Copernicus Overview

Major Emergency Management Conference
Athlone 2017
• Copernicus is a European programme implemented by the European Commission.

• The services address six thematic areas: land, marine, atmosphere, climate change, emergency management and security.

• The Copernicus EMS Mapping service provides timely and accurate geospatial information derived from satellite remote sensing and completed by available in-situ data and open source information.
Who does what?

• Coordinated and paid by DG GROW (Internal Market, Industry, Entrepreneurship and SMEs)

• Technical support, contract management and quality assurance by the Joint Research Centre

• Operated by the Emergency Response Coordination Centre

• Service triggered by the Authorised Users

• Maps produced by the Service Provider

• Satellite images obtained by the European Satellite Agency
Rapid Mapping Activation Workflow

Crisis

Authorised User

Service Request Form (SRF)

Criteria check

ERCC

Service activation

ESA
Imagery from Contributing Missions, Sentinel

Service Provider
Product specification
Satellite image ordering
Production

Interaction on product specification

Map delivery

SFTP
EMS Portal
Typical Timeline

Disaster

Activation of the service

~2h

Satellite tasking

Some hours to 30h

≤12h*

EMS Rapid Mapping

Map delivery

* Production time in service level 1
The service handles
- Floods
- Earthquakes
- Fires
- Severe Storms
- Technological disasters
- Humanitarian crises
- Tsunamis

Satellite imagery used
- Optical Images
- SAR images (radar)
Users can request 3 types of map products
Type 1: Reference (with data prior to the disaster)
Type 2: Reference + Delineation (assessment of the event extent)
Type 3: Reference + Delineation + Grading (damage grade and its spatial distribution)

Maps are provided at two different scales:

<table>
<thead>
<tr>
<th>Overview</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:25.000</td>
<td>1:5000</td>
</tr>
<tr>
<td>1:50.000</td>
<td>1:10.000</td>
</tr>
<tr>
<td>1:100.000</td>
<td>1:15.000</td>
</tr>
<tr>
<td>1:200.000</td>
<td>1:20.000</td>
</tr>
<tr>
<td>1:500.000</td>
<td>1:25.000</td>
</tr>
</tbody>
</table>

**Base layer**

- **Hydrology**: rivers, lakes, reservoirs and open water, etc
- **Toponyms and administrative boundaries**
- **Physiography**: cliffs, contours and spot heights, etc
- **Land cover**: cropland, grassland, scrub, forest, natural vegetation, bare soil, wetlands, etc
- **Settlements**, both formal (urban, suburban, rural, etc) and informal (slums, IDP camps, etc)
- **Transport**: all transport networks and related infrastructure (e.g. roads, tracks, trails, railways, bridges, harbours, and airfields)
- **Industry and Utilities**: industrial facilities and power stations
• During an emergency, maps are provided within days or hours (in the so-called "rapid mapping").

• For prevention and preparedness purposes, maps are provided within weeks or months (in the "risk and recovery mapping").

• Both sorts of requests are channelled through the ERCC.

• The ERCC has a dual role: as an entry focal point and as an Authorised User in its own right.
**Rapid mapping products**
- On demand
- Standardized
- Hours-days

**Risk and recovery products**
- On demand
- Standard base widely adaptable to user requests
- Weeks-months

- Reference maps
- Pre-disaster situation maps
- Reference maps
- Post-disaster situation maps

- Reference maps
- Disaster response maps
Rapid mapping products

<table>
<thead>
<tr>
<th>Map types and production mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production mode (service levels and delivery times)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Map type</th>
<th>SL1*</th>
<th>SL5**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference map</td>
<td>9h</td>
<td>5 working days OR more (specify):</td>
</tr>
<tr>
<td>Delineation map</td>
<td>12h</td>
<td>5 working days OR more (specify):</td>
</tr>
<tr>
<td>Grading map</td>
<td>12h</td>
<td>5 working days OR more (specify):</td>
</tr>
</tbody>
</table>

(*) is the fastest delivery (less than 1 day, times are map specific, see glossary at the end). For delineation and grading map a First Available Map is provided by default within 3h. (**) for activations which require delivery in some days, normally 5 working days.
# Risk and recovery products

<table>
<thead>
<tr>
<th>MAP TYPE</th>
<th>CONTENT</th>
<th>DELIV. TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>REFERENCE</td>
<td>Detailed status of the territory and assets.</td>
<td>30d(#)</td>
</tr>
<tr>
<td></td>
<td>- e.g. <strong>topographic features and specific information</strong>, e.g. land use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>zoning plans, mitigation measures</td>
<td></td>
</tr>
<tr>
<td>PRE - DISASTER</td>
<td>Relevant info to help planning for contingencies on vulnerable areas</td>
<td>30d(#)</td>
</tr>
<tr>
<td></td>
<td>- E.g. <strong>hazard</strong> exposure to hazardous events; <strong>vulnerability / resilience</strong> of settlements and buildings; <strong>risk</strong> status for population and assets; Evacuation plans; Forecasts; Alerts</td>
<td></td>
</tr>
<tr>
<td>POST - DISASTER</td>
<td>Relevant thematic information, beyond the immediate response phase</td>
<td>30d(#)</td>
</tr>
<tr>
<td></td>
<td>- E.g. <strong>hazard</strong> exposure to hazardous events; <strong>vulnerability / resilience</strong> of settlements and buildings; <strong>risk</strong> status for population and assets; <strong>post disaster</strong> needs assessment; <strong>recovery plans</strong>; <strong>reconstruction / rehabilitation</strong> monitoring; <strong>IDP monitoring</strong> (IDP camps, IDP movements).</td>
<td></td>
</tr>
</tbody>
</table>

((#) calendar day after signature of a specific contract, which may require normally 30 days after the service request)
### Delineation mapping

- Delineation maps provide an assessment of the event extent (and of its evolution if requested). Delineation maps are derived from satellite post-disaster images. They vary depending on the disaster type and the delineation of the areas impacted by the disaster.

- Used extensively for the severe weather of 2015-2016, detailing the extent of the flood.
Grading Maps

- Grading maps provide an assessment of the damage grade (and of its evolution if requested). Grading maps are derived from post-event satellite images.
- Grading maps include the extent, magnitude or damage grades specific to each disaster type.
- They may also provide relevant and up-to-date information that is specific to affected population and assets, e.g. settlements, transport networks, industry and utilities.
Examples of Grading Maps

• Earthquake grading map with the count of the number of destroyed/damaged buildings in each cell of a regular grid.
• Population, roads, hospitals, shelters, gathering areas, etc. may be included.
Future

• Copernicus working with the Department of Housing, Planning & Local Government’s GIS team to develop a way of utilising ArcGIS online (AGOL) which is ESRI’s collaborative web GIS, it allows users to create and share maps, data and applications.

• This collaboration will allow Copernicus maps to utilise the data from AGOL and develop all lawyers as deemed required by the emergency, quickly and easily.
THANK YOU FOR YOUR ATTENTION

paul.rock@housing.gov.ie