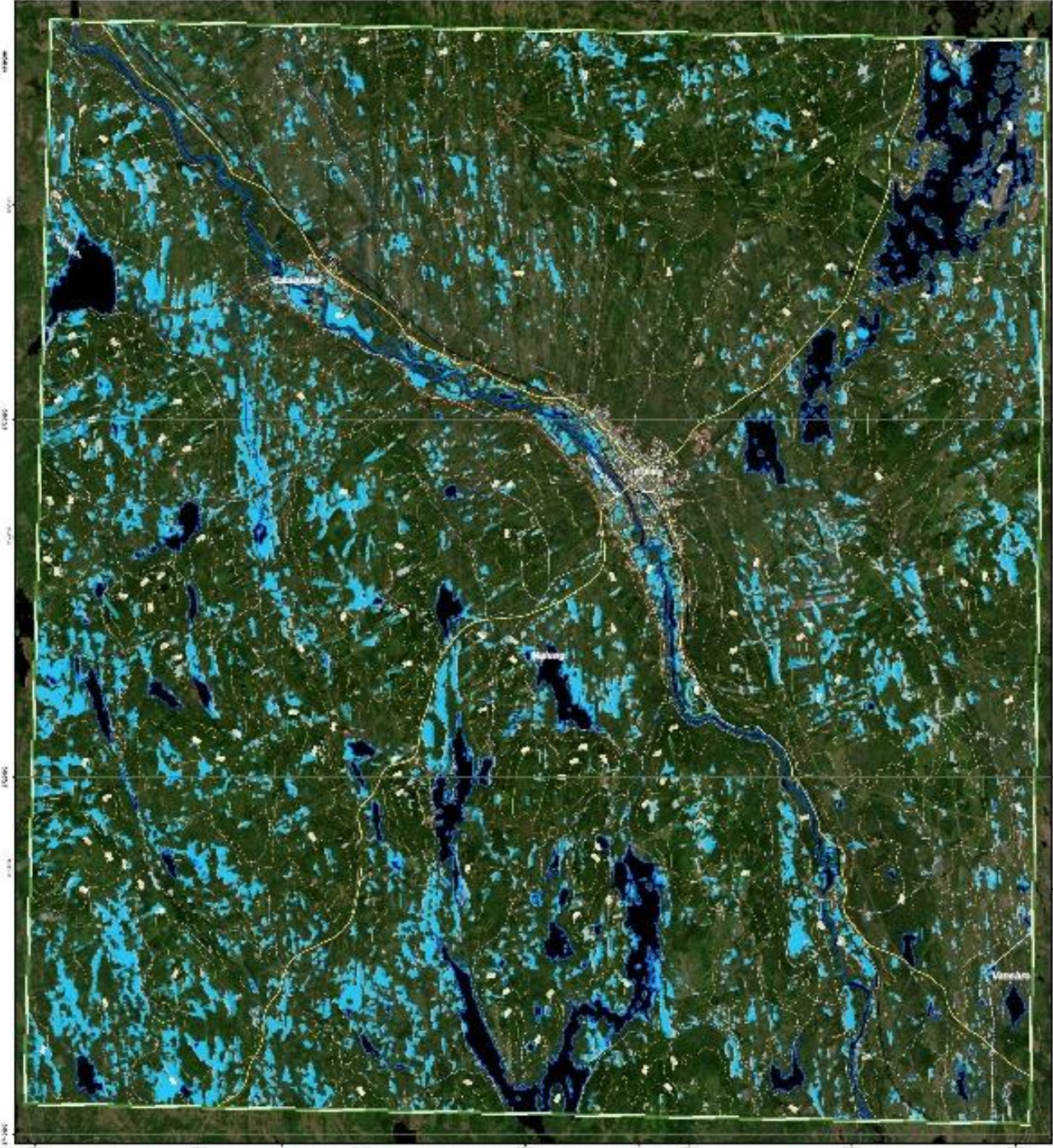


Damaged



Destroyed

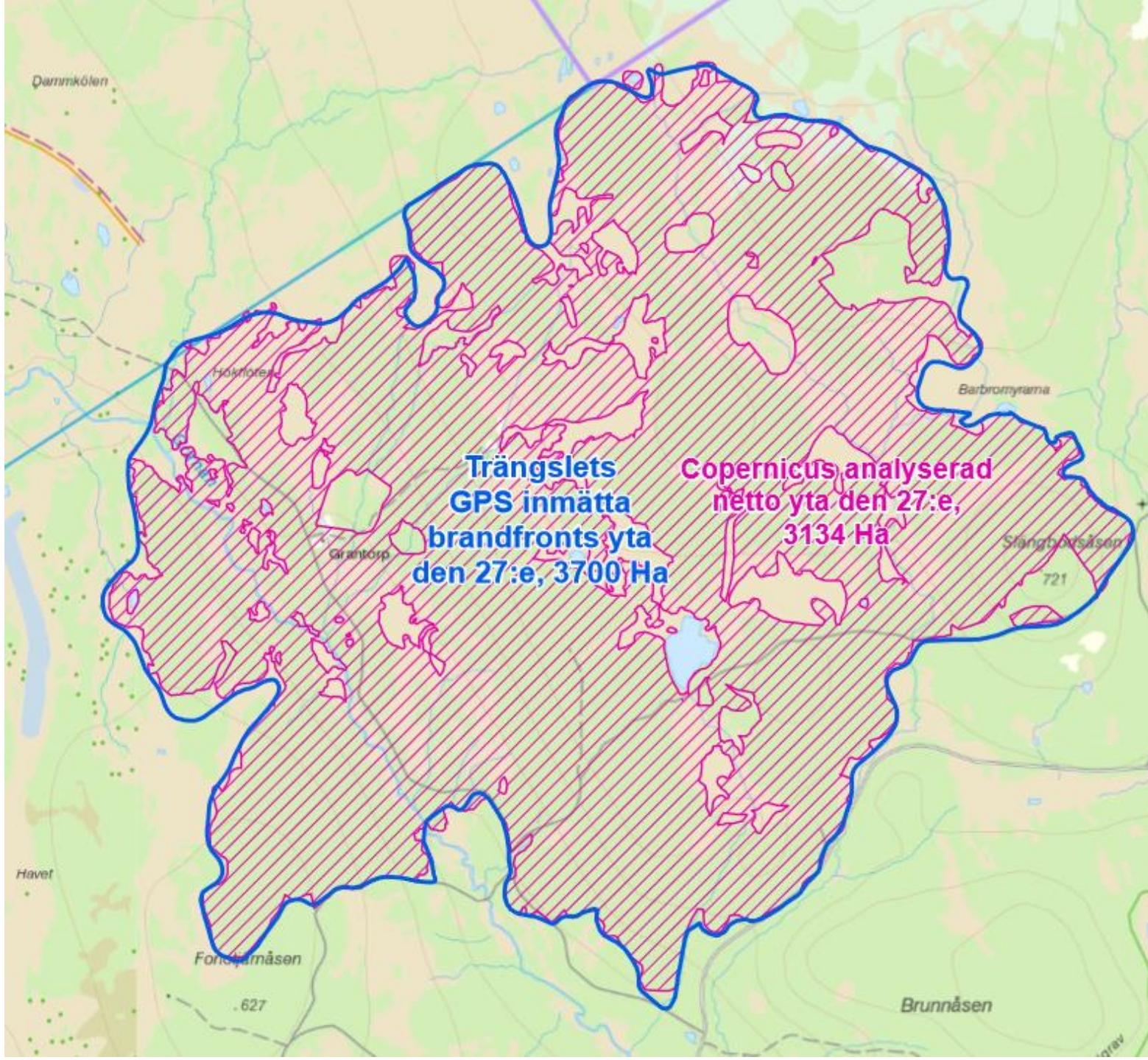




Validering – Översvämning Dalarna, april 2018

- Viktigt med validering
- Automatiska analyser
- Vattenmättad snö – översvämning
- Feedback till producenter

Egenvalidering – Trängslet, Dalarna 2018-07-27





Risk & Recovery Mapping (RRM)

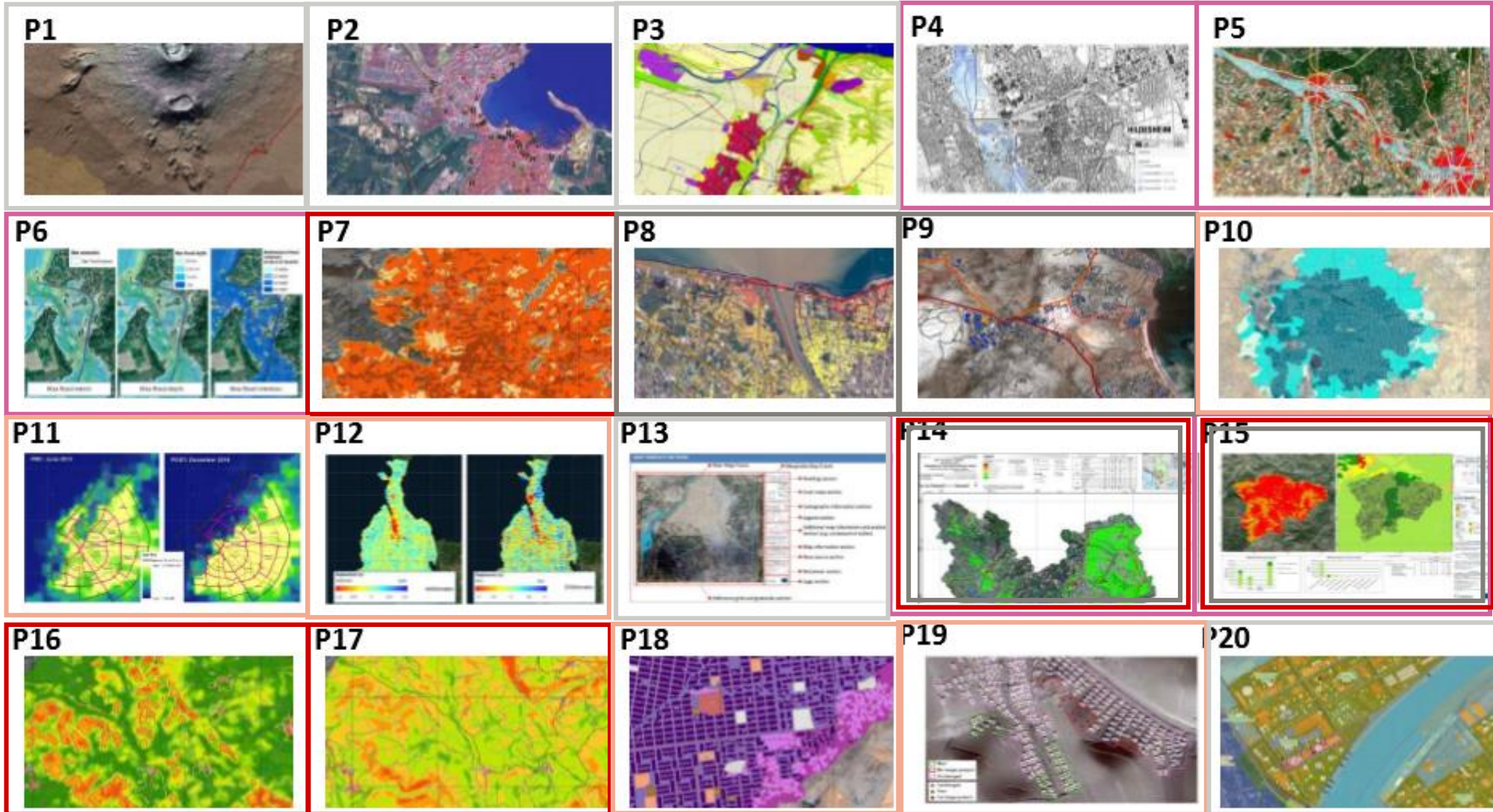
- On-demand service
- Serves prevention, preparedness, disaster risk reduction, reconstruction, recovery
- Not constrained by the need for rapid delivery
- Service is customised to suit the user requirements specific to each activation
- Product delivery in days/weeks
- Is more dependent on the integration of relevant ancillary layers





RRM STANDARD - product overview

Emergency
Management



EUROPEAN FOREST FIRE INFORMATION SYSTEM (EFFIS)

On-demand
mapping



Rapid
Mapping



Risk and Recovery
Mapping

Early warning
and monitoring



Floods



Fires



Droughts

Copernicus EMS Early Warning and Monitoring offers critical geospatial information at European and global level through continuous observations and forecasts for floods, droughts and forest fires.



Floods

The **European Flood Awareness Systems (EFAS)** and **Global Flood Awareness Systems (GloFAS)** provide complementary flood forecast information to relevant stakeholders that support flood risk management at the national, regional and global level.



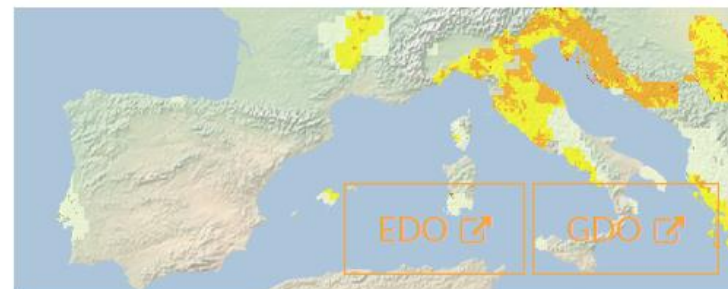
Fires

The **European Forest Fire Information System (EFFIS)** monitors forest fire activity in near-real time. EFFIS supports wildfire management at the national and regional level for EU member states and across the Middle East and North Africa.

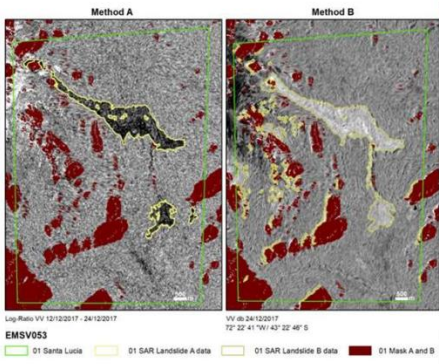


Droughts

The **Drought Observatory (DO)** provides drought-relevant information and early-warnings for **Europe (EDO)** and **globally (GDO)**. The service publishes short analytical reports (Drought News) in anticipation of an imminent drought.



På gång!



Iterativ utveckling

Alternativa plattformar

Introducing an aerial capacity for imagery

- Mapping drones**
 - European regulation is in place since recent (risk based)
 - For CEMS focusing on 'specific category' (BVLOS)
 - Need to create European local network of authorized drone operators
 - Ability to cover up to 30 km²
 - 5 to 10 cm
 - RGB/NIR and UAV Lidar
- Planes**
 - Mature market segment since decades (classic photogrammetry)
 - European Flight permissions are well established
 - Ability to cover large areas (up to 625 km²) with superior resolution (10 to 20 cm)
 - Perfectly compatible with using VHR



Activation viewer

- Risk & Recovery Activations
- Cloud Optimized Geotiff post event imagery
- Near real time Activations publications
- Interface evolution
 - Image and product metadata
 - Layer tree rationalisation
 - Direct links for download



Ökad användning av radarsatellitdata

Karttjänst för aktiveringar

Automatic Aol Definition

Impact based definition of Aols for satellite tasking using early alert & warning systems

- Red GDACS alert** = request for international humanitarian support is likely
- Combining hazard intensity with the GHSL Settlement Model grid to identify the most critical areas in terms of exposure
- Objective: gain time!
 - Support the user
 - Task images asap
- Event types:
 - Tropical cyclones
 - Earthquakes
 - Tsunamis



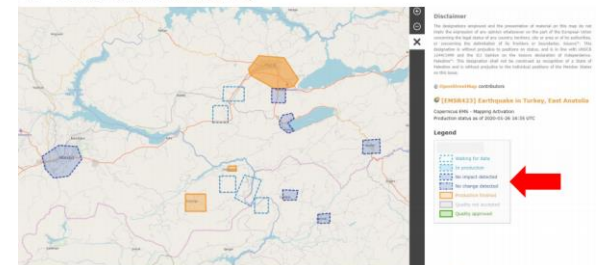
Earthquake in Turkey 24/1/2020 (EMSR432)

Använda pretasking med hjälp av GDACS och EWS

Karttjänst för stöd vid nya aktiveringar

ONLINE ACTIVATION EXTENT MAP

4. Online Activation Extent Map





Myndigheten för
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och beredskap

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