Copernicus KEN Workshop

December, 5th 2017

Copernicus EMS – (Rapid) Mapping component

Access to NMCA data: use case

In situ

Fabio GIULIO TONOLO – ITHACA
www.ithacaweb.org

Copernicus Europe's eyes on Earth | European Commission | Implemented by | European Environment Agency

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)

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

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.

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: Plèiades-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 COPERNICUS 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)

Copernicus EMS Rapid Mapping(RM) – Use case

In situ

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

- Flood in Braunschweig, Germany

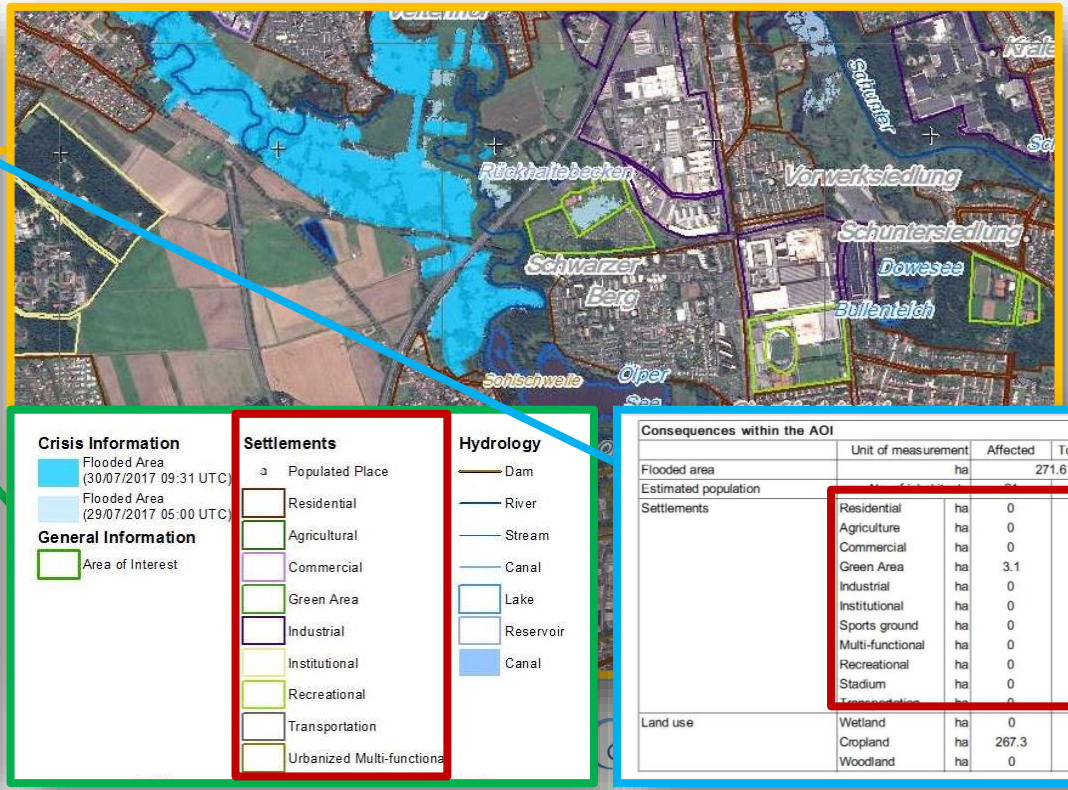
Just one among the possible examples

(recent activation, use of settlement layer, …)

Copernicus EMS RM – Use case - Products

In situ

- *[EMSR215] Braunschweig: **Delineation Map**, Monitoring 1*



Consequences within the AOI

		Unit of measurement	Affected	Total in AOI
Flooded area		ha	271.6	
Estimated population				
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
Land use	Wetland	ha	0	37.0
	Cropland	ha	267.3	9617.0
	Woodland	ha	0	1602.0

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)

Copernicus EMS RM – Use case – Access to NMCA data

- Focus: **Settlement** → Inspire theme: Buildings (**BU - Annex 3**)
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- EEA-EGG Agreement
  - NMCA → Federal Agency for Cartography and Geodesy (BKG) (Germany)
    - ~~Topographic Map 1:25.000 (WMS)~~
    - ~~Topographic Map 1:50.000 (WMS)~~

    ← **Simple View Services not enough**

    - ~~Digital Orthophotos - 40 cm ground resolution (WMS)~~
    - **Basic Digital Landscape Model (WFS)**

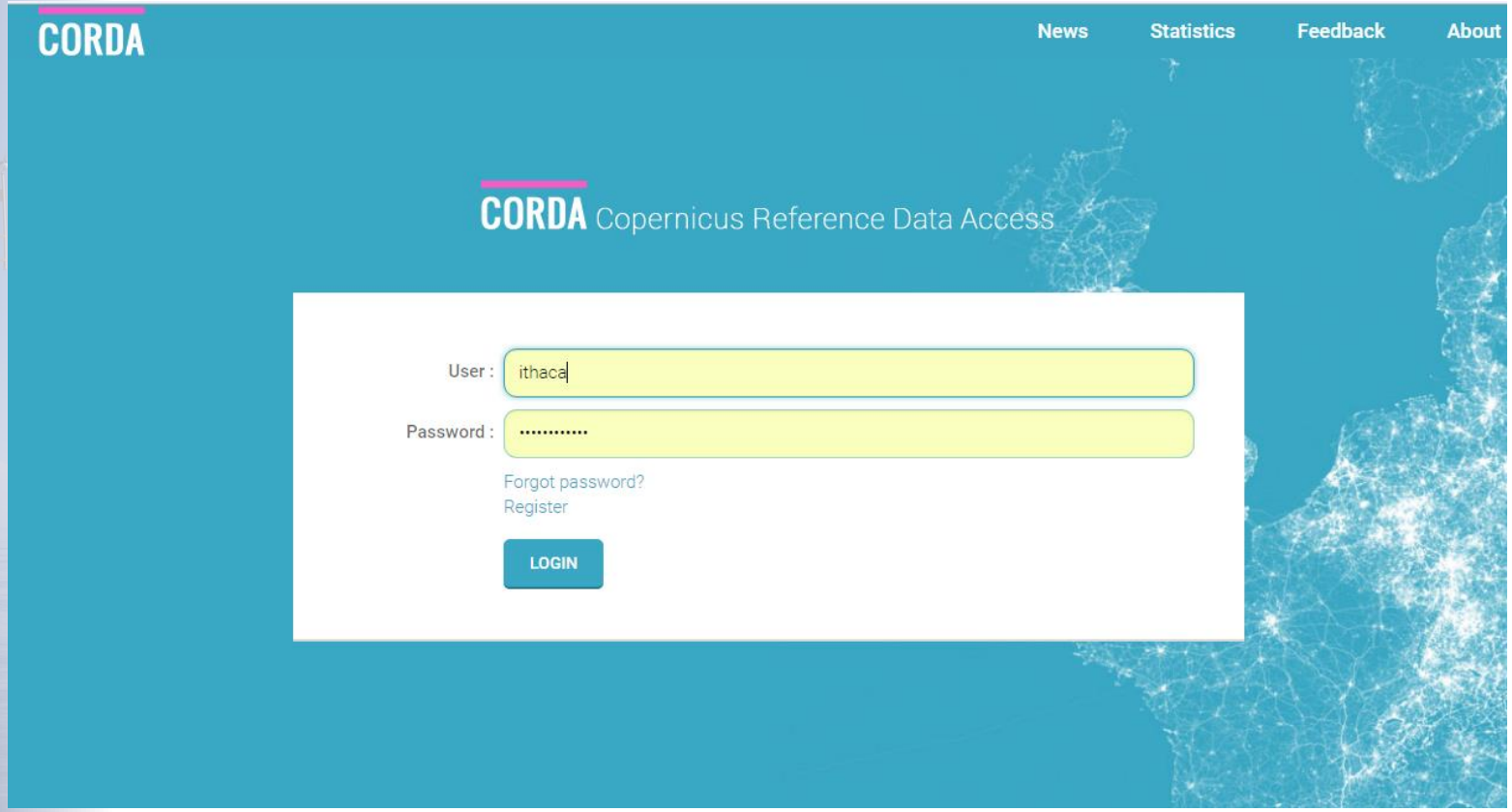
      Covered INSPIRE themes: AU, EL, GN, HY, LU, TN ← **BU?**

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**

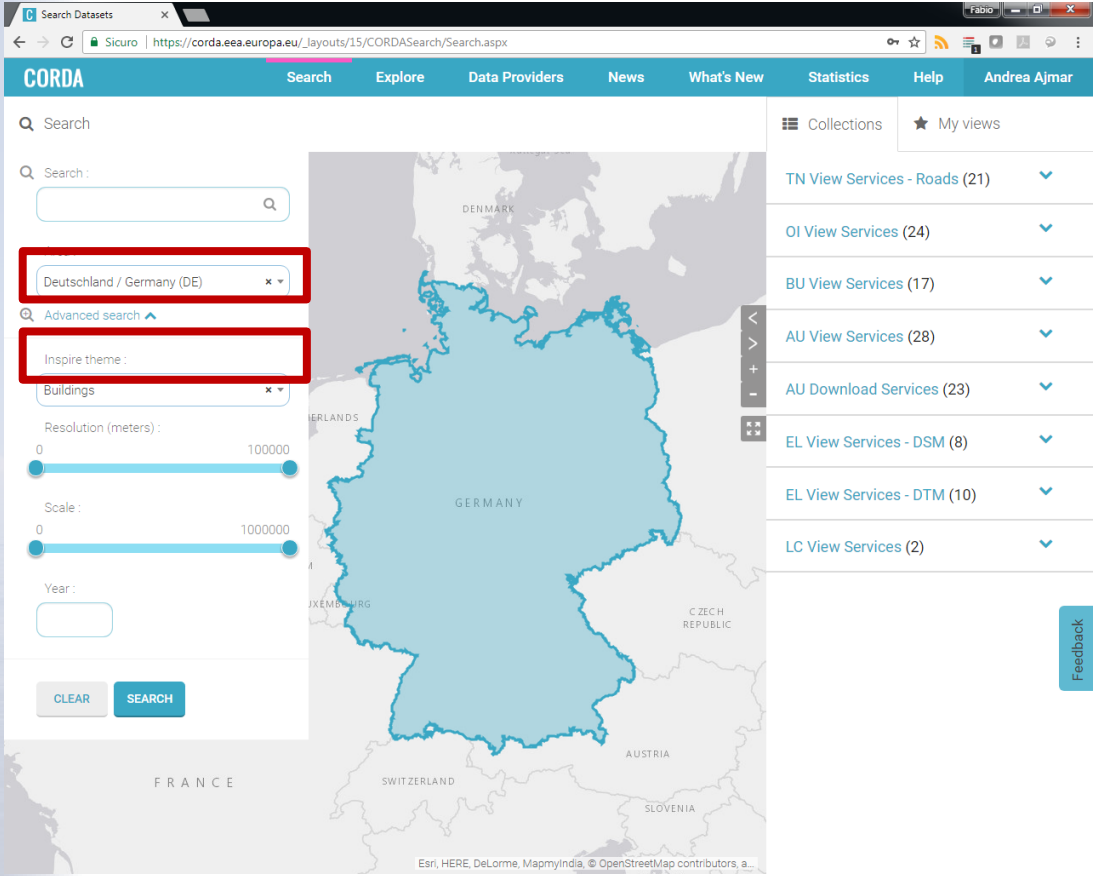
Copernicus EMS RM – Use case – Data Access - CORDA

In situ



Copernicus EMS RM – Use case – Data Access - CORDA

In situ



Selection of :

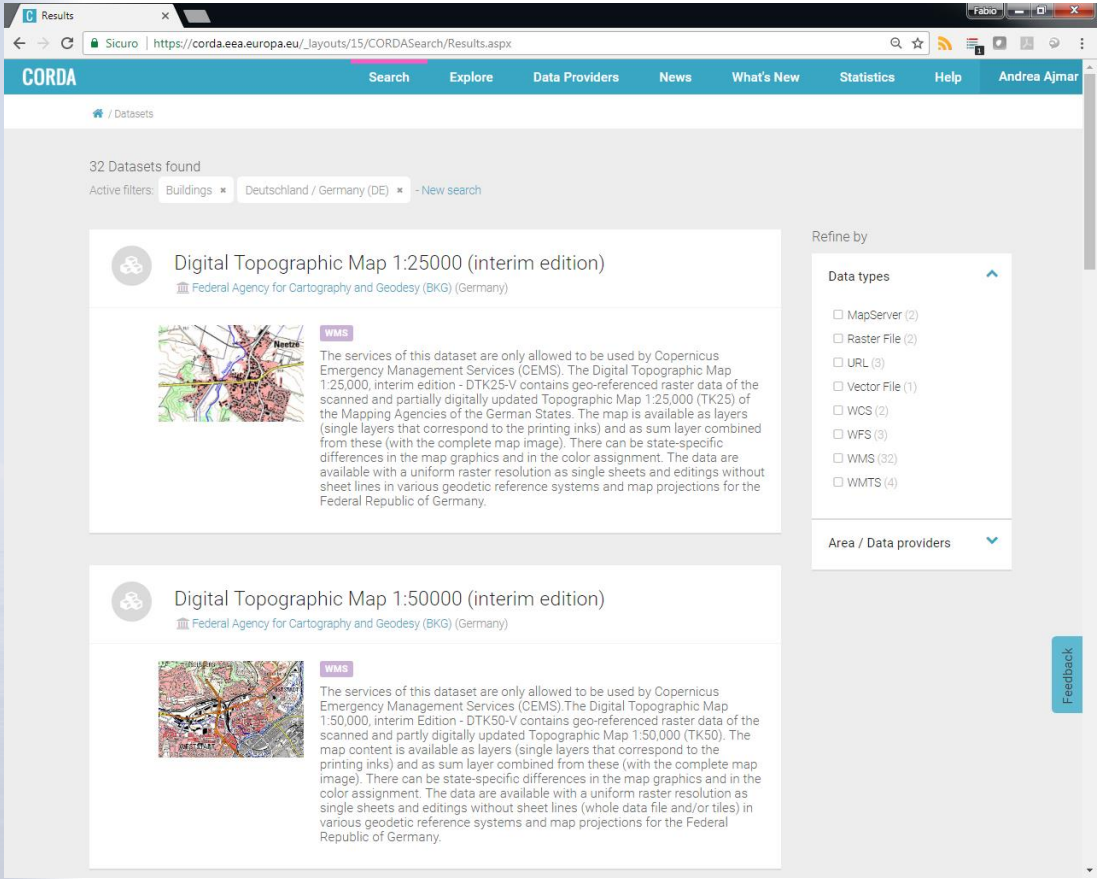
- **Area of Interest**
- **INSPIRE theme**

Implemented by

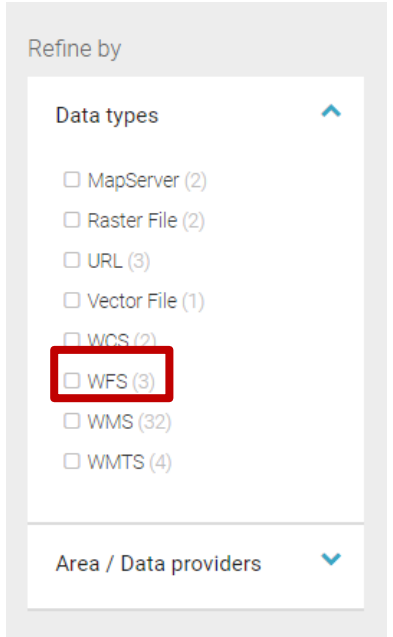
European Environment Agency

Copernicus EMS RM – Use case – Data Access - CORDA

In situ



Focus on WFS (3/50)



Implemented by

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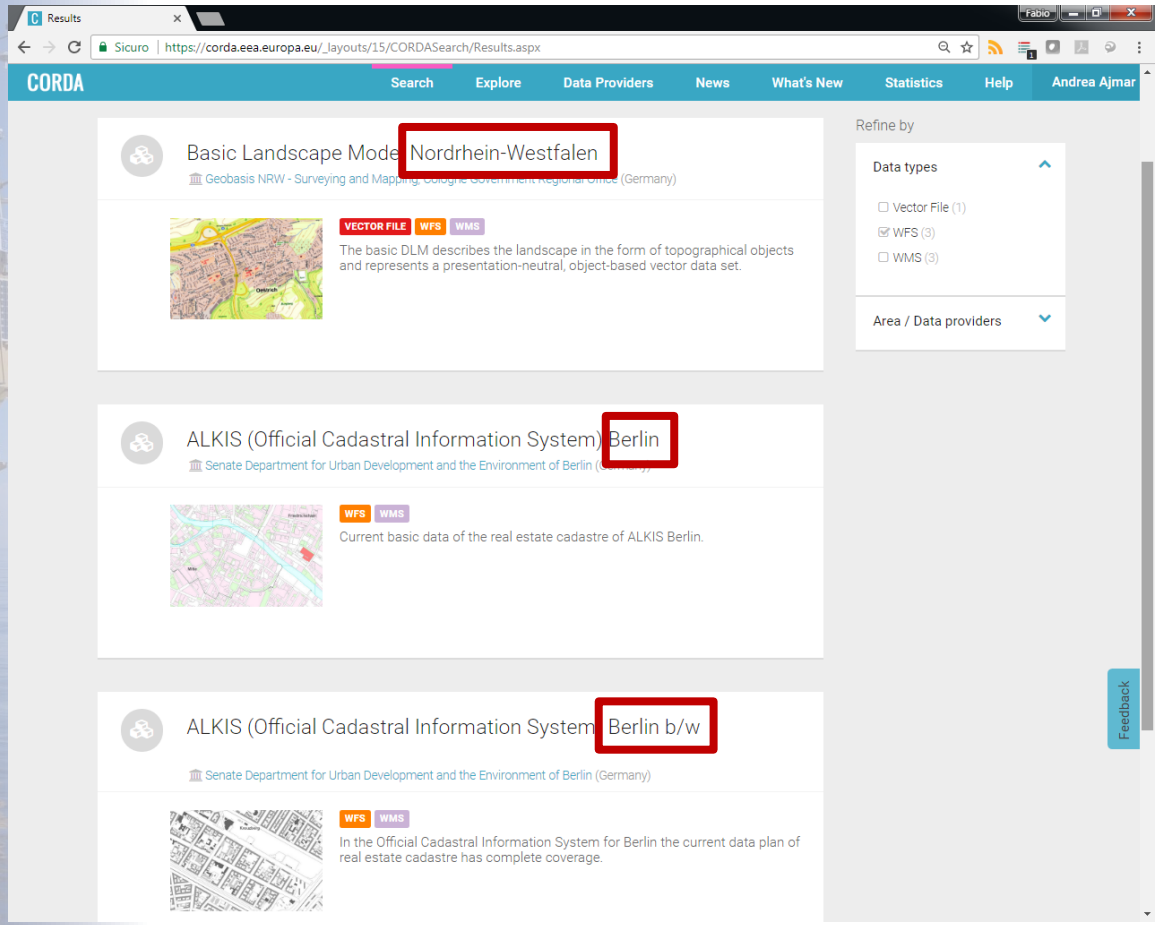
Copernicus EMS RM – Use case – Data Access - CORDA

In situ



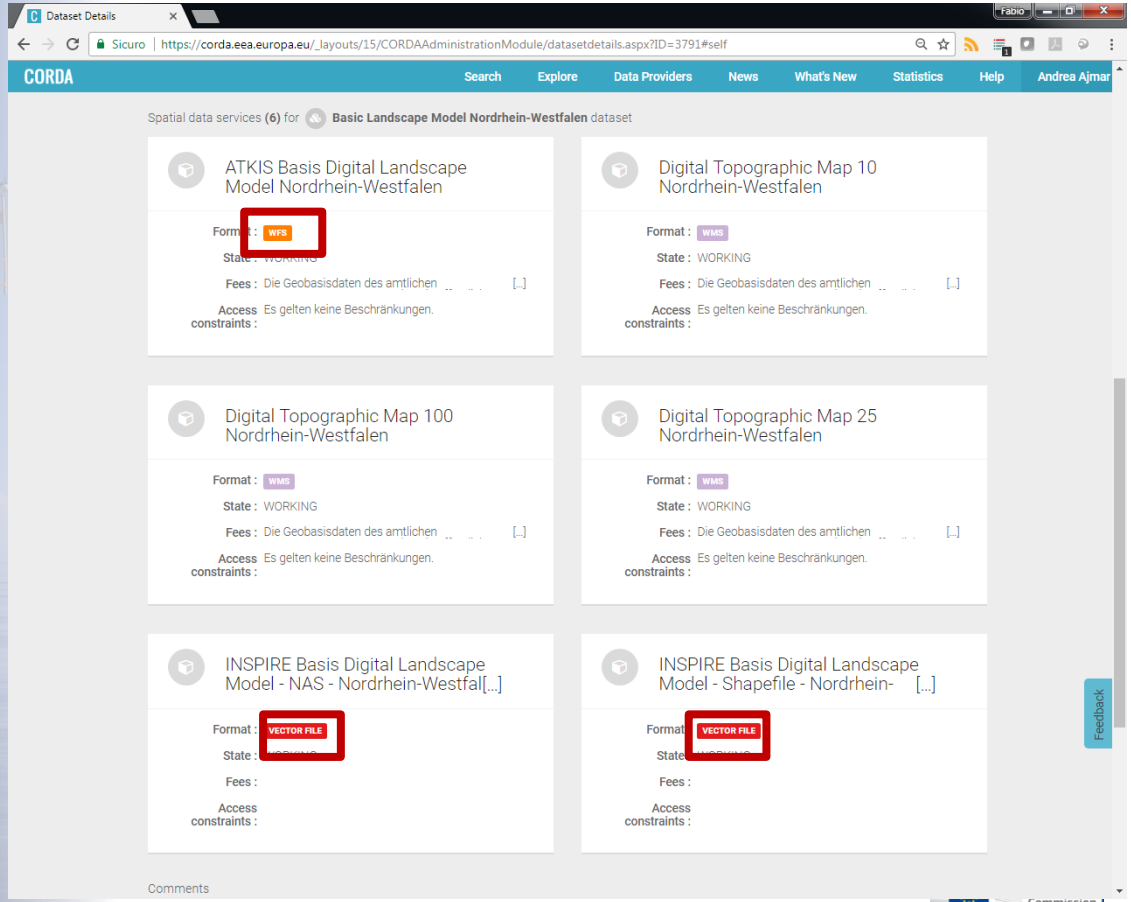
Area of Interest (Lower Saxony) **not covered by proper services** (WFS, download)

Implemented by

European Environment Agency

Copernicus EMS RM – Use case – Data Access - CORDA

In situ



Let's simulate the Area of Interest is covered.

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

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Copernicus Europe's eyes on Earth

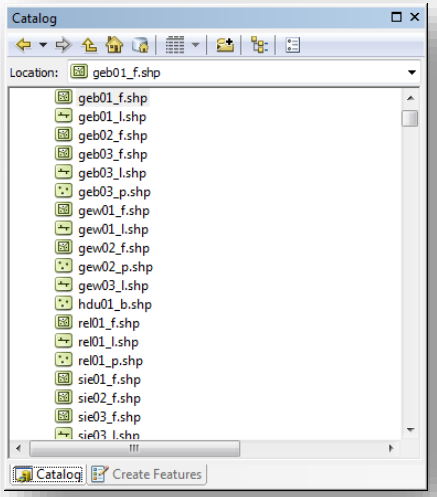
European Environment Agency

Copernicus EMS RM – Use case – Technical issues

In situ

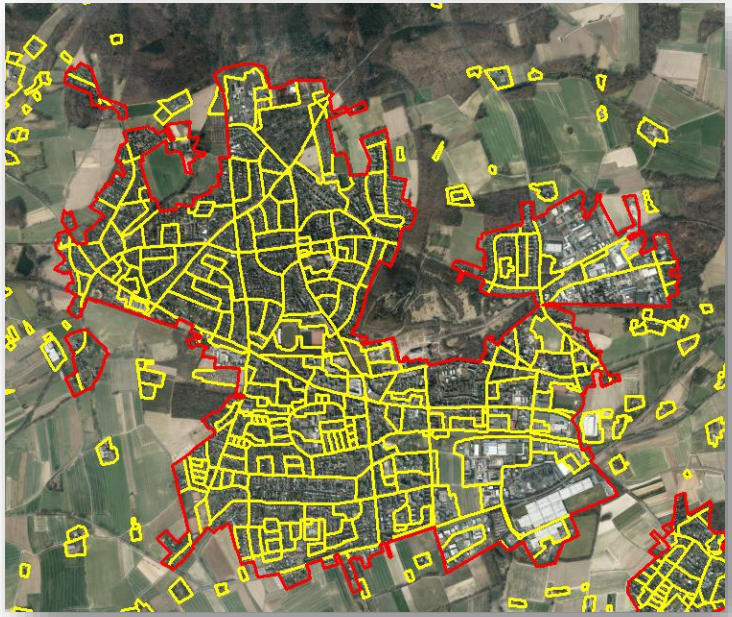
Vector package:

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



Level of detail:

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



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	BEZ	FGT	FKT	NAM	PEG	ZNM	ZUS
0	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BP82	0	2015-12-06T19:58:47Z									
1	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CDQf	0	2015-12-06T19:58:47Z									
2	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BV61	0	2015-12-06T19:58:47Z									
3	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C93r	0	2015-12-06T19:58:47Z									
4	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000ByR0	0	2015-12-06T19:58:47Z									
5	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000D3bj	0	2015-12-06T19:58:47Z									
6	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000Cxix	0	2015-12-06T19:58:47Z									
7	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C8MQ	0	2015-12-06T19:58:47Z									
8	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CTX5	0	2015-12-06T19:58:47Z									
9	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CUDx	0	2015-12-06T19:58:47Z									
10	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BR2N	0	2015-12-06T19:58:47Z									
11	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000Bol5	0	2015-12-06T19:58:47Z									
12	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BShG	0	2015-12-06T19:58:47Z									
13	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CBSx	0	2015-12-06T19:58:47Z									
14	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000BfTT	0	2016-10-31T11:43:11Z									
15	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CExS	0	2016-10-31T11:43:11Z									
16	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CzYH	0	2015-12-06T19:58:47Z									
17	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CLlZ	0	2015-12-06T19:58:47Z									
18	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000C3Ab	0	2016-10-31T11:43:11Z									
19	Polygon	NW	Basis-DLM	41001	AX_Wohnbauflaeche	DENWAT01D000CN0n	0	2015-12-06T19:58:47Z									

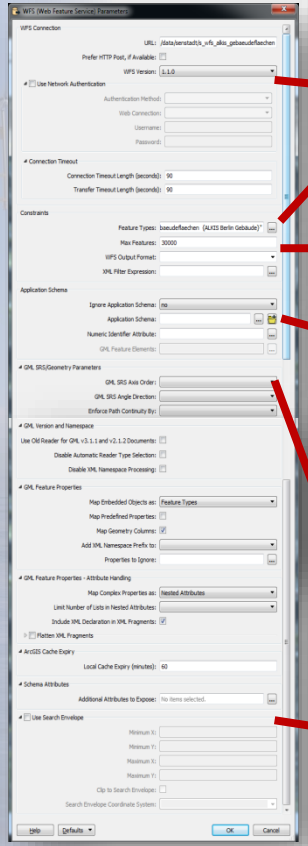
1 (0 out of 394830 Selected)

sie02_f

Catalog | Create Features | Table

Copernicus EMS RM – Use case – Technical issues

WFS: **settings**



WFS Version: 1.1.0

1.0.0
1.1.0
2.0.0

ication Method:

Feature Types: baeudeflaechen {ALKIS Berlin Gebäude}" ...

Max Features: 30000

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: 0

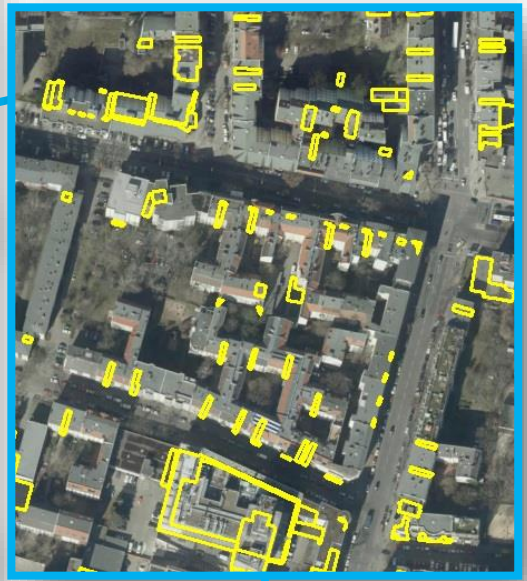
Minimum Y: 0

Maximum X: 0

Maximum Y: 0

Clip to Search Envelope:

Search Envelope Coordinate System:



Conclusions

In situ

NMCA1 NMCA2 NMCA3 NMCA4 . . . NMCAn

STANDARD CASE

Copernicus Europe's eyes on Earth

Implemented by

European Environment Agency

Conclusions

In situ

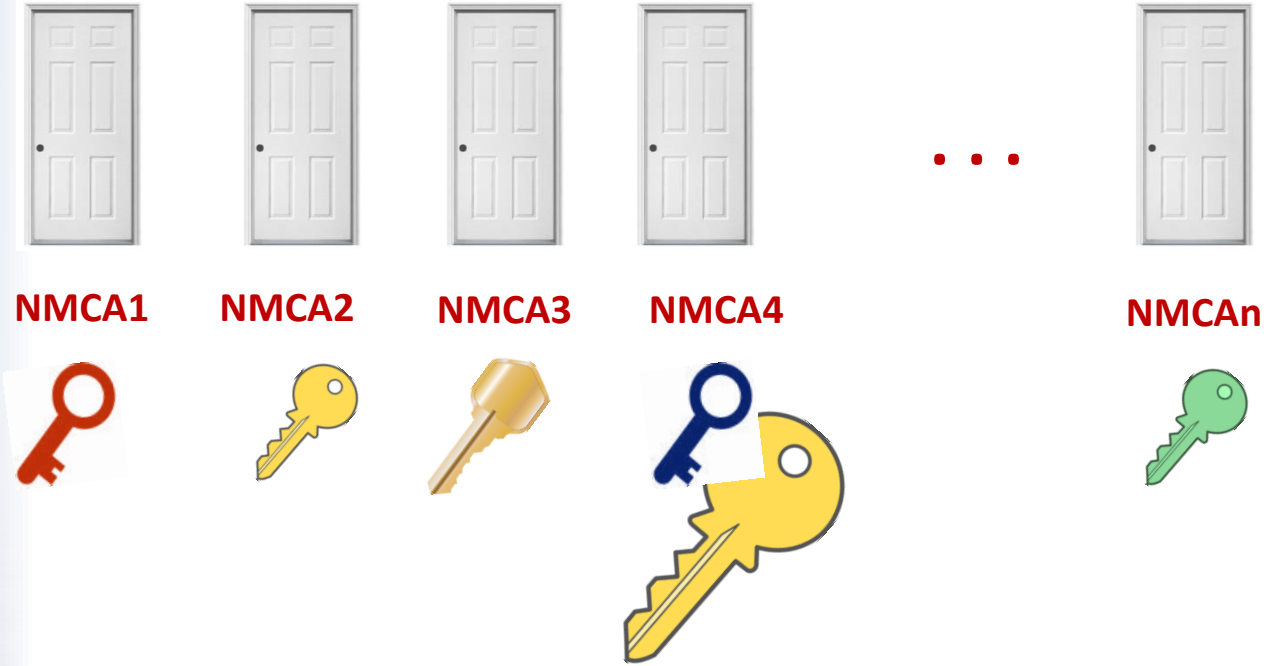
AGREEMENT

EEA -EGG

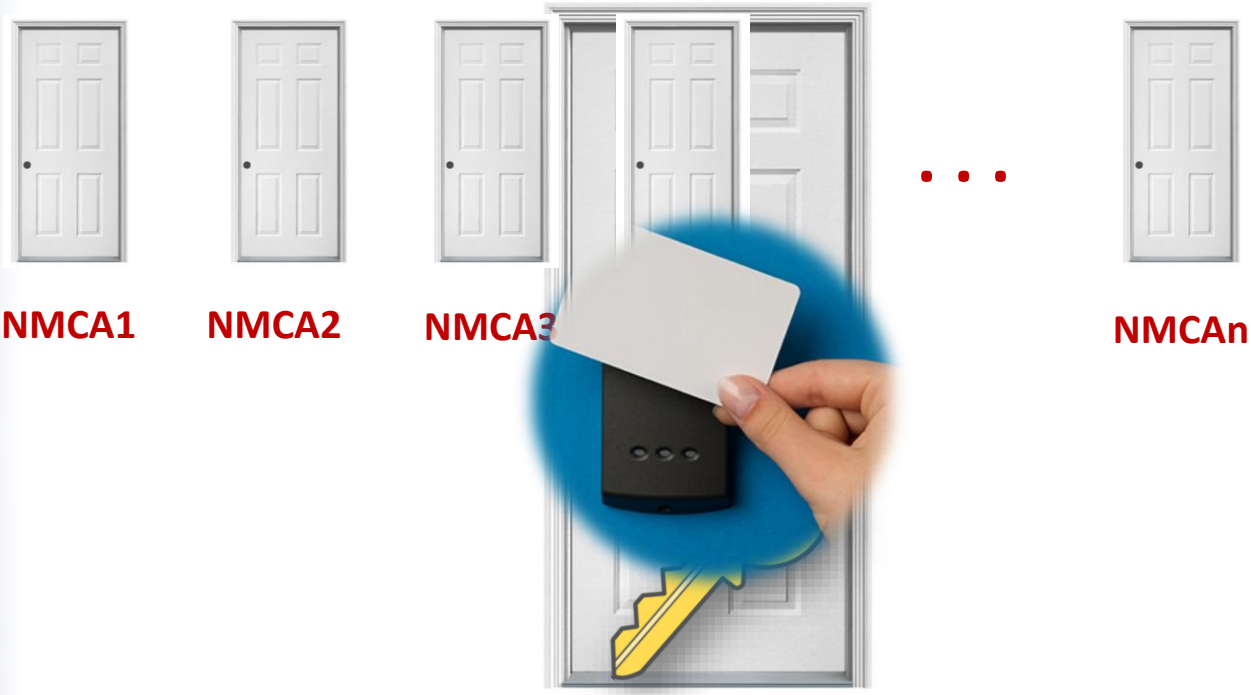
Implemented by

Conclusions

In situ



Conclusions



INSPIRE Compliant

(ELF/ELS-like solutions)

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