



## JRC CONFERENCE AND WORKSHOP REPORTS

# 2017 User Workshop of the Copernicus Emergency Management Service – Summary Report

*Workshop held on 20-21  
June 2017 at JRC Ispra*

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## List of abbreviations and definitions

AOI	Area of Interest (area of analysis)
AU	Authorised User
CSC-DA	Copernicus Space Component - Data Access
DG ECHO	European Commission Directorate General Humanitarian Aid & Civil Protection
DG GROW	European Commission Directorate General Internal Market, Industry, Entrepreneurship and SMEs (former DG ENTR)
DWH	ESA's Data Warehouse
EC	European Commission
EEA	European Environment Agency
EEAS	European External Action Service
EFAS	European Flood Awareness System (EMS Early Warning component)
EFFIS	European Forest Fire Information System (EMS Early Warning component)
EndU	End User
EMS	Copernicus Emergency Management Service
EMSN	Activation code for Risk & Recovery Mapping activations
EMSR	Activation code for Rapid Mapping activations
EMSV	Activation code for Validation exercises
EO	Earth Observation
ERCC	Emergency Response Coordination Centre operating within DG ECHO
ESA	European Space Agency
GIO	GMES Initial Operations
JRC	European Commission Directorate General Joint Research Centre
RM	Rapid Mapping module of the EMS Mapping component
RRM	Risk & Recovery Mapping module of the EMS Mapping component
SFTP	Secure File Transfer Protocol
SP	Service Providers (providing RM, RRM and Validation services)
UAS	Unmanned Aerial Systems
UAV	Unmanned Aerial Vehicle
VAL	Validation module of the EMS Mapping component
VHR	Very high resolution data

## **Acknowledgements**

The workshop organisers would like to thank all participants for the fruitful exchange during this workshop. The annual user workshop is a unique occasion to bring together users and all actors on the service side, i.e. the Commission as service coordinator and the service and data providers. Special thanks go to the users and service providers for their valuable input, and the JRC EMS Mapping team who prepared and shaped the content of this workshop and its main output, the colleagues of our partner EC Directorate Generals GROW and ECHO for their input.

We would like to extend our gratitude to those who made this workshop possible and in particular the JRC Disaster Risk Management Unit of Directorate E which hosted the workshop, and in particular Gabriela Bruma, Regina Corradini and Cristina Mottalini for the smooth administrative organisation.

## Abstract

This report summarises the User Workshop of the Copernicus Emergency Management Service (EMS) – Mapping component which was held on 20-21 June 2017 at the Joint Research Centre (JRC) in Ispra, Italy. The User Workshop is the annual forum at which users, service providers, the Commission and other stakeholders exchange views and experiences of the Copernicus EMS - Mapping component. It was attended by 50 participants from across Europe, of whom eighteen were users of this service component. The focus of the User Workshop was on the two on-demand Mapping services - i.e. "Rapid Mapping" and "Risk and Recovery Mapping" - which provide geo-spatial information in support to all phases of disaster management. The information is mainly derived from satellite imagery and complemented by available ancillary data.

During the first day of the Workshop, the focus was on providing insights in the technical and scientific capacity of the "Risk & Recovery" Mapping service, which delivers maps and analysis in support of disaster risk reduction, preparedness and prevention, recovery and reconstruction. The aim of this part of the Workshop was to increase awareness of this service module, which is less known than the "Rapid Mapping" service - the "24/7" (i.e. always on) service supporting emergency response operations. Users were invited to present their experience with both service modules, while a live demo of Unmanned Aerial Systems (UAS), was made, in order to show the potential of these platforms in the context of the fast provision of airborne imagery in an emergency situation.

The second day of the Workshop addressed the evolution of Copernicus EMS - Mapping. Two Horizon 2020 projects were introduced and discussed: while iREACT (<http://www.i-react.eu/>) looks at exploiting advanced cyber technologies for disaster management, E2mC (<https://www.e2mc-project.eu/>) focuses on exploiting social data and crowdsourcing for use in Rapid Mapping.

Other evolution-related topics addressed were links with the two Copernicus EMS Early Warning Systems (i.e. the European Flood Awareness System and the European Forest Fire Information System), product dissemination and potential new products. All topics were further discussed in groups. As every year, the discussions at the User Workshop are summarised and processed by the JRC, with a view to guiding the overall evolution of the service.

The workshop agenda and presentations are available at: <http://emergency.copernicus.eu/mapping/ems/copernicus-ems-mapping-user-workshop-2017>

# 1 Introduction

This report summarises the 2017 edition of the user workshop of the Mapping component of the Copernicus Emergency Management Service (EMS), one of the six Copernicus core services. The workshop was held on 20-21 June 2017 at the European Commission (EC) Joint Research Centre (JRC) in Ispra, Italy. The workshop focused on the Mapping component of EMS and aimed at exchanging with Authorised Users and End Users, the three EC Directorate Generals involved in the service coordination (GROW, ECHO, JRC), service providers and other stakeholders (ESA) views and experiences with the service component. The focus this year was on exchanging on user experiences and potential of the Risk & Recovery Mapping module, synergies with the other CEMS components EFFIS and EFAS, new developments and related Horizon 2020 projects. Among the 50 participants there were 18 users from 11 countries.

The JRC is implementing the service in the frame of the Administrative Agreement and related sub-cross delegation with DG GROW (JRC No. 33539-2014 NFP). Since the start of operations in April 2012 JRC is the technical coordinator of the service. In February 2015 the second phase started with some improvements of the service portfolio. The service is planned to continue in the current set-up until 2019 with service framework contracts for Rapid Mapping and Risk & Recovery Mapping ending in January 2019, and for Validation ending in January 2020. In view of this, but not only, the annual user workshop serves for collecting feedback feeding into the evolution of the service.

The user workshop is one important channel for feedback collection in addition to the more frequent feedback collection through user feedback forms (after each RM and RRM service activation) and during interviews in the frame of the validation exercises (for selected activations only). It is unique in the sense that it allows collecting interactive feedback and not only from those who are frequently using the service but also from those who have for one reason or another not yet used the service. As every year, some of those who have actually used the service were invited to present their experience.

The workshop was structured to give room to both users to present their experience with the service and to all participants for discussing the current status of the service and its possible evolution. This report aims at providing an overview of the topics addressed, discussions and main conclusions which are input to the overall evolution of the service. All presentations are available at:

<http://emergency.copernicus.eu/mapping/ems/copernicus-ems-mapping-user-workshop-2017>.

## **2 Workshop Agenda**

The agenda of the workshop is provided in Table 1. During the first day of the Workshop, the focus was on providing insights in the technical and scientific capacity of the Risk & Recovery Mapping service, which delivers maps and analysis in support of disaster risk reduction, preparedness and prevention, recovery and reconstruction. The aim of this part of the Workshop was to increase awareness of this service module, which is less known than the Rapid Mapping service - the "24/7" (i.e. always on) service supporting emergency response operations. Users were invited to present their experience with both service modules, while a live demo of Unmanned Aerial Systems (UAS) was made, in order to show the potential of these platforms in the context of the fast provision of airborne imagery in an emergency situation.

The second day of the Workshop addressed the continuing evolution of Copernicus EMS - Mapping. Two Horizon 2020 projects were introduced and discussed: while iREACT (<http://www.i-react.eu/>) looks at exploiting advanced cyber technologies for disaster management, E2mC (<https://www.e2mc-project.eu/>) focuses on exploiting social data and crowdsourcing use in Rapid Mapping. Other evolution-related topics addressed were links with the two Copernicus EMS Early Warning Systems (i.e. the European Flood Awareness System and the European Forest Fire Information System), product dissemination and potential new products. All topics were further discussed in break-out sessions for which a summary is provided in section 3.



**Table 1. Agenda of the 2017 EMS Mapping User workshop.**

<b>Tuesday 20 June</b>		
<b>Timing</b>	<b>Item</b>	<b>Speakers</b>
09:00 – 10:00	Welcome coffee and introduction of participants	I. Clark, F. Villette, ALL
10:00 – 11:15	Status of the four Mapping modules	A. Wania, P. Spruyt, M. Broglia
<b>11:15 – 11:30</b>	<b>Coffee break</b>	
11:30 – 12:30	Technical and scientific capacity of Risk & Recovery Mapping presented by the service providers (part I): <ul style="list-style-type: none"> <li>- Airbus Defence &amp; Space</li> <li>- Indra</li> </ul>	S. Clandillon A. Utanda
<b>12:30 – 13:30</b>	<b>Lunch</b>	
13:30 – 14:00	Technical and scientific capacity of Risk & Recovery Mapping presented by the service providers (part II): <ul style="list-style-type: none"> <li>- Geoapikonisis S.A.</li> </ul>	D. Aifantopoulou
14:00 – 14:30	Risk & Recovery Mapping user experience from Germany	F. Löw
14:30 – 14:45	Open discussion on Risk & Recovery Mapping	ALL
<b>14:45 – 15:10</b>	<b>Coffee break</b>	
15:10 – 16:00	Rapid Mapping user experience: <ul style="list-style-type: none"> <li>- Arpa Piemonte</li> <li>- Fondazione Edmund Mach</li> </ul>	L. Lanteri L. DeLucchi
16:00 – 18:00	Unmanned aerial systems (UAS) mapping devices (live demo)	P. Spruyt, R. Zielinski
<b>20:00</b>	<b>Social Dinner at Hotel Villa Borghi</b>	
<b>Wednesday 21 June</b>		
09:00 – 09:30	UAS devices: presentation of results from previous day and future developments for aerial capacity	P. Spruyt
09:30 – 9:50	H2020 projects: iREACT	F. Scullino
09:50 – 10:10	H2020 projects: E2mC	D. Grandoni
10:10 – 10:55	Synergies with the other EMS components: <ul style="list-style-type: none"> <li>- European Flood Awareness System (EFAS)</li> <li>- European Forest Fire Information System (EFFIS)</li> </ul>	P. Salamon T. Artés Vivancos
<b>10:55 – 11:15</b>	<b>Coffee break</b>	
11:15 – 11:30	Product dissemination (delivering maps versus delivering data)	S. Dalmasso
11:30 – 11:45	Service improvement	M. Broglia, M. Rossi
11:45 – 12:45	Introduction to new potential products	A. Steel, U. Donezar, D. Grandoni
<b>12:45 – 13:45</b>	<b>Lunch</b>	
13:45 – 15:30	Group discussions	ALL
<b>15:30 – 15:45</b>	<b>Coffee break</b>	
15:45 – 16:00	Summary of the discussions	JRC
16:00 – 16:15	Conclusions of the workshop	JRC

### **3 Summary of Group Discussions (Day 2)**

This session was designed to collect detailed and direct feedback from participants during discussion in small groups. The discussion was organized following the “World

café” approach<sup>1</sup> with participants rotating between each of the following three groups (“tables”):

1. Risk & Recovery Mapping,
2. Product Access/dissemination,
3. Potential new products.

The time for discussion in each group was set to 20 min. A summary of each group is provided in the following sections.

### **3.1 Risk & Recovery Mapping**

Overall, the workshop was a very good occasion to discuss the service module with service providers, current and future users. Participants expressed the wish to have such discussions repeated ideally with more time. As an outcome of discussion panels several suggestions for service improvement were made:

- improve communication with users about activation status and progress, at any stage, in order to support better understanding of the process, expected result and time frame;
- enhance communication between the service provider and the user;
- better communicate the portfolio of the service, using material from existing activations, to provide a potential user with an inspiration for future activation;

Additionally a positive feedback was received to ongoing changes into the service, namely:

- focusing on vector data as deliverables instead of the numerous printout maps in various data formats. This change allows easy product integration in GIS environment on user site, sharing data, reusing and combining it with other data;
- data dissemination of RRM products by shifting from a traditional map concept throughout vector data to interactive mapping service (i.e. online viewer).

Users also shared problems on their side which are affecting the decision process previous to an activation request (cross institutional, etc.).

### **3.2 Product Access/Dissemination**

Below follows a short report on the discussion about data dissemination platforms, following the demo of the Activation Viewer prototype done during the workshop (Product dissemination).

Some initial questions were asked to the audience but other additional topics were raised during the discussion.

Currently, users access Mapping products (raster and vector) through SFTP or the EMS portal (file download). In future, access will be provided also through web services and interactive web maps.

- 1. Do you prefer to use the data on line on a web client or locally using ArcGIS/QGIS?*

All the users expressed the importance of both web and local data use. In particular web is important for preview and for showing results to management and non GIS skilled users while the possibility to get vector data and WMS streams is relevant for data analyst that load data in a local GIS installation. The advantage of WMS data is that it is pre styled and doesn't require any further work, on this topic it would be appreciated to ship the style descriptor file along with the zipped vector package to who prefers to work in local GIS applications.

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<sup>1</sup> [https://en.wikipedia.org/wiki/World\\_Caf%C3%A9](https://en.wikipedia.org/wiki/World_Caf%C3%A9)

Some improvements to the demonstrated prototype Activation Viewer were suggested like the possibility to download all data for a given AOI or all the layers of a specific type (i.e. crisis points) for the whole activation.

For satellite images it would be very useful to share a unified layer (mosaic) of the whole activation together with the current setup which shares one satellite image per AOI. This would be useful to who wants to use satellite images as WMS background in their local GIS, in order to have the activation coverage with one single layer.

*2. Do you think that the satellite images used for the analysis are useful for your work?*

All users agreed that this is very important and well appreciated. Major interest is in the WMS endpoint for local GIS integration. The freedom from license restriction is extremely important for people working in the field not related to an entity that can get original RAW data.

*3. What data formats would you expect to be able to get? (Kml, csv, excel, xml, rasters, etc)*

All users highlighted that the WMS is the most important format together with vector packages but also other vector formats (WFS) like geoJSON so that can be integrated in DIAS<sup>2</sup> cloud infrastructures.

The zipped vector files should contain a license text file, the style descriptor file.

Seems that the 200dpi maps format is not necessary, 100 and 300 dpi is enough, PDF is the preferred way because of the possibility to toggle layers.

*4. What kind of analysis tools would you expect in a web mapping client?*

Most of the users do not need analysis tools but in general the possibility to have population density calculations, assets and land cover analysis would be appreciated.

*5. Do you think that the possibility to save and share custom maps is useful?*

In general this is perceived as a good option.

*6. The Activation Viewer could evolve in a fully featured Geo CMS with possibility to add your own layers, documents and share it within your network. Do you think this could be interesting?*

This is perceived as an interesting feature but not a priority.

*Other suggestions and feedback*

- The users expressed concerns about how to use the WMS data when there's lack of connectivity in the field, one option discusses is to ship a storage device with the possibility to stream a pre-generated WMS cache using a wi-fi local area network. ERCC already ships USB sticks with all available data and it could be possible to upgrade it and add service crisis data and satellite images cache.
- All users requested the possibility to have a printing tool integrated in the future interactive web service (called Activation Viewer); it should be able to easily print PDF maps from the current map view in different sizes and templates.
- It is important to ship, along with the vector packages, a text file containing the reasoning for the data version/information (i.e. if is a not compliant version, monitoring, etc.)
- At the moment the Activation Viewer can only show one data version at time but some users requested the possibility to show time series for example through a

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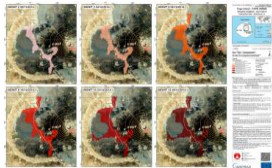

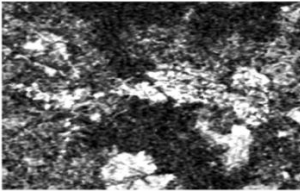


<sup>2</sup> Copernicus Data and Information Access Services

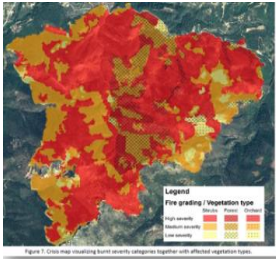
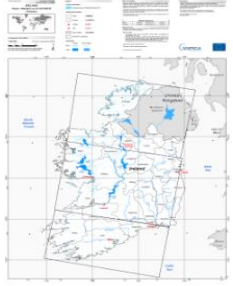
slider able to show the different data versions produces (when the versions are actually monitoring), moreover a notification mechanism (email, push notifications on mobile) for new data versions will be highly appreciated. To be noted that the EMS portal offers already mail and RSS notifications

### 3.3 Potential new products

In the various validation exercises potential new products, new visualization of crisis information or alternative approaches was explored. A selection of those was discussed based on prepared discussion materials, e.g. prototypes, examples, list of possible features. The outcomes of the discussion including a ranking by the users are provided in the following table.

**Table 2:** Summary of the outcome of the discussion table on potential new products

Product	Product example	Discussion	Rank
Monitoring mapping products		<ul style="list-style-type: none"> <li>Appreciated by the users</li> <li>Importance of using outline instead of filled polygons</li> <li>Include in each frame               <ol style="list-style-type: none"> <li>Day N and day N-1</li> <li>2 days comparison: (equal, increase, decrease)</li> </ol> </li> <li>Index</li> </ul>	1 <sup>st</sup>
Flood map + flood dynamics		<ul style="list-style-type: none"> <li>Appreciated by the users</li> <li>Feasibility depends on the possibility to publish summarized EFAS data which is normally accessed by EFAS members only</li> </ul>	2 <sup>nd</sup>
SAR coherence in building damage assessments		<ul style="list-style-type: none"> <li>Appreciated by the users and the ERCC</li> <li>Useful because works with any weather</li> <li>Drawback: accuracy is lower compared to optical</li> </ul>	3 <sup>rd</sup>
Alternative representations for damage assessment		<ul style="list-style-type: none"> <li>Appreciated by the users</li> <li>It is important to agree the best representation for each specific event/risk</li> </ul>	4 <sup>th</sup>
First guess maps		<ul style="list-style-type: none"> <li>Very high variability in the data sources. It is difficult to define requirements in a contract</li> <li>The ERCC already has access to the same and other sources</li> <li>Doubt on the usefulness</li> </ul>	5 <sup>th</sup>

Grading + land use/land cover in forest fires		<ul style="list-style-type: none"> <li>• Appreciated by the users</li> <li>• Already possible in Risk &amp; Recovery Mapping</li> </ul>	6 <sup>th</sup>
Regional coverage in flood mapping		<ul style="list-style-type: none"> <li>• It can be useful for large events only and if related to the peak impact</li> <li>• As the large extent entails high variability of the territorial geography, the service providers considers this product feasible only as "best effort"</li> </ul>	7 <sup>th</sup>
<b>Other potential products suggested during the discussion</b>			
<ul style="list-style-type: none"> <li>• Final summary impact product</li> <li>• Dynamic products (time slider)</li> </ul>			
<b>Other relevant points</b>			
<ul style="list-style-type: none"> <li>• Include social media to increase accuracy</li> <li>• Continue offering different formats, and in particular add web services</li> <li>• Users want crisis information (including EFFIS and EFAS) from Copernicus and baseline data from their local/national GIS</li> <li>• Deliver the full set of information as layers; represent less in the map</li> <li>• Background: use updated optical or prefer a simplified topographic map (also greyscale)</li> <li>• Link validation recommendations better to Rapid Mapping and Risk &amp; Recovery Mapping</li> </ul>			

## 4 Conclusions

The objective to raise awareness about the potential of Risk & Recovery Mapping at the workshop was achieved. One of the main reasons for not using the service seems to be the lack of understanding of what the service can provide (use cases). Different from RM it does not work with standardised products but can be customised to very specific user needs. The analysis involves not only remote sensing data but also ancillary information and often modelling. Both the discussions during the first day following the demonstration of the technical capacity of the service provider consortia and the user experience triggered a number of questions and reflections which were continued in the dedicated group discussion on the second day. Participants expressed the wish to repeat such discussions, ideally with more time.

Despite activation volume of RRM increased during 2016-2017, the service is still not used at its best. JRC informed about the efforts made to increase awareness such as the regular launch of calls for expression of interest (launched by JRC, last time in spring 2017). In addition, under the Copernicus User Uptake initiative the Commission is continuously organising so-called Copernicus Information Sessions in the various Member States and Copernicus participating countries. The country can define the content of the session (selection from a set of thematic modules covering the entire

Copernicus programme) and JRC suggested making more use of this. Induced by the discussions during the workshop several users expressed an interest in activating the service soon. Further to these initiatives, the JRC is giving particular attention to the RRM module when presenting the EMS mapping component.

The two Rapid Mapping end users presentations provided valuable insights in the usage of the products once they are released. The presentations addressed topics such as accuracy and accordingly reliability of the information extracted from remote sensing data, limitations of the technology (radar versus optical), image acquisition time with respect to event peak (floods). It also showed the need to continue raising awareness about the technical aspects and decisions process in activations as well as the possible contribution of users in helping to improve the service as such.

In terms of service evolution, new potential products and other aspects of potential service improvement were discussed with both service providers and users. Most of these were outcomes of the Validation module which was not discussed with a wider audience before and thus was a unique opportunity to gather first feedback. The proposals were ranked to allow JRC addressing these for potential inclusion. As another potential evolution of EMS two unmanned aerial systems were presented in a live demo. Their inclusion in EMS operations is intended and the results of the ongoing pilot study will provide the arguments for this. Other evolution elements concern the further linking with the EMS flood and fire warning and awareness systems. Linking those with EMS is more advanced for the flood warning system for which a procedure was established for pre-tasking of imagery. The procedure was presented at the workshop and put in place officially after the workshop. For the fire awareness system JRC is currently investigating synergies. The focus here is on Rapid Mapping of fires where both services are complementary and have potential for increasing efficiency. An enhancement was defined for the validation workflow, following the request of RM and RRM SPs for more involvement. The SPs will be notified as soon as a new validation case is scheduled and invited to provide additional notes on the activation at their convenience. In case the VAL SP has questions regarding the activations under validation, the JRC will forward these to the SPs. The JRC VAL team will have periodical (e.g. yearly) meetings with the RM and RRM SPs for discussing validation outcomes.

The presentations from the two EMS related H2020 projects provided insights to activities outside the EMS service set-up which target improving the uptake of products and their improvement and evolution. These are partially relevant for inclusion in the service in the near future (social media) or showed how EMS data are further processed to encourage integration in operational workflows.

The participation of the attendees in the discussion and their appreciation motivate us to work on the preparation of the edition 2018. Observing the development of this workshop and collecting feedback from the participants, we could draw some useful hints for the future setup of the workshop. The good result of the world café approach suggests us to keep and increase the presence of interactive sessions. In particular, brainstorming and cooperative design session would be good tools for gathering further ideas and addressing the service evolution from the user perspective. A further possibility to be considered is extending the duration of the workshop, e.g. adding short trainings on activating the EMS for the countries which did not activate yet and short tutorials on scientific and technologic developments related to the emergency mapping.



## Annexe 1: Live Demo of Unmanned Aerial Systems (UAS)

At the end of first day a live demo was held to show the potential of unmanned aerial systems in the context of fast provision of aerial imagery in an emergency situation (Figure 1).



**Figure 1. Group picture acquired using Albris platform during demo 2.**

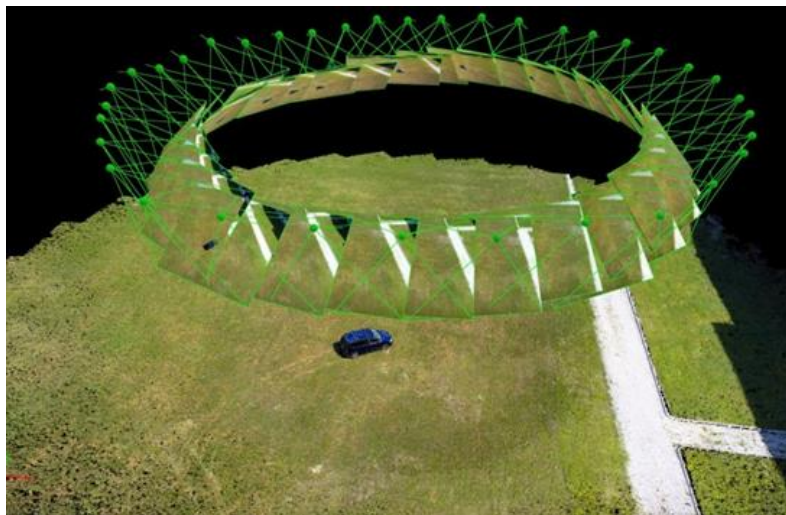
### *Demo 1*

Fixed wing Ebee Sensefly was used covering 0.18 km<sup>2</sup> in less than 6 minutes using 70% side and strip overlap with 69 images taken. The flight results were then used to generate ortho-rectified imagery and digital surface model with 3cm resolution.

### *Demo 2*

Using a rotary blade Albris Sensefly 2 types of semi-autonomous flights were performed.

- Around point of interest (Figure 2). This mission block automatically centres the flight path on a specific point of interest. This type of mission blocks is used to create 3D models of an object.



**Figure 2 Example of set of images taken in semi-autonomous mode for selected point of interest (car) by the Albris platform**

- Panorama (Figure 3). This mission block can suit a wide range of applications. It gives 360 degree view of an area.



**Figure 3 Panorama, 360 degree view over selected point, acquired in semi-autonomous mode by the Albris platform**

## **Annexe 2: Summary of Selected Sessions**

### **Product Dissemination**

The JRC developed a web service, named Activation Viewer, with web mapping capabilities for enhancing and facilitating the way users consume and use the data produced by the Mapping services. The tool was designed with a focus on serving Rapid Mapping crisis information.

The Activation Viewer, which is entirely based on open source software, gives a preview of the crisis layers on an interactive web map and access to them through OGC compliant web services. Such web services cover the most common WMS/WMTS for integration of data into mobile or desktop platforms as well as vector formats such as WFS, Shapefiles and KML.

Under test is the possibility of serving WMS (tiled and down sampled) of satellite imagery.

### **Service Improvement and Introduction to new potential Products**

A general overview on the vision of the feedback-driven decision support system was shared with the participants. Several concepts related to the management of information and recommendations provided to EMS Mapping services as outcome of validation exercises were stressed. In particular, the concepts of **source of information** (user consultation, validation requests, feedback forms, workshops, etc.), **thematic area of application** (categories) and **required actions** (short-term, long-term, not applicable, addressed, under discussion) were clarified. Examples of recommendations by required action and by categories were given. Most of the showcased recommendations concerned the category: 'Geospatial data and map project' regarding the inclusion in maps of ancillary information (e.g. forecasted peak date and time from EFAS in flood mapping products), description of grading categories for fires, delivery of more standardized attribute information,... but others also concerned data dissemination (enhance discovery services in the EMS portal) and Service-level procedures such as providing a description of changes between map versions and opting for an interactive online Service Request Form.

In conclusion, proposals for potential new products, new visualization of crisis information or alternative approaches were also showed as part of examples of recommendations from the validation service:

- **Inclusion of flood dynamics and hydrological information into flood delineation products:**

The proposal concerns the inclusion of hydrological information that can combine information on water extent change with estimated forecasted peak date and time. While the inclusion of water extent change (derived from flooded area layers) in monitoring products seems feasible, linking the products with probabilistic hydrological forecasts from EFAS requires further discussion as this is made accessible in real time to the EFAS partners only, via an interactive



password-protected, web-based information system (EFAS-IS). In general, this proposed feature was appreciated by users, a good part of which are also EFAS partners. A specific comment was addressed on the background information related to flood delineation products: grey basemaps were preferred to images so to give emphasis to the water extent.

- **Forest fire grading products with categories combined with LULC data:**  
Combining forest fire grading assessments with land cover information was suggested during a validation exercise related to an activation concerned with post-fire assessment and recovery plan for a biodiversity hotspot area. Users have reported that this solution is already available as part of Risk and Recovery Mapping, some other have seen a useful additional feature to be included in Rapid Mapping activations as affected vegetation types becomes clearer and immediately available (fuel maps). In general, concerns were expressed regarding the symbology to apply which may be difficult to read.
- **Monitoring multi-frame maps:**  
This proposed product concerns the visualization of multiple layers for monitoring products. It may consist in displaying different dates in multi-frame maps or having more layers visualized in the same frame. Users have expressed the wish of assessing changes in crisis information directly in the products combining before and after layers. They have underlined the relevance of having outlines instead of filled polygons. In addition, they suggested for 2 days-comparison (equal, increase, decrease) applicable to events that requires monitoring such as floods, fires, lava eruptions, etc. Features of geoPDFs were also discussed and one option suggested was having all layers available with indices for each layer available.
- **First guess maps:**  
This type of product relates to first recognition of preliminary data using web/media sources and any other type of available data source. Users have generally considered this product as difficult to implement, given the high variability of data sources and describing requirements in a contract for their purposes. Indeed, ERCC has already access to similar products from other sources (reliefweb, UNOCHA, etc.).
- **Flood delineation products with regional coverage:**  
This product concerns flood delineation covering large areas making use of SAR images from contributing missions (e.g. Sentinel 1). Users suggested it can be useful for large events only and if close to the flood peak. As the large extent entails high variability of the territorial geography, the service providers considers this product feasible only as "best effort" and as 'not validated product'. Currently analytical methods are under investigation but visual correction of errors is foreseen and apparently unfeasible in a Rapid Mapping context using high resolution over very large areas.
- **Alternative representation to damage assessments:**  
The goal of this proposed type of products is to derive consistent, seamless information for from point-based damage assessments with the aim of giving an overview of estimated damage. Users generally perceived the added value of interpolation techniques for visualization of damage grading. Nevertheless, product delivery was seen a critical issue as the product, being derived from first releases of damage assessments, may be available after the first assessments.
- **SAR interferometric products for building damage assessments:**  
The use of interferometry with SAR images has been widely tested and explored. This product should not be confused with building damage assessments conducted through analysis of high resolution optical data as it can offer a preliminary estimation of damage over large areas. Users as well as ERCC expressed appreciations. Further discussions with service providers are ongoing in order to understand the feasibility of operations.

Finally, the form for collecting user feedback on new types of products was presented to introduce the following work during the group discussions.

## Annexe 3: List of Participants

**Table 3. List of workshop participants**

NB	First Name	Last Name	Organisation	Country	Role in EMS context
1	Spyros	AFENTOULIDIS	EC Humanitarian Aid & Civil Protection (DG ECHO), Emergency Response Coordination Centre (ERCC)	Belgium	User
2	Dorothea	AIFANTOPOULOU	Geoapikonisis SA	Greece	Risk & Recovery Mapping service provider
3	Veronique	AMANS	European Space Agency	Italy	Coordination of access to satellite data
4	Tomas	ARTÉS VIVANCOS	EC Joint Research Centre (JRC)	Italy	EFFIS
5	Marco	BROGLIA	EC Joint Research Centre (JRC)	Italy	Validation project manager
6	Jim	CASEY	Office of Public Works	Ireland	User
7	Viorel	CHENDES	National Institute of Hydrology and Water Management	Romania	User
8	Stephen	CLANDILLON	ICube-SERTIT, Université de Strasbourg	France	Rapid Mapping service provider
9	Ian	CLARK	EC Joint Research Centre (JRC)	Italy	Head of the Disaster Risk Management Unit
10	Vasile	CRACIUNESCU	Romanian National Meteorological Administration	Romania	User
11	Simone	DALMASSO	EC Joint Research Centre (JRC)	Italy	Rapid Mapping
12	Luca	DELUCCHI	Fondazione Edmund Mach	Italy	User
13	Annalaura	DI FEDERICO	e-GEOS	Italy	Rapid Mapping service provider
14	Freerk	DIJKSTRA	National Operations Centre	Netherlands	User
15	Uxue	DONEZAR	Trabajos Catastrales SA	Spain	Validation service provider
16	Daniel	FERNER	European Space Agency	Italy	Coordination of access to satellite data
17	Isabel	GOÑI	Trabajos Catastrales SA	Spain	Validation service provider
18	Klemen	GORSE	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief	Slovenia	User
19	Domenico	GRANDONI	e-GEOS	Italy	E2mC project
20	Agust Gunnar	GYLFASON	National Commissioner of the Icelandic Police, Department of Civil Protection & Emergency Management	Iceland	User
21	Tom	HARMATHA	EC Joint Research Centre (JRC)	Italy	Mapping
22	Zsolt	KASA	Ministry of Interior, National Directorate General for Disaster Management	Hungary	User

NB	First Name	Last Name	Organisation	Country	Role in EMS context
23	Zaneta	KASCIUKAITIENE	Fire and Rescue department under the Ministry of Interior of Lithuania	Lithuania	User
24	Luca	LANTERI	Arpa Piemonte	Italy	User
25	Peter	LÁSZLÓ	Ministry of Interior, National Directorate General for Disaster Management	Hungary	User
26	Guillaume	LOPES	Ministère de l'Intérieur	France	User
27	Fabian	LÖW	Federal Office of Civil Protection and Disaster Assistance (BBK)	Germany	User
28	Lucia	LUZIETTI	e-GEOS	Italy	Rapid Mapping service provider
29	Antigoni	MAISTRALI	EC Joint Research Centre (JRC)	Italy	Validation
30	Ines	MARI RIVERO	EC Joint Research Centre (JRC)	Italy	Rapid Mapping
31	Emilio	MARTORANA	EC Joint Research Centre (JRC)	Italy	Mapping
32	Federica	MASTRACCI	e-GEOS	Italy	Rapid Mapping service provider
33	Elena	MAZON	Indra Espacio	Spain	Risk & Recovery Mapping service provider
34	Ola	NORDBECK	EC Internal Market, Industry, Entrepreneurship and SMEs (DG GROW)	Belgium	EMS project manager
35	Roberta	ONORI	Italian Civil Protection Department	Italy	User
36	Stéphane	OUREVITCH	SpaceTec Partners	Belgium	SpaceTec
37	Ioannis	PAPOUTSIS	National Observatory of Athens	Greece	Risk & Recovery Mapping service provider
38	Rocco	PISPICO	Arpa Piemonte	Italy	User
39	Vesna	PREDOVNIK	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief	Slovenia	User
40	Massimiliano	ROSSI	EC Joint Research Centre (JRC)	Italy	Validation
41	Peter	SALAMON	EC Joint Research Centre (JRC)	Italy	EFAS project manager
42	Francesco	SCULLINO	Istituto Superiore Mario Boella	Italy	iREACT project
43	Peter	SPRUYT	EC Joint Research Centre (JRC)	Italy	Risk & Recovery Mapping, Aerial component project manager
44	Alan	STEEL	EC Joint Research Centre (JRC)	Italy	Validation
45	Angel	UTANDA	Indra Espacio	Spain	Risk & Recovery Mapping service provider
46	Francoise	VILLETTE	EC Internal Market, Industry, Entrepreneurship and SMEs (DG GROW)	Belgium	EMS project manager
47	Daniel-Cosmin	VLAIC	General Inspectorate of Emergency Situation	Romania	User

<b>NB</b>	<b>First Name</b>	<b>Last Name</b>	<b>Organisation</b>	<b>Country</b>	<b>Role in EMS context</b>
48	Annett	WANIA	EC Joint Research Centre (JRC)	Italy	Rapid Mapping project manager
49	Rafal	ZIELINSKI	EC Joint Research Centre (JRC)	Italy	Risk & Recovery Mapping

## References

Copernicus EMS portal: [emergency.copernicus.eu](http://emergency.copernicus.eu)

Workshop website: <http://emergency.copernicus.eu/mapping/ems/copernicus-ems-mapping-user-workshop-2017>

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