

Copernicus KEN Workshop

December, 5th 2017



In situ

Copernicus EMS – (Rapid) Mapping component Access to NMCA data: use case

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www.ithacaweb.org



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In situ

Copernicus EMS components

- The [Copernicus Emergency Management Service \(EMS\)](#) provides maps and analyses based on satellite imagery (before, during or after a crisis)
- Two components:
 - **EMS Mapping**
 - **EMS Early Warning**



The [EMS Mapping](#) Component provides two service modules:

- (1) [Rapid Mapping \(RM\)](#): (available 24/7/365) ← **Use case focus**
- (2) [Risk & Recovery Mapping \(RRM\)](#)



In situ

Copernicus EMS Mapping – Requirements

- In situ data (including a range of **reference topographic dataset**) are required primarily for the following reasons:
 - 1) To **reduce the delivery time**
 - 2) To increase the **thematic and geometric accuracy**
 - 3) To facilitate the **integration** of the data and information

...
- The main challenge is **accessing and exploiting in situ data** within emergency management timeframe (delivery **within hours** to days).
 - Service providers need information in advance (access details, data formats/models) to develop ad-hoc ETL procedures. In some cases, access should be granted by the NMCA, and technical and infrastructure-related restrictions (downtime, file size limits) also play a role.

Source: [Fact Sheet On Copernicus In Situ Data Requirements](#)



In situ

Copernicus EMS Mapping – EEA-EGG Agreement

- NMCA role in EU
- The **cooperation agreement** between the **EEA and EuroGeographics** has five main objectives:
 - To improve Copernicus access to EuroGeographics data and services, produced using official geospatial data from its members (NMCA).
 - To enhance the dialogue between Copernicus and EuroGeographics members.
 - To foster knowledge exchange between Copernicus and EuroGeographics members.
 - To promote awareness raising activities.
 - To support initiatives to provide pan-European harmonised data services.



In situ

Copernicus EMS Mapping – Copernicus Data Policy

- [Copernicus Data Policy](#)
 - **Full, free and open data**
(limitations can be set in exceptional cases, e.g. sensitivity issues)
- CEMS Mapping
Data sources listed in:

Maps (marginalia)

Vectors (attributes)

Data Sources

Pre-event image: Pre-event aerial orthoimages © 2012 courtesy of e-Geos (acquired 20/08/2012, GSD 0.5 m, 0% cloud coverage).
Post-event image: Pléiades-1A/B © CNES (2017), distributed by Airbus DS (acquired on 30/10/2017 10:40 UTC, GSD 0.5 m, approx. 17.5% cloud coverage, 9.5° off-nadir angle), provided under COBERNICUS by the European Union and ESA, all rights reserved.

Base vector layers: Geoportale Nazionale © Ministero dell'Ambiente (<http://www.pcn.minambiente.it>) © OpenStreetMap contributors, openstreetmap.org, refined by the producer.

Inset maps: JRC 2013, © EuroGeographics, Natural Earth 2012, CCM River DB © EUJRC2007, GeoNames 2013.

Population data: Landscan 2010 © UT BATTELLE, LLC
Digital Elevation Model: EU-DEM (25 m)



In situ

Copernicus EMS Rapid Mapping(RM) – Use case

- [Copernicus Emergency Management Service](#)
(© 2017 European Union), EMSR215

- Flood in Braunschweig, Germany

*Just one among the possible examples
(recent activation, use of settlement layer, ...)*



The screenshot displays the Copernicus Emergency Management Service (EMS) website. The header includes the European Commission logo and the text "COPERNICUS Emergency Management Service". The navigation bar lists "Home", "What is Copernicus", "EMS - Mapping", "EMS - Early Warning System", "News", and a search bar. The "LATEST NEWS" section highlights "EMSR215: Flood in Braunschweig".

EMSR215: Flood in Braunschweig

Event Time (UTC): 2017-07-27 08:00
Event Time (LOC): 2017-07-27 10:00
Event Type: Flood (Riverine flood)
Activation Time (UTC): 2017-07-27 08:16
Reference maps produced: 0
Delineation maps produced: 2
Grading maps produced: 1
Activation Status: Closed
Affected Countries/Territories: Federal Republic of Germany
Authorized User: Germany|Geminsames Melde- und Lagezentrum von Bund und Landern (BBK)
Activation Reason: Rain is set to fall across nearly every part of the country on Tuesday and has already hit northern and central areas hard specially in Braunschweig. Southern Lower Saxony and northern Thuringia were battered by storms between Monday and Tuesday, with between 50 to 80 litres of rain per square-metre falling over the last 24 hours - in some areas up to 100 litres.

The page includes two maps: a regional map of Germany showing the flood area in Braunschweig, and a detailed "EMSR215 - Activation Extent Map" showing the flood extent in Braunschweig. The activation extent map is labeled "Release: r04 - Version: v1 - Delivered: 2017-07-30 20:00" and "View as: EMSR215-AEM-JPG · EMSR215-AEM-KMZ · EMSR215-AEM".

Filter by map type: **ALL** · DELINEATION · GRADING

[EMSR215] Braunschweig: Delineation Map

Downloadable items

Format	100 DPI	200 DPI	300 DPI
PDF	100 DPI	200 DPI	300 DPI
JPEG	100 DPI	200 DPI	300 DPI
TIFF	100 DPI	200 DPI	300 DPI
Vector package:	ZIP		

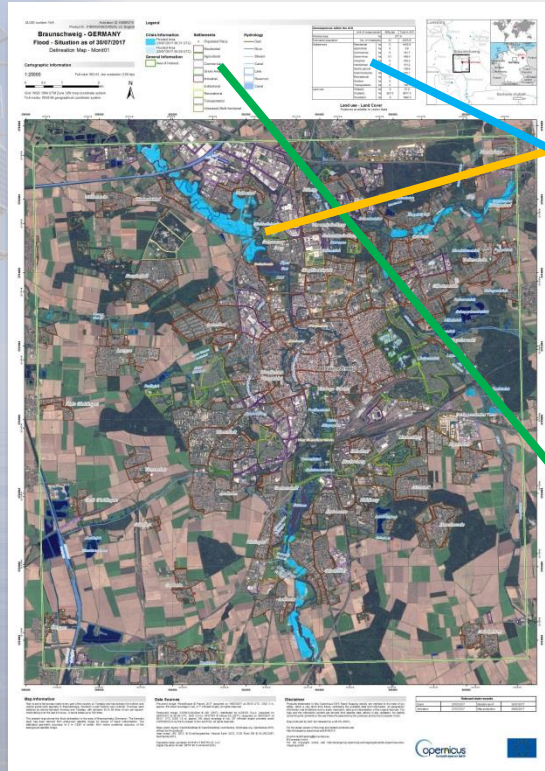
Published: 2017-08-09 15:17:07 (UTC)
Product version: v2
Map scale: 1:25000
Status: Quality approved



In situ

Copernicus EMS RM – Use case - Products

- [EMSR215] Braunschweig: Delineation Map, Monitoring 1



Crisis Information

- Flooded Area (30/07/2017 09:31 UTC)
- Flooded Area (29/07/2017 05:00 UTC)

General Information

- Area of Interest

Settlements

- Populated Place
- Residential
- Agricultural
- Commercial
- Green Area
- Industrial
- Institutional
- Recreational
- Transportation
- Urbanized Multi-functions

Hydrology

- Dam
- River
- Stream
- Canal
- Lake
- Reservoir
- Canal

Consequences within the AOI

	Unit of measurement	Affected	Total in AOI
Flooded area	ha	0	271.6
Estimated population			66646
Settlements			
Residential	ha	0	4433.9
Agriculture	ha	0	3.6
Commercial	ha	0	161.7
Green Area	ha	3.1	436.4
Industrial	ha	0	763.2
Institutional	ha	0	101.2
Sports ground	ha	0	135.8
Multi-functional	ha	0	312.1
Recreational	ha	0	293.7
Stadium	ha	0	3.1
Transportation	ha	0	426.7
Land use			
Wetland	ha	0	37.0
Cropland	ha	267.3	9617.0
Woodland	ha	0	1602.0



In situ

Copernicus EMS RM – Use case – Access to NMCA data

- Focus: **Settlement** → Inspire theme: Buildings (**BU - Annex 3**)
 - Different levels of detail:
 - Single building (>1:10,000)
 - Building block (1:10,001-1:50,000)
 - Built-up area (<1:50,000)
- EEA-EGG Agreement
 - NMCA → Federal Agency for Cartography and Geodesy (BKG) (Germany)
 - Topographic Map 1:25.000 (WMS)
 - Topographic Map 1:50.000 (WMS)
 - Digital Orthophotos - 40 cm ground resolution (WMS)
 - Basic Digital Landscape Model (WFS)



In situ

Copernicus EMS RM – Use case – Access to NMCA data

- Focus: **Settlement** → Inspire theme: Buildings (**BU - Annex 3**)
 - Different levels of detail:
 - Single building (>1:10,000)
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 - ~~Topographic Map 1:25,000 (WMS)~~
 - ~~Topographic Map 1:50,000 (WMS)~~
 - ~~Digital Orthophotos – 40 cm ground resolution (WMS)~~
 - **Basic Digital Landscape Model (WFS)**

← **Simple View Services not enough**

Covered INSPIRE themes: AU, EL, GN, HY, LU, TN

← **BU?**



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In situ

Copernicus EMS RM – Use case – Access to NMCA data

- How to access the required dataset after having verified it is included in the Agreement?
 - Contact Point ← **E-mail address only**: night/week-end/holiday?
 - National Geoportal ← **Ad-hoc credentials required**: just 1 case
 - CORDA ← **A single entry point node to the relevant national and regional geospatial reference data**



In situ

Copernicus EMS RM – Use case – Data Access - CORDA

CORDA

[News](#)

[Statistics](#)

[Feedback](#)

[About](#)

CORDA Copernicus Reference Data Access

User :

Password :

[Forgot password?](#)

[Register](#)

LOGIN



In situ

Copernicus EMS RM – Use case – Data Access - CORDA

Search Datasets

Search Explore Data Providers News What's New Statistics Help Andrea Ajmar

Q Search

Q Search :

Deutschland / Germany (DE)

Advanced search

Inspire theme :

Buildings

Resolution (meters) :

0 100000

Scale :

0 1000000

Year :

CLEAR SEARCH

GERMANY

Denmark

France

Switzerland

Austria

Slovenia

Czech Republic

Feedback

Collections My views

TN View Services - Roads (21)

OI View Services (24)

BU View Services (17)

AU View Services (28)

AU Download Services (23)

EL View Services - DSM (8)

EL View Services - DTM (10)

LC View Services (2)

Selection of :

- Area of Interest
- INSPIRE theme



In situ

Copernicus EMS RM – Use case – Data Access - CORDA

Results

← → ↻ | Sicuro | https://corda.eea.europa.eu/_layouts/15/CORDASearch/Results.aspx | 🔍 ⭐ 📄 📱 🗨

CORDA | Search | Explore | Data Providers | News | What's New | Statistics | Help | Andrea Ajmar

🔗 / Datasets

32 Datasets found

Active filters: Buildings ✕ | Deutschland / Germany (DE) ✕ | - New search

Digital Topographic Map 1:25000 (interim edition)

Federal Agency for Cartography and Geodesy (BKG) (Germany)

WMS

The services of this dataset are only allowed to be used by Copernicus Emergency Management Services (CEMS). The Digital Topographic Map 1:25,000, interim edition - DTK25-V contains geo-referenced raster data of the scanned and partially digitally updated Topographic Map 1:25,000 (TK25) of the Mapping Agencies of the German States. The map is available as layers (single layers that correspond to the printing inks) and as sum layer combined from these (with the complete map image). There can be state-specific differences in the map graphics and in the color assignment. The data are available with a uniform raster resolution as single sheets and editings without sheet lines in various geodetic reference systems and map projections for the Federal Republic of Germany.

Digital Topographic Map 1:50000 (interim edition)

Federal Agency for Cartography and Geodesy (BKG) (Germany)

WMS

The services of this dataset are only allowed to be used by Copernicus Emergency Management Services (CEMS). The Digital Topographic Map 1:50,000, interim Edition - DTK50-V contains geo-referenced raster data of the scanned and partly digitally updated Topographic Map 1:50,000 (TK50). The map content is available as layers (single layers that correspond to the printing inks) and as sum layer combined from these (with the complete map image). There can be state-specific differences in the map graphics and in the color assignment. The data are available with a uniform raster resolution as single sheets and editings without sheet lines (whole data file and/or tiles) in various geodetic reference systems and map projections for the Federal Republic of Germany.

Refine by

Data types ⬆

- ☐ MapServer (2)
- ☐ Raster File (2)
- ☐ URL (3)
- ☐ Vector File (1)
- ☐ WCS (2)
- ☐ WFS (3)
- ☐ WMS (32)
- ☐ WMTS (4)

Area / Data providers ⬇

Feedback

Focus on WFS (3/50)

Refine by

Data types ⬆

- ☐ MapServer (2)
- ☐ Raster File (2)
- ☐ URL (3)
- ☐ Vector File (1)
- ☐ WCS (2)
- ☒ WFS (3)
- ☐ WMS (32)
- ☐ WMTS (4)

Area / Data providers ⬇



In situ

Copernicus EMS RM – Use case – Data Access - CORDA

Results

Sicuro | https://corda.eea.europa.eu/_layouts/15/CORDASearch/Results.aspx

CORDA Search Explore Data Providers News What's New Statistics Help Andrea Ajmar

Basic Landscape Model **Nordrhein-Westfalen**
Geobasis NRW - Surveying and Mapping, Cologne Government Regional Office (Germany)

VECTOR FILE WFS WMS

The basic DLM describes the landscape in the form of topographical objects and represents a presentation-neutral, object-based vector data set.

ALKIS (Official Cadastral Information System) **Berlin**
Senate Department for Urban Development and the Environment of Berlin (Germany)

WFS WMS

Current basic data of the real estate cadastre of ALKIS Berlin.

ALKIS (Official Cadastral Information System) **Berlin b/w**
Senate Department for Urban Development and the Environment of Berlin (Germany)

WFS WMS

In the Official Cadastral Information System for Berlin the current data plan of real estate cadastre has complete coverage.

Refine by

Data types

☐ Vector File (1)

☒ WFS (3)

☐ WMS (3)

Area / Data providers

Feedback

Area of Interest
(Lower Saxony) **not
covered by proper
services** (WFS,
download)





In situ

Copernicus EMS RM – Use case – Data Access - CORDA

Dataset Details

Spatial data services (6) for Basic Landscape Model Nordrhein-Westfalen dataset

- ATKIS Basis Digital Landscape Model Nordrhein-Westfalen
Format: **WFS**
State: WORKING
Fees: Die Geobasisdaten des amtlichen ...
Access: Es gelten keine Beschränkungen, constraints:
- Digital Topographic Map 10 Nordrhein-Westfalen
Format: **WMS**
State: WORKING
Fees: Die Geobasisdaten des amtlichen ...
Access: Es gelten keine Beschränkungen, constraints:
- Digital Topographic Map 100 Nordrhein-Westfalen
Format: **WMS**
State: WORKING
Fees: Die Geobasisdaten des amtlichen ...
Access: Es gelten keine Beschränkungen, constraints:
- Digital Topographic Map 25 Nordrhein-Westfalen
Format: **WMS**
State: WORKING
Fees: Die Geobasisdaten des amtlichen ...
Access: Es gelten keine Beschränkungen, constraints:
- INSPIRE Basis Digital Landscape Model - NAS - Nordrhein-Westfal[...]
Format: **VECTOR FILE**
State: WORKING
Fees:
Access: Es gelten keine Beschränkungen, constraints:
- INSPIRE Basis Digital Landscape Model - Shapefile - Nordrhein- [...]
Format: **VECTOR FILE**
State: WORKING
Fees:
Access: Es gelten keine Beschränkungen, constraints:

Comments

Let's simulate the Area of Interest is covered.

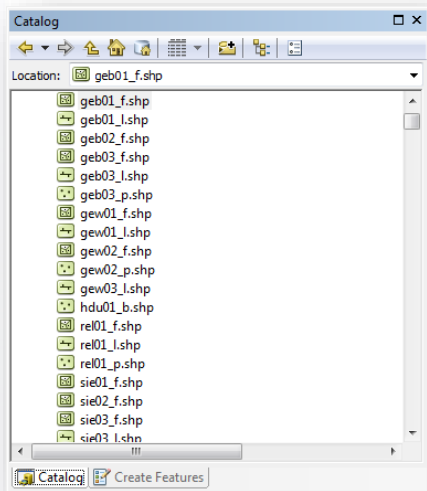
- **WFS Service**
- **Download** (vector file)



In situ

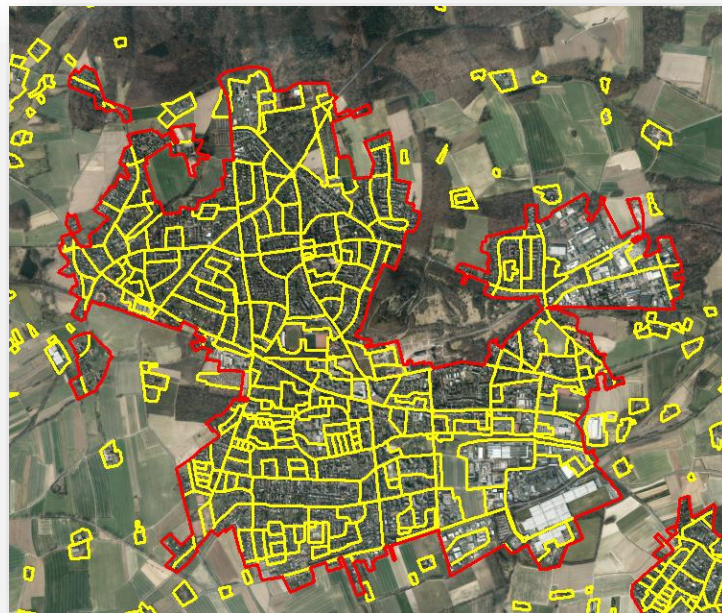
Vector package:

- Is **data model** information available?
 - E.g. which layer for BU among the 41 layers?



Level of detail:

- Only **building block** and **Built-up area** (no single building)





In situ

Copernicus EMS RM – Use case – Technical issues

Thematic information

- Is the settlement **main use category** available?
- National language:** field, domain and values interpretation issues
- Completeness issues



Table

sie02_f

FID	Shape	LAND	MODELLART	OBJART	OBJART_TXT	OBJID	HDU_X	BEGINN	ENDE	AGT	B	B	BEZ	FGT	FKT	NAM	PEG	ZNM	ZUS
0	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BP82	0	2015-12-06T19:58:47Z			10	0							
1	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CDQf	0	2015-12-06T19:58:47Z			10	0							
2	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BV61	0	2015-12-06T19:58:47Z			10	0							
3	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C93r	0	2015-12-06T19:58:47Z			10	0							
4	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000ByR0	0	2015-12-06T19:58:47Z			10	0							
5	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000D36j	0	2015-12-06T19:58:47Z			10	0							
6	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000Ccxk	0	2015-12-06T19:58:47Z			10	0							
7	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C8MQ	0	2015-12-06T19:58:47Z			10	0							
8	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CTX5	0	2015-12-06T19:58:47Z			10	0							
9	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CUDx	0	2015-12-06T19:58:47Z			10	0							
10	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BR2N	0	2015-12-06T19:58:47Z			10	0							
11	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BoIS	0	2015-12-06T19:58:47Z			10	0							
12	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BShG	0	2015-12-06T19:58:47Z			10	0							
13	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CBSx	0	2015-12-06T19:58:47Z			10	0							
14	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BfTT	0	2016-10-31T11:43:11Z			10	0							
15	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CExs	0	2016-10-31T11:43:11Z			10	0							
16	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C2yH	0	2015-12-06T19:58:47Z			10	0							
17	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CLIZ	0	2015-12-06T19:58:47Z			10	0							
18	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C3Ab	0	2016-10-31T11:43:11Z			10	0							
19	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CN0n	0	2015-12-06T19:58:47Z			10	0							

1 (0 out of 394830 Selected)

sie02_f

Catalog Create Features Table



In situ

Copernicus EMS RM – Use case – Technical issues

WFS: settings

WFS Connection

URL:

WFS Version: **1.1.0**

Authentication Method:

Web Connection:

Connection Timeout:

Transfer Timeout Length (seconds):

Constraints

Feature Types: **baeudeflaechen {ALKIS Berlin Gebäude}**

Max Features:

WFS Output Format:

WFS Filter Expression:

Application Scheme

Ignore Application Scheme: ☐

Application Scheme:

Human Identifier Attribute:

GML Feature Elements:

GML SRS/Geometry Parameters

GML SRS Axis Order:

GML SRS Angle Direction:

Enforce Path Continuity By:

Schema Attributes

Additional Attributes to Expose:

Use Search Envelope: ☒

Search Envelope Coordinate System:

WFS Version:

1.1.0

1.0.0

1.1.0

2.0.0

Authentication Method:

Feature Types: **baeudeflaechen {ALKIS Berlin Gebäude}**

Max Features:

Application Schema:

GML SRS/Geometry Parameters

GML SRS Axis Order:

GML SRS Angle Direction:

Enforce Path Continuity By:

1,2

2,1

1,2,3

2,1,3

☒ Use Search Envelope

Minimum X:

Minimum Y:

Maximum X:

Maximum Y:

Clip to Search Envelope: ☐

Search Envelope Coordinate System:



European
Commission



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by





In situ

Conclusions



NMCA1



NMCA2



NMCA3



NMCA4

...



NMCA_n



...



STANDARD CASE



Implemented
by





In situ

Conclusions



NMCA1



NMCA2



NMCA3



NMCA4



...



NMCA_n



AGREEMENT

EEA -EGG



Implemented
by





In situ

Conclusions



NMCA1



NMCA2



NMCA3



NMCA4



...



NMCA_n



CORDA



Implemented
by



6 December, 2017



In situ

Conclusions



NMCA1



NMCA2



NMCA3



...



NMCA_n

INSPIRE Compliant
(ELF/ELS-like solutions)



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Fabio GIULIO TONOLO – ITHACA

www.ithacaweb.org



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