

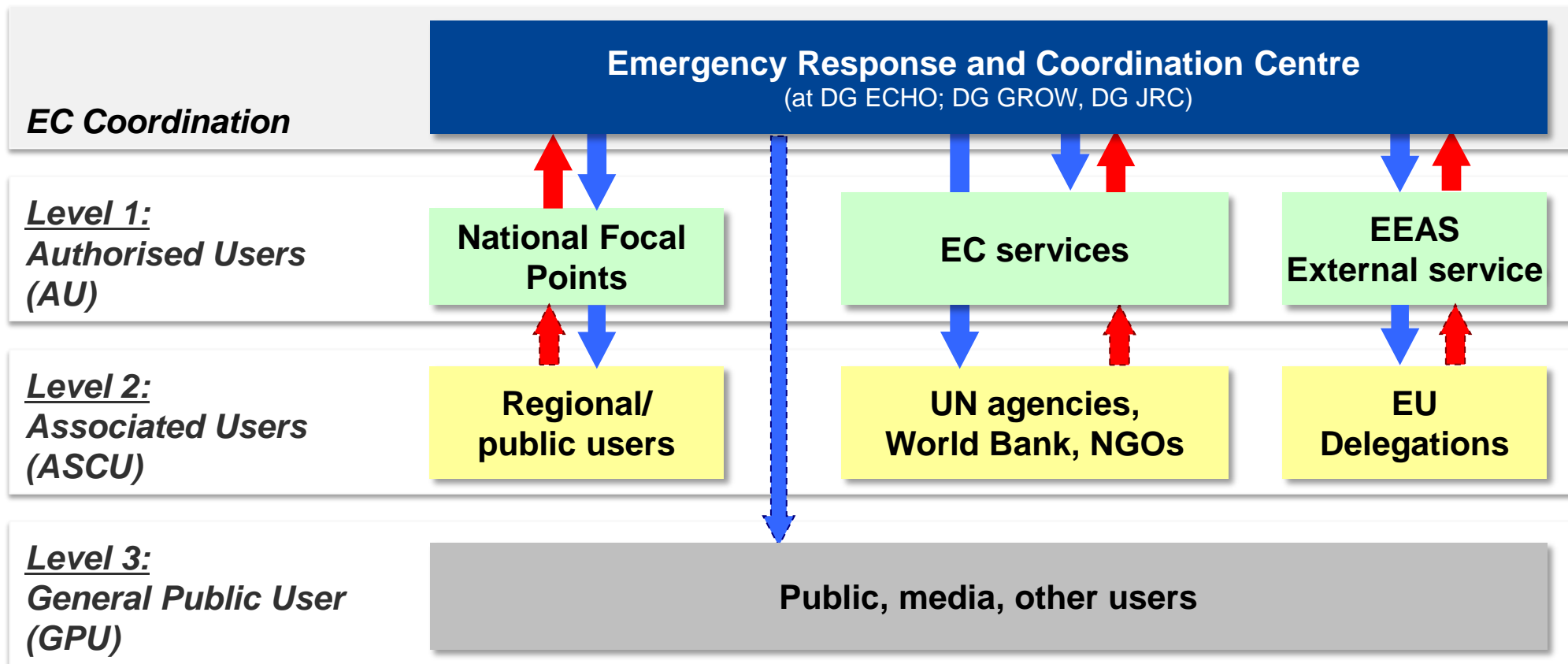


Peter SPRUYT

European Commission

DG JRC, Global Security and
Crisis management unit,
IPSC

Copernicus EMS Mapping - Users





What is possible with Rapid Mapping?

- ★ On-demand, fast provision (**hours-days**) of geo-spatial information in support to emergency management activities
- ★ Provide an overview of the reference situation on the ground
 - ★ Location of assets (settlements, transportation, land use, land cover, etc.)
 - ★ Terrain, hydrology
- ★ Delineate the disaster's extent (e.g. flooded or burnt area, lava flow extent)
- ★ Locate damages to buildings, transportation infrastructure, etc. (to be used for quantitative estimates)

□ How many activations?

133 in total since April 2012:

→ 75 in Europe, 58 outside

□ Which kind of disaster?

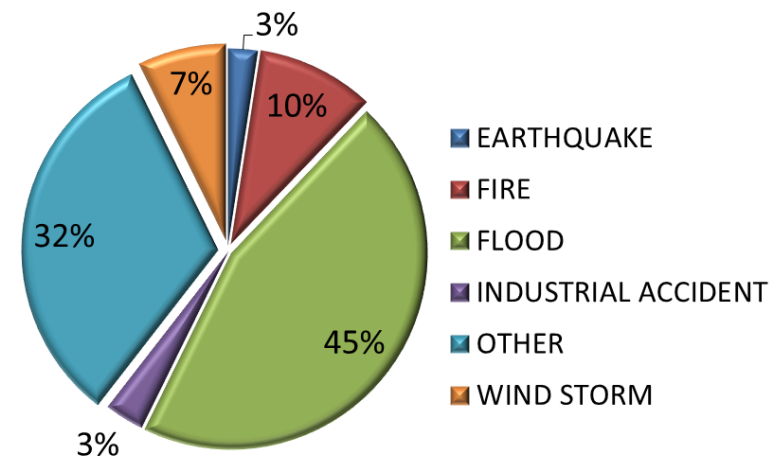
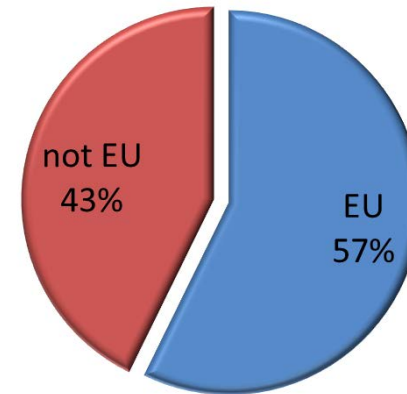
16 Fires, 57 Floods, 3 Earthquakes,
4 Industrial accidents, 42 Other

- In Europe: mostly floods
- Outside Europe: many humanitarian

□ Who is activating?

Activations are received by:

- MS Civil Protection,
- European Services or
- UN agencies via DG ECHO



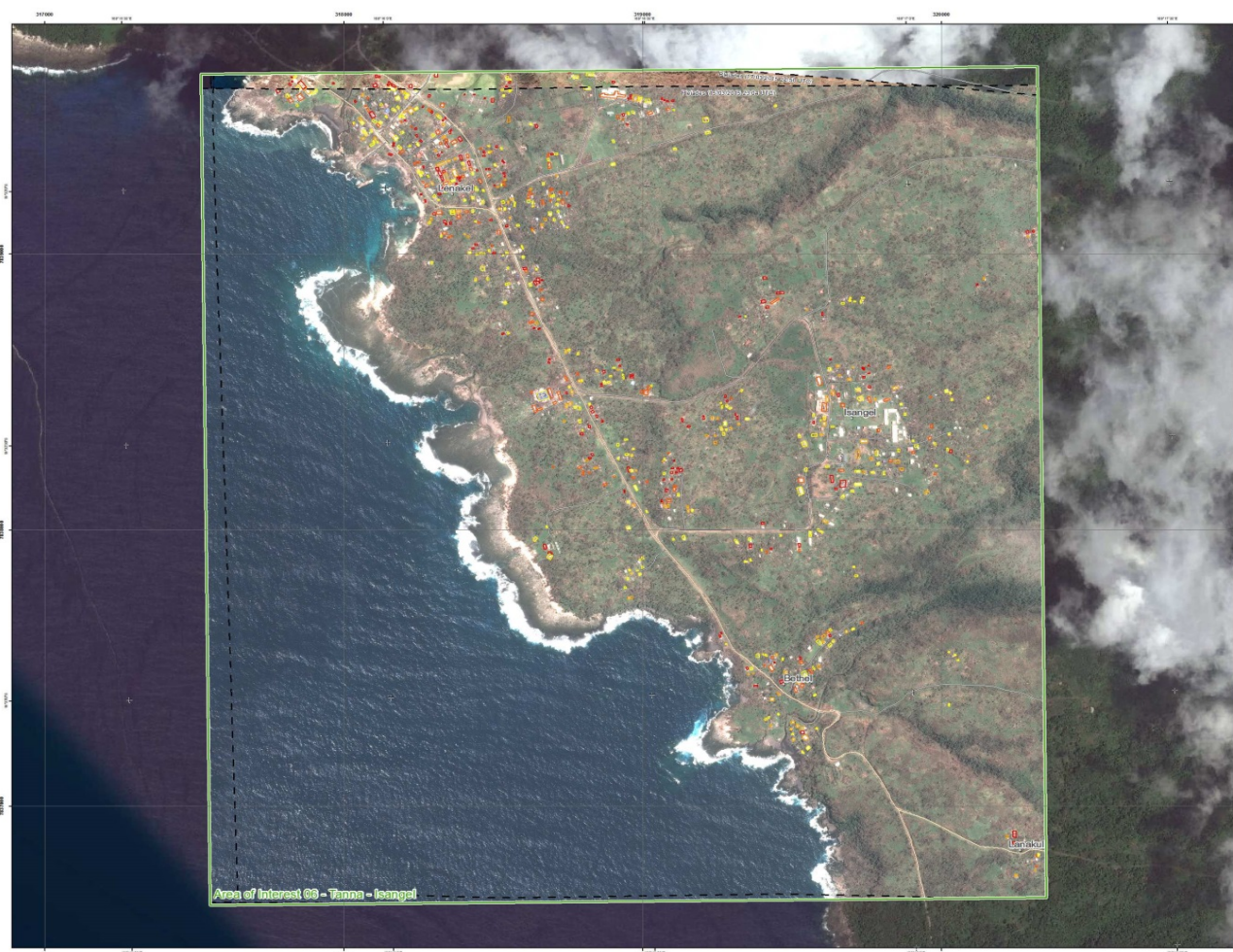
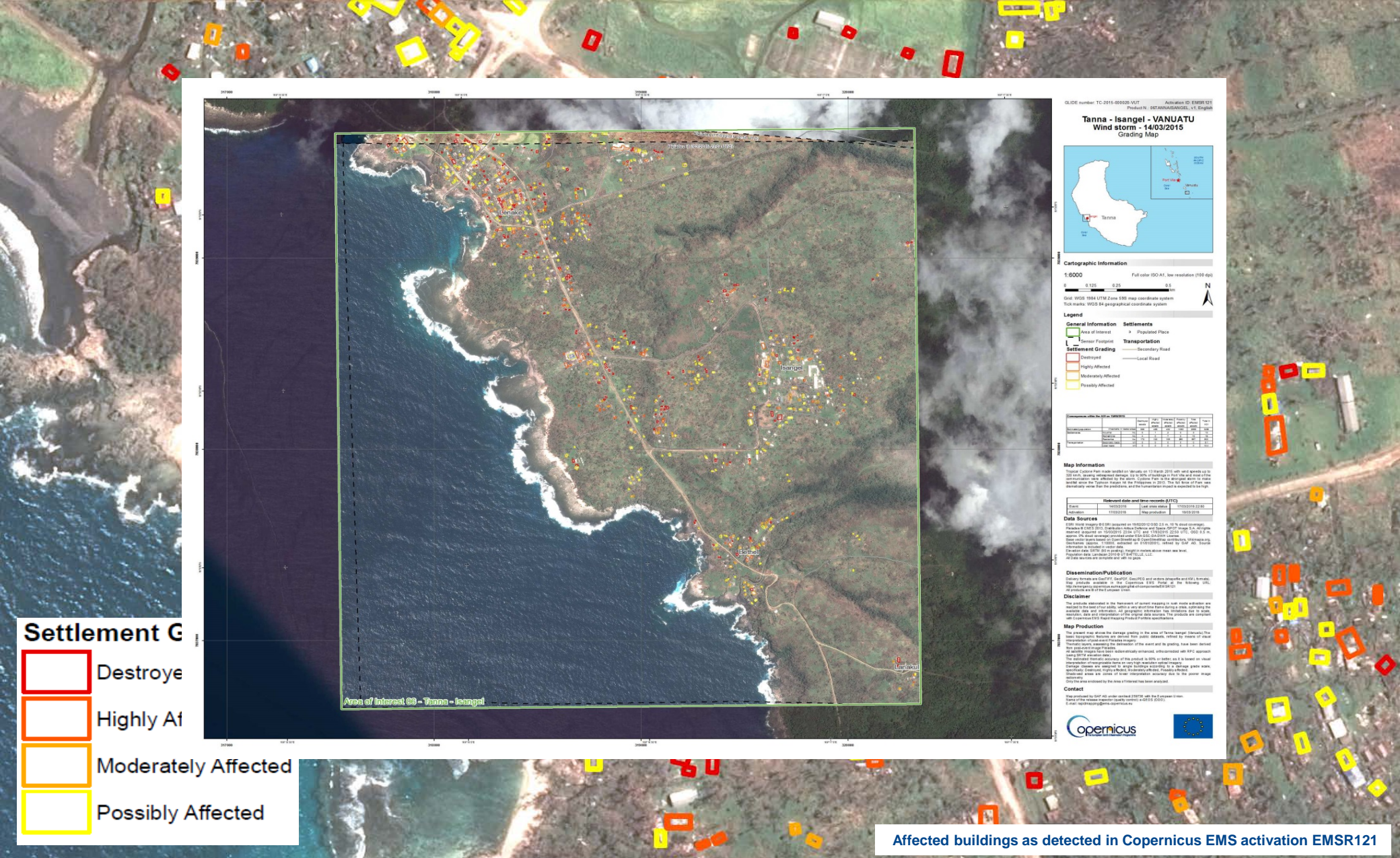


Tanna Island, Vanuatu





Post event image 17/03/2015 Pleiades 2.5m



GLIDE number: TC-2015-00009-VUT Activation ID: EMSR121
Product: ESTANNAISANGEL_v1.1_English

Tanna - Isangel - VANUATU Wind storm - 14/03/2015 Grading Map

Cartographic Information
Full color ISO A1, low resolution (160 dpi)
Scale: 1:6000
Grid: WGS 1984 UTM Zone 50E map coordinate system
Tick marks: WGS 84 geographical coordinate system

Legend

General Information	Settlements	Transportation
Area of Interest	Populated Place	Primary Road
Source Footprint	Secondary Road	Local Road
Destroyed		
Highly Affected		
Moderately Affected		
Possibly Affected		

Map Information
Copernicus EMS activation on 14/03/2015 with a spatial scale of 1:6000. Grading map showing the damage to the roads in the area of interest. The map shows the damage to the roads in the area of interest. The map shows the damage to the roads in the area of interest.

Product	Version	Created	Modified	Author	Reviewer
Grading Map	1.0	14/03/2015	14/03/2015

Data Sources
Copernicus EMS activation on 14/03/2015 with a spatial scale of 1:6000. Grading map showing the damage to the roads in the area of interest. The map shows the damage to the roads in the area of interest.

Dissemination/Publication
This product is available in the Copernicus EMS Portal at the following URL: <http://www.copernicus.eu/portal/activation/estanna-isangel>

Map Production
This product is available in the Copernicus EMS Portal at the following URL: <http://www.copernicus.eu/portal/activation/estanna-isangel>

Contact
Copernicus EMS activation on 14/03/2015 with a spatial scale of 1:6000. Grading map showing the damage to the roads in the area of interest. The map shows the damage to the roads in the area of interest.

Settlement Grading

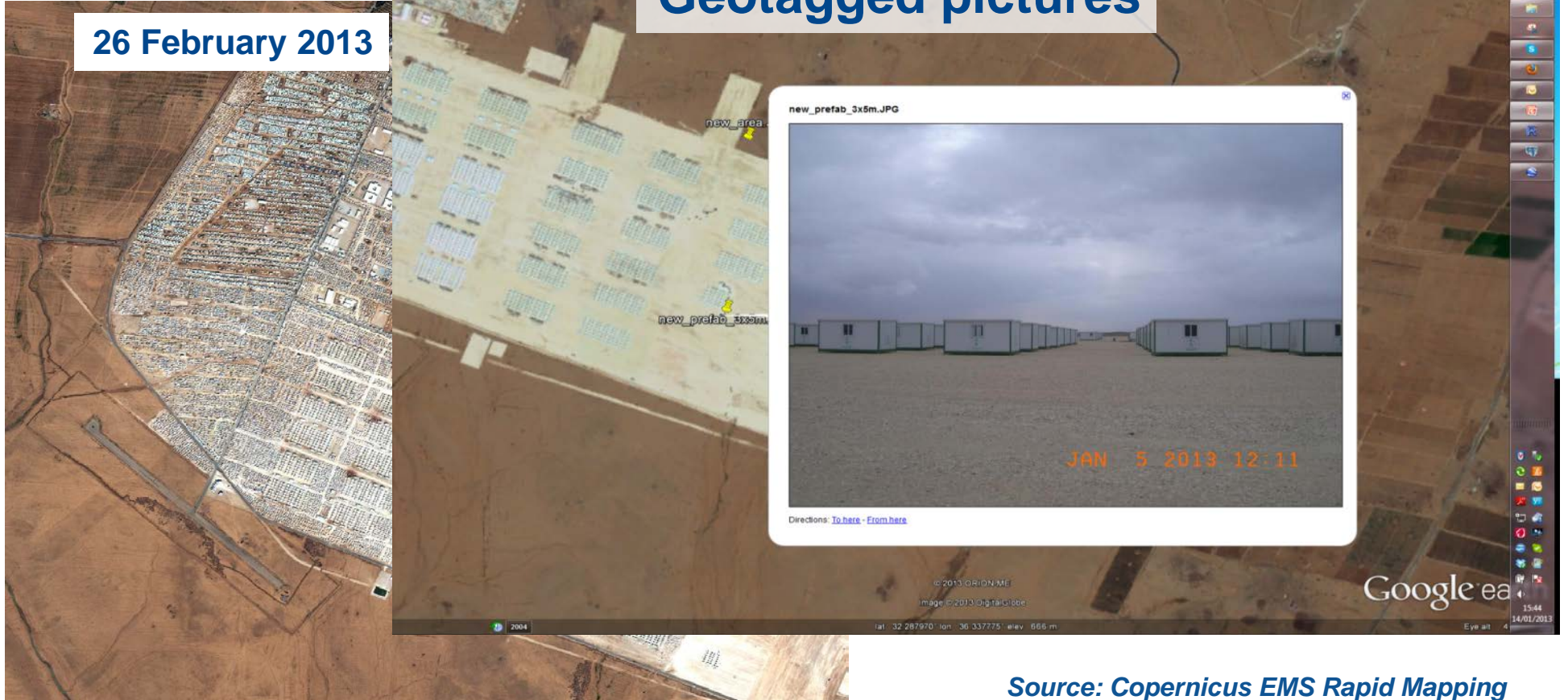
- Destroyed
- Highly Affected
- Moderately Affected
- Possibly Affected

Humanitarian Aid

IDP camp near Al M

26 February 2013

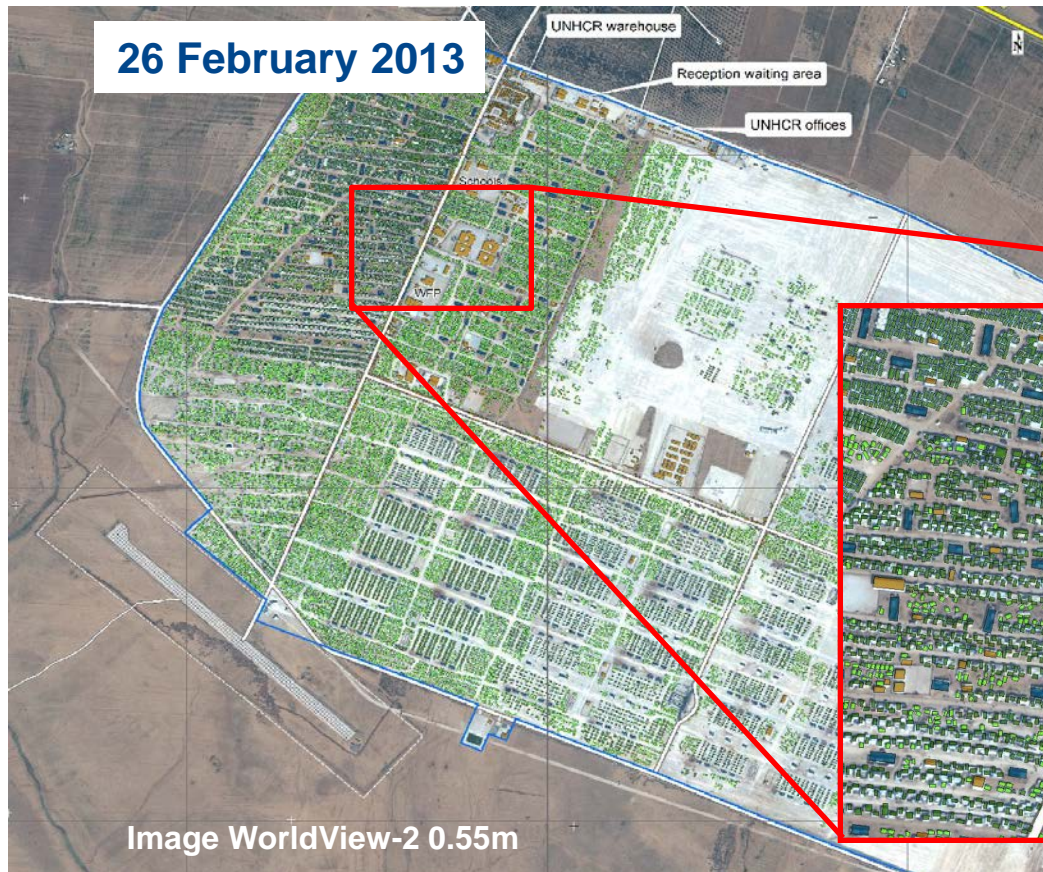
Geotagged pictures



Source: Copernicus EMS Rapid Mapping
activations EMSR014, EMSR025

Humanitarian Aid

IDP camp near Al Mafrq (Jordan)



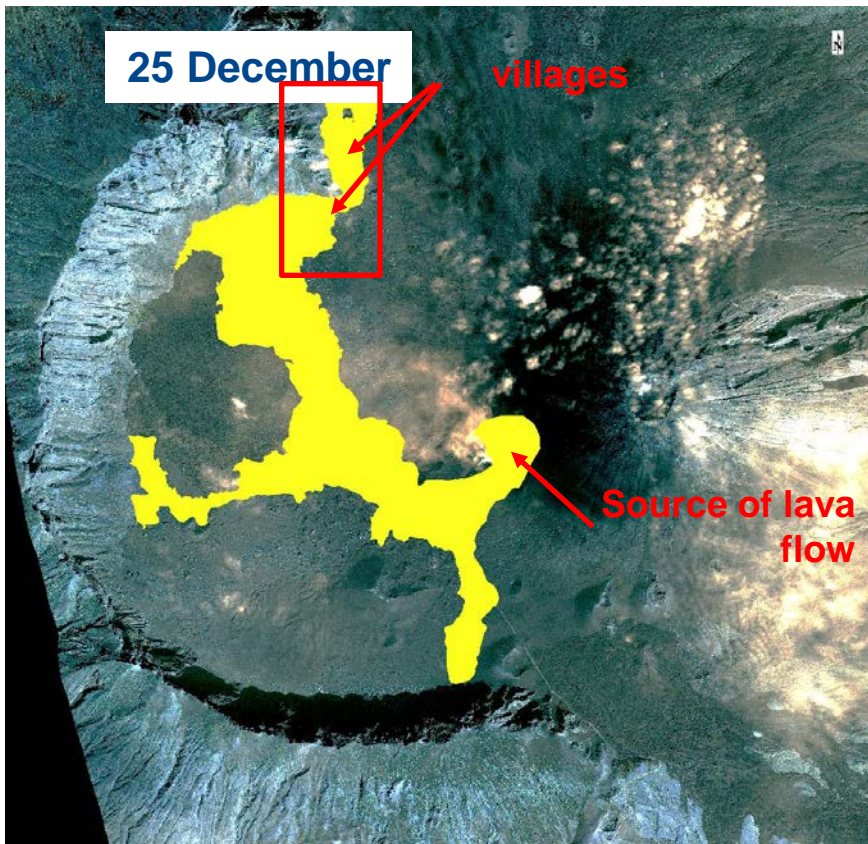
- Reference map => camp delineation, identification of building footprints, infrastructure

Facilities within the camp on date 26/02/2013	
Shelter	8091
Tent	15403
Washing Facility	364
Other Infrastructure	903
Total	24761

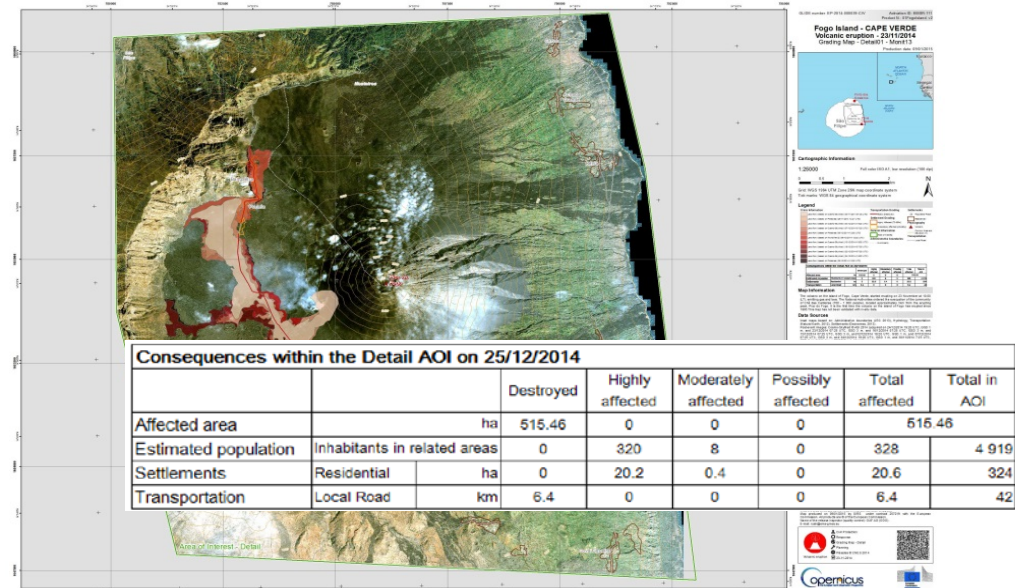


Volcanic eruption

Fogo Island (Cape Verde), November-December 2014

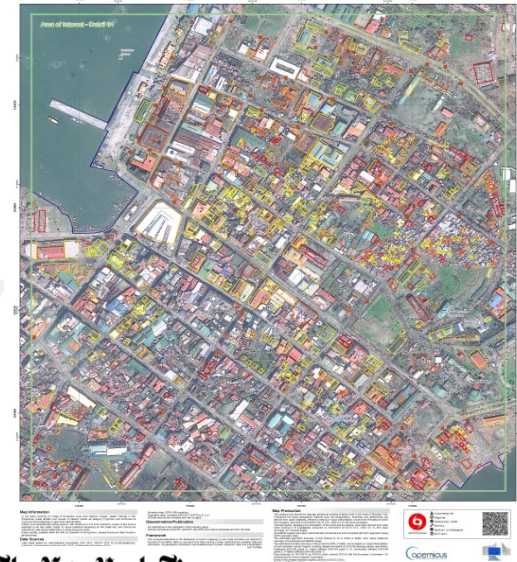
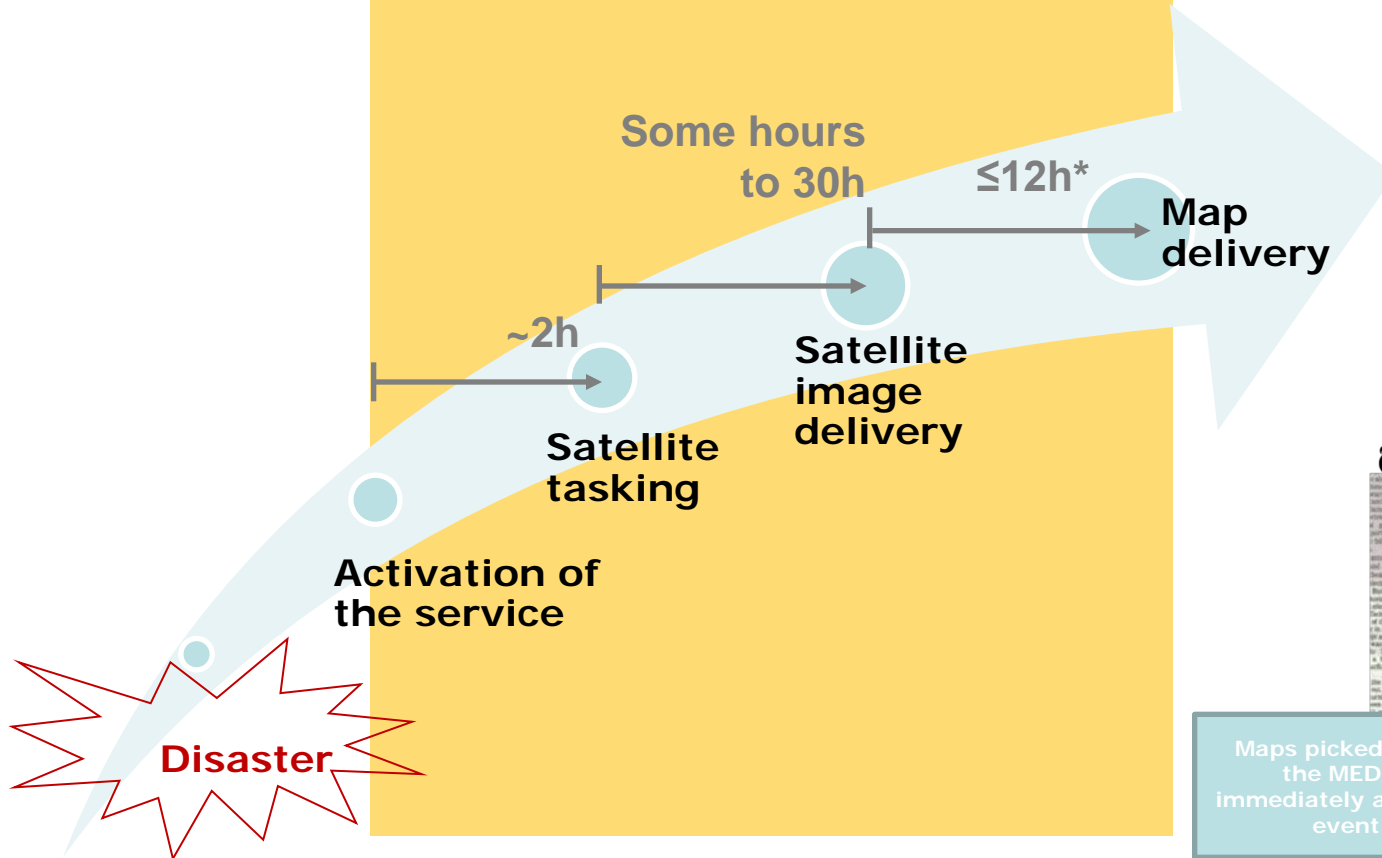


- Monitoring of the lava flow extent for one month mainly from Radar data
- Evacuation of two villages in the caldera



Timeline

EMS Rapid Mapping



Maps picked up by the MEDIA immediately after the event

* Production time in service level 1

Emergency Management Service (EMS) has two components:

▶ **Mapping**

- **Rapid Mapping**
- **Risk & Recovery**

▶ **Early Warning**

- **EFAS (floods)**
- **EFFIS (forest fires)**





Copernicus Emergency Management Service

Which contribution can Risk & Recovery mapping make?

Provides on-demand geospatial information supporting emergency management activities not related to the immediate response. It addresses prevention, preparedness, disaster risk reduction and supports the recovery phase.

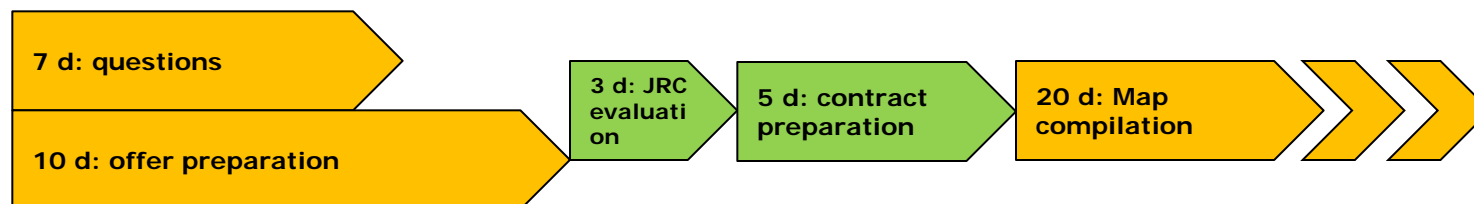
Product delivery phase: 35 days (15 + 20)

MAP TYPE	CONTENT	DELIV. TIME
REFERENCE	Detailed status of the territory and assets. <ul style="list-style-type: none"> E.g. Topographic features and specific information, e.g. land use zoning plans, mitigation measures 	20d(#)
PRE - DISASTER	Relevant info to help planning for contingencies on vulnerable areas <ul style="list-style-type: none"> E.g. Hazard exposure to hazardous events; Vulnerability / resilience of settlements and buildings; Risk status for population and assets; Evacuation plans; Forecasts; Alerts 	20d(#)
POST - DISASTER	Relevant thematic information, beyond the immediate response phase <ul style="list-style-type: none"> E.g. Hazard exposure to hazardous events; Vulnerability / resilience of settlements and buildings; Risk status for population and assets; Post disaster needs assessment; Recovery plans; Reconstruction / rehabilitation monitoring; IDP monitoring (IDP camps, IDP movements). 	20d(#)

(#) working days after signature of a specific contract, which may require normally 15 days after the service request

New timeliness

- ★ After receipt of Technical Annex the Service Providers (SP) have these deadlines:
- ★ 7 working days for posing questions
- ★ 10 working days for sending an offer
- ★ JRC: Evaluation (3 days), preparation of contract (5 days)
- ★ SP: 20 working days from contract signature
- ★ Open: which working days calendar is applied?

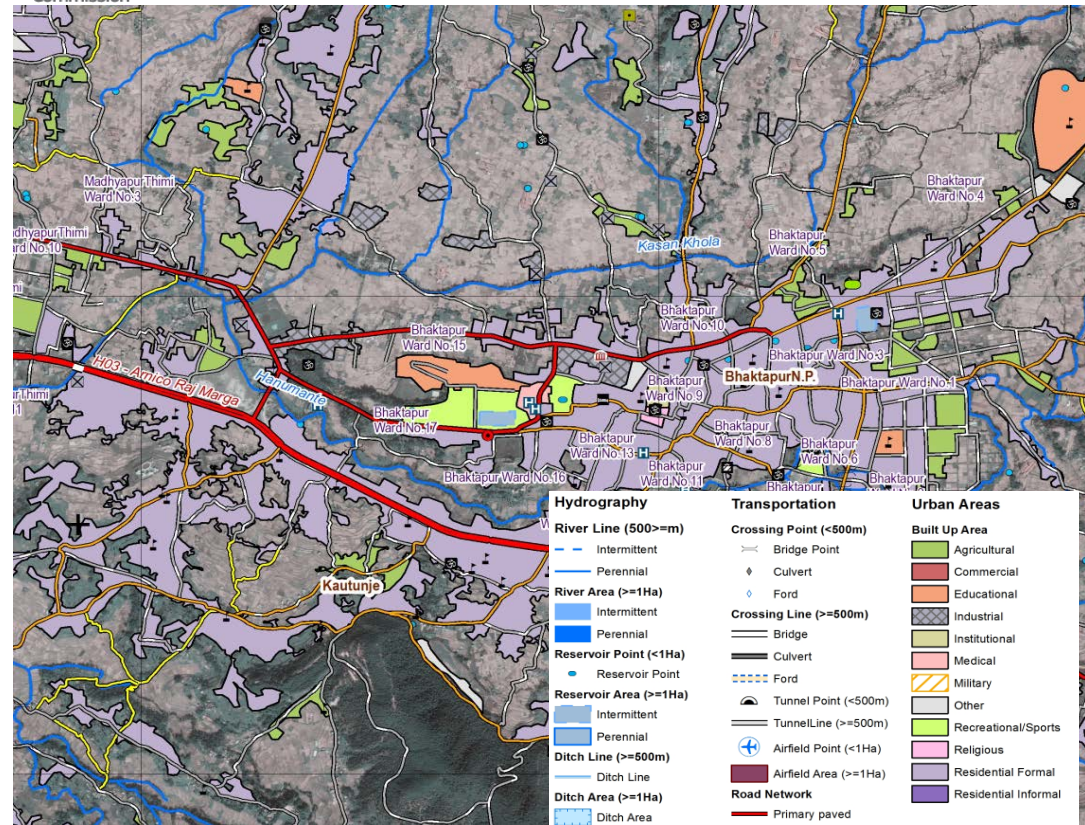


Reference Maps



Aim: Providing comprehensive knowledge of the territory and assets in the context of prevention, preparedness, disaster risk reduction and recovery.

Topographic features
Disaster risk information
Other available information for crisis management



EMSNO12: Kathmandu – Bhaktapur, Nepal, reference map, 2014, scale: 1:25,000.

Typical key features of reference maps (not exclusive)

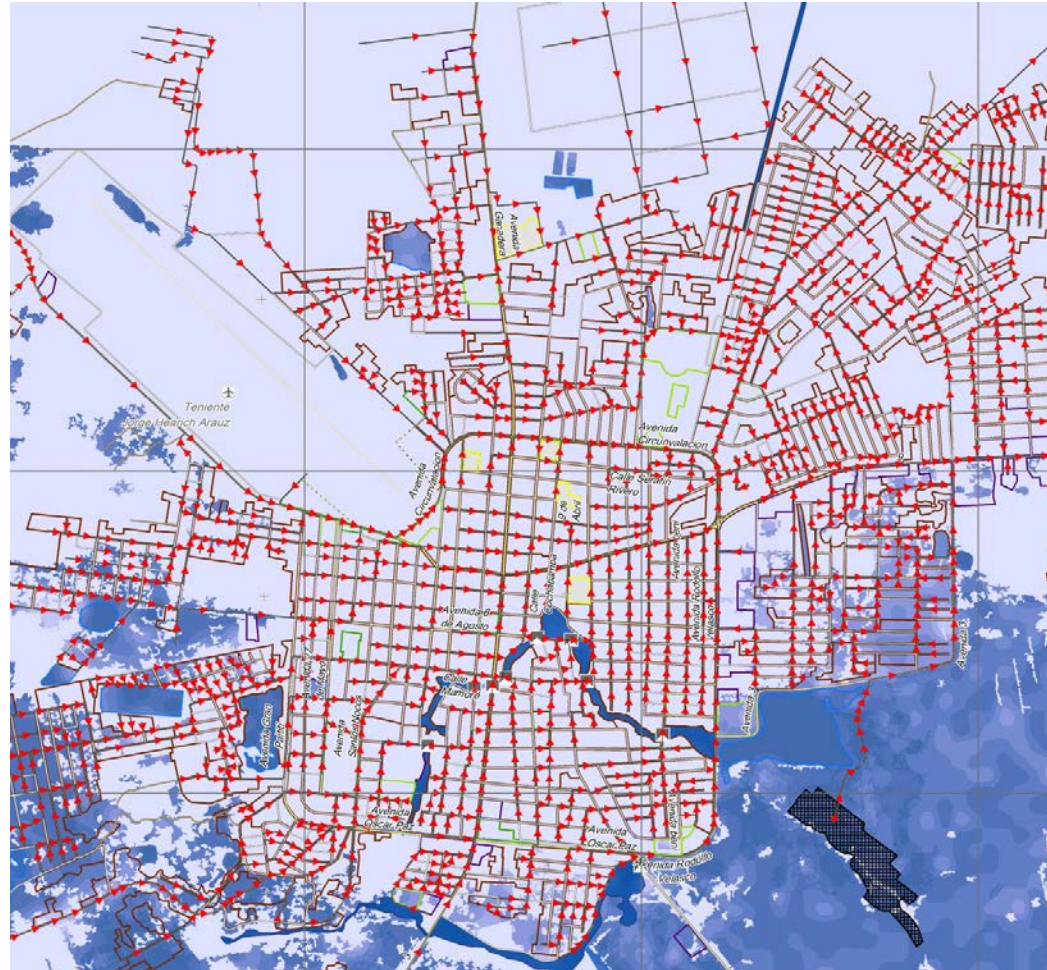
Hydrology	Transport	Population-related (incl. Industry & Utilities)	Land cover & Physiography
Rivers	Railways	Toponyms	Woodland
Canals	Roads	Administrative boundaries	Natural vegetation
Lakes	Cart tracks	Built-up areas	Cropland
Reservoirs	Bridges	Settlements	Grassland
Open Water	River crossing points	Processing / industrial plants	Scrub
Shorelines	Airfields	Pipelines	Bare soil
Dams	Runways	Power lines	Snow/Ice
Wells	Ports	Power stations	Floodplains
Ponds			Void Areas
			Contours, spot heights
			Cliffs

Pre-disaster maps



★ Aim : Provide relevant and up-to-date thematic information that can help civil protection and humanitarian aid agencies plan for contingencies and areas vulnerable to hazards.

★ Examples: Hazard exposure, Vulnerability or resilience, Risk status for population and assets, Evacuation plans



EMSN014: Rio Mamore, Trinidad, Bolivia, Flood risk assessment, 1/11/2014, scale: 1:20,000.

Post-disaster maps



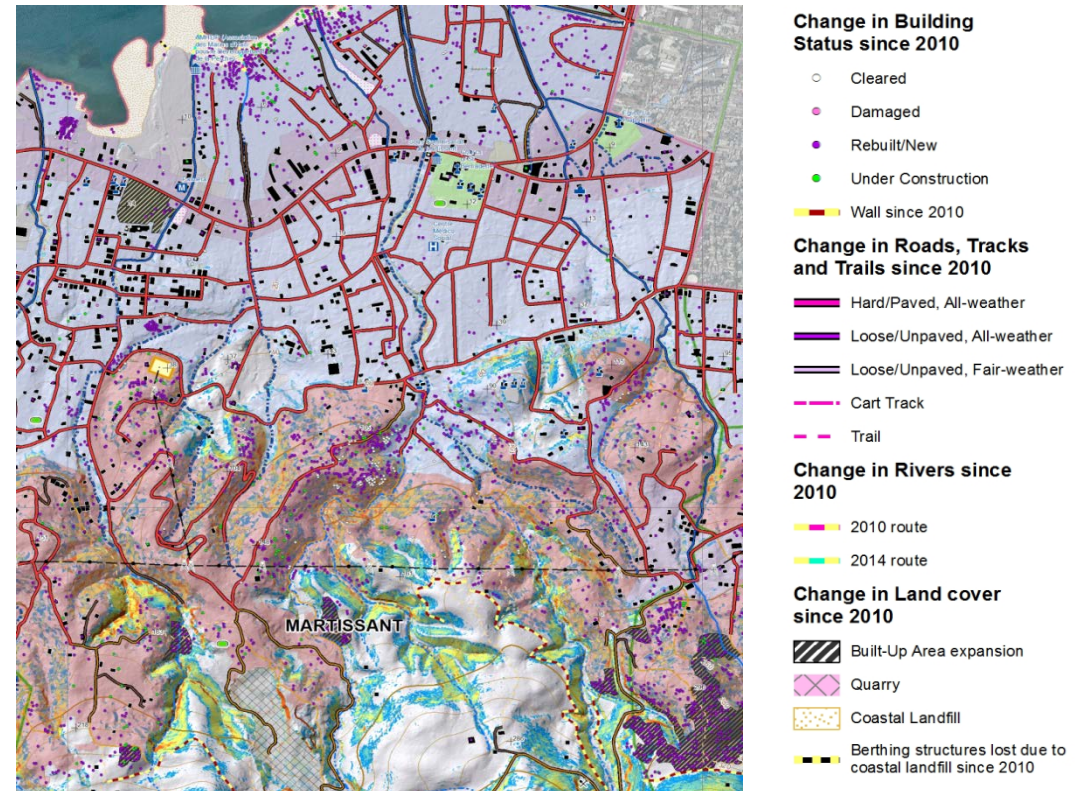
Provide relevant and up-to-date thematic information beyond the immediate response phase.

- Topographic features
- Disaster risk information
- Specific information regarding recovery needs, reconstruction planning and progress monitoring, long-term impact

Examples:

Hazard exposure and vulnerability and risk status of (in particular) new assets.

Post-disaster needs assessment, recovery plans, reconstruction/rehabilitation monitoring

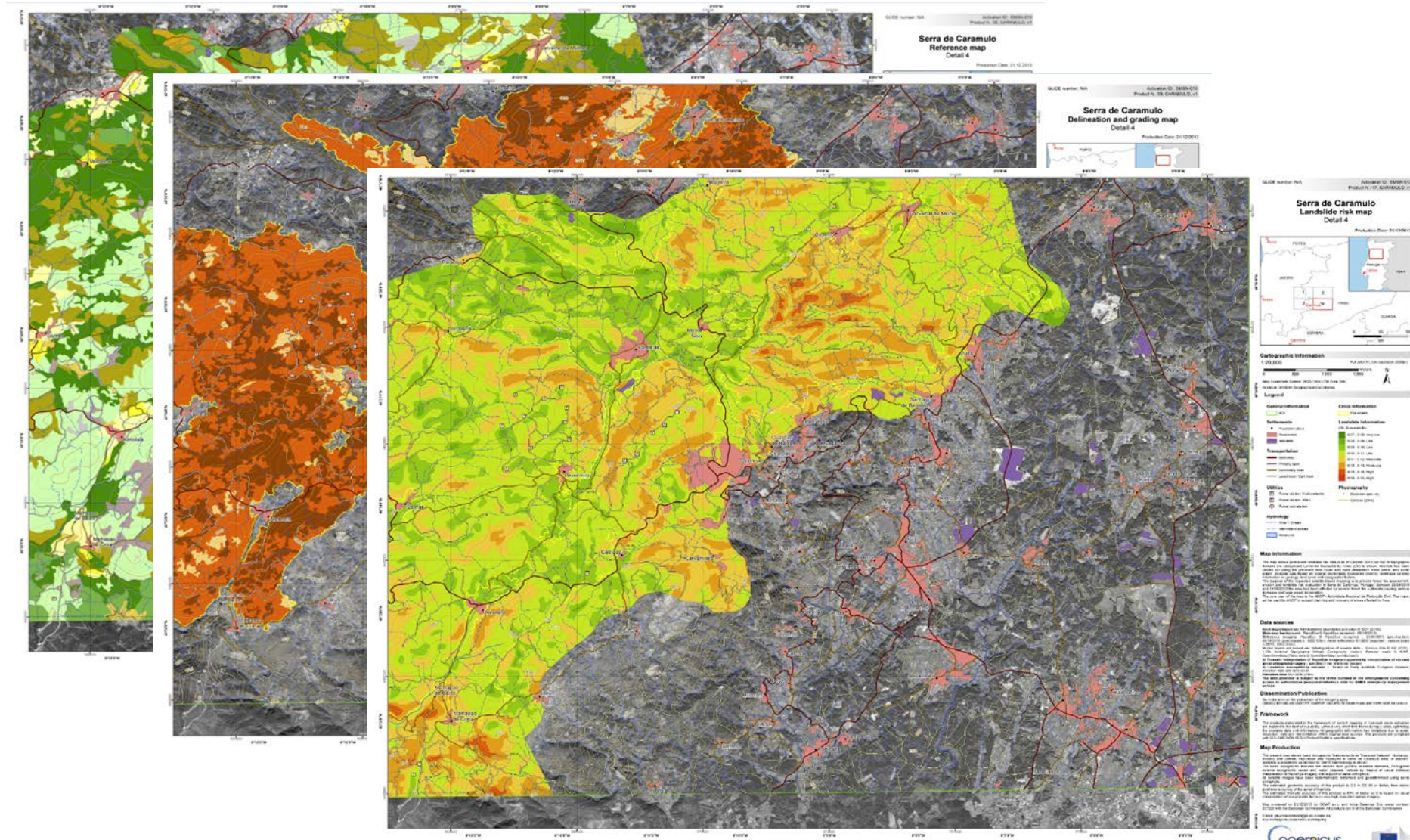


EMS013: Martissant/Carrefour Feuilles/Baillergeau, Haiti, Reference Map Thematic Change 2010 - 2014, scale: 1:10,000.

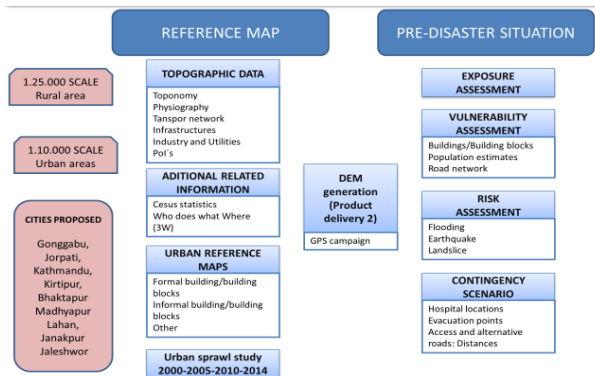


European
Commission

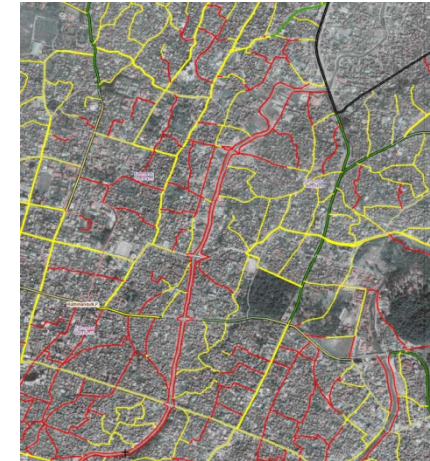
Forest fire (pt) Sierra de Caramulo analysis



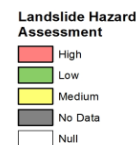
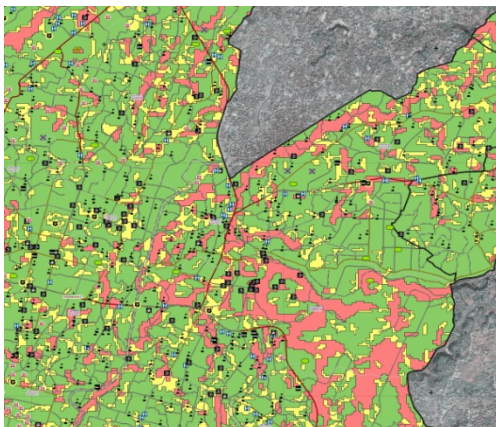
Example - EMSN012: Preparedness, disaster risk assessment and disaster risk reduction covering districts of: Kathmandu/Bhaktapur, Dhanusa, Siraha and Mahottari



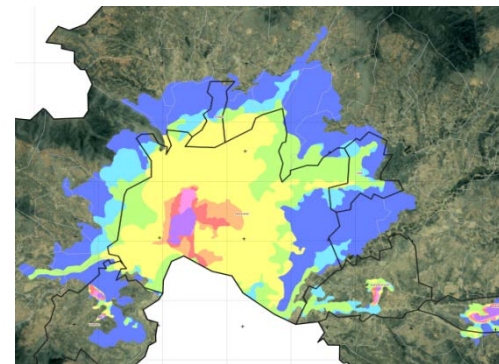
EMSN012: Kathmandu – Bhaktapur, Nepal. Overview of generated products. Next to a map set of reference maps, several pre-disaster map sets have been created, covering exposure, vulnerability and risk assessment including a contingency scenario. In addition a DEM has been derived.



EMSN012: Kathmandu – Bhaktapur, Nepal. Road network vulnerability. The methodology for generating this map is based on geology type, road hierarchy and surface, and the frequency of bridges.



EMSN012: Kathmandu – Bhaktapur, Nepal. Landslide hazard exposure. The methodology for generating this map is based on landslide hazard index computation using slope factor, lithological factor, soil moisture conditions factor and precipitation factor.



EMSN012: Kathmandu – Bhaktapur, Nepal. Urban Sprawl. This map shows the urban sprawl of Kathmandu, Bhaktapur, Kirtipur, Madhyapur Thimi, Jorpati and Gonggabu cities between 1972 and 2014, understanding as urban area a continuous aggregation of buildings with high-medium density of houses that can be observed in the Landsat imagery. These cities belong to Kathmandu and Bhaktapur

Integration of aerial platforms for image acquisition in Copernicus Emergency Management Service (EMS)

- Pilot activities on role of (un) manned aerial platforms is launched beginning of 2015 in complement or alternative to satellite sensors during specific disasters
- Assessment of UAS deployment mechanisms and legislation and regulation will be addressed
- Integration of UAS and airplanes in Copernicus EMS will be tested for potential scale-up after 2015

LOT 1 UAV mapping

- 10 cm resolution
- Up to 40 km² a day
- Price per km²

LOT 2 : manned aerial

- 10 to 20 cm resolution
- Up to 625 km²
- Price per fixed module

<i>GSD 10 cm</i>
5 km x 5 km
10 km x 10 km
<i>GSD 20 cm</i>
10 km x 10 km
25 km x 25 km

Deliverables

Ortho rectified imagery (RGB or NIR) + Digital elevation model or Digital surface model

Delivery and deployment time

Request by DG JRC through a dedicated order form.

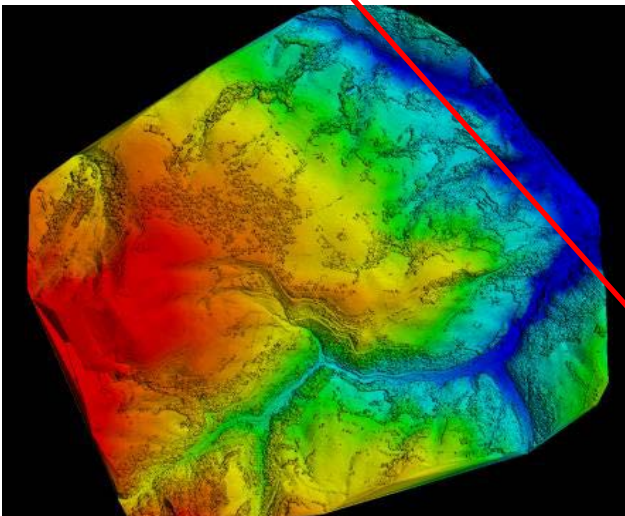
After signature by both parties the contractor has 48 Hr to deliver.

Communication protocol to monitor the work

24 September 2015

Mapping Landslides using UAS

*Bosnia
& Herzegovina Floods*



The Copernicus Emergency Service

- ★ <http://www.copernicus.eu/>
- ★ <http://www.emergency.copernicus.eu>