

Modern Cartography at BEV

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BEV - Bundesamt für Eich- und Vermessungswesen



Content

- **New analogue und digital Products**
 - The new official map series
 - AMap mobile
 - International datasets
- **Current Developments**
 - Deriving KM50-V automatically
 - Modification of production environment
- **Possible Products and Services**

Content

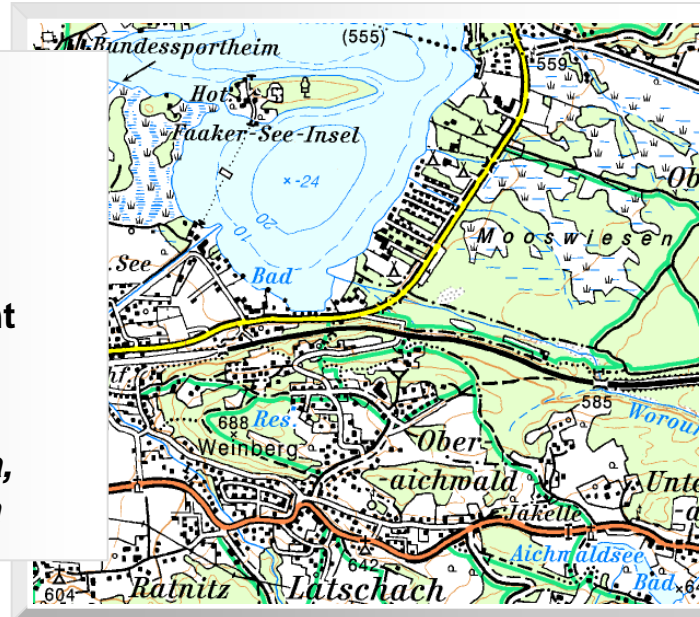
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Kartographische Modelle

structured
digital
availability
of
map content



*Raster data,
Vektor data*



KM50-R (KM50-V)
KM200-R
KM250-V
KM500-V (KM500-R)

Cartographic
Models
are
Scale dependent!

Digital provision in BEV Geoportal

Analogue map series since 2011

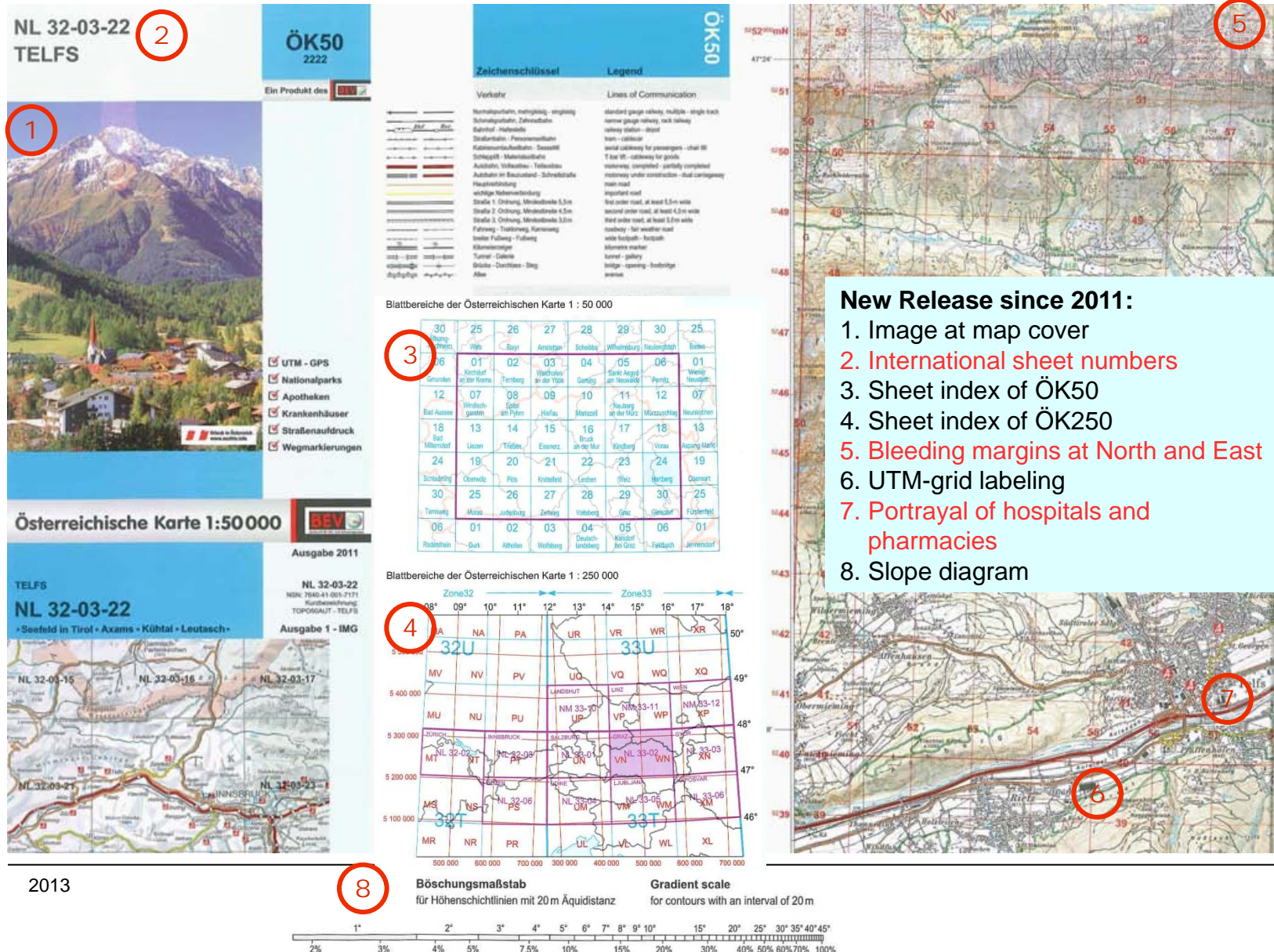


- ÖK25V enlargement of ÖK50
- ÖK50 basic map series
- ~~ÖK200~~ map series of provinces
- ÖK250 medium scale map series
- ÖK500 small scale map
- region maps 1: 50 000, 1: 25 000

civilian-military
abandoned
civilian-military
civilian-military

**civilian - military maps for
national crisis and disaster management**

New civilian-military release of ÖK50



New civilian-military release of ÖK250

NM 33-12 WIEN

ÖK250

Ein Produkt des **BEV**

Topographische Karte

UTM - GPS
Krankenhäuser
Straßenaufdruck
Straßennummern

Österreichische Karte 1:250 000

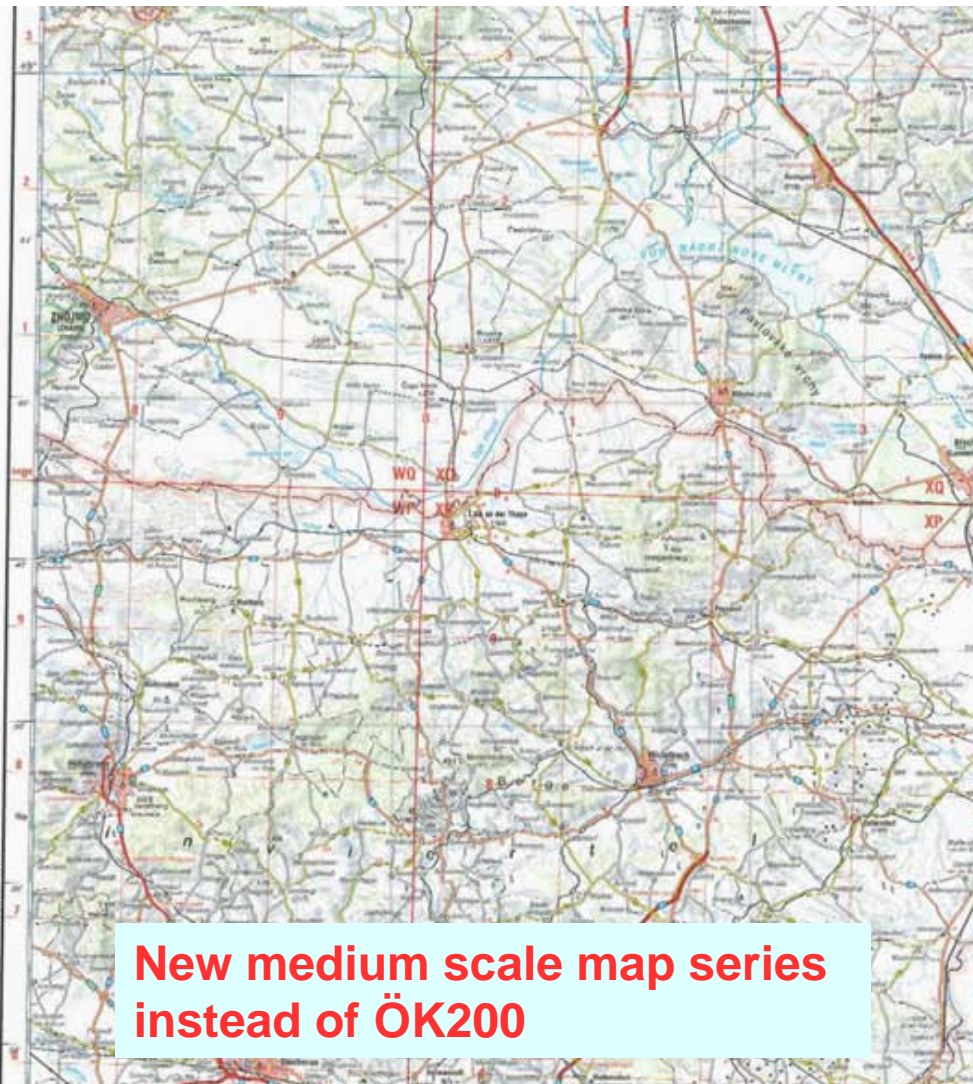
NM 33-12
BAG Vermessungsamt
750-5-100-1121
Rechenweg
140512-7
Ausgabe 1-IMG

Wien
Wienerwald • Weinviertel • Bratislava

Legend

Zeichensystem

Legend symbols and descriptions for various features including roads, railways, water bodies, and administrative boundaries.



New medium scale map series instead of ÖK200

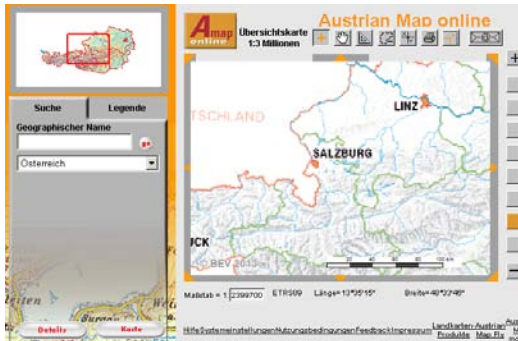
[illegible]

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Austrian Map - AMap

AMap online



www.austrianmap.at

AMap Fly 5.0 (DVD)



only few DVDs available
will be abandoned

AMap mobile



for iPhone and Android

Development of AMap mobile



- **Technical and organisational cooperation with swisstopo.ch**
- **Programing (iOS and Android) by external partner**
- **Launching of iOS – Edition: September 2012 (for iPhone und iPad)**
- **Launching of Android – Edition: March 2013 (from Android-Version 2.2 „Froyo“)**

Data inside App

In both editions:

- Overview map 1:1 Million (free of charge)
- Cartographic Model 1:500 000 (free of charge)
- Cartographic Model 1:200 000
- Cartographic Model 1:50 000
- Geonam
- Elevation model
- Data volume about 4 and 4,5 GB

Common Functions (iOS und Android)

- **Structure of menu is the same**
- **Continuous zooming in maps of all scales**
- **Recording of tracks using GPS**
- **Vertical profile of tracks**
- **Placing of POIs**
- **Searching via Geonam or coordinates**
- **Metadata of the displayed map sheet (KM50)**
- **Display of coordinates in UTM or WGS84**
- **Import / Export in GPX-format (for tracks)**
- **Use of compass (if available)**

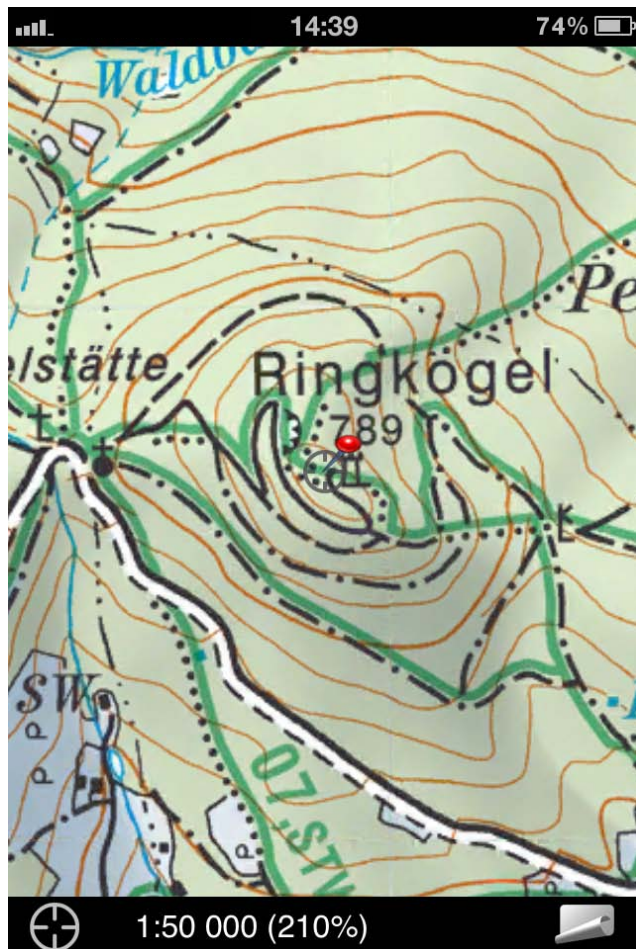
Differences between iOS and Android

In principle:

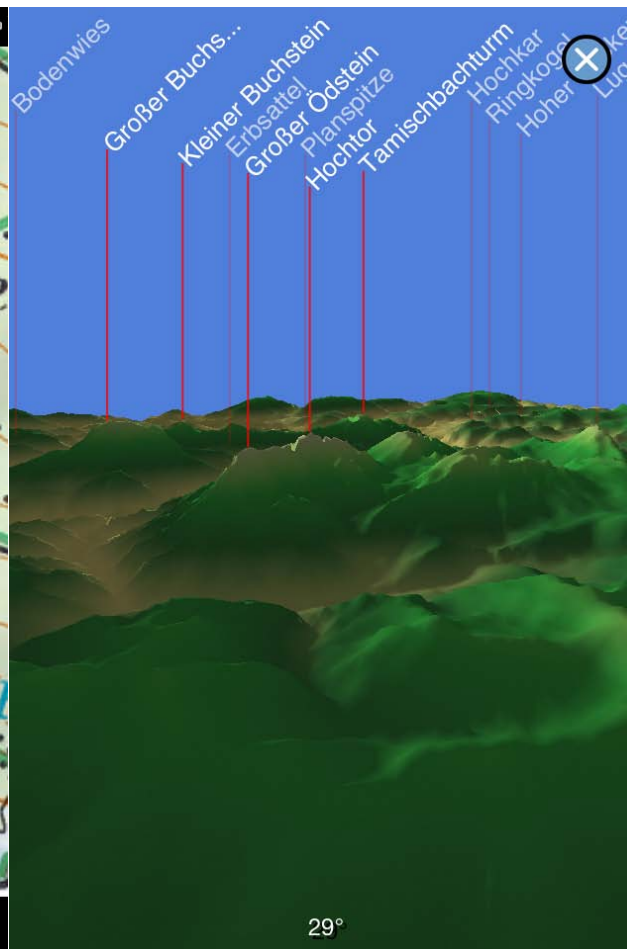
- Due to technical reasons there are differences in functionalities
- Usage and Performance are dependent on device and Android-version
- Development for iOS is „easier“
- Fewer functions at Android (i.e. no Panorama- and Augmented Reality function) result in more stability

iOS views

View 1:50 000 with POI



Panorama-View



Track-Infos and vertical profile



iOS views

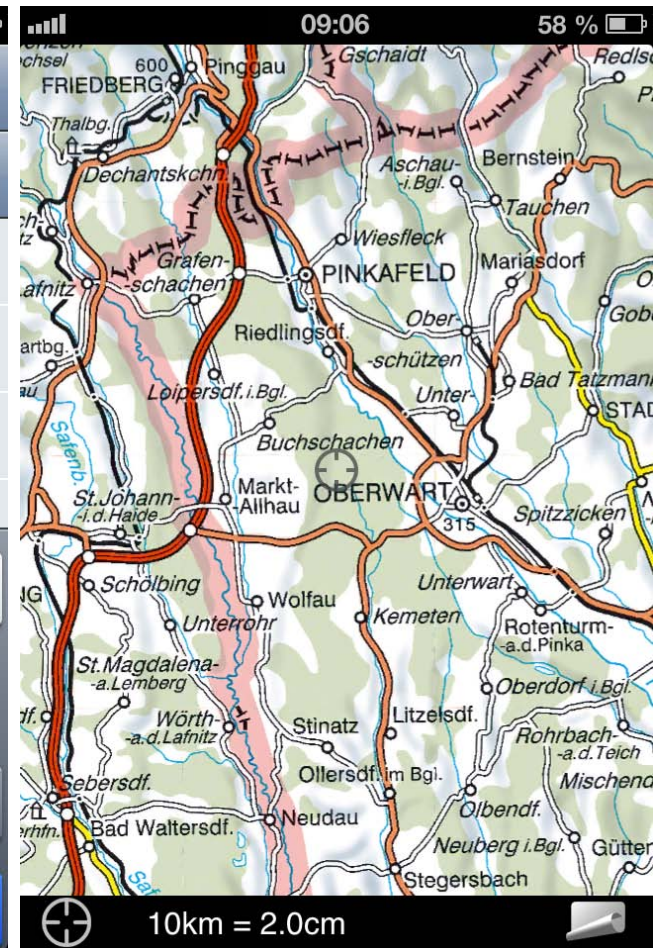
Editing Tracks



Search via Geonam

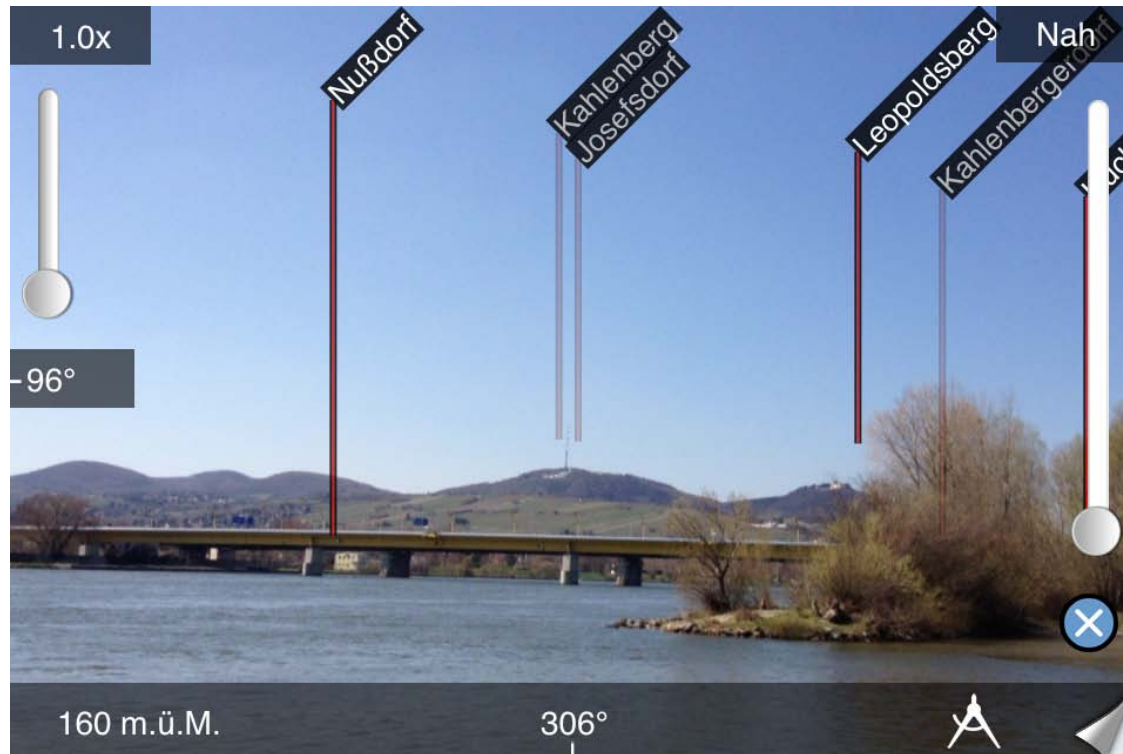


View 1:500 000



iOS views

Augmented Reality – View with iPhone

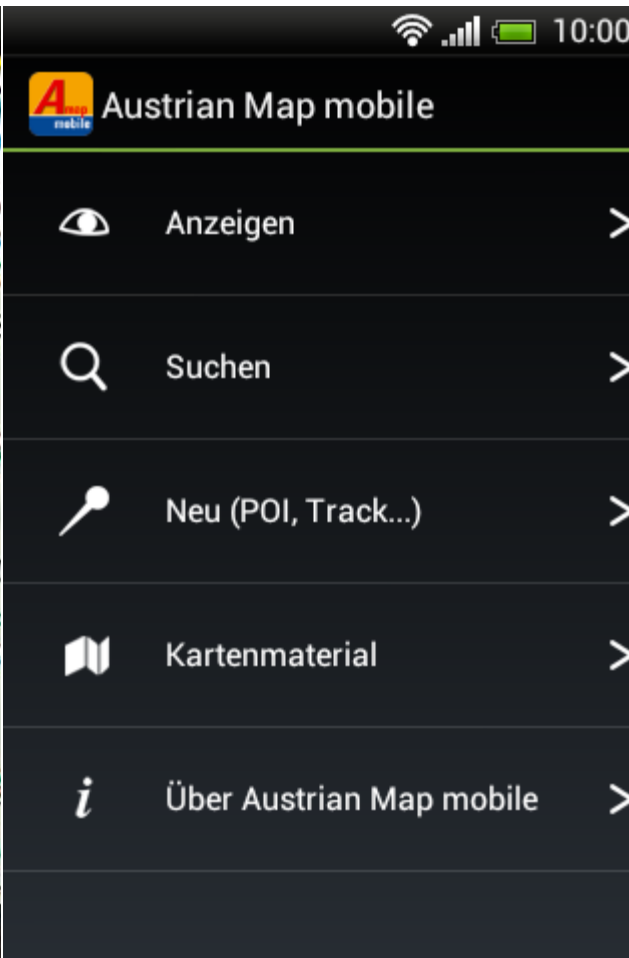


Android views

View 1:200 000



main menu



View 1:50 000 with Track

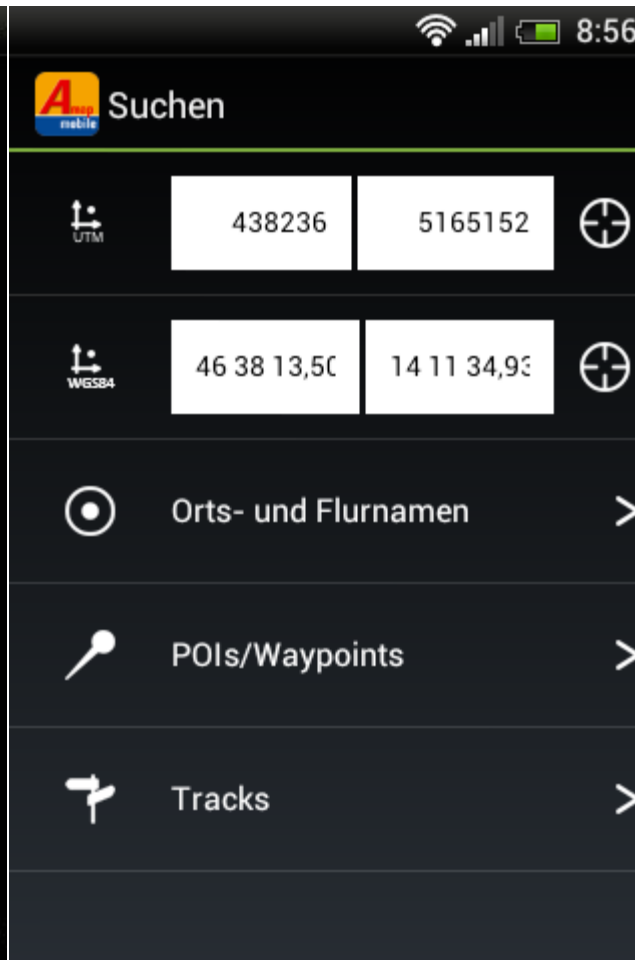


Android views

Metadata



Search menu



Search via Geonam



Problematic issues at Apps

- **Performance in case of weak processors / low RAM**
- **System crash at devices with low performance (low memory, usually at Android)**
- **unknown problems due to plenty of Android devices**
- **Problems with recovery of bought map data (Data Backup by users!)**
- **In general: Battery operation of Smartphones or Tablets is often too short for longer (walking-)tours**

Outlook

- **Continuous updates of map data**
- **Additions for Android: Panorama, Augmented Reality**
- **Developments for other operating systems are not planned**
- **Data add-ons (i.e. Orthophotos) are possible**
- **Further developments are matter of BEV strategy in future**

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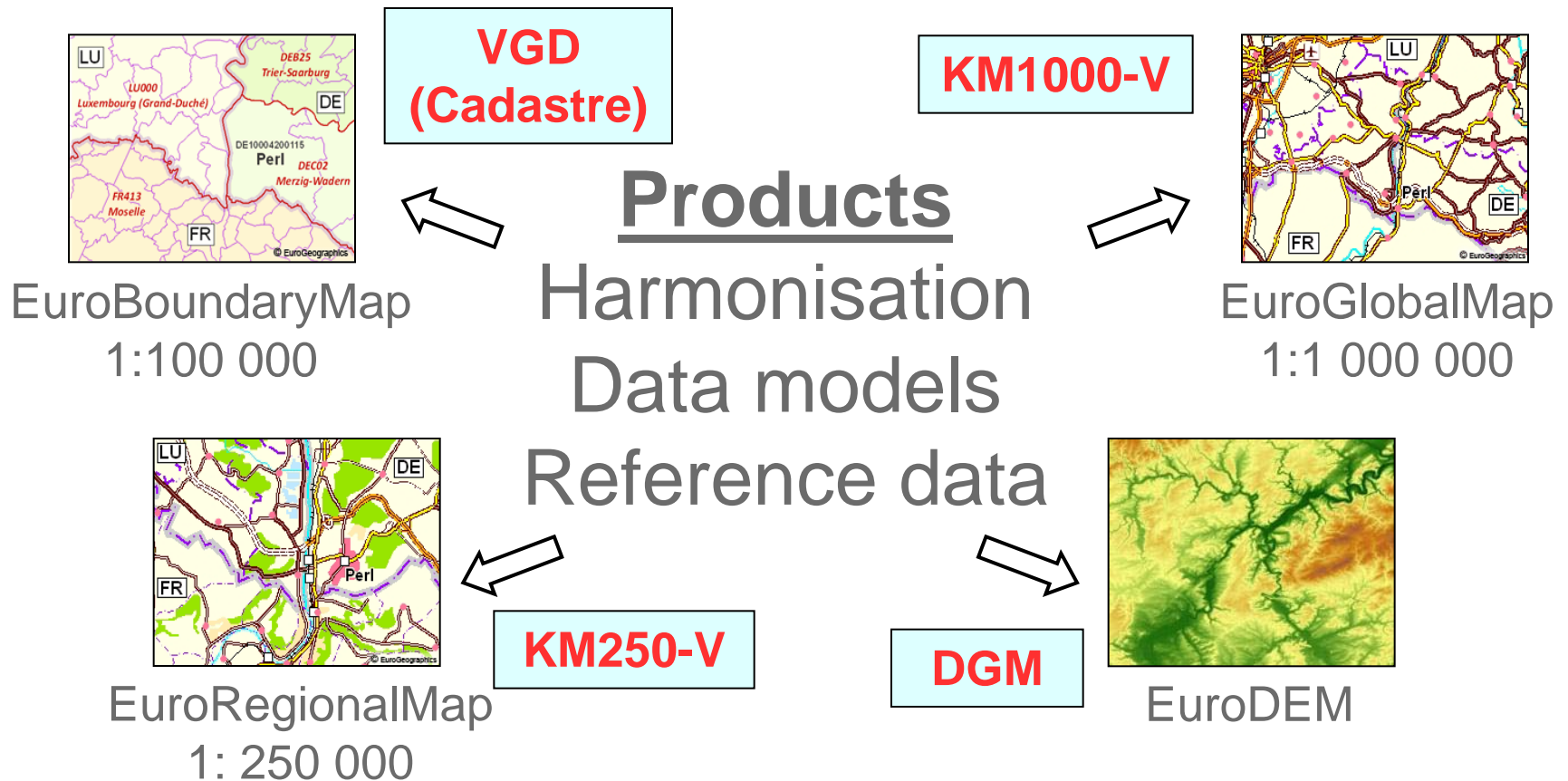
EuroGeographics

The logo for EuroGeographics, featuring the text "EuroGeographics" in white on a dark blue background with a yellow swoosh.

- Association of European National Mapping and Cadastral Agencies
- Currently 56 organisations from 45 countries
- www.eurogeographics.org



EuroGeographics Pan-European Datasets

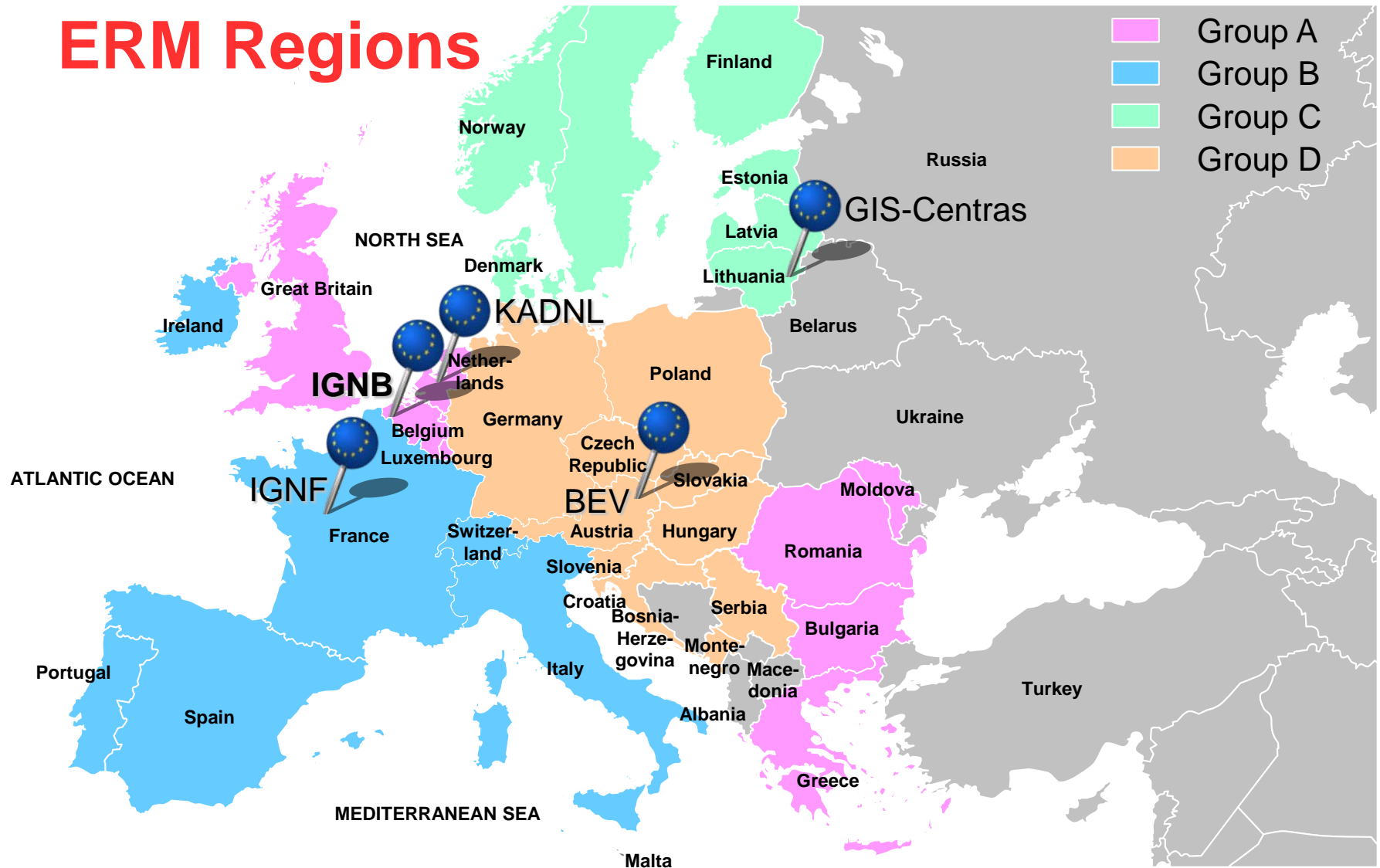


EuroRegionalMap (ERM)

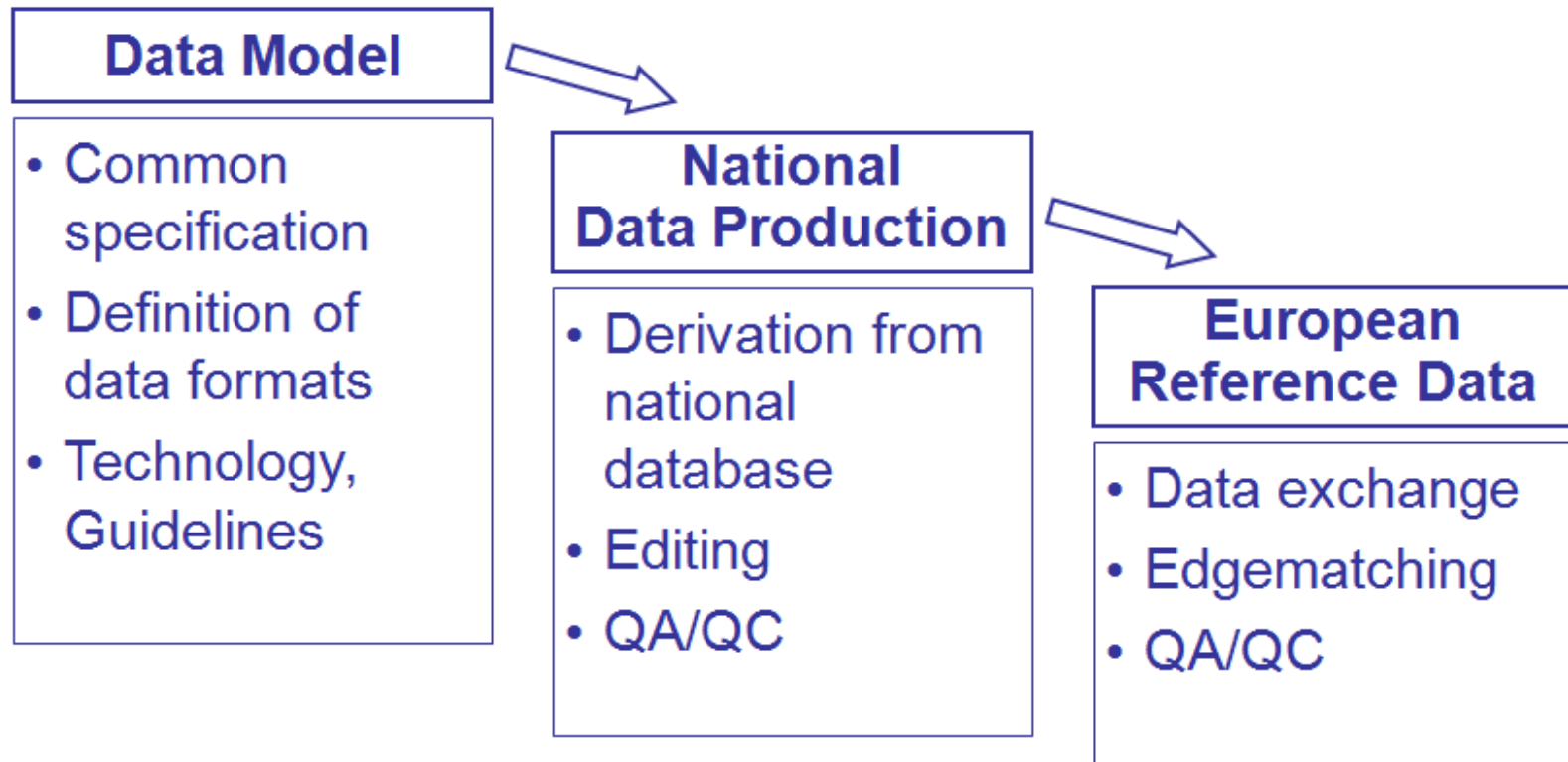
- Multifunctional topographical reference dataset
- Scale 1:250 000
- Thematic Layers:
 - Administrative boundaries
 - Hydrography (rivers, lakes, sea, wetland, glacier)
 - Transport Network (roads, railways, airports, ferry lines)
 - Settlements (built-up areas)
 - Vegetation and Soil (wood/forest, plantation, agricultural area)
 - Miscellaneous objects (national parks, points of interest)
 - Named Location (geographical names)
- Production manager: IGN, Belgium
- Production Management Team



ERM Regions



Workflow



Requirements

Coordinates	Geographical in degrees (longitude, latitude) with decimal fraction and based on the ETRS89 spatial reference system (which corresponds to WGS84 reference system)
Horizontal geometric resolution	equivalent precision of 5 meters or 0.2 in arc-seconds or 0.00005 in decimal degrees
Positional accuracy	125 meters
Minimum size of polygon	0.06 km ²
Feature coding structure	DIGEST FACC Edition 2.1, Sep. 2001
Character sets used	UNICODE system or ISO8859 –series
Metadata	According to INSPIRE

Data Schema

Simple feature class
PhysL

Geometry: Polyline
Contains M values: No
Contains Z values: No

Field name	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Object ID						
Shape	Geometry	Yes					
FCsubtype	Long integer	Yes	2		0		
glid	String	Yes					38
F_CODE	String	No					5
ICC	String	Yes					5
SN	Long integer	Yes			0		
PFH	Long integer	Yes	-29997		0		
USE_	Long integer	Yes			0		
VRR	Long integer	Yes			0		
Shape_Length	Double	Yes			0	0	

Subtypes of PhysL

Subtype field: FCsubtype
Default subtype: 2

Subtype Code	Subtype Description	Field name	Default value	Domain
2	Embankment/Fill	F_CODE	DB090	EuroRegionalMap_DB090
		PFH	-29997	
		USE_	0	PhysL_USE
		VRR	0	PhysL_VRR
1	Bluff/Climp Escarpment	F_CODE	DB010	EuroRegionalMap_DB010
		PFH	-32768	EuroRegionalMap_Null
		USE_	-32768	EuroRegionalMap_Null
		VRR	-32768	EuroRegionalMap_Null

Coded value domain
PhysL_USE

Description: Long integer
Field type: Duplicate
Split policy: Default value
Merge policy:

Code	Description
0	Unknown
69	Levee/Dike
127	As a Causeway
136	As a fill
997	Unpopulated

Coded value domain
PhysL_VRR

Description: Long integer
Field type: Duplicate
Split policy: Default value
Merge policy:

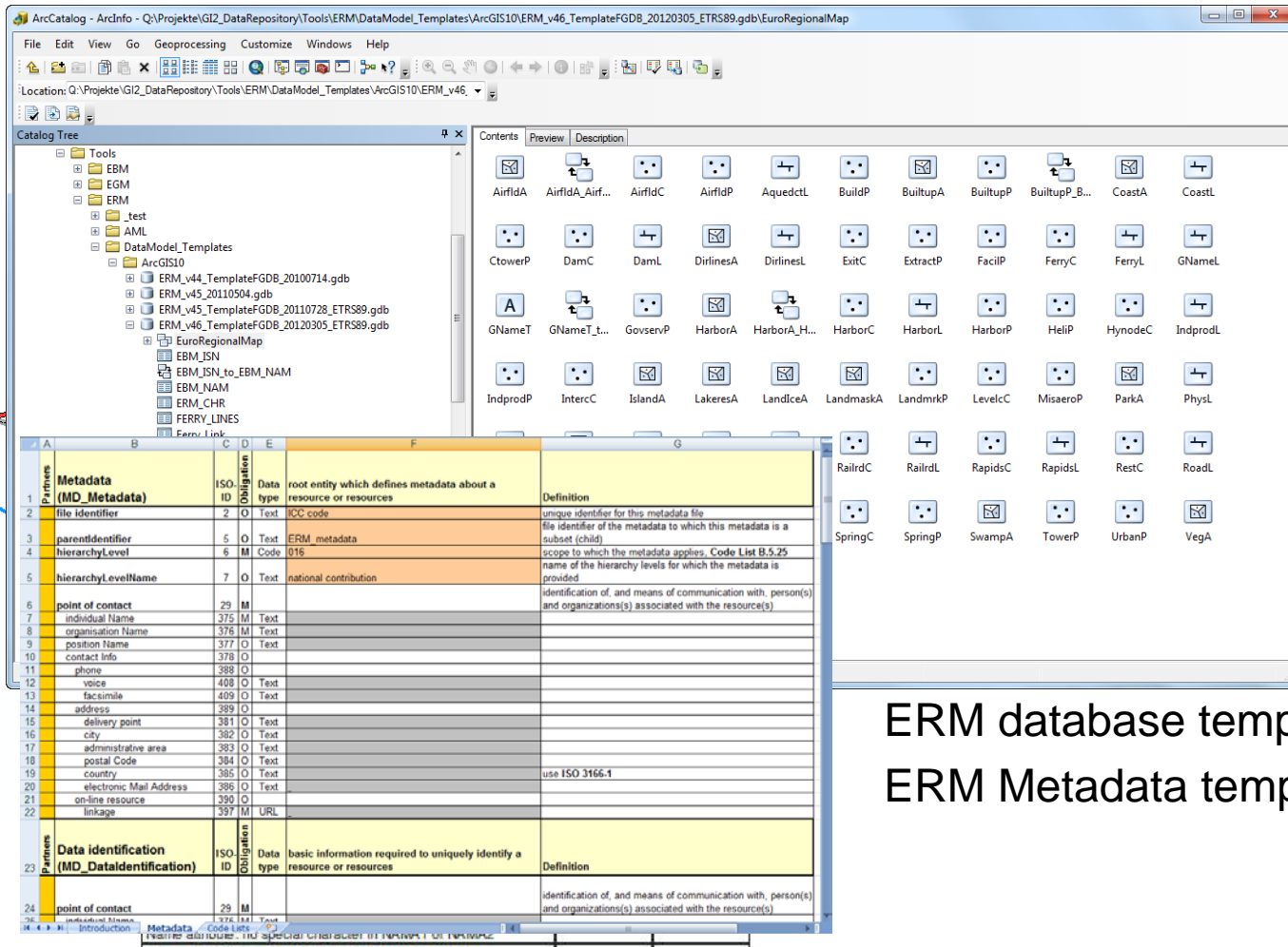
Code	Description
0	Unknown
1	Above Surface/ Does not cover
8	Covers and uncovers
997	Unpopulated
998	Not Applicable

Coded value domain
EuroRegionalMap_Null

Description: Long integer
Field type: Duplicate
Split policy: Default value
Merge policy:

Code	Description
-32768	Null/ No Value

Technical Documents



The screenshot displays the ArcCatalog interface with the 'EuroRegionalMap' project open. The 'Catalog Tree' on the left shows the project structure, including 'DataModel_Templates' and 'EuroRegionalMap'. The 'Contents' pane on the right lists various data layers, including 'AirfidA', 'AirfidC', 'AirfidP', 'AqueductL', 'BuildP', 'BuiltupA', 'BuiltupP', 'BuiltupP_B...', 'CoastA', 'CoastL', 'CtowerP', 'DamC', 'DamL', 'DirLinesA', 'DirLinesL', 'ExitC', 'ExtractP', 'FacilP', 'FerryC', 'FerryL', 'GNameL', 'GNameT', 'GNameT_...', 'GossenP', 'HarborA', 'HarborA_H...', 'HarborC', 'HarborL', 'HarborP', 'Helip', 'HynodeC', 'IndprodL', 'IndprodP', 'InterC', 'IslandA', 'LakeresA', 'LandiceA', 'LandmaskA', 'LandmrkP', 'LevelC', 'MisaeroP', 'ParkA', 'PhysL', 'RaildC', 'RaildL', 'RapidsC', 'RapidsL', 'RestC', 'RoadL', 'SpringC', 'SpringP', 'SwampA', 'TowerP', 'UrbanP', and 'VegA'.

The 'Metadata (MD_Metadata)' table is displayed in the foreground, showing the following data:

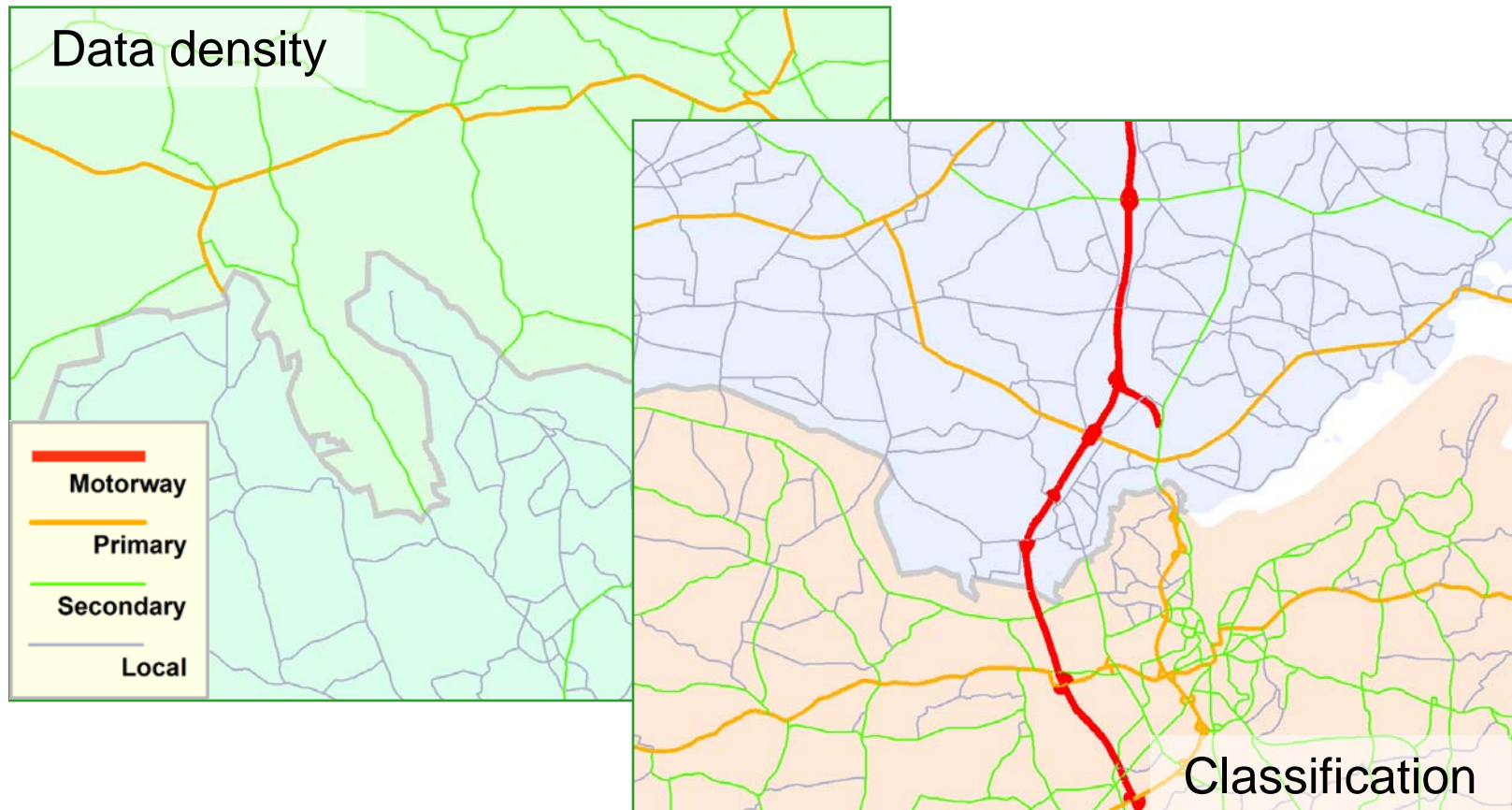
Partners	Metadata (MD_Metadata)	ISO ID	Obligation	Data type	Definition
1	file identifier	2	O	Text	unique identifier for this metadata file
2	parentIdentifier	5	O	Text	file identifier of the metadata to which this metadata is a subset (child)
3	hierarchyLevel	6	M	Code	scope to which the metadata applies, Code List B.5.25
4	hierarchyLevelName	7	O	Text	name of the hierarchy levels for which the metadata is provided
5	point of contact	29	M	Text	identification of, and means of communication with, person(s) and organizations(s) associated with the resource(s)
6	individual Name	375	M	Text	
7	organisation Name	376	M	Text	
8	position Name	377	O	Text	
9	contact info	378	O	Text	
10	phone	389	O	Text	
11	voice	408	O	Text	
12	facsimile	409	O	Text	
13	address	389	O	Text	
14	delivery point	381	O	Text	
15	city	382	O	Text	
16	administrative area	383	O	Text	
17	postal Code	384	O	Text	
18	country	385	O	Text	use ISO 3166-1
19	electronic Mail Address	386	O	Text	
20	on-line resource	390	O	Text	
21	linkage	397	M	URL	
22	Data identification (MD_DataIdentification)	ISO ID	Obligation	Data type	Definition
23	point of contact	29	M	Text	identification of, and means of communication with, person(s) and organizations(s) associated with the resource(s)

ta
Production

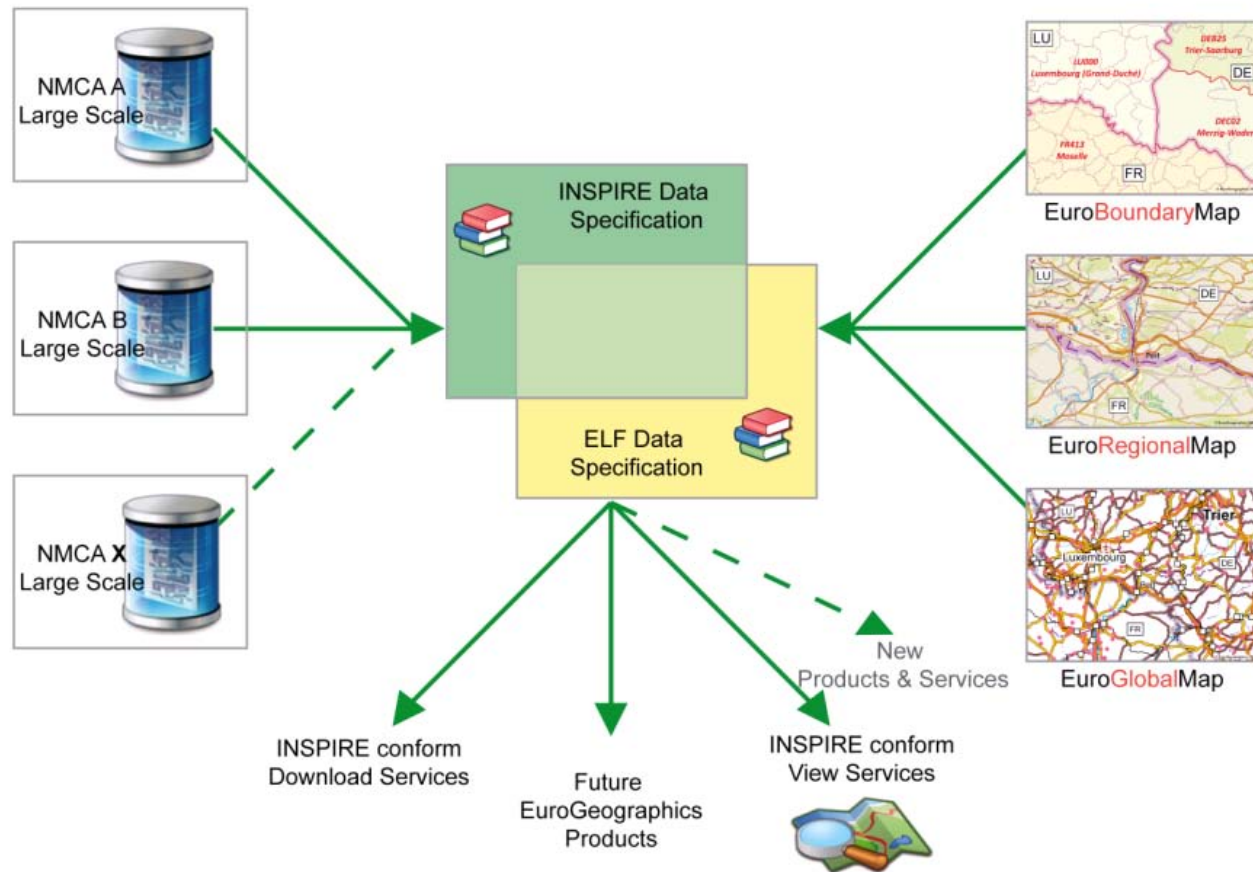
on

ERM database templates
ERM Metadata templates

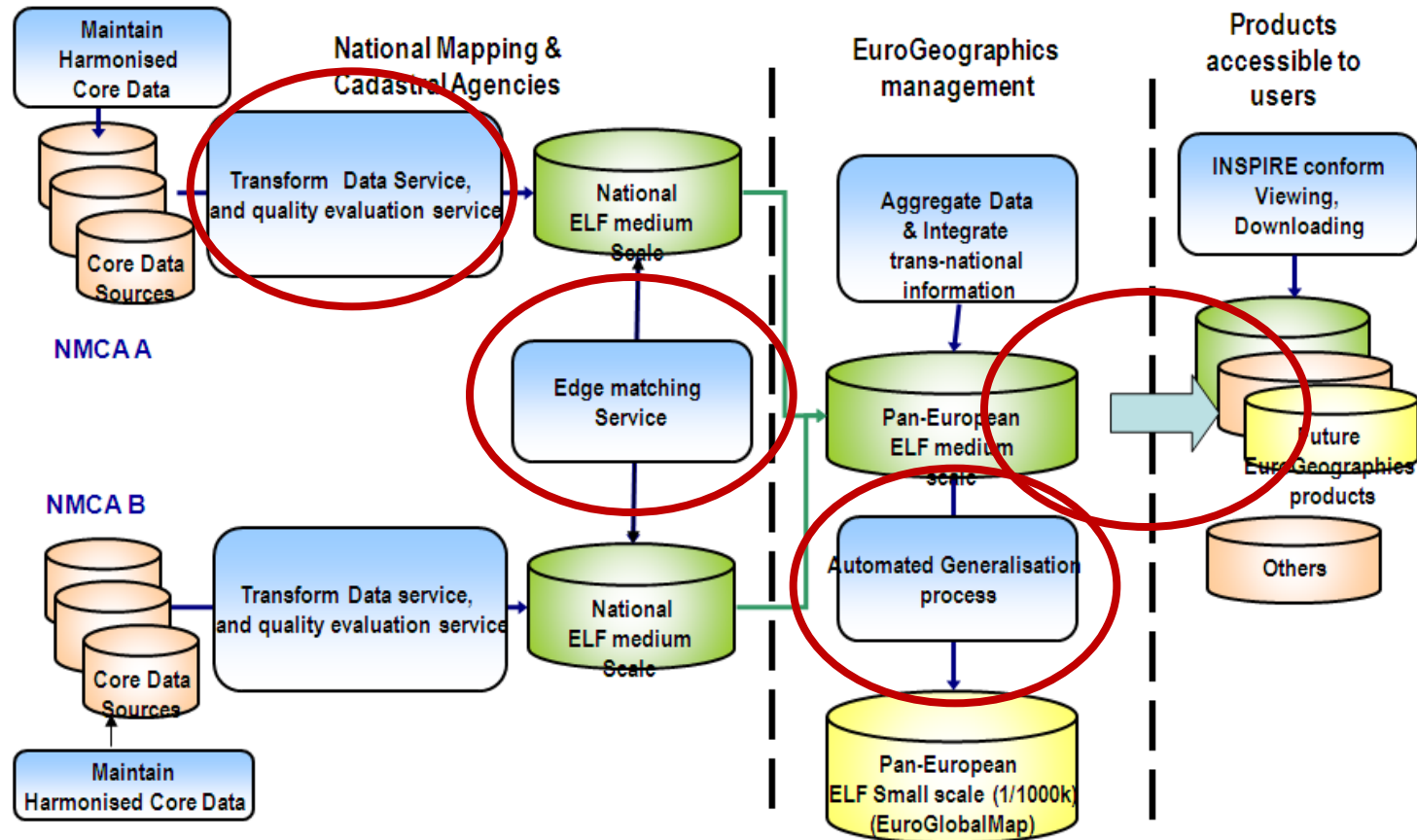
Challenges in Data Harmonisation



ERM in Future (ELF medium scale)



ERM in Future (ELF medium scale)



Content

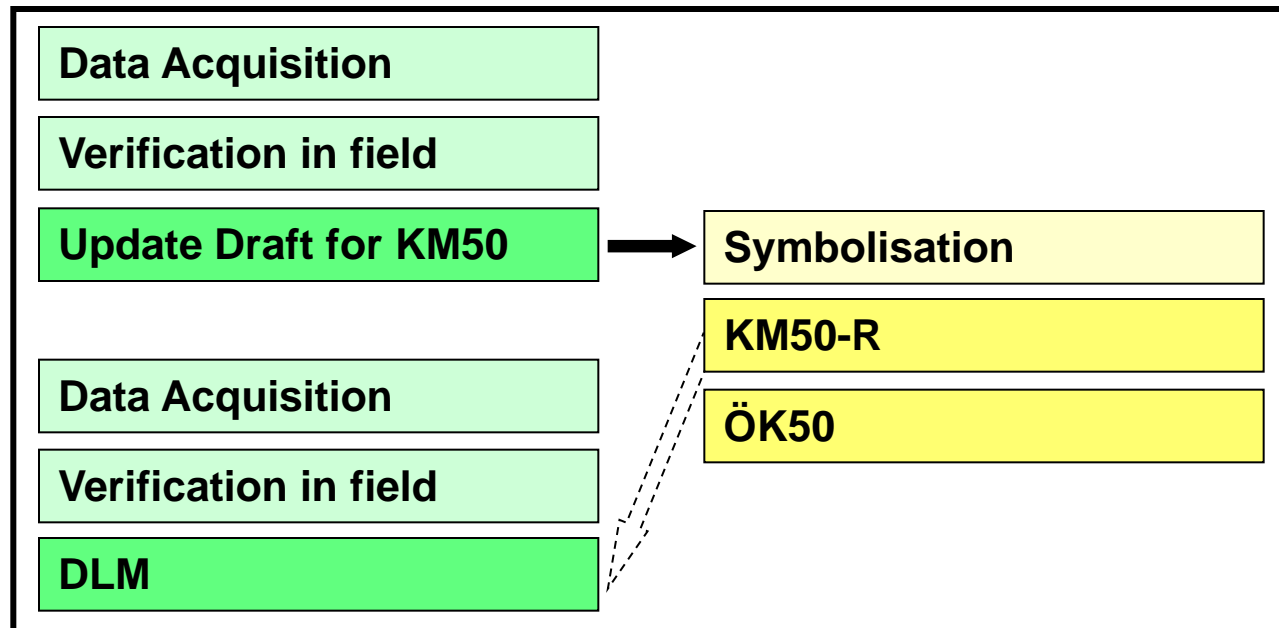
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Motivation

- **GIS-based map production**
 - **Intelligent map data**
 - Support Automation
 - Fast maintenance process
 - **Many products from one GIS-dataset**
 - Topographic maps for WEB
 - Digital map data inside GIS
 - Printed maps

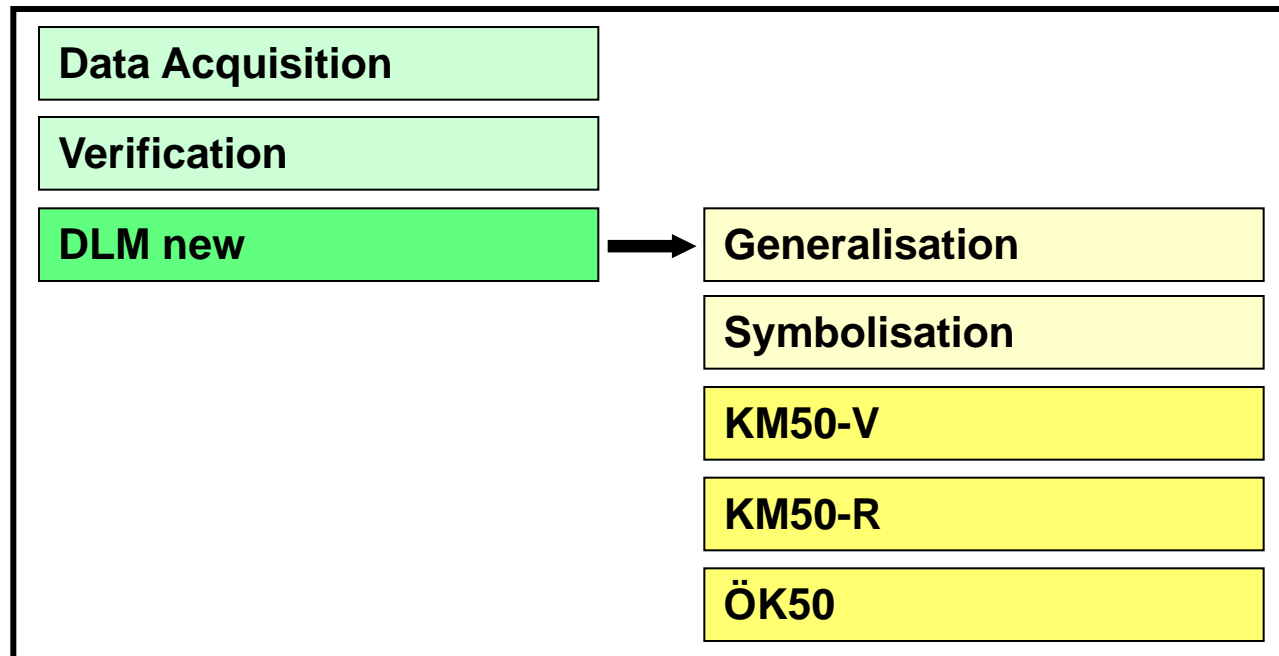
Production process DLM / KM

So far:



Production process DLM / KM

New:



Status of generalization module



automatic generalization

model generalization DLM

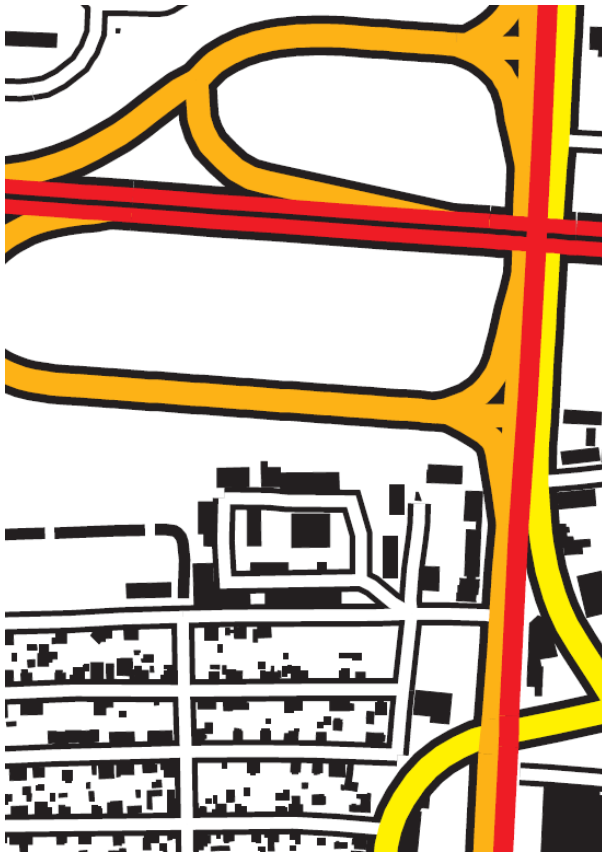
selection (lines)

displacement (lines)

generalization of buildings

line object ... road, foot path, railway, river

Examples

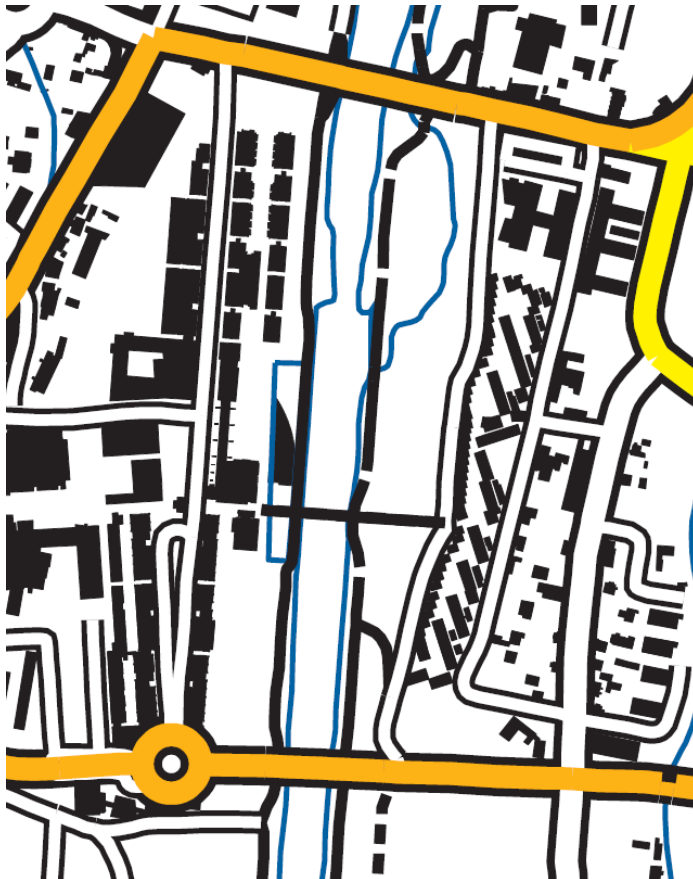


DLM symbolized for 1:50 000

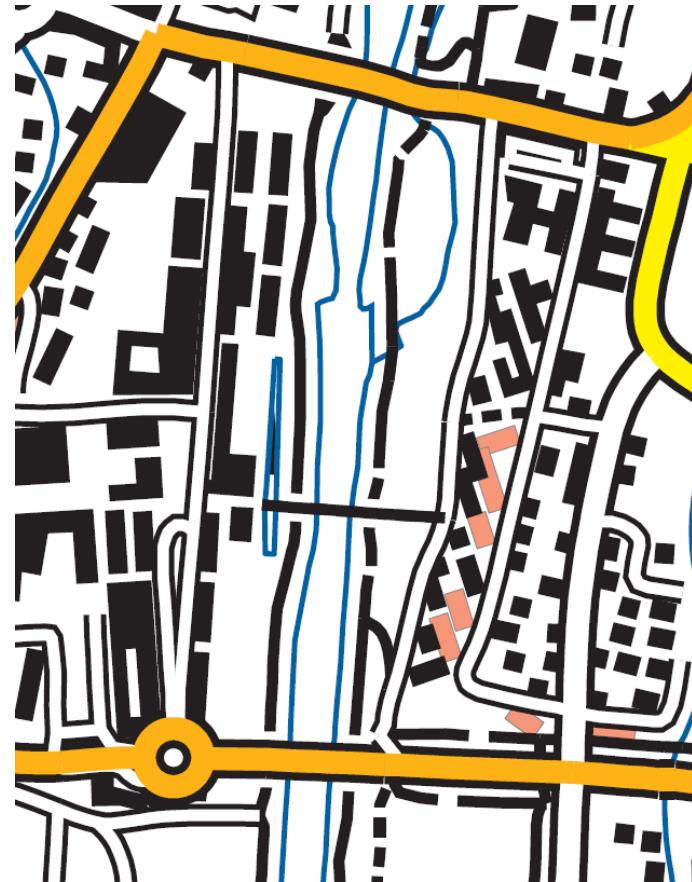


KM50-V

Examples



DLM symbolized for 1:50 000



KM50-V

Examples



DLM symbolized for 1:50 000



KM50-V

Content

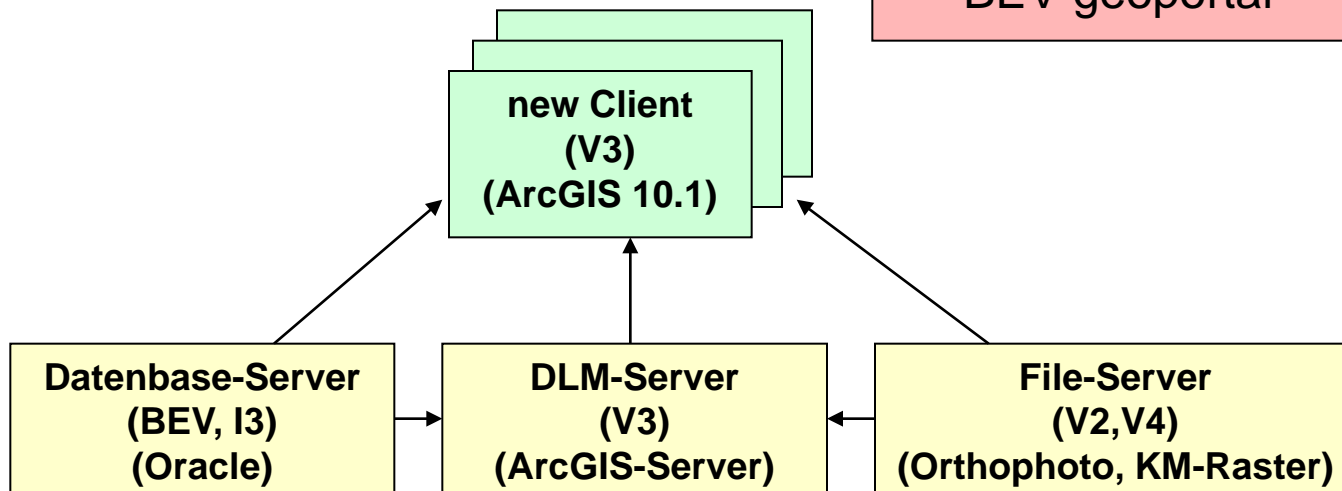
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DLM Migration

- ArcGIS 10.1
- Oracle Datenbank

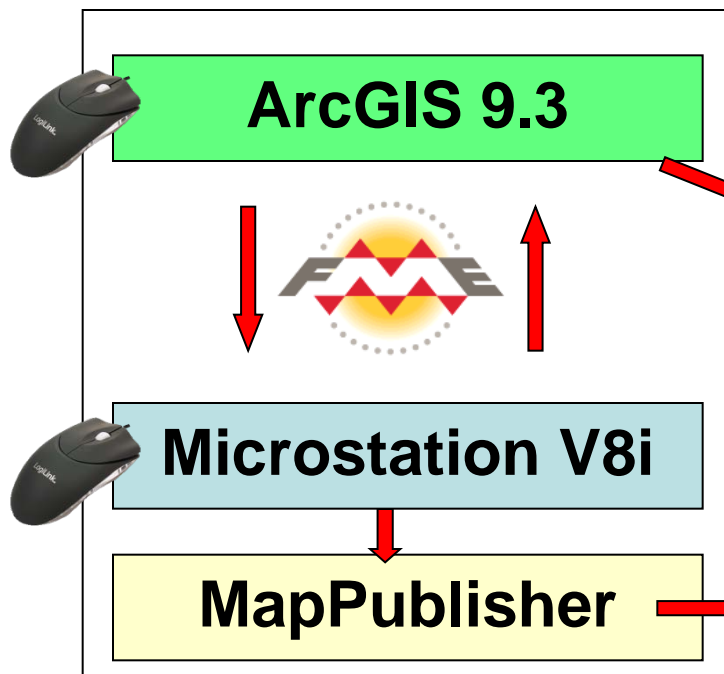
Data model in line with

- Cartographic Models
- INSPIRE
- BEV geoportal

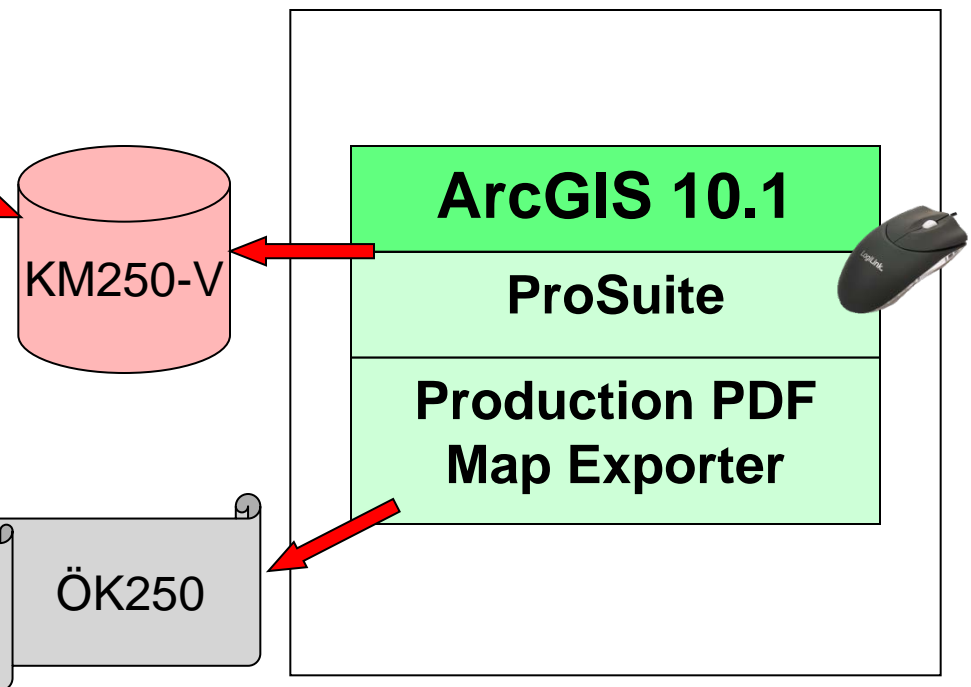


KM250-V Editing with ArcGIS

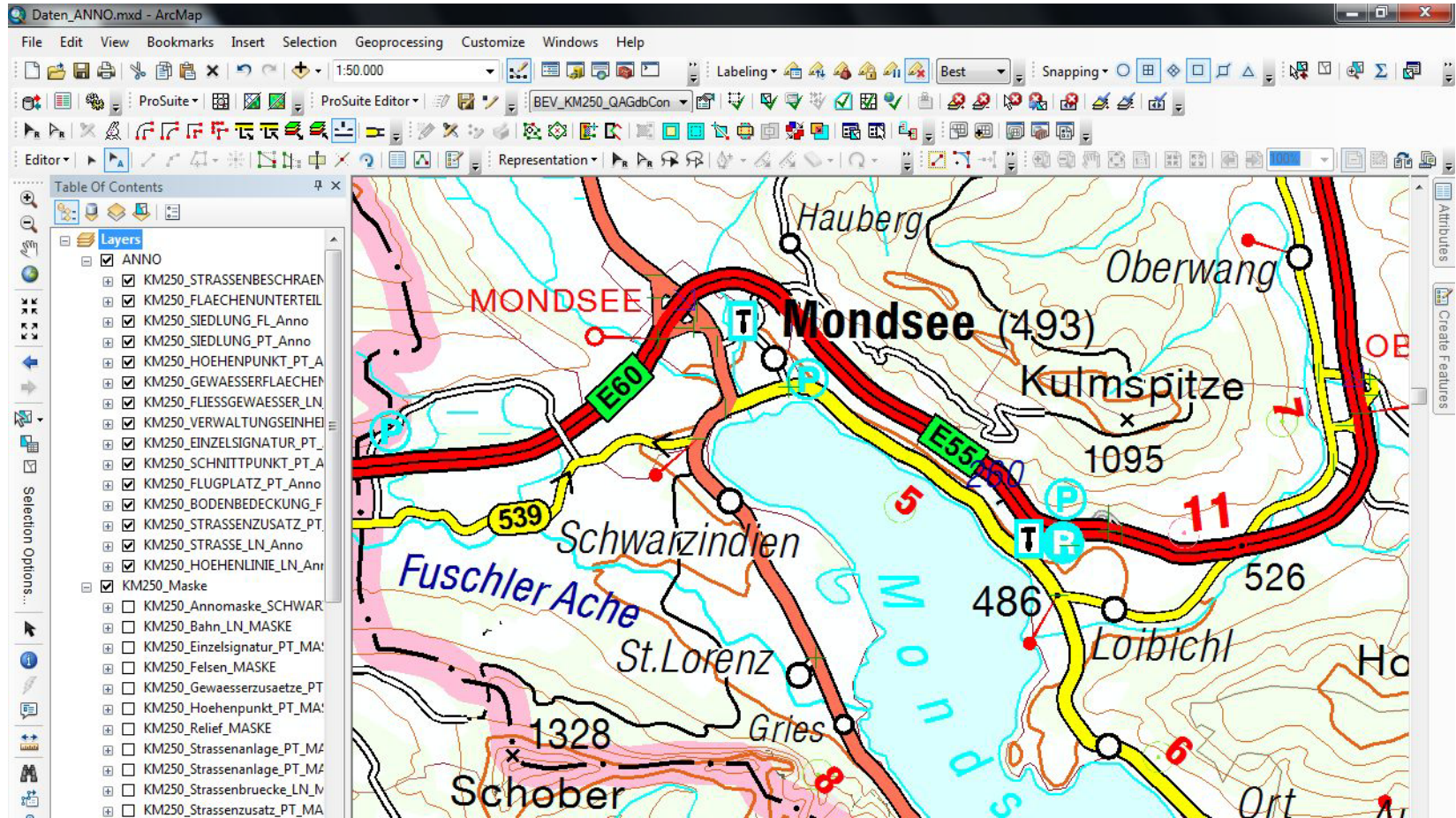
Right now:



In testing:



KM250-V Editing with ArcGIS



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Possible Products and Services

- KM10-V, KM25-V
- GeoService of Cartographic Models
- Print-on-demand

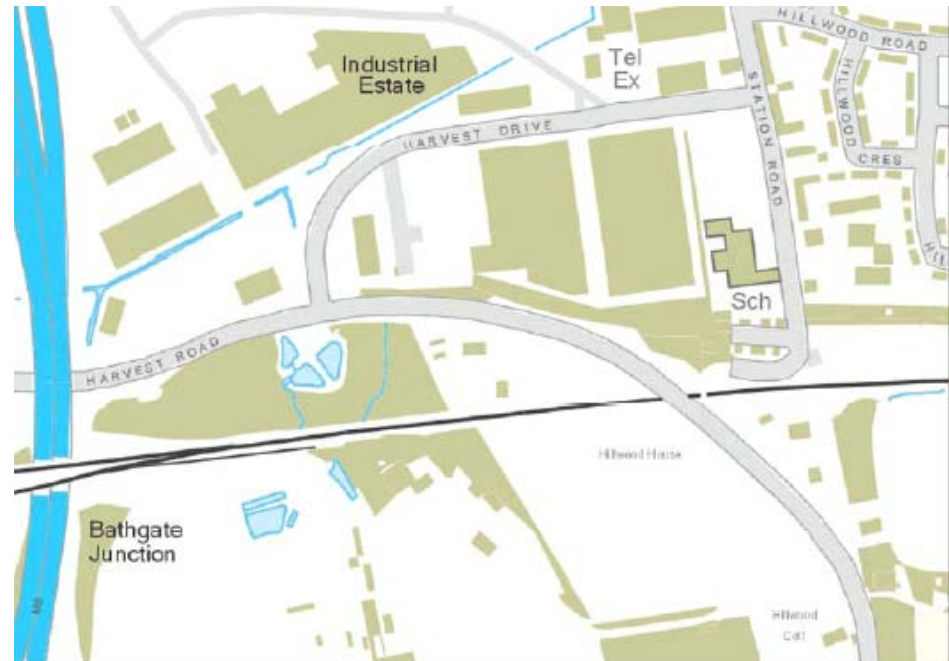
KM10-V

- Vector data resp. online maps in scale 1:10 000
 - Derived from DLM with buildings and street names
 - Symbolized for 1:10 000
- Examples in Europe
 - KMS - National Survey and Cadastre of Denmark



KM10-V

- Vector data resp. online maps in scale 1:10 000
 - Derived from DLM with buildings and street names
 - Symbolized for 1:10 000
- Examples in Europe
 - Ordnance Survey GB
OS VectorMap Local



KM10-V

- Vector data resp. online maps in scale 1:10 000
 - Derived from DLM with buildings and street names
 - Symbolized for 1:10 000
- Examples in Europe
 - LVG Bayern: Digitale Ortskarte 1:10 000 - DOK



KM25-V

- Vector data resp. online maps in scale 1:25 000
 - Derived from DLM
 - Symbolized for 1:25 000
- Examples in Europe
 - Swisstopo: DKM25



KM25-V

- Vector data resp. online maps in scale 1:25 000
 - Derived from DLM
 - Symbolized for 1:25 000
- Examples in Europe
 - Ordnance Survey GB
OS VectorMap District




GeoService of Cartographic Models

- Multi-scale web mapping
 - Designing not just one map but
 - 20 zoom levels
 - of increasing content
 - all consistent

➔ Combination with foreground information from GIS

➔ Integration in foreign applications



Zoom Level	Map Scale
19	1 : 1,128.497176
18	1 : 2,256.994353
17	1 : 4,513.988705
16	1 : 9,027.977411
15	1 : 18,055.954822
14	1 : 36,111.909643
13	1 : 72,223.819286
12	1 : 144,447.638572
11	1 : 288,895.277144
10	1 : 577,790.554289
9	1 : 1,155,581.108577
8	1 : 2,311,162.217155
7	1 : 4,622,324.434309
6	1 : 9,244,648.868618
5	1 : 18,489,297.737236
4	1 : 36,978,595.474472
3	1 : 73,957,190.948944
2	1 : 147,914,381.897889
1	1 : 295,828,763.795777
0	1 : 591,657,527.59155

**Bing/Google/Esri
scale/zoom levels**

GeoService of Cartographic Models

Zoom Level	Map Scale
19	1 : 1,128.497176
18	1 : 2,256.994353
17	1 : 4,513.988705
16	1 : 9,027.977411
15	1 : 18,055.954822
14	1 : 36,111.909643
13	1 : 72,223.819286
12	1 : 144,447.638572
11	1 : 288,895.277144
10	1 : 577,790.554289
9	1 : 1,155,581.108577
8	1 : 2,311,162.217155
7	1 : 4,622,324.434309
6	1 : 9,244,648.868618

Orthophoto

Cadastre

KM10-V

KM25-V

KM50-V

KM250-V

KM500-V

KM1000-V

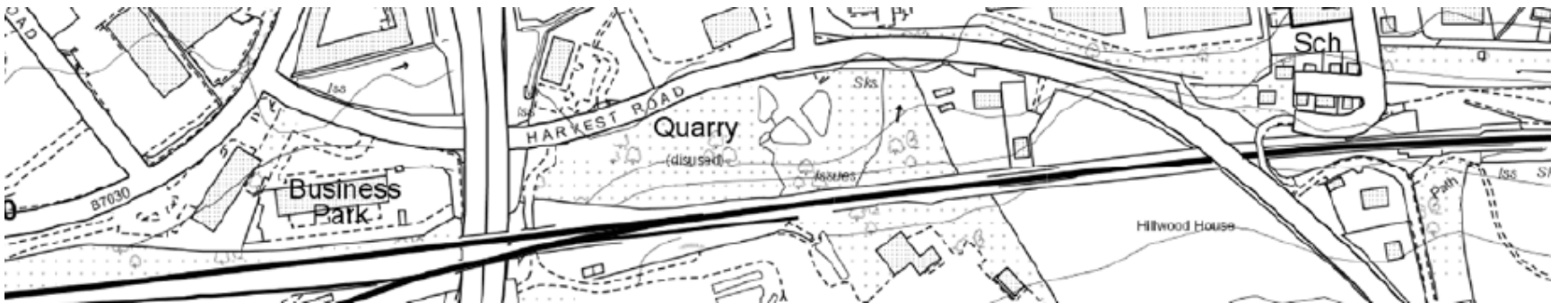
GeoService of Cartographic Models

- With different map designs



GeoService of Cartographic Models

- With different map designs



Print-on-Demand

- Service for printing (plotter) of personalized maps
 - Individual map extent, map title, image for map cover,
- Examples in Europe
 - Ordnance Survey GB
 - NLS Finland
 - IGN Belgium
 - IGN France
 - Lantmäteriet Sweden



Print-on-Demand

OS Select: Your own custom maps in a few easy steps



Make my map ▶

From **£16.99**

Map options

Choose the map type

OS Explorer (1:25 000) (20x20km) ▼

Choose the map format


Folded (800x800mm) ▼

Choose a language for the map key

English ▼

CONTINUE
Personalise your map

Your map's centre
Your map's area
Map cover design
OS Select



This is a preview of your map showing the surrounding area. Within the red square, indicates the area covered by your map.

You can also preview the **your map's central area** if you need to.

You can adjust the centre point of your map using the arrow tools provided, but be aware - **the location name** ("greenwich") and **your map centre may no longer be the same place!**

You can always **re-centre the map on your original location.**

Print-on-Demand

OS Select: Your own custom maps in a few easy steps



From **£16.99**

Personalise your map

Choose an image for the map cover

Give your map a title (up to 16 characters)

...and a sub-title (up to 32 characters)

ADD TO BASKET - £16.99

Your map's centre

Your map's area

Map cover design

OS Select

Choose an image for your map cover

OS
Ordnance
Survey

OS Select™

Karte Pro V

Personalisierte Karte

Explorer Map

Preview is an approximation of final design

2013

BEV – Department Cartography

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Questions

