



In situ

Improved access to authoritative data to support Copernicus

Jose Miguel Rubio & Henrik Steen Andersen
European Environment Agency





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Copernicus' Access to In Situ Data

Copernicus helps us better understand our planet and sustainably manage the environment we live in.

Key user requirements cannot be met unless Copernicus has access to essential in situ data.



Copernicus in situ data means observation data from ground-borne, seaborne or airborne sensors, as well as reference and ancillary data licensed or provided for use in Copernicus.



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Copernicus' Access to In Situ Data

The Copernicus Services require in situ data to produce and validate their products.



The Copernicus Space Component requires in situ data for calibration and validation of Sentinel observations.

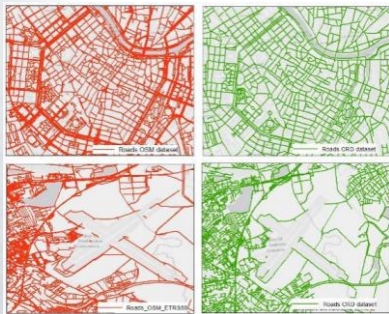


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Copernicus' need for & use of in situ data

Three types of in situ data

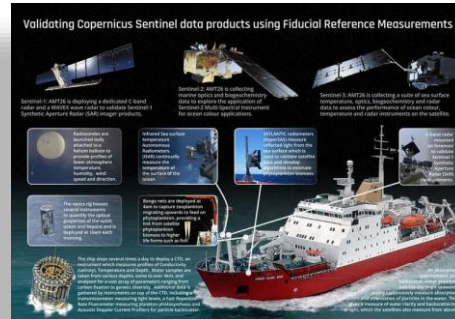
- Geospatial Data (transport networks, elevation, settlements, industry,...);
- Environmental Observations (temperature, aerosols, waves, radiation, salinity, ...);
- Fiducial Reference Measurements (very precise SI-traceable and fully characterized measurements).



Temperature-measuring surface drifters. Credit: NCE



Source: DMI





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Cooperation and data sharing is key

Latest Copernicus EMS - Mapping Activations

Act. Code	Title	Act. Date	Type	Country/Terr. Feed
EMSR545	Wildfire in Andalusia, Spain	2021-09-09	Wildfire	Spain
EMSR544	Wildfires in Galicia, Spain	2021-09-07	Wildfire	Spain
EMSN106	Wildfire in Ezcaray, Spain	2021-08-30	Wildfire	Spain
EMSN105	Floods in Solingen, Germany	2021-08-27	Flood	Germany
EMSN104	ETA and IOTA hurricanes effects in...	2021-08-19	Storm	Guatemala
EMSR543	Fire in La Palma, Canary Islands, Spain	2021-08-17	Wildfire	Spain
EMSR542	Forest fire in Lavrio, Eastern Attica,...	2021-08-17	Wildfire	Greece
EMSR541	Fire in Var, France	2021-08-17	Wildfire	France
EMSR540	Fire in Western Attica, Greece	2021-08-17	Wildfire	Greece
EMSR539	Fire in Algarve, Portugal	2021-08-17	Wildfire	Portugal

Activation codes: ... Mapping

Authoritative geospatial data make a difference



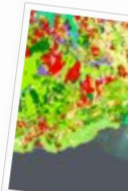
Urban Atlas



Riparian Zones



Natura 2000 (N2K)



Coastal Zones



Copernicus products support national monitoring and emergency management

EMSR517: Flood in Western Germany

Event Time (UTC): 2021-07-13 16:00

Event Time (LOC): 2021-07-13 18:00

Event Type: Flood (Riverine flood)

Activation Time (UTC): 2021-07-13 17:11

Activation Status: Closed

Affected Countries/Territories:

Germany

Federal States

North Rhine-Westphalia

Rhineland-Palatinate

Lower Saxony

Hesse

Baden-Württemberg

Thuringia

Saxony-Anhalt

Saxony

Bavaria

Brandenburg

Mecklenburg-Vorpommern

Schleswig-Holstein

Berlin

Lower Saxony

North Rhine-Westphalia

Rhineland-Palatinate

Lower Saxony

Hesse

Baden-Württemberg

Thuringia

Saxony-Anhalt

Saxony

Bavaria

Brandenburg

Mecklenburg-Vorpommern

Schleswig-Holstein

Berlin

Lower Saxony

North Rhine-Westphalia

Rhineland-Palatinate

Lower Saxony

Hesse

Baden-Württemberg

Thuringia

Saxony-Anhalt

Saxony

Bavaria

Brandenburg

Mecklenburg-Vorpommern

Schleswig-Holstein

Berlin

Lower Saxony

North Rhine-Westphalia

Rhineland-Palatinate



Activation Reason:

Heavy rains affected Rhineland-Palatinate area where a severe flood event is expected over the next few days along the river Moselle. The German Joint Information and Coordination Center triggered the Copernicus EMS

EMSR518: Flood in Belgium

Event Time (UTC): 2021-07-14 20:00

Event Time (LOC): 2021-07-14 18:00

Event Type: Flood (Riverine flood)

Activation Time (UTC): 2021-07-14 14:00

Activation Status: Closed

Affected Countries/Territories:

Kingdom of Belgium

Kingdom of the Netherlands

Service Output: 4 products (18 maps)

Definition: 4 products (18 maps)

Authorized User:

Belgium/Centre Gouvernemental de Coordination et de

Crise

Activation Reason:

Heavy rain affected the Walloon Region in Belgium, where a severe flood event is expected in the Eastern parts over the next days. The National Crisis Center triggered the Copernicus EMS Rapid Mapping Service to monitor the flood evolution over the affected areas.



European Environment Agency



European Commission

Copernicus
Europe's eyes on Earth

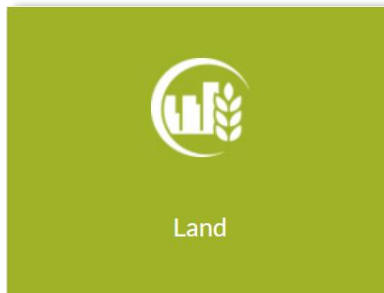
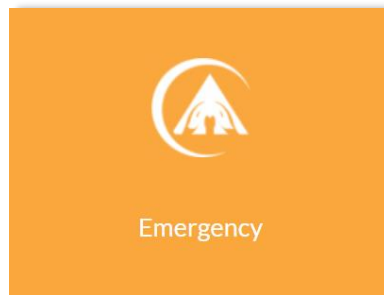


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Data from NMCAs are essential for Services

Settlements
Industry and Utilities
Hydrography
Transport infrastructure
Elevation
Land cover
Population/Census







BORDER SURVEILLANCE COMPONENT
MARITIME SURVEILLANCE COMPONENT
SUPPORT TO EU EXTERNAL ACTION



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EEA's main cross-cutting activities

Determine State of Play	 https://insitu.copernicus.eu/state-of-play
Provide access to data	 https://corda.eea.europa.eu/
Engage with data providers	  https://insitu.copernicus.eu/data-access/agreements
Provide support and advice	 https://insitu.copernicus.eu/library/reports



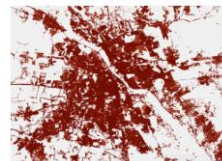
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COPERNICUS LAND MONITORING SERVICE

PAN-EUROPEAN COMPONENT

	Geo-referenced image data of the earth's surface at very high spatial resolution, from either satellite or airborne sensors. Ideally, this should include colour-infrared spectral information. Access is most efficient through well-functioning and fast WMS service.
	The observed actual cover and land use of the earth's surface, both in terms of natural and man-made features (e.g. cropland, grassland, forest, natural vegetation, bare soil, wetland, built-up area). Land Parcel Information System (LPIS) data are highly desirable.
	Natural and artificial water features (e.g. streams, rivers, canals, lakes, reservoirs) which represent the water bodies and drainage network.
	Up-to date geospatial representations of the transport networks including information on the width and type of network element.
	Digital elevation models for land and ice surfaces. Includes terrestrial elevation and shoreline.
	Exact administrative delimitations of countries and their sub-regions (e.g. provinces, departments, districts).



HRIL Imperviousness Degree 2012, City of Warsaw, Poland



HRIL Forest: Tree Cover Density 2012, City of Warsaw, Poland

REQUIREMENTS AND THEIR DETAILS

REQUIREMENT UID	REQUIREMENT	NOTE	DETERMINATION	QUALITY CONTROL	GROUP	UNCERTAINTY (%)	UPDATE FREQUENCY	TIMELINESS	SCALE	HOMOGENEOUS RESOLUTION
35	Administrative Boundaries	Administrative boundaries for the generation of products at pan-European scale	View and Download service	Manual	Administrative boundaries	N/A	1 year	3 hours	1:25000	5 m
144	Administrative Boundaries	Administrative boundaries for the generation of products at local scales	View and Download service	Manual	Administrative boundaries	0.5 %	1 year	3 hours	1:10000	5 m
437	Biogeographic regions	Differentiation of geographic space into biogeographic regions based on climate related and environmental variables. Normal requirement: vector. Coverage requirement: vector.	View and Download service	Manual	Physiography		3 years	1 week	1:100000	5 km
213	Digital Elevation Model				Global					
296	Digital Elevation Model									
379	Digital Elevation Model									
360	Ortho-imagery									

PRODUCTS AND ASSOCIATED REQUIREMENTS

PRODUCT	REQUIREMENT	REQUIREMENT UID
Corine Land Cover	Administrative Boundaries	144
	Administrative Boundaries	35

DATASETS AND RELATED DATA PROVIDERS PER REQUIREMENT

REQUIREMENT	REQUIREMENT UID	DATA	DATA PROVIDER	DATA PROVIDER TYPE
Corine Land Cc				
Administrative Boundaries	35	EEA reference grid	EEA	Institutional
		EEA39 Boundary Layers	EEA	Institutional

LEVEL OF COMPLIANCE BETWEEN DATASETS AND REQUIREMENTS

	PRODUCT	DATA	REQUIREMENT	REQUIREMENT UID	LEVEL OF COMPLIANCE DATA vs REQUIREMENT	DATA LINK NOTE
Administrative						
Biogeographic	Corine Land Cover	Bling maps	Orthoimagery - Very High Resolution - Up-to-date - Homogeneous	219	Partially	Useful resource for visual interpretation if no other types of validation and calibration data are available. Useful for completion of the database of training and testing samples, calibration and validation. Very limited metadata available. Not pure in-situ dataset, combined with satellite imagery.
		Coastal Zones Land Cover / Land Use	Land Cover	436	Partially	only partial coverage of Europe
			Land Use	487	Partially	Thematic classes are a mixture of land cover and land use. Coverage may not be complete.
		Copernicus Land Monitoring Service Pan-European High Resolution Layers	Land Cover	436	Fully	Consists of different layers covering various topics (Forest, Grassland, Water/Wetland, Imperviousness), homogeneous datasets for

<https://insitu.copernicus.eu/state-of-play>

European Environment Agency



European Commission





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State of Play – a cross-cutting view

Characteristics analysed:

- Level of detail
- Update frequency
- Area (spatial coverage)
- Temporal coverage
- Data policy
- Data type
- Format
- Dissemination / service
- INSPIRE theme

Requirement Groups
Administrative boundaries
Aerial Ortho-imagery
Cryosphere
Digital Elevation Model
Hydrography
Industry and Utilities
Land cover/Land use
Large scale population information
Maritime elements
Meteorology
Ocean
Physiography
Settlements
Terrestrial
Toponyms
Transportation network

Aerial Ortho-imagery	CEMS		CLMS			CSS			Total final scores
	Rapid Mapping	Risk and Recovery	Local Land	Pan-EU Land	Global Land	Border Surveillance	Maritime Surveillance	Support to EU External action	
Level of detail	12	9	4.4	4.0	NA	4.0	NA	NA	33.3
Area	12	9	8.7	7.9	NA	4.0	NA	NA	41.7
Data type	4	3	2.2	2.0	NA	1.3	NA	NA	12.5
Data format	4	3	2.2	2.0	NA	1.3	NA	NA	12.5
Temporal coverage	12	9	8.7	7.9	NA	NA	NA	NA	37.6
Update frequency	12	9	6.5	5.9	NA	4.0	NA	NA	37.5
Data policy	12	9	8.7	7.9	NA	NA	NA	NA	37.6
Dissemination	4	3	6.5	5.9	NA	1.3	NA	NA	20.8
INSPIRE Theme	4	3	2.2	2.0	NA	1.3	NA	NA	12.5

Table 3 – Aerial Ortho-imagery final scores table

Level of CRITICALITY
HIGH
MEDIUM
LOW
NONE
NA (Not Applicable)

The given Requirement's characteristic is essential for the products generation.

The given Requirement's characteristic is significant for the products generation and onerous activities are required to meet the Requirement.

The given Requirement's characteristic is weakly relevant for the products generation and minor additional activities are required to meet the Requirement.

No issue emerged for the fulfillment between Dataset and the related Requirement





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State of play 2021 – Geospatial data



Key challenges

- Technical:
 - Spatial coverage
 - Temporal coverage
 - Update frequency
 - Level of detail
- Legal:
 - Data policy constraints

Key recommendations

- Increase engagement and advocacy
- Improving in situ data provision frameworks (e.g. with EGG)
- Strengthened international engagement
- New technical solutions





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CORDA and National Mapping Agencies

- CORDA is a controlled and monitored gateway to geospatial data restricted to Copernicus services;
- CORDA gives access to datasets from 267 data providers – almost 2000 datasets and 6000 data services;
- CORDA contains links to **almost 500 datasets** covering 14 themes produced by **36 NMCA**s.



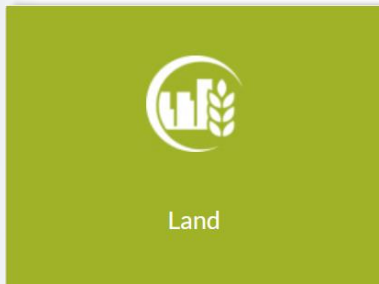
Country	Number of datasets	Country	Number of datasets
Albania	21	Kosovo	1
Austria	13	Ireland	43
Belgium	11	Latvia	3
Bulgaria	1	Luxembourg	29
Croatia	9	Malta	5
Cyprus	18	Netherlands	8
Czechia	25	Norway	25
Denmark	16	Poland	16
Estonia	17	Portugal	20
Finland	13	Romania	6
France	16	Slovakia	20
Georgia	1	Slovenia	17
Germany	15	Spain	27
Greece	3	Sweden	8
Hungary	3	Switzerland	36
Iceland	17	United Kingdom	22
Eurogeographics	1		
Total	485		



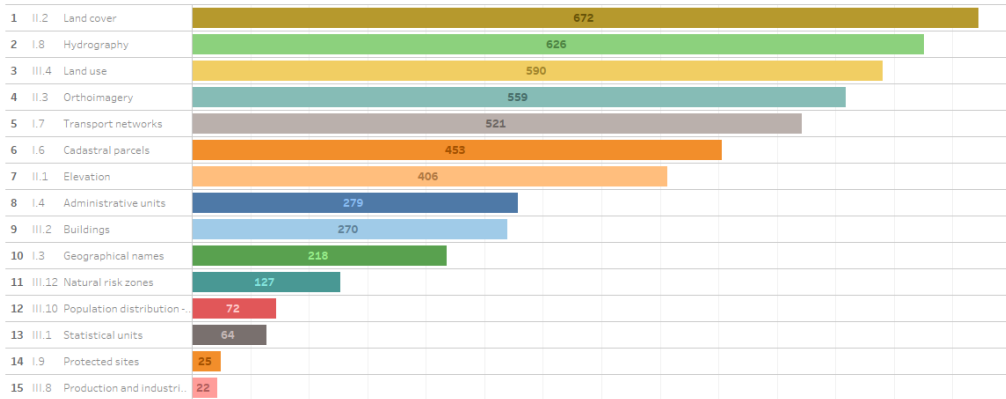


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What data are the Services looking for?



Ranking by INSPIRE themes for Land Monitoring Services

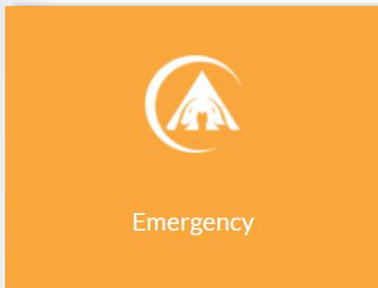


Rank	Dataset Name	Data Provider	Country	Hits
1	GSD-General Map	The Swedish mapping, cadastral and land registration authority	Sweden	112
2	Basic Landscape Model	Federal Agency for Cartography and Geodesy (BKG)	Germany	66
3	Agricultural Land Use 2015 of Flanders	Department of Agriculture and Fisheries	Belgium	64
4	EuroGlobalMap	EuroGeographics	European Bodies	60
5	GRBgis - Large-scale Reference File of Flanders	Flanders Information Agency	Belgium	54
6	Topographic Database	National Land Survey of Finland (NLS) / (MML)	Finland	49
7	Topographic Map of North Rhine-Westphalia	Geobasis NRW - Surveying and Mapping, Cologne Government Regional Office	Germany	49
8	TOP10NL Digital topographic map 1:10000	The Netherlands' Cadastre, Land Registry and Mapping Agency	Netherlands	48
9	FranceRaster®	National Institute of Geographic and Forest Information (IGN)	France	48
10	DTK25 Digital Topographic Map 1:25000	Federal Agency for Cartography and Geodesy (BKG)	Germany	48

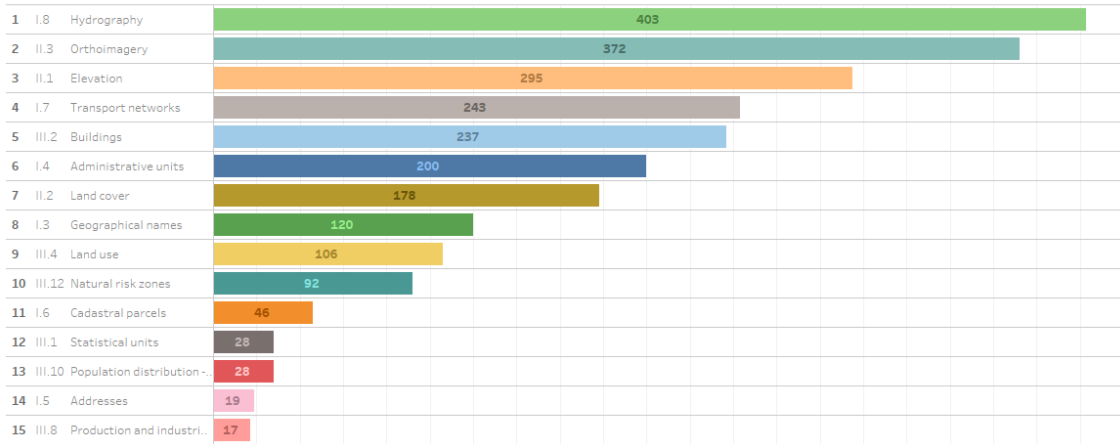


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What data are the Services looking for?



Ranking by INSPIRE themes for Emergency Services



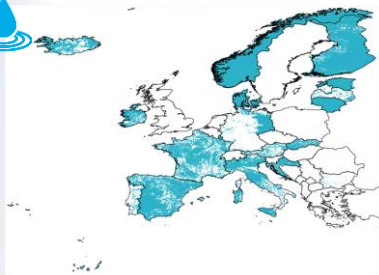
Rank	Dataset Name	Data Provider	Country	Hits	
1	Topographic Map of North Rhine-Westphalia	Geobasis NRW - Surveying and Mapping, Cologne Government Regional Office	Germany	63	
2	Base map 1: 5000	State Geodetic Administration of the Republic of Croatia (DGU)	Croatia	45	
3	DTK25 Digital Topographic Map 1:25000	Federal Agency for Cartography and Geodesy (BKG)	Germany	40	
4	Topographic Database	National Land Survey of Finland (NLS) / (MML)	Finland	35	
5	BDTRE - Geo-topographic database 2016 of Piedmont	Piedmont Region	Italy	35	
6	Buildings multi-country	European Environment Agency (EEA)	European Bodies	34	
7	EuroGlobalMap	EuroGeographics	European Bodies	33	
8	GSD-General Map	The Swedish mapping, cadastral and land registration authority	Sweden	32	
9	Digital orthophotos 0.4 m	Federal Agency for Cartography and Geodesy (BKG)	Germany	31	
10	Basic Landscape Model	Federal Agency for Cartography and Geodesy (BKG)	Germany	30	



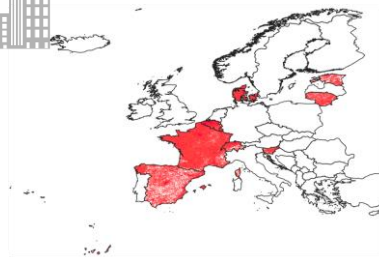
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Thematic multi-country datasets

Multi-country datasets are based on INSPIRE compliant and compatible data made available according to the INSPIRE Directive



Standing water



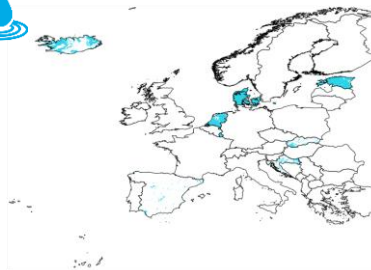
Buildings



Administrative Units



Watercourses



Wetlands



Land water boundary





In situ

EEA and EuroGeographics

- The EEA has signed an overarching Partnership agreement with EuroGeographics (March 2017)
- The EEA has evaluated key activities initiated by EuroGeographics with Copernicus' requirements in mind
- EuroGeographics involved in Copernicus in situ data coordination contract

Home » News » EEA and EuroGeographics sign agreement

Partnership agreed to improve access to pan-European maps for Copernicus users

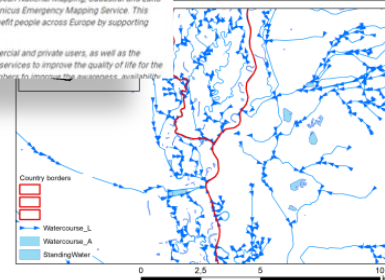
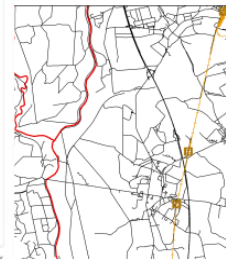
Users of Copernicus services are set to benefit from a new partnership which improves access to pan-European maps and land information from official sources. The cooperation agreement signed today (29 March 2017) between the European Environment Agency (EEA) and EuroGeographics signals a commitment to make more national authoritative geospatial information available through the European Commission's flagship initiative for earth observation and monitoring.



Left: Executive Director Hans Bruyninckx (EEA); Middle: Miki Gory, Secretary General and Executive Director (EuroGeographics); Right: Anders Sandin, Chair of the EuroGeographics Copernicus Knowledge Exchange Network.

Mrs Ingrid Vanden Bergh, President, EuroGeographics said: "Our members, the European National Mapping, Cadastral and Land Registry Authorities, already provide data to crisis response teams through the Copernicus Emergency Mapping Service. This new agreement strengthens and builds on their relationship with the EEA and will benefit people across Europe by supporting wider initiatives underpinned by pan-European harmonised data."

Dr Hans Bruyninckx, Executive Director, EEA said: "Policy makers, researchers, commercial and private users, as well as the global scientific community all use information provided by the different Copernicus services to improve the quality of life for the citizens of Europe. We are delighted to be working with EuroGeographics and its members to improve the awareness, availability





In situ

EEA and NMCA's – bilateral agreements

- EEA has signed 24 bilateral agreements with NMCA's
- Scope: Emergency Management Service
 - Limited purpose for EMS production
 - Acknowledgement required
 - No other re-use allowed
- Online national data covered:
 - Ortophotos, accuracy around 0.5m
 - Raster maps >1:50.000
 - Vector data > 1:50.000 (admin boundaries, transport, hydrography...)
 - DEM 1m-25m



Country	Date of signature
Germany	18/05/2016
Iceland	25/11/2016
Cyprus	28/11/2016
Czech Rep.	28/11/2016
Georgia	29/11/2016
Spain	29/11/2016
Greece	30/11/2016
Denmark	01/12/2016
Sweden	02/12/2016
Northern Ireland	02/12/2016
Malta	05/12/2016
Estonia	06/12/2016
Italy	13/12/2016
Portugal	13/12/2016
Azerbaijan	14/12/2016
France	15/12/2016
Belgium	22/12/2016
Romania	22/12/2016
Lithuania	22/12/2016
Slovenia	03/01/2017
Slovakia	07/02/2017
Finland	23/11/2017
Albania	22/12/2017
Ireland	22/12/2017





In situ

Towards a single agreement

- Members are now signing bilaterally Copernicus Service Framework Agreements with EuroGeographics
 - Annex I – Emergency Service
- Other Annexes (Land and Security) in preparation
- One single license agreement between EuroGeographics and EEA
- Implementation under EEA in situ coordination activities



Copernicus Services Framework Agreement

Between: EuroGeographics AISBL, an international non-profit organisation under Belgian Law, with its registered office at address Rue du Nord, 76, 1000 Brussels, Belgium.
Registration N°833.607.112

Hereafter "EuroGeographics" or "the Association";

Hereby duly represented by [.....];

And: [Name] a national organisation having the status of a [.....] registered under the laws of [.....] with its registered address [.....]
Registration N° (if any)
VAT N° (if any)
Hereafter "the Member";
Hereby duly represented by [.....];

Annex 1

1. This Annex

Parties have entered into a Copernicus Services Framework Agreement, the "Agreement" on [.....]. Under this Agreement, the Member grants a license to EuroGeographics to use, apply and exploit authoritative Geospatial or the Copernicus Emergency Management Services. There will be a reference to the EEA. The EEA will only be allowed to sub-license to its service users in the framework of the Copernicus Services and in accordance with the next.

The relationship between the Parties is governed by the Agreement, as amended by this Annex, which forms an integral part of the Agreement. The definitions in the Agreement have the same meaning in this Annex. In case of discrepancies between the Agreement and this Annex, the terms of the Agreement will prevail.

In this Annex, the Parties agree to enable the access and use of authoritative Geospatial Data for the Copernicus Emergency Management Service "EMS".

2. and use of Geospatial Data for EMS

The following data will be granted:

- Orthophotos, accuracy = to or better than 0.5 m
- Raster topographical maps 1:50 000 or larger
- Referenced datasets in vector format with an accuracy equivalent to a scale of 1:50 000 or larger (please select all you give permission for)
- ☐ administrative boundaries
- ☐ transportation infrastructure
- ☐ built up areas
- ☐ toponyms / place names
- ☐ hydrography
- ☐ buildings
- ☐ addresses
- ☐ cadastral parcels
- ☐ other (please detail)





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Concluding remarks

- NMCA's are already contributing essential data to Copernicus services (e.g., via CORDA) but there are still important gaps to fill
- State of Play reports and factsheets includes a detailed discussion of requirements per product, their use, and their criticality;
- A fruitful cooperation and exchange of information and ideas is already ongoing via EuroGeographics;
- The upcoming Partnership Agreement reflects a joint vision on cooperation and data sharing.





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Thank you for your attention

jose.rubio@eea.europa.eu

