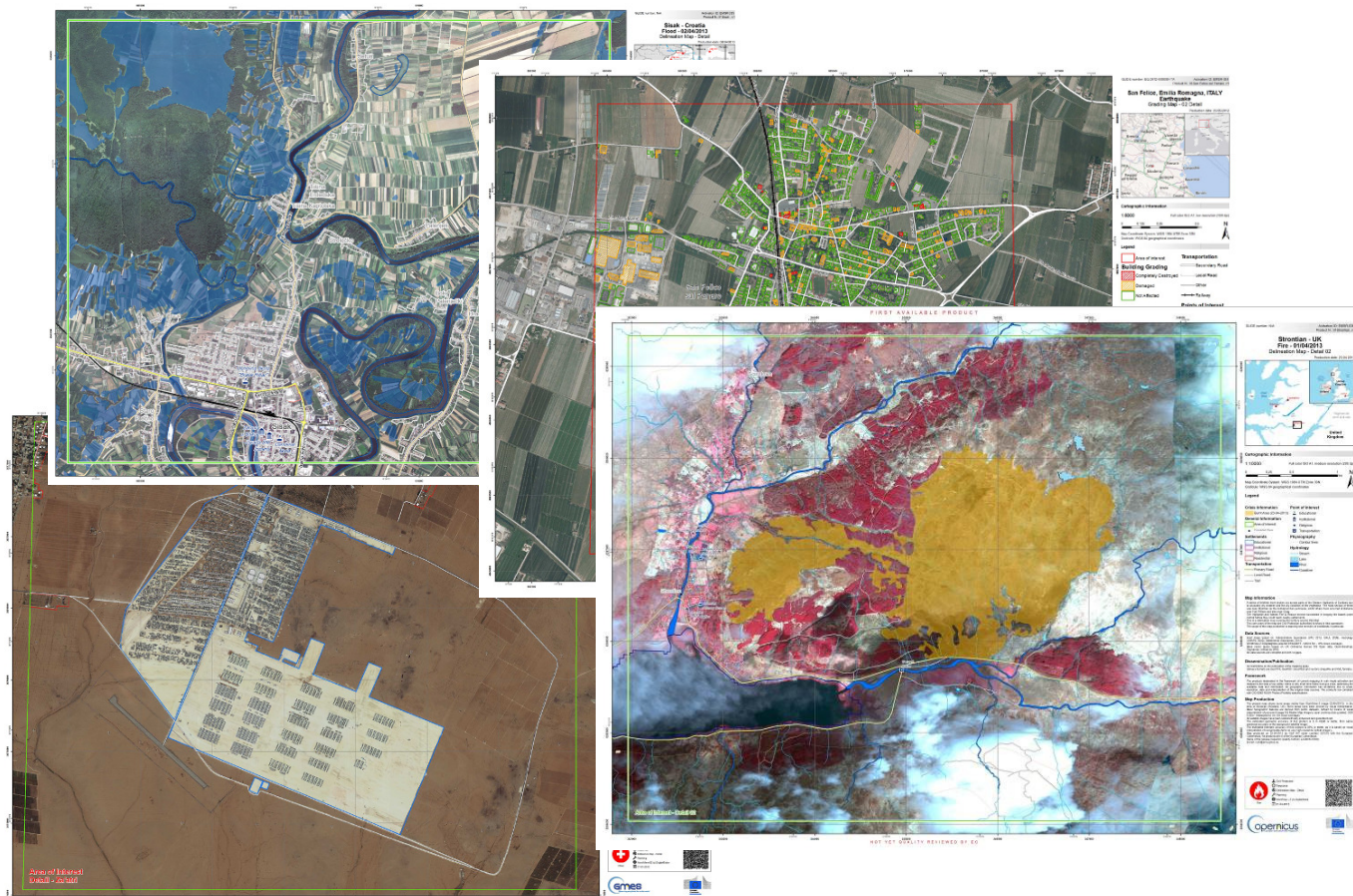# J R C   T E C H N I C A L   R E P O R T S

Copernicus-EMS
MAPPING GUIDELINES and
best practice

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2013

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Copernicus-EMS
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Table of contents

1. Introduction

1.1. Scope, aim and use of this document

This document contains the guidelines to be applied in Copernicus Emergency Management Service (EMS) mapping production. The main focus is on the rush mode mapping service, however the guidelines are applicable to the non-rush service as well.

The aim of the document is to complement the specifications contained in the product portfolios, thus reducing the case-by-case adaptations and facilitating a more consistent high quality level of the products.

The service provider is requested to:

i)   follow the specifications contained in the Copernicus EMS Mapping product portfolios;

ii) follow the Service Request Form

iii) follow the guidelines contained in this document, which are to be used as a help, not as a strict guidance or as rules;

iv) follow the (possible) specific requests coming from the Authorized User (AU), the Emergency Response Centre (ERC) and the Joint Research Centre (JRC);

v)   apply case-by-case adaptations if this leads to a better usability and readability of the specific product;

vi) apply internal quality control to ensure that the above actions are taken and applied consistently following by default the hierarchical order from point i) to iv). Exceptional cases need an agreement with the JRC.

1.2. Lineage and developments

The document is based on the following main elements:

i)   the Copernicus EMS Mapping product portfolios specifications for rush and non-rush mode mapping services;

ii) the JRC validation protocol for emergency response geo information products;

iii) the experience of the JRC in rush mapping, tuned to the specific cases via a systematic quality control of Copernicus EMS products generated in more than 35 activations;

iv) the experience of the service provider in charge of the Copernicus EMS mapping in rush mode service (which is based on the experience made in the SAFER project);

v)   the joint effort of the JRC and the service provider through experience sharing, technical agreements and practical testing of several alternatives.

This living document is subject to possible updates following further experience coming from the Copernicus EMS mapping services, the validation service and following cooperation with international mechanisms active in the field of emergency response mapping, in particular with the International Working Group on Satellite Emergency Mapping (IWG-SEM).

1.3. Innovations introduced by Copernicus

Copernicus-EMS product portfolios have been built starting from the experience made by the Commission in precursor projects and adding features aiming to improve quality, reliability and usability of products, e.g.: distinction between delineation and grading products; settlements digitalization granularity linked to the map scale (building footprint required for

1:10,000 or more detail scales); classification of the settlements according to their principal use; availability of a guaranteed set of topographic features (mainly for reference maps); summary tables summarizing the count of the affected assets; event layered geopdf files and vector files included in the default delivery formats.

These innovations increased the complexity of the products and the density of their information content; hence, during the first part of the Copernicus activity, some experiments were applied to the products, in order to implement the new features and explore different solutions (e.g. hatching versus transparency for the flooded areas).

1.4. JRC Quality Control

The Copernicus–EMS mapping services are operational since April 1st 2012 and the map production covered all the most common event types and all the product types foreseen in the rush mode portfolio.

The JRC quality reviewed the products for all the activations and in case of issues requested updates to the Service Provider, thus generating new product versions. Table 1 shows the count of the number of activations versus delivered versions. When the number of versions is 1, the first set of products has been accepted; when 2 versions are available, the quality control generated 1 request for adjustment; etc. The count includes new versions generated by quality issues and by requirements expressed during the activation.

Number of versions	Number of activations	Total number of activations	Percentage
1	16	40	40%
2	22	40	55%
3	2	40	5%

Table 1: count of activations versus product versions delivered

The experience developed during the systematic quality control is one of the elements on which this document is based.

1.5. Organization of this document

The document approaches the map per part component. Each of the chapters 2-7 describes one of the main map components (title, cartographic information, overview maps, legend, summary table and map frame) whereas chapter 8 covers some sections of the marginalia. Chapter 9 is devoted to vector data, which are a relevant feature of the Copernicus EMS – Mapping product portfolio. Guidelines about a map element are given as much as possible in the specific section regarding the same element, trying to avoid repetitions. Some remarks are given at the end of each chapter and chapter 10 collects general remarks, mainly related to the overall delivery and consistency across the components that constitute the product.

The guidelines are often presented in a schematic way. Comments may be present, depending on the topic.

1.6. Acknowledgements

2. Map title area

The title area communicates to the user the main features of the map; in other words "What is the map about".
The information to give are almost fixed, hence the guidelines are detailed.

2.1. Contents and fonts

Location of the event   • main affected city (region when relevant) and country   • default font: Arial 20, bold
Topic/event and its date   • default font: Arial, 18, bold
Map type   • reference map, delineation map, grading map   • Overview, detail (with number of detail when more than one detail map is present)   • Monitoring step number (when monitoring is activated)   • default font: Arial, 16
GLIDE number (if available)   • default font: Arial, 10
Activation ID   • default font: Arial, 10
Product and version number   • default font: Arial, 10
Production date   • default font: Arial, 10
In case of limited distribution add a mark, depending on the case   • The mark will be agreed with the ERC, following request from the AU; e.g. "COMMISSION INTERNAL"   • default font: Arial, 20, bold

2.2. Best practice examples

The examples shown in Figure 1 are good examples which follow the guidelines

GLIDE number: EQ-2012-000090-ITA	Activation ID: EMSR-004
	Product N.: 05San Felice sul Panaro, v3

San Felice, Emilia Romagna, ITALY
Earthquake - 29/05/2012
Grading Map - 02 Detail

Production date: 31/05/2012

GLIDE number: N/A	Activation ID: EMSR-009
	Product N.: 01Mariannelund, v1

Mariannelund - SWEDEN
Flood - 07/07/2012
Delineation Map - 02Detail - Monit. 03

Production date: 16/07/2012

GLIDE number: N/A	Activation ID: EMSR-016
	Product N.: 01LaGomera, v1

La Gomera - SPAIN
Forest Fire - 04/08/2012
Delineation Map - Detail

Production date: 16.08.2012

GLIDE number: N/A	Activation ID: EMSR-027
	Product N.: 01Zarqa, v2

Zarqa - JORDAN
Humanitarian Aid - 08/02/2013
Reference Map - 02Detail

Production date: 12/02/2013

GLIDE number: N/A	Activation ID: EMSR-031
	Product N.: 03Daraa, v2

Daraa - SYRIA
Humanitarian Crisis - 31/01/2013
Reference Map - Overview
COMMISSION INTERNAL

Production date: 19/03/2013

GLIDE number: N/A	Activation ID: EMSR-035
	Product N.: 02Metcovich, v2

Metcovich - Croatia
Flood - 02/04/2013
Delineation Map - Detail

Production date: 10/04/2013

Figure 1: Examples of map title areas
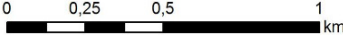
3. Cartographic information

The cartographic information section communicates to the user the basic cartographic features of the map, independent from the map contents.
The information to give are almost fixed, hence the guidelines are detailed.
The section heading font is Arial, 12, bold.

3.1. Contents and fonts

Cartographic scale • Scale **ratio**, e.g. 1:10,000 (default font: Arial, 16, bold) • Scale **bar**, e.g.
North arrow, e.g.
Color / black&white map • default font: Arial, 12
Map size, i.e. the paper size for printing and obtaining the declared cartographic scale • default font: Arial, 12
Map resolution, expressed in dpi • default font: Arial, 12
Ellipsoid, datum and cartographic projection(s) • default font: Arial, 10

3.2. Best practice examples

The examples shown in Figure 2 are good practices which follow the guidelines.
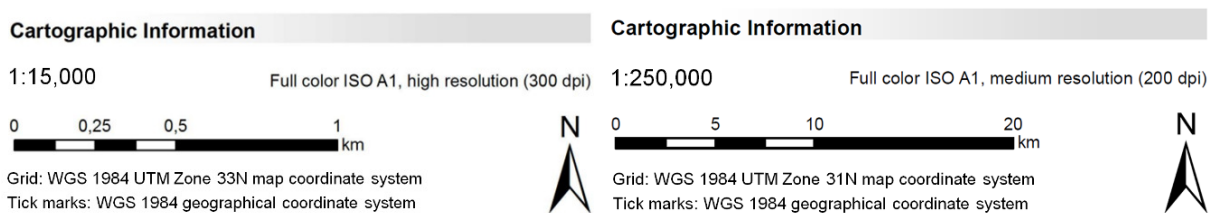
Figure 2 : Examples of cartographic information sections

4. Overview/navigation maps (inset maps)

The small overview maps at the top right corner of each EMS map (immediately below the title) aim to allow the user to locate the event; in other words "locating the map". Their contents, symbology and scale are designed to this aim.

Until activation number 26, inset maps were based on the global raster layer "Bing Maps"[1] which offers worldwide data (boundaries, roads, etc.). Figure 3 shows a couple of examples of such maps.
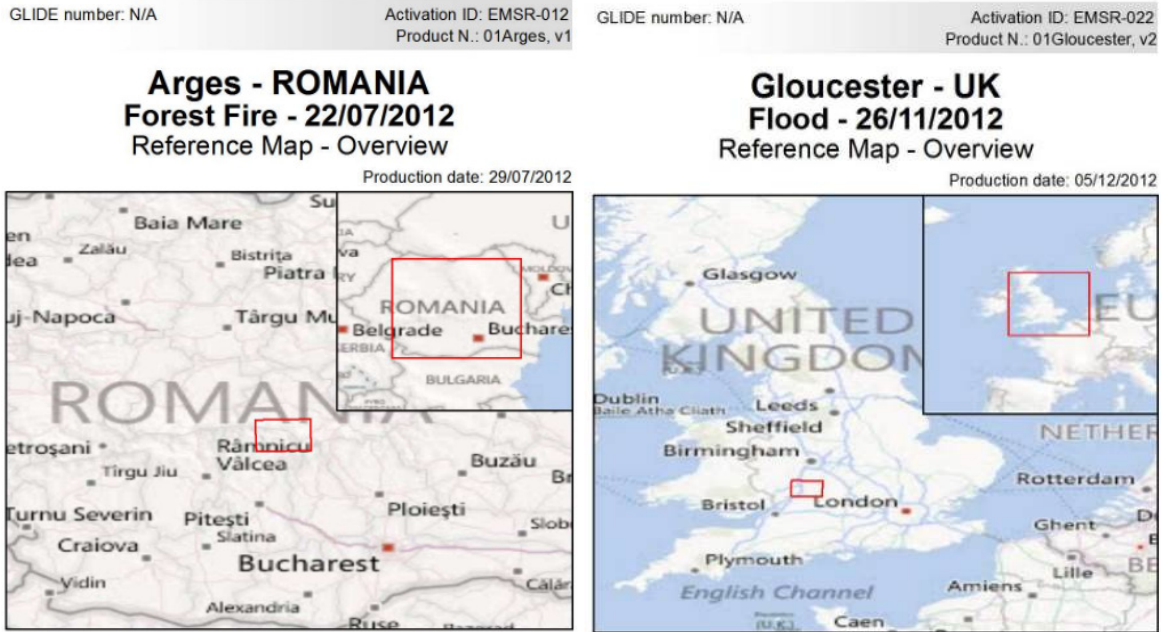
Figure 3: example of global raster layers used in overview maps

Bing maps and raster layers in general are not really appropriate for inset maps, because many labels are truncated, the information is not homogeneous from country to country and there is no freedom to modify the labeling.

World global vector layers like Gaul, ESRI, Natural Earth, JRC, etc. allow to solve the aforementioned issues, hence are preferable to global raster layers for inset maps. Other possible information sources are mentioned in chapter 10. Maps for the same cases presented in Figure 3 have been reproduced with global vector layers. Figure 4 shows a first version with rich contents, and Figure 5 contains a second version with selected contents and improved symbology.

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[1] (c) 2011 Microsoft Corporation and its data suppliers
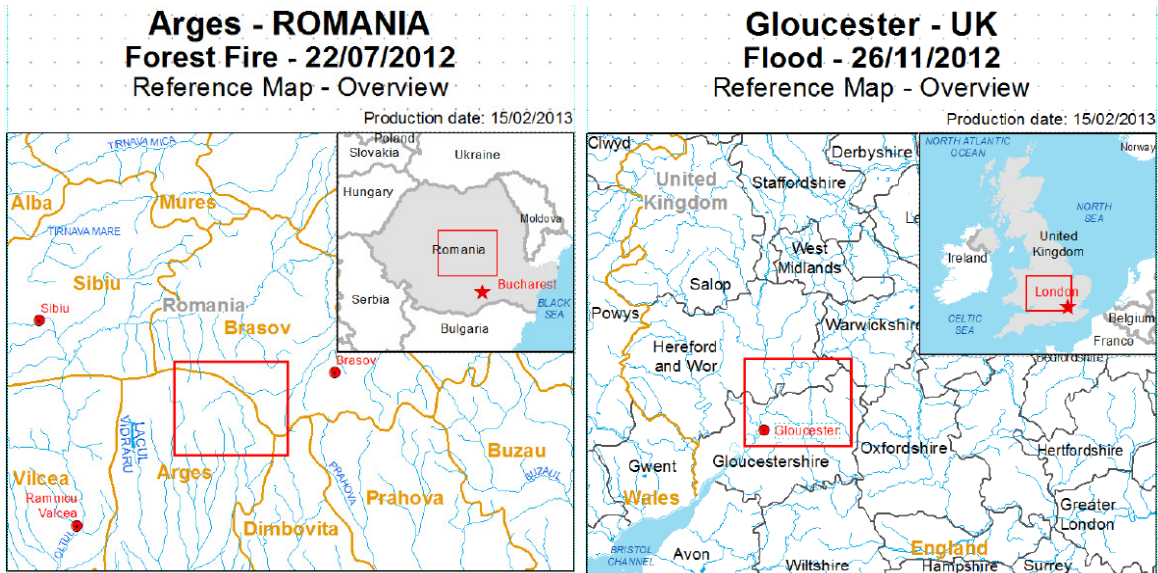
Figure 4: Examples of global vector layers used in overview maps – first version
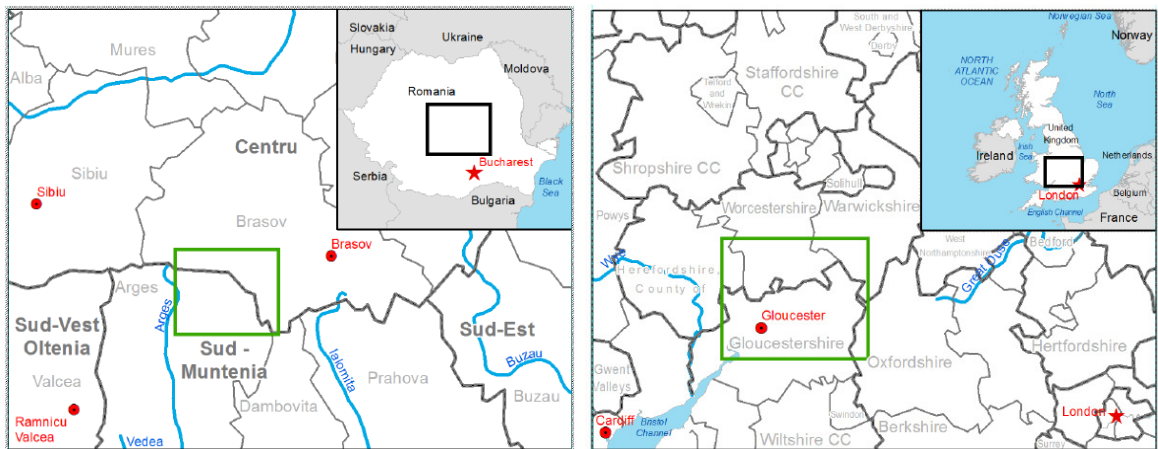
Figure 5: Examples of global vector layers used in overview maps – second version

Examples in Figure 5 also show the need to improve other aspects, e.g. the scale choice, the need to add major roads, some more towns in the bigger map.

Starting from activation number 27 the use of such vector global layers has been introduced in the production workflow.

As the expected contents of inset maps can be fixed, the graphic symbology can be specified at a relatively high degree of detail. The following paragraphs give guidelines for inset maps.

4.1. Contents and symbology

Inset map 1 (smaller)	Inset map 2 (bigger)
International boundaries and names	**International boundaries and names**
• Source: World_Countries_poly (JRC); names: European style guide http://publications.europa.eu/code/en/en-5000500.htm	• Source: e.g. World_Countries_poly (JRC); names: European style guide http://publications.europa.eu/code/en/en-5000500.htm

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• Affected country(ies) fill: white • Other countries fill: light gray (224,224,224) • Outline: darker gray (130,130,130); width: 0.40 • Labels: black with a white mask of 0.4. Affected country in bold with the same mask	• Affected country(ies) fill: white • Other countries fill: light gray (225,225,225) • Outline: darker gray (104,104,104) with a dashed black line inside; total width: 1.20 • No label
	Administrative boundaries and names • Source: In EU, 2 layers e.g. from NUTS_2010_03M (GISCO). By default, admin level 1 and 2. In case the presence of level 1 or 2 boundaries is not sufficient to easily locate the AOI, add level 3. The level 3 addition also depends on the availability of other features (roads, rivers, cities, etc). Out EU, 1 layer: e.g. from WorldAdminUnits_Statoids (admin level 1, JRC). Source for names: European style guide http://publications.europa.eu/code/en/en-5001000.htm: • Admin 1 level: gray (130, 130, 130); width: 0.8 • Admin 2 level: gray (178,178,178); width: 0.5 • Admin 3 level: gray (178,178,178); width: 0.5, dashed line • Admin 1 label dark gray bold (130, 130, 130) with white mask of 0.4 • Admin 2 label color is gray (178, 178, 178) with white mask of 0.4 • Admin 3 label color is gray (225, 225, 225) with white mask of 0.4 • Label size: admin2 is smaller than admin 1 (admin 3 is smaller than admin2) Add the terms "region", "province", "district" only if needed to avoid ambiguities The layers order is country border on top of admin1 and of top of admin2 (and on top of admin3)
Relevant islands and names (if any) • The island or the group of islands names are displayed • The sovereign country name is displayed	**Relevant islands and names (if any)** • The island or the group of islands names are displayed

in brackets	
Country capital and name • Only for the affected country • Source: European style guide http://publications.europa.eu/code/en/en-5000500.htm • Symbol: star; label color: red (255, 0, 0)	**Country capital and name (if close by)** • Only for the affected country. Try to include it when possible and in agreement with scale guidelines. • Source: European style guide http://publications.europa.eu/code/en/en-5000500.htm; alternative: Geonames (definition query: fcode=PPLC) • Symbol: star; label color: red (255, 0, 0)
	Main town and names The main towns locations are included • Symbol: red circle with thin black border; label color: red (255, 0, 0)
Oceans and seas and names • The default color is light blue (151, 219, 242) • Label color: dark blue (0, 77, 168)	**Oceans and seas and names** • The default color is light blue (151, 219, 242) • Label color: dark blue (0, 77, 168)
Big lakes and names • The default color is dark blue (0, 169, 230) • Label color: dark blue (0, 92, 230) with a white mask of 0.4	**Lakes and names** • The default color is dark blue (0, 169, 230) • Label color: dark blue (0, 92, 230) with a white mask of 0.4
	Main rivers and names Add only the features which are needed/helpful for better locating the AOI. • The default color is dark blue (0, 169, 230) • Label color: dark blue (0, 92, 230) with a white mask of 0.4
	Main roads Add only features which are needed/helpful for better locating the AOI.
Inset map 2 extent Outline: Black; width: 1	**Map frame extent (OVR or DET)** Outline: black; width:1
Optional contents	**Optional contents** A worldwide free raster layer could be displayed as background (e.g. Natural Earth1, Natural Earth2, Gray Earth, Cross-Blended Hypsometric Tints, etc.) Only add this raster layer if needed/helpful for better locating the AOI

4.2. Scale and position

Inset map 1 (smaller)	Inset map 2 (bigger)
The scale is adapted to ensure that:	The scale is adapted to ensure that:

i) the area of the event is clearly located;	i) the area of the event is clearly located;
ii) the inset map 2 extent is clearly visible;	ii) the map frame extent is clearly visible;
iii) the expected information contents are clearly readable.	iii) the expected information contents are clearly readable.
By default the scales of OVR and DTL inset maps is the same	
By default the position of inset map1 is at the upper right corner of inset map 2. It can vary according to the inset2 map content.	The position of inset map2 is fixed in the map template

4.3. Remarks and comments

Inset map 1 (smaller)	Inset map 2 (bigger)
Visibility levels (1 is the more visible)	Visibility levels (1 is the more visible)
1. Affected country and international boundary	1. Affected country and international boundary
2. Inset map2 extent	2. Map frame extent
3. Country capital	3. Country capital (if close by)
4. Relevant islands (if any)	4. Main towns
5. Oceans, seas, big lakes	5. Administrative level1 and 2 boundaries
	6. Main rivers
	7. Main roads
	6. Relevant islands (if any)
	8. Oceans, seas, lakes
No overlapping or truncated labels	
Credit the sources (copyright) in the data sources section	

5. Map legend

Map legend items are classified, grouped and labeled following the Product Portfolio specifications and the Service Request Forms terminology, in order to improve the maps' usability for the AUs.
The following guidelines give further detail and are expected to cover almost all of cases. Minor variations consequent to the documented specific activation requirements, constraints and characteristics are possible.
The section heading font is Arial, 12, bold.

5.1. Crisis Information

5.1.1. Items for delineation maps

- **Flooded area (date)**
- **Reference water (date** [when available]**)**
- **Burnt area (date)**
- **Landslide (date)**
- **Etc.**

5.1.2. Items for delineation change maps

Features affected by changes will be classified according to their status and legend items.
Possible status
- **New**
- **Changed**
- **No longer present**

Legend items are by default
- For settlements, use the normal legend, e.g. residential, Industrial
- For refugee or IDP camp use normal legend items, e.g. shelter, school
- For utilities, use the normal legend items, e.g. power plant
- For transportation, use the normal legend items, e.g. primary road trunk, rail station
- For land use – land cover use the normal legend items, e.g. cropland, forest

Examples
- **New residential**
- **Changed primary road trunk**
- **No longer present station**
- **New forest**

5.1.3. Items for refugee or IDP camp maps

- **Refugee Camp delineation (depending on the case)**
- **IDP Camp delineation (depending on the case)**
- **Shelter**

- **Tent**
- **Administative building**
- **Washing facility**
- **Water tank**
- **Warehouse**
- **Toilet**
- **School**
- **Power generator**
- **Kitchen**
- **Entrance**
- **Etc.**
- **Not classified (do not use the class "Other")**

5.1.4. Items for grading maps

- **Area grading, e.g. Fire grading/Flood grading**

  This legend item fits events for which the impact is expressed as area coverages with a specific severity, e.g. fires, floods. The area grading will be classified according to the following categories:
  - Totally affected
  - Highly affected
  - Moderately affected
  - Possibly affected
  - There is no legend item for not affected areas

  Grading categories can be established qualitatively, preferably based on reference in literature and must be applied consistently across events of the same type, e.g. forest fires, urban floods, etc. The applied definition is mentioned/referenced in the map marginalia, "Map production" section.

- **Settlements grading / Transportation grading / Utilities grading**

  Settlements grading, transportation grading and utilities grading items fit events which mainly affect assets (i.e. settlements, transportation and utilities) or individual objects. Earthquakes, explosions fit in this category.

  For **footprints** of individual objects (e.g. a house, a road) the grading will be classified according to the following categories:
  - Destroyed
  - Highly affected
  - Moderately affected
  - Possibly affected
  - There is no legend item for not affected assets

  For **building blocks and built-up areas** the grading will be classified according to the following categories:
  - Destroyed [100%]
  - Highly affected [70-99%]
  - Moderately affected [40-69%]

o Possibly affected [1-39%]
o There is no legend item for not affected assets

5.1.5. Other items

Applicable with other crisis information. They describe distinct observations that are relevant in the emergency context, and may be part of the specific request, for example:
- **Debris**
- **Road block**
- **Crater**

Do not use the class "Other"

5.1.6. Items to describe the reliability of the crisis information

- **Not analyzed**
- **Not reliable**
- **Partially reliable**
- **Etc.**

    Whenever a part of the crisis information has a reduced reliability e.g. due to use of SAR in urban floods or gaps in data sources (e.g. cloud coverage), it must be clearly marked in the map frame and classified according to the levels of reliability present in the legend.
    Example: flood map with clouds. Some areas are completely covered by the clouds whereas some other are partially covered by clouds (haze) and/or affected by clouds shadow.
    Case (i) imagery is radar. In general, the non-urban flooded areas will not be marked, regardless of clouds, haze and shadow, as far as they have the expected reliability. Urban flooded areas may be marked according to the estimated level of reliability.
    Case (ii) imagery is optical. The area completely covered by the clouds is marked as not analyzed, to make clear (unlike the previous case) that no information is available. Areas affected by haze/shadow will be marked according to the estimated level of reliability.

5.2. General Information

- **Area of interest**
- **Sensor footprint**

    Sensor footprint is marked in the map only when it is visible in the map frame.
    In exceptional cases different map areas are derived from different sensors, e.g. in case of cloud coverage different images may be mosaicked in order to cover the AOI. Such areas are marked in the map.
- **Sources**

    In exceptional cases parts of map areas may be derived from different data sources, e.g. most part of the buildings is derived from national geodatabases and a minor part is derived from OSM. The sources are mentioned in the marginalia section "Data sources" as well as the sentence "Source information is included in vector files". Only in case the difference of reliability, completeness or accuracy of the sources is very relevant, the sources are marked in the map.

- **No image data**

  When an area of the map is not covered by any sensor and it is not possible or feasible to use alternative sensors (e.g. Landsat), the uncovered area is marked as "No image data"

5.3. Administrative boundaries

- **International boundary**
- Administrative level 1, e.g. **Region**
- Administrative level 2, e.g. **Province**
- Etc., until the relevant administrative boundary level

5.4. Settlements

- **Agriculture**
- Including greenhouses, silos, etc.
- **Commercial**
- **Educational**
- **Industrial**

  Including production sites
- **Institutional**
- **Medical**
- **Military**

  The use of this category should be done with caution in order to avoid disclosing sensitive information. In case of doubt, agree with the AU.
- **Recreational**

  Including parks, open spaces, sport facilities, e.g. stadium
- **Religious**
- **Residential**
- **Transportation**
- **Not classified (do not use the class "Other")**
- **Populated place** (The term has the same graphic as the labels in the map frame)

5.5. Hydrology

- **Coastline**
- **Dam**
- **Lake**
- **Reservoir**
- **River**
- **Stream**
- **Canal**
- **Waterway**

- **Etc. (do not use the class "Other")**

5.6. Point of interest

- **Educational**
- **Industrial**
- **Institutional**
- **Medical**
- **Medical**
- **Religious**
- **Transportation**
- **Cemetery**
- **Etc. (do not use the class "Other")**

5.7. Physiography

- **Contour line and elevation (m)**
- **Height above sea level (m)**
- **Etc.**

5.8. Utilities

- **Power plant**
- **Quarry**
- **Water treatment plant**
- **Etc.**
- **Not classified (do not use the class "Other")**

5.9. Transportation

- **Motorway**
- **Primary road**
- **Secondary road**
- **Local road**
  Includes local paved roads, dirt roads, etc. which allow car transit
- **Tramway**
- **Subway/Metro**
- **Railway**
- **Station**
  Includes tram, metro, rail
- **Bridge**
- **Tunnel**
- **Aerodrome**
- **Runway**

- **Harbour**
- **Etc.**
- **Not classified (do not use the class "Other")**

5.10. Land Use - land cover

- **Bare soil**
- **Cropland**
- **Grassland**
- **Scrub**
- **Woodland**
- **Forest**
- **Wetland**
- **Firebreak**
- **Etc.**
- **Not classified (do not use the class "Other")**

By default, for readability reasons, the land use – land cover features should be left in the vector data files and not displayed in the maps. The standard statement "Features available in vector data" is put in the legend under the heading "Land Use – land cover".

5.11. Remarks and comments

- The crisis information items are in the top part of the legend with a blank space separating the crisis information from the rest of the legend
- Only items displayed in the map frame will be included in the legend
- The default font for the legend headings is Arial, 12, bold
- The default font for the legend items is Arial, 10

6. Summary table

This table contains summary figures regarding the exposed or affected population, settlements, transportation, utilities, land use, etc.

6.1. Heading and contents

6.1.1. Reference maps

- Heading: "Exposure within the overview/detail AOI"
- Contents
  - The estimated population
  - The measure of settlements, transportation, utilities classified per legend category
  - The measure of land use classified into categories (if requested by the AU)
- Figures are referred to the map's AOI

6.1.2. "Change" maps

- Heading: "Changes within the overview/detail AOI on date"
- Contents
  - The estimated population change (when possible)
  - The measure of the changed settlements, transportation, utilities classified per legend category
  - The measure of the changed land use classified into categories (if requested by the AU)
- Figures are referred to the map's AOI

6.1.3. Refugees/IDP camp maps

- Heading: "Structures and population within the refugee/IDP camp on date"
- Contents
  - The estimated camp population (with source)
  - The measure of the camp area (corresponds to the camp delineation item)
  - The measure of camp structures classified per legend category
- Figures are referred to the camp's extent

6.1.4. Delineation maps

- Heading: "Consequences within the overview/detail AOI on date"
- Contents
  - The potentially affected population
  - The measure of affected settlements, transportation, utilities classified per legend category

- o The measure of affected land use classified into categories (if requested by the AU)
- Figures are referred to the map's AOI

6.1.5. Grading maps

- Heading: "Consequences within the overview/detail AOI on date"
- Contents
  - o The potentially affected population. When possible, classified per damage grade.
  - o The measure of total and affected settlements, transportation, utilities classified per legend category and damage grade
  - o The measure of affected land use classified into categories and damage grades (if requested by the AU)
- Figures are referred to the map's AOI

6.2. Remarks and comments

The unit measures are
- km for linear assets
- ha for building blocks, built-up area and land use
- number for footprints and punctual objects
- number for population

Only in case the table is too long for the available space
- it is delivered as document file (e.g. doc, xls) included in the vector data package
- a summary table is displayed on the map
- The standard statement "Full table available in vector data package" is put under the summary map
- The default font for the table heading is Arial, 10, bold
- The default font for the text is Arial, 10

6.3. Best practice examples

6.3.1. Reference map

Exposure within the detail AOI			
Estimated population		inhabitants	24500
Settlements	Commercial	ha	53
	Industrial	ha	325
	Recreational	ha	167
	Residential	ha	690
Transportation	Motorways	km	6
	Primary roads	km	42
	Local roads	km	167
	Railways	km	8
	Stations	No.	1
Utilities	Power plant	ha	12
	Quarry	ha	24

Land use	Bare soil	ha	1730
	Cropland	ha	4620
	Grassland	ha	550
	Scrub	ha	1830
	Woodland	ha	605

6.3.2. Delineation map

Consequences within the detail AOI on 27/03/2013				
			Affected	Total in AOI
Burnt/Flooded/Affected area*		ha	1273	
Estimated population		Inhabitants	3630	24500
Settlements	Commercial	ha	8	53
	Industrial	ha	112	325
	Recreational	ha	12	167
	Residential	ha	130	690
		ha		
Transportation	Motorways	km	3	6
	Primary roads	km	5	42
	Local roads	km	26	167
	Railways	km	1	8
	Stations	No.	0	1
Utilities	Power plant	ha	1	12
	Quarry	ha	0	24
Land use	Bare soil	ha	400	1730
	Cropland	ha	400	4620
	Grassland	ha	65	550
	Scrub	ha	65	1830
	Woodland	ha	80	605

* Only mention the relevant text, e.g.: "Burnt area" for fires, "Flooded area" for floods, "affected area" for earthquakes, tsunamis, wind storm, industrial accident, explosion, etc.

6.3.3. Grading map

Case a) applies to the sub cases of:
- Area grading, e.g. Fire grading/Flood grading and

- Settlements grading, Transportation grading, Utilities grading for building blocks and built-up areas

Consequences within the detail AOI on 27/03/2013								
			Destroyed area	Highly affected area	Moderately affected area	Possibly affected area	Total affected area	Total in AOI
Burnt/Flooded /Affected area*		ha	43	95	370	765	1273	
Estimated population	Inhabitants in related areas		45	635	1210	1740	3630	24500
Settlements	Commercial	ha	1	2	2	3	8	53
	Industrial	ha	12	34	25	41	112	325
	Recreational	ha	2	4	3	3	12	167
	Residential	ha	13	15	55	47	130	690
		ha						
Transportation	Motorways	km	0	0	2	1	3	6
	Primary roads	km	1	0	2	2	5	42
	Local roads	km	5	6	7	8	26	167

24

			Destroyed	Highly affected	Moderately affected	Possibly affected	Total affected	Total
	Railways	km	0	0	0	1	1	8
	Stations	No.	0	0	0	0	0	1
Utilities	Power plant	ha	0	0	0	1	1	12
	Quarry	ha	0	0	0	0	0	24
Land use	Bare soil	ha	0	0	100	300	400	1730
	Cropland	ha	0	0	140	260	400	4620
	Grassland	ha	0	0	15	50	65	550
	Scrub	ha	10	20	15	20	65	1830
	Woodland	ha	5	20	15	40	80	605

Summary table

Consequences within the detail AOI on 27/03/2013								
			Destroyed	Highly affected	Moderately affected	Possibly affected	Total affected	Total
Burnt/Flooded/Affected area*			43	95	370	765	1273	
Estimated population	Affected inhabitants in related areas		45	635	1210	1740	3630	24500
Settlements	Total	ha	28	55	85	94	262	1235
Transportation	Roads	km	6	6	11	11	35	215
	Rail lines	km	0	0	0	1		8
	Stations	No.	0	0	0	0		1
Utilities	Power plant	ha	0	0	0	1	1	36
Land use	Total	ha	15	40	285	670	1010	9335

Case b) applies to the sub case of:

- Settlements grading, Transportation grading, Utilities grading for footprints

Consequences within the detail AOI on 27/03/2013								
			Destroyed	Highly affected	Moderately affected	Possibly affected	Total affected	Total in AOI
Estimated population	Inhabitants in related settlements		45	635	1210	1740	3630	24500
Settlements	Commercial	No.	1	2	2	3	8	53
	Industrial	No.	1	3	2	4	10	32
	Recreational	No.	1	2	2	2	7	34
	Residential	No.	13	15	55	47	130	690
		No.						
Transportation	Motorways	km	0	0	2	1	3	6
	Primary roads	km	1	0	2	2	5	42
	Local roads	km	5	6	7	8	26	167
	Railways	km	0	0	0	1	1	8
	Stations	No.	0	0	0	0	0	1
Utilities	Power plant	No.	0	0	0	1	1	12
	Quarry	No.	0	0	0	0	0	24
Land use	Bare soil	ha	0	0	100	300	400	1730
	Cropland	ha	0	0	140	260	400	4620
	Grassland	ha	0	0	15	50	65	550
	Scrub	ha	10	20	15	20	65	1830
	Woodland	ha	5	20	15	40	80	605

The layout can be rearranged to better show the information.

7. Map frame (map content representation)

The map frame contains the spatial representation of the geographic features of the map and some supporting elements, e.g. the graticule.

7.1. Crisis information

The crisis information (flooded area, burnt area, IDP camp, grading, etc.) is the most visible in the map frame (and in the legend). It should be immediately visible. This can be achieved by using bright colors, low transparency, high position in the layers order, etc. Graphical symbols thickness must be used with care, as it may impact the overall readability.

7.1.1. Delineation maps

- **Flooded Areas**
    - o filled polygon without outline, fill color light and bright blue, possibly with (low) transparency
- **Burnt Areas**
    - o filled polygon without fill color bright orange, possibly with transparency
- **Landslides**
    - o filled polygon without , fill color dark orange, possibly with transparency

7.1.2. Delineation change maps

- Color ranges are:
    - o Bright green for new features
    - o Bright orange for changed features
    - o Bright red for removed features
- Settlement features keep their original symbology (except for the color)
- Transportation features keep their original symbology (except for the color)
- Utility features keep their original symbology (except for the color) but need specific adjustment to distinguish them from settlements and also to distinguish between utilities subtypes, e.g. power plant, quarry, etc.

7.1.3. Refugee or IDP camp maps

- Camp delineation is a polygon without filling and with bright color in the green/blue range (e.g. 7, 223, 169) outline
- Camp structures are polygons with colors following when possible settlements colors for corresponding functions

7.1.4. Grading maps

- **Area grading, e.g. Fire grading/Flood grading**
    Graded areas are filled polygons without outline. Different colors/tones must be used to represent the different grades foreseen in the legend. Such colors must ensure that grades are identifiable and distinguishable although the presence of the background

image. Transparency is an option but must be used with care, as it will allow the background image color to appear and may easily lead to a change in the final perceived color.

- o Flood grading: bright colors in blue range
- o Fire grading: bright colors ranging from red to yellow
- o Landslide: bright colors in (dark) orange range

- **Settlements grading, Transportation grading, Utilities grading**

    Graded settlements, transportation and utilities keep their original symbology except for the color.
    Bright colors ranging from red to yellow must be used to represent the different grades foreseen in the legend. Such colors must ensure that grades are identifiable and distinguishable although the presence of the background image.
    No or very low transparency is preferable.

7.1.5. Reliability of the analysis

The default symbol to mark the map frame in parts according to their reliability is a thin, dashed line. For not analyzed areas, a light gray shade can be used.

7.2. General information

- **Area of Interest**
    - o Should be a square or a rectangle (no circle or irregular shapes)
    - o Should be clearly visible in the map
    - o Green (56,168,0) with white mask is the default color
    - o The labels at the AOI corner should have the same color and a white mask
    - o The overview map includes the overview AOI and the detail AOI(s). When more than 1 detail AOIs are present, their labels in the overview map include the number of the detail AOI.
- **Sensor footprint**
    - o All visible sensor footprints are marked as dashed line, plus label with sensor, acquisition date and time
- **Sources**
    - o The default symbol to mark different data sources for different parts of the map frame is a thin, dashed line plus a label with source and date.
- **No image data**
    - o Light and subtle gray area with darker gray outline.
- **Graticule and tick marks**

    By default, two coordinate systems are used; their graticule and tick marks are displayed in the map frame and the respective coordinate values are marked at regular intervals on the external borders of the map frame
    - o Graticule: WGS 84 UTM Map coordinate system, zone of the AOI
        - ▪ Very thin gray lines
        - ▪ The font of the graticule labels is Arial, 8
    - o Tick marks: WGS 84 Geographical coordinate system

- Very small light gray or white crosses
- The font of the tick labels is Arial, 8

Graticule and tick marks are the less prominent elements of the map frame (except for the background image), though visible.

The user may request a national coordinate system instead of the default UTM coordination system. The graticule rules apply to the national coordinate system in that case.

7.3. Administrative boundaries and labels

- Administrative **boundaries**
  - Symbology: a set of symbols like
    - +++++++ International boundary
    - ---------- Administrative level 1, e.g. Region
    - ·········· Administrative level 2, e.g. Province
    - · · · · · · Etc.
  - Color: gray-black range, with white mask
  - Visibility is related to the hierarchical level of the boundary
    - The most visible is the international boundary and all levels must be distinguishable
    - Size, color (and transparency) are used to achieve the result
- Administrative boundaries (i.e. administrative units) **labels**
  - By default, white text with dark mask
    - The mask color is distinguishable from the background (light background is suggested)
  - The names of the different administrative levels are different from country to country. www.statoids.com is a support to choose the right name of the administrative levels
  - Well positioned (not truncated, not overlapping)
  - Sometimes it could be necessary to add the term «district» or «province» after the name or to put an example of the labeling color used in the legend.
  - Clearly visible but not covering other information; in particular crisis information

7.4. Settlements

- Each settlement is classified according to its principal use and construction material in the vector files
- Principal use classes are displayed in the map (principal construction material will not be displayed on maps except in case of specific demand)
- Outline (not transparent) polygons without filling; in exceptional cases, transparent filling may be used for the sake of readability
- Outline colors:
  - Avoid bright red, orange, yellow and blue which are for crisis information
  - Use moderate bright colors (less prominent than crisis information)

- o Suggested color ranges. Colors need to be checked in the specific case (in particular against the background) and may need adjustment to ensure readability and distinguishability.
    - Agriculture (greenhouses) –dark green
    - Commercial – light violet
    - Educational – light pink
    - Industrial – dark violet
    - Institutional - khaki
    - Medical – dark pink
    - Recreational - light green
    - Religious – light gray
    - Residential - brown
    - Transportation – dark gray
    - Not classified – ivory
  - o When it is impossible to classify built-up areas according to their principal use, use the residential color.
- Populated places are represented by a label (and a point).
  - o The label has the same graphic as the term "populated place" in the legend.
  - o Label size
    - compromise between small size and readability
    - "proportional" to the population of the place (the city names must be clearly visible)
  - o If the place mentioned in the map title is in the AOI, its label is displayed
- Building footprints and building block cannot overlap with roads (exceptional cases like roads/railways actually passing under buildings are acceptable); whereas roads may overlap to built-up area. The following guidelines help to avoid problems:
  1. Prepare the transportation network road,
  2. Display the transportation network and use it as a reference for step 3
  3. Prepare the settlements layer
  In steps 1and 3
  - o use (background) image interpretation and/or other available sources (chapter 10.6);
  - o ensure that the acquisition scale of the sources is compatible with the map scale;
  - o If you do not apply interpretation of the (background) image, use the image to check (and correct) the layer (e.g. adding the missing elements);

When applying the suggested guidelines, the vector files should be correct, nevertheless some overlapping problem may arise at representation level, due to various map scales and the thickness of graphical symbols. In this case the following guidelines may solve the problem:
  1. Adapt symbols in order to obtain readability and non-overlap;
  2. if step 1 is not sufficient, then apply a buffer to the transportation network and clip the settlements with the buffer.

The buffer size must

- o Respect the metric tolerance allowed by the map scale
- o Ensure alignment between transportation network and settlements edges
- o Ensure the space for applying the symbology

7.5. Hydrology

- For lakes and seas use an outline polygon, outline color dark blue
- For reference river bed use a filled polygon without outline, fill color dark blue
- Always put the river name in detailed and overview maps (specially for floods)
    - o The river name is aligned (parallel) to the river axis
- The reference water color should be darker than the flooded areas

7.6. Points of interest

- Symbols
- Size is a compromise between small size and readability
- Color is dark blue-gray. It may be adapted to the specific case. A white mask may be added according to the background

7.7. Physiography

- In presence of contour lines, put at least some values of altitude in meters
- Elevation points may be useful as well

7.8. Utilities

- Polygons
- Outline with a specific pattern filling is recommended
- Colors
    - o Avoid bright red, orange, yellow and blue which are for crisis information
    - o Use moderate bright colors (less prominent than crisis information)

7.9. Transportation

- Avoid bright red, orange, yellow and blue which are for crisis information
- Use (very) subtle colors and transparency if necessary (transportation are always less prominent than crisis information)
- **Roads** are lines with a main color and very thin black borders
    - o Suggested main color ranges. Colors need to be checked in the specific case and may need adjustment to ensure readability and distinguishability.
        - ▪ Motorway – light orange-pink
        - ▪ Primary road – light yellow
        - ▪ Secondary road – white or in-between light yellow and white
        - ▪ Local road – white
    - o Both color visibility and size must decrease from motorway to local road, in order to distinguish road classes hierarchy

- o Adapt the width of the road line to the scale. The width should be a balance between representing the real size of the road and not covering the background image
- o Get a coverage of connected roads (in case, digitize the OSM missing roads)
- o In case local roads reduce map readability do not display them
- o Consider labeling motorways and primary roads with small labels (ensure readability of crisis information)
- **Transportation lines on rail** are lines with small perpendicular dashing
  - o Color ranges. Colors need to be checked in the specific case and may need adjustment to ensure readability and distinguishability.
    - Railway – black
    - Subway/Metro – fuchsia
    - Tramway – violet
- Use the same symbology in reference and delineation maps (except for possible road size adjustment)
- Airport/aerodrome: symbology is scale dependent

7.10. Land Use - land cover

- Polygons
- By default, for readability reasons, the land use – Land cover features should be left in the vector data files and not displayed in the maps, unless requested by the AU or in specific cases (e.g. the map is requested for land use assessment)
- When displayed, an outline with a specific pattern filling is recommended
- Colors
  - o Avoid bright red, orange, yellow and blue which are for crisis information
  - o Use moderate bright colors (less prominent than crisis information)
  - o Colors similar to Corine Land cover are suggested

7.11. Digitalization of assets polygons

Assets polygons are: settlements plus transportation (when poly, e.g. harbour) and utilities.
They have to be digitized at the following level of detail, depending on the map scale:
- Built-up area (1:50,001 till 1:500,000)
- Building blocks (1:10,001 till 1:50,000)
- Building footprint (>1:10,000)

Labels "Built-up area", "Building blocks", "Building footprint" do not appear in the legend.
Each settlement will be classified according to its principal use and construction material in the vector files.

7.12. Joint representation of assets and crisis information

Assets are: settlements plus transportation and utilities
- Reference maps
  - o Assets are classified according to the legend

- In change maps, changes have priority over other legend items, i.e.
  - change symbology has priority
  - changes are more visible than assets
- In refugee or IDP camp maps transportation have the same legend items for areas in and out of the camp

- **Delineation maps**
  - Assets are classified according to their use
  - Settlements, utilities are on top of the crisis information
  - Transportation is below crisis information
  - Nevertheless, crisis information must be the most visible item; in case its visibility is affect, relative visibilities of crisis information and assets must be adapted, e.g. working on color brightness, transparency, symbology thickness. Also background may need to be adapted.

- **Grading maps**
  - Area grading, e.g. Fire grading/Flood grading follows the same guidelines as per delineation maps
  - Settlements grading, Transportation grading and Utilities grading
    - Affected assets are classified according to their damage grade, i.e. their color will correspond to the damage grading legend
    - Affected assets will keep their original symbology, except for the color. In this way it will not possible to distinguish settlement classes, but it will be possible to distinguish road classes (size) and rails (vertical dashing)
    - Only affected assets will be displayed
    - Points of interest will not appear
  - Crisis information (i.e. grading) must be the most visible item; in case its visibility is affected, relative visibilities of crisis information and other items must be adapted, e.g. working on color brightness, transparency, symbology thickness. Also background may need to be adapted.

7.13. Satellite images

- Co-registration
  - images used in the reference/delineation/grading maps must be co-registered satisfying the map cartographic tolerance, in order to avoid vector features mismatching
  - As normally the digitization process starts on the pre-event image, the post-event image(s) should be registered to the pre-event image
- RGB stretch
  - Carful stretch, prefer light results to dark ones
  - A subtle, faded image is less visible
  - In case of a map having two images of the same sensor, apply harmonization of the RGB stretch
- Transparency can be used to obtain a nice as well as readable background.

- Use natural colors as much as possible (unless Authorized User asks otherwise). For SPOT and DEIMOS data there are two options

    a) Use PixelSense CIR to change Spot color infrared to a pseudo natural color. (Source: http://www.alphapixel.com/node/58) .The result is not always optimum

    b) Create the blue missing band following these steps
      - Extracting the single Red and Green band with ENVI band math (or any other similar function in other softwares)
      - Calculating the blue missing band as (0.85 x b1*) - (0.15 x b2*)
      - Creating the layer stack RGB and playing with the histogram for a good stretch

    The SPOT bands are : XS1(b1)=Green, XS2(b2)=Red, XS3(b3)=NIR, SWIR(b4)= Shortwave IR

Figure 6: Left: actual Spot5 rendering; middle: Pixelsense; right: using the ad hoc formula

7.14. Remarks and comments

7.14.1. General

- The symbology of each map must ensure high readability; to this aim it may be necessary to *adapt the symbology to the specific case.*
- The chosen symbology must ensure that features are identifiable, distinguishable and linkable to the legend items in spite of the presence of the background image and of other symbols.
- Visibility levels (1 is the more visible)
    1. Crisis information

2. Settlements, utilities and transportation
3. AOI
4. Other legend items
5. Graticule and tick marks
6. Background image

- When not in conflict with other readability issues, the layers with transparencies should be put at the lowest level, in order to reduce as much as possible limitations in pfd files
- Clip features outside AOI (for overview and detail maps)
- Credit the sources (copyright) in the data sources section

7.14.2. Symbology

- Graphical symbols thickness must be used with care, as it may impact the overall readability. As a general guideline, the more dense is the map (e.g. small scale, urban areas, many topographic features are requested by the user), the thinner are the graphical symbols to be used (keeping colors and shapes as much as possible)
- Transparency must be used with care, as it will allow the background image color to appear and may easily lead to a change in the final perceived color. As a general guideline, the more light, subtle, faded and uniform is the background image, the more transparency can be used.
- If a feature (e.g. lake, sea, etc.) is clearly visible and identifiable by common interpretation skills in the satellite image, prefer an outline to a filled polygon
- Label size and color are important tools to differentiate information in colored satellite background.

7.14.3. Consistency and reliability

- Symbology used in different detail maps of the same product must be the same. Symbology used in overview and detail maps must – as far as possible – be the same. In any case it must be consistent.
- Symbology used in map frame and legend must be the same.

8. Other sections in marginalia

8.1. Map information

This section describes in short the event and its consequences, including figures, e.g. the magnitude of the event, the number of affected municipalities and persons and the total affected area.
The text is factual and neutral; information sources (for the mentioned figures) are included. The text must be agreed with the authorizing institution which in the Copernicus EMS case is the European Commission Emergency response Centre (EC/ERC).

8.2. Data sources

All data sources used in the map (map frame, summary table inset maps, etc.) are listed, with their:
- Accuracy, i.e. nominal scale (vector) / resolution (raster)
- date (for crisis information source - usually it is a post-event image - time is included as well)
- degree of completeness/information on occlusion
- degree of reliability
- copyright (when relevant)

For data sources regarding contour lines or height point are present in the map, add the statement that these elements are in meters above mean sea level.
In case different sources have been used for a legend item:
- they are mentioned in this section
- a short explanation of their accuracy/completeness/reliability with respect to map areas is added
- the sentence "Source information is included in vector files" is added.

8.3. Dissemination/publication

The dissemination policy is mentioned.
By default
- No restrictions on the publication of the map products apply

In case restrictions apply, they are mentioned, e.g.
- Commission internal
- The dissemination/publication of the map is restricted for three weeks, etc.

The delivery formats are listed. By default:
- Delivery formats are GeoTIFF, GeoPDF, GeoJPEG and vectors (shapefile and KML formats)

8.4. Framework

This section shortly describes the framework in which the products are generated, mentioning:
- The rush (or non-rush) production mode
- Compliancy to the GIO EMS – Mapping product portfolio specifications

- The framework contract
- The fact that all products are © of the European Commission

8.5. Map production

This section shortly describes the main steps of the map production process/workflow, including
- Methodology
- Definition of grading categories/reference to the definition
- Use of the data sources
- Orthorectification
- Digitalization
- Type of analysis, e.g. automatic or semi-automatic classification, applied algorithm, visual interpretation
- Main limitations of data sources or analysis techniques actually used/applied in the specific case
- Estimated geometric and thematic accuracy and the methodology used for the assessment
- Producer name
- Quality control operator name
- Contact point for information request

8.6. Map label

This section summarizes the main features of the map taking a user-oriented approach and including
- the type of event the map is related to
- the event date
- the type of user the product is addressed to
- the phase of the disaster response management cycle the product is supposet to support
- the type of product according to the GIO EMS – Mapping product portfolio
- the main information source

8.7. Logos

Copernicus and European Commission logos are included.
Provider logo is not included, but the producer is mentioned in the map production section.

8.8. Remarks and comments

- The default font for the section headings is Arial, 12, bold
- The default font for the text is Arial, 10

9. Vector data

Vector files are a relevant component of the Copernicus EMS – Mapping product, as they allow the AU to ingest the map information in the local GIS and process it according to the specific disaster response management workflow. As vector files are likely to be used by the AU in rush mode context, they must be as easy to use as possible.

9.1. Complete

- Vector files contain all the geographic features displayed in the maps, including their classification; the AU is must be allowed to import in the local GIS all the information contained in the map
- Information not displayed in the map is included in the vector files as well, e.g.
    - non-affected assets in grading maps
    - land use (when requested)
- Each map component (e.g. reference-overview, reference-detail01, delineation-overview, grading-detail01, grading-detail01-monitor01, etc.) contains in its "vector" folder all its vector files (this generates duplication across map components), including information not displayed in the map (e.g. not affected assets and land use)
- Vector files contain information on the data source. This is particularly relevant when different sources are used for a given legend item
- Attributes
    - The ones needed to select/classify the features according to the legend items are always present in the vector files
    - The relevant attributes (e.g. settlement type, road type, grading, etc.) are filled for every feature

9.2. Consistent

- Physical organization of all vector features is always consistent with the map legend organization and hierarchy (see chapter 5).

    Example: the legend class "Hydrology" contains "River"(line), "Stream", "River"(poly) and "Lake" subclasses; four possible options are the following

	1-item files	Multiple items files
Using folders	Hydrology folder - rivers(line) file - streams file - rivers(poly) file - lakes file	Hydrology folder - line (with classification attribute) - poly (with classification attribute)
Using filenames only	- hydrology_rivers(line) file - hydrology_streams file - hydrology_rivers(poly) file	- hydrology_line (with classification attribute) - hydrology_poly (with classification attribute)

	- hydrology_lakes file	

- Vector features are clipped to the AOI of the (overview or detail) map
- Spatial Accuracy of the vector features is consistent with the map scale
- In case of settlement, utilities and transportation grading, the grading information is added to the original file, i.e. the feature is classified and not duplicated
- Filenames (and folder names when used) are consistent
  - with legend items, including legend headings
  - across components and products of the same activation
- The attribute values are included in the respective domains
- Each legend item is completely contained in one file only

9.3. Self-explanatory

- Filenames (and folder names when used) are self-explanatory
  - The required way to achieve this is to use the same wording as per the legend items (see chapter 5)
    - In case some name abbreviation is required (e.g. for containing the filename length), unequivocal and still self-explanatory relation with the legend items is kept, e.g. transportation ▶ transp; hydrology ▶ hydro; Settlements ▶ settle
    - In case name coding is necessary (it is advised to avoid as much as possible this case) a document explaining codes is delivered with the vector files
  - Multiple legend items files
    - In case a file contains more than 1 legend item, its name includes reference to the geometric type, e.g. point, line, poly.;
      Example: in case "River"(line), "Stream" are stored in the same vector file, the filename will include _line
      Exceptional simplifications are possible (e.g. for roads, see examples of suggested names)
  - Examples of suggested names (and content aggregation)
    - settlements - contains all items, classified by an attribute
    - roads – contains motorways, primary roads, secondary roads, local roads, classified by an attribute
    - transportation_lines - contains motorways, primary roads, secondary roads, local roads, railways, metro, etc. classified by an attribute
    - utilities – contains power plants, quarries, etc., classified by an attribute
    - administrative_boundaries – contains all administrative boundaries, classified by an attribute
    - settlements_grading – contains all items, classified by two attributes (grading, functional category)
    - utilities_grading – contains all items, classified by two attributes (grading, functional category)

- - roads_grading - contains motorways, primary roads, secondary roads, local roads classified by two attributes (grading, functional category)
- Attributes
  - Have self-explanatory names, e.g.
    - Road_class/road_type – to classify roads into motorways, primary, etc.
    - Settlement_class/Settlement_type - to classify settlements into commercial, educational, etc.
    - Grading – classify features into damage grading classes
    - In case some name abbreviation is required (e.g. for containing the name length), unequivocal and still self-explanatory relation with the legend item and meaning of the attribute is kept, e.g. Settlement_class ▶ Sett_class
  - Have self-explanatory contents (i.e. descriptive and not coded)
    - In particular, unequivocal and self-explanatory relation with the legend item and meaning of the attribute is kept, e.g.
      - the attribute classifying the settlements contains values like "commercial", "educational", "residential", etc.
      - the attribute classifying the roads contains values like "motorway", "primary_road", etc.
  - Unnecessary attributes should not be included in the vector files. (The necessary attributes are the ones which bring all the information contained in the map and in the summary table (except for image and some labels)).

10. General remarks

10.1. Quality control and checks

- Always apply internal quality control during map production/before delivery.
- Always visually check the result. To this aim, looking at the printed map (real scale) is usually very helpful. Display on a big screen (real scale) is an option.
- Maps readability must be ensured. Given the high variability of the products (i.e. map scale, features density, type of background image, etc.), it may be necessary to *adapt the symbology to the specific case.*

10.2. Consistency

The main consistency elements are described in chapters 7and 9. They must be ensured:

- across products of the same activation
- across component of the same product, i.e. overview map and delineation maps, (for the corresponding items)
- across formats, i.e. jpeg, tiff, pdf, vectors
- between legend and map frame (the symbols must be the same)

The same consistency elements should be ensured as much as possible across different activations.

10.3. First Available Maps

- Maps and vectors which constitute the first available map follow these same guidelines
- Inset maps can be in draft, including AOI, administrative boundaries, capital, main towns, seas/oceans only
- Maps are marked:
    - o In the heading: "First available map"
    - o In the footer: "Not yet quality reviewed by EC"
    - o Using a thin, red, neat, expanded font
- Vector files are marked
    - o "FirstAvailableMap" is added to the filename
    - o A text attribute is added to the features and contains "First available map"

10.4. Pdf files

Layer names must follow similar guidelines as per vector files, i.e. be self-explicative and consistent with legend items wording and hierarchy.

10.5. Filenames

- For vector files, see chapter 9
- For raster files, apply the following
  Example: EMSR002_04GDYNIA_00REFERENCE_00OVERVIEW_v1_100dpi.jpg

- – EMSR002 is activation code (all capitals)
- – 04GDYNIA is product code and name together (all capitals)
- – 00REFERENCE (01DELINEATION, 02GRADING) is the first part of the product component (all capitals)
- – 00OVERVIEW (01DETAIL, 01DETAIL-MONIT01) is the second part of the product component (all capitals)
- – v1 is the version (v is not capital)
- – 100dpi is resolution
- – _ is the field delimitator

10.6. Possible data sources for map preparation

Satellite images coming from the ESA-DAP mechanism are the primary data source for map preparation.
Any other useful sources fulfilling the quality requirements of the products can be used, provided that (i) their licensing conditions are compatible (ii) they are free of charge for the service, (iii) they do not create additional administrative burden.
The JRC may provide some data, e.g. administrative boundaries for world countries
A list of other possible sources is given below. Licensing condition must be checked and respected; copyright must be checked, respected and quoted.

- Bing maps
- ESRI
- Gaul
- European style guide: http://publications.europa.eu/code/en/en-000100.htm http://publications.europa.eu/code/en/en-5000500.htm
- GeoNames (in a subordinate position with respect to Europe style guide)
- Gisco (for EU)
- Google earth
- National data portals
- Natural Earth
- OSM
- Etc.

11. References

- European Commission, "GIO-EMS mapping in rush mode product portfolio specifications", Annex A to the tender specifications for GIO - Emergency Management Service - Mapping in Rush Mode (IPSC/2011/02/04/OC)
- European Commission, "GIO-EMS mapping in non-rush mode product portfolio specifications". Annex A to the Tender specifications for GIO – Emergency Management Service - Mapping in non-rush Mode (IPSC/2011/02/05/OC)
- European Commission, Rush mode and non-rush mode Service Request Forms (available to the authorized users of the GIO EMS - Mapping services)
- Broglia M., Corbane C., Carrion D., Lemoine G., Pesaresi M., Validation Protocol for Emergency Response Geo-Information Products, JRC Scientific and technical report, EUR 24496 EN-2010, ISBN 978-92-79-16428-6, ISSN 1018-5593, European Union, 2010
- Extraction guide for emergency mapping (based on SAFER experience). Document provided by eGEOS as annex to its technical offer for tender IPSC/2011/02/04/OC "GMES Initial Operations: Emergency Management Service – Mapping in Rush Mode"
- IWG SEM website, http://iwg-sem.org

Abstract

This document contains the mapping guidelines for Copernicus Emergency Management Service (EMS) mapping production. It summarizes the JRC experience developed in the frame of Copernicus with respect to the challenging task of providing maps in support of the disaster risk management cycle. The main focus is on the rush mode mapping service, however the guidelines are applicable to the non-rush service as well.

The document approaches the map per part component: title, cartographic information, overview maps, legend, and map frame, etc. Some specific and innovative elements are introduced, e.g. the summary table and the standard use of vector files. Particular attention is devoted to the consistency across the components that constitute the product.

The structure and the schematic organization of the guidelines allow considering this document as a kind of practical handbook.

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle. Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.

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